Session Border Controllers (SBC)

Multi-Service Business Routers (MSBR)

Mediant™ Series

Command Line Interface (CLI) Reference Guide

HD VoIP Sounds Better

Version 6.8

December 2016

Document # LTRT-17923

AudioCodes

Table of Contents

1 Introduction 21

2 Document Conventions 23

3 Getting Started 25

3.1 Connecting to the CLI 25
3.1.1 RS-232 25
3.1.2 SSH 25
3.1.3 Telnet 25
3.2 CLI Structure 26
3.2.1 Authentication 26
3.2.2 Understanding CLI Modes 26
3.2.3 Using CLI Shortcuts 34
3.2.4 Common CLI Commands 36
3.2.5 Working with Tables 37
3.2.6 CLI Error Messages 39

Root-Level Commands 41

4 Introduction 43

5 Debug Commands 45

5.1 debug bgp 45
5.2 Debugging – Packet Capturing 46
5.2.1 debug capture data interface 46
5.2.2 debug capture data physical clear 48
5.2.3 debug capture data physical start 49
5.2.4 debug capture data physical stop vrf 50
5.2.5 debug capture data physical insert-pad 52
5.2.6 debug capture data physical target 53
5.2.7 debug capture data physical autostop 54
5.2.8 debug capture data physical <interface> 56
5.2.9 debug capture voip interface 57
5.2.10 debug capture voip physical 59
5.2.11 debug capture trim 61
5.3 debug debug-recording 62
5.4 debug cli 64
5.5 debug cpu 65
5.6 Debug DSL Connection 66
5.6.1 debug adsl-connection 66
5.7 Data-Routing Debug Commands 67
5.7.1 debug data-dns-view 67
5.7.2 debug dhcpv6-client 68
5.7.3 debug ethernet 69
5.7.4 debug exception-info 70
5.7.5 debug phy-err-injection 71
5.7.6 debug ipv6-ra 72
5.7.7 debug data-syslog 73
5.7.8 debug syslog-server 74
5.7.9 debug speedtest 75
5.7.10 debug ospf packet 77
5.7.11 debug ospf ism 78
5.7.12 debug ospf event 79
5.7.13 debug ospf nsm 80
5.7.14 debug ospf nssa 81

5.7.15 debug ospf lsa 82
5.7.16 debug ospf6 zebra 83
5.7.17 debug ospf6 spf 84
5.7.18 debug ospf6 route 85
5.7.19 debug ospf6 neighbor 86
5.7.20 debug ospf6 lsa 87
5.7.21 debug ospf6 message 88
5.7.22 debug ospf6 interface 89
5.7.23 debug ospf6 flooding 90
5.7.24 debug ospf6 abr 91
5.7.25 debug ospf6 asbr 92
5.7.26 debug ospf6 border-routers 93
5.7.27 debug rip events 94
5.7.28 debug zebra events 95
5.7.29 debug vrf *table name* ospf packet 96
5.7.30 debug vrf *table name* ospf nssa 97
5.7.31 debug vrf *table name* ospf nsm 98
5.7.32 debug vrf table name ospf lsa 99
5.7.33 debug vrf *table name* ospf ism 100
5.7.34 debug vrf table name ospf event 101
5.7.35 debug vrf *table name* bgp 102
5.7.36 debug vrf table name zebra 103
5.7.37 debug vrf table name ripng 104
5.7.38 debug vrf ospf6 105
5.7.39 debug vrf table name ospf zebra 107
5.7.40 debug vrf *table name* ospf6 abr 108
5.7.41 debug vrf *table name* ospf6 asbr 109
5.7.42 debug vrf *table name* ospf6 zebra 110
5.7.43 debug vrf table name ospf6 spf time 111
5.7.44 debug vrf *table name* ospf6 spf process 112
5.7.45 debug vrf *table name* ospf6 spf database 113
5.7.46 debug vrf *table name* ospf6 route intra-area 114
5.7.47 debug vrf *table name* ospf6 route table 115
5.7.48 debug vrf *table name* ospf6 route memory 116
5.7.49 debug vrf *table name* ospf6 neighbor 117
5.7.50 debug vrf *table name* ospf6 neighbor event 118
5.7.51 debug vrf *table name* ospf6 neighbor state 119
5.7.52 debug vrf *table name* ospf6 message 120
5.7.53 debug vrf table name ospf6 lsa unknown 121
5.7.54 debug vrf *table name* ospf6 lsa router 122
5.7.55 debug vrf table name ospf6 lsa network 123
5.7.56 debug vrf table name ospf6 lsa link 124
5.7.57 debug vrf *table name* ospf6 lsa intra-prefix 125
5.7.58 debug vrf table name ospf6 lsa inter-prefix 126
5.7.59 debug vrf *table name* ospf6 lsa inter-router 127
5.7.60 debug vrf table name ospf6 lsa as-external 128
5.7.61 debug vrf table name ospf6 lsa XXXX/0xXXXX 129
5.7.62 debug vrf *table name* ospf6 interface 130
5.7.63 debug vrf *table name* ospf6 flooding 131
5.7.64 debug vrf *table name* ospf6 border-routers 132
5.7.65 debug vrf table name ospf6 route inter-area 133
5.7.66 debug vrf table name rip events 134
5.7.67 debug vrf *table name* rip packet 135
5.7.68 debug vrf *table name* rip zebra 136
5.7.69 debug zebra kernel 137
5.7.70 debug zebra packet 138
5.7.71 debug zebra rib 139
5.7.72 debug ripng events 140
5.7.73 debug ripng packet 141
5.7.74 debug ripng zebra 142

5.7.75 debug rip packet 143
5.7.76 debug rip zebra 144
5.7.77 debug rmx-serial 145
5.8 VoIP Debug Commands 146
5.8.1 debug fax 146
5.8.2 debug pstn 147
5.8.3 debug sip 148
5.8.4 debug voip activate-channel 149
5.8.5 debug voip open-channel 150
5.8.6 debug voip wait-for-detection 151
5.8.7 debug voip interface 152
5.8.8 debug voip open-and-activate 153
5.8.9 debug voip dial-string 154
5.8.10 debug voip close-channels 155
5.8.11 debug test-call ip dial 156
5.8.12 debug test-call ip drop 157
5.8.13 debug test-call ip set 158
5.9 System Debug Commands 159
5.9.1 debug log 159
5.9.2 debug ha 160
5.9.3 debug usb devices 161
5.9.4 debug usb-3g devices 162
5.9.5 debug usb serial-trace 163
5.9.6 debug reset-history 164
5.9.7 undebug 165
6 Show Commands 167
6.1 show users 167
6.2 show running-config 168
6.3 Show System Commands 170
6.3.1 show system assembly 170
6.3.2 show system active-alarms 171
6.3.3 show system alarms-history 172
6.3.4 show system cpu-util history 174
6.3.5 show system utilization history 176
6.3.6 show system feature-key 178
6.3.7 show system high-availability 179
6.3.8 show system ntp-status 180
6.3.9 show system hardware 181
6.3.10 show system power 182
6.3.11 show system version 183
6.3.12 show system nqm 185
6.3.13 show system power 186
6.3.14 show system power detail 188
6.3.15 show system tls 190
6.4 Show VoIP Commands 191
6.4.1 show voip interface network 191
6.4.2 show voip ports 192
6.4.3 show voip calls 193
6.4.4 show voip calls active descending 194
6.4.5 show voip calls statistics 195
6.4.6 show voip calls active summary 196
6.4.7 show voip calls active ip2ip 197
6.4.8 show voip calls active gw 198
6.4.9 show voip calls active sbc 199
6.4.10 show voip calls active <session ID> 200
6.4.11 show voip calls history 203

6.4.12 show voip coders-stats 204
6.4.13 show voip interface 205
6.4.14 show voip cpu-stats 208
6.4.15 show voip dsp 209
6.4.16 show voip groups 211
6.4.17 show voip e911 212
6.4.18 show voip gw 213
6.4.19 show voip devices 216
6.4.20 show voip dhcp 217
6.4.21 show voip other-dialog statistics 218
6.4.22 show voip proxy 219
6.4.23 show voip register 220
6.4.24 show voip route 222
6.4.25 show voip tdm 223
6.4.26 show voip tls 224
6.4.27 show voip security 226
6.4.28 show voip subscribe list 227
6.4.29 show voip subscribe statistics 228
6.4.30 show voip voip-network 229
6.4.31 show voip arp 231
6.4.32 show voip firewall 232
6.4.33 show voip groups 233
6.4.34 show voip channel-stats analog 234
6.4.35 show voip channel-stats channel-count 235
6.4.36 show voip channel-stats digital 236
6.4.37 show voip channel-stats jitter-threshold 237
6.4.38 show voip channel-stats pl 238
6.4.39 show voip channel-stats pl-threshold 239
6.4.40 show voip channel-stats rtt-threshold 240
6.4.41 show voip channel-stats virtual 241
6.4.42 show voip wan-bindings 242
6.4.43 show voip ldap 243
6.5 Show Data Commands 244
6.5.1 show data bridge-configuration 244
6.5.2 show data crypto 245
6.5.3 show data dot11radio 246
6.5.4 show data dot1x-status 247
6.5.5 show data l2tp-server 248
6.5.6 show data SHDSL status 249
6.5.7 show data interfaces shdsl 250
6.5.8 show data interfaces 251
6.5.9 show data ip connections 253
6.5.10 show data ip interface 256
6.5.11 show data ip firewall states 258
6.5.12 show data ip dhcp pool 259
6.5.13 show data ip dhcp binding 260
6.5.14 show data hosts 261
6.5.15 show data ip arp / show data arp 262
6.5.16 show data ipv6 neighbors 263
6.5.17 show data ip dhcp-server 264
6.5.18 show data ip pim 265
6.5.19 show data ip prefix-list 268
6.5.20 show data ipv6 prefix-list 269
6.5.21 show data route-map 270
6.5.22 show data access-lists 271
6.5.23 show data mac-address interface BVI 272
6.5.24 show data mac-address-table count vlan 273
6.5.25 show data mac-address-table vlan 274
6.5.26 show data mac-address-table address 275

6.5.27 show data port monitoring 276
6.5.28 show data track brief 277
6.5.29 show data bfd neighbors [vrf <VRF table name>] 278
6.5.30 show data bfd neighbors details [vrf <VRF table name>] 279
6.5.31 show data ip nat activity 280
6.5.32 show data ip nat rules 281
6.5.33 show data ip nat pools 282
6.5.34 show data ip nat translations 283
6.5.35 show data ip nat activity 284
6.5.36 show data spanning-tree info 285
6.5.37 show data spanning-tree interface-info 286
6.5.38 show data spanning-tree 287
6.5.39 show data interfaces spanning-tree 288
6.5.40 show data ip route 289
6.5.41 show data ipv6 route 290
6.5.42 show data ip extcommunity-list 291
6.5.43 show data ip community-list 292
6.5.44 show data ip bgp 293
6.5.45 show data ip ospf vrf 294
6.5.46 show data ip ospf interface 296
6.5.47 show data ip ospf neighbor 297
6.5.48 show data ip ospf database 298
6.5.49 show data ip rip 300
6.5.50 show data ipv6 ripng 301
6.5.51 show data ip rip status 302
6.5.52 show data ipv6 ripng status 303
6.5.53 show data debugging rip 304
6.5.54 show data debugging ripng 305
6.5.55 show data debugging ospf 306
6.5.56 show data debugging ospf6 307
6.5.57 show data ipv6 ospf6 308
6.5.58 show data ip vrf 310
6.5.59 show data ip route vrf 311
6.5.60 show data qos match-map 312
6.5.61 show data qos service-map 313
6.5.62 show data qos queue 314
6.5.63 show data log-history 315
6.5.64 show data vrrp 316

7 Clear Commands 319

7.1 Data-Routing Clear Commands 319
7.1.1 clear data log-history 319
7.1.2 clear data mac-address-table 320
7.1.3 clear data dns-view counters 321
7.1.4 clear data dsl-connection-attempts 322
7.1.5 clear ip access-list counters 323
7.1.6 clear ip arp 324
7.1.7 clear ip bgp 326
7.1.8 clear ip dhcp binding 328
7.1.9 clear ip mroute 329
7.1.10 clear ip nat 330
7.1.11 clear ip prefix-list 331
7.1.12 clear ip vrf 332
7.1.13 clear ipv6 dhcpv6 335
7.1.14 clear ipv6 neighbors 336
7.1.15 clear ipv6 vrf 337
7.1.16 clear ipv6 prefix-list 338
7.1.17 clear l2tp-server 339
7.1.18 clear counters 340

7.1.19 clear qos counters 341
7.1.20 clear pptp-server 342
7.2 VoIP Clear Commands 343
7.2.1 clear voip gw 343
7.2.2 clear voip calls 344
7.2.3 clear voip statistics 345
7.3 System Clear Commands 346
7.3.1 clear alarms-history 346
7.3.2 clear user 347
8 Maintenance and File Commands 349
8.1 Copy Commands 349
8.1.1 copy <file> 349
8.1.2 copy call-progress-tones 351
8.1.3 copy coder-table 353
8.1.4 copy data configuration file 355
8.1.5 copy voice configuration file 357
8.1.6 copy cli-script 360
8.1.7 copy cas-table 362
8.1.8 copy firmware 363
8.1.9 copy startup-script 364
8.1.10 copy nqm-history 365
8.1.11 copy web-logo 366
8.1.12 copy dial-plan 368
8.1.13 copy debug-file 370
8.1.14 copy voice-xml 372
8.1.15 copy voice-prompts 374
8.1.16 copy prerecorded-tones 376
8.1.17 copy user-info 378
8.2 usb Auto-Run 380
8.2.1 usb list 381
8.2.2 usb remove 382
8.3 cmdshell 383
8.4 dir 384
8.5 reload 385
8.6 write 387
8.7 write factory 388
8.8 write-and-backup 389
8.9 erase 390
8.10 nslookup 391
8.11 ping 392
8.12 traceroute 395
8.13 pstn nfas-group-switch-activity 396
8.14 admin register 397
System CLI Commands 399
9 Introduction 401
9.1 configure system 401
10 Banner Message 403
10.1 welcome-msg 403
10.2 text 404

11 Application Commands 405
11.1 NTP Commands 405
11.1.1 ntp 405
11.1.2 primary-server 406
11.1.3 secondary-server 407
11.1.4 update-interval 408
11.1.5 utc-offset 409
11.1.6 auth-key-id 410
11.1.7 ntp-server 411
11.2 Day Light Saving Time Commands 412
11.2.1 summer-time 412
12 Syslog Commands 413
12.1 logging 413
12.2 syslog 414
12.3 debug-level 415
12.4 clear system-log 416
12.5 clear system cpu-util history 417
13 Regional Setting Commands 419
13.1 clock 419
14 Certificate Commands 421
14.1 copy <cert file> 421
14.2 tls 423
14.2.1 certificate create-self-signed 424
14.2.2 certificate subject clear 425
14.2.3 certificate subject field-set 426
14.2.4 certificate status 427
14.2.5 certificate export 428
14.2.6 certificate import 429
14.2.7 certificate details 430
14.2.8 private-key import 431
14.2.9 private-key generate 432
14.2.10 trusted-root detail 433
14.2.11 trusted-root export 434
14.2.12 trusted-root import 435
14.2.13 trusted-root delete 436
14.2.14 trusted-root summary 437
15 High Availability (HA) Commands 439
15.1 high-availability 439
16 Management Commands 441
16.1 oamp-default-network-src 441
16.2 Telnet/SSH Commands 442
16.2.1 cli-terminal 442
16.2.2 telnet-max-sessions 444
16.2.3 window height 445
16.3 Web and Telnet Access List Commands 446
16.3.1 web 446
16.3.2 mgmt-access-list 447
16.4 RADIUS Setting Commands 449
16.4.1 radius 449

16.4.2 auth-server-ip 451
16.4.3 auth-server-port 452
16.4.4 enable-mgmt-login 453
16.4.5 source data 454
16.4.6 source voip 456
16.5 TR-069 (CWMP) Commands 457
16.5.1 cwmp 457
16.6 SNMP Commands 459
16.6.1 snmp 459
16.6.2 snmp trap 460
16.6.3 bind 461
16.6.4 ro-community-string 462
16.6.5 rw-community-string 463
16.6.6 snmp-acl community-string 464
16.6.7 delete-ro-community-string 465
16.6.8 delete-rw-community-string 466
16.6.9 engine-id 467
16.6.10 port 468
16.6.11 snmp trap destination 469
16.6.12 snmp v3-users 470
17 Test Call Commands 471
17.1 test-call 471
18 NQM Commands 473
18.1 NQM Configuration 473
18.2 nqm sender-table 473
18.2.1 sender-name 474
18.2.2 active 475
18.2.3 target-ip-address 476
18.2.4 target-port 477
18.2.5 packet-interval 478
18.2.6 payload-size 479
18.2.7 packet-tos 480
18.2.8 packet-timeout 481
18.2.9 rtt-threshold 482
18.2.10 jitter-threshold 483
18.2.11 pl-threshold 484
18.2.12 cq-mos-threshold 485
18.2.13 lq-mos-threshold 486
18.2.14 probe-name 487
18.2.15 source-interface-name 488
18.3 nqm probing-table 489
18.3.1 probe-name 490
18.4 nqm responder-table 491
18.4.1 responder-name 492
18.4.2 source-interface-name 493
18.4.3 active 494
18.4.4 local-port 495
18.5 duration 496
18.6 frequency 497
18.7 life-span 498
18.8 start-time 499
18.9 history-entries 500

19 Feature and Product Keys Update Commands 501
19.1 feature-key 501
19.2 product-key 502
20 Automatic Update Commands 503
20.1 automatic-update 503
20.2 auto-firmware 505
20.3 crc-check 506
20.4 http-user-agent 507
20.5 predefined-time 508
20.6 pwd 509
20.7 run 510
20.8 run-on-reboot 511
20.9 source 512
20.10 tftp-block-size 513
20.11 update-firmware 514
20.12 update-frequency 515
20.13 use-zero-conf-certs 516
20.14 verify-certificate 517
20.15 verify-ssl-subject-name 518
20.16 zero-conf 519
20.17 zero-conf-server 520
21 Power over Ethernet Commands 521
21.1 interface poe-table 521
VoIP Commands 523
22 Introduction 525
23 Network Commands 527
23.1 Ethernet Group Table Commands 527
23.1.1 ether-group 527
23.1.2 mode 528
23.2 IP Interface Table Commands 529
23.2.1 interface network-if 529
23.2.2 interface vlan 531
23.2.3 application-type 532
23.2.4 ip-address 533
23.2.5 ip gateway 534
23.2.6 ip name-server 535
23.2.7 desc 536
23.3 Ethernet Device Table Commands 537
23.3.1 interface network-dev 537
23.4 Static Routing Commands 538
23.4.1 routing static 538
23.5 Quality of Service (QoS) Commands 540
23.5.1 qos vlan-mapping 540
23.5.2 qos application mapping 542
23.6 Domain Name Server (DNS) Commands 543
23.6.1 voip-network dns-to-ip 543

23.6.2 voip-network srv2Ip 544
24 Time Division Multiplexing (TDM) Commands 545
24.1 tdm 545
24.2 configure voip tdm 546
25 Security Commands 547
25.1 Firewall Commands 547
25.1.1 access-list 547
26 PSTN Commands 549
26.1 interface 549
27 Media Commands 553
27.1 Voice Commands 553
27.1.1 media voice-processing 553
27.1.2 media voice-processing codecs 555
27.2 Fax/Modem/Caller ID Commands 556
27.2.1 media fax-modem 556
27.2.2 media fax-modem t38 557
27.2.3 media fax-modem V1501 558
27.2.4 media fax-modem bypass 559
27.3 RTP/RTCP Commands 560
27.3.1 media RTP-RTCP 560
27.3.2 media RTP-payload-types 561
27.4 IP Media Commands 562
27.4.1 ip-media ip-media-settings 562
27.4.2 media IPM-detectors 563
27.5 Media Realm Commands 564
27.5.1 media realm 564
27.6 General Media Commands 565
27.6.1 media general 565
27.7 Media Security Commands 566
27.7.1 media security 566
28 QoE Commands 567
28.1 media qoe 567
28.2 media bw-management 568
28.3 media qoe-rules 569
28.4 qoe media-enhancement 570
28.5 qoe media-enhancement-rules 571
29 Applications Enabling Commands 573
29.1 appli-enabling 573
29.2 enable-crp 574
29.3 enable-sas 575
29.4 enable-sbc 576
29.5 enable-ip2ip 577
30 VoIP Network Commands 579
30.1 voip-network realm 579
30.2 voip-network srd 580

30.3 voip-network sip-interface 581
30.4 voip-network ip-group 582
30.5 voip-network proxy-ip 584
30.6 voip-network proxy-set 585
30.7 voip-network NATTranslation 586
30.8 always-use-source-address 587

31 SIP Definition Commands 589

31.1 SIP General Parameter Commands 589
31.1.1 account 589
31.1.2 account setting 590
31.1.3 advanced settings 591
31.1.4 general settings 593

32 Configuring In-band Signaling Commands 595

32.1 media in-band-signaling 595
32.2 Advanced Parameter Commands 597
32.2.1 advanced settings 597
32.2.2 enbl-non-inv-408 599
32.2.3 net-node-id 600
32.3 Account Table Commands 601
32.3.1 account 601
32.3.2 account setting 602
32.4 SIP Proxy and Registration Commands 603
32.4.1 proxy and registration 603
32.5 Message Policy and Manipulation Commands 605
32.5.1 sbc message-policy 605
32.5.2 manipulations message-manipulations 606

33 Coders and Profiles Commands 607

33.1 coders-and-profiles coders-group 607
33.2 coders-and-profiles ip-profile 608
33.3 coders-and-profiles tel-profile 611

34 Gateway and IP to IP Commands 613

34.1 interface fxs-fxo 613
34.1.1 analog-port-enable 615
34.2 Analog 616
34.2.1 authentication 616
34.2.2 automatic-dialing 617
34.2.3 caller-display-info 618
34.2.4 call-forward 619
34.2.5 call-waiting 620
34.2.6 enable-caller-id 621
34.2.7 enable-did 622
34.2.8 charge-code 623
34.2.9 fxo-setting 624
34.2.10 keypad-features 625
34.2.11 metering-tones 626
34.2.12 gen-mtr-tones 627
34.2.13 reject-anonymous-calls 628
34.2.14 tone-index 629
34.3 Digital 630

34.3.1 digital-gw-parameters 630
34.3.2 isdn-supp-serv 632
34.3.3 rp-network-domains 633
34.4 DTMF and Supplementary 634
34.4.1 dtmf-and-suppl dtmf-and-dialing 634
34.4.2 dtmf-and-suppl supplementary-services 635
34.5 Hunt or Trunk Group 637
34.5.1 hunt-or-trunk-group trunk-group 637
34.5.2 hunt-or-trunk-group trunk-group-setting 639
34.6 Manipulations 640
34.6.1 cause-map-isdn2sip 640
34.6.2 cause-map-sip2isdn 641
34.6.3 dst-number-map-ip2tel 642
34.6.4 dst-number-map-tel2ip 643
34.6.5 src-number-map-ip2tel 644
34.6.6 src-number-map-tel2ip 645
34.6.7 calling-name-map-ip2tel 646
34.6.8 calling-name-map-tel2ip 647
34.6.9 general-setting 648
34.6.10 phone-context-table 649
34.6.11 redirect-number-map-ip2tel 650
34.6.12 redirect-number-map-tel2ip 651
34.7 Routing 652
34.7.1 gw routing alt-route-cause-tel2ip 652
34.7.2 gw routing alt-route-cause-ip2tel 653
34.7.3 gw routing fwd-on-bsy-trk-dst 654
34.7.4 gw routing general-setting 655
34.7.5 gw routing ip2tel-routing 656
34.7.6 gw routing tel2ip-routing 657
35 SBC Commands 659
35.1 General Settings 659
35.1.1 sbc general-setting 659
35.1.2 sbc-rtcpxr-report-mode 661
35.1.3 sbc-server-auth-mode 662
35.1.4 sbc-usr-reg-grace-time 663
35.2 Admission Control 664
35.2.1 sbc-admission-control 664
35.3 Allowed Coders Group 665
35.3.1 allowed-coders-group 665
35.4 Routing SBC 666
35.4.1 classification 666
35.4.2 condition-table 667
35.4.3 ip2ip-routing 668
35.4.4 sbc-alternative-routing-reasons 669
35.5 Manipulations SBC 670
35.5.1 manipulations ip-inbound-manipulation 670
35.5.2 manipulations ip-outbound-manipulation 671
36 Cloud Resilience Package (CRP) Commands 673
36.1 crp-emerg-nb 673
37 SAS Commands 675
37.1 sasregistrationmanipulation 675
37.2 stand-alone-survivability 676

38 IP Media Commands 677
38.1 voice-streaming ivr 677
39 Services Commands 679
39.1 SIP Recording 679
39.1.1 enable-sip-rec 679
39.1.2 siprec-server-dest-username 680
39.1.3 sip-rec-routing 681
39.2 LDAP 682
39.2.1 ldap 682
39.2.2 ldap-servers-search-dns 683
39.3 Least Cost Routing 684
39.3.1 services least-cost-routing cost-group-time-bands 684
39.3.2 services least-cost-routing routing-rule-groups 685
39.3.3 services least-cost-routing cost-group 686
Data-Router Commands 687
40 Introduction 689
41 WAN Access Commands 691
41.1 General WAN Commands 691
41.1.1 interface 691
41.1.2 ip address 707
41.1.3 vrrp 708
41.1.4 description 709
41.1.5 duplex 710
41.1.6 bind 711
41.2 Cellular 3G Modem Configuration Commands 713
41.2.1 interface cellular 0/0 713
41.2.2 ppp authentication 714
41.2.3 apn 715
41.2.4 phone 716
41.2.5 initstr 717
41.2.6 tty 718
41.2.7 pin 719
41.2.8 backup monitoring 720
41.2.9 sms 721
41.3 ADSL/VDSL Commands 722
41.3.1 interface DSL 0/0 722
41.3.2 mode 723
41.4 Fiber Optic Commands 724
41.4.1 interface fiber 724
41.5 SHDSL Commands 725
41.5.1 interface SHDSL 0/0 725
41.5.2 mode 726
41.5.3 group 727
41.5.4 pairs 728
41.5.5 termination 729
41.5.6 linerate 730
41.5.7 annex 731
41.5.8 interface atm 732
41.5.9 pvc 733
41.5.10 encapsulation 734
41.5.11 ubr / cbr / vbr 735
41.5.12 ppp user 736

41.5.13 T1 WAN Commands 737
41.5.14 T1 Physical Interfaces 737
41.5.15 Serial Interfaces 747
41.5.16 Multilink Interfaces (MLP over T1 WAN) 762
41.6 Backup Group Commands 768
41.6.1 backup-group 768
41.6.2 backup monitoring group 769
42 Layer-2 (LAN) Commands 771
42.1 Wi-Fi Commands 771
42.1.1 radio shutdown 771
42.2 Data Services Commands 772
42.2.1 DNS Server 772
42.2.2 DHCP Server 784
42.2.3 DHCP Client 791
42.2.4 shutdown 810
42.2.5 mtu 811
42.2.6 mss 812
42.2.7 speed 814
42.2.8 Switch Port Interface Commands 815
42.2.9 network 819
42.2.10 IP Destination Reachability 820
42.2.11 ip reassembly 823
42.2.12 service tcp keepalives 824
42.3 Port Monitoring Commands 825
42.3.1 port-monitor 825
42.4 Spanning Tree Commands 826
42.4.1 Spanning Tree General Commands 826
42.4.2 Spanning Tree Interface Commands 831
42.5 LLDP and LLDP-MED Commands 836
42.5.1 lldp run 836
42.5.2 lldp holdtime 837
42.5.3 lldp location 838
42.5.4 lldp network-policy 839
42.5.5 lldp timer 840
43 Layer-3 Commands 841
43.1 IPv6 Commands 841
43.1.1 ipv6 enable 841
43.1.2 IPv6 Static Routes Commands 842
43.1.3 Acquiring IPv6 Address from DHCPv6 Server 846
43.1.4 Acquiring IPv6 Address from Router Advertisement 847
43.1.5 IPv6 Router Advertisement Daemon Commands 848
43.1.6 QoS Commands 859
43.2 Data Routing Commands 882
43.2.1 Static Routing Commands 883
43.2.2 Dynamic Routing Commands 894
43.3 GRE and IPIP Tunnel Interface Commands 1072
43.3.1 interface gre|ipip 1072
44 Security 1077
44.1 ip synflood-protection 1077
44.2 VPN Commands 1078
44.2.1 IPSec (crypto) 1078
44.2.2 L2TP and PPTP Tunnel Interface Commands 1086

44.2.3 l2tp-server 1096
44.2.4 pptp-server 1097
44.2.5 vpn-users 1098
44.3 Port Security based on MAC Address 1099
44.3.1 authentication static 1099
44.4 Access Control List (ACL) Commands 1100
44.4.1 access-list 1100
44.4.2 ip access-list extended 1103
44.4.3 ip access-list standard 1104
44.4.4 <rule id> deny|permit 1105
44.4.5 ip access-list resequence 1106
44.4.6 ip access-group 1107
44.5 Firewall Commands 1108
44.5.1 firewall enable 1108
44.5.2 mtu 1109
44.5.3 desc 1110
44.5.4 shutdown 1111
44.6 NAT Commands 1112
44.6.1 ip nat inside source 1112
44.6.2 ip nat inside destination 1115
44.6.3 ip nat pool 1116
44.6.4 ip nat translation 1117
44.7 802.1x LAN Port-based Authentication Commands 1118
44.7.1 dot.1x lan-authentication enable 1118
44.7.2 dot1x radius-server 1119
44.7.3 dot1x reauth-time 1120
44.7.4 authentication dot1x 1121
44.8 802.1X On-board RADIUS Server Authentication Commands 1122
44.8.1 dot1x local-user 1122
44.8.2 interface dot11radio 1123
44.8.3 security 802.1x 1124
44.8.4 security wpa 1125
44.8.5 security mode 1126
44.8.6 no shutdown 1127
44.9 Ethernet Commands 1128
44.9.1 ethernet l2tunnel 1128
44.9.2 ethernet cfm 1129
44.10 TACACS+ Commands 1130
44.10.1 tacacs-server 1130
44.10.2 aaa authentication login tacacs+ 1132
44.10.3 aaa accounting exec start-stop tacacs+ 1133
44.10.4 aaa accounting command start-stop tacacs+ 1134
44.10.5 aaa authorization command tacacs+ 1135
44.10.6 aaa authorization enable if-authenticated tacacs+ 1136
45 Performance Monitoring Commands 1137
45.1 pm sample-interval 1137

List of Tables

Table 3-1: CLI Shortcuts 34
Table 3-2: Common CLI Commands 36
Table 3-3: CLI Error Messages 39
Table 44-1: Algorithms Table 1080
Table 44-2: Transform Table 1082

Notice

This document describes Command Line Interface (CLI) commands for the AudioCodes Mediant product line.

Information contained in this document is believed to be accurate and reliable at the time of printing. However, due to ongoing product improvements and revisions, AudioCodes cannot guarantee accuracy of printed material after the Date Published nor can it accept responsibility for errors or omissions. Updates to this document and other documents as well as software files can be downloaded by registered customers at http://www.audiocodes.com/downloads.

Date Published: December-8-2016

Trademarks

WEEE EU Directive

Pursuant to the WEEE EU Directive, electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.

Customer Support

Customer technical support and services are provided by AudioCodes or by an authorized AudioCodes Service Partner. For more information on how to buy technical support for AudioCodes products and for contact information, please visit our Web site at www.audiocodes.com/support.

Abbreviations and Terminology

Each abbreviation, unless widely used, is spelled out in full when first used.

Document Revision Record

LTRT	Description
17910	Initial document release for Version 6.8.
17911	Modification to write-and-backup command.
17912	Additional modification to write-and-backup command.
17918	Additional commands included.
17920	New commands added: debug adsl-connection; show system cpu-util history; show system utilization history; clear system cpu-util history; mss. Commands modified: ip dhcp-client default-route.
17921	Modification to ip route vrf command. New debug capture data physical clear command. New RIPng commands added – default-information, default-metric, distribute-list, network, passive-interface, route, route-map, timers
17923	Modifications to the following commands: debug capture voip physical; show data track brief; show data bfd neighbors [vrf <VRF table name>]; show data bfd neighbors details [vrf <VRF table name>]; bfd neighbor; ip route ip address; ip route source; ip route vrf.

Related Documentation

Manual Name
Mediant 500 E-SBC User's Manual
Mediant 500 MSBR User's Manual
Mediant 800B Gateway & E-SBC User's Manual
Mediant 800B MSBR User's Manual
Mediant 1000B Gateway & E-SBC User's Manual
Mediant 2600 E-SBC User's Manual
Mediant 4000 SBC User's Manual
Mediant 9000 SBC User's Manual
Mediant Software SBC User's Manual

Documentation Feedback

AudioCodes continually strives to produce high quality documentation. If you have any comments (suggestions or errors) regarding this document, please fill out the Documentation Feedback form on our Web site at http://www.audiocodes.com/downloads.

1 Introduction

This document provides a reference for the device's System, VoIP and Data Router Command Line Interface (CLI) commands. It describes the syntax and use of all the CLI commands.

This page is intentionally left blank.

2 Document Conventions

Throughout this document, section headings are created for main commands. These commands appear in the CLI as prompts once you type the command and then press Enter. For example, the below shows such a command (**cli-terminal**) and its prompt:

```
(config-system)# cli-terminal
(cli-terminal)#
```

Therefore, for the command in the above example, the document includes the section heading "cli-terminal".

Section headings are also created for commands that are entered at the CLI root prompt "#". For example:

```
# reload
```

Sub-commands do not appear as CLI prompts. They are entered at the prompt of their related (main) command. Therefore, throughout the document, sub-commands are described under the section headings of their related commands. For example, the below shows a sub-command (**ssh**) entered at the prompt of its related command (**cli-terminal**):

```
(config-system)# cli-terminal
(cli-terminal)# ssh on
```

This document also uses the following typographical conventions:

Table 1-1: Typographical Conventions

Convention	Description
Bold font	Indicates commands and subcommands. `# ping 10.4.0.1 timeout 10`
< >	Indicates a value (digits or characters) that you need to enter, for example: `# ping <ip address> timeout <duration>`
|	Indicates a choice between commands or sub-commands. For example: `# reload {if-needed | now | without-saving}`
[]	Indicates commands that are optional (not mandatory). The following example shows two optional commands, **size** and **repeat**: `# ping <ip address> timeout <duration> [size <max packet size>] [repeat <1-300>]`
{}	Indicates a choice between commands where it is mandatory to select one of them, for example: `# reload {if-needed | now | without-saving}`

This page is intentionally left blank.

3 Getting Started

The following describes how to connect to the CLI.

3.1 Connecting to the CLI

The CLI can be accessed via RS-232 interface, Telnet or SSH protocols via the Ethernet interface.

3.1.1 RS-232

The device can be accessed via RS-232 by connecting a VT100 terminal to the device or using a terminal emulation program with a PC. Most Windows® computers come with a program called HyperTerminal®, which is located under **Programs** > **Accessories** > **Communications**.

Once you have connected via a VT100 terminal and started the HyperTerminal program, set the program settings as follows:

- 115200 baud rate
- 8 data bits
- No parity
- 1 stop bit
- No flow control

If you are using HyperTerminal, name your new connection and then set up the new connection via the resulting dialog box. The box allows you to determine the type of connection you are using. Verify COM1 and select **OK**.

Another dialogue box appears for entering the COM1 properties. Enter the program settings in this box; select **Apply** and then **OK**. You should then be presented with a terminal window in which you can interface with your device.

3.1.2 SSH

The device can be accessed by SSH protocol using SSH client software.

One of the most popular freeware SSH client software is Putty, which can be downloaded from the following URL:

http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

By default the SSH access is disabled. Enable SSH access via CLI (**configure system** > **cli-terminal** > **ssh on** > **activate**), or set the '*SSHServerEnable'* ini parameter to '1'.

3.1.3 Telnet

The device can be accessed by Telnet protocol using Telnet client software. Most Windows® computers come with a program called 'Telnet', which can be activated via the Windows command-line.

3.2 CLI Structure

The following describes the CLI structure.

3.2.1 Authentication

When the device is accessed, the user is prompted to enter the device administrator's Username and Password.

The device administrator's credentials are common to all AudioCodes management interfaces (e.g. Web).

The default username and password are 'Admin', 'Admin' respectively.

3.2.2 Understanding CLI Modes

As you begin communication, you should understand the command modes. Each command mode enables the user to access more commands and to make more changes in the device's configuration.

The CLI has two command modes:

- Basic
- Enable

The two command modes are organized in a two-tiered hierarchy with Basic at the bottom and Enable at the top.

3.2.2.1 Basic Command Mode

Interaction with your device begins at the Basic Command Mode. The commands supported by this command tier are limited, as is interaction with the device itself. The Basic Mode is for users without access to the higher-tiered commands, to keep them from changing the preferred configurations of the device.

The Basic Mode is accessed by beginning a CLI session (after successful authentication) and it enables the user to display system information and activate several debugging facilities.

The Basic Mode prompt is '>'.

3.2.2.2 Enable Command Mode

Enable Command Mode is the high-level tier in the command hierarchy, basically one step up from the Basic Mode. A password ('Admin' by default) is required to access the Enable Mode.

The Enable command is required only for users with Administrator or Monitor access levels; Security Administrator and Master access levels automatically enter Enable mode upon initial login.

From the Enable Mode, you can access the configurations of your product as well as handle how your device boots and runs, among other things.

The Enable Mode is accessed by entering `'enable'` while in the Basic Command Mode.

The Enable Mode prompt is '#'.

3.2.2.2.1 enable

This command switches the device to Enable Mode from Basic mode.

Syntax:

The syntax of this command includes the following:

```
enable
```

Defaults:

The default password for switching to Enable Mode is 'Admin'.

Note:

- When switching to Enable Mode, the user will be prompted to enter the Enable Mode password.
- This password can be changed via the *enable password* command.

Command Modes:

Basic

Related Commands:

disable, enable password

Examples:

The following example command switches the device to Enable mode.

```
# enable
```

3.2.2.2.2 disable

This command switches the device back to Basic mode from Enable mode.

Syntax:

The syntax of this command includes the following:

```
disable
```

Defaults:

NA

Note:

NA

Command Modes:

Enable

Related Commands:

enable, enable password

Examples:

The following example command switches the device back to Basic mode.

```
# disable
```

3.2.2.2.3 enable password

This command sets the Enable Mode password for switching to Enable Mode from Basic mode.

Syntax:

The syntax of this command can include the following variations:

```
enable password <password>
```

The command's syntax format is described below:

Arguments	Description
password	Enter the new password.

Defaults:

NA

Command Modes:

Enable

Related Commands:

disable, enable

Examples:

The following example command sets the Enable Mode password. To 'Admin'

```
# enable password Admin
```

3.2.2.3 Configuration Modes

Configurations are the means by which you set up your device and system according to your personal requirements and preferences.

All configurations are accessed through the Enable Command Mode. The configuration is divided into the following main configuration-sets:

- **configure system:** Contains the general and system oriented configuration command of the device - for example, Syslog configuration. To access this mode, type the following command:

```
# configure system
```

- **configure voip:** Contains VoIP-oriented configuration commands - for example SIP, VoIP network interfaces and VoIP Media configurations. To access this mode, type the following command:

```
# configure voip
```

- **configure data:** Contains the data-router oriented configuration command of the device. To access this mode, type the following command:

```
# configure data
```

- **configure wizard:** Accesses the CLI Wizard utility for initial configuration providing connectivity to the device's OAMP network interface. For more information on how to use this utility, refer to the *CLI Wizard User's Guide.* To access this mode, type the following command:

```
# configure-wizard
```

3.2.2.4 CLI Mode Commands

The following commands describe to enable and disable modes within CLI.

3.2.2.4.1 username administrator

This command configures the device's administrator credentials.

Syntax:

The syntax of this command can include the following variations:

```
username administrator name <name>
username administrator password <password>
```

The command's syntax format is described below:

Arguments	Description
name	Sets the new value for the administrator's name.
password	Sets the new value for the administrator's password.

Defaults:

NA

Note:

The administrator's credentials are device wide. i.e., setting the administrator's credentials will take effect in the Web as well as the CLI authentication and vice-versa.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets the administrator's name to 'James'.

```
# username administrator name James
```

3.2.2.4.2 telnet

This command invokes a Telnet session towards a remote host.

Syntax:

The syntax of this command can include the following variations:

```
telnet <remote-host> <remote-port> interface vlan <vlan-ID>
telnet <remote-host> <remote-port> source vlan <vlan-ID>
telnet <remote-host> <remote-port> source data interface
<interface type> <interface id>
telnet <remote-host> <remote-port> source data source-address
interface <interface type> <interface id>
telnet <remote-host> <remote-port> source data vrf <string>
```

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

The command's syntax format is described below:

Arguments	Description
remote-host	Defines the remote host IP address.
remote-port	Defines the remote host port number. This argument is not mandatory.

Defaults:

Default remote port is 23 (if not entered otherwise by the user).

Note:

- The **telnet** command is used mainly for remote management proposes.
- A remote administrator can access the device' CLI from the WAN leg while performing the full authentication process.
- The user can then invoke Telnet sessions towards other devices in the LAN in order to manage them. That way, no special pin-holes or forwarding rules should be declared in order to manage the LAN devices.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example invokes a Telnet session.

```
# telnet 10.4.4.25
```

3.2.3 Using CLI Shortcuts

The CLI provides several shortcuts to help you configure your device more easily. See the following table for descriptions.

Table 3-1: CLI Shortcuts

Shortcut	Description
Up arrow key	To re-display a previously entered command, use the **Up** arrow key. Continuing to press the **Up** arrow key cycles through all commands entered, starting with the most recent command.
<Tab> key	Pressing the **<Tab>** key after entering a partial (but unique) command completes the command, displays it on the command prompt line, and waits for further input. Pressing the **<Tab>** key after entering a partial and not unique command displays all completing options.

?	The CLI contains help to guide you through the configuration process. Using the question mark, do one of the following:
	Displays a list of all subcommands in the current mode. For example:
	`(config data)# interface ?`
	`  BVI  bridge interface`
	`  GigabitEthernet  GigabitEthernet`
	`  vlan  Vlan interface`
	
	Displays a list of available commands beginning with certain letter(s). For example:
	`(config data)# interface G?`
	`  GigabitEthernet  GigabitEthernet`
	
	Obtains syntax help for a specific command by entering the command, a space, and then a question mark (?). The device's CLI displays the range of values and a brief description of the next parameter expected for that particular command. For example:
	`(config data)# interface vlan ?`
	`  [1-3999]  Vlan ID`
	
	In case there is a command that can be invoked (all its arguments are inserted), using the question mark at its end displays <cr>. For example:
	`(config data)# logging host 10.1.1.1 ?`
	`  <cr>`

CTRL + A	Jump to the beginning of the displayed command line. This shortcut is helpful when using the **no** form of commands (when available).
CTRL + E	Jump to the end of the displayed command line.
CTRL + U	Clears the current displayed command line.
CTRL + Z	Returns to the Enabled mode prompt "#".
auto finish	You need only enter enough letters to identify a command as

Shortcut	Description
	unique. For example, entering "`int G 0/0`" at the configuration prompt provides you access to the configuration parameters for the specified Gigabit-Ethernet interface. Entering "`interface GigabitEthernet 0/0`" would work as well, but is not necessary.

3.2.4 Common CLI Commands

The following table contains descriptions of common CLI commands.

Table 3-2: Common CLI Commands

Command	Description

do	Provides a way to execute commands in other command sets without taking the time to exit the current command set. The following example shows the **do** command, used to view the GigabitEthernet interface configuration while in the virtual-LAN interface command set:
	`(config data)# interface vlan 1`
	`(conf-if-VLAN 1)# do show interfaces GigabitEthernet 0/0`

no	Undoes an issued command or disables a feature. Enter **no** before the command: `no debug log`
activate	Activates a command. When you enter a configuration command in the CLI, the command is not applied until you enter the **activate and exit** commands. **Note:** Offline configuration changes require a reset of the device. A reset can be performed at the end of the configuration changes. A required reset is indicated by an asterisk (*) before the command prompt.

exit	Leaves the current command-set and returns one level up. If issued on the top level, the session ends.
	For online parameters, if the configuration was changed and no **activate** command was entered, the **exit** command applies the **activate** command automatically. If issued on the top level, the session will end:
	`(config data)# exit`
	`# exit`
	`(session closed)`

display	Shows the configuration of current configuration set.
help	Shows a short help how-to string.
history	Shows a list of previously run commands.
list	Shows the available command list of the current command-set.

<filter>	Applied to a command output. The filter should be typed after the command with a pipe mark (|)
	Supported filters:
	include <word> – filter (print) lines which contain <word>
	exclude <word> – filter lines which does not contain <word>
	grep <options> - filter lines according to *grep* common Unix utility options
	egrep <options> - filter lines according to e*grep* common Unix utility options
	begin <word> – filter (print) lines which begins with <word>
	between <word1> <word2> – filter (print) lines which are placed between <word1> and <word2>
	count – show the output's line count
	Example:
	`# show version|grep Number`
	`;Serial Number: 2239835;Slot Number: 1`

3.2.5 Working with Tables

The following commands describe how to work with tables in CLI.

3.2.5.1 <table name> new

This command provides support for automatically assigning the next consecutive, available index number to a newly added table row.

Syntax:

```
# <table name> new
```

Note:

This command is supported on Mediant 500; Mediant 8xx; Mediant 1000B; Mediant 2600; Mediant 4000; Mediant SW.

Command Modes:

Enable

Examples:

The following is an example of how this command is used. For instance, if three rows are currently defined in the Account table (account-0, account-1, and account-2) and a new entry is subsequently defined, account-3 is automatically created and its configuration mode is accessed:

```
(config-voip)# sip-definition account new
(account-3)#
```

3.2.5.2 <table name> <index> insert

This command provides support for adding a table row to any specific index number, even if a row has already been configured for that index entry.

Syntax:

```
# <table name> <index> insert
```

Note:

- This command is supported on Mediant 500; Mediant 8xx; Mediant 1000B; Mediant 2600; Mediant 4000; Mediant SW.
- This command is applicable only to tables that do not have "child" tables (sub-tables).

Command Modes:

Enable

Examples:

The following is an example of how this command is used. For instance, if three rows are currently defined in the Account table (account-0, account-1, and account-2) and a new row is added with Index 1, the previous account-1 becomes account-2 and the previous account-2 becomes account-3, and so on. The following command is run for this example:

```
(config-voip)# sip-definition account 1 insert
```

3.2.6 CLI Error Messages

The following table lists and defines some of the more common error messages given in the CLI.

Table 3-3: CLI Error Messages

Message	Helpful Hints
Invalid command	The command may not be valid in the current command mode, or you may not have entered enough correct characters for the command to be recognized. Try using '?' to determine your error.
Incomplete command	You may not have entered all of the pertinent information required to make the command valid. Try using '?' to determine your error.

Note:

- Optional arguments in commands are marked in square brackets **[ ]**.
- To ensure that all failed CLI commands' error/information messages are displayed in the CLI console, you can redirect these messages, received from the Syslog console, to the CLI console by running the **debug log** command. This command can be disabled by running the **no debug log** command.

This page is intentionally left blank.

Part I

Root-Level Commands

4 Introduction

This part describes the commands located at the root level.

This page is intentionally left blank.

5 Debug Commands

The following describes the Debug command options.

5.1 debug bgp

This command describes debugging utilities.

Syntax:

The syntax of this command can include the following variations:

```
debug bgp events
debug bgp filters
debug bgp fsm
debug bgp keepalives
debug bgp updates [in|out]
debug bgp zebra
```

The command syntax format is described below:

Arguments	Description
zebra	Debugs BGP Zebra messages.
events	Debugs BGP events.
filters	Debugs BGP filters.
fsm	Debugs BGP Finite State Machine.
keepalives	Debugs BGP keepalives.
updates	Debugs BGP updates.
in	Debugs inbound updates
out	Debugs outbound updates

Defaults:

NA

Note:

When using **no debug,** PSTN turns off debug pstn.

Command Modes:

Enable

Examples:

The following example debugs inbound updates.

```
# debug bgp updates in
```

5.2 Debugging – Packet Capturing

MSBR supports advanced debugging using packet capturing. The captured files are saved to a pcap file. You can also send the file to an FTP or a TFTP server or save the file to a USB device connected to the MSBR. You can also save the file locally on the MSBR, but in this case, the file size is limited to 20 MB.

To capture traffic on a physical interface, use the following commands:

5.2.1 debug capture data interface

This command captures network traffic on one of the data sub-system network interfaces.

Syntax:

The syntax of this command includes the following variations:

```
debug capture data interface <interface type> <interface ID>
[ipsec]  proto <protocol filter> host <host filter>
debug capture data interface <interface type> <interface ID>
[ipsec] proto <protocol> host <host filter> port <port filter>
debug capture data interface <interface type> <interface ID>
[ipsec] proto <protocol> host <host filter> port <port filter>
tftp-server <tftp server ip address>
debug capture data interface <interface type> <interface ID>
[ipsec] proto  udp <host filter> any port <port filter> ftp-server
<ftp server ip address>
```

The command's syntax format is described below:

Arguments	Description
interface type interface ID	Defines the Interface Type and ID of the network interface on which to start the debug capture process. Each interface type has its own interface ID options: ▪ vlan <vlan number> ▪ GigabitEthernet <slot/port> ▪ GigabitEthernet <slot/port.vlan number>
protocol filter	Captures specific protocol, or all protocols. Available options are: ▪ all ▪ ip ▪ ipv6 ▪ tcp ▪ udp ▪ arp ▪ icmp
host filter	Captures traffic from/to a specific host (IP address), or *any*.
port filter	Captures traffic from/to a specific port. Valid ports are 1-65535, or the keyword *any*. When using *arp* or *icmp* as protocol filter, port filter cannot be used, and the only valid value is *any*. This argument is optional.
tftp server ip address	When this argument is omitted, captured traffic is printed to the CLI console. When using this argument, the captured

Arguments	Description
	traffic is saved to a file in pcap format, and when the capture is stopped (using ctrl-c), the capture file is uploaded, via TFTP, to the TFTP server specified in this argument. The TFTP server IP address specified in this argument must be accessible from one of the data sub-system network interfaces, so that the capture file will be uploaded to the server successfully. Use *ping* test to make sure this TFTP server is accessible. This argument is optional.
ftp server ip address	This command provides support for sending debug captures to an FTP server. **Note:** This is only applicable to MSBR devices.

Defaults:

NA

Command Modes:

Enable

Related Commands:

debug capture voip

Examples:

The following example starts a debug capture on the network interface vlan 77, with a protocol filter (tcp), a host filter (192.168.0.15), and a port filter (80). The captured traffic will be printed to the CLI session:

```
# debug capture data interface vlan 77 proto tcp host 192.168.0.15
port 80
```

The following example starts a debug capture on the network interface GigabitEthernet 0/0, with a protocol filter (udp), no host filter, and no port filter. The captured traffic will be saved to a temporary file, and will be sent, when *ctrl-c* is used, to the TFTP server at address 192.168.1.12. This server is accessible via network interface vlan 1:

```
# debug capture data interface GigabitEthernet 0/0 proto udp host
any port any tftp-server 192.168.0.15
```

5.2.2 debug capture data physical clear

The command deletes debug captured files from the device's RAM..

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical clear
```

Command Modes:

Enable

Related Commands:

NA

Examples

The following example deletes debug captured files from the device's RAM.

```
# debug capture data physical clear
```

5.2.3 debug capture data physical start

The command starts capturing files.

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical start
```

Defaults:

By default, capture is inactive.

Note:

- Once this command is issued, recording is performed to an in-memory buffer.
- If the buffer becomes full, recording stops.

Command Modes:

Enable

Related Commands:

NA

Examples

The following example performs a network capture of both LAN and ADSL.

```
# debug capture data physical start
Note: Debug capture data will be collected locally, and later
sent to a PC via TFTP/FTP. Please make sure that
VLAN 1 is defined and the PC is accessible through it.
```

5.2.4 debug capture data physical stop vrf

This command stops capturing files.

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical stop server-ip vrf <vrf name>
```

The command's syntax format is described below:

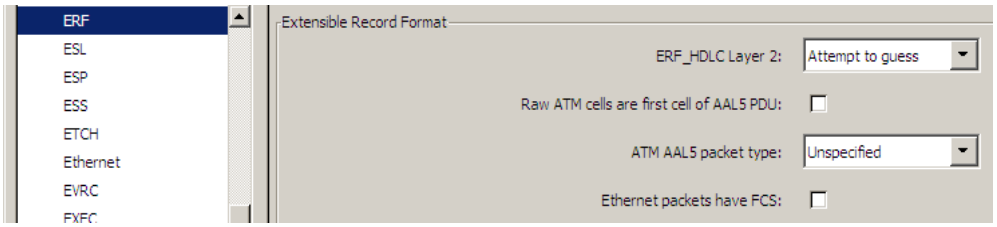
Arguments	Description
server-ip	Defines the IP address of the TFTP/FTP server.
vrf name	Defines the VRF name.

Defaults:

By default, capture is inactive.

Note:

- The captured data is collected locally, and only then sent to the PC later on.
- The **usb** option is only applicable when a USB stick is connected to the device. This applies only to Mediant 5xx and Mediant 8xx devices.
- Once the *start* command is issued, recording is performed to an in-memory buffer. If the buffer becomes full, recording stops.
- The *stop* command creates a file named `debug-capture-data-<timestamp>.pcap` and sends it to the TFTP server. The TFTP server must be configured to allow file uploads.
- The generated PCAP file is in the Extensible Record Format (ERF); recent versions of Wireshark (1.5.0 or newer) are recommended for proper dissection.
- Wireshark's ERF settings must be configured as follows:



Command Modes:

Enable

Related Commands:

NA

Examples

The debug capture is de-activated using the following existing commands:

```
# debug capture data physical stop 192.168.0.3 vrf vrf1
Trying to send capture to TFTP/FTP server , filename debug-
capture-data-16032014-154400
Finished
```

5.2.5 debug capture data physical insert-pad

This command makes a manual mark in the captured file.

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical insert-pad
```

Defaults:

By default, capture is inactive.

Command Modes:

Enable

Related Commands:

NA

Examples

The following example inserts a manual mark in the captured file.

```
# debug capture data physical insert-pad
```

5.2.6 debug capture data physical target

This command defines the destination server for the captured packet file.

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical target ftp user <ftp username>
password <ftp password>
debug capture data physical target tftp
debug capture data physical target usb
```

The command's syntax format is described below:

Arguments	Description
ftp	Defines using an FTP server.
tftp	Sends the capture to a TFTP server.
usb	Saves the capture to USB storage.

Defaults:

By default, capture is inactive.

Note:

The **usb** option is only applicable when a USB stick is connected to the device. This applies only to Mediant 5xx and Mediant 8xx devices.

Command Modes:

Enable

Related Commands:

NA

Examples

The following example sets the destination for the captured packet file as a TFTP server.

```
# debug capture data physical target tftp
```

5.2.7 debug capture data physical autostop

This command provides support for starting a debug-traffic capture on the device's physical network interfaces and allowing it to run until a user-defined event. This event can be a Syslog message or an interface state-change.

All physical targets (TFTP, FTP, and USB), and SSH retrieval are supported, as well as regular and cyclic-buffer modes. When combined with cyclic-buffer mode, this command makes diagnosis of network problems easier.

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical auto-stop {event|keep|send} syslog
<message>
debug capture data physical auto-stop event state-change
<interface>
debug capture data physical auto-stop event state-change any
debug capture data physical auto-stop {send <IP address>|keep}
no debug capture data physical auto-stop
```

The command's syntax format is described below:

Arguments	Description
auto-stop	Enables auto-stop capture on predefined events. • event – Selects events • keep – Keeps capture for SSH retrieval • send - Sends capture to the TFTP/FTP server
<interface>	Use one of the following: • eth-lan • eth-wan • cellular-wan • shdsl-wan • t1-wan • dsl-wan depending on the hardware capabilities of the device. This command may be issued multiple times to capture data from several interfaces at once.

Defaults:

By default, capture is inactive.

Note:

This command is applicable to Mediant MSBR.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following are examples of how this command can be used.

- Defines the Syslog message event, upon which the device stops the debug capture:

```
# debug capture data physical auto-stop event syslog
"<message>"
```

- Defines the state change on a specific interface, upon which the device stops the debug capture:

```
# debug capture data physical auto-stop event state-change
<interface, e.g., GigabitEthernet 0/0>
```

- Defines a state change on any interface, upon which the device stops the debug capture:

```
# debug capture data physical auto-stop event state-change any
```

- Defines what to do with the debug capture when it is automatically stopped:

```
# debug capture data physical auto-stop {send <IP
address>|keep}
```

Where:

send sends the capture to the defined IP address

keep saves the capture on the device for later retrieval

- Disables the automatic stopping feature for debug captures:

```
# no debug capture data physical auto-stop
```

5.2.8 debug capture data physical <interface>

This command records all traffic on the device's interfaces, saving the result in a PCAP-format file (suitable for Wireshark) on a TFTP server. This command provides support for debug capturing of Asynchronous Transfer Mode (ATM) packets over ADSL through the ADSL/VDSL PHY (physical layer) chipset. It also supports ATM AAL5 (ATM Adaptation Layer 5) and ATM OAMP cells.

Syntax:

The syntax of this command can include the following variations:

```
debug capture data physical <interface>
```

The command's syntax format is described below:

<interface>	Description
cellular-wan	Defines the cellular WAN interface.
eth-lan	Defines LAN Ethernet interfaces.
eth-wan	Defines WAN Ethernet interfaces.
fiber-wan	Defines the WAN fiber interface.
xdsl-wan	Defines any DSL interface (ADSL, VDSL) that is installed on the MSBR.

Defaults:

By default, capture is inactive.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example performs a network capture of both LAN and ADSL.

```
# debug capture data physical eth-lan
# debug capture data physical xdsl-wan
```

5.2.9 debug capture voip interface

This command captures network traffic on one of the voip sub-system network interfaces.

Syntax:

The syntax of this command includes the following variations:

```
debug capture voip interface vlan <vlanID> proto <protocol filter>
host <host filter>
debug capture voip interface vlan <vlanID> proto <protocol> host
<host filter> port <port filter>
debug capture voip interface vlan <vlanID> proto <protocol> host
<host filter> port <port filter> tftp-server <tftp server ip
address>
debug capture voip interface vlan <vlanID> proto <protocol> host
<host filter> port <port filter> ftp-server <ftp server ip
address>
debug capture voip physical eth-lan
debug capture voip physical start
```

The command syntax format is described below:

Arguments	Description
vlanID	Defines the VLAN ID of the network interface on which to start the debug capture process.
protocol filter	Captures a specific protocol, or all protocols. Available options are: *all*, *ip*, *tcp*, *udp*, *arp*, *icmp.*
host filter	Captures traffic from/to a specific host (IP address), or *any*.
port filter	Captures traffic from/to a specific port. Valid ports are 1-65535, or the keyword *any*. When using *arp* or *icmp* as protocol filter, port filter cannot be used, and the only valid value is *any*. This argument is optional.
tftp server ip address	When this argument is omitted, captured traffic is printed to the CLI console. When using this argument, the captured traffic is saved to a file in *pcap* format. When the capture is stopped (using ctrl-c), the capture file is uploaded, via TFTP, to the TFTP server specified in this argument. **Note:** The TFTP server IP address specified in this argument must be accessible from one of the voip sub-system network interfaces, so that the capture file will be uploaded to the server successfully. Use *ping* test to make sure this TFTP server is accessible. This argument is optional.
ftp server ip address	This command provides support for sending debug captures to an FTP server. **Note:** This is only applicable to MSBR devices.

Command Modes:

Enable

Related Commands:

debug capture data

Examples:

The following example starts a debug capture on the network interface vlan 12, with a protocol filter (ip), no host filter, and no port filter. The captured traffic will be printed to the CLI session:

```
# debug capture voip interface vlan 12 proto all host any
```

The following example starts a debug capture on the network interface vlan 1, with a protocol filter (ip), no host filter, and a port filter (514). The captured traffic will be saved to a temporary file, and will be sent, when *ctrl-c* is used, to the TFTP server at address 171.18.1.21. This server is accessible via network interface vlan 2014:

```
# debug capture voip interface vlan 1 proto ip host any port 514
tftp-server 171.18.1.21
```

5.2.10 debug capture voip physical

This command captures network traffic on one of the voip sub-system network interfaces.

Syntax:

The syntax of this command includes the following variations:

```
debug capture voip physical {eth-lan|start|cyclic-buffer|
get_last_capture| insert-pad|show|stop|target|clear}
[{ ftp|tftp|usb }]
```

The command syntax format is described below:

Arguments	Description
eth-lan	Defines the LAN frames capture.
start	Starts the capture.
cyclic-buffer	Use cyclic-buffering mode.
get_last_capture	Get the last capture file.
insert-pad	Inserts the PAD packet now.
show	Displays debug status and rules.
stop	Stop the capture and sends to USB.
target	Sets the capture storage target { ftp|tftp|usb }
clear	Deletes the captured files from the device's RAM.

Command Modes:

Enable

Note:

The **usb** option is only applicable when a USB stick is connected to the device. This applies only to Mediant 5xx and Mediant 8xx devices.

Related Commands:

debug capture data

Examples:

The following are examples of how this command is used:

- Starts physical VoIP debug capture:

```
# debug capture voip physical eth-lan
# debug capture voip physical start
```

- Captures packets continuously in a cyclical buffer (packets always captured until stop command):

```
# debug capture VoIP physical cyclic buffer
```

- Retrieves latest capture (PCAP file) saved on a specified server:

```
# debug capture VoIP physical get_last_capture <TFTP/FTP
server IP address>
```

  The file is saved to the device's memory (not flash) and is erased after a device reset.

- Marks the captured file (useful for troubleshooting process):

```
# debug capture VoIP physical insert-pad
```

  Before running this command, the debug capture must be started.

- Displays debug status and configured rules:

```
# debug capture VoIP physical show
```

- Specifies the destination (FTP, TFTP, or USB) to send the PCAP file:

```
# debug capture VoIP physical target {ftp|tftp|usb}
```

- Stops the debug capture, creates a file named debug-capture-voip-<timestamp>.pcap, and sends it to the TFTP or FTP server:

```
# debug capture voip physical stop <TFTP/FTP server IP
address>
```

- Deletes the captured files from the device's RAM:

```
# debug capture voip physical clear
```

5.2.11 debug capture trim

This command debugs trip captured traffic.

Syntax:

The syntax of this command includes the following variations:

```
debug capture trim in-file <USB file name>
debug capture trim offset <length>
```

The command syntax format is described below:

Arguments	Description
USB file name	Defines the existing file on USB storage.
length	Defines the desired length of capture, in hours:minutes:seconds.

Command Modes:

Enable

Examples:

The following is an example of how this command is used:

```
# debug capture trim in-file FileA
```

5.3 debug debug-recording

This command enables debug-recording features. The **no debug syslog-server** command disables the Syslog server.

Syntax:

The syntax of this command can include the following variations:

```
debug debug-recording status
debug debug-recording [dest ip]ip-trace
debug debug-recording [dest ip]port [port number]
debug debug-recording pstn-trace
debug debug-recording signaling
debug debug-recording signaling-media
debug debug-recording signaling-media-pcm
no debug syslog-server
```

The command's syntax format is described below:

Arguments	Description
status	Displays debug-recording status
dest ip	Defines debug-recording destination IP address – IPv4, or IPv6 for Mediant MSBR if communication with the Syslog server is through the WAN interface.
ip-trace	Debug-recording Filter Type IP Trace
port	Debug-recording Destination Port
pstn-trace	Debug-recording Capture Type PSTN Trace
signaling	Debug-recording Capture Type Signaling
signaling-media	Debug-recording Capture Type Signaling-Media
signaling-media-pcm	Debug-recording Debug-recording Capture Type Signaling-Media-PCM

Defaults:

NA

Note:

This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Command Modes:

Enable

Example:

The following example enables the Syslog to a specific IP address and Port.

```
# debug syslog-server 10.15.1.0
Syslog enabled to dest IP Address: 10.15.1.0 Port 514
```

5.4 debug cli

This command debugs CLI utilities.

Syntax:

The syntax of this command can include the following variations:

```
debug cli delayed-command <delay> {minutes|seconds} <command>
debug cli delayed-command cancel <number>
debug cli delayed-command show
```

The command syntax format is described below:

Arguments	Description
delay	Defines how much time to wait before issuing command.
command	Sets the command to be issued (in quotes).
number	Defines the number of the command to cancel.
show	Lists the currently set commands.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of how this command can be used.

```
# debug cli delayed-command 10 minutes “clear”
```

5.5 debug cpu

This command debugs CPU usage.

Syntax:

The syntax of this command can include the following variations:

```
debug cpu data load avg
debug cpu data load off
debug cpu data load on <delay>
```

The command syntax format is described below:

Arguments	Description
avg	Sets data cpu usage average.
off	Sets data cpu usage off.
on	Sets data cpu usage on.
delay	Sets the delay in seconds.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets data cpu usage off.

```
# debug cpu data load off
```

5.6 Debug DSL Connection

The following are Debug DSL Connection commands.

5.6.1 debug adsl-connection

This command displays the xDSL line synchronization status (Physical Interface). The output can be displayed in CLI and also in the Syslog viewer once Syslog has been enabled.

Syntax:

The syntax of this command can include the following variations:

```
debug adsl-connection
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

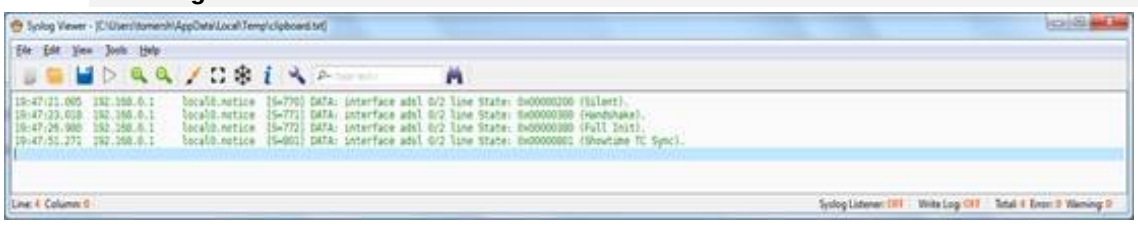
- The following example displays this information to the CLI screen:

```
# debug log
# debug adsl-connection

May 16 20:01:01  DATA: interface adsl 0/2 line State: 0x00000200
(Silent).
May 16 20:01:03  DATA: interface adsl 0/2 line State: 0x00000300
(Handshake).
May 16 20:01:07  DATA: interface adsl 0/2 line State: 0x00000380
(Full Init).
May 16 20:01:32  DATA: interface adsl 0/2 line State: 0x00000801
(Showtime TC Sync).
```

- The following example displays this information to the Syslog server,

```
# enable syslog
# debug adsl-connection
```



5.7 Data-Routing Debug Commands

The following are Data-Routing Debug commands.

5.7.1 debug data-dns-view

This command starts debug DNS views.

Syntax:

The syntax of this command can include the following variations:

```
debug data-dns-view
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example starts debug DNS views.

```
# debug data-dns-view
```

5.7.2 debug dhcpv6-client

This command debugs CPU usage.

Syntax:

The syntax of this command can include the following variations:

```
debug cpu data load avg
debug cpu data load off
debug cpu data load on <delay>
```

The command syntax format is described below:

Arguments	Description
avg	Sets data cpu usage average.
off	Sets data cpu usage off.
on	Sets data cpu usage on.
delay	Sets the delay in seconds.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets data CPU usage off.

```
# debug cpu data load off
```

5.7.3 debug ethernet

This command provides support for performing loopback testing on specific WAN interfaces for monitoring and troubleshooting (debugging). Loopback debugging can be activated on any WAN interface (name or type) and allows the remote side to loopback traffic through the device's WAN interface (typically used to check traffic flow). This is to comply with the IEEE 802.3ah standard for Operation, Administration, and Management (OAM) for link-fault management by remote loopback (on the Ethernet WAN interface).

The **no debug** command is used to disable the feature.

Syntax:

The syntax of this command can include the following variations:

```
debug ethernet loopback interface <interface name / type>
```

Defaults:

NA

Note:

- All communication through the loopback WAN interface stops when this command is enabled.
- This command is only applicable to Mediant 500 MSBR and Mediant 800/B MSBR.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of using debug ethernet.

```
# debug ethernet loopback interface GigabitEthernet 0/0
```

5.7.4 debug exception-info

This command debugs exception information.

Syntax:

The syntax of this command can include the following variations:

```
debug exception-info <folder>
```

The command syntax format is described below:

Arguments	Description
folder	Sets the debug exception folder number. The range is 1-9.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of how this command can be used.

```
# debug exception-info 1
```

5.7.5 debug phy-err-injection

This command debugs physical error injection.

Syntax:

The syntax of this command can include the following variations:

```
debug phy-err-injection set delay-depth <delay depth>
debug phy-err-injection set delay-rate <delay rate>
debug phy-err-injection set drop-rate <drop rate>
debug phy-err-injection set interface atm [group/subinterface]
debug phy-err-injection set interface efm [slot/port.vlanID]
debug phy-err-injection set interface fiber [slot/port]
debug phy-err-injection set interface gigabitethernet
[slot/port.vlanID]

debug phy-err-injection show
debug phy-err-injection start
debug phy-err-injection stop
```

The command syntax format is described below:

Arguments	Description
delay-depth	Sets the delay depth. The range is 2-99.
delay-rate	Sets the delay percentage The range is 0-50.
drop-rate	Sets the drop percentage The range is 0-100.
interface	Sets the interface to run Rx error on.
atm	Sets the DSL ATM sub-interface.
fiber	Sets the fiber interface.
show	Shows the RX physical error injection configuration.
start	Starts the RX physical error injection.
stop	Stops the RX physical error injection.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example starts the RX physical error injection.

```
# debug phy-err-injection start
```

5.7.6 debug ipv6-ra

This command debugs IPv6 RA information.

Syntax:

The syntax of this command can include the following variations:

```
debug ipv6-ra <ra level>
```

The command syntax format is described below:

Arguments	Description
ra level	Sets the debug ipv6 RA level.(1-low, 5-high)

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets the ipv6-ra level to 5.

```
# debug ipv6-ra 5
```

5.7.7 debug data-syslog

This command activates data networking debugging messages to Syslog.

Syntax:

The syntax of this command can include the following variations:

```
debug data-syslog
```

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example activates data networking debugging messages to Syslog.

```
# debug data-syslog
```

5.7.8 debug syslog-server

This command enables Syslog and sets the ip address and port.

Syntax:

The syntax of this command can include the following variations:

```
debug syslog-server <dest-ip> <port [port]>
no debug syslog-server
```

The command syntax format is described below:

Arguments	Description
dest-ip	Sets the syslog-server Destination IP.
port	Sets the Syslog-server Destination Port.

Note:

- The **no debug syslog-server** command disables the Syslog server.
- The destination IP address can be IPv4, or IPv6 for Mediant MSBR if communication with the Syslog server is through the WAN interface.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example enables the Syslog to a specific IP address and Port.

```
# debug syslog-server 10.15.1.0
Syslog enabled to dest IP Address: 10.15.1.0 Port 514
```

5.7.9 debug speedtest

This command performs a network speed test against a provisioned file server.

Syntax:

The syntax of this command can include the following variations:

```
debug speedtest set download <down-url>
debug speedtest set upload <up-url>
debug speedtest set upsize <up-filesize>
debug speedtest run
debug speedtest show
```

The command's syntax format is described below:

Arguments	Description
down-url	Defines the URL of the test file on remote server. Supported protocols are HTTP and FTP.
up-url	Defines the URL of the test location on the remote server where data can be uploaded. Supported protocols are HTTP and FTP.
up-filesize	Defines the length of upload test file, in bytes.

Defaults:

By default, testing URLs are not defined and the upload test size is set to 500000 bytes.

Note:

- Set the download URL to point to a large file (e.g. more than 2MB) on a testing server.
- To perform just the download speed test, do not configure an upload URL.
- Once the download and/or upload URLs are configured, run the test using the "*debug speedtest run*" command.
- The test runs in the background, its status may be checked using the "*debug speedtest show*" command. Enter the *show* command repeatedly until the test is complete.
- DNS must be configured correctly for speed test URLs.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example performs a network speed test.

```
# debug speedtest set download
http://speedtest.bezeq.co.il/speedtest/random1000x1000.jpg
# debug speedtest set upload
http://speedtest.bezeq.co.il/speedtest/speedtest/upload.aspx
# debug speedtest run
# debug speedtest show
Speed test results:

Download: Idle
URL:
                      Bytes transferred: 0
                      Speed: 0 bits/sec
Upload  : Idle
URL:
                      Bytes transferred: 0
                      Speed: 0 bits/sec
```

5.7.10 debug ospf packet

This command shows the Open Shortest Path First (OSPF) routing table, as determined by the most recent SPF calculation.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf packet {hello|dd|ls-request|ls-update|ls-ack|all)
(send|recv) [detail]
no debug ospf packet {hello|dd|ls-request|ls-update|ls-ack|all}
(send|recv) [detail]
```

Defaults:

NA

Command Modes:

Enable

Example:

This example shows the OSPF routing table, as determined by the most recent SPF calculation.

```
# debug ospf packet
```

5.7.11 debug ospf ism

This command debugs the OSPF Interface State Machine.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf ism
debug ospf ism {status|events|timers}
no debug ospf ism
no debug ospf ism {status|events|timers}
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs OSPF Interface State Machine.

```
# debug ospf ism
```

5.7.12 debug ospf event

This command debugs the OSPF event information..

Syntax:

The syntax of this command can include the following variations:

```
debug ospf event
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs OSPF event information.

```
# debug ospf event
```

5.7.13 debug ospf nsm

This command debugs NSM TImer Information.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf nsm
debug ospf nsm {status|events|timers}
no debug ospf nsm
no debug ospf nsm {status|events|timers}
```

The command syntax format is described below:

Arguments	Description
status	Debugs NSM status Information.
events	Debugs NSM events Information.
timers	Debugs NSM timers Information.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs NSM TImer Information.

```
# debug ospf nsm timers
```

5.7.14 debug ospf nssa

This command debugs Not So Stubby Areas (NSSA) information.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf nssa
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs NSSA Information.

```
# debug ospf nssa
```

5.7.15 debug ospf lsa

This command debugs OSPF Link State Advertisements (LSA).

Syntax:

The syntax of this command can include the following variations:

```
debug ospf lsa
debug ospf lsa {generate|flooding|refresh|install}
no debug ospf lsa
no debug ospf lsa {generate|flooding|refresh|install}
```

The command syntax format is described below:

Arguments	Description
generate	Debugs LSA generation.
flooding	Debugs LSA flooding.
refresh	Debugs LSA refresh.
install	Debugs LSA install/delete.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPF Link State Advertisement.

```
# debug ospf lsa
```

5.7.16 debug ospf6 zebra

This command debugs the Open Shortest Path First (OSPF) for IPv6 connection between Zebra.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 zebra [send|recv]
```

The command syntax format is described below:

Arguments	Description
send	Debugs Sending zebra.
recv	Debugs Receiving zebra.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs sending zebra.

```
# debug ospf6 zebra send
```

5.7.17 debug ospf6 spf

This command debugs the Open Shortest Path First (OSPF) for IPv6 SPF calculation.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 spf {database|process|time}
```

The command syntax format is described below:

Arguments	Description
database	Logs the number of LSAs at SPF Calculation time.
process	Debugs detailed SPF process.
time	Measures the time taken by SPF Calculation.

Defaults:

NA

Command Modes:

Enable

Example:

This example measures the time taken by a debug SPF Calculation.

```
# debug ospf6 spf time
```

5.7.18 debug ospf6 route

This command debugs the route table calculation.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 route table
debug ospf6 route memory
debug ospf6 route inter-area
debug ospf6 route intra-area
```

The command syntax format is described below:

Arguments	Description
table	Debugs details.
memory	Debug route memory use.
inter-area	Debugs the inter-area route calculation.
intra-area	Debugs the intra-area route calculation.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs route memory use.

```
# debug ospf6 route memory
```

5.7.19 debug ospf6 neighbor

This command debugs the OSPFv3 neighbor.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 neighbor [event|state]
```

The command syntax format is described below:

Arguments	Description
event	Debugs details.
state	Debug route memory use.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPFv3 neighbor.

```
# debug ospf6 neighbor
```

5.7.20 debug ospf6 lsa

This command debugs Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 lsa [XXXX/0xXXXX]
debug ospf6 lsa as-external
debug ospf6 lsa inter-prefix {examin|flooding|originate}
debug ospf6 lsa inter-router {examin|flooding|originate}
debug ospf6 lsa intra-prefix {examin|flooding|originate}
debug ospf6 lsa link {examin|flooding|originate}
debug ospf6 lsa network {examin|flooding|originate}
debug ospf6 lsa router {examin|flooding|originate}
debug ospf6 lsa unknown {examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
XXXX/0xXXXX	Specifies LS type as Hexadecimal.
as-external	Debugs AS-External-LSA.
inter-prefix	Debugs Inter-Prefix-LSA.
inter-router	Debugs Inter-Router-LSA.
intra-prefix	Debugs Intra-Prefix-LSA.
link	Debugs Link-LSA.
network	Debugs Network-LSA.
router	Debugs Routr-LSA.
unknown	Debugs Unknown-LSA
examin	Debugss Examining LSA.
flooding	Debug Flooding LSA.
originate	Debug Originating LSA.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs Routr-LSAs.

```
# debug ospf6 lsa router
```

5.7.21 debug ospf6 message

This command debugs the OSPFv3 message.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 message all [recv|send]
debug ospf6 message dbdesc [recv|send]
debug ospf6 message hello [recv|send]
debug ospf6 message lsack [recv|send]
debug ospf6 message lsreq [recv|send]
debug ospf6 message lsupdate [recv|send]
debug ospf6 message unknown [recv|send]
```

The command syntax format is described below:

Arguments	Description
recv	Debugs only receiving messages.
send	Debugs only sending messages.
dbdesc	Debugs Database Description messages.
hello	Debugs Hello messages.
lsack	Debugs the Link State Acknowledgement (lsack) messages.
lsreq	Debugs the Link State Request (lsreq) messages.
lsupdate	Debugs Link State Update messages.
unknown	Debugs unknown messages.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs all OSPFv3 receiving messages.

```
# debug ospf6 all send
```

5.7.22 debug ospf6 interface

This command debugs the OSPFv3 Interface.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 interface
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPFv3 Interface.

```
# debug ospf6 interface
```

5.7.23 debug ospf6 flooding

This command debugs the OSPFv3 flooding function.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 flooding
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPFv3 flooding function.

```
# debug ospf6 flooding
```

5.7.24 debug ospf6 abr

This command debugs the OSPFv3 ABR function.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 abr
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPFv3 ABR function.

```
# debug ospf6 abr
```

5.7.25 debug ospf6 asbr

This command debugs the OSPFv3 ASBR function.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 asbr
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPFv3 ASBR function.

```
# debug ospf6 asbr
```

5.7.26 debug ospf6 border-routers

This command debugs the border routers.

Syntax:

The syntax of this command can include the following variations:

```
debug ospf6 border-routers [area-id] <a.b.c.d>
debug ospf6 border-routers [router-id] <a.b.c.d>
```

The command syntax format is described below:

Arguments	Description
area-id	Debug border routers in a specific area.
router-id	Debug a specific border router.
a.b.c.d	Defines the Area ID/Router ID.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the border routers.

```
# debug ospf6 border-routers
```

5.7.27 debug rip events

This command debugs IPv4 RIP events.

Syntax:

The syntax of this command can include the following variations:

```
debug rip events
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs IPv4 RIP events.

```
# debug rip events
```

5.7.28 debug zebra events

This command sets the Debug option for Zebra events.

Syntax:

The syntax of this command can include the following variations:

```
# debug zebra events
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets the Debug option for Zebra events.

```
# debug zebra events
```

5.7.29 debug vrf *table name* ospf packet

This command, activated by the dynamic routing protocol running inside the specified VRF, shows the Open Shortest Path First (OSPF) routing table, as determined by the most recent SPF calculation.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> ospf packet  {hello|dd|ls-request|ls-update|ls-ack|all} [send|recv] [detail]
```

Defaults:

NA

Command Modes:

Enable

Example:

This example shows the OSPF routing table, as determined by the most recent SPF calculation.

```
# debug vrf vrf20 ospf packet
```

5.7.30 debug vrf *table name* ospf nssa

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs OSPF Not-So-Stubby Area (NSSA) information.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> ospf nssa
```

Defaults:

NA

Command Modes:

Enable

Example:

This example shows how the command can be used.

```
# debug vrf vrf100 ospf nssa
```

5.7.31 debug vrf *table name* ospf nsm

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs OSPF Neighbor State Machine (NSM) information.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> ospf nsm {status|events|timers}
```

Arguments	Description
status	Debugs NSM status Information.
events	Debugs NSM events Information.
timers	Debugs NSM timers Information.

Defaults:

NA

Command Modes:

Enable

Example:

This example shows how the command can be used.

```
# debug vrf vrf100 ospf nsm
```

5.7.32 debug vrf table name ospf lsa

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs OSPF Link State Advertisement.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> ospf lsa {generate|flooding|refresh|install}
```

Arguments	Description
generate	Debugs the LSA Generation
flooding	Debugs the LSA Flooding.
refresh	Debugs the LSA Install/Delete.
install	Debugs the OSPF6 Interface.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPF Link State Advertisement.

```
# debug vrf vrf1 ospf lsa generate
```

5.7.33 debug vrf *table name* ospf ism

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPF Interface State Machine.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> ospf ism {status|events|timers}
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPF Interface State Machine.

```
# debug vrf vrftable ospf ism
```

5.7.34 debug vrf table name ospf event

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs OSPF event information.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> ospf events
```

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the OSPF event information.

```
# debug vrf vrftab2 ospf ism
```

5.7.35 debug vrf *table name* bgp

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the Border Gateway Protocol (BGP) information.

Syntax:

The syntax of this command can include the following variations:

```
debug vrf <vrf table> bgp {events|filters|fsm|keepalives|zebra}
debug vrf <vrf table> bgp <updates> [in|out]
```

Arguments	Description
events	Debugs BGP events.
filters	Debugs BGP filters.
fsm	Debugs NSM timers Information.
keepalives	Debugs BGP Finite State Machine.
updates	Debugs BGP updates.
zebra	Debugs BGP Zebra messages.
in	Debugs Inbound updates.
out	Debugs Outbound updates.

Defaults:

NA

Command Modes:

Enable

Example:

This example debugs the BGP information.

```
# debug vrf vrftabl20 bgp
```

5.7.36 debug vrf table name zebra

This command, activated by the dynamic routing protocol running inside the specified VRF, allows for debugging information on Virtual Routing and Forwarding (VRF) instances.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> zebra events
# debug vrf <vrf table name> zebra kernel
# debug vrf <vrf table name> zebra packet [recv] [detail]
# debug vrf <vrf table name> zebra packet [send] [detail]
# debug vrf <vrf table name> zebra rib [queue]
```

The command syntax format is described below:

Arguments	Description
recv	Sets the Debug option for receive packets.
send	Sets the Debug option for send packets.
detail	Sets the Debug option for detailed information.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example allows for debugging information on VRF instances.

```
# debug zebra vtable1 zebra events
```

5.7.37 debug vrf table name ripng

This command, activated by the dynamic routing protocol running inside the specified VRF, allows for debugging RIP Next Generation (RIPng) configurations.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ripng events
# debug vrf <vrf table name> ripng packet [recv] [detail]
# debug vrf <vrf table name> ripng packet [send] [detail]
# debug vrf <vrf table name> ripng zebra
```

The command syntax format is described below:

Arguments	Description
recv	Sets the Debug option for receive packets.
send	Sets the Debug option for send packets.
detail	Sets the Debug option for detailed information.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example allows for debugging RIPng configurations.

```
# debug vrf vtable3 ripng events
```

5.7.38 debug vrf ospf6

This command debugs OSPF6.

Syntax:

The syntax of this command can include the following variations:

```
# debug [vrf <vrf name>] ospf6 lsa {<XXXX/0xXXXX>|as-
external|inter-prefix|inter-router|intra-
prefix|link|network|router|unknown} [examin| flooding|originate]
# debug [vrf <vrf name>] ospf6 abr
# debug [vrf <vrf name>] ospf6 asbr
# debug [vrf <vrf name>] ospf6 border-routers [area-id|router-id]
# debug [vrf <vrf name>] ospf6 flooding
# debug [vrf <vrf name>] ospf6 interface
# debug [vrf <vrf name>] ospf6 message
# debug [vrf <vrf name>] ospf6 neighbor
# debug [vrf <vrf name>] ospf6 route
# debug [vrf <vrf name>] ospf6 spf
# debug [vrf <vrf name>] ospf6 zebra
```

The command syntax format is described below:

Arguments	Description
XXXX/0xXXXX	Specifies the Link-state type as Hexadecimal.
lsa	Debugs Link-state Advertisements (LSAs).
as-external	Debugs the AS-External-LSA.
inter-prefix	Debugs the Inter-Prefix-LSA.
inter-router	Debugs the Inter-Router-LSA.
intra-prefix	Debugs the Intra-Prefix-LSA.
link	Debugs the Link-LSA.
network	Debugs the Network-LSA.
router	Debugs the Debug Router-LSA.
unknown	Debugs the Unknown-LSA.
lsa	Defines the Link-state Advertisement.
examin	Debugs the Examining LSA.
flooding	Debugs the Flooding LSA.
originate	Debugs the Originating LSA.
abr	Debugs the OSPF6 ABR function.
asbr	Debugs the OSPF6 ASBR function.
border-routers	Debugs the border router.
flooding	Debugs the OSPF6 flooding function.
interface	Debugs the OSPF6 Interface.
message	Debugs the OSPF6 message.

Arguments	Description
neighbor	Debugs the OSPF6 neighbor.
route	Debugs the route table calculation.
spf	Debugs the SPF calculation
zebra	Debugs connection with Zebra

Defaults:
NA

Command Modes:
Enable

Example:
The following example debugs RIP and zebra communication.

```
# debug ospf6 zebra
```

5.7.39 debug vrf table name ospf zebra

This command, activated by the dynamic routing protocol running inside the specified VRF, allows for debugging Zebra redistribute.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf zebra [redistribute|interface]
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of how to use this command.

```
# debug zebra vtable18 ospf zebra interface
```

5.7.40 debug vrf *table name* ospf6 abr

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 Area Border Router (ABR) function.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 abr
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs the OSPFv3 ABR function.

```
# debug vrf vtable4 ospf6 abr
```

5.7.41 debug vrf *table name* ospf6 asbr

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 Autonomous System Boundary Routers (ASBR).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 asbr
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs the OSPFv3 ASBR function.

```
# debug vrf vtable4 ospf6 asbr
```

5.7.42 debug vrf *table name* ospf6 zebra

This command, activated by the dynamic routing protocol running inside the specified VRF, displays information about ospf6 and the zebra daemon, including of routes to the System Routing table.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 zebra [send] [detail]
# debug vrf <vrf table name> ospf6 zebra [recv] [detail]
```

The command syntax format is described below:

Arguments	Description
recv	Sets Debug receiving Zebra.
send	Sets Debug sending Zebra
detail	Sets the Debug option for detailed information.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example allows for debugging RIP configurations.

```
# debug vrf vtable4 rip events
```

5.7.43 debug vrf table name ospf6 spf time

This command, activated by the dynamic routing protocol running inside the specified VRF, measures time taken by SPF Calculation.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 spf time
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example measures time taken by SPF Calculations.

```
# debug vrf vrf5 ospf6 spf time
```

5.7.44 debug vrf *table name* ospf6 spf process

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the detailed SPF Process.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 spf process
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs the detailed SPF Process.

```
# debug vrf vrf6 ospf6 spf process
```

5.7.45 debug vrf *table name* ospf6 spf database

This command, activated by the dynamic routing protocol running inside the specified VRF, logs the number of LSAs at SPF Calculation time.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 spf database
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example logs the number of LSAs at SPF Calculation time.

```
# debug vrf vrf7 ospf6 spf database
```

5.7.46 debug vrf *table name* ospf6 route intra-area

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs intra-area route calculations.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 route intra-area
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs intra-area route calculations.

```
# debug vrf vrf8 ospf6 route intra-area
```

5.7.47 debug vrf *table name* ospf6 route table

This command, activated by the dynamic routing protocol running inside the specified VRF, produces debug details.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 route table
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example produces debug details.

```
# debug vrf vrf8 ospf6 route table
```

5.7.48 debug vrf *table name* ospf6 route memory

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs route memory use.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 route memory
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs route memory use.

```
# debug vrf vrf8 ospf6 route memory
```

5.7.49 debug vrf *table name* ospf6 neighbor

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 neighbor.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 neighbor
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs the OSPFv3 neighbor.

```
# debug vrf vrf9 ospf6 neighbor
```

5.7.50 debug vrf *table name* ospf6 neighbor event

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 neighbor event.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 neighbor event
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs the OSPFv3 neighbor event.

```
# debug vrf vrf10 ospf6 neighbor event
```

5.7.51 debug vrf *table name* ospf6 neighbor state

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 neighbor state change.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 neighbor state
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs the OSPFv3 neighbor state change.

```
# debug vrf vrf10 ospf6 neighbor state change
```

5.7.52 debug vrf *table name* ospf6 message

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs OSPFv3 messages.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 message <message type> [send]|
[recv]
```

The command syntax format is described below:

Arguments	Description	
message-type	all	Debugs all messages.
	dbdesc	Debugs Database Description messages.
	hello	Debugs Hello messages.
	lsack	Debugs Link State Acknowledgement messages.
	lsreq	Debugs Link State Request messages.
	lsupdate	Debugs Link State Update messages.
	unknown	Debugs Unknown messages.
recv	Debugs only receiving message.	
send	Debugs only sending message.	

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs all messages.

```
# debug vrf vrf10 ospf6 message all
```

5.7.53 debug vrf table name ospf6 lsa unknown

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs unknown Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa unknown
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs unknown LSAs.

```
# debug vrf vrf10 ospf6 lsa unknown
```

5.7.54 debug vrf *table name* ospf6 lsa router

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs router Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa router
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs router LSAs.

```
# debug vrf vrf10 ospf6 lsa router
```

5.7.55 debug vrf table name ospf6 lsa network

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs network Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa network
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs network LSAs.

```
# debug vrf vrf10 ospf6 lsa network
```

5.7.56 debug vrf table name ospf6 lsa link

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa link
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs link LSAs.

```
# debug vrf vrf10 ospf6 lsa link
```

5.7.57 debug vrf *table name* ospf6 lsa intra-prefix

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs intra-prefix Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa intra-prefix
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs intra-prefix LSAs.

```
# debug vrf vrf10 ospf6 lsa intra-prefix
```

5.7.58 debug vrf table name ospf6 lsa inter-prefix

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs inter-prefix Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa inter-prefix
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs inter-prefix LSAs.

```
# debug vrf vrf10 ospf6 lsa inter-prefix
```

5.7.59 debug vrf *table name* ospf6 lsa inter-router

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs inter-router Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa inter-router
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs inter-router LSAs.

```
# debug vrf vrf10 ospf6 lsa inter-router
```

5.7.60 debug vrf table name ospf6 lsa as-external

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs Autonomous System as-external Link State Advertisements (LSAs).

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa as-external
{examin|flooding|originate}
```

The command syntax format is described below:

Arguments	Description
examin	Debugs examining LSAs.
flooding	Debugs flooding LSAs.
originate	Debugs originating LSAs.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs AS-external LSAs.

```
# debug vrf vrf10 ospf6 lsa as-external
```

5.7.61 debug vrf table name ospf6 lsa XXXX/0xXXXX

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs Link State Advertisements (LSAs), specified as hexadecimal.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 lsa XXXX/0xXXXX
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs Link State Advertisements (LSAs), specified as hexadecimal.

```
# debug vrf vrf10 ospf6 lsa 80000002
```

5.7.62 debug vrf *table name* ospf6 interface

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 Interface.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 interface
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs the OSPFv3 Interface.

```
# debug vrf vrf10 ospf6 interface
```

5.7.63 debug vrf *table name* ospf6 flooding

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the OSPFv3 flooding function.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 flooding
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs the OSPFv3 flooding function.

```
# debug vrf vrf10 ospf6 flooding
```

5.7.64 debug vrf *table name* ospf6 border-routers

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs the border router.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 border-routers area-id <area-id>
# debug vrf <vrf table name> ospf6 border-routers router-id <router-id>
```

The command's syntax format is described below:

Arguments	Description
area-id	Defines the border-router's area-id in a.b.c.d format
border-id	Defines the border-router's router-id in a.b.c.d format.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example debugs the border router.

```
# debug vrf vrf10 ospf6 border-routers area-id 12.1.3.55
```

5.7.65 debug vrf table name ospf6 route inter-area

This command, activated by the dynamic routing protocol running inside the specified VRF, debugs inter-area route calculations.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> ospf6 route inter-area
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example debugs inter-area route calculations.

```
# debug vrf vrf8 ospf6 route inter-area
```

5.7.66 debug vrf table name rip events

This command, activated by the dynamic routing protocol running inside the specified VRF, displays detailed information about RIP events, including sending and receiving packets, timers, and changes in interfaces.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> rip events
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example displays detailed information about RIP events.

```
# debug vrf vtable4 rip events
```

5.7.67 debug vrf *table name* rip packet

This command, activated by the dynamic routing protocol running inside the specified VRF, displays detailed information about the RIP packets. The origin and port number of the packet as well as a packet dump is shown.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> rip packet [recv] [detail]
# debug vrf <vrf table name> rip packet [send] [detail]
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example allows for debugging RIP configurations.

```
# debug vrf vtable4 rip packet
```

5.7.68 debug vrf *table name* rip zebra

This command, activated by the dynamic routing protocol running inside the specified VRF, displays the communication between RIP and zebra, including the addition and deletion of paths to the kernel and the sending and receiving of interface information.

Syntax:

The syntax of this command can include the following variations:

```
# debug vrf <vrf table name> rip zebra
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example displays the communication between RIP and zebra.

```
# debug vrf vtable4 rip zebra
```

5.7.69 debug zebra kernel

This command sets the Debug option for Zebra between kernel interfaces.

Syntax:

The syntax of this command can include the following variations:

```
# debug zebra kernel
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets the Debug option for Zebra between kernel interfaces.

```
# debug zebra kernel
```

5.7.70 debug zebra packet

This command sets the Debug option for Zebra packets.

Syntax:

The syntax of this command can include the following variations:

```
# debug zebra packet [recv] [detail]
# debug zebra packet [send] [detail]
```

The command syntax format is described below:

Arguments	Description
recv	Sets the Debug option for receive packets.
send	Sets the Debug option for send packets.
detail	Sets the Debug option for detailed information.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets the Debug option for send packets.

```
# debug zebra packet send
```

5.7.71 debug zebra rib

This command debugs Routing Information Base (RIB) events.

Syntax:

The syntax of this command can include the following variations:

```
# debug zebra rib [queue]
```

The command syntax format is described below:

Arguments	Description
queue	Debugs RIB queueing.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of using this command.

```
# debug zebra rib
```

5.7.72 debug ripng events

This command debugs IPv6 RIPng events.

Syntax:

The syntax of this command can include the following variations:

```
debug ripng events
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs IPv6 RIP events.

```
# debug ripng events
```

5.7.73 debug ripng packet

This command debugs IPv6 RIPng packets.

Syntax:

The syntax of this command can include the following variations:

```
debug ripng packet
debug ripng packet recv [detail]
```

The command syntax format is described below:

Arguments	Description
recv	Sets the debug option for receive packets.
send	Sets the debug option for send packets.
detail	Sets the debug option for detailed information.

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs IPv6 RIPng packets.

```
# debug ripng packet
```

5.7.74 debug ripng zebra

This command debugs IPv6 RIPNG and Zebra communication.

Syntax:

The syntax of this command can include the following variations:

```
debug ripng zebra
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs RIP and zebra communication.

```
# debug ripng zebra
```

5.7.75 debug rip packet

This command debugs IPv4 RIP packets.

Syntax:

The syntax of this command can include the following variations:

```
debug rip packet
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs IPv4 RIP packets.

```
# debug rip packet
```

5.7.76 debug rip zebra

This command debugs IPv4 RIP and Zebra communication.

Syntax:

The syntax of this command can include the following variations:

```
debug rip zebra
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs RIP and zebra communication.

```
# debug rip zebra
```

5.7.77 debug rmx-serial

This command defines RMX serial debugging.

Syntax:

The syntax of this command can include the following variations:

```
debug rmx-serial clear-logs
debug rmx-serial copy-logs-usb
debug rmx-serial list-logs
debug rmx-serial profile {current|list-logs|read-log <run number>}
debug rmx-serial read-log <run number>
debug rmx-serial tap
```

The command syntax format is described below:

Arguments	Description
clear-logs	Sets the debug option for receive packets.
copy-logs-usb	Copies all saved RMX logs to USB storage.
list-logs	Lists saved RMX logs.
run number	Defines the run number of the saved RMX log.
tap	Taps into RMX serial.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines RMX serial debugging.

```
# debug rmx-serial
```

5.8 VoIP Debug Commands

The following are VoIP Debug commands.

5.8.1 debug fax

This command enables Fax Modem debugging with a debug level. Use **no debug fax** to turn off debug fax.

Syntax:

The syntax of this command can include the following variations:

```
debug fax {basic|detail} [num of next sessions for debug]
no debug fax
```

The command syntax format is described below:

Arguments	Description
basic	Sets debug fax level to Basic.
detail	Sets debug fax level to Detail.
num of next sessions for debug	Defines the number of next sessions for debug.

Defaults:

NA

Note:

This command is only applicable to **Gen 5** devices.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example enables the next 10 sessions to be traced.

```
# debug fax basic 10
```

5.8.2 debug pstn

This command activates PSTN debug.

Syntax:

The syntax of this command can include the following variations:

```
debug pstn
no debug pstn
```

Defaults:

NA

Note:

Using **no debug pstn** turns off debug pstn.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example turns on debug PSTN. .

```
# debug pstn
```

5.8.3 debug sip

This command enables SIP debugging with default debug levels.

Syntax:

The syntax of this command can include the following variations:

```
debug sip [<level>|status]
no debug sip
```

Defaults:

NA

Note:

- If no level is specified, level 5 is used.
- Using **no debug sip** sets the level to '0'.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example sets the debug level to 5. .

```
# debug sip 5
```

5.8.4 debug voip activate-channel

This command activates the channel.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip activate-channel analog <slot/port> <remote ip
address> <remote udp port> <local ip address>
# debug voip activate-channel digital <slot/trunk/channel> <remote
ip address> <remote udp port> <local ip address>
# debug voip activate-channel virtual <caller id> <remote ip
address> <remote udp port> <local ip address>
```

The command syntax format is described below:

Arguments	Description
slot/port	Defines the slot/port of the required channel.
remote ip address	Defines the remote IP address.
udp port	Defines the remote UDP port. Range is [0-65535].
local ip address	Defines the local IP address.
slot/trunk/channel	Defines the slot and trunk of the required channel.
caller id	Defines the Caller ID. Range is [0- 64000].

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of how this command can be used.

```
# debug voip activate-channel analog 1/2 10.12.13.144 100
10.12.13.101
```

5.8.5 debug voip open-channel

This command opens the channel.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip open-channel analog <slot/port> <ibs detection direction>
# debug voip open-channel digital <slot/trunk/channel> <ibs detection direction>
# debug voip open-channel virtual <caller id> <ibs detection direction>
```

The command syntax format is described below:

Arguments	Description
slot/port	Defines the slot/port of the required channel.
ibs detection direction	Defines the IBS detection direction – (0 - TDM, 1 – Network)
slot/trunk/channel	Defines the slot and trunk of the required channel.
caller id	Defines the Caller ID. Range is [0- 64000].

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of how this command can be used.

```
# debug voip open-channel analog 1/2 1
```

5.8.6 debug voip wait-for-detection

This command waits for the digit detection event.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip wait-for-detection
```

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of how this command can be used.

```
# debug voip wait-for-detection
```

5.8.7 debug voip interface

This command displays the current PSTN trace level of a trunk.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip interface {e1-t1|bri} <module(slot)/trunk> trace-level {full-isdn|full-isdn-with-duplications|layer3|layer3-no-duplications|no-trace|q921-raw-data|q931|q931-q921-raw-data|q931-raw-data}
```

Defaults:

NA

Note:

This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of how this command can be used.

```
# debug voip interface bri 2/4
```

5.8.8 debug voip open-and-activate

This command opens and activates a channel.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip open-and-activate {analog|digital|virtual} <start-channel> <num of channels> <dest ip> <dest port>
```

The command syntax format is described below:

Arguments	Description
analog	Debugs FXS/FXO channel.
digital	Debugs BRI/PRI channel.
virtual	Debugs the virtual channel.
start-channel	Defines the Start channel (0 – 255).
num of channels	Defines the number of channel (1 – 256).
dest ip	Defines the destination IP (in the format a.b.c.d).
dest port	Defines the Destination Port (0 – 65335).

Defaults:

NA

Command Modes:

Enable

Note:

Use the **show system assembly** for orientation on the current hardware.

Examples:

The following is an example of how this command can be used.

```
# debug voip open-and-activate digital 1 20 1.2.3.4 2
```

5.8.9 debug voip dial-string

This command sends a string of DTMF tones.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip dial-string {analog|digital|virtual} <channel number>
<generation direction> <string> <duration>
```

The command syntax format is described below:

Arguments	Description
analog	Debugs the FXS/FXO channel.
digital	Debugs the BRI/PRI channel.
virtual	Debugs the virtual channel.
analog channel number	Defines the analog channel number (0 – 29).
digital channel number	Defines the digital channel number (0 – 2016).
virtual channel number	Defines the virtual channel number (0 – 64000).
generation direction	Defines the generation direction: • 0 - TDM • 1 - Network
string	Defines the string to dial (Valid digits: 0 - 9, A – F).
duration	Defines the duration of digits (0-100000).

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of how this command can be used.

```
# debug voip dial-string analog 15 1 abcdef123 10
```

5.8.10 debug voip close-channels

This command debugs voip close-channels.

Syntax:

The syntax of this command can include the following variations:

```
# debug voip close-channels {analog|digital|virtual} <start-
channel> <num of channels>
```

The command syntax format is described below:

Arguments	Description
analog	Debugs the FXS/FXO channel.
digital	Debugs the BRI/PRI channel.
virtual	Debugs the virtual channel.
analog start channel	Defines the analog start channel (0 – 7).
digital start channel	Defines the digital start channel (0 – 59).
virtual start channel	Defines the virtual start channel (0 – 255).
analog num of channels	Defines the analog number of channels (1 – 8).
digital num of channels	Defines the digital number of channels (1 – 60).
virtual num of channels	Defines the virtual number of channels (1 – 256).

Note:

Use the **show system assembly** for orientation on the current hardware.

Command Modes:

Enable

Examples:

The following is an example of how this command can be used.

```
# debug voip close-channels analog 7 1
```

5.8.11 debug test-call ip dial

This command configures and initiates a test call to IP by dialing using specified parameters.

Syntax:

The syntax of this command can include the following variations:

```
# debug test-call ip dial from <calling number> to <called number>
dest-addrss <target host> sip interface <sip_interface>
# debug test-call ip dial from id to <table-index>
```

The command syntax format is described below:

Arguments	Description
calling number	Defines the calling number.
called number	Defines the called number.
target host	Defines the target host.
sip_interface	Defines the SIP interface.
table-index	Defines the table-index.

Command Modes:

Enable

Examples:

The following example configures and initiates a test call to IP.

```
# debug test-call ip dial from id to 2
```

5.8.12 debug test-call ip drop

This command drops the latest outgoing test call.

Syntax:

The syntax of this command can include the following variations:

```
# debug test-call ip drop <calling number>
# debug test-call ip drop id <table-index>
```

The command syntax format is described below:

Arguments	Description
calling number	Drops outgoing test call by number.
table-index	Drops outgoing test calls by table index

Command Modes:

Enable

Examples:

The following example drops the latest outgoing test call.

```
# debug test-call ip drop id 3
```

5.8.13 debug test-call ip set

This command sets test-call options.

Syntax:

The syntax of this command can include the following variations:

```
# debug test-call ip set called number <called number>
# debug test-call ip set caller-id <caller-id>
# debug test-call ip set calling number <calling number>
# debug test-call ip set dest-address <target host> sip-interface
<sip-interface>
# debug test-call ip set play dtmfs <dtmf string>
# debug test-call ip set sip-interfaces <sip_interfaces>
# debug test-call ip set timeout <seconds>
# debug test-call ip set transport-type <transport type>
```

The command syntax format is described below:

Arguments	Description
called number	Sets the called number.
caller-id	Sets the caller-id.
calling number	Sets the calling number.
target host	Sets the target host.
sip-interface	Sets the sip interface.
dtmf string	Sets the DTMFs to be played.
sip-interfaces	Sets SIP interfaces to listen on.
seconds	Sets the disconnection timeout in seconds.
transport type	Sets the transport type: • UDP • TCP • TLS

Command Modes:

Enable

Examples:

The following example sets the test-call option transport type to UDP.

```
# debug test-call ip set transport-type UDP
```

5.9 System Debug Commands

The following are System Debug commands.

5.9.1 debug log

This command displays debugging messages to the CLI session.

Syntax:

The syntax of this command can include the following variations:

```
debug log [full]
no debug log
```

The command syntax format is described below:

Arguments	Description
full	Activates logging to CLI session (full format)

Defaults:

NA

Note:

- Activating the debug log facility will redirect the device error messages (e.g., Syslog messages) to the CLI console as well as their original destination.
- A 'no' command is supported for this command (*no debug log*), which disables the logging facility.
- When working via telnet/SSH, "debug log" affects only the current CLI session.
- To cancel log display to **all** CLI sessions, use "*no debug log all*".

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example upgrades and activates the logging facility redirection.

```
# debug log
```

5.9.2 debug ha

This command displays debugging HA information.

Syntax:

The syntax of this command can include the following variations:

```
debug ha <clear-counters>
```

The command's syntax format is described below:

Arguments	Description
clear-counters	Clears HA debug counters (keep-alive packets sent between active and redundant devices).

Note:

This command is supported on Mediant 800 E-SBC; Mediant 2600; Mediant 4000; Mediant SW.

Command Modes:

Enable

Related Commands:

NA

Examples:

The following example clears HA debug counters.

```
# debug ha clear-counters
```

5.9.3 debug usb devices

This command displays connected USB devices.

Syntax:

The syntax of this command can include the following variations:

```
# debug usb devices
```

Command Modes:

Enable

Examples:

The following example displays connected USB devices.

```
# debug usb devices
```

5.9.4 debug usb-3g devices

This command displays connected USB devices.

Syntax:

The syntax of this command can include the following variations:

```
# debug usb-3g devices#
```

Command Modes:

Enable

Examples:

The following example displays connected USB devices.

```
# debug usb-3g devices
T:  Bus=01 Lev=00 Prnt=00 Port=00 Cnt=00 Dev#=  1 Spd=480 MxCh= 1
B:  Alloc=  0/800 us ( 0), #Int=  0, #Iso=  0
D:  Ver= 2.00 Cls=09(hub  ) Sub=00 Prot=01 MxPS=64 #Cfgs=  1
P:  Vendor=0000 ProdID=0000 Rev= 2.06
S:  Manufacturer=Linux 2.6.21.7-Cavium-Octeon dwc_otg_hcd
S:  Product=DWC OTG Controller
S:  SerialNumber=dwc_otg
C:* #Ifs= 1 Cfg#= 1 Atr=e0 MxPwr=  0mA
I:* If#= 0 Alt= 0 #EPs= 1 Cls=09(hub  ) Sub=00 Prot=00 Driver=hub
E:  Ad=81(I) Atr=03(Int.) MxPS=   4 Ivl=256ms
```

5.9.5 debug usb serial-trace

This command traces the raw interface to a CLI session or Syslog.

Syntax:

The syntax of this command can include the following variations:

```
# debug usb serial-trace {cli|syslog}
```

Command Modes:

Enable

Examples:

The following example traces the raw interface to a Syslog.

```
# debug usb serial-trace syslog
```

5.9.6 debug reset-history

This command debugs reset history.

Syntax:

The syntax of this command can include the following variations:

```
debug reset-history
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example debugs reset history.

```
# debug reset-history
```

5.9.7 undebug

This command disables the debugging function.

Syntax:

The syntax of this command can include the following variations:

```
# undebug all bgp
# undebug bgp [bgp type]
# undebug vrf <vrf table name> all bgp
# undebug vrf <vrf table name> bgp [bgp type]
```

The command syntax format is described below:

Arguments	Description
events	Disables BGP events.
filters	Disables BGP filters.
fsm	Disables BGP fsm information.
keepalives	Disables BGP keepalives.
updates	Disables BGP updates.
zebra	Disables BGP zebra information.

Defaults:

NA

Command Modes:

Enable

Related Commands:

NA

Examples:

The following is an example of using this command.

```
# undebug bgp events
BGP events debugging is off
```

This page is intentionally left blank.

6 Show Commands

The following describes the Show command options.

6.1 show users

This command provides support for displaying and terminating users that are currently logged into the device's CLI. This applies to users logged into the CLI through RS-232 (console), Telnet, or SSH.

It displays the type of interface (console, Telnet, or SSH), user's username, remote IP address from where the user logged in, and the duration (days and time) of the session. Each user is displayed with a unique index (session ID).

Syntax:

The syntax of this command includes the following variations:

```
show users
```

Note:

- The device can display management sessions of up to 24 hours. After this time, the duration counter is reset.
- This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Command Modes:

Basic

Related Commands:

Examples:

The following example displays all active calls.

```
# show users
[0]  console      Admin       local             0d00h03m15s
[1]  telnet       John        10.4.2.1          0d01h03m47s
[2]* ssh          Alex        192.168.121.234   12d00h02m34s
```

The current session from which the show command was run is displayed with an asterisk (*).

6.2 show running-config

This command outputs the current system configuration in the form of a CLI command script. This script can be cut and pasted to the console for execution (limited by the client's capability of saving data to the clipboard).

The command 'show running-configuration > [URL]' will output the script to a file on a remote location. HTTP and HTTPS are supported.

Syntax:

The syntax of this command can include the following variations:

```
show running-config {data|full|no-switchports}
show running-configuration > [URL]
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ **>** Sends output to a URL ▪ **data** - Displays the "data" portion as well ▪ **full** - Displays the parameters that are equal to the default value. In regular mode, only configuration that is not equal to the default is displayed. ▪ **no-switchports** - The output does not contain the switchport information. In the data portion, these are the FastEthernet 5/x and GigabitEthernet 4/y interfaces. For a description of these parameters, refer to the *User's Manual*.

Command Modes:

Basic

Related Commands:

NA

Example:

The following example defines general VoIP configuration

.

```
# show running-config

# Running Configuration Mediant 2600

## VoIP Configuration

  configure voip
   appli-enabling
    enable-ip2ip on
    enable-sas on
    enable-sbc on
    activate
   exit
   coders-and-profiles coders-group-0 0
    name "g711Alaw64k"
    p-time 20
    activate
   exit
   gw routing tel2ip-routing 1
    dst-phone-prefix "exit"
    activate
   exit
   gw digitalgw rp-network-domains 1
    name "dsn"
    ip-to-tel-interworking disable
    activate
   exit
   gw digitalgw rp-network-domains 2
    name "dod"
    ip-to-tel-interworking disable
    activate
   exit
   gw digitalgw rp-network-domains 3
    name "drsn"
    ip-to-tel-interworking disable
    activate
   exit
   gw digitalgw rp-network-domains 5
    name "uc"
    activate
   exit
   gw digitalgw rp-network-domains 7
    name "cuc"
    ip-to-tel-interworking disable
    activate
   exit
```

6.3 Show System Commands

The following commands define the **show system** commands.

6.3.1 show system assembly

This command displays system information.

Syntax:

The syntax of this command includes the following variations:

```
show system assembly
```

Command Modes:

Enable

Examples:

```
# show system assembly
 Board Assembly Info:

| Slot No.| Module Type|Num of Ports |
| 0 | CPU   | 0      |
| 1 | FXS   | 4      |
| 2 | FXO   | 4      |
| 3 | Empty | 0      |
| 4 | GB-ETH      | 4      |
| 5 | FAST-ETH    | 8      |
```

6.3.2 show system active-alarms

This command displays the system active alarms.

Syntax:

The syntax of this command includes the following variations:

```
show system active-alarms
```

Command Modes:

Enable

Examples:

```
# show system active-alarms
1. Board#1      14 major      Network element operational state
change alarm. Operational state is disabled.
 2. Board#1/WanLink#1  78 major      WAN link alarm. FE interface
1 is down.
 3. Board#1/EthernetLink#2    9 minor      Ethernet link alarm.
LAN port number 2 is down.
 4. Board#1/EthernetLink#3    9 minor      Ethernet link alarm.
LAN port number 3 is down.
 5. Board#1/EthernetLink#4    9 minor      Ethernet link alarm.
LAN port number 4 is down.
 6. Board#1/EthernetLink#5    9 minor      Ethernet link alarm.
LAN port number 5 is down.
 7. Board#1/EthernetLink#6    9 minor      Ethernet link alarm.
LAN port number 6 is down.
 8. Board#1/EthernetLink#7    9 minor      Ethernet link alarm.
LAN port number 7 is down.
 9. Board#1/EthernetLink#8    9 minor      Ethernet link alarm.
LAN port number 8 is down.
10. Board#1/EthernetLink#9    9 minor      Ethernet link alarm.
LAN port number 9 is down.
11. Board#1/EthernetLink#10   9 minor      Ethernet link alarm.
LAN port number 10 is down.
12. Board#1/EthernetLink#11   9 minor      Ethernet link alarm.
LAN port number 11 is down.
13. Board#1/EthernetLink#12   9 minor      Ethernet link alarm.
LAN port number 12 is down.
```

6.3.3 show system alarms-history

This command displays the system alarms history.

Syntax:

The syntax of this command includes the following variations:

```
show system alarms-history
```

Command Modes:

Enable

Examples:

```
# show system alarms-history
  1. Board#1      14 major      Network element operational state
change alarm. Operational state is disabled.
  2. Board#1/WanLink#1  78 major      WAN link alarm. FE interface
1 is down.
  3. Board#1/EthernetLink#2    9 minor      Ethernet link alarm.
LAN port number 2 is down.
  4. Board#1/EthernetLink#3    9 minor      Ethernet link alarm.
LAN port number 3 is down.
  5. Board#1/EthernetLink#4    9 minor      Ethernet link alarm.
LAN port number 4 is down.
  6. Board#1/EthernetLink#5    9 minor      Ethernet link alarm.
LAN port number 5 is down.
  7. Board#1/EthernetLink#6    9 minor      Ethernet link alarm.
LAN port number 6 is down.
  8. Board#1/EthernetLink#7    9 minor      Ethernet link alarm.
LAN port number 7 is down.
  9. Board#1/EthernetLink#8    9 minor      Ethernet link alarm.
LAN port number 8 is down.
 10. Board#1/EthernetLink#9    9 minor      Ethernet link alarm.
LAN port number 9 is down.
 11. Board#1/EthernetLink#10   9 minor      Ethernet link alarm.
LAN port number 10 is down.
 12. Board#1/EthernetLink#11   9 minor      Ethernet link alarm.
LAN port number 11 is down.
 13. Board#1/EthernetLink#12   9 minor      Ethernet link alarm.
LAN port number 12 is down. 2. Board#1/WanLink#1  78 major
WAN link alarm. FE interface 1 is down.
 3. Board#1/EthernetLink#2    9 minor      Ethernet link alarm.
LAN port number 2 is down.
 4. Board#1/EthernetLink#3    9 minor      Ethernet link alarm.
LAN port number 3 is down.
 5. Board#1/EthernetLink#4    9 minor      Ethernet link alarm.
LAN port number 4 is down.
 6. Board#1/EthernetLink#5    9 minor      Ethernet link alarm.
LAN port number 5 is down.
 7. Board#1/EthernetLink#6    9 minor      Ethernet link alarm.
LAN port number 6 is down.
```

```
 8. Board#1/EthernetLink#7    9 minor      Ethernet link alarm.
LAN port number 7 is down.
 9. Board#1/EthernetLink#8    9 minor      Ethernet link alarm.
LAN port number 8 is down.
10. Board#1/EthernetLink#9    9 minor      Ethernet link alarm.
LAN port number 9 is down.
11. Board#1/EthernetLink#10   9 minor      Ethernet link alarm.
LAN port number 10 is down.
12. Board#1/EthernetLink#11   9 minor      Ethernet link alarm.
LAN port number 11 is down.
13. Board#1/EthernetLink#12   9 minor      Ethernet link alarm.
LAN port number 12 is down.
```

6.3.4 show system cpu-util history

This command shows data and voice CPU utilization history. The CPUs utilization history is collected for up to 72 hours according to the following:

- For the last 60 seconds, the CPU utilization is saved on a per second basis i.e. the MSBR retrieves the CPU utilization history of every second in the last minute.
- For the last 60 minutes (last hour), the MSBR retrieves 60 values. Every retrieved value is the average of the CPU utilization for every 60 second interval.
- For the last 72 hours (3 days) the MSBR retrieves 72 values. Every retrieved value is the average of the CPU utilization for every 60 minute interval.

Syntax:

The syntax of this command includes the following variations:

```
show system cpu-util history data
show system cpu-util history voice
```

The command syntax format is described below:

Arguments	Description
data	Show data CPU utilization history.
voice	Show voice CPU utilization history.

Command Modes:

Enable

Examples:

```
# show system cpu-util history data
Data Cpu Utilization in last 72 hours



 1111111
 5495656
|
|
|
|
|
|
|
|
|
|*******
+-----------------------------------------------------------------------
-------

12345678911111111112222222222333333333344444444455555555556666666
666777
```

```
012345678901234567890123456789012345678901234567890123456789012

Data Cpu Utilization in last 60 minutes



 111111111111111111111111111111111111111111111111111111111111111
 545455455545555454545545545555455555455545455554454444554555555
|
|
|
|
|
|
|
|
|
|**************************************************************
+------------------------------------------------------------
 123456789111111111122222222233333333334444444445555555556
          012345678901234567890123456789012345678901234567890

Data Cpu Utilization in last 60 seconds



 111111111111111111111111111111111111111111111111111111111111111
 555444555555666555555444555445555555555555555554443335555555
|
|
|
|
|
|
|
|
|
|**************************************************************
+------------------------------------------------------------
 123456789111111111122222222233333333334444444445555555556
          012345678901234567890123456789012345678901234567890
```

6.3.5 show system utilization history

This command shows data and voice memory utilization history. The same method that is used for CPU utilization history is used for memory utilization history

Syntax:

The syntax of this command includes the following variations:

```
show system utilization history data
show system utilization history voice
```

The command syntax format is described below:

Arguments	Description
data	Show data memory utilization history.
voice	Show voice memory utilization history.

Command Modes:

Enable

Examples:

```
# show system utilization history voice
Voice Memory Utilization in last 72 hours



 55555555
 32232222
|
|
|
|
|
|********
|********
|********
|********
|********
+-----------------------------------------------------------------
-------

12345678911111111112222222222333333333344444444455555555556666666
666777

012345678901234567890123456789012345678901234567890123456789012

Voice Memory Utilization in last 60 minutes
```

```
 555555555555555555555555555555555555555555555555555555555
 223333333333333333332222322222222222222222222233222222222222
|
|
|
|
|
|************************************************************
|************************************************************
|************************************************************
|************************************************************
|************************************************************
+------------------------------------------------------------
 123456789111111111122222222233333333334444444445555555556
          012345678901234567890123456789012345678901234567890
```

6.3.6 show system feature-key

This command displays system feature-key information.

Syntax:

The syntax of this command includes the following variations:

```
show system feature-key
```

Command Modes:

Enable

Examples:

```
# show system feature-key
Key features:
Board Type: Mediant 800 - MSBG
Security: IPSEC MediaEncryption StrongEncryption
EncryptControlProtocol
DATA features: Routing FireWall&VPN WAN Eth-Port=12 BGP Advanced-
Routing Wan-Rate=1020Mbps
Coders: G723 G729 G728 NETCODER GSM-FR GSM-EFR AMR EVRC-QCELP G727
ILBC EVRC-B AMR-WB G722 EG711 MS_RTA_NB MS_RTA_WB SPEEX_WB
PSTN FALLBACK Supported
E1Trunks=1
T1Trunks=1
FXSPorts=4
FXOPorts=4
DSP Voice features: RTCP-XR AMRPolicyManagement
Channel Type: RTP DspCh=32
PSTN Protocols: IUA=1
IP Media: Conf VXML VoicePromptAnnounc(H248.9) CALEA TrunkTesting
POC
SS7 Links: MTP2=1 MTP3=1 M2UA=1 M3UA=1
Control Protocols: MGCP SIP SASurvivability SBC=1
Default features:
Coders: G711 G726
```

6.3.7 show system high-availability

This command displays HA status and network monitor status.

Syntax:

The syntax of this command includes the following variations:

```
show system high-availability {status|network-monitor-status}
```

The command's syntax format is described below:

Arguments	Description
status	Displays HA status.
network-monitor-status	Displays network monitor status.

Command Modes:

Enable

Examples:

```
# show system high-availability status
```

6.3.8 show system ntp-status

This command displays NTP information.

Syntax

The syntax of this command can include the following variations:

```
show system ntp-status
```

Defaults:

NA

Command Modes:

Enable

Example

This example displays NTP information.

```
# show system ntp-status
Configured NTP server #1 is 192.168.0.199
Configured NTP server #2 is 192.168.0.3
NTP is synchronized, stratum 0, reference is INIT
** Precision 0.00000 seconds
** Root delay 0.00000 seconds
** Root dispersion 0.01824 seconds
** Reference time 00000000.00000000 (2036-02-07 06:28:16 UTC)
** UTC offset 0 seconds
Current local time: 2014-03-16 10:49:03
The output contains synchronization status, synchronization
```

6.3.9 show system hardware

This command provides support for indicating incompatible hardware components (e.g., NIC, RAM, and core) of the hardware platform on which the Mediant SE or Mediant VE is being installed. During installation (from a CD), if an incompatible hardware component is detected, a warning message box is displayed, listing the incompatible components. The user can abort installation or continue the installation process, as desired. Incompatible components are indicated with an asterisk (*).

Syntax:

The syntax of this command can include the following variations:

```
show system hardware
```

Defaults:

NA

Note:

This command is applicable to Mediant SW E-SBC.

Command Modes:

Enable

Example

This example displays incompatible NICs:

```
# show system hardware
    cpu: Intel<R> Xeon<R> CPU E31220 @ 3.10GHz, total 4 cores
    memory:  4096 MB
    chassis: ProLiant DL120 G7
    network:
         Intel Corporation 82574L Gigabit Network Connection
         Intel Corporation 82574L Gigabit Network Connection
         * Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit
Ethernet (rev 10)
         * Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit
Ethernet (rev 10)
```

6.3.10 show system power

This command displays the system PoE information.

Syntax:

The syntax of this command can include the following variations:

```
show system power
```

Defaults:

NA

Command Modes:

Enable

Example

This example displays the system PoE information,

```
show system power
```

6.3.11 show system version

This command shows the current running software and hardware version.

Syntax:

The syntax of this command can include the following variations:

```
show system version
```

Command Modes:

Basic

Related Commands:

NA

Command Modes:

Enable

Example

This example displays the current running software and hardware version,

```
# show system version

Version info:
--------------
;Board: M1K-MSBR Mike
;HW Board Type: 47  FK Board Type: 67
;Serial Number: 3845462
;Slot Number: 1
;Software Version: 6.80A.009.001
;DSP Software Version: 204IM3=> 660.10
;Second DSP Software Version: 204IM3=> 660.10
;Board IP Address: 10.15.7.95
;Board Subnet Mask: 255.255.0.0
;Board Default Gateway: 10.15.0.1
;Ram size: 497M   Flash size: 64M
;Num of DSP Cores: 4  Num DSP Channels: 16
;Num of physical LAN ports: 3
;Profile: NONE
;Key features:;Board Type: 67 ;Coders: G723 G729 G728 NETCODER
GSM-FR GSM-EFR AMR EVRC-QCELP G727 ILBC EVRC-B AMR-WB G722 EG711
MS_RTA_NB MS_RTA_WB SILK_NB SILK_WB SPEEX_NB SPEEX_WB ;Eth-Port=2
;DATA features: Routing FireWall&VPN WAN BGP Advanced-Routing 3G
WIFI-5GHz IPv6 FTTX-WAN ;IP Media: Conf VXML ;DSP Voice features:
RTCP-XR ;QOE features: VoiceQualityMonitoring MediaEnhancement
;Security: IPSEC MediaEncryption StrongEncryption
EncryptControlProtocol ;Channel Type: RTP DspCh=30 IPMediaDspCh=2
;E1Trunks=1 ;T1Trunks=1 ;FXSPorts=4 ;FXOPorts=4 ;Control
Protocols: TRANSCODING=2 TestCall=2 Zero-conf SIPRec=2 CODER-
```

```
TRANSCODING=2 SBC-SIGNALING=10 SBC-MEDIA=10 MGCP SIP
SASurvivability SBC=20 ;Default features:;Coders: G711 G726;

;---------  HW components ---------
;
; Slot # : Module type : # of ports : # of DSPs
;----------------------------------------------
;      1 : Empty
;      2 : BRI         :          4 :         2
;      3 : DAA_O       :          4 :         1
;      4 : Empty
;      5 : FXS         :          4 :         1
;      6 : Empty
;----------------------------------------------
```

6.3.12 show system nqm

This command displays the latest results of previous Network Quality Monitoring (NQM) probing sessions.

Syntax:

The syntax of this command can include the following variations:

```
show system nqm [nqm session id]
show system nqm [nqm session id] [number of rows to display]
```

The command's syntax format is described below:

Arguments	Description
[nqm session id]	Defines the NQM session id to display. This number corresponds to the sender row index and can therefore be in the range of 0-9.
[number of rows to display]	Defines the number of table rows to display. This can be in the range of [1 – 1000]. If not set, will default to 10 table rows.

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the NQM results file of sender 0 to a HTTP server.

```
# show system nqm 100
```

6.3.13 show system power

This command displays the power summary of the PoE interface. For more information, refer to the **Configuring Power over Ethernet** chapter in the *Mediant 800 MSBR SIP User's Manual*.

Syntax:

The syntax of this command can include the following variations:

```
show system power
```

The command's syntax format is described below:

Defaults:

NA

Note:

This command is only applicable to the Mediant 800 MSBR.

Command Modes:

Enable

Example:

The following example displays the power summary for Port 5/1.

:

```
# configure data
(config-data)# interface GigabitEthernet 5/1
(conf-if-FE 5/1)# power disable
(conf-if-FE 5/1)# show system power

Main Power Supply: 53.0 (v)
System Power Information:
| Calculated Power                                | Measured Power
|
| Power     | Allocated | Allocated | Power     | Consumed  |
Remaining |
| Budget    | Power     | Power     | Left      | Power     |
Power     |
| (mWatt)   | (mWatt)   |(Percent)  | (mWatt)   | (mWatt)   |
(mWatt)   |
|-----------------------------------------------------------------
------|
|     120000|          0|          0|     120000|          0|
120000|

| Interface         | Status          | Class  | Delivered     |
|                   |                 |        | Power[mW]     |
|-------------------------------------------------------------|
|GigabitEthernet 4/1|Invalid signature|       0|        0/15400|
```

```
|GigabitEthernet 4/2|Enabled          |       0|        0/15400|
|GigabitEthernet 4/3|Enabled          |       0|        0/15400|
|GigabitEthernet 4/4|Enabled          |       0|        0/15400|
|FastEthernet 5/1   |Disabled         |       0|            n/a|
|FastEthernet 5/2   |Enabled          |       0|        0/15400|
|FastEthernet 5/3   |Enabled          |       0|        0/15400|
|FastEthernet 5/4   |Enabled          |       0|        0/15400|
|FastEthernet 5/5   |Enabled          |       0|        0/15400|
|FastEthernet 5/6   |Enabled          |       0|        0/15400|
|FastEthernet 5/7   |Enabled          |       0|        0/15400|
|FastEthernet 5/8   |Enabled          |       0|        0/15400|
```

6.3.14 show system power detail

This command displays the power detail of the PoE interface. For more information, refer to the **Configuring Power over Ethernet** chapter in the *Mediant 800 MSBR SIP User's Manual*.

Syntax:

The syntax of this command can include the following variations:

```
show system power detail
```

The command's syntax format is described below:

Defaults:

NA

Note:

This command is only applicable to the Mediant 800 MSBR.

Command Modes:

Enable

Example:

The following example displays the power summary for Port 5/1

```
# configure data
(config-data)# interface GigabitEthernet 4/1
(conf-if-GE 4/1)# show system power detail

Main Power Supply: 53.1 (v)
System Power Information:
| Calculated Power                              | Measured Power
|
| Power     | Allocated | Allocated | Power     | Consumed  |
Remaining |
| Budget    | Power     | Power     | Left      | Power     |
Power     |
| (mWatt)   | (mWatt)   |(Percent)  | (mWatt)   | (mWatt)   |
(mWatt)   |
|-----------------------------------------------------------------
------|
|     120000|          0|          0|     120000|          0|
120000|

| Interface          | Status          | Class  | IsPort | Port |
Ch Current | Ch Volt | Used Power     |
|                    |                 |        | On     | Mode |
[mA]       | [dV]    | [mW]           |
```

```
|-------------------------------------------------------------------
-------------------------------------|
|GigabitEthernet 4/1 |Invalid signature|       0|off     |AF    |
4|        0|          0/4000|
|GigabitEthernet 4/2 |Enabled          |       0|off     |AF    |
0|       73|         0/15400|
|GigabitEthernet 4/3 |Enabled          |       0|off     |AF    |
0|        0|         0/15400|
|GigabitEthernet 4/4 |Enabled          |       0|off     |AF    |
0|      246|         0/15400|
|FastEthernet 5/1    |Enabled          |       0|off     |AF    |
0|        0|          0/5000|
|FastEthernet 5/2    |Enabled          |       0|off     |AF    |
0|        0|         0/15400|
|FastEthernet 5/3    |Enabled          |       0|off     |AF    |
0|        0|         0/15400|
|FastEthernet 5/4    |Enabled          |       0|off     |AF    |
0|        0|         0/15400|
|FastEthernet 5/5    |Enabled          |       0|off     |AF    |
0|      150|         0/15400|
|FastEthernet 5/6    |Enabled          |       0|off     |AF    |
0|        0|         0/15400|
|FastEthernet 5/7    |Enabled          |       0|off     |AF    |
0|        0|         0/15400|
|FastEthernet 5/8    |Enabled          |       0|off     |AF    |
0|        0|         0/15400|

General System Information: Alarm Clear
```

6.3.15 show system tls

This command displays TLS security information.

Syntax:

The syntax of this command can include the following variations:

```
show system tls  {certificate|contexts|trusted-root}
```

The command's syntax format is described below:

Arguments	Description
certificate	Displays certificate information.
contexts	Displays TLS security context information.
trusted-root	Displays trusted certificates.

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays the active contexts.

```
# show system tls contexts
Context #  Name
---------  --------------------------
0          default
2          abcd

Total 2 active contexts.
Total certificate file size: 4208 bytes.
```

6.4 Show VoIP Commands

The following describes the Show VoIP commands.

6.4.1 show voip interface network

This command displays VoIP interface table details.

Syntax:

The syntax of this command includes the following variations:

```
show voip interface network <vlan id>
show voip interface network description
```

The command syntax format is described below:

Arguments	Description
vlan id	Defines a valid VLAN interface ID in the range of 1 and 255.

Command Modes:

Enable

Examples:

The following example displays interface VLAN 2 details:

```
# show voip interface network 2
Name: M_12
Application Type: CONTROL
IP address: 10.12.60.66
PrefixLength: 16
Gateway: 0.0.0.0
Vlan ID: 3
Primary DNS: 0.0.0.0
Secondary DNS: 0.0.0.0
Uptime:  69:54:48
rx_packets 0     tx_packets   6
rx_bytes     0     tx_bytes     462
```

The following example displays brief descriptions for all interfaces.

```
# show voip interface network description
```

```
Index Application Type    IP Address    Prefix Gateway
VlanID Interface Name
0     O+M+C   10.4.60.62    16     10.4.0.1      1      O+M+C
2     CONTROL 10.12.60.66   16     0.0.0.0       3      M_12
3     MEDIA   10.13.60.66   16     10.13.0.1     2      M_13
```

6.4.2 show voip ports

This command displays the VoIP ports. The information displayed includes the port number, port name, port MAC address, speed, duplex mode, native VLAN ID, and status of the Ethernet link ("UP" or "DOWN").

Syntax:

The syntax of this command includes the following variations:

```
show voip ports
```

Command Modes:

Enable

Note:

Applicable to the following: Mediant 500 E-SBC; Mediant 800 E-SBC; Mediant 1000B E-SBC; Mediant 2600; Mediant 4000; Mediant SW.

Examples:

The following example displays the VoIP ports:

```
Port Num  Port Name  MAC Address       Speed     Duplexity  Link Status Native VLAN
--------  ---------  ------------      ------    ---------  -----------  ----------
1          GE_1      00:90:8f:3b:46:29 100Mbps     Full       UP            1
2          GE_2      00:90:8f:3b:46:29 1Gbps       Full       DOWN          0
```

6.4.3 show voip calls

This command displays all active calls.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls
```

Examples:

The following example displays all active calls.

```
# show voip calls

Total Active Calls: 1
| Session ID    |     Caller         |     Callee         | Origin
|      Remote IP     |End Point Type |Duration|Call State
================================================================
============================================================
|326433737      |3005                |2000                |Outgoin
g|10.8.6.36           |FXS-3/3         |00:00:06|Connected
```

6.4.4 show voip calls active descending

This command displays currently active calls in descending order by call duration.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls active descending
```

Examples:

The following example displays currently active calls in descending order by call duration.

```
#  descending
Total Active Calls: 1000
| Session ID    |     Caller          |     Callee          | Origin
|      Remote IP     |End Point Type |Duration|Call State
=============================================================
=========================================================
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:47|Connected
|314380187      |1571@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:47|Connected
|314380188      |1572@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:46|Connected
|314380188      |1572@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:46|Connected
|314380189      |1573@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:46|Connected
|314380189      |1573@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:45|Connected
|314380208      |1592@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:45|Connected
|314380226      |1610@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:44|Connected
|314380226      |1610@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:44|Connected
|314380246      |1630@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:43|Connected
|314380246      |1630@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:43|Connected
|314380265      |1649@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:43|Connected
|314380265      |1649@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:43|Connected
|314380266      |1650@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:42|Connected
|314380266      |1650@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:42|Connected
|314380279      |1663@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC            |00:04:42|Connected
|314380279      |1663@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC            |00:04:42|Connected
|314380280      |1664@10.3.3.194     |100@10.3.91.2
```

6.4.5 show voip calls statistics

This command displays all call statistics (Gateway and SBC).

Syntax:

The syntax of this command includes the following variations:

```
show voip calls statistics {gw|sbc} [<ip2tel | tel2ip>]
```

The command's syntax format is described below:

Arguments	Description
ip2tel	Displays VoIP SIP Gateway IP-to-Tel Calls Statistics
tel2ip	Displays VoIP SIP Gateway Tel-to-IP Calls Statistics

Examples:

The following example displays Gateway call statistics.

```
# show voip calls stat gw
Gateway Basic Statistics:
Active TDM channels: 0
Active DSP resources: 0
Active analog channels: 0
Active G.711 channels: 0
Average voice delay (ms): 0
Average voice jitter (ms): 0
Total Tx RTP packets: 770
Total Rx RTP packets: 771
Total call attempts: 3
```

6.4.6 show voip calls active summary

This command displays a summary of currently active calls.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls active summary
```

Examples:

The following example displays a summary of currently active calls.

```
# show voip calls active summary
Total Active Calls: 1000
Total Active GW Calls: 0
Total Active IP2IP Calls: 0
Total Active SBC Calls: 1000
```

6.4.7 show voip calls active ip2ip

This command displays call information of currently active IP-to-IP calls in ascending order by call duration.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls active ip2ip
```

Examples:

The following example displays call information of currently active IP-to-IP calls in ascending order by call duration.

```
# show voip calls active ip2ip
Total Active Calls: 13
```

6.4.8 show voip calls active gw

This command displays call information of currently active gateway calls in ascending order by call duration.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls active gw
```

Examples:

The following example displays call information of currently active IP-to-IP calls in ascending order by call duration.

```
# show voip calls active ip2ip
Total Active Calls: 5
```

6.4.9 show voip calls active sbc

This command displays call information of currently active SBC calls in ascending order by call duration.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls active sbc
```

Examples:

The following example displays call information of currently active SBC calls in ascending order by call duration.

```
# show voip calls active sbc
Total Active Calls: 1000
| Session ID    |     Caller          |     Callee          | Origin
|      Remote IP     |End Point Type |Duration|Call State
=============================================================
=========================================================
|314380675      |1129@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:12|Connected
|314380675      |1129@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:12|Connected
|314380674      |1128@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:12|Connected
|314380668      |1122@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:13|Connected
|314380668      |1122@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:13|Connected
|314380667      |1121@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:13|Connected
|314380649      |1103@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:13|Connected
|314380648      |1102@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:14|Connected
|314380648      |1102@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:14|Connected
|314380630      |1084@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:14|Connected
|314380630      |1084@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:14|Connected
|314380628      |1082@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:15|Connected
|314380625      |1079@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:15|Connected
|314380609      |1063@10.3.3.194     |100@10.3.91.2
|Outgoing|10.3.3.194(IPG-2)   |SBC           |00:05:15|Connected
|314380608      |1062@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:16|Connected
|314380607      |1061@10.3.3.194     |100@10.3.91.2
|Incoming|10.3.3.194(IPG-1)   |SBC           |00:05:16|Connected
```

6.4.10 show voip calls active <session ID>

This command displays detailed call information for a specific session ID.

Syntax:

The syntax of this command includes the following variations:

```
show voip calls active <session id>
```

Examples:

The following example displays call information for Session ID order by call duration.

```
# show voip calls active 314380187
Total 2 Active Calls fits Session-ID = 314380187

============================================================
End Point Type: SBC
SIP Method: INVITE
SIP Call ID: 213455445116201310458@10.3.91.2
SessionId: 314380187
Call Direction: Outgoing
Source IP: 10.3.91.2
SourcePort: 5060
Dest IP: 10.3.3.194
DestPort: 5060
Transport Type: UDP
Call Duration: 00:05:56
Setup Time: 10:45:08.700  UTC Tue Jun 11 2013
Connect Time: 10:45:08.825  UTC Tue Jun 11 2013
Source URI: 1571@10.3.3.194
Source URI Before Map: 1571@10.3.3.194
Destination URI: 100@10.3.91.2
Destination URI Before Map: 100@10.3.91.2
RedirectReason: -1
Redirect URI:
Redirect URI Before Map:
SigIPDiffServ: 40
IP Group: 2       (TP6310_194)
SRD: 0     (srd0)
SIPInterfaceID: 0
ProxySetId: 2
IP-Profile: 0           ()
Media Releam: 0            (mr0)
Direct Media: no

------------------------------------------------------------
Media Type: AUDIO
Cid: 1715
Coder: g711Alaw64k
Packets Interval: 20
Local RTP IP: 10.3.91.2
```

```
LocalRtpPort: 9060
Remote RTP IP: 10.3.3.194
RemoteRtpPort: 28520
Input Packets: 17757
Output Packets: 17756
Packets Loss: 0
Remote Packets Loss: 0
RTP Delay: 4294967295
RTP Jitter: 3
RTP SSRC: 2324039615
Remote RTP SSRC: 313809060
LocalRFactor: 127
RemoteRFactor: 127
LocalMosCQ: 127
RemoteMosCQ: 127
RTPIPDiffServ: 46
Latched RTP IP:
LatchedRtpPort: 0
Latched T.38 IP:
LatchedT38Port: 0

============================================================
End Point Type: SBC
SIP Method: INVITE
SIP Call ID: 20134836111620131045 9@10.3.3.194
SessionId: 314380187
Call Direction: Incoming
Source IP: 10.3.3.194
SourcePort: 5060
Dest IP: 10.3.91.2
DestPort: 5060
Transport Type: UDP
Call Duration: 00:05:56
Setup Time: 10:45:08.700  UTC Tue Jun 11 2013
Connect Time: 10:45:08.825  UTC Tue Jun 11 2013
Source URI: 1571@10.3.3.194
Source URI Before Map: 1571@10.3.3.194
Destination URI: 100@10.3.91.2
Destination URI Before Map: 100@10.3.91.2
RedirectReason: -1
Redirect URI:
Redirect URI Before Map:
SigIPDiffServ: 40
IP Group: 1       (TP6310_194)
SRD: 0     (srd0)
SIPInterfaceID: 0
ProxySetId: 1
IP-Profile: 0           ()
Media Releam: 0            (mr0)
Direct Media: no
```

```
-----------------------------------------------------------
Media Type: AUDIO
Cid: 1714
Coder: g711Alaw64k
Packets Interval: 20
Local RTP IP: 10.3.91.2
LocalRtpPort: 9070
Remote RTP IP: 10.3.3.194
RemoteRtpPort: 28500
Input Packets: 17669
Output Packets: 17671
Packets Loss: 0
Remote Packets Loss: 0
RTP Delay: 4294967295
RTP Jitter: 0
RTP SSRC: 173285770
Remote RTP SSRC: 1016034000
LocalRFactor: 127
RemoteRFactor: 127
LocalMosCQ: 127
RemoteMosCQ: 127
RTPIPDiffServ: 46
Latched RTP IP:
LatchedRtpPort: 0
Latched T.38 IP:
LatchedT38Port: 0
```

6.4.11 show voip calls history

This command displays CDR history information .

Syntax:

The syntax of this command includes the following variations:

```
show voip calls history
```

Note:

This command is only applicable to Mediant 5xx, Mediant 8xx, and Mediant 1000B (running Linux), and only for Gateway calls (not SBC).

Examples:

The following example displays CDR history information .

```
# show voip calls history
| Call End Time                  |End Point      |     Caller         |     Callee
|Direction|  Remote IP    |Duration| Termination Reason | Session ID
=============================================================================================
=================================================================
|15:06:36.000  UTC Tue Aug 12 2014|ISDN-1/1/2     |100                 |400
|Incoming |10.33.8.51     |        |NO_ANSWER           |1596538769
|15:05:56.000  UTC Tue Aug 12 2014|FXS-3/1        |200                 |100
|Outgoing |10.33.8.51     |00:00:14|NORMAL_CALL_CLEAR   |1596538762
|15:05:54.000  UTC Tue Aug 12 2014|ISDN-1/1/1     |400                 |200
|Outgoing |10.33.8.52     |00:01:20|NORMAL_CALL_CLEAR   |1596538765
|15:04:27.000  UTC Tue Aug 12 2014|               |100                 |444
|Incoming |10.33.8.51     |        |GENERAL_FAILED      |1596538766
|15:04:25.000  UTC Tue Aug 12 2014|ISDN-1/1/1     |100                 |400
|Incoming |10.33.8.51     |00:00:02|NORMAL_CALL_CLEAR   |1596538764
|15:04:14.000  UTC Tue Aug 12 2014|ISDN-1/1/1     |400                 |202
|Outgoing |10.33.8.52     |00:00:03|NORMAL_CALL_CLEAR   |1596538754
|15:04:06.000  UTC Tue Aug 12 2014|FXS-3/1        |200                 |201
|Outgoing |10.33.8.52     |00:00:04|NORMAL_CALL_CLEAR   |1596538750
```

6.4.12 show voip coders-stats

This command displays the number and percentage of active channels using each audio coder.

Syntax:

The syntax of this command includes the following variations:

```
show voip coders-stats
```

Note:

The command is applicable to Mediant 5xx, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Examples:

The following example shows 67 channels (25.18%) of the 266 active channels are using the G.729e coder, 76 (28.57%) are using the G.726 coder, and 123 (46.24%) are using the G.722 coder.

```
# show voip coders-stats
There are 266 active channels.
Coder     Number of Channels      Percentage
-----------------------------------------
G729e           67                25.18
G726            76                28.57
G722            123               46.24
```

6.4.13 show voip interface

The following commands define the **show voip** commands.

6.4.13.1 show voip interface e1-t1 | bri

This command displays trunk information including the PSTN trace level.

Syntax:

The syntax of this command includes the following variations:

```
show voip interface {e1-t1|bri} <module(slot)/trunk>
```

The command syntax format is described below:

Arguments	Description
slot	Defines the module slot index as shown on the front panel.
trunk	Defines the trunk within the selected module.

Related Commands:

```
interface e1-t1 <slot/port>
interface bri <slot/port>
```

The above commands enter a specific PSTN interface (E1/T1 or BRI) configuration.

Note:

The displayed parameters depend on the protocol type.

Examples:

The following example displays the current status, main Performance Monitoring (PM) parameters and main configuration parameters.

```
# show voip interface e1-t1 1/1
# show voip interface bri 1/2
          Mediant 800 - MSBG# show voip interface bri 1/2

          show voip interface bri 1\2
          ----------------------------
          module/port: 1\2
          trunk number:      1
          protocol:    bri_euro_isdn
          state:       active
          alarm status:      LOS 0,  LOF 0
          d-channel status:  not established
          loopback status:   no loop
```

```
main performance monitoring counters collected in the last 330
seconds:
          Slips:    25  Slip seconds:      1
          Code violations: 0  Code violation seconds:  0
          HDLC CRC errors: 2  LOF seconds:       1

          basic configuration:
          isdn-layer2-mode: BRI_L2_MODE_P2MP
          isdn configuration:
          isdn-termination-side:       USER_TERMINATION_SIDE
          isdn-bits-cc-behavior:       0
          isdn-bits-incoming-calls-behavior: 0
          isdn-bits-outgoing-calls-behavior: 0
          isdn-bits-ns-behavior:       0
          isdn-bits-ns-extension-behavior:   0
```

6.4.13.2 show voip interface fxs-fxo

This command displays the current status, main PM parameters and main configuration parameters to a specific analog interface (FXS or FXO).

Syntax:

The syntax of this command includes the following variations:

```
show voip interface fxs-fxo <slot/port>
```

The command syntax format is described below:

Arguments	Description
slot	Defines the module slot index as shown on the front panel.
port	Defines the port index within the selected module.

Related Commands:

```
interface fxs-fxo <slot/port>
```

Examples:

The following example displays the current status, main PM parameters and main configuration parameters.

```
# show voip interface fxs-fxo
```

6.4.14 show voip cpu-stats

This command displays CPU percentage use.

Syntax:

The syntax of this command includes the following variations:

```
show voip cpu-stats
```

Examples:

The following example displays CPU percentage use.

```
# show voip cpu-stats
CPU percentage: 47%
```

6.4.15 show voip dsp

The following commands define the **show voip dsp** commands.

6.4.15.1 show voip dsp perf

This command displays performance monitoring of DSP data.

Syntax:

The syntax of this command includes the following variations:

```
show voip dsp perf
```

Examples:

The following example displays performance monitoring of DSP data.

```
# show voip dsp perf

DSP Statistics (statistics for 144 seconds):
Active DSP resources: 0
Total DSP resources: 76
DSP usage : 0
```

6.4.15.2 show voip dsp status

This command displays the current DSP status.

Syntax:

The syntax of this command includes the following variations:

```
show voip dsp status
```

Examples:

The following example displays the current DSP status.

```
# show voip dsp status

Group:0 DSP firmware:624AE3 Version:0660.07 - Used=0 Free=72
Total=72
  DSP device   0:  Active    Used= 0   Free= 6   Total= 6
  DSP device   1:  Active    Used= 0   Free= 6   Total= 6
  DSP device   2:  Active    Used= 0   Free= 6   Total= 6
  DSP device   3:  Active    Used= 0   Free= 6   Total= 6
  DSP device   4:  Active    Used= 0   Free= 6   Total= 6
  DSP device   5:  Active    Used= 0   Free= 6   Total= 6
  DSP device   6:  Active    Used= 0   Free= 6   Total= 6
  DSP device   7:  Active    Used= 0   Free= 6   Total= 6
  DSP device   8:  Active    Used= 0   Free= 6   Total= 6
  DSP device   9:  Active    Used= 0   Free= 6   Total= 6
  DSP device  10:  Active    Used= 0   Free= 6   Total= 6
  DSP device  11:  Active    Used= 0   Free= 6   Total= 6
Group:1 DSP firmware:204IM Version:0660.07 - Used=0 Free=8 Total=8
  DSP device  12:  Active    Used= 0   Free= 4   Total= 4
  DSP device  13:  Active    Used= 0   Free= 4   Total= 4
Group:2 DSP firmware:204IM Version:0660.07 - Used=0 Free=4 Total=4
  DSP device  14:  Active    Used= 0   Free= 4   Total= 4
Group:4 DSP firmware:204IM Version:0660.07 - Used=4 Free=0 Total=4
  DSP device  15:  Active    Used= 4   Free= 0   Total= 4
```

6.4.16 show voip groups

This command displays the configuration and status of the Ethernet port Group Members. For each Group Member, the name, mode of operation, status, number of ports whose link is up, and ports comprising the group are displayed.

Syntax:

The syntax of this command includes the following variations:

```
show voip groups
```

Note:

This command is applicable to Mediant 800 E-SBC, Mediant 1000 E-SBC, Mediant 2600, Mediant 4000, and Mediant SW.

Example:

The following example displays the configuration and status of the Ethernet port Group Members.

```
# show voip groups

G. Num    Group Name   Mode         State Uplinks   Group Members
 ------  --------------  -------------------  ----- -------  ----
 0     GROUP_1     REDUN_1RX_1TX/2   Up     1    GE_4_1 ,GE_4_2
 1     GROUP_2     REDUN_1RX_1TX/2  Down    0    GE_4_3 ,GE_4_4
```

6.4.17 show voip e911

This command displays e911 (ELIN) information.

Syntax:

The syntax of this command includes the following variations:

```
show voip e911
```

Note:

This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, and Mediant 4000.

Example:

The following example displays the configuration and status of the Ethernet port Group Members.

```
# show voip e911
```

6.4.18 show voip gw

This command provides support for the following additional show CLI commands that display various statistics and call counters relating to the Gateway (analog and digital PSTN) application.

6.4.18.1 show voip gw statistics basic-statistics

This command displays performance monitoring.

Syntax:

The syntax of this command includes the following variations:

```
show voip gw statistics basic-statistics
```

Examples:

The following example displays performance monitoring.

```
# show voip gw statistics basic-statistics
    Active TDM channels           2
    Active DSP resources          2
    Active analog channels        0
    Active G.711 channels         1
    Average voice delay (ms)      0
    Average voice jitter (ms)     0
    Total RTP packets TX          125
    Total RTP packets RX          140
    Total call attempts           2
```

6.4.18.2 show voip gw calls-count tel2ip

This command displays various Tel-to-IP call counters.

Syntax:

The syntax of this command includes the following variations:

```
show voip gw calls-count tel2ip
```

Note:

This command is only applicable to MSBR devices.

Examples:

The following example displays various Tel-to-IP call counters.

```
# show voip gw calls-count tel2ip

Number of attempted calls: 5
Number of established calls: 5
Percentage of successful calls(ASR): 100.000000
Number of calls terminated due to a busy line: 0
Number of calls terminated due to no answer: 0
Number of calls terminated due to forward: 0
Number of calls terminated due to no route: 0
Number of calls terminated due to no matched capabilities: 0
Number of calls terminated due to no resources: 0
Number of calls terminated due to other failures: 0
Average call duration (ACD) [sec]: 103
Attempted fax calls counter: 0
Successful fax calls counter: 0
```

6.4.18.3 show voip gw calls-count ip2tel

This command displays various IP-to-Tel call counters.

Syntax:

The syntax of this command includes the following variations:

```
show voip gw calls-count ip2tel
```

Note:

This command is only applicable to MSBR devices.

Examples:

The following example displays various Tel-to-IP call counters.

```
# show voip gw calls-count ip2tel
```

```
Number of attempted calls: 5
Number of established calls: 5
Percentage of successful calls(ASR): 100.000000
Number of calls terminated due to a busy line: 0
Number of calls terminated due to no answer: 0
Number of calls terminated due to forward: 0
Number of calls terminated due to no route: 0
Number of calls terminated due to no matched capabilities: 0
Number of calls terminated due to no resources: 0
Number of calls terminated due to other failures: 0
Average call duration (ACD) [sec]: 18
Attempted fax calls counter: 0
Successful fax calls counter: 0
```

6.4.19 show voip devices

This command displays the configured VoIP Ethernet Devices in the Ethernet Device table. For each Ethernet Device, the device name, VLAN ID, and associated Ethernet port Group is displayed.

Syntax:

The syntax of this command includes the following variations:

```
show voip devices
```

Note:

This command is applicable to Mediant 5xx, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant 9000, Mediant SW devices.

Command Modes:

Basic

Examples:

The following example displays configured VoIP Ethernet Devices in the Ethernet Device table.

```
# show voip devices
D.Num   Device Name         VlanID     GroupName
------  -----------------   ---------  -------------
  0       vlan 1              1             GROUP_1
  1       vlan 20             20            GROUP_2
```

6.4.20 show voip dhcp

This command displays DHCP server leases.

The syntax of this command includes the following variations:

```
show voip dhcp black-list
show voip dhcp clients
show voip dhcp ip <ip address>
show voip dhcp mac <mac address>
```

The command syntax format is described below:

Argument	Description
black-list	Displays DHCP server conflicting IP addresses.
clients	Displays DHCP server leases.
ip address	Locates the DHCP server lease by IP address in the format of x.x.x.x.
mac address	Locates the DHCP server lease by MAC address in the format of XX:XX:XX:XX:XX:XX.

Command Modes:

Basic

Examples:

The following example displays DHCP server conflicting IP addresses

```
# show voip dhcp black-list
```

6.4.21 show voip other-dialog statistics

This command displays other dialog statistics.

Syntax:

The syntax of this command includes the following variations:

```
# show voip other-dialog statistics
```

Examples:

The following example displays other dialog statistics.

```
# show voip other-dialog statistics
SBC SUBSCRIBE Dialog Statistics:
Active SUBSCRIBE dialogs: 4
Active incoming SUBSCRIBE dialogs: 6
Active outgoing SUBSCRIBE dialogs: 8
```

6.4.22 show voip proxy

This command displays the status of the Proxy Sets. The status ("OK" or "FAIL") indicates IP connectivity with the proxy server.

Syntax:

The syntax of this command includes the following variations:

```
show voip proxy sets status
```

Examples:

The following example displays performance monitoring.

```
# show voip proxy sets status

    Active Proxy Sets Status
  ID       IP ADDRESS                    STATUS
  0         Not Used(--)                   --
  1         10.8.6.31(10.8.6.31)          OK
  2         10.8.2.19(10.8.2.19)          OK
  3         Not Used(--)                   --
  4         Not Used(--)                   --
  5         Not Used(--)                   --
  6         Not Used(--)                   --
  7         Not Used(--)                   --
  8         Not Used(--)                   --
  9         Not Used(--)                   --
  10        Not Used(--)                   --
```

6.4.23 show voip register

This command displays VoIP registration status of users.

Syntax:

The syntax of this command includes the following variations:

```
show voip register < argument >
```

The command's syntax format is described below:

Argument	Description
account	Displays gateway and SBC accounts registration status. **show voip register account** {gw|sbc}
board	Displays registration status for the entire gateway. **show voip register board**
db sbc	• Displays the total number of SBC contacts and Address of Records (AOR). **show voip register db sbc** • Displays a specific SBC user's registration detailed information. **show voip register db sbc user <AOR>** The following example displays the registration status of SBC user 2017's AOR. **show voip register db sbc user 2017** *** SBC Registered Contacts for AOR '2017' *** sip:2017@10.8.2.225:5080;expire=90; Active: YES; IPG#4; ResourceID#(#983) **Active:YES** indicates that the user has been successfully registered. **Active:NO** indicates that the user has been registered and is waiting for approval. • Displays the registration status of all the SBC contacts of all SBC user's AORs listed in the device's Users' Registration database (SBC User Information table). This also includes showing the IP Group to which the contact belongs. **show voip register db sbc list** **Note:** This is only applicable to SBC applications.
db sas	Displays the total number of SAS contacts and Address of Records (AOR). **show voip register db sas**
ports	Displays registration status for ports. **show voip register ports**
user-info	Displays user-info information summary for the gateway and SBC. **show voip register user-info <gw|sbc>**

Examples:

The following example displays Ports Registration Status.

```
# show voip register ports

*** Ports Registration Status ***

Gateway      Port                Status
=================================================
Module 3     Port 1     FXO      REGISTERED
-------------------------------------------------
Module 3     Port 2     FXO      REGISTERED
-------------------------------------------------
Module 3     Port 3     FXO      REGISTERED
-------------------------------------------------
Module 3     Port 4     FXO      NOT REGISTERED
-------------------------------------------------
Module 5     Port 1     FXS      NOT REGISTERED
-------------------------------------------------
Module 5     Port 2     FXS      NOT REGISTERED
-------------------------------------------------
Module 5     Port 3     FXS      NOT REGISTERED
-------------------------------------------------
Module 5     Port 4     FXS      REGISTERED
```

6.4.24 show voip route

This command displays the IP Routing table.

Syntax:

The syntax of this command includes the following variations:

```
show voip route
```

Examples:

The following example displays the IP Routing table.

```
# show voip route
Codes: C - connected, S - static

C  169.253.0.0/16  is directly connected, InternalIf 2, Active
C  10.15.0.0/16  is directly connected, NET1_VLAN, Active
S  0.0.0.0/0  [1] via 10.15.0.1, NET1_VLAN, Active
```

6.4.25 show voip tdm

This command displays VoIP information.

Syntax:

The syntax of this command includes the following variations:

```
show voip tdm
```

Examples:

The following example displays VoIP information.

```
# show voip tdm
Clock status:
        TDM Bus Active Clock Source Internal
 Configuration:
        PCM Law Select 3
        TDM Bus Clock Source 1
        TDM Bus Local Reference 0
        TDM Bus Type 2
        Idle ABCD Pattern 15
        Idle PCM Pattern 255
        TDM Bus PSTN Auto Clock Enable 0
        TDM Bus PSTN Auto Clock Reverting Enable 0
```

6.4.26 show voip tls

This command displays TLS information.

Syntax:

The syntax of this command includes the following variations:

```
show voip tls certificate
show voip tls contexts
show voip tls trusted-root detail <trusted certificate number>
show voip tls trusted-root summary
```

The command syntax format is described below:

Argument	Description
certificate	Displays device certificate information.
contexts	Displays TLS security context information.
trusted-root	Displays trusted certificates – either in detail or summary

Examples:

The following example displays TLS information.

```
# show voip tls certificate
Certificate:
    Data:
        Version: 1 (0x0)
        Serial Number: 0 (0x0)
    Signature Algorithm: sha1WithRSAEncryption
        Issuer: CN=ACL_4793675
        Validity
            Not Before: Jan  1 00:00:47 2010 GMT
            Not After : Dec 27 00:00:47 2029 GMT
        Subject: CN=ACL_4793675
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                Public-Key: (1024 bit)
                Modulus:
                    00:d6:7a:4d:ac:ff:2e:dc:57:5d:b1:1e:e7:e7:7f:
                    11:74:4a:d9:2b:36:40:06:b2:2a:d8:7e:b5:22:21:
                    49:9e:59:d8:04:dc:98:cb:74:93:e1:f7:d2:b2:4f:
                    13:17:e8:1a:b3:0a:3c:03:81:19:55:8a:21:47:8a:
                    64:08:5f:88:8d:15:c6:93:3b:0b:bb:5a:21:19:3b:
                    ed:62:68:a4:69:5a:ef:83:0d:db:01:5b:2e:69:a7:
                    de:8c:be:fb:28:6e:67:8e:56:26:72:ac:31:e0:1f:
                    90:8a:8e:02:1e:46:00:93:91:f5:28:e3:3a:62:07:
                    91:3e:73:55:8f:1f:0f:de:09
                Exponent: 65537 (0x10001)
    Signature Algorithm: sha1WithRSAEncryption
         81:a6:1a:ca:84:67:06:95:20:74:e3:d6:f6:a2:72:b8:17:e8:
         91:71:e4:b0:01:68:17:21:44:7a:62:d4:6d:57:6f:2d:b4:8c:
```

```
        a9:70:cd:18:29:77:5c:15:b5:dd:71:7c:50:2c:bd:66:e1:b8:
        c5:40:89:95:8c:70:11:9f:5c:12:24:f1:8d:db:66:06:73:b8:
        b1:c0:5c:0e:2b:01:ac:82:f0:fc:8d:71:5a:9b:a2:cb:a5:5a:
        86:1d:f0:4f:81:0e:d2:34:df:13:f1:3c:e5:94:52:03:ab:70:
        90:48:0f:97:16:52:74:c7:b4:b6:e3:a0:0c:bd:d8:60:2a:68:
        13:26
```

6.4.27 show voip security

This command provides an enhancement to the Intrusion Detection System (IDS) feature, by supporting dynamic blacklisting of remote hosts (IP addresses / ports) considered by the device as malicious.

Syntax:

The syntax of this command includes the following variations:

```
# show voip security ids blacklist active
# show voip security ids active-alarm all
# show voip security ids active-alarm match <IDS Match Policy ID>
rule <IDS Rule ID>
```

Examples:

The following example displays the blacklist.

```
# show voip security ids blacklist active
Active blacklist entries:
10.33.5.110(NI:0) remaining 00h:00m:10s in blacklist
```

Where *SI* is the SIP Interface, and *NI* is the Network interface.

The following example displays the blacklist all active IDS alarms:

```
# show voip security ids active-alarm all
IDSMatch#0/IDSRule#1: minor alarm active.
```

The following example displays details regarding an active IDS alarm of the specified match and rule IDs:

```
# show voip security ids active-alarm match 0 rule 1
IDSMatch#0/IDSRule#1: minor alarm active.
- Scope values crossed while this alarm is active:
    10.33.5.110(SI0)
```

6.4.28 show voip subscribe list

This command displays SUBSCRIBE dialog sessions.

Syntax:

The syntax of this command includes the following variations:

```
# show voip subscribe list [<session-id>|descending|summary]
```

The command's syntax format is described below:

Arguments	Description
session-id	Displays detailed Sessions information for the specified Session ID.
descending	Displays currently active VoIP SIP SUBSCRIBE Dialogs sorted in descending order by call duration.
summary	Displays summary of currently active SUBSCRIBE Dialogs.

Examples:

The following example displays a summary of currently active SUBSCRIBE Dialogs.

```
# show voip subscribe list summary
```

6.4.29 show voip subscribe statistics

This command displays SUBSCRIBE dialog statistics.

Syntax:

The syntax of this command includes the following variations:

```
# show voip subscribe statistics
```

Examples:

The following example displays a summary of currently active SUBSCRIBE Dialogs.

```
# show voip subscribe statistics
SBC SUBSCRIBE Dialog Statistics:
Active SUBSCRIBE dialogs: 4
Active incoming SUBSCRIBE dialogs: 6
Active outgoing SUBSCRIBE dialogs: 8
```

6.4.30 show voip voip-network

This command provides support for displaying the following QoS metrics per IP Group in the CLI:

- QoE profile metrics per IP Group and its associated Media Realm on currently established calls such as MOS, jitter, packet loss, and delay. Metrics are displayed as average amounts.
- Bandwidth Profile (BW) metrics for Tx and Rx traffic per IP Group and/or Media Realm. Metrics are displayed with a status color for each specific port.
- QoE profile metrics for the remote (far-end) such as MOS, jitter, packet loss, and delay. Each metric is displayed with a specific color.
- Group MSA metrics for the IP Group and the Media Realm. Metrics are displayed as an aggregated value.

Syntax:

The syntax of this command includes the following variations:

```
# show voip voip-network {ipgroup|media realm} ip-group id media-statistics
```

The command's syntax format is described below:

Option	Description
ipgroup	Displays IP Group information.
media realm	Displays media realm information.

Note:

This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Examples:

The following example displays QoS metrics.

```
IPGroup 1. BWProfile: -1, QoEProfile: -1
---------------------------------------
MSA: 0
Averages: MOS 0  Remote MOS 0 Delay 0 Remote Delay 0 Jitter 0
Remote Jitter 0
Fraction loss  tx 0 Fraction loss rx 0
Packet sent 0 Packet received 0
Audio Tx BW 0, Audio Tx Status Green
Audio Rx BW 0, Audio Rx Status Green
Total Tx BW 0, Total Tx Status Green
Total Rx BW 0, Total Rx Status Green
Video Tx BW 0, Video Tx Status Green
Video Rx BW 0, Video Rx Status Green
MSA color Gray MSA remote color Gray
MOS color Gray remote MOS color Gray
```

```
Delay color Gray  remote Delay color Gray
PL color Gray  remote PL color Gray
Jitter color Gray  remote Jitter color Gray
color is not relevant

Media Realm 255. BWProfile -1, QoEProfile: -1
```

6.4.31 show voip arp

This command provides support for displaying the Address Resolution Protocol (ARP) cache for the device's voice functionality. The feature displays your Ethernet/MAC addresses which are mapped to IP addresses for the hosts which have previously ARP'ed the device.

Syntax:

The syntax of this command includes the following variations:

```
# show voip arp
```

Defaults:

NA

Command Modes:

Basic

Note:

This is applicable to all products.

Examples:

The following example displays the results of using this command.

```
# show voip arp
IP Address  MAC Address    Interface      Type
10.8.2.19                   8c:89:a5:8f:9b:21   eth3.1   stale
10.8.2.225                  00:e0:81:ca:e9:cc   eth3.1   stale
10.8.0.1                    2c:21:72:a0:b9:81   eth3.1   reachable
End of arp table, 3 entries displayed.
```

6.4.32 show voip firewall

This command displays active VoIP firewall rules.

Syntax:

The syntax of this command includes the following variations:

```
# show voip firewall
```

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays active VoIP firewall rules.

```
# show voip firewall
```

6.4.33 show voip groups

This command displays VoIP groups information.

Syntax:

The syntax of this command includes the following variations:

```
# show voip groups
```

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays VoIP groups information.

```
# show voip groups
```

6.4.34 show voip channel-stats analog

This command displays statistics of a channel.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats analog
```

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays statistics of a channel.

```
# show voip channel-stats
```

6.4.35 show voip channel-stats channel-count

This command displays the number of opened channels.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats channel-count
```

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays the number of opened channels.

```
# show voip channel-stats channel-count
number of opened channels
1 Analog channels,   2 Digital channels,   4 Virtual channels
```

6.4.36 show voip channel-stats digital

This command displays statistics of a channel.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats digital <channel-number> <number of channels>
```

The command syntax format is described below:

Arguments	Description
channel-number	Displays the statistics for a channel number The range is 0-255. Use 'show system assembly'.
number of channels	Displays the number of channels The range is 1 - 256.

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays how this command can be used.

```
# show voip channel-stats digital 1 3
```

6.4.37 show voip channel-stats jitter-threshold

This command displays statistics of channels with jitter greater than the threshold.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats jitter-threshold <threshold>
```

The command syntax format is described below:

Argument	Description
threshold	Displays the statistics for a channel number with a jitter greater than this threshold The range is 0-65535.

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays statistics of channels with a jitter greater than 1000.

```
# show voip channel-stats jitter-threshold 1000
```

6.4.38 show voip channel-stats pl

This command displays statistics of channels with packet loss.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats pl
```

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays statistics of channels with packet loss.

```
# show voip channel-stats pl
```

6.4.39 show voip channel-stats pl-threshold

This command displays statistics of channels with a packet loss greater than the threshold.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats pl-threshold <threshold>
```

The command syntax format is described below:

Argument	Description
threshold	Displays the statistics for channels with a packet loss greater than this threshold. The range is 0-65535.

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays the statistics for channels with a packet loss greater than this threshold of 500.

```
# show voip channel-stats pl-threshold 500
```

6.4.40 show voip channel-stats rtt-threshold

This command displays statistics of channels with Round-trip time (RTT) greater than the threshold.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats rtt-threshold <threshold>
```

The command syntax format is described below:

Argument	Description
threshold	Displays the statistics for channels with a RTT greater than this threshold. The range is 0-65535.

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays the statistics for channels with a RTT greater than this threshold of 100.

```
# show voip channel-stats pl-threshold 100
```

6.4.41 show voip channel-stats virtual

This command displays statistics of a channel.

Syntax:

The syntax of this command includes the following variations:

```
# show voip channel-stats virtual <channel-number> <number of channels>
```

The command syntax format is described below:

Arguments	Description
channel-number	Displays the statistics for a channel number. The range is 0-255.
number of channels	Displays the number of channels The range is 1 - 256.

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays the statistics of a channel.

```
# show voip channel-stats virtual 1 10
```

6.4.42 show voip wan-bindings

This command displays VoIP WAN interface bindings.

Syntax:

The syntax of this command includes the following variations:

```
# show voip wan-bindings
```

Defaults:

NA

Command Modes:

Basic

Examples:

The following example displays VoIP WAN interface bindings.

```
# show voip wan-bindings
```

6.4.43 show voip ldap

This command displays LDAP information.

Syntax:

The syntax of this command includes the following variations:

```
# show voip ldap cache-hits-pm
# show voip ldap print-cache <from cache index> <to cache index>
# show voip ldap searches-pm
# show voip ldap timeout-pm
```

The command syntax format is described below:

Arguments	Description
cache-hits-pm	Prints the cache hits PM.
print-cache	Prints the LDAP cache.
searches-pm	Prints the searches PM.
timeout-pm	Prints the searches timeout PM.

Defaults:

NA

Command Modes:

Basic

Examples:

The following example prints the cache hits PM.

```
# show voip ldap cache-hits-pm
```

6.5 Show Data Commands

The following commands define the **show data** commands.

6.5.1 show data bridge-configuration

This command displays the Ethernet bridging configuration.

Syntax:

The syntax of this command can include the following variations:

```
show data bridge-configuration
```

Defaults:

This command has no defaults.

Command Modes:

Example:

This example displays the Ethernet bridging configuration.

```
# show data bridge-configuration
```

6.5.2 show data crypto

This command displays encryption module information.

Syntax:

The syntax of this command can include the following variations:

```
show data crypto status
show data crypto conf
show data crypto debug
show data crypto server
```

The command's syntax format is described below:

Arguments	Description
status	Displays IPSec VPN status.
conf	Displays IPSec VPN configuration.
debug	Displays IPSec VPN diagnostic information.
server	Displays VPN server.

Defaults:

This command has no defaults.

Command Modes:

Crypto configuration can be viewed in enabled mode.

Example:

This example displays the configured crypto status.

```
(data-status)# show data crypto status
```

6.5.3 show data dot11radio

This command displays the dot11radio status.

Syntax:

The syntax of this command can include the following variations:

```
show data dot11radio associations
show data dot11radio channels
show data dot11radio interface
show data dot11radio other-ap
```

The command's syntax format is described below:

Arguments	Description
associations	Displays the stations associated with this access-point.
channels	Displays the available wireless channels.
interfaces	Displays the Wi-Fi interface ID
other-ap	Displays the access-points in the range.

Defaults:

This command has no defaults.

Command Modes:

Enabled

Example:

This example defines the Stations associated with this access-point.

```
# show data dot11radio associations
```

6.5.4 show data dot1x-status

This command displays 802.1x port status.

Syntax:

The syntax of this command can include the following variations:

```
show data dot1x-status
```

Note:

The RADIUS server must be configured for EAP.

Command Modes:

Enabled

Example:

This example defines the Stations associated with this access-point.

```
# show data dot1x-status

Port    Auth      State        Timeout Username
----    ----      -----        ------- --------
  1     Disabled  Idle               0
  2     Enabled   Forwarding        75 John
  3     Disabled  Idle               0
  4     Disabled  Idle               0
```

6.5.5 show data l2tp-server

This command displays the L2TP server connections.

Syntax:

The syntax of this command can include the following variations:

```
show data l2tp-server
```

Defaults:

This command has no defaults.

Command Modes:

Enables

Example:

This example displays incoming L2TP connections.

```
# show data l2tp-server
```

6.5.6 show data SHDSL status

This command displays configured SHDSL groups and their connectivity status.

Syntax:

The syntax of this command is:

```
show data shdsl status
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example demonstrates how to view configured SHDSL groups:

```
# show data shdsl status
```

6.5.7 show data interfaces shdsl

This command displays detailed information about SHDSL connectivity.

Syntax:

The syntax of this command is:

```
show data interfaces shdsl
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example shows how to view current SHDSL status:

```
# show data interfaces shdsl
```

6.5.8 show data interfaces

This command displays configuration parameters and statistics for a group of interfaces or a specific interface. The sample intervals for the performance statistics can be configured using the *pm sample-interval* command.

Syntax:

The syntax of this command can include the following variations:

```
show data interfaces
show data interfaces <interface type> <interface id>
```

The command's syntax format is described below:

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Arguments	Description
description	Displays information such as name, status, protocol and description for all the interfaces.
status	Displays information such as name, description, status, VLAN, speed and duplex for all the switch port interfaces only.
switchport	Displays information such as name, status, administrative mode, access mode VLAN, trunking native mode VLAN and trunking VLANs enabled for all the switch port interfaces only.
interface name	Look for interface naming on the *interface* command. Displays detailed information such as name, description, status, hardware address, IP address, state time, mtu and statistics for the specified interface.
no argument	Displays detailed information such as name, description, status, hardware address, IP address, state time, mtu and statistics for the all the interfaces.

Defaults:

NA

Command Modes:

Enable

Related Commands:

pm sample-interval

Example:

The following example displays configuration parameters and statistics for a group of interfaces or a specific interface.

```
# show data interfaces
GigabitEthernet 0/0 Disconnected        .
  Description: WAN Ethernet
  Hardware address is 00:90:8F:3A:AD:58
  Port Link:DOWN
  IP address negotiated using DHCP is 0.0.0.0
  State Time:   0:00:33
  Time since creation:   0:35:10
  mtu auto
  napt
  DNS is configured dynamic
  DNS primary IP address is 0.0.0.0
  DNS secondary IP address is 0.0.0.0

  rx_packets 0                rx_bytes 0                rx_dropped
0                 rx_errors 0
  tx_packets 0                tx_bytes 0                tx_dropped
0                 tx_errors 0
  5-minute input rate:   0 bits/sec, 0 packets/sec
  5-minute output rate:  0 bits/sec, 0 packets/sec
  15-second input rate:  0 bits/sec, 0 packets/sec
  15-second output rate: 0 bits/sec, 0 packets/sec
```

6.5.9 show data ip connections

This command displays the data-router IP network connections in the CLI.

Syntax:

```
show data ip connections all [detail]

show data ip connections brief

show data ip connections interface <interface type> <interface id>

show data ip connections port <port number> [detail]

show data ip connections queue <queue name> [detail]

show data ip connections queue <queue name> [port] <port number>
[detail]

show data ip connections summary port <port number>

show data ip connections summary port all-ports top <number of
ports to show>

show data ip connections top <number of connections to show>
[detail]
```

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Argument	Value
number of ports to show	Determines the number of ports to show.
number of connections to show	Determines the number of connections to show.
detail	Displays the ports/connections with their details.

Defaults:

NA

Command Modes:

Basic

Example:

- The following example displays all IP connections .

```
# show data ip connections all

IP  connections summary: 28 TCP, 39 UDP, 0 ICMP. Total 115
connections.
NAT connections summary: 0 TCP, 0 UDP, 0 ICMP. Total 0 NAT
connections.
Fastpath packets: 687102, Fullpath packets: 1104728

1 UDP in 0.0.0.0:68 out 0.0.0.0:68 other 0.0.0.0:67 inf local_dev
Route Outgoing
2 UDP in 10.13.2.15:68 out 10.13.2.15:68 other 255.255.255.255:67
inf local_dev
Route Outgoing
3 UDP in 224.0.0.252:5355 out 224.0.0.252:5355 other
10.13.22.78:64164 inf VLAN
1 Route Incoming
…
```

- The following example displays a brief summary of all the current IP network connections:

```
# show data ip connections brief

IP  connections summary: 28 TCP, 53 UDP, 0 ICMP. Total 129
connections.
NAT connections summary: 0 TCP, 0 UDP, 0 ICMP. Total 0 NAT
connections.
Fastpath packets: 696322, Fullpath packets: 1119176
```

- The following example displays the IP network connections for a specific interface.

```
# show data ip connections interface gigabitethernet 0/0 all
```

- The following example displays IP network connections for a specific port:

```
# show data ip connections port 1 detail
```

- The following example displays IP network connections for a specific QoS queue, configured in the QOS service map menu, e.g., (conf-s-map)# queue Data1.

```
# show data ip connections queue 1
```

- The following example displays a summary of IP network connections for a specific port or all ports.

```
# show data ip connections summary port all-ports
port    68: Pkt 0/0 Kb 0.0/0.0 pps 0/0 kbps 0.0/0.0
port    67: Pkt 0/0 Kb 0.0/0.0 pps 0/0 kbps 0.0/0.0
port   137: Pkt 680/0 Kb 51.7/0.0 pps 0/0 kbps 0.0/0.0
```

  Where:

  - *Pkt 0/0*: received/sent packets
  - *Kb 0.0/0.0*: received/sent kilobytes
  - *pps 0/0*: number of received/sent packets per second
  - *kbps*: number of received/sent kilobytes per second

- The following example displays the most recent number (1 – 100) of connections:

```
# show data ip connections top 10
```

6.5.10 show data ip interface

This command displays a brief summary such as name, IP address, status and protocol for all Layer 3 interfaces.

Syntax:

```
show data ip interface [brief]
show data ip interface <interface type> <interface id>
```

The command's syntax format is described below:

Arguments	Description
brief	Displays a brief summary of IP status and configuration.

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays a brief summary such as name, IP address, status and protocol for all Layer 3 interfaces.

```
# show data ip interface brief
Interface                    IP Address          Status
Protocol
GigabitEthernet 0/0          0.0.0.0             Disconnected
Up
VLAN 1                       192.168.0.1         Connected
Up
VLAN 4001                    169.254.254.253     Connected
Up
BVI 1                        unassigned          Disabled
Down
GRE 1                        0.0.0.0             Disabled
Down
GRE 6                        0.0.0.0             Disabled
Down
IPIP 1                       0.0.0.0             Disabled
Down
L2TP 0                       0.0.0.0             Disabled
Down
L2TP 1                       0.0.0.0             Disabled
Down
Cellular 0/0                 0.0.0.0             Disabled
Down
```

6.5.11 show data ip firewall states

This command displays a Firewall states.

Syntax:

```
show data ip firewall states [brief]
```

The command's syntax format is described below:

Arguments	Description
brief	Displays a firewall states summery.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays firewall states.

```
# show data ip interface states brief
```

6.5.12 show data ip dhcp pool

This command displays DHCP pool information such as name, status, IP addresses and lease time for a specified interface or all Layer 3 interfaces.

Syntax:

```
show data ip dhcp pool
show data ip dhcp pool <interface name>
```

The command's syntax format is described below:

Arguments	Description
interface name	Looks for interface naming on the *interface* command.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays DHCP pool information such as name, status, IP addresses and lease time for a specified interface or all Layer 3 interfaces.

```
# show data ip dhcp pool
```

6.5.13 show data ip dhcp binding

This command displays all Layer 3 interfaces that receive addresses from the DHCP server.

Syntax:

```
show data ip dhcp binding
```

No arguments for this command.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays all Layer 3 interfaces that receive addresses from the DHCP server.

```
# show data ip dhcp binding
```

6.5.14 show data hosts

This command displays the configured DNS server entries and current DNS entries in cache for all Layer 3 interfaces. This includes A/SRV/NAPTR records, and their parameters.

Syntax:

```
show data hosts
```

No arguments for this command.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays the configured DNS server addresses and current name/address list in cache for all Layer 3 interfaces.

```
# show data hosts
```

6.5.15 show data ip arp / show data arp

This command displays all the ARP entries in the cache.

Syntax:

```
show data ip arp
show data arp
```

No arguments for this command.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays all the ARP entries in the cache.

```
# show data arp

IP Address          MAC Address         Interface
169.254.254.254     00:90:8f:3a:ad:56   VLAN 4001

End of arp table, 1 entries displayed.
```

6.5.16 show data ipv6 neighbors

This command displays IPv6 neighbor discovery (ND) cache information.

Syntax:

```
show data ipv6 neighbors
```

No arguments for this command.

Defaults:

NA

Command Modes:

Basic

Note:

This is applicable to Mediant MSBR products.

Example:

The following example displays IPv6 neighbor discovery (ND) cache information.

```
# show data ipv6 neighbors
IPv6 Address                 Age Link-layer Addr State Interface
FE80::290:8FFF:FE4A:230D           0 0090.8f4a.230d  STALE Gi0/0
FE80::4637:E6FF:FE32:9D1           0 4437.e632.09d1  REACH Gi0/0
2010:3::90:52                      0 4437.e632.09d1  REACH Gi0/0
2010:3::40:81                      0 0090.8f4a.230d  STALE Gi0/0
```

6.5.17 show data ip dhcp-server

This command displays all the ARP entries in the cache.

Syntax:

```
show data ip dhcp-server all
```

No arguments for this command.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays all information of all interfaces.

```
# show data ip dhcp-server all
```

6.5.18 show data ip pim

This command displays PIM information.

Syntax:

```
show data ip pim bsr-router
show data ip pim groups
show data ip pim interfaces
show data ip pim rp
```

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays PIM information.

```
# show data ip mroute

 (Source, Multicast Group)        Input Interface      Output
Interface
(192.168.10.3, 232.0.0.42)       VLAN 1               Fiber 0/1

Show data ip mroute interfaces
500L - MSBR2*# show data ip mroute interfaces
   Interface    BytesIn  PktsIn  BytesOut PktsOut Flags    Local
Remote
 0 VLAN 1        26082   162      6956    7        NONE
192.168.2.1     0.0.0.0
 2 Giga  0/0     0       0        0               NONE
172.17.116.22   0.0.0.0
 3 Fiber 0/1     6956    7        0       0        NONE
200.200.200.2   0.0.0.0
 4 PIM           0       0        0       0        REGISTER
192.168.2.1     0.0.0.0

500L - MSBR2*# show data ip mroute detail
Iif - Incoming interface, Oif - Outgoing interface
Origin           Group        Iif      Pkts     Bytes   Wrong
Oifs:TTL
192.168.10.3     232.0.0.42   VLAN 1   36       27360   0
Fiber 0/1:1 PIM:1
```

```
show data ip pim groups
Multicast Group Routing Table - Legend:
----
Flags:
SPT         Shortest Path Tree, internal interface toward source
WC          (*,G) entry
RP          internal interface iif toward RP
CACHE       a mirror for the kernel cache
SG          (S,G) pure, not hanging off of (*,G)
CLONE_SG    clone (S,G) from (*,G) or (*,*,RP)
----
Multicast Group Routing Table
 Source          Group            RP addr          Flags
---------------------------(*,G)----------------------------
 INADDR_ANY       232.0.0.42       200.0.0.2        WC RP
Joined   oifs: Fiber 0/1
Pruned   oifs:
Leaves   oifs:
Asserted oifs:
Outgoing oifs: Fiber 0/1
Incoming     : PIM_FORWARDING

TIMERS:  Entry   Joine-Prune     Register-Suppression   Assert
         165     20              0                      0

VLAN 1                        :  0
Fiber 0/1                     :  165
GigabitEthernet 0/0           :  0
PIM_FORWARDING                :  0

 Source          Group           RP addr         Flags
---------------------------(S,G)----------------------------
 192.168.10.3    232.0.0.42      200.0.0.2       SPT CACHE SG
Joined   oifs: Fiber 0/1 PIM_FORWARDING
Pruned   oifs:
Leaves   oifs:
Asserted oifs:
Outgoing oifs: Fiber 0/1 PIM_FORWARDING
Incoming     : VLAN 1

TIMERS:  Entry   Joine-Prune     Register-Suppression   Assert
         180     30              0                      0

VLAN 1                        :  0
Fiber 0/1                     :  180
GigabitEthernet 0/0           :  0
PIM_FORWARDING                :  0

 Source          Group           RP addr         Flags
-------------------------(*,*,RP)--------------------------
Number of Groups: 1
Number of Cache MIRRORs: 1
```

```
show data ip pim interfaces
Virtual Interface Table - Flag Legend:
----
DOWN           Kernel state of interface
DISABLED       Administratively disabled
DR             Specified interface is the esignated router
NO-NBR         No PIM neighbors on virtual interface
PIM            PIM neighbor on virtual interface
DVMRP          DVMRP neighbor on virtual interface
----
Virtual Interface Table
 Vif  Local address    Interface                    Thresh  Flags
Neighbors       (Expire)
   0  192.168.0.1      BVI 1                        1       DR
NO-NBR
   2  10.31.2.86       GigabitEthernet 0/0          1
DISABLED
   3  200.0.0.1        Fiber 0/1                    1       PIM
200.0.0.2       (00:01:30)

show data ip pim rp
RP address      Interface             Group prefix   Priority
Holdtime (Seconds)
200.0.0.2       Fiber 0/1             224.0.0.0/4    1
65535
```

6.5.19 show data ip prefix-list

This command configures an IPv4 prefix-list associated with a VRF.

Syntax:

```
show data ip prefix-list <name> [a.b.c.d/m] [first-match]
show data ip prefix-list <name> [a.b.c.d/m] [longer]
show data ip prefix-list <name> seq <sequence number>
show data ip prefix-list <name> vrf <vrf name>
show data ip prefix-list detail <name>
show data ip prefix-list summary <name>
show data ip prefix-list [vrf <VRF name>] detail <name>
show data ip prefix-list [vrf <VRF name>] summary <name>
```

Arguments	Description
name	Displays details for a specific prefix-list name.
[a.b.c.d/m]	Displays IP prefix network/length.
first-match	Displays the first matched prefix.
longer	Displays the lookup longer prefix.
seq	Displays a sequence number of an entry.
sequence number	Sequence Number in the range of 1 – 4294967295.
Vrf	Associate with a defined VRF
vrf name	Displays VRF table name.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays NAT activity and statistics

```
# show data ip prefix-list plist vrf vrfname
```

6.5.20 show data ipv6 prefix-list

This command configures an IPv6 prefix-list associated with a VRF.

Syntax:

```
show data ipv6 prefix-list [<prefix-list name>][x:x::x:x/m] first-match|longer]

show data ipv6 prefix-list [<prefix-list name>] seq <sequence-number>

show data ipv6 prefix-list detail [<prefix-list name>]

show data ipv6 prefix-list summary [<prefix-list name>]

show data ipv6 prefix-list [<prefix-list name>] vrf <VRF table name> [x:x::x:x/m] first-match|longer]

show data ipv6 prefix-list [<prefix-list name>] vrf <VRF table name> seq <sequence-number>
```

Arguments	Description
prefix-list name	Defines a prefix-list name
x:x::x:x/m	Defines an IPv6 prefix network/length e.g., 3ffe::/16
first-match	Defines the first-match prefix.
longer	Looks up the longer prefix.
seq	Defines to display the sequence number of an entry.
sequence number	Defines the sequence number in the range [1-4294967295].
vrf table name	Defines the VRF table name.
detail	Displays details of the prefix-lists.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays IPv6 summary

```
# show data ipv6 prefix-list plist summary
```

6.5.21 show data route-map

This command configured a prefix-list associated with a VRF.

Syntax:

```
show data route-map <name> [vrf <VRF name>]
```

Arguments	Description
<name>	Defines a prefix-list name
<vrf name>	Defines a VRF name

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays NAT activity and statistics

```
# show data route-map plist1 vrf vrfnam1
```

6.5.22 show data access-lists

This command displays configured access lists.

Syntax:

The syntax of this command can include the following variations:

```
show data access-lists
show data ip access-list <name>
```

The commands syntax format is described below:

Arguments	Description
<name>	Defines the name or number of the access-list to display.

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example demonstrates how to view configured access lists:

```
# show data access-lists
# show data ip access-list 155
```

6.5.23 show data mac-address interface BVI

This command displays the MAC table of a specific bridge.

Syntax:

The syntax of this command can include the following variations:

```
show data mac-address-table interface BVI <Bridge Id>
```

The commands syntax format is described below:

Arguments	Description
<Bridge Id>	Defines the bridge identifier. The valid range is 1-255.

Defaults:

This command has no defaults.

Note:

The command shows up to 1000 entries.

Command Modes:

Enable

Example:

The following example demonstrates how to view bridge 11 mac table:

```
# show data mac-address-table interface BVI 11
```

6.5.24 show data mac-address-table count vlan

This command displays the Ethernet switch MAC table size.

Syntax:

The syntax of this command can include the following variations:

```
show data mac-address-table count vlan [VLAN ID [1-3999]]
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays the Ethernet switch MAC table size.

```
# show data mac-address-table count vlan 1

GE switch: 136 occupied entries.

FE switch: 0 occupied entries.
```

6.5.25 show data mac-address-table vlan

This command displays the MAC address per VLAN.

Syntax:

The syntax of this command can include the following variations:

```
show data mac-address-table vlan <VLAN ID>
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays MAC addresses for VLAN 1.

```
# show data mac-address-table vlan 1
    MAC Address                 port
    ------------------------------------------------------------
    1    00:00:e2:91:3c:f5      4/1
    2    00:01:6c:59:ab:32      4/1
    3    00:01:6c:59:f1:4e      4/1
         …
    135  e8:9a:8f:32:ff:f6      4/1
```

6.5.26 show data mac-address-table address

This command displays the VLAN and physical port through which a specific MAC address is acquired:

Syntax:

The syntax of this command can include the following variations:

```
show data mac-address-table address <MAC address>
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays a specific MAC addresses.

```
# show data mac-address-table address 00:0c:29:76:a8:eb
MAC Address             VLAN    Port
----------------------------------------
00:0C:29:76:A8:EB       1       4/1
```

6.5.27 show data port monitoring

This command displays the port monitoring status.

Syntax:

The syntax of this command can include the following variations:

```
show data port-monitoring
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example defines a key to a peer ip.

```
# show data port-monitoring
```

6.5.28 show data track brief

This command display all active tracks status including Configured ID and Probe Type, the state (up/down) and maximum probe trip time.

Syntax:

The syntax of this command can include the following variations:

```
show data track brief
```

Defaults:

This command has no defaults.

Command Modes:

Basic

Example:

The following example shows the state of all tracks.

```
# show data track brief
Track        Type                State         Max round trip time (m.s)
5            ICMP reachability   Down          0
```

6.5.29 show data bfd neighbors [vrf <VRF table name>]

This command displays the state of all Bidirectional Forwarding Detection (BFD) neighbors. The parameters shown are:

- **NeighAddr:** Displays the neighbor IP address
- **Holdown (mult):** Displays the Hold down time and multiplier
- **RH/RS:** Displays the BFD state received in the last packet from the neighbor
- **State:** Displays the State of the neighbor
- **Int:** Displays the outgoing interface for the BFD packets

Syntax:

The syntax of this command can include the following variations:

```
show data bfd neighbors [vrf <VRF table name>]
```

Defaults:

This command has no defaults.

Command Modes:

Basic

Example:

The following example shows the status of all the configured BFD neighbors.

```
# show data bfd neighbors
    NeighAddr                              Holdown(mult) RH/RS State        Int
  1 192.168.100.10                           600(3)         Up Up          VLAN 2
```

6.5.30 show data bfd neighbors details [vrf <VRF table name>]

This command displays more details about each bfd neighbor.

Syntax:

The syntax of this command can include the following variations:

```
show data bfd neighbors details [vrf <VRF table name>]
```

Defaults:

This command has no defaults.

Command Modes:

Basic

Example:

The following example shows the status of all the configured BFD neighbors.

```
# show data neighbors details
     NeighAddr                              Holdown(mult) RH/RS State        Int
 1 192.168.100.10                           600(3)         Up Up          VLAN 2
OutAddr: 192.168.100.254
Local Diag: 1, Demand mode: 0, Poll bit: 0
MinTxInt: 200000, MinRxInt: 200000, Multiplier: 3
Received MinRxInt: 200000, Received Multiplier: 3
Holdown (hits): 600(1), Hello (hits): 200(4575)
Rx Count: 4575
Tx Count: 4578
Last packet: Version: 1               - Diagnostic: 3
             State bit: Up            - Demand bit: 0
             Poll bit: 0              - Final bit: 0
             Multiplier: 3            - Length: 24
             My Discr: 1              - Your Discr: 51
             Min tx interval: 200000  - Min rx interval: 200000
             Min Echo interval: 0
```

6.5.31 show data ip nat activity

This command displays NAT activity and statistics.

Syntax:

```
show data ip nat activity rates [sort-by] {byte-rate|packet-rate|total-packets}
show data ip nat activity refreshing
```

Arguments	Description
rates	Displays NAT activity and statistics (with rate details)
refreshing	Displays NAT activity and statistics (auto-refreshing)
byte-rate	Sorts output by byte rate per second.
packet-rate	Sorts output by packet rate per second.
total-packets	Sorts output by total packets.

Defaults:

NA

Command Modes:

Basic

Example:

The following example displays NAT activity and statistics

```
# show data ip nat activity
```

6.5.32 show data ip nat rules

This command displays configured NAT rules, mapping LAN traffic to WAN IP address pools. For information on NAT rules, refer to the "**ip nat inside**" configuration command.

Syntax:

The syntax of this command is:

```
show data ip nat rules
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays the current NAT rules:

```
# show data ip nat rules
```

6.5.33 show data ip nat pools

This command displays configured IP address pools, used for network address translation (NAT). For information on NAT pools, refer to the "**ip nat pool**" configuration command.

Syntax:

The syntax of this command is:

```
show data ip nat pools
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays the current NAT pools:

```
# show data ip nat pools
```

6.5.34 show data ip nat translations

This command displays the currently active NAT translation entries, each consisting of a LAN address, a WAN address, and a remote WAN host.

Syntax:

The syntax of this command is:

```
show data ip nat translations
```

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays the current NAT table:

```
# show data ip nat translations
```

6.5.35 show data ip nat activity

This command displays the currently active NAT translation entries, with additional information regarding the volume of traffic for each entry.

Syntax:

The syntax of this command can include the following variations:

```
show data ip nat translations
show data ip nat translations refreshing
```

The commands syntax format is described below:

Arguments	Description
refreshing	Displays the information without returning to the command prompt. The data will be refreshed automatically every 5 seconds. Press CTRL-C to exit the command.

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example displays NAT activity:

```
# show data ip nat activity
```

6.5.36 show data spanning-tree info

This command displays the status and parameters of the spanning tree in the system.

Syntax:

The syntax of this command is:

```
show spanning-tree info
```

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the status and parameters of the spanning tree in the system:

```
# show spanning-tree info
```

6.5.37 show data spanning-tree interface-info

This command displays the status and parameters of the spanning tree for a specific interface.

Syntax:

```
show data spanning-tree interface-info GigabitEthernet <slot/port>
show data spanning-tree interface-info FastEthernet <slot/port>
```

The command's syntax format is described below:

Arguments	Description
slot/port	Defines the interface you want to see.

Defaults:

NA

Command Modes:

Enable

Example:

The following example shows the status of interface 4/1.

```
# show data spanning-tree interface-info GigabitEthernet 4/1
```

6.5.38 show data spanning-tree

This command displays the status and parameters of the spanning tree including system status and all the relevant interfaces.

Syntax:

```
show data spanning-tree
```

No arguments for this command.

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays the status and parameters of the spanning tree including system status and all the relevant interfaces.

```
# show data spanning-tree
```

6.5.39 show data interfaces spanning-tree

This command shows the description for a specified interface.

Syntax:

```
show data interfaces GigabitEthernet <slot/port> spanning-tree
show data interfaces FastEthernet <slot/port> spanning-tree
```

The command's syntax format is described below:

Arguments	Description
slot/port	Defines the interface you want to see.

Defaults:

NA

Command Modes:

Enable

Example:

This example shows the description for a specified interface.

```
# show data interfaces GigabitEthernet 4/1 spanning-tree
```

6.5.40 show data ip route

This command displays the existing IPv4 routing rules.

Syntax:

The syntax of this command can include several variations. The most common are:

```
show data ip route
show data ip route bgp
show data ip route connected
show data ip route ospf
show data ip route rip
show data ip route static
show data ip route a.b.c.d
show data ip route summary
```

The command's syntax format is described below:

Arguments	Description
bgp	Displays the Border Gateway Protocol routes.
connected	Displays connected routes
ospf	Displays the OSPF protocol routes.
rip	Displays Routing Information Protocol (RIP) routes.
static	Displays static routes.
a.b.c.d	Displays only routes to a specific address.
summary	Displays a summary of all ipv4 routes.

Defaults:

NA

Command Modes:

Basic

Example:

This example displays the existing routing rules.

```
# show data ip route
```

6.5.41 show data ipv6 route

This command displays the existing IPv6 routing rules.

Syntax:

The syntax of this command can include several variations.

```
show data ipv6 route
show data ipv6 route bgp
show data ipv6 route connected
show data ipv6 route kernel
show data ipv6 route ospf6
show data ipv6 route ripng
show data ipv6 route static
show data ipv6 route x:x::x:x[/m]
show data ipv6 route summary
```

The command's syntax format is described below:

Arguments	Description
bgp	Displays the Border Gateway Protocol (BGP) routes.
connected	Displays connected routes.
kernel	Displays kernel routes.
ospf6	Displays the OSPF IPv6 protocol routes.
ripng	Displays RIPng routes.
static	Displays static routes.
x:x::x:x[/m]	Displays only routes to a specific IPv6 address.
summary	Displays a summary of all ipv4 routes.

Defaults:

NA

Command Modes:

Basic

Example:

This example displays the existing routing rules.

```
# show data ipv6 route
```

6.5.42 show data ip extcommunity-list

This command displays the current extcommunity-list information. When *name* is specified the community list's information is shown.

Syntax:

The syntax of this command can include the following variations:

```
show data ip extcommunity-list
show data ip extcommunity-list [word] vrf [vrf name]
show data ip extcommunity-list [1-99] vrf [vrf name]
```

The command's syntax format is described below:

Arguments	Description
word	Defines the extcommunity-list name.
1-99	Defines the extcommunity-list number.
vrf	Associate with defined VRF.
vrf name	Defines the VRF table name.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the current extcommunity-list information.

```
# show data ip extcommunity-list
```

6.5.43 show data ip community-list

This command display current community list information. When *name* is specified, the specified community list's information is shown.

Syntax:

The syntax of this command can include the following variations:

```
show data ip community-list
show data ip community-list [<word>|1-99] [vrf <VRF name>]
```

The command's syntax format is described below:

Arguments	Description
word	Defines a community-list name
1-99	Defines a community-list number
VRF name	Show a community-list defined in VRF

Defaults:

NA

Command Modes:

Enable

Example:

This command displays current community list information. When *name* is specified, the specified community list's information is shown.

```
# show data ip community-list commlist
```

6.5.44 show data ip bgp

This command displays bgp dynamic routing protocol information.

Syntax:

The syntax of this command can include the following variations:

```
show data ip bgp [vrf <VRF name>] [neighbors]

show data ip bgp [vrf <VRF name>] [neighbors] <neighbor>
advertised-routes|routes
```

Argument	Description
neighbors	Displays detailed information on TCP and BGP neighbor connections.
neighbor	Displays the neighbor to display information about – in a.b.c.d format.
advertised-routes	Displays the routes advertised to a BGP neighbor.
routes	Displays routes learned from the neighbor.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays BGP routes.

```
show data ip bgp
```

6.5.45 show data ip ospf vrf

This command shows information on a variety of general OSPF and area state and configuration information, associated with the defined VRF.

Syntax:

The syntax of this command can include the following variations:

```
show data ip ospf [vrf <VRF table name>][border-routers]

show data ip ospf [vrf <VRF table name>][database] <Link State ID>
[adv-router <advertising router>]

show data ip ospf [vrf <VRF table name>][database][asbr-summary]
<Link State ID> [adv-router <advertising router>]

show data ip ospf [vrf <VRF table name>][database[self-originate]

show data ip ospf [vrf <VRF table name> [[interface] <interface
type> <interface id> [detail]

show data ip ospf [vrf <VRF table name>][route]
```

Argument	Description
border-routers	Displays border-routers for this area.
asbr-summary	Displays ASBR summary link states.
external	Displays External link states.
max-age	Displays LSAs in MaxAge list.
network	Displays Network link states.
nssa-external	Displays NSSA external link states.
router	Displays Router link states.
self-originate	Displays Self-originated link states.
summary	Displays Network summary link states.
link-state-id	Enter Link State ID (as an IP address – a.b.c.d)
adv-router	Display Advertising Router link states.
advertising router	Display Advertising Router (as an IP address – a.b.c.d)
neighbor	Displays the neighbor list.
detail	Displays details of all neighbors.
route	Displays OSPF routing table.

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

This example shows how this command can be used.

```
show data ip ospf vrf abc
```

6.5.46 show data ip ospf interface

This command shows the state and configuration of OSPF the specified interface, or all interfaces if no interface is given.

Syntax:

The syntax of this command can include the following variations:

```
show data ip ospf interface <interface type> <interface id>
```

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

This example shows the state and configuration of OSPF for the specified interface,

```
show data ip ospf interface gre 100
```

6.5.47 show data ip ospf neighbor

This command displays OSPF-related neighbor information.

Syntax:

The syntax of this command can include the following variations:

```
show data ip ospf neighbor
show data ip ospf neighbor <interface type> <interface id>
show data ip ospf neighbor detail
show data ip ospf neighbor <interface type> <interface id>
detail
```

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

This example shows the OSPF routing table, as determined by the most recent SPF calculation.

```
# show data ip ospf neighbor
```

6.5.48 show data ip ospf database

This command shows the OSPF Link-State Advertisement (LSA) database.

Syntax:

The syntax of this command can include the following variations:

```
show data ip ospf database

show data ip ospf database asbr-summary <Link State ID> [adv-
router <advertising router>]

show data ip ospf database asbr-summary [self-originate]

show data ip ospf database asbr-summary [adv-router <advertising
router>]

show data ip ospf database external <Link State ID> [adv-router
<advertising router>]

show data ip ospf database external [adv-router <advertising
router>]

show data ip ospf database external [self-originate]

show data ip ospf database max-age

show data ip ospf database network <Link State ID> [adv-router
<advertising router>]

show data ip ospf database network [adv-router <advertising
router>]

show data ip ospf database network [self-originate]

show data ip ospf database nssa-external <Link State ID> [adv-
router <advertising router>]

show data ip ospf database nssa-external [adv-router <advertising
router>]

show data ip ospf database nssa-external [self-originate]

show data ip ospf database router <Link State ID> [adv-router
<advertising router>]

show data ip ospf database router [adv-router <advertising
router>]

show data ip ospf database router [self-originate]

show data ip ospf database self-originate
```

```
show data ip ospf database summary <Link State ID> [adv-router
<advertising router>]

show data ip ospf database summary [adv-router <advertising
router>]

show data ip ospf database summary [self-originate]
```

Argument	Description
asbr-summary	Displays ASBR summary link states.
external	Displays External link states.
max-age	Displays LSAs in MaxAge list.
network	Displays Network link states.
nssa-external	Displays NSSA external link states.
router	Displays Router link states.
self-originate	Displays Self-originated link states.
summary	Displays Network summary link states.
link-state-id	Enter Link State ID (as an IP address – a.b.c.d)
adv-router	Display Advertising Router link states.
advertising router	Display Advertising Router (as an IP address – a.b.c.d)

Defaults:

NA

Command Modes:

Enable

Example:

This example shows the OSPF LSA database.

```
# show data ip ospf database
```

6.5.49 show data ip rip

This command displays the Routing Information Protocol (RIP) routing for IPv4.

Syntax:

The syntax of this command can include the following:

```
show data ip rip [vrf <VRF name>] [status]
```

The command syntax format is described below:

Arguments	Description
VRF name	Displays the VRF name.
status	Displays IP routing protocol process parameters and statistics.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays RIP routes.

```
# show data ip
```

6.5.50 show data ipv6 ripng

This command displays Routing Information Protocol New Generation (RIPng) routing for IPv6.

Syntax:

The syntax of this command can include the following:

```
show data ipv6 ripng [vrf <VRF name>]
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays RIP routes.

```
# show data ipv6 ripng
```

6.5.51 show data ip rip status

The command displays all IPv4 RIP routes. For routes that are received through RIP, this command will display the time the packet was sent and the tag information. This command will also display this information for routes redistributed into RIP.

Syntax:

The syntax of this command can include the following:

```
show data ip rip status
```

Defaults:

NA

Command Modes:

Enable

Example:

This example displays RIP routes.

```
# show data ip rip status
```

6.5.52 show data ipv6 ripng status

The command displays all IPv6 RIPng routes. For routes that are received through RIPng, this command will display the time the packet was sent and the tag information. This command will also display this information for routes redistributed into RIPng.

Syntax:

The syntax of this command can include the following:

```
show data ipv6 ripng status
```

Defaults:

NA

Command Modes:

Enable

Example:

This example displays RIP routes.

```
# show data ipv6 ripng status
```

6.5.53 show data debugging rip

This command displays the RIP debugging option for IPv4.

Syntax:

The syntax of this command can include the following variations:

```
show data debugging  [vrf <VRF name>] rip
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the Virtual Routing and Forwarding (VRF) name.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the RIP debugging option.

```
# show data debugging rip
```

6.5.54 show data debugging ripng

This command displays the RIP debugging option for IPv6.

Syntax:

The syntax of this command can include the following variations:

```
show data debugging [vrf <VRF name>] ripng
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the Virtual Routing and Forwarding (VRF) name.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the RIP debugging option.

```
# show data debugging ripng
```

6.5.55 show data debugging ospf

This command displays debugging information for ospf.

Syntax:

The syntax of this command can include the following variations:

```
show data debugging ospf
```

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the debugging information for ospf.

```
# show data debugging ospf
```

6.5.56 show data debugging ospf6

This command displays debugging information for ospf6.

Syntax:

The syntax of this command can include the following variations:

```
show data debugging  [vrf <VRF name>] ospf6
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the Virtual Routing and Forwarding (VRF) name.

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the debugging information for ospf6.

```
# show data debugging ospf6
```

6.5.57 show data ipv6 ospf6

This command displays OSPF debugging information for IPv6.

Syntax:

The syntax of this command can include the following variations:

```
show data ipv6 ospf6 [area <a.b.c.d>] spf tree

show data ipv6 ospf6 [border-routers <Router ID a.b.c.d>|details]

show data ipv6 ospf6 database [*|adv-router|as-external|detail|
dump|group-membership|inter-prefix|inter-router
internal|intra-prefix|link|linkstate-id|network|router|self-
originated|type-7 ]

show data ipv6 ospf6 interface <interface name> <interface ID>
```

The command syntax format is described below:

Arguments	Description
area <a.b.c.d>	Displays information for a specific area.
border-routers	Displays routing table for ABR and ASBR.
database	Display Link state database
interface	Displays Interface information
linkstate	Displays linkstate routing table
neighbor	Displays a Neighbor list
redistribute	Displays Redistributing External information
route	Displays Routing Table
simulate	Displays Shortest Path First calculation
VRF name	Displays the Virtual Routing and Forwarding (VRF) name.
*	Displays any Link state type
adv-router	Searches by Advertising Router
as-external	Displays as-External LSAs
detail	Displays details of LSAs
dump	Displays a dump of LSAs
group-membership	Displays Group-Membership LSAs
inter-prefix	Displays Inter-Area-Prefix LSAs
inter-router	Displays Inter-Area-Router LSAs
internal	Displays LSA's internal information
intra-prefix	Displays Intra-Area-Prefix LSAs
link	Displays Link LSAs
linkstate-id	Searches by Link state ID

Arguments	Description
network	Displays Network LSAs
router	Displays Router LSAs
self-originated	
type-7	Displays Type-7 LSAs
database	Defines the database options as one of the following: • * Displays any Link state type • **adv-router** Searches by Advertising Router • **as-external** Displays as-External LSAs • **detail** Displays details of LSAs • **dump** Displays a dump of LSAs • **group-membership** Displays Group-Membership LSAs • **inter-prefix** Displays Inter-Area-Prefix LSAs • **inter-router** Displays Inter-Area-Router LSAs • **internal** Displays LSA's internal information • **intra-prefix** Displays Intra-Area-Prefix LSAs • **link** Displays Link LSAs • **linkstate-id** Searches by Link state ID • **network** Displays Network LSAs • **router** Displays Router LSAs • **self-originated** • **type-7** Displays Type-7 LSAs
interface name	Defines the interface name as one of the following: ▪ **bvi:** Bridge interface ▪ **cellular:** Cellular 3G interface ▪ **gigabitethernet:** Gigabit Ethernet interface ▪ **gre:** GRE tunnel interface ▪ **ipip:** IPIP tunnel interface ▪ **l2tp:** L2TP tunnel interface ▪ **loopback:** PPPoE interface ▪ **pppoe:** PPPoE interface ▪ **pptp:** PPTP tunnel interface ▪ **vlan:** VLAN interface ▪ **prefix:** Displays connected prefixes

Defaults:

NA

Command Modes:

Enable

Example:

This example displays the RIP debugging option.

```
# show data ipv6 ospf6
```

6.5.58 show data ip vrf

This command shows the configured vrfs with its associated interfaces.

Syntax:

The syntax of this command includes the following variations:

```
show data ip vrf [string]
```

The command syntax format is described below:

Arguments	Description
string	Optional – Defines the vrf name to show a specific vrf

Defaults:

N/A

Command Modes:

Disable

Related Commands:

```
ip vrf, ip vrf forwarding
```

Example:

The following example shows all the vrf configurations:

```
# show data ip vrf
```

6.5.59 show data ip route vrf

This command shows a VRF route table.

Syntax:

The syntax of this command includes the following variations:

```
show data ip route vrf <string> [route_type]
```

The command syntax format is described below:

Arguments	Possible Values	Description
route_type	[a.b.c.d[/m]]	Displays the Network / IP prefix in the IP routing table to display.
	bgp	Displays Border Gateway Protocol (BGP) routes.
	connected	Displays connected routes.
	kernel	Displays kernel routes.
	ospf	Displays Open Shortest Path First (OSPF) routes.
	rip	Displays Routing Information Protocol (RIP) routes.
	static	Displays static routes.
	summary	Displays a summary of all routes.

Defaults:

NA

Command Modes:

Disable

Related Commands:

```
ip vrf, ip vrf forwarding, ip route vrf
```

Example:

The following example shows the route table of vrf VOIP:

```
# show data ip route vrf VOIP
```

6.5.60 show data qos match-map

This command displays configuration parameters for a group of match-maps or a specific match-map.

Syntax:

The syntax of this command can include the following variations:

```
show data qos match-map
show data qos match-map [input/ output]
show data qos match-map [interface name]
show data qos match-map [input/ output] [interface name]
```

The command's syntax format is described below:

Arguments	Description
Input/ output	Displays detailed information about all match and set rules of all match-maps of the selected direction (either input or output).
[interface name]	Displays detailed information about all match and set rules of all match-maps of the selected interface. Look for interface naming on the *interface* command.
No argument	Displays detailed information about all match and set rules of all match-maps (for input and output of all the interfaces).

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays configuration parameters for a group of match-maps or a specific match-map:

```
# show data qos match-map
```

6.5.61 show data qos service-map

This command displays configuration parameters for a group of service-maps or a specific service-map.

Syntax:

The syntax of this command can include the following variations:

```
show data qos service-map
show data qos service-map [LAN/ WAN]
```

The command's syntax format is described below:

Arguments	Description
[LAN/ WAN]	Displays detailed information such as minimum and maximum bandwidth, list of queues, queue policy and queue priority for either LAN or WAN service-maps.
No argument	Displays detailed information such as minimum and maximum bandwidth, list of queues, queue policy and queue priority for all the service-maps.

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays configuration parameters for a group of service-maps or a specific service-map.

```
show data qos service-map
```

6.5.62 show data qos queue

This command displays statistics for a group of queues or a specific queue.

Syntax:

The syntax of this command can include the following variations:

```
show data qos queue
show data qos queue [LAN/ WAN]
show data qos queue [LAN/ WAN][queue name]
```

The command's syntax format is described below:

Arguments	Description
[LAN/ WAN]	Displays detailed statistics such as sent/ delayed/ dropped packets and rate for all the output LAN or WAN queues.
[queue name]	Displays detailed statistics such as sent/ delayed/ dropped packets and rate for a selected queue.
No argument	Displays detailed statistics such as sent/ delayed/ dropped packets and rate for all the output queues.

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays statistics for a group of queues or a specific queue

```
show data qos queue
```

6.5.63 show data log-history

This command displays buffered log messages relating to the data functionality of the device. The buffer may be cleared using the command "**clear data log-history**".

Syntax:

The syntax of this command is:

```
show data log-history
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays the data log buffer:

```
# show data log-history
```

6.5.64 show data vrrp

This command displays Virtual Router Redundancy Protocol (VRRP) status.

Syntax:

The syntax of this command is:

```
show data vrrp
show data vrrp interface <interface name>
show data vrrp brief
```

The command's syntax format is described below:

Arguments	Description
interface name	Displays VRRP interface status.
brief	Displays VRRP brief status.

Defaults:

NA

Command Modes:

Enable

Example:

The following example displays the VRRP status:

```
# show data vrrp
VLAN 1 - Group 1
  State is Master
  Virtual IP address is 10.4.6.14
  Advertisement interval is 1 sec
  Preemption is enabled
  Priority is 100
  Master Router is 10.4.6.12 (local), priority is 100
  Master Advertisement interval is 1 sec
  Master Down interval is 3.609 sec

VLAN 2 - Group 1
  State is Master
  Virtual IP address is 10.7.5.4
  Advertisement interval is 10 sec
  Preemption is enabled
  Priority is 120
  Master Router is 10.7.7.7 (local), priority is 120
  Master Advertisement interval is 10 sec
  Master Down interval is 30.531 sec
```

```
# show data vrrp interface vlan 2
VLAN 2 - Group 1
  State is Master
  Virtual IP address is 10.7.5.4
  Advertisement interval is 10 sec
  Preemption is enabled
  Priority is 120
  Master Router is 10.7.7.7 (local), priority is 120
  Master Advertisement interval is 10 sec
  Master Down interval is 30.531 sec
# show data vrrp brief
Interface              Grp Pri Time,msec  Own Pre State  Master
addr      Group addr
VLAN 1000              2   100 765609      Y   Y  Master
101.101.101.101  2.2.2.2
VLAN 1000              100 255 3003        Y   Y  Master
101.101.101.101  101.101.101.101
VLAN 2                 3   100 3609        Y   Y  Master
10.50.50.50      200.200.200.200
VLAN 2                 4   100 3609        Y   Y  Master
10.50.50.50      10.4.3.2
VLAN 2                 2   120 300531      Y   Y  Master
10.50.50.50      10.9.9.9
```

This page is intentionally left blank.

7 Clear Commands

The following describes the clear command options.

7.1 Data-Routing Clear Commands

The following are Data-Routing Clear commands.

7.1.1 clear data log-history

This command clears the data logs.

Syntax:

```
clear data log-history
```

Defaults:

NA

Command Modes:

Enable

Note:

This command is only applicable to MSBR devices.

Example:

The following clears the data logs.

```
# clear data log-history
```

7.1.2 clear data mac-address-table

This command clears the MAC table.

Syntax:

```
clear data mac-address-table [vlan <vlan id>]
```

Defaults:

NA

Command Modes:

Enable

Note:

This command is only applicable to MSBR devices.

Example:

The following clears the MAC table.

```
# clear data mac-address-table
```

7.1.3 clear data dns-view counters

This command clears the DNS counters.

Syntax:

```
clear data dns-view counters
```

Defaults:

NA

Command Modes:

Enable

Note:

This command is only applicable to MSBR devices.

Example:

The following clears the DNS table.

```
# clear data dns-view counters
```

7.1.4 clear data dsl-connection-attempts

This command clears the data logs for dsl connection attempts.

Syntax:

```
clear data dsl-connection-attempts
```

Defaults:

NA

Command Modes:

Enable

Note:

This command is only applicable to MSBR devices.

Example:

The following clears the data logs.

```
# clear data dsl-connection attempts
```

7.1.5 clear ip access-list counters

This command clears IP access list counters.

Syntax:

The syntax of this command includes the following variations:

```
clear ip access-list counters
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example clears IP access list counters:

```
# clear ip access-list counters
```

7.1.6 clear ip arp

This command enables the deletion of a specific arp entry or flushing the arp cache.

Syntax:

The syntax of this command includes the following variations:

```
clear ip arp all
clear ip arp <ip address>
clear ip arp interface <interface type> <interface id>
```

The command syntax format is described below:

Arguments	Description
all	Clears the entire ARP cache
ip address	Clears a specific ARP entry in the format a.b.c.d
interface	Clears the entire ARP cache on a specific interface
interface type	Defines the type of the network interface.
interface id	Defines the ID of the network interface.

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Examples:

- The following example clears the entire ARP cache:

```
# clear ip arp all
```

- The following example clears the 10.1.2.3 ARP entry:

```
# clear ip arp 10.1.2.3
```

- The following example clears the entire ARP cache on the network interface vlan 2:

```
# clear ip arp interface vlan 2
```

7.1.7 clear ip bgp

This command resets IP BGP information.

Syntax:

The syntax of this command includes the following variations:

```
clear ip   [vrf <VRF name>] bgp {*|autonomous-system-
number|neighbor-address|peer-group group-name} [in [prefix-
filter]|ipv4|out|rsclient|soft [in [prefix-filter]|out}

clear ip bgp dampening [network-address] [ipv4-mask]

clear ip bgp external [in [prefix-filter]] [out] [soft [in
[prefix-filter]|out]]

clear ip bgp view view-name [*|neighbor-address ] [rsclient]
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.
*	Defines that all current BGP sessions will be reset.
autonomous-system-number	Clear peers with the Autonomous System number. Range is from 1 to 65535.
neighbor-address	Defines the BGP neighbor that will be reset. The value for this argument can be an IPv4 or IPv6 address.
group-name	Clears all members of the peer-group.
in	Initiates an inbound reconfiguration.
prefix-filter	Clears the existing outbound route filter (ORF) prefix list to trigger a new route refresh or soft reconfiguration, which updates the ORF prefix list.
ipv4	Defines the reset of IPv4 address family sessions.
out	Initiates an outbound reconfiguration.
rsclient	Initiates a soft reconfiguration for rsclient RIP.
soft	Initiates a soft reset.
dampening	Clears the route flap dampening information.
external	Clears all external peers.
view-name	Defines the BGP view name to be cleared.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example specifies the reset of all address family sessions.

```
# clear ip bgp all
```

7.1.8 clear ip dhcp binding

This command enables the deletion of a specific bind or clears the entire pool.

Syntax:

The syntax of this command can include the following variations:

```
clear ip dhcp binding all
clear ip dhcp binding <ip address>
```

The command's syntax format is described below:

Arguments	Description
ip address	Defines the IP address to clear.
all	Clear all automatic bindings

Defaults:

NA

Command Modes:

Enable

Example:

The following example clears the 10.1.2.3 binding.

```
# clear ip dhcp binding 10.1.2.3
```

7.1.9 clear ip mroute

This command deletes the multicast route table entries.

Syntax:

The syntax of this command can include the following variations:

```
clear ip mroute vrf <VRF name>
```

The command's syntax format is described below:

Arguments	Description
vrf name	Defines the VRF table name to clear.

Defaults:

NA

Command Modes:

Enable

Example:

The following example clears the multicast route table entries.

```
# clear ip mroute vrf vtab
```

7.1.10 clear ip nat

This command deletes NAT connections.

Syntax:

The syntax of this command can include the following variations:

```
clear ip nat translations
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example clears NAT connections.

```
# clear ip mroute
```

7.1.11 clear ip prefix-list

This command clears counters for IP prefix lists.

Syntax:

The syntax of this command can include the following variations:

```
clear ip prefix-list [<prefix-list name> <IP prefix
network/length>]
```

The command syntax format is described below:

Arguments	Description
prefix-list name	Defines the name of the prefix list from which the hit count is to be cleared.
IP prefix network/length>	Defines the IP prefix network/length in the format A.B.C.D/M

Defaults:

NA

Command Modes:

Enable

Example:

The following example clears counters for IP prefix lists.

```
# clear ip prefix-list
```

7.1.12 clear ip vrf

This command clears the counters on an IPv4 prefix-list associated with a VRF.

Syntax:

The syntax of this command can include the following variations:

```
clear ip [vrf <VRF name>] bgp * in [prefix-filter]
clear ip [vrf <VRF name>] bgp * ipv4 multicast in [prefix-filter]
clear ip [vrf <VRF name>] bgp * ipv4 multicast out
clear ip [vrf <VRF name>] bgp * ipv4 multicast soft [in|out]
clear ip [vrf <VRF name>] bgp * ipv4 unicast in [prefix-filter]
clear ip [vrf <VRF name>] bgp * ipv4 unicast out
clear ip [vrf <VRF name>] bgp * ipv4 unicast soft [in|out]

clear ip [vrf <VRF name>] bgp * out
clear ip [vrf <VRF name>] bgp * rsclient
clear ip [vrf <VRF name>] bgp * soft [in|out]
clear ip [vrf <VRF name>] bgp * vpnv4 unicast [in|out|soft]

clear ip [vrf <VRF name>] bgp <AS number> in [prefix-filter]

clear ip [vrf <VRF name>] bgp ipv4 multicast in prefix-filter
clear ip [vrf <VRF name>] bgp ipv4 multicast out
clear ip [vrf <VRF name>] bgp ipv4 multicast soft [in|out]
clear ip [vrf <VRF name>] bgp ipv4 unicast in [prefix-filter]
clear ip [vrf <VRF name>] bgp ipv4 unicast out
clear ip [vrf <VRF name>] bgp ipv4 unicast soft [in|out]

clear ip [vrf <VRF name>] bgp <IP address> in [prefix-filter]

clear ip [vrf <VRF name>] bgp <IP address> ipv4
<multicast|unicast> in [prefix-filter]
clear ip [vrf <VRF name>] bgp <IP address> ipv4
<multicast|unicast> out
clear ip [vrf <VRF name>] bgp <IP address> ipv4
<multicast|unicast> soft [in|out]clear ip [vrf <VRF name>] bgp <IP
address> out
clear ip [vrf <VRF name>] bgp <IP address> rsclient
clear ip [vrf <VRF name>] bgp <IP address> soft [in|out]

clear ip [vrf <VRF name>] bgp <IP address> vpnv4 unicast in
clear ip [vrf <VRF name>] bgp <IP address> vpnv4 unicast out
clear ip [vrf <VRF name>] bgp <IP address> vpnv4 unicast soft
[in|out]

clear ip [vrf <VRF name>] bgp <IPv6 address> rsclient

clear ip [vrf <VRF name>] bgp dampening <a.b.c.d> <e.f.g.h>
clear ip [vrf <VRF name>] bgp dampening <a.b.c.d/m>
```

```
clear ip [vrf <VRF name>] bgp external [in prefix-filter]

clear ip [vrf <VRF name>] bgp ipv4 <multicast|unicast> in [prefix-
filter]
clear ip [vrf <VRF name>] bgp ipv4 <multicast|unicast>  out
clear ip [vrf <VRF name>] bgp ipv4 <multicast|unicast>  out soft
[in|out]
clear ip [vrf <VRF name>] bgp out soft [in|out]

clear ip [vrf <VRF name>] bgp peer-group <peer-group name> in
[prefix-filter]

clear ip [vrf <VRF name>] bgp peer-group <peer-group name> ipv4
<multicast|unicast>  in

clear ip [vrf <VRF name>] bgp peer-group <peer-group name> ipv4
<multicast|unicast>  out

clear ip [vrf <VRF name>] bgp peer-group <peer-group name> ipv4
<multicast|unicast> soft [in|out]

clear ip [vrf <VRF name>] bgp view <view-name> * [in prefix-
filter]

clear ip [vrf <VRF name>] bgp view <view-name> * [ipv4
<multicast|unicast>  in prefix-filter]

clear ip [vrf <VRF name>] bgp view <view-name> * [ipv4
<multicast|unicast>  soft [in|out]]

clear ip [vrf <VRF name>] bgp view <view-name> * [soft [in|out]]

clear ip [vrf <VRF name>] bgp view <view-name> <BGP neighbor IP
address> rsclient

clear ip [vrf <VRF name>] prefix-list <a.b.c.d/m>
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.
a.b.c.d/m	Defines the optional prefix address.
*	Clears all peers.
AS number	Clear peers with the AS number. The range is 1 – 65535).
IP address	Defines the BGP neighbor IP address.
a.b.c.d/m	Defines the IP prefix network/length.
a.b.c.d	Defines the network to clear damping information.
e.f.g.h	Defines the network mask

Arguments	Description
in	Defines a soft reconfiguration inbound update.
prefix-filter	Pushes out prefix-list ORF and does inbound soft reconfiguration.
soft	Defines a soft reconfiguration.
multicast	Pushes out prefix-list ORF and does inbound soft reconfiguration.
unicast	Defines a soft reconfiguration inbound update.
rsclient	Defines a soft reconfiguration for rsclient RIB.

Defaults:

NA

Command Modes:

Enable

Example:

The following example clears the counters on prefix-list associated with a VRF.

```
# clear ip vrf vrfname bgp 10.13.3.12
```

7.1.13 clear ipv6 dhcpv6

This command delete items from the DHCPv6 database.

Syntax:

The syntax of this command can include the following variations:

```
clear ipv6 dhcpv6 binding X:XX::XX
clear ipv6 dhcpv6 all
clear ipv6 dhcpv6 interface bvi [bridge interface index]
clear ipv6 dhcpv6 interface dot11radio [wifi interface index]
clear ipv6 dhcpv6 interface vlan [vlan interface index]
```

The command's syntax format is described below:

Arguments	Description
X:XX::XX	Clears a specific IPv6 binding
all	Clears all automatic bindings
interface	Clears the binding from a specific interface
bridge interface index	Clears the binding from the bridge interface. Range [1-255].
wifi interface index	Clears the binding from the Wi-Fi interface. Range [1-4].
vlan interface	Clears the binding from the vlan interface. Range [1-3999].

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of this command.

```
# clear ipv6 dhcpv6 binding 1:11::21
```

7.1.14 clear ipv6 neighbors

This command clears ipv6 entries from the neighbors table.

Syntax:

The syntax of this command can include the following variations:

```
clear ipv6 dhcpv6 binding X:XX::XX
clear ipv6 dhcpv6 all
clear ipv6 dhcpv6 interface bvi [bridge interface index]
clear ipv6 dhcpv6 interface dot11radio [wifi interface index]
clear ipv6 dhcpv6 interface vlan [vlan interface index]
```

The command's syntax format is described below:

Arguments	Description
X:XX::XX	Clears a specific IPv6 binding.
all	Clears all automatic bindings.
interface	Clears the binding from a specific interface.
bridge interface index	Clears the binding from the bridge interface. Range [1-255].
wifi interface index	Clears the binding from the Wi-Fi interface. Range [1-4].
vlan interface	Clears the binding from the vlan interface. Range [1-3999].

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of this command.

```
# clear ipv6 dhcpv6 binding 1:11::21
```

7.1.15 clear ipv6 vrf

This command deletes ipv6 information associated with a defined VRF.

Syntax:

The syntax of this command can include the following variations:

```
clear ipv6 vrf <VRF name> prefix-list <prefix-list name>
[X:X::X:X/M
```

The command's syntax format is described below:

Arguments	Description
X:X::X:X/M	Defines the IPv6 prefix network/length.
prefix-list name	Defines the name of the prefix list.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of this command.

```
# clear ipv6 vrf vrf1 prefix-list 1:11::21:1/4
```

7.1.16 clear ipv6 prefix-list

This command clears the counters on an IPV6 prefix-list.

Syntax:

The syntax of this command can include the following variations:

```
clear ipv6 prefix-list [<prefix-list name>][x:x::x:x/m]
```

The command's syntax format is described below:

Arguments	Description
x:x::x:x/m	Defines the IPv6 prefix network/length

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of this command.

```
# clear ipv6 prefix-list plist 3ffe::/16
```

7.1.17 clear l2tp-server

This command clears incoming L2TP connections.

Syntax:

```
clear l2tp-server all
clear l2tp-server conn <connection number>
```

The command's syntax format is described below:

Arguments	Description
connection number	Defines the incoming connection number, as reported by the *show data l2tp-server* command.

Defaults:

NA

Command Modes:

Enable

Note:

This command is only applicable to MSBR devices.

Example:

The following clears all incoming L2TP connections.

```
# clear l2tp-server all
```

7.1.18 clear counters

This command has two options:

- to clear a specific interface counters
- to clear all the interfaces counters

Syntax:

The syntax of this command includes the following variations:

```
clear counters [interface type <interface ID>]| loopback <loopback interface ID>
```

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Related Commands:

Examples:

The following example clears the network interface vlan 5 counters.

```
# clear counters vlan 5
```

7.1.19 clear qos counters

This command clears QoS counters.

Syntax:

The syntax of this command includes the following variations:

```
clear qos counters [interface type <interface ID>]
```

The command syntax format is described below:

Arguments	Description
interface type	Defines the Type of the network interface. **Interface Types:** • BVI Bridge interface • GigabitEthernet Gigabit Ethernet interface • cellular Cellular 3G interface • gre Tunnel GRE interface • ipip Tunnel IPIP interface • l2tp L2TP Tunnel interface • loopback PPPoE interface • pppoe PPPoE interface • pptp PPTP Tunnel interface • vlan Vlan interface • loopback Loopback interface
interface ID	Defines the ID of the network interface

Defaults:

NA

Command Modes:

Enable

Related Commands:

Examples:

The following example clears the QoS counters.

```
# clear qos counters vlan 5
```

7.1.20 clear pptp-server

This command clears incoming PPTP connections.

Syntax:

```
clear l2tp-server all
clear l2tp-server conn <connection number>
```

The command's syntax format is described below:

Arguments	Description
connection number	Defines the incoming connection number, as reported by the *show data pptp-server* command.

Defaults:

NA

Command Modes:

Enable

Note:

This command is only applicable to MSBR devices.

Example:

The following clears all incoming PPTP connections.

```
# clear pptp-server all
```

7.2 VoIP Clear Commands

The following are VoIP Clear commands.

7.2.1 clear voip gw

This command clears VoIP.

Syntax:

```
clear voip gw calls-count
clear voip gw statistics
```

The command's syntax format is described below:

Arguments	Description
calls-count	Clears the calls count.
statistics	Clears the call statistics.

Defaults:

NA

Command Modes:

Enable

Example:

The following clears VoIP calls count.

```
# clear voip gw calls-count
```

7.2.2 clear voip calls

This command disconnects active calls.

Syntax:

```
clear voip calls <Session ID>
```

The command's syntax format is described below:

Arguments	Description
Session ID	Clears VoIP Active calls of a specified Session ID

Defaults:

NA

Command Modes:

Enable

Example:

The following displays and then clears VoIP calls.

```
# show voip calls
Total Active Calls: 1
| Session ID    |     Caller          |     Callee          | Origin
|      Remote IP     |End Point Type |Duration|Call State
=================================================================
=========================================================
|326433737      |3005                 |2000                 |Outgoin
g|10.8.6.36           |FXS-3/3         |00:00:06|Connected

# clear voip calls 326433737
1 Active Calls were Manually disconnected
```

7.2.3 clear voip statistics

This command clears SIP VoIP Calls or GW Statistics.

Syntax:

```
clear voip statistics
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example clears SIP VoIP Calls.

```
# clear voip statistics
```

7.3 System Clear Commands

The following are System Clear commands.

7.3.1 clear alarms-history

This command clears the alarms history table

Syntax:

```
clear alarms-history
```

Defaults:

NA

Command Modes:

Enable

Example:

The following clears the alarms history table.

```
# clear alarms-history
```

7.3.2 clear user

This command ends the CLI session of a specific CLI user. When this command is run, it drops the Telnet/SSH session or logs out the RS-232 session and displays the login prompt.

Syntax:

```
clear user <session id>
```

Defaults:

NA

Note:

- The session from which the command is run cannot be terminated.
- This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Command Modes:

Enable

Example:

The following ends the CLI session of a specific user.

```
# clear user 1
```

This page is intentionally left blank.

8 Maintenance and File Commands

The following describes the Maintenance and File commands.

8.1 Copy Commands

The following describes the Copy commands.

8.1.1 copy <file>

This command copies a file from a URL source to the device.

Syntax:

The syntax of this command can include the following variations:

```
copy <file> from <URL>
```

The command's syntax format is described below:

Arguments	Description
file	The auxiliary file type can be one of the following: ▪ **adsl-firmware** - ADSL firmware file ▪ **call_progress_tones** - Call progress call file ▪ **cas_table** - CAS table file ▪ **coder_table** - Coder table file ▪ **cli-script** – CLI configuration file ▪ **data-configuration** – Data configuration file ▪ **dial_plan** – Dial plan file ▪ **firmware** – Firmware, burn and reload ▪ **nqm-history** - Export Network Quality Monitoring history file ▪ **prerecorded_tones** - Prerecorded tones file ▪ **startup-script** - CLI configuration file ▪ **tls_cert** – TLS certificate file ▪ **tls_private_key** – TLS private key file ▪ **tls_root_cert** – TLS trusted root certificate file ▪ **voice-configuration** - Voice configuration file (ini file) ▪ **voice_prompts** – Voice prompt file ▪ **user_info** – User info file ▪ **web_logo** – Web logo file ▪ **voice_xml** – Voice xml file
from	Copy (download) a specific auxiliary file or auxiliary file package from a specified URL.
URL	Defines the file source URL. Can be one of the following: ▪ http ▪ https ▪ tftp

Defaults:

NA

Note:

- CAS table auxiliary file copy is supported only on MSBR devices.
- A copied file must be burned (via the 'write' command) in order to stay persistent.
- Please refer to the user manual in order to learn about the device's Auxiliary Files format and roles.

Command Modes:

Enable

Related Commands:

erase, dir, write

Examples:

In this example, the MSBR copies the firmware file from the TFTP server, burns it to memory, and then reboots.

```
# copy firmware from
http://192.169.11.11:80/M5XX_SIP_F6.60A.260.002.cmp
Copying file...
done.
Restarting...
```

8.1.2 copy call-progress-tones

This command copies the call progress tones file.

Syntax:

The syntax of this command can include the following variations:

```
copy call-progress-tones from <URL> source data interface
<interface type> <interface id>

copy call-progress-tones from <URL> source data source-address
interface <interface type> <interface id>

copy call-progress-tones from <URL> source data vrf <string>
```

The command syntax format is described below:

Arguments	Description
URL	Defines the file source URL. Can be one of the following: ▪ http ▪ https ▪ tftp
from	Copies the configuration file from URL file source.
source	▪ interface – Defines the source interface to bind to ▪ source-address – Defines the source address ▪ vrf – Defines the VRF

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Examples:

The following example copies the coder-table.

```
# copy coder-table from http://192.169.11.11:80/M5XX_SIP_F6.60A.260.002.cmp
```

8.1.3 copy coder-table

This command copies the coder table.

Syntax:

The syntax of this command can include the following variations:

```
copy coder-table from <URL> source data interface <interface type>
<interface id>

copy coder-table from <URL> source data source-address interface
<interface type> <interface id>

copy coder-table from <URL> source data vrf <string>
```

The command syntax format is described below:

Arguments	Description
URL	Defines the file source URL. Can be one of the following: ▪ http ▪ https ▪ tftp
from	Copies the configuration file from URL file source.
source	▪ interface – Defines the source interface to bind to ▪ source-address – Defines the source address ▪ vrf – Defines the VRF

Interface Type		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Examples:

The following example copies the coder-table.

```
# copy coder-table from http://192.169.11.11:80/M5XX_SIP_F6.60A.260.002.cmp
```

8.1.4 copy data configuration file

This command copies the data configuration file from a URL source to the device and from the device to a destination URL or CLI console.

Syntax:

The syntax of this command can include the following variations:

```
copy data-configuration {from|to} <URL> source {data|voip}
<source> interface <if-name>
copy data-configuration {from|to}  console
copy data-configuration to usb:///<ini configuration file name>
```

The command syntax format is described below:

Arguments	Description
data-configuration-file	Defines the Data (router's) configuration file.
<URL>	When copying **from** a URL, the file source URL can be one of the following: *http, https* and *tftp*. When copying **to** a URL, the file destination URL can be one of the following: *http, https*.
from	Copies the configuration file from URL file source.
to	Copies the current running configuration (file) to a destination.
console	Copies the configuration file to the CLI console.
source	▪ **interface** – Defines the source interface to bind to ▪ **source-address** – Defines the source address ▪ **vrf –** Defines the VRF
usb	Copy the configuration file from URL file source

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Note:

- Copy to / from a USB stick that is connected to the device, is only applicable to Mediant 5xx and Mediant 8xx devices.
- When copying the configuration file to a URL destination, the device uses the PUT HTTP command in order to transfer the file.
- Please refer to the User Manual in order to learn about the device's data and voice configuration file formats and roles.
- This command copies the voice configuration file (ini). The 'apply-after-reset' option of this command is intended for sending a future-version ini file, as part of a firmware upgrade process.
- This file will be applied only when the system is loaded with the new firmware, preventing unnecessary errors regarding the new ini file. After using this option, a new firmware MUST be loaded, resulting in a system reset.
- Once this option is used, no other configuration can be applied.

Command Modes:

Enable

Related Commands:

copy firmware

Examples:

The following example copies the voice configuration file to the CLI console.

```
# copy data-configuration to console
```

8.1.5 copy voice configuration file

This command copies the vice configuration file from a URL source to the device and from the device to a destination URL or CLI console.

Syntax:

The syntax of this command can include the following variations:

```
copy voice-configuration {from|to} <URL> source {data|voip}
<source> interface <if-name>
copy voice-configuration {from|to} console
copy voice-configuration to usb:///<ini configuration file name>
```

The command syntax format is described below:

Arguments	Description
voice-configuration-file	Defines the voice configuration file (i.e. *ini* file).
<URL>	When copying **from** a URL, the file source URL can be one of the following: *http, https* and *tftp*. When copying **to** a URL, the file destination URL can be one of the following: *http, https*.
from	Copies the configuration file from URL file source.
to	Copies the current running configuration (file) to a destination.
console	Copies the configuration file to the CLI console.
source	▪ **interface** – Defines the source interface to bind to ▪ **source-address** – Defines the source address ▪ **vrf –** Defines the VRF
usb	Copy the configuration file from URL file source

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Note:

- **Copy to / from** a USB stick that is connected to the device, is only applicable to Mediant 5xx and Mediant 8xx devices.
- When copying the configuration file to a URL destination, the device uses the PUT HTTP command in order to transfer the file.
- Please refer to the User Manual in order to learn about the device's data and voice configuration file formats and roles.
- This command copies the voice configuration file (*ini*). The 'apply-after-reset' option of this command is intended for sending a future-version *ini* file, as part of a firmware upgrade process.
- This file will be applied only when the system is loaded with the new firmware, preventing unnecessary errors regarding the new *ini* file. After using this option, a new firmware MUST be loaded, resulting in a system reset.
- Once this option is used, no other configuration can be applied.

Command Modes:

Enable

Related Commands:

copy firmware

Examples:

The following example copies the voice configuration file to the CLI console.

```
# copy voice-configuration to console
```

8.1.5.1 Progress Indication for File Transfer in CLI

File transfer progress information is displayed when a file is transferred from/to the device, using the `copy from/to` CLI command. This is applicable to the TFTP, HTTP/S, FTP/S, and USB protocols. **(The USB option is applicable only to the `copy to` command for Mediant 5xx and Mediant 8xx.)**

Below is an example of a file download progress display:

%	Total	%	Received	%	Xferd	Average Dload	Speed Upload	Time Total	Time Spent	Time Left	Current Speed
100	29.2M	100	29.2M	0	0	939k	0	0:00:31	0:00:31	--:--:--	945k

Where:

- **%:** Percentage of total bytes transmitted (downloaded and uploaded) - downloaded is displayed only when downloading a file (i.e., `copy from` command)
- **Total:** Total bytes transmitted - downloaded and uploaded
- **%:** Percentage of downloaded bytes (for `copy from` command)
- **Received:** Currently downloaded bytes (for `copy from` command)
- **%:** Percentage of uploaded bytes (for `copy to` command)
- **Xferd:** Currently uploaded bytes (for `copy to` command)
- **Average Dload:** Average download speed in bytes/sec (for `copy from` command)
- **Speed Upload:** Average upload speed in bytes/sec (for `copy to` command)
- **Time Spent:** Elapsed time
- **Time Left:** Duration remaining to complete file transfer
- **Current Speed:** Current transmission speed in bytes/sec

Note: For the MSBR series, when downloading a file using FTP through the WAN interface (data source), the only progress information displayed is the number of transferred bytes.

This is applicable to Mediant 5xx, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

8.1.6 copy cli-script

This command copies a cli-script file from a URL source to the device and also from the device to a URL source.

Syntax:

The syntax of this command can include the following variations:

```
copy cli-script from <URL> source data interface <interface type>
<interface id>

copy cli-script from <URL> source data source-address interface
<interface type> <interface id>

copy cli-script from <URL> source data vrf <string>

copy cli-script to <URL> source data interface <interface type>
<interface id>

copy cli-script to <URL> source data source-address interface
<interface type> <interface id>

copy cli-script to <URL> source data vrf <string>
```

The command syntax format is described below:

Arguments	Description
URL	When copying **from** a URL, the file source URL can be one of the following: • HTTP • HTTPS • TFTP • USB
	When copying **to** a URL, the destination URL can be one of the following: • HTTP • HTTPS • TFTP • USB

Defaults:

NA

Note:

- This command loads a show-run output file into the board (via HTTP, HTTPS and , TFTP) and applies it.
- The script is activated immediately. The user does not need to do any additional action besides loading it.
- The USB option is applicable only to Mediant 500 and Mediant 8xx.
- This command is only applicable to MSBR.

Command Modes:

Enable

Examples:

The following example copies the data configuration from the TFTP server.

```
# copy cli-script from tftp://192.168.0.3/script1.txt
```

8.1.7 copy cas-table

This command copies the CAS configuration table file.

Syntax:

The syntax of this command can include the following variations:

```
copy cas-table from <URL> source data interface <interface type>
<interface id>

copy cas-table from <URL> source data source-address interface
<interface type> <interface id>

copy cas-table from <URL> source data vrf <string>

copy cas-table to <URL> source data interface <interface type>
<interface id>

copy cas-table to <URL> source data source-address interface
<interface type> <interface id>

copy cas-table to <URL> source data vrf <string>
```

The command syntax format is described below:

Arguments	Description
URL	When copying **from** a URL, the file source URL can be one of the following: • HTTP • HTTPS • TFTP • USB
	When copying **to** a URL, the destination URL can be one of the following: • HTTP • HTTPS • TFTP • USB

Defaults:

NA

Command Modes:

Enable

Examples:

The following example copies the CAS configuration from the TFTP server.

```
# copy cas-table from tftp://192.168.0.3/script1.txt
```

8.1.8 copy firmware

This command provides support for initiating a Hitless/non-hitless Software upgrade procedure.

Syntax:

The syntax of this command can include the following variations:

```
copy firmware from <URL and file name>
copy firmware from <URL and file name> non-hitless
copy firmware from usb:///<cmp file name>
```

The command's syntax format is described below:

Arguments	Description
URL	Defines the file source URL. Can be one of: HTTP, HTTPS or TFTP.

Defaults:

NA

Note:

- The **copy firmware from usb** option is only applicable when a USB stick is connected to the device. This applies only to Mediant 5xx and Mediant 8xx devices.
- The new firmware is copied and burned to the non-volatile (NV) memory of the device.
- The current running configuration (voice and data) is saved on the NV memory as well.
- The device automatically reloads with the new firmware.
- This command is applicable to Mediant 800 E-SBC, Mediant 2600, Mediant 4000, and Mediant SW.

Command Modes:

Enable

Related Commands:

copy (configuration)

Examples:

The following example upgrades the device's firmware from a source URL file.

```
# copy firmware from http://www.exmaple.com/firmware.cmp
```

8.1.9 copy startup-script

This command provides support for applying a "purified" version of the current configuration to enable proper functioning of the device. This is useful when the device has correct configuration, but for some or other reason it doesn't function properly. This may be attributed to accumulated "mess" due to lengthy and numerous configurations. This command enables the device to do a "fresh-and-clean" start with the current configuration.

Syntax:

The syntax of this command can include the following variations:

```
copy startup-script from <URL> on-demand
copy startup-script from <URL> source data [interface <interface type> <interface id>] [on-demand]
copy startup-script from <URL> source data [source-address] [interface <interface type> <interface id>] [on-demand]
copy startup-script from <URL> source data vrf <vrf string> on-demand
copy startup-script from <URL> source voip on-demand
copy startup-script from running-config
```

The command's syntax format is described below:

Arguments	Description
URL	Defines the file source URL.
running-config	Runs the startup-script from current running configuration
on-demand	Do not run the script after download.

Defaults:

NA

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Related Commands:

copy (configuration)

Examples:

The following example runs the startup-script from current running configuration.

```
# copy startup-script from running-config
```

8.1.10 copy nqm-history

This command copies an NQM results file from the device to a destination URL.

Syntax:

The syntax of this command is:

```
copy nqm-history <nqm session id> <URL>
```

The command syntax format is described below:

Arguments	Description
nqm session id	Defines the NQM Session id to have its result file retrieved. This number corresponds to the sender row index and can therefore be in the range of 0-9.
URL	Defines the file destination URL. It can be one of the following: *http, https*.

Defaults:

NA

Note:

When copying the NQM file to a URL destination, the device uses the PUT HTTP command to transfer the file.

Command Modes:

Enable

Related Commands:

NA

Example:

The following example copies the NQM results file of sender 0 to a HTTP server.

```
copy nqm-history 0 http://10.4.2.2/MyHistoryFiles/
```

8.1.11 copy web-logo

This command copies the Web logo file.

Syntax:

The syntax of this command is:

```
copy web-logo from <URL> source data interface <interface type>
<interface id>

copy web-logo from <URL> source data source-address interface
<interface type> <interface id>

copy web-logo from <URL> source data vrf

copy web-logo from <URL> source voip
```

The command syntax format is described below:

Arguments	Description
URL	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP
source	Specifies the source CPU to copy from (default data).
interface	Specifies the source interface to bind to.
source-address	Specifies the source address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the Web logo file.

```
copy web-logo from http://10.4.2.2/MyHistoryFiles/
```

8.1.12 copy dial-plan

This command copies the dial-plan file.

Syntax:

The syntax of this command is:

```
copy dial-plan from <URL> source data interface <interface type>
<interface id>

copy dial-plan from <URL> source data source-address interface
<interface name> <interface id>

copy dial-plan from <URL> source data vrf

copy dial-plan from <URL> source voip
```

The command syntax format is described below:

Arguments	Description
URL	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP
source	Specifies the source CPU to copy from (default data).
interface	Specifies the source interface to bind to.
source-address	Specifies the source address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the dial plan file.

```
copy dial-plan from http://10.4.2.2/MyHistoryFiles/
```

8.1.13 copy debug-file

This command copies the debug-file file.

Syntax:

The syntax of this command is:

```
copy debug-file to <URL> file-index <number>

copy debug-file to <URL> source data file-index *

copy debug-file to <URL> source data source-address interface
<interface name> <interface id> file-index <source interface
number>

copy debug-file to <URL> source data vrf <string> <interface id>
file-index <source interface number>

copy debug-file to <URL> source voip vrf <string> file-index <voip
source>
```

The command syntax format is described below:

Arguments	Description
URL	Copies auxiliary files, configuration and firmware to/from NV memory.
source	Specifies the source CPU to copy from (default data).
source-address	Specifies the source address.
*	Defines the data source.
source interface number	Specifies the source interface to bind to

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

.

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the dial plan file.

```
copy dial-plan from http://10.4.2.2/MyHistoryFiles/
```

8.1.14 copy voice-xml

This command copies the voice xml file.

Syntax:

The syntax of this command is:

```
copy voice-xml from <URL> source data interface <interface type>
<interface id>

copy voice-xml from <URL> source data source-address interface
<interface name> <interface id>

copy voice-xml from <URL> source data vrf

copy voice-xml from <URL> source voip
```

The command syntax format is described below:

Arguments	Description
URL	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP
source	Specifies the source CPU to copy from (default data).
interface	Specifies the source interface to bind to.
source-address	Specifies the source address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the voice XML file.

```
copy voice-xml from http://10.4.2.2/MyHistoryFiles/
```

8.1.15 copy voice-prompts

This command copies the voice prompts file.

Syntax:

The syntax of this command is:

```
copy voice-prompts from <URL> source data interface <interface
type> <interface id>

copy voice-prompts from <URL> source data source-address interface
<interface name> <interface id>
copy voice-prompts from <URL> source data vrf

copy voice-prompts from <URL> source voip
```

The command syntax format is described below:

Arguments	Description
URL	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP
source	Specifies the source CPU to copy from (default data).
interface	Specifies the source interface to bind to.
source-address	Specifies the source address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the voice prompts file.

```
copy voice-prompts from http://10.4.2.2/MyHistoryFiles/
```

8.1.16 copy prerecorded-tones

This command copies the prerecorded-tones file.

Syntax:

The syntax of this command is:

```
copy prerecorded-tones from <URL> source data interface <interface
type> <interface id>

copy prerecorded-tones from <URL> source data source-address
interface <interface name> <interface id>

copy prerecorded-tones from <URL> source data vrf

copy prerecorded-tones from <URL> source voip
```

The command syntax format is described below:

Arguments	Description
URL	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP
source	Specifies the source CPU to copy from (default data).
interface	Specifies the source interface to bind to.
source-address	Specifies the source address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the prerecorded tones file.

```
copy prerecorded-tones from http://10.4.2.2/MyHistoryFiles/
```

8.1.17 copy user-info

This command copies the user-information file.

Syntax:

The syntax of this command is:

```
copy user-info from <URL> source data interface <interface type>
<interface id>

copy user-info from <URL> source data source-address interface
<interface name> <interface id>

copy user-info from <URL> source data vrf

copy user-info from <URL> source voip
```

The command syntax format is described below:

Arguments	Description
URL	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP
source	Specifies the source CPU to copy from (default data).
interface	Specifies the source interface to bind to.
source-address	Specifies the source address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example copies the user-information file.

```
copy user-info from http://10.4.2.2/MyHistoryFiles/
```

8.2 usb Auto-Run

You can run commands by simply connecting a USB flash drive to the MSBR. Once connected, the MSBR runs commands located in the file, "ac_autorun.txt", line-by-line similar to a Telnet connection. The MSBR treats the commands in the "ac_autorun.txt" file as a regular console input and therefore, the username, password and enable password need to be included in the "ac_autorun.txt" file. The output of the commands is written in the file "ac_output.txt".

While reading and executing commands from the USB flash drive, the "Status" LED is lit red. After finishing the command execution, the LED flashes green.

8.2.1 usb list

This command prints files to a USB. This behaves similar to the "dir" command in Windows or Linux.

Syntax:

The syntax of this command can include the following:

```
usb list
```

Defaults:

NA

Note:

NA

Command Modes:

Enable

Examples:

The following is an example of using USB commands:

```
# Message that appears on USB insertion
MSBR# [4297251.615000] sda: assuming d[4297251.621000] sda:
assuming drive cache: write through
[4297251.628000] sda: p1 exceeds device capacity

# Backup configuration
MSBR# copy cli-script to usb:///config_back_up_27apr2014.cfg
Sending file...done

# Show files on the USB
MSBR# usb list
-rwxrwxrwx 1 root 0 34330640 Apr 24 2014
MP500_MSBG_SIP_F6.80A.025.cmp
drwxrwxrwx 2 root 0 4096 Feb 25 20:58 System Volume Information
-rwxrwxrwx 1 root 0 31759825 Apr 9 2014
YairE_CFM_FIX_MSBR_LAB_UB.cmp -rwxrwxrwx 1 root 0 3559 Apr 4 23:29
config_back_up_27apr2014.cfg
-rwxrwxrwx 1 root 0 3559 Apr 4 22:54 runcfg.txt
```

8.2.2 usb remove

This command safely removes an attached USB device.

Syntax:

The syntax of this command can include the following:

```
usb remove
```

Defaults:

NA

Note:

NA

Command Modes:

Enable

Examples:

The following example removes the USB drive:

```
# usb remove
```

8.3 cmdshell

This command displays the classic cmdshell interface.

Syntax:

The syntax of this command can include the following:

```
cmdshell
```

Defaults:

NA

Note:

NA

Command Modes:

Enable

Examples:

The following example displays the classic cmdshell interface.

```
# cmdshell
```

8.4 dir

This command displays the device's current auxiliary files directory information.

Syntax:

The syntax of this command can include the following:

```
dir
```

Defaults:

NA

Note:

NA

Command Modes:

Enable

Related Commands:

erase, copy (auxiliary file), write

Examples:

The following example displays the device's current auxiliary files directory information.

```
# dir
```

8.5 reload

This command reloads the device, with or without data configuration burn.

Syntax:

The syntax of this command can include the following variations:

```
reload if-needed
reload now
reload without-saving
reload without-saving in <minutes>
no reload without-saving in <minutes>
```

The command's syntax format is described below:

Arguments	Description
now	Saves configuration and restarts.
if-needed	Reloads the system only if an offline configuration has been changed.
without-saving	Performs a restart without writing the configuration.
minutes	Specifies a number of minutes after which the device will restart. Use this command before making changes to sensitive settings; if your changes cause the device to lose connectivity, just wait for the device to restart with the previous working configuration. To cancel the timed restart, use the "no" form of this command.

Defaults:

Burns the configuration upon reload.

Note:

- By default, when the device is reloaded, the configuration and the auxiliary files are burned to NV memory.
- Activating the 'reload' command is equivalent to activating the 'write' command followed by the 'reload without-saving' command.

Command Modes:

Enable

Related Commands:

Write

Examples:

The following example performs a restart without writing the configuration.

```
# reload without-saving
```

8.6 write

This command writes the current configuration set and auxiliary files to the NV memory.

Syntax:

The syntax of this command can include the following variations:

```
write
```

Defaults:

NA

Note:

- This command should be invoked in the following scenarios in order to save the configuration set and auxiliary files to the NV memory:
  - After completing a configuration set (i.e. after invoking one or more of the commands in the 'config' mode command-set)
  - After copying a new auxiliary file ('copy' command)
  - After copying a new configuration file ('copy' command)
  - After erasing an auxiliary file ('erase' command)

Command Modes:

Enable

Related Commands:

reload, copy, erase, write factory

Examples:

The following example writes configuration and auxiliary files to NV memory.

```
# write
```

8.7 write factory

This command restores the factory settings of the device.

Syntax:

The syntax of this command can include the following variations:

```
write factory
```

Defaults:

NA

Note:

- When this command is invoked, current configuration will be lost. Auxiliary files will also be erased. The device will then reload with its factory setting configuration.
- Please refer to the User Manual in order to learn about the device's Factory Settings.

Command Modes:

Enable

Related Commands:

write

Examples:

The following example restores the factory settings of the device.

```
# write factory
```

8.8 write-and-backup

This command provides the capability of saving the configuration to flash and uploading it to an external server using TFTP/HTTP/HTTPS protocols, as well as saving the configuration to USB storage. The archived files are saved to a user-defined URL path of a remote server (TFTP or HTTP/S), or to a USB storage stick attached to the device (applicable only to **Mediant 5xx and Mediant 8xx**).

The device first saves the configuration to its flash memory and then sends the file to the defined URL. The configuration in the archived file is based only on CLI commands. This command is useful, for example, for reverting the device's configuration to a previously backed-up configuration.

Syntax:

The syntax of this command can include the following variations:

```
write-and-backup to <URL path with file name>
write-and-backup to usb:///<file name>
```

Note:

This command is applicable to all products.

Command Modes:

Enable

Related Commands:

write

Examples:

The following example automatically archives device configuration.

```
# write-and-backup to http://www.exmaple.com/configuration.txt
```

8.9 erase

This command erases a device's auxiliary file.

Syntax:

The syntax of this command can include the following variations:

```
erase <file>
```

The command's syntax format is described below:

Arguments	Description
file	Defines the file name to be erased.

Defaults:

NA

Note:

- The file name should be copied from the 'dir' command output.
- The file is being erased from RAM (and from the current device's run usage). In order to erase the file completely from the NV memory, a 'write' command should also be issued.

Command Modes:

Enable

Related Commands:

dir, copy (auxiliary file), write

Examples:

The following example prints the directory listing of the device and then erases one of the files.

```
# erase voice_prompts
```

8.10 nslookup

This command (name server lookup) can translate a domain name to an IP address (or vice versa). It queries the Domain Name System (DNS) to obtain domain name or IP address mapping.

Syntax:

The syntax of this command can include the following variations:

```
nslookup <hostname> source data type <query type>
nslookup <hostname> source voip interface vlan <vlan id> type
<query type>
```

The command's syntax format is described below:

Query Type	Description
a	Use a Host address.
aaaa	Use an IP6 Address.
naptr	Use naptr (Naming Authority PoinTeR).
srv	Use Server selection.
vlan id	Use vlan ID in range 1 -3999.

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of how this command can be used.

```
# nslookup abc123 source data type srv
```

8.11 ping

This command sends ping packets with an optional interface name, number of echo requests and payload size. This command supports IPv4 and IPv6 addresses.

You can ping from a data-router or VoIP interface to a destination address. This support also extends to Virtual Routing and Forwarding (VRF) interfaces.

Syntax:

The syntax of this command can include the following variations:

```
ping ipv6|<IPv4 address>|ethernet|atm
```

- IPv6 address:

```
ping ipv6 <IPv6 address> {source {data|voip][size <0-max IP
packet size>] [repeat <1-300>]

ping ipv6 <IPv6 address> source voip [size <0-max IP packet
size>] [repeat <1-300>]

ping ipv6 <IPv6 address> source voip interface vlan <1-3999>
[size <0-max IP packet size>] [repeat <1-300>]

ping ipv6 <IPv6 address> source voip interface name <string>
[size <0-max IP packet size>] [repeat <1-300>]

ping ipv6 <IPv6 address> source data [vrf <string>] source-
address interface <layer-3 interface> [size <0-max IP packet
size>] [repeat <1-300>]

ping ipv6 <IPv6 address> source data [size <0-max IP packet
size>] [repeat <1-300>]

ping ipv6 <IPv6 address> source data interface <layer-3
interface> [size <0-max IP packet size>] [repeat <1-300>]
```

- IPv4 address

```
ping <IPv4 address> source voip [size <0-max IP packet size>]
[repeat <1-300>]

ping <IPv4 address> source voip interface vlan <1-3999> [size
<0-max IP packet size>] [repeat <1-300>]

ping <IPv4 address> source voip interface name <string> [size
<0-max IP packet size>] [repeat <1-300>]

ping <IPv4 address> source data vrf <string> source-address
interface {layer3Interfaces} [size <0-max IP packet size>]
[repeat <1-300>]

ping <IPv4 address> source data vrf <string> [size <0-max IP
packet size>] [repeat <1-300>]
```

```
ping <IPv4 address> source data source-address interface
{layer3Interfaces} [size <0-max IP packet size>] [repeat <1-
300>]

ping <IPv4 address> source data [size <0-max IP packet size>]
[repeat <1-300>]

ping <IPv4 address> source data interface {layer3Interfaces}
[size <0-max IP packet size>] [repeat <1-300>]

ping <IPv4 address> [size <0-max IP packet size>] [repeat <1-
300>]
```

- Ethernet:

```
ping ethernet mpid <MPID> domain <domain>
```

- ATM:

```
ping atm [GROUP ID] [VPI]
ping atm [GROUP ID] [VPI] [VCI]
```

The command syntax format is described below:

Arguments	Description
IPv6 address	Defines an IPv6 address as X:X::X:X or hostname.
IPv4 address	Defines the IPv4 IP address as a.b.c.d or hostname.
layer3Interfaces	(Optional) Defines the Layer-3 interfaces: • gigabitethernet • cellular • gre • ipip • l2tp • pppoe • pptp • vlan • loopback • bvi • vti
repeat	(Optional) Defines the number of echo requests.
size	(Optional) Defines the payload size.
source	Defines the source CPU to ping from (default is data).

Note:

- IPv6 ping support is only applicable for data-router interfaces (i.e., Mediant MSBR devices).
- IPv6 ping is currently only supported on Ethernet and Fiber interfaces.

Command Modes:

Enable

Examples:

- The following example sends 3 ICMP packets with 555 bytes payload size to 10.4.0.1 via interface vlan 1:

```
# ping 10.4.0.1 source voip interface vlan 1 repeat 3 size 555
PING 10.4.0.1 (10.4.0.1): 555 data bytes
563 bytes from 10.4.0.1: icmp_seq=0 ttl=255 time=1.3 ms
563 bytes from 10.4.0.1: icmp_seq=1 ttl=255 time=1.1 ms
563 bytes from 10.4.0.1: icmp_seq=2 ttl=255 time=1.2 ms
--- 10.4.0.1 ping statistics ---
3 packets transmitted, 3 packets received, 0 packet loss
round-trip min/avg/max = 1.1/1.2/1.3 ms
```

- The following are examples of sending **ping** commands from the data-router interface (i.e., Mediant MSBR devices).
  - Sending a ping from the main routing table:

    ```
    # ping 10.4.5.6
    ```

  - Sending a ping from a defined VRF named VOIP:

    ```
    # ping 10.4.5.6 source data vrf VOIP
    ```

  - Sending a ping with a source address of the interface vlan 1 (from the main routing table):

    ```
    # ping 10.4.5.6 source data source-address interface vlan
    1
    ```

  - Sending a ping with the source address of interface vlan 1 from defined vrf named VOIP (This ping will work only if vlan 1 belongs to this vrf):

    ```
    # ping 10.4.5.6 source data vrf VOIP source-address
    interface vlan 1
    ```

- The following example pings an IPv6 destination address from a VRF interface “VOIP” (only applicable to data-router/MSBR).

```
ping ipv6 2001:15::300 source data vrf VOIP
The following example pings an IPv6 destination address
# ping ipv6 2000::1
Reply from 2000::1 : time=1 ms
Reply from 2000::1 : time=1 ms
Reply from 2000::1 : time=1 ms
Reply from 2000::1 : time=1 ms
4 packets transmitted, 4 packets received
Round-trip min/avg/max = 1/1/1 ms
```

8.12 traceroute

This command provides support for performing a traceroute. A traceroute is a diagnostic tool for displaying the route (path) and measuring transit delays of packets across an IP network.

The command supports both IPv4 and IPv6 addresses. In IPv4, it supports hostname resolution as well. The command sends three requests to each hop on the way to the destination.

Syntax:

The syntax of this command can include the following variations:

```
# traceroute ipv6 <X:X::X:X> [source|vrf <vrf name>] voip
interface [name network interface|vlan vlan id ]
# traceroute <a.b.c.d or hostname> [vrf <vrf name>]
# traceroute ethernet mpid <MPID> domain <domain name>
```

The command syntax format is described below:

Arguments	Description
<X:X::X:X>	Defines the IPv6 IP address.
vrf name	Defines the Virtual Routing and Forwarding (VRF) name.
vlan id	Defines the VLAN ID. Range is 1 – 3999.

Defaults:

NA

Command Modes:

Enable

Note:

This is applicable to Mediant MSBR products.

Examples:

The following are examples of using this command.

- IPv6:

```
# traceroute ipv6 2014:6666::dddd
1 2014:7777::aa55 (2014:7777::aa55) 2.421 ms 2.022 ms 2.155 ms
2 2014:6666::dddd (2014:6666::dddd) 2.633 ms 2.481 ms 2.568 ms
Traceroute: Destination reached
```

- IPv4:

```
# traceroute 10.3.0.2
1 1 (10.4.0.1) 2.037 ms 3.665 ms 1.267 ms
2 1 (10.3.0.2) 1.068 ms 0.796 ms 1.070 ms
Traceroute: Destination reached
```

8.13 pstn nfas-group-switch-activity

This command provides support for initiating a manual switchover between D-channels (primary and backup) pertaining to the same NFAS group.

Syntax:

The syntax of this command can include the following variations:

```
pstn nfas-group-switch-activity [nfas group number]
```

The command syntax format is described below:

Arguments	Description
nfas group number	Defines the NFAS Group number. The range is 1-12.

Note:

This is applicable to Mediant 500, Mediant 8xx, and Mediant 1000B.

Command Modes:

Enable

Examples:

The following example describes how this command can be used.

```
# pstn nfas-group-switch-activity 2
```

8.14 admin register

This command triggers user registration with a proxy server, through the CLI. These commands can also be used to unregister users.

Syntax:

```
admin register <option>
admin unregister <option>
```

The command syntax format is described below:

Option	Description
accounts	Register Accounts
gw	Register Gateway
ports	Register Ports (Module and Port)
suppserv	Register Supp Serv Gateway Users
userinfo	Register User-Info User **Note:** This option requires additional parameters – *gw* or *sbc*.

Defaults:

NA

Command Modes:

Enable

Example:

The following example registers Module 3 and Port 1.

```
# admin register ports 3 1
Registering module 3 port 1 (200)
```

This page is intentionally left blank.

Part II

System CLI Commands

9 Introduction

This part describes the commands located under the **configure system** mode.

9.1 configure system

To access these commands, enter "**`configure system`**" at the Enabled mode prompt.

Syntax:

```
configure system
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following switches to the system configuration command-set.

```
# configure system
```

This page is intentionally left blank.

10 Banner Message

The banner message appears when the administrator connects to the device. To configure the banner message, use the following commands.

10.1 welcome-msg

This command allows you to configure banner messages.

Syntax:

```
welcome-msg {<index>|display|new}
```

The command syntax format is described below:

Arguments	Description
index	Defines the index counting from 0 to 19. You can configure 20 banner messages.
display	Displays the banner configuration.
new	Configures the first banner message with an empty configuration.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the first banner message with an empty configuration.

```
# configure system
(config-system)# welcome-msg new
(welcome-msg-1)#
```

10.2 text

This command configures the actual banner message.

Syntax:

```
text <message>
```

The command syntax format is described below:

Arguments	Description
message	Defines the text for the Welcome message for the Web interface and CLI. Enter the message and enclose it in double apostrophes.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the first banner message with an empty configuration.

```
# configure system
(config-system)# welcome-msg 0
(welcome-msg-0)# text "This is the banner text"
```

11 Application Commands

The following describes application commands.

11.1 NTP Commands

The following commands configure the Network Time Protocol (NTP) application.

11.1.1 ntp

This command accesses the NTP configuration level.

Syntax:

The syntax of this command includes the following variations:

```
ntp
```

Example:

The following example accesses the NTP configuration level.

```
(config-system)# ntp
(ntp)#
```

11.1.2 primary-server

This command configures the Network Time Protocol (NTP) Server FQDN or IP Address.

Syntax:

The syntax of this command includes the following variations:

```
primary-server <IP address>
```

Example:

The following example sets the NTP Server FQDN or IP Address.

```
(config-system)# ntp
(ntp)# primary-server 10.4.4.2
```

11.1.3 secondary-server

This command defines the NTP Secondary FQDN or Server IP address.

Syntax:

The syntax of this command includes the following variations:

```
secondary-server <IP address>
```

Example:

The following example defines the NTP Secondary FQDN or Server IP address.

```
(config-system)# ntp
(ntp)# secondary-server 10.4.4.2
```

11.1.4 update-interval

This command defines the NTP update time interval in seconds.

Syntax:

The syntax of this command includes the following variations:

```
update-interval <seconds>
```

Example:

The following example defines the NTP update time interval.

```
(config-system)# ntp
(ntp)# update-interval 100
```

11.1.5 utc-offset

This command defines the NTP time to offset in seconds.

Syntax:

The syntax of this command includes the following variations:

```
utc-offset <seconds>
```

Example:

The following example defines the NTP time to offset.

```
(config-system)# ntp
(ntp)# utc-offset 100
```

11.1.6 auth-key-id

This command sets the authentication key ID.

Syntax:

The syntax of this command includes the following variations:

```
auth-key-id <number>
```

Arguments	Description
number	Defines the NTP authentication key identifier. If 0, the authentication is off.

Example:

The following example sets the authentication key ID to "1".

```
(config-system)# ntp
(ntp)# auth-key-id 1
```

11.1.7 ntp-server

This command defines a NTP server assigned to the DHCP pool on the specified interface.

Syntax:

```
ntp-server <ntp ip address>
```

The command's syntax format is described below:

Arguments	Description
ntp ip address	Specifies a valid IPv4 address for NTP server. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). This parameter is optional. (BOOTP / DHCP Option 42).

Defaults:

NA

Note:

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example sets the NTP server IP address.

```
(config-system)# ntp
(dhcp-conf-VLAN 5)# ntp-server 10.4.4.2
```

11.2 Day Light Saving Time Commands

The following command configures Day Light Saving Time.

11.2.1 summer-time

This command configures the daylight saving time (summer time) settings.

Syntax:

The syntax of this command includes the following variations:

```
start <start date and time>
end <end date and time>
offset <offset time>
summer-time <on/off>
```

The command syntax format is described below:

Arguments	Description
start date and time	Defines the start date and time in *mo:dd:hh:mm* format.
end date and time	Defines the end date and time in *mo:dd:hh:mm* format.
offset time	Defines the offset time (0 – 120 minutes).

12 Syslog Commands

The following commands configure the Syslog settings.

12.1 logging

This command filters definitions for debug recording and syslog.

Syntax:

```
# logging
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ dbg-rec-dest-ip ▪ dbg-rec-dest-port ▪ dbg-rec-status ▪ debug-level ▪ defaults ▪ syslog ▪ syslog-ip ▪ syslog-port ▪ system-log-size For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example starts Debug Recording.

```
(config-system)# logging
(logging)# dbg-rec-status start
```

12.2 syslog

This command configures logging settings.

Syntax:

The syntax of this command includes the following variations:

```
syslog <on/off>
syslog-ip <IP address>
syslog-port <port>
```

The command syntax format is described below:

Arguments	Description
IP address	Defines the IP address of the Syslog server. The IP address can be IPv4, or for Mediant MSBR it can be IPv6 if communication with the Syslog server is through the WAN interface. **Note:** Changes to this parameter will take effect when applying the `activate` or `exit` command.
port	Defines the port (0 – 65535).

Example:

The following configures logging settings.

```
(config-system)# logging
(logging)# syslog

  syslog (on)
```

12.3 debug-level

This command sets the debug level.

Syntax:

The syntax of this command includes the following variations:

```
debug-level <level number>
```

The command syntax format is described below:

Arguments	Description
level number	Defines the debug level, where 0 is the lowest debug level and 7 is the highest debug level.

Example:

The following sets the debug level to the highest level.

```
(config-system)# logging
(logging)# debug-level 7
```

12.4 clear system-log

This command clears the system logs.

Syntax:

```
clear system-log
```

Defaults:

NA

Command Modes:

Enable

Example:

The following clears the alarms history table.

```
# clear system-log
```

12.5 clear system cpu-util history

This command clears the history of the cpu utilization.

Syntax:

```
clear system cpu-util history
```

Defaults:

NA

Command Modes:

Enable

Example:

The following clears the history of the cpu utilization.

```
# clear system cpu-util history
```

This page is intentionally left blank.

13 Regional Setting Commands

The following describes regional setting commands.

13.1 clock

This command configures the date and time of the system.

Syntax:

The syntax of this command includes the following variations:

```
date <date>
time <time>
```

The command syntax format is described below:

Arguments	Description
date	Defines the date format: d:m:yyyy.
time	Defines the time format: h:m:s.

Command Modes:

Enable

Examples:

This example sets the date of the system.

```
(config-system)# clock
(clock)# date 23/11/2013
```

This page is intentionally left blank.

14 Certificate Commands

The following commands configure Certificates.

14.1 copy <cert file>

This command copies the certificate file from the server.

Syntax:

The command's syntax format is described below:

```
# copy <cert file> from <server>

# copy <cert file> from <server> source data interface <interface
name> <interface id> context <TLS context number>

# copy <cert file> from <server> source data source-address
interface <interface name> <interface id> context <TLS context
number>

# copy <cert file> from <server> source data vrf <string> context
<TLS context number>

# copy <cert file> from <server> source voip context <TLS context
number>

# copy <cert file> from <server> source voip context <TLS context
number>
```

The certificate file can be one of the following:

Cert File	Description
tls-cert	Defines the TLS Certificate file.
tls-private-key	Defines the TLS Private Key file.
tls-root-cert	Defines the TLS Trusted-Root Certificate file.

The command syntax format is described below:

Arguments	Description
server	Defines the File source URL. Can be one of the following: ▪ HTTP ▪ HTTPS ▪ TFTP

Command Modes:

Enable

Examples:

This example downloads the certificate from the TFTP server to the MSBR.

```
# copy tls-cert from tftp://192.168.0.3/cert.pem
Copying file... 0 bytes
done.
use 'write' command in order to burn to NV memory

# copy tls-root-cert from tftp://192.168.0.3/caroot.pem
Copying file... 0 bytes
done.
use 'write' command in order to burn to NV memory

# copy tls-private-key from tftp://192.168.0.3/pkey.pem
Copying file... 0 bytes
done.
use 'write' command in order to burn to NV memory
# write
Writing configuration...done
```

14.2 tls

This command configures Transport Layer Security (TLS).

Syntax:

The command's syntax format is described below:

```
# tls <index>
# no tls <index>
```

The syntax of this command includes the following variations:

Command	Description
index	Allows you to define the index or contact number. Range is 0 – 999.

Command Modes:

Enable

Examples:

The following example removes index 2.

```
(config-system)# no tls 2
TLS context #2 removed.
```

The following example defines a TLS context.

```
(config-system)# tls 2
(tls-2)# name user2
(tls-2)# no tls-v1-limit
(tls-2)# ciphers server ALL
(tls-2)# ciphers client RC4:!ADH
(tls-2)# ocsp server-primary 10.31.4.21
(tls-2)# no ocsp server-secondary
(tls-2)# ocsp port 2560
(tls-2)# ocsp enable
(tls-2)# ocsp default-response reject
```

14.2.1 certificate create-self-signed

This command creates a Certificate Signing Request (CSR).

```
# certificate create-self-signed
```

Command Modes:

Enable

Examples:

The following example creates a Certificate Signing Request (CSR).

```
(config-system)# tls 3
(tls-3)#)# certificate create-self-signed
New certificate generated.
```

14.2.2 certificate subject clear

This command clears subject name of the certificate.

```
# certificate subject clear
```

Command Modes:

Enable

Examples:

The following example clears subject name of the certificate.

```
(config-system)# tls 3
(tls-3)#)# certificate subject clear
```

14.2.3 certificate subject field-set

This command defines the certificate subject name fields.

Syntax:

```
# certificate subject field-set {common-name|
country|locality|org-unit|organization|state}
```

The syntax of this command includes the following variations:

Arguments	Description
common-name	Defines the common name (Subject Name).
country	Defines the Country Code. The format is XX.
locality	Defines the Locality or city.
org-unit	Defines the Organizational unit.
organization	Defines the Organization name.
state	Defines the State.

Command Modes:

Enable

Examples:

The following example defines the certificate subject name fields.

```
(config-system)# tls 3
(tls-3)# certificate subject field-set common-name MSBR
(tls-3)# certificate subject field-set country US
(tls-3)# certificate subject field-set locality Chicago
(tls-3)# certificate subject field-set org-unit Marketing
(tls-3)# certificate subject field-set organization MyCompany
(tls-3)# certificate subject field-set state Illinois
```

14.2.4 certificate status

This command displays the current certificate status.

Syntax:

```
# certificate status
```

Command Modes:

Enable

Examples:

The following example defines the certificate subject name fields.

```
(config-system)# tls 2
(tls-2)# certificate status
Security context #2 - user2
Certificate subject: /CN=yairMsbr/O=AudioCodes/L=Lod/C=IL
Certificate issuer : /CN=yairMsbr/O=AudioCodes/L=Lod/C=IL
Time to expiration : 7299 days

Key size: 512 bits
Active sockets: 0
The currently-loaded private key matches this
certificatecertificate subject field-set country
```

14.2.5 certificate export

This command displays the current certificate status.

Syntax:

```
# certificate export
```

Command Modes:

Enable

Examples:

The following example displays the current certificate status.

```
(config-system)# tls 2
(tls-2)# certificate export
Local certificate:
-----BEGIN CERTIFICATE-----
MIIBcDCCARoCAQAwDQYJKoZIhvcNAQEFBQAwQzERMA8GA1UEAxMIeWFpck1zYnIx
EzARBgNVBAoTCkF1ZGlvQ29kZXMxDDAKBgNVBAcTA0xvZDELMAkGA1UEBhMCSUww
HhcNMTMwODI2MDkwMTM2WhcNMzMwODIxMTIwMTM2WjBDMREwDwYDVQQDEwh5YWly
TXNicjETMBEGA1UEChMKQXVkaW9Db2RlczEMMAoGA1UEBxMDTG9kMQswCQYDVQQG
EwJJTDBcMA0GCSqGSIb3DQEBAQUAA0sAMEgCQQDdsjBgqaRx+KCGQ8rx/i5+UO/T
l8EHvpudREGtcowRRw/t5LnIfIq9bjkzH9x5Ol5qYO38K+7pNn3dc6WHOA8BAgMB
AAEwDQYJKoZIhvcNAQEFBQADQQDGP4REchoO6vEVLCFmzC3hvymPQLDmhDKeS0ra
Mv1qO7l+bGePhUnIcpv1KEiZN70nvLd/Lx/pgf35MGPf/9O6
-----END CERTIFICATE-----
```

14.2.6 certificate import

This command imports a certificate, in textual PEM format.

Syntax:

```
# certificate export
```

Command Modes:

Enable

Examples:

The following example displays the current certificate status.

```
(config-system)# tls 2
(tls-2)# certificate import
This action will erase the existing certificate.
Are you sure? (Y/N) y
Enter data below. Type a period (.) on an empty line to finish.
-----BEGIN CERTIFICATE-----
MIIDxzCCAzCgAwIBAgICAkAwDQYJKoZIhvcNAQEEBQAwgasxCzAJBgNVBAYTAklM
ZGRlZCBQcm9kdWN0cyBDQTEjMCEGCSqGSIb3DQEJARYUWWFpckVAYXVkaW9jb2Rl
...
Xubs00BQuW9AK+M=
-----END CERTIFICATE-----
.

File replaced.
```

14.2.7 certificate details

This command displays detailed certificate information.

Syntax:

```
# certificate details
```

Command Modes:

Enable

Examples:

The following example displays detailed certificate information.

```
(config-system)# tls 2
(tls-2)# certificate details
Certificate:
    Data:
        Version: 1 (0x0)
        Serial Number: 0 (0x0)
    Signature Algorithm: sha1WithRSAEncryption
        Issuer: CN=MSBR, O=MyCompany, L=Chicago, C=US
        Validity
            Not Before: Aug 26 09:01:36 2013 GMT
            Not After : Aug 21 12:01:36 2033 GMT
        Subject: CN=MSBR, O=MyCompany, L=Chicago, C=US
```

14.2.8 private-key import

This command imports a private key, in textual PEM format.

```
# private-key import
```

Command Modes:

Enable

Examples:

The following example imports a private key.

```
(config-system)# tls 3
(tls-3)# private-key import
```

14.2.9 private-key generate

This command controls the size (in bits) of the RSA key created by the "generate" subcommand.

Syntax:

```
# private-key generate {512|1024|2048}
```

The command's syntax format is described below:

Arguments	Description
512	Generates a 512-bit RSA key.
1024	Generates a 1024-bit RSA key.
2048	Generates a 2048-bit RSA key.

Command Modes:

Enable

Examples:

The following example generates a 512-bit RSA key.

```
(config-system)# tls 3
(tls-3)# private-key generate 512
Generating new key, size 512 bits (this might take a while)...
New private key generated.
```

14.2.10 trusted-root detail

This command displays a summary of trusted root certificates.

Syntax:

```
# trusted-root detail [number]
```

The command syntax format is described below:

Arguments	Description
number	Displays the details of particular root certificate number.

Command Modes:

Enable

Examples:

The following example displays a summary of trusted root certificates.

```
(config-system)# tls 2
(tls-2)# trusted-root detail 1
Certificate:
    Data:
        Version: 3 (0x2)
        Serial Number:
            d0:1e:40:90:00:00:27:4b:00:00:00:01:00:00:00:04
    Signature Algorithm: sha1WithRSAEncryption
        Issuer: C=US, ST=Utah, L=Salt Lake City, O=Xcert EZ by
DST, CN=Xcert EZ
by DST/emailAddress=ca@digsigtrust.com
        Validity
            Not Before: Jul 14 16:14:18 1999 GMT
            Not After : Jul 11 16:14:18 2009 GMT
        Subject: C=US, ST=Utah, L=Salt Lake City, O=Xcert EZ by
DST, CN=Xcert EZ
by DST/emailAddress=ca@digsigtrust.com
        Subject Public Key Info:
...
```

14.2.11 trusted-root export

This command exports an individual trusted root certificate.

Syntax:

```
# trusted-root export [number]
```

The command syntax format is described below:

Arguments	Description
number	Exports a particular root certificate number.

Command Modes:

Enable

Examples:

The following example displays a summary of trusted root certificates.

```
(config-system)# tls 2
(tls-2)# trusted-root export 1
-----BEGIN CERTIFICATE-----
MIID+DCCAuCgAwIBAgIRANAeQJAAACdLAAAAAQAAAAQwDQYJKoZIhvcNAQEFBQAw
gYwxCzAJBgNVBAYTAlVTMQ0wCwYDVQQIEwRVdGFoMRcwFQYDVQQHEw5TYWx0IExh
Wa9gvR8N26E0HzDEPYutsB0Ek+1f1eS/IDAE9EjpMwHRLpAnUrOb3jocq6mXf5vr
...
```

14.2.12 trusted-root import

This command imports a trusted root certificate, in textual PEM format.

Syntax:

```
# trusted-root import
```

Command Modes:

Enable

Examples:

The following example imports a trusted root certificate.

```
(config-system)# tls 2
(tls-2)# trusted-root import

Enter data below. Type a period (.) on an empty line to finish.
-----BEGIN CERTIFICATE-----
MIID+DCCAuCgAwIBAgIRANAeQJAAACdLAAAAAQAAAAQwDQYJKoZIhvcNAQEFBQAw
gYwxCzAJBgNVBAYTAlVTMQ0wCwYDVQQIEwRVdGFoMRcwFQYDVQQHEw5TYWx0IExh
...
wo3CbezcE9NGxXl8
-----END CERTIFICATE-----
.

File added.
```

14.2.13 trusted-root delete

This command deletes an individual trusted root certificate.

Syntax:

```
# trusted-root delete [number]
```

Command Modes:

Enable

Examples:

The following example deletes an individual trusted root certificate.

```
(config-system)# tls 2
(tls-2)# trusted-root delete 3
Certificate removed.
```

14.2.14 trusted-root summary

This command displays a summary of trusted root certificates.

Syntax:

```
# trusted-root summary
```

Command Modes:

Enable

Examples:

The following example displays a summary of trusted root certificates.

```
(config-system)# tls 2
(tls-2)# trusted-root summary
63 trusted certificates.
Num Subject                Issuer                 Expires
-----------------------------------------------------------------------
1 Xcert EZ by DST         Xcert EZ by DST        7/11/2009
2 wireless                wireless               6/06/2010
3 wireless                wireless               3/10/2015
4 VeriSign, Inc.          VeriSign, Inc.         5/18/2018
5 VeriSign, Inc.          VeriSign, Inc.         8/01/2028
6 VeriSign, Inc.          VeriSign, Inc.         8/01/2028
7 VeriSign, Inc.          VeriSign, Inc.         5/18/2018
8 VeriSign, Inc.          VeriSign, Inc.         8/01/2028
```

This page is intentionally left blank

15 High Availability (HA) Commands

The following commands configure High Availability.

15.1 high-availability

This command sets the high availability protocol parameters.

Syntax:

```
# high-availability
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ manual-switch-over ▪ net-mon-destination ▪ net-mon-enable ▪ net-mon-ping-retries ▪ net-mon-ping-timeout ▪ net-mon-source-interface ▪ priority ▪ redundant-priority ▪ redundant-unit-id-name ▪ remote-address ▪ reset-redundant-unit ▪ revertive-mode ▪ unit-id-name For a description of these parameters, refer to the *User's Manual*.

Note:

This command is supported on Mediant 800 E-SBC; Mediant 2600; Mediant 4000; Mediant SW.

Command Modes:

Enable

Examples:

The following example sets the unit-id-name to 'uid_1'.

```
(config-system)# high-availability
(ha)# unit-id-name uid_1
```

This page is intentionally left blank.

16 Management Commands

The commands below describe the various Management commands.

16.1 oamp-default-network-src

This command selects the default network of OAMP services (Data or VoIP).

Syntax:

The syntax of this command includes the following variations:

```
oamp-default-network-src data|voip
```

Arguments	Description
data	Defines the Syslog messages that are sent from the WAN interface.
voip	Defines the Syslog messages are sent from the VoIP LAN interface for OAMP.

Defaults:

Data

Command Modes:

Enable

Examples:

This example selects the default Network of OAMP services.

```
(config-system)# oamp-default-network-src data
```

16.2 Telnet/SSH Commands

The following commands configure Telnet/SSH.

16.2.1 cli-terminal

This command configures the CLI management interface.

Syntax:

This configuration set includes the following sub-commands:

```
idle-timeout <timeout-minutes>
password-obscurity {on|off}
rs232-console {on|off}
ssh {on|off}
ssh-acl <acl-name>
ssh-admin-key <rsa-key>
ssh-port <port-num>
telnet {enable|disable|ssl}
telnet-acl <acl-name>
telnet-port <port-num>
wan-ssh-allow {on|off}
wan-telnet-allow {on|off}
```

Arguments	Description
idle-timeout	Configures how long a CLI session may remain idle, before being disconnected by the device.
password-obscurity	Hides PPP passwords in the output of "show running-config".
rs232-console	Enables or disables the RS-232 port.
ssh	Enables or disables SSH access.
ssh-acl	Selects an access-list permitting clients to connect to the SSH interface. The access-list is defined under "configure data".
ssh-admin-key	Sets the RSA key (entered as hexadecimal digits) of the SSH client. See the User's Manual for further information on SSH access using an RSA key.
ssh-port	Selects the TCP port number on which SSH is active.
telnet	Enables or disables Telnet access.
telnet-acl	Selects an access-list permitting clients to connect to the Telnet interface. The access-list is defined under "configure data".
telnet-port	Selects the TCP port number on which Telnet is active.
wan-ssh-allow	Allows access to SSH from the WAN interface.
wan-telnet-allow	Allows access to Telnet from the WAN interface.

Command Modes:

Enable

Examples:

This example configures SSH.

```
(config-system)# cli-terminal
(cli-terminal)# ssh on
```

16.2.2 telnet-max-sessions

This command defines the maximum permitted number of concurrent Telnet/SSH sessions.

Syntax:

```
# telnet-max-sessions <number>
```

The command's syntax format is described below:

Arguments	Description
number	Defines the maximum allowed number of SSH sessions. For MP-1xx, the range is 1-2. For all other products, the range is 1-5.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the maximum permitted number of concurrent Telnet/SSH sessions.

```
(config-system)# cli-terminal
(cli-terminal)# telnet-max-sessions 5
```

16.2.3 window height

The **window-height** command enables the user to manually or automatically configure the height of the CLI terminal window.

Syntax:

This configuration set includes the following sub-commands:

```
window-height [0-65535]
window-height automatic
```

Command	Description
[0-65535]	Defines the number of lines in the terminal.
automatic	When the automatic mode is configured, whenever you manually change the height of the cli terminal i.e. by dragging with the mouse, the change is automatically saved.

Command Modes:

Enable

Examples:

This example sets the window height to 5.

```
(config-system)# cli-terminal
(cli-terminal)# window-height 5
```

16.3 Web and Telnet Access List Commands

The following commands configure the Web and Telnet Access List.

16.3.1 web

This command enables and defines the Web server.

Syntax:

The syntax of this command includes the following variations:

```
web
<parameter> <value>
```

Arguments	Description
<parameter> <value>	Sets the following parameters: ▪ control-pass-via-snmp ▪ http-auth-mode ▪ http-port ▪ https-cipher-string ▪ https-port ▪ req-client-cert ▪ secured-connection ▪ wan-http-allow ▪ wan-https-allow ▪ web-acl For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

This example enables the use of client certificates for HTTPS connection.

```
(config-system)# web
(web)# req-client-cert on
```

16.3.2 mgmt-access-list

This command enables an IP address to connect to the management interface.

Syntax:

```
# mgmt-access-list <index>
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ ip-address For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables '10.11.12.120' to connect to the management interface.

```
(config-system)# mgmt-access-list 9
(mgmt-access-list 9)# ip-address 10.11.12.120
```

This example displays all mgmt-access-list configurations.

```
(config-system)# mgmt-access-list display

---- mgmt-access-list-0 ----
  ip-address (10.4.2.2)

---- mgmt-access-list-1 ----
  ip-address (10.4.2.3)

---- mgmt-access-list-2 ----
  ip-address (0.0.0.0)

---- mgmt-access-list-3 ----
  ip-address (0.0.0.0)

---- mgmt-access-list-4 ----
  ip-address (0.0.0.0)

---- mgmt-access-list-5 ----
```

```
  ip-address (0.0.0.0)

---- mgmt-access-list-6 ----
  ip-address (0.0.0.0)

---- mgmt-access-list-7 ----
  ip-address (0.0.0.0)

---- mgmt-access-list-8 ----
  ip-address (0.0.0.0)

---- mgmt-access-list-9 ----
  ip-address (0.0.0.0)
```

16.4 RADIUS Setting Commands

The following commands configure the RADIUS settings.

16.4.1 radius

This command enables and defines the RADIUS server. This "source data" parameter provides support for specifying a WAN interface as the source for RADIUS messages.

This parameter provides support for RADIUS server's source interface data. It also enables the NAS-IP-Address sent in RADIUS packets, adjusts and updates according to the address of the selected source interface.

Syntax:

The syntax of this command includes the following variations:

```
radius <parameter> <value>
```

Arguments	Description
parameter	Sets the following parameters: ▪ auth-server-ip ▪ auth-server-port ▪ default-access-level ▪ double-decode-url ▪ enable ▪ enable-mgmt-login ▪ local-cache-mode ▪ local-cache-timeout ▪ shared-secret ▪ source data: ✓ interface <source data interface> ✓ source-address interface <source IP address> **Note:** The source data parameter is only applicable to the data-router interface (i.e., Mediant MSBR). ▪ timeout-behavior ▪ vsa-access-level ▪ vsa-vendor-id For a description of these parameters, refer to the *User's Manual*.

Note:

NA

Command Modes:

Enable

Examples:

This example defines the default access level for the device.

```
(config-system)# radius
(radius)# default-access-level 1
```

This is an example of using the source data parameter:

```
(radius)# source data interface gigabitethernet 0/0
```

The `show run` CLI command can be used to verify that data packets for RADIUS are being sent from the specified WAN interface.

To return to the OAMP interface, the following `no` command is used:

```
(radius)# no source data interface <source data interface>
```

16.4.2 auth-server-ip

This command configures the RADIUS server IP address.

Syntax:

```
# auth-server-ip <a.b.c.d>
```

Arguments	Description
a.b.c.d	Defines the RADIUS authentication server IP address.

Defaults:

NA

Command Modes:

Enable

Note:

This configuration requires a reset.

Examples:

The following example configures the RADIUS server IP address.

```
(config-system)# radius
(radius)# auth-server-ip 192.168.0.199
```

16.4.3 auth-server-port

This command configures the RADIUS server port number.

Syntax:

```
# auth-server-port <port>
```

Arguments	Description
port	Defines the RADIUS authentication port.

Defaults:

NA

Command Modes:

Enable

Note:

This configuration requires a reset.

Examples:

The following example configures the RADIUS port.

```
(config-system)# radius
(radius)# auth-server-port 1812
```

16.4.4 enable-mgmt-login

This command enables RADIUS for access to the MSBR's management interface.

Syntax:

```
# enable-mgmt-login {on|off}
```

Arguments	Description
on	Enables RADIUS for access to the MSBR's management interface.
off	Disables RADIUS for access to the MSBR's management interface.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables RADIUS for access to the MSBR's management interface.

```
(config-system)# radius
(radius)# enable-mgmt-login on
```

16.4.5 source data

This command specifies the data source for the RADIUS server.

Syntax:

```
# source data interface <interface type> <interface id>
# source data source-address interface <interface type> <interface id>
# source data vrf <interface type> <interface id>
```

The command's syntax format is described below:

Arguments	Description
interface	Defines the source interface to bind to.
source-address	Defines the source address.
vrf	Defines the vrf.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of how this command can be used.

```
(config-system)# ntp
(ntp)# source data interface gre 100
```

16.4.6 source voip

This command specifies the voip source for the RADIUS server.

Syntax:

```
# source voip
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example specifies the voip source for the RADIUS server.

```
(config-system)# ntp
(ntp)# source voip
```

16.5 TR-069 (CWMP) Commands

The following commands configure TR-069.

Note: TR-069 commands are only applicable to MSBR devices.

16.5.1 cwmp

This command sets the TR-069 protocol parameters.

Syntax:

```
# cwmp
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ acl-url ▪ acs-password ▪ acs-url-provisioning-mode ▪ acs-user-name ▪ activate ▪ connection-request-password ▪ connection-request-url ▪ connection-request-user-name ▪ debug-mode ▪ defaults ▪ defaults-inform-interval ▪ interface-name ▪ port ▪ protocol ▪ send-connection-request ▪ service For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the TR069 application's interface name.

```
(config-system)# cwmp
(cwmp-tr069)# interface-name int_name
```

16.6 SNMP Commands

The following commands configure SNMP.

16.6.1 snmp

This command enables configuring SNMP Support.

Syntax:

```
# snmp
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ disable ▪ engine-id ▪ port ▪ ro-community-string ▪ rw-community-string ▪ delete-ro-community-string ▪ delete read-only community string ▪ snmp-acl ▪ sys-contact ▪ sys-location ▪ sys-name ▪ sys-oid ▪ trusted-managers ▪ wan-snmp-allow For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the contact person for this managed node.

```
(config-system)# snmp
(snmp)# sys-contact JJOnes
```

16.6.2 snmp trap

This command configures SNMP trap managers.

Syntax:

```
snmp trap
<parameter> <value>
```

Arguments	Description
<parameter> <value>	Sets the following parameters: ▪ auto-send-keep-alive ▪ community-string ▪ defaults ▪ manager-host-name For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

This example defines the community string used in traps.

```
(config-system)# snmp trap
(snmp-trap)# community-string comm_string_A
```

16.6.3 bind

This command provides support for binding SNMP trap requests to a VRF only when the management-servers are bind to all-vrfs. In all other cases, the SNMP traps will be sent through the management-servers source. In other words, the administrator can specify from which data VRF to send the traps (as an SNMP client) to the SNMP manager.

Syntax:

```
bind vrf <vrf name> trap-pdu
```

Arguments	Description
vrf name	Defines the VRF name.

Defaults:

NA

Command Modes:

Enable

Examples:

This example binds management servers to all-vrfs and SNMP traps to VRF 'data'.

```
(config-system)# bind vrf all-vrfs management-servers
(config-system)# snmp
(snmp)# bind vrf data trap-pdu
```

16.6.4 ro-community-string

This command defines a read-only community string.

Syntax:

```
ro-community-string <string>
```

Arguments	Description
string	Defines the read-only community string to be deleted.

Defaults:

NA

Command Modes:

Enable

Examples:

This example defines a community string - string_A.

```
# configure system
(config-system)# snmp
(snmp)# ro-community-string string_A
```

16.6.5 rw-community-string

This command defines a read-write community string.

Syntax:

```
rw-community-string <string>
```

Arguments	Description
string	Defines the read-write community string to be deleted.

Defaults:

NA

Command Modes:

Enable

Examples:

This example defines a community string - string_B.

```
# configure system
(config-system)# snmp
(snmp)# rw-community-string string_B
```

16.6.6 snmp-acl community-string

This command provides support for applying access control list rules (ACL) to SNMP Community strings -- read-only (RO) or read-write (RW). By associating an ACL rule with an SNMP Community string, the source and/or destination address of the packet, received from the management station and in which the Community string is received, can be specified. This adds enhanced security by reducing the likelihood of malicious attacks on the device if the Community string is discovered by an attacker.

Syntax:

The syntax of this command includes the following variations:

```
snmp-acl community-string <community string> rw|ro <ACL rule group name>
```

Arguments	Description
community string	Defines an SNMP community string.
ro	Defines a read-only community string.
rw	Defines a read-write community string.
ACL rule group name	Defines the ACL rule string name.

Command Modes:

Enable

Note:

- SNMP Community strings are used only for SNMPv1 and SNMPv2c (SNMPv3 uses username-password authentication, along with an encryption key).
- This command is applicable to Mediant MSBR devices.

Examples:

The example configuration below applies ACL rule named "MGMT" to the read-only SNMP Community string "public1":

- Configured ACL:

```
(config-data)# access-list MGMT deny udp any eq 68
```

- Configured SNMP Community string:

```
(config-system)# snmp
<snmp >#  ro-community-string public1
```

- Binding SNMP Community string to ACL:

```
<snmp> # snmp-acl community-string public1 ro MGMT
```

To delete a community string - ACL association, simply add single apostrophes at the end of the command line, for example:

```
<snmp> # snmp-acl community-string public1 ro MGMT ''
```

16.6.7 delete-ro-community-string

This command deletes read-only community strings.

Syntax:

```
delete-ro-community-string <string>
```

Arguments	Description
string	Defines the read-only community string to be deleted.

Defaults:

NA

Command Modes:

Enable

Examples:

This example deletes community string string_A.

```
# configure system
(config-system)# snmp
(snmp)# delete-ro-community-string string_A
```

16.6.8 delete-rw-community-string

This command deletes read-write community strings.

Syntax:

```
delete-rw-community-string <string>
```

Arguments	Description
string	Defines the read-only community string to be deleted.

Defaults:

NA

Command Modes:

Enable

Examples:

This example deletes community string string_B.

```
# configure system
(config-system)# snmp
(snmp)# delete-rw-community-string string_B
```

16.6.9 engine-id

This command defines the SNMP Engine ID in 12 HEX Octets in xx:xx:...:xx format.

Syntax:

```
engine-id <string>
```

Arguments	Description
string	Defines the SNMP Engine ID in 12 HEX Octets in **xx:xx:...:xx** format.

Defaults:

NA

Command Modes:

Enable

Examples:

This example defines the SNMP Engine ID.

```
# configure system
(config-system)# snmp
(snmp)# engine-id 11:22:…..:66
```

16.6.10 port

This command defines the port number for SNMP requests and responses.

Syntax:

```
port <port number>
```

Arguments	Description
port number	Defines the port number for SNMP requests and responses in the range of 100-65534.

Defaults:

NA

Command Modes:

Enable

Examples:

This example defines #1102 as the port number for SNMP requests and responses.

```
# configure system
(config-system)# snmp
(snmp)# port 1102
```

16.6.11 snmp trap destination

This command enables SNMPv3 USM user or SNMPv2 user to associate with this trap destination. By default it is associated with the SNMPv2 user.

Syntax:

```
# snmp trap destination <index>
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ ip-address ▪ port ▪ send-trap ▪ trap-user For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the trap ports to be used by the different managers.

```
(config-system)# snmp trap destination 4
(trap-destination 4)# port 18
```

16.6.12 snmp v3-users

This command configures SNMP v3 users.

Syntax:

The syntax of this command includes the following variations:

```
snmp v3-users <index>
<parameter> <value>
```

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ auth-key ▪ auth-protocol ▪ defaults ▪ group ▪ priv-key ▪ priv-protocol ▪ username For a description of these parameters, refer to the *User's Manual*.

Command Modes:

Enable

Examples:

This example configures read only snmp v3 user with no authentication or privacy.

```
(config-system)# snmp v3-users 1
(v3-users-1)# username j_brown
(v3-users-1)# group read-only
(v3-users-1)# auth-protocol none
(v3-users-1)# auth-protocol none
```

17 Test Call Commands

The following commands configure Test calls.

17.1 test-call

This command defines Test Call settings.

Syntax:

```
# test-call
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ activate ▪ defaults ▪ sbc-test-id ▪ sbc-test-id [STRING] ▪ test-call-table [0-4] ▪ test-call-table [0-4] insert ▪ test-call-table display ▪ test-call-table find-by application-type gw-ip-to-ip ▪ test-call-table find-by application-type sbc ▪ test-call-table find-by auto-register disable ▪ test-call-table find-by auto-register enable ▪ test-call-table find-by bandwidth-profile [STRING] ▪ test-call-table find-by call-duration [-1-100000] ▪ test-call-table find-by call-party called ▪ test-call-table find-by call-party caller ▪ test-call-table find-by called-uri [STRING] ▪ test-call-table find-by calls-per-second [1-10] ▪ test-call-table find-by dst-address [STRING] ▪ test-call-table find-by dst-transport not-configured ▪ test-call-table find-by dst-transport tcp ▪ test-call-table find-by dst-transport tls ▪ test-call-table find-by dst-transport udp ▪ test-call-table find-by endpoint-uri [STRING] ▪ test-call-table find-by ip-group-id [-2-100] ▪ test-call-table find-by max-channels [1-400] ▪ test-call-table find-by password [STRING] ▪ test-call-table find-by play disable ▪ test-call-table find-by play dtmf ▪ test-call-table find-by play prt ▪ test-call-table find-by qoe-profile [STRING] ▪ test-call-table find-by route-by dst-address ▪ test-call-table find-by route-by ip-group ▪ test-call-table find-by route-by tel-to-ip

Arguments	Description
	▪ test-call-table find-by schedule-interval [0-100000] ▪ test-call-table find-by srd [0-32] ▪ test-call-table find-by test-duration [0-100000] ▪ test-call-table find-by test-mode continuous ▪ test-call-table find-by test-mode once ▪ test-call-table find-by user-name [STRING] ▪ test-call-table new ▪ testcall-dtmf-string ▪ testcall-dtmf-string [STRING] ▪ testcall-id ▪ testcall-id [STRING] ▪ exit ▪ help ▪ history ▪ list ▪ pwd ▪ quit For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the incoming Test Call prefix to '180'.

```
(config-system)# test-call
(test-call)# testcall-id 180
```

18 NQM Commands

The commands below describe the various Network Quality Monitoring (NQM) commands.

18.1 NQM Configuration

In order to configure a valid NQM session, you have to configure a 'sender' termination on one device and a 'responder' termination on another device.

To configure a 'sender' termination, configure a line in the probing table (if not defined earlier) followed by defining a sender line in the sender table.

To configure a 'responder' termination, configure a valid line in the responder table.

Note: NQM commands are only applicable to Mediant 800 MSBR.

18.2 nqm sender-table

This command selects a row in the sender table to configure.

Syntax:

The syntax of this command is:

```
nqm sender-table [row index]
```

The command's syntax format is described below:

Arguments	Description
row index	Defines the Row index in the sender table. The range is [0-9].

Defaults:

NA

Command Modes:

Enable

Example:

This example selects row 0 to be configured.

```
(config-system)# nqm sender-table 0
```

18.2.1 sender-name

This command sets the current sender row's name.

Syntax:

The syntax of this command is:

```
sender-name [name string]
```

The command's syntax format is described below:

Arguments	Description
name string	Defines the name string up to 64 characters. This must be unique within the table.

Defaults:

Default string value is 'Unknown'.

Command Modes:

Enable

Example:

This example sets the sender name to be 'main_office_voip_checker_1'.

```
(config-system)# nqm sender-table 1
(sender-table-1) sender-name main_office_voip_checker_1
```

18.2.2 active

This command sets the state of this sender row.

Syntax:

The syntax of this command is:

```
active [0/1]
```

The command's syntax format is described below:

Arguments	Description
0/1	Defines the state of the sender row. Possible values are: • 0 – not active • 1 – active

Defaults:

1

Command Modes:

Enable

Example:

This example disables the sender line.

```
(config-system)# nqm sender-table 1
(sender-table-1)# active 0
```

18.2.3 target-ip-address

This command sets the destination ip address of the packets sent by this sender row.

Syntax:

The syntax of this command is:

```
target-ip-address [a.b.c.d]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines a valid IPv4 address.

Defaults:

0.0.0.0

Command Modes:

Enable

Example:

This example sets packets stream destination address to 88.3.2.1.

```
(config-system)# nqm sender-table 1
(sender-table-1)# target-ip-address 88.3.2.1
```

18.2.4 target-port

This command sets the destination port of the packets sent by this sender row.

Syntax:

The syntax of this command is:

```
target-port [port number]
```

The command's syntax format is described below:

Arguments	Description
port number	Defines the port number in the range of 3900 – 3990. The number must be a multiple of 10.

Defaults:

3900

Command Modes:

Enable

Example:

This example sets packets stream destination port to 3960.

```
(config-system)# nqm sender-table 1
(sender-table-1)# target-port 3960
```

18.2.5 packet-interval

This command sets the time interval between each packet transmission.

Syntax:

The syntax of this command is:

```
packet-interval [time interval]
```

The command's syntax format is described below:

Arguments	Description
time interval	Defines the time in msec that lapses between each packet transmission. Range is [5-1000].

Defaults:

20 msec

Command Modes:

Enable

Example:

This example sets the time interval between each packet transmission to 40 msec.

```
(config-system)# nqm sender-table 1
(sender-table-1)# packet-interval 40
```

18.2.6 payload-size

This command sets the IP payload size of the transmitted packets for this sender row.

Syntax:

The syntax of this command is:

```
set payload-size [size]
```

The command's syntax format is described below:

Arguments	Description
size	Defines the IP payload size in bytes. The range is [30-1420]. Note that this size does not include the IP header itself and any underlying layers.

Defaults:

180 (mimics g711 20msec packet)

Command Modes:

Enable

Example:

This example sets the packet payload to 512 bytes.

```
(config-system)# nqm sender-table 1
(sender-table-1)# payload-size 512
```

18.2.7 packet-tos

This command sets the 8-bit TOS (Type of Service) field in the IP header.

Syntax:

The syntax of this command is:

```
packet-tos [TOS value]
```

The command's syntax format is described below:

Arguments	Description
TOS value	Defines the TOS field in the IP header 8 bit value. The range is [0-255].

Defaults:

0

Command Modes:

Enable

Example:

This example sets the packet TOS to EF (Expedited Forwarding).

```
(config-system)# nqm sender-table 1
(sender-table-1)# packet-tos 184
```

18.2.8 packet-timeout

This command sets timeout for waiting on received packets at the sender side.

Syntax:

The syntax of this command is:

```
packet-timeout [timeout duration]
```

The command's syntax format is described below:

Arguments	Description
timeout duration	Defines the number of msec to wait for transmitted packets to return. The range is [0-32000].

Defaults:

10000

Command Modes:

Enable

Example:

This example sets the packet timeout to 1 second.

```
(config-system)# nqm sender-table 1
(sender-table-1)# packet-timeout 1000
```

18.2.9 rtt-threshold

This command sets the round trip time threshold for this sender. If the calculated value for some NQM sessions exceeds this threshold, an alarm is issued.

Syntax:

The syntax of this command is:

```
rtt-threshold [threshold value]
```

The command's syntax format is described below:

Arguments	Description
threshold value	Defines the threshold value in msec. The range is [0-32000], where 0 refers to no threshold is set.

Defaults:

0

Command Modes:

Enable

Example:

This example sets the RTT threshold to 1 second.

```
(config-system)# nqm sender-table 1
(sender-table-1)# rtt-threshold 1000
```

18.2.10 jitter-threshold

This command sets the jitter threshold for this sender. If the calculated value for some NQM sessions exceeds this threshold, an alarm is issued.

Syntax:

The syntax of this command is:

```
jitter-threshold [threshold value]
```

The command's syntax format is described below:

Arguments	Description
threshold value	Defines the threshold value in msec. The range is [0-32000] where 0 refers to 'no' threshold is set.

Defaults:

0

Command Modes:

Enable

Example:

This example sets the jitter threshold to 1 second.

```
(config-system)# nqm sender-table 1
(sender-table-1)# jitter-threshold 1000
```

18.2.11 pl-threshold

This command sets the packet loss rate threshold for this sender. If the calculated value for some NQM session exceeds this threshold, an alarm is issued.

Syntax:

The syntax of this command is:

```
set pl-threshold [threshold value]
```

The command's syntax format is described below:

Arguments	Description
threshold value	Defines the number of lost packets. The range is [0-32000] where 0 means no threshold is set.

Defaults:

0

Command Modes:

Enable

Example:

This example sets the packet loss threshold to 5 packets.

```
(config-system)# nqm sender-table 1
(sender-table-1)# pl-threshold 5
```

18.2.12 cq-mos-threshold

This command sets the conversation quality Mean Opinion Score (MOS) value threshold for this sender. If the calculated value for some NQM sessions is lower than this threshold, an alarm is issued.

Syntax:

The syntax of this command is:

```
cq-mos-threshold [threshold value]
```

The command's syntax format is described below:

Arguments	Description
threshold value	Defines the MOS value threshold multiplied by 10. The range is [0-50] where 0 refers to no threshold is set.

Defaults:

0

Command Modes:

Enable

Example:

This example sets conversation quality MOS value threshold to 42.

```
(config-system)# nqm sender-table 1
(sender-table-1)# cq-mos-threshold 42
```

18.2.13 lq-mos-threshold

This command sets the listener quality MOS value threshold for this sender. If the calculated value for some NQM sessions is lower than this threshold, an alarm is issued.

Syntax:

The syntax of this command is:

```
lq-mos-threshold [threshold value]
```

The command's syntax format is described below:

Arguments	Description
threshold value	Defines the MOS value threshold multiplied by 10. The range is [0-50] where 0 refers to no threshold is set.

Defaults:

0

Command Modes:

Enable

Example:

This example sets listener quality MOS value threshold to 38.

```
(config-system)# nqm sender-table 1
(sender-table-1)# lq-mos-threshold 38
```

18.2.14 probe-name

This command sets this sender row's reference to an entry in the probing table previously described. By setting this reference, the sender uses the attributes defined in that certain probing table entry.

Syntax:

The syntax of this command is:

```
set probe-name [probing table row name]
```

The command's syntax format is described below:

Arguments	Description
[probing table row name]	Defines the name of an existing entry (row) in the probing table.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the sender row to use the attributes of a probing row named 'voip_probe_1' (See the example above in the Probing Table configuration).

```
(config-system)# nqm sender-table 1
(sender-table-1)# probe-name voip_probe_1
```

18.2.15 source-interface-name

This command sets the network interface on which the sender sends and receives packets.

Syntax:

The syntax of this command is:

```
set source-interface-name {NQM_WAN|name from net interface table}
```

The command's syntax format is described below:

Arguments	Description
{NQM_WAN|name from net interface table}	Defines the following values: • **NQM_WAN** – Use this value when a WAN interface is chosen. • **name from net interface table** – When sending/receiving on a LAN interface, choose an existing interface name from the 'network interface table'.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets this sender row to use the WAN interface.

```
(config-system)# nqm sender-table 1
(sender-table-1)# source-interface-name NQM_WAN
```

18.3 nqm probing-table

This command chooses a row in the probing table to configure.

Syntax:

The syntax of this command is:

```
nqm probing-table [row index]
nqm probing-table display
nqm probing-table new
```

The command's syntax format is described below:

Arguments	Description
[row index]	Defines the row index in the probing table with the range of [0-9].

Defaults:

NA

Command Modes:

Enable

Example:

This example selects row 0 to be configured.

```
# configure system
(config-system)# nqm probing-table 0
```

18.3.1 probe-name

This command sets the current row's name to be referenced by the corresponding sender table rows (See Sender Table configuration below).

Syntax:

The syntax of this command is:

```
probe-name [name string]
```

The command's syntax format is described below:

Arguments	Description
[name string]	Defines the name string which can be up to 64 characters. It must be unique within the table.

Defaults:

Default string value is 'Unknown'.

Command Modes:

Enable

Example:

This example sets the probe-name to 'voip_probe_1'.

```
(config-system)# nqm probing-table 1
(probing-table-1)# probe-name voip_probe_1
```

18.4 nqm responder-table

This command selects a row to configure in the responder table.

Syntax:

The syntax of this command is:

```
nqm responder-table [row index]
```

The command's syntax format is described below:

Arguments	Description
[row index]	Defines the Row index in the responder table. The range is [0-9].

Defaults:

NA

Command Modes:

Enable

Example:

This example selects row 0 to be configured.

```
(config-system)# nqm responder-table 1
(responder-table-1)# nqm responder-table 0
```

18.4.1 responder-name

This command sets the current responder row's name.

Syntax:

The syntax of this command is:

```
responder-name [name string]
```

The command's syntax format is described below:

Arguments	Description
[name string]	Defines the name string up to 64 characters. It must be unique within the table.

Defaults:

The default string value is 'Unknown'.

Command Modes:

Enable

Example:

This example sets the responder name to be 'main_office_voip_responder_1'.

```
(config-system)# nqm responder-table 1
(responder-table-1)# responder-name main_office_voip_responder_1
```

18.4.2 source-interface-name

This command sets the network interface on which the responder will receive and send packets.

Syntax:

The syntax of this command is:

```
source-interface-name {NQM_WAN|name from net interface table}
```

The command's syntax format is described below:

Arguments	Description
{NQM_WAN|name from net interface table}	Defines the following values: • **NQM_WAN** – Use this when a WAN interface is chosen. • **name from net interface table** – When sending/receiving on a LAN interface, choose an existing interface name from the 'network interface table'.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets this responder row to use the WAN interface.

```
(config-system)# nqm responder-table 1
(responder-table-1)# source-interface-name NQM_WAN
```

18.4.3 active

This command sets the state of this responder row.

Syntax:

The syntax of this command is:

```
active [0/1]
```

The command's syntax format is described below:

Arguments	Description
[0/1]	Defines the values: • 0 – not active • 1 – active

Defaults:

1

Command Modes:

Enable

Example:

This example disables the responder line.

```
(config-system)# nqm responder-table 1
(responder-table-1)# active 0
```

18.4.4 local-port

This command sets the local port on which this responder will listen for incoming packets.

Syntax:

The syntax of this command is:

```
local-port [port number]
```

The command's syntax format is described below:

Arguments	Description
[port number]	Defines the port number in the range 3900 – 3990. The number must be a multiple of 10.

Defaults:

3900

Command Modes:

Enable

Example:

This example sets the local port to listen upon to 3960.

```
(config-system)# nqm responder-table 1
(responder-table-1)# local-port 3960
```

18.5 duration

This command sets the duration in which packets are sent to the responder during a single NQM sender session cycle.

Syntax:

The syntax of this command is:

```
duration [duration]
```

The command's syntax format is described below:

Arguments	Description
[duration]	Defines the number of seconds in the range [20-32000].

Defaults:

20 seconds

Command Modes:

Enable

Example:

This example sets the packet sending duration to 30 seconds.

```
(config-system)# nqm probing-table 1
(probing-table-1)duration 30
```

18.6 frequency

This command sets the periodic interval (in seconds) at which each sender NQM session occurs.

Syntax:

The syntax of this command is:

```
frequency [period]
```

The command's syntax format is described below:

Arguments	Description
[period]	Defines the duration in seconds of one NQM probe cycle in the range [25 – 32000].

Defaults:

60 seconds

Command Modes:

Enable

Example:

This example sets the frequency period to 1 hour (3600 seconds).

```
(config-system)# nqm probing-table 1
(probing-table-1) frequency 3600
```

18.7 life-span

This command sets the life span of the NQM sender session row that references this probe line.

Syntax:

The syntax of this command is:

```
life-span [duration]
```

The command's syntax format is described below:

Arguments	Description
[duration]	Defines the life span duration in seconds. '0' refers to an infinite life-span.

Defaults:

0

Command Modes:

Enable

Example:

This example sets an infinite life span.

```
(config-system)# nqm probing-table 1
(probing-table-1)# life-span 0
```

18.8 start-time

This command sets the start time for NQM sender session rows that refer to this probe line.

Syntax:

The syntax of this command is:

```
start-time {now|pending|yyyy:MM:dd:HH:mm:ss}
```

The command's syntax format is described below:

Arguments	Description
{now|pending|yyyy:MM:dd:HH:mm:ss}	Defines the following values: • now – Start immediately • pending – Don't start • yyyy:MM:dd:HH:mm:ss – Start at this defined time

Defaults:

Command Modes:

Enable

Example:

This example sets the start time of any referring sender table row immediately after it is activated.

```
(config-system)# nqm probing-table 1
(probing-table-1)start-time now
```

18.9 history-entries

This command sets the number of previous result entries to be saved locally in the device.

Syntax:

The syntax of this command is:

```
history-entries [number of entries]
```

The command's syntax format is described below:

Arguments	Description
[number of entries]	Defines the number of previous result entries to save in the range [1-1000].

Defaults:

100 entries

Command Modes:

Enable

Example:

This example sets the saved entry file to save the latest 500 result entries.

```
(config-system)# nqm probing-table 1
(probing-table-1)# history-entries 500
```

19 Feature and Product Keys Update Commands

The commands below describe the Feature and Product Keys Update commands.

19.1 feature-key

This command updates the feature-key.

Syntax:

This configuration set includes the following sub-commands:

```
feature-key <”string”>
```

Command	Description
“string”	Sets the feature key string. Note that the feature key string must be within quotes.

Command Modes:

Enable

Examples:

This example sets a feature-key.

```
(config-system)# feature-key
“r6wmr5to25smaB12d21aiSl94yMCf3lsfjBjagcch1kq9AZ9MJqqCOw44ywFcMlIb
iBaeNcsjh878ld1f2wKbY3IXJj1SOlcbiBfc6FBj1fROlJ9XvAw8k1IXdoFcOpeQJp
2e0sti1s0blNecypomhgU5yTlPREPQtl2e1wpiNgx7lRfeyXV?2s9@coFcOhdayWjW
hQuJeIgb5VbfyENc2w46O6OG3lf7NJnbkF5mxkka5xccyoVedYq1gMc”
```

19.2 product-key

This command provides support for a Product Key for the Mediant SE SBC and Mediant VE SBC product lines.

Syntax:

```
# product-key [product key string]
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of using this command.

```
(config-system)# product-key
Product Key: 123
```

20 Automatic Update Commands

The commands below describe the Automatic Update command. The Automatic Update feature allows you to download a configuration file or an image file from a server. If the file is different from the file currently on the MSBR, it will be applied using the same rules as the **copy** command. In other words, configuration of the "cli-script" is added to the current configuration, and the "startup-script" will then rewrite the configuration and the MSBR will reset twice.

To configure Automatic Update, use the following commands:

20.1 automatic-update

This command enables Automatic Update configuration.

Syntax:

```
# automatic-update
```

The <file> for the Automatic Update can be one of the following:

<file>	Description	Values
call-progress-tones	Defines a URL of a Call Progress Tone file.	[URL]
cas-table	Defines a URL of a Channel Associated Signaling (CAS) file.	[URL]
cli-script	Defines a URL to a CLI show-run script.	[URL]
coder-table	Defines a URL to Coder table file.	[URL]
data-configuration	Defines a Data configuration file.	[URL]
dial-plan	Defines a URL of Dial Plan file.	[URL]
firmware	Defines URL of CMP file.	[URL]
prerecorded-tones	Defines URL of Prerecorded Tone file.	[URL]
startup-script	Defines URL of Startup script file.	[URL]
tls-cert	Defines URL of TLS certificate file.	[URL]
tls-private-key	Defies URL of TLS private key file.	[URL]
tls-root-cert	Defines URL of TLS root CA file.	[URL]
user-info	Defines the user information file.	
voice-configuration	Defines the URL of the Voice configuration file.	[URL]
voice-prompts	Defines the URL of the Voice Prompts file.	[URL]
voice-xml	Defines the URL of the Voice XML file.	[URL]
web-logo	Defines the URL for downloading a logo file for the web interface.	[URL]

Defaults:

NA

Command Modes:

Enable

Note:

- This command is only applicable to MSBR devices.
- The URL can be either IPv4 or IPv6. If it is IPv6, then the address must configured within square brackets:
  - URL with host name (FQDN) for DNS resolution into an IPv6 address:
  - http://[FQDN]:<port>/<filename>
  - URL with IPv6 address:
  - http://[IPv6 address]:<port>/<filename>

Examples:

The following is an example of how this command can be used:

```
# configure system
(config-system)# automatic-update
(automatic-update)# cli-script "http://192.168.0.199/cliconf.
txt"
Note: Changes to this parameter will take effect when applying the
'activate' or 'exit' command
(automatic-update)# activate
```

20.2 auto-firmware

This command provides a link to a software image (cmp file) to be downloaded from a remote server, based on a time stamp.

Syntax:

```
# auto-firmware <URL>
```

Command	Description
URL	Defines a link to a software image (cmp file) to be downloaded from a remote server, based on a timestamp.

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of using this command.

```
# configure system
(config-system)# automatic-update
(automatic-update)# auto-firmware "http://195.16.0.190/cliconf.
txt"
Note: Changes to this parameter will take effect when applying the
'activate' or 'exit' command
(automatic-update)# activate
```

20.3 crc-check

This command enables a Cyclic Redundancy Check (CRC) for Configuration files.

Syntax:

```
# crc-check {off|regular|voice-conf-ordered}
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of using this command.

```
# configure system
(config-system)# automatic-update
(automatic-update)# crc-check regular
```

20.4 http-user-agent

This command defines the User-Agent HTTP header in the Auto-Update HTTP Get requests.

Syntax:

```
# http-user-agent <string>
```

Command	Description
string	Defines the User-Agent HTTP header in the Auto-Update HTTP requests.

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of using this command.

```
# configure system
(config-system)# automatic-update
(automatic-update)# http-user-agent UM_header.ABCD
```

20.5 predefined-time

This command schedules the automatic update time.

Syntax:

```
# predefined-time <HH:MM>
```

Command	Description
HH:MM	Schedules an automatic update to a predefined time of the day

Defaults:

NA

Command Modes:

Enable

Examples:

This example schedules an automatic update at 12:00 pm.

```
# configure system
(config-system)# automatic-update
(automatic-update)# predefined-time 12:00
```

20.6 pwd

This command displays the current configuration mode path.

Syntax:

```
# pwd
```

Defaults:

NA

Command Modes:

Enable

Examples:

This example displays the current configuration mode path.

```
# configure system
(config-system)# automatic-update
(automatic-update)# pwd
/config-system/automatic-update
```

20.7 run

This command explicitly triggers the automatic update. This does not replace the activate command.

Syntax:

```
# run
```

Defaults:

NA

Command Modes:

Enable

Examples:

This example explicitly triggers the automatic update. .

```
# configure system
(config-system)# automatic-update
(automatic-update)# run
```

20.8 run-on-reboot

This command determines whether the Automatic Update runs as part of the system initialization process.

Syntax:

```
# run-on-reboot {on|off}
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example disables the Automatic Update feature from being activated upon a device reset.

```
# configure system
#(config-system)# automatic-update
#(automatic-update) run-on-reboot off
```

20.9 source

This command specifies the source interface to receive files from.

Syntax:

```
# source voip
# source data interface <ifname> <slot/port.vlanId>
# source data source-address interface <ifname> <slot/port.vlanId>
# source data vrf <VRF name>
```

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Arguments	Description
VRF name	Defines the VRF name.

Defaults:

data

Command Modes:

Enable

Examples:

The following example specifies "voip" as the source interface to receive files from.

```
# configure system
#(config-system)# automatic-update
#(automatic-update) source voip
```

20.10 tftp-block-size

This command defines the TFTP block size via voip source, according to RFC 2348.

Syntax:

```
# tftp-block-size <block size>
```

Arguments	Description
block size	Sets the TFTP block size (512-8192).

Defaults:

Command Modes:

Enable

Examples:

The following example sets the TFTP block size to 512.

```
# configure system
#(config-system)# automatic-update
#(automatic-update) tftp-block-size 512
```

20.11 update-firmware

This command enables auto-update for firmware.

Syntax:

```
# update-firmware {on|off}
```

Arguments	Description
on	Enables auto-update for firmware.
off	Disables auto-update for firmware.

Defaults:

Command Modes:

Enable

Examples:

The following example enables auto-update for firmware.

```
# configure system
#(config-system)# automatic-update
#(automatic-update) update-firmware on
```

20.12 update-frequency

This command sets the automatic update interval in minutes.

Syntax:

```
# update-frequency <minutes>
```

Arguments	Description
minutes	Sets the number of minutes the gateway waits between automatic updates (0-65535).

Defaults:

Command Modes:

Enable

Examples:

The following example sets the automatic update interval to 100 minutes.

```
# configure system
(config-system)# automatic-update
(automatic-update)# update-frequency 100
```

20.13 use-zero-conf-certs

This command determines whether auto-update will use the ZeroConf TLS context when connecting to the HTTPS URL.

Syntax:

```
# use-zero-conf-certs {on|off}
```

Arguments	Description
on	Auto-update uses the ZeroConf TLS context when connecting to the HTTPS URL.
off	Auto-update will not use the ZeroConf TLS context when connecting to the HTTPS URL.

Defaults:

Command Modes:

Enable

Examples:

The following example sets Auto-update to use the ZeroConf TLS context when connecting to the HTTPS URL.

```
# configure system
(config-system)# automatic-update
(automatic-update)# use-zero-conf-certs on
```

20.14 verify-certificate

This command verifies the server certificate via HTTPS.

Syntax:

```
# verify-certificate {on|off}
```

Arguments	Description
on	Enables verification of the server certificate via HTTPS.
off	Disables verification of the server certificate via HTTPS.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables verification of the server certificate via HTTPS.

```
# configure system
#(config-system)# automatic-update
#(automatic-update) verify-certificate on
```

20.15 verify-ssl-subject-name

This command configures the AutoUpdate facility to verify the SSL Subject Name in the server's certificate when using HTTPS.

Syntax:

```
# verify-ssl-subject-name {on|off}
```

Arguments	Description
on	Enables the AutoUpdate facility to verify the SSL Subject Name in the server's certificate when using HTTPS.
off	Disables the AutoUpdate facility to verify the SSL Subject Name in the server's certificate when using HTTPS.

Defaults:

Command Modes:

Enable

Examples:

The following example enables the AutoUpdate facility to verify the SSL Subject Name in the server's certificate when using HTTPS.

```
# configure system
(config-system)# automatic-update
(automatic-update)# verify-ssl-subject-name on
```

20.16 zero-conf

This command enables automatic, remote configuration of newly deployed, non-configured devices, using AudioCodes HTTPS Redirect Server.

Syntax:

```
zero-conf {on|off}
```

Arguments	Description
on	Enables the Zero Configuration feature.
off	Disables the Zero Configuration feature.

Defaults:

Command Modes:

Enable

Examples:

The following example enables the Zero Configuration feature.

```
# configure system
(config-system)# automatic-update
(automatic-update)# zero-conf on
```

20.17 zero-conf-server

This command defines a link to a Zero-Configuration redirect server.

Syntax:

```
zero-conf-server <URL>
```

Command	Description
URL	Defines a link to a Zero-Configuration redirect server.

Defaults:

Command Modes:

Enable

Examples:

The following example provides a link to a Zero-Configuration redirect server.

```
(config-system)# automatic-update
(automatic-update)# zero-conf-server https://syssw-
wiki.corp.audio.com/redirect
```

21 Power over Ethernet Commands

The following commands configure Power over Ethernet (PoE).

Note: PoE commands are only applicable to Mediant 800 MSBR.

21.1 interface poe-table

This command sets the Power over Ethernet table.

Syntax:

```
interface poe-table <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ port-enable ▪ port-max-power ▪ port-at-enable For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables Power over Ethernet AT Class 4.

```
(config-system)# interface poe-table 0
(poe-table-0)# port-at-enable 1
```

This page is intentionally left blank.

Part III

VoIP Commands

22 Introduction

This part describes the commands located under the **configure voip** mode. To access these commands, enter "**`configure voip`**" at the Enabled mode prompt.

Note: For a detailed description of the parameters described in this part, refer to the device's *User's Manual*.

This page is intentionally left blank.

23 Network Commands

The following describes Network commands.

23.1 Ethernet Group Table Commands

The commands below describe the Ethernet Group Table.

23.1.1 ether-group

This command creates an Ethernet Group table.

Syntax:

The syntax of this command includes the following variations:

```
ether-group <index>
ether-group display
ether-group find-by <member1> <member2> mode
ether-group new
```

The command syntax format is described below:

Arguments	Description
<index>	Defines the Interface index between 0 and 5.
find-by	Finds row by column name and value.
display	Displays all network interfaces configuration.
new	Adds a new line in first available index.

Command Modes:

Enable

Examples:

The following example creates a new line in the Ethernet Group table.

```
(config-voip)# ether-group new
(ether-group-0)#
```

23.1.2 mode

This command defines the group mode of operation.

Syntax:

The syntax of this command includes the following variations:

```
mode {1rx-1tx|2rx-1tx|2rx-2rx}
```

Command Modes:

Enable

Examples:

The following example creates a group mode.

```
(config-voip)# ether-group new
(ether-group-0)# mode 1rx-1tx
```

23.2 IP Interface Table Commands

The following describes the IP Interface Table commands.

23.2.1 interface network-if

This command displays and configures the network interface table settings.

Syntax:

The syntax of this command includes the following variations:

```
interface network-if display
interface network-if <index>
```

The command syntax format is described below:

Arguments	Description
display	Displays all network interfaces configuration.
<index>	Defines the interface index between 0 and 15.

Configuration Parameters

Parameter Name	Configuration Parameter Name	Options
application-type	InterfaceTable_ApplicationTypes	control maintenance media media-control oamp oamp-control oamp-media oamp-media-control
gateway	InterfaceTable_Gateway	
ip-address	InterfaceTable_IPAddress	
mode	InterfaceTable_InterfaceMode	ipv4-manual ipv6-manual ipv6-manual-prefix
name	InterfaceTable_InterfaceName	
prefix-length	InterfaceTable_PrefixLength	
primary-dns	InterfaceTable_PrimaryDNSServerIPAddress	
secondary-dns	InterfaceTable_SecondaryDNSServerIPAddress	
underlying-dev	InterfaceTable_UnderlyingDevice	0 - disable

Parameter Name	Configuration Parameter Name	Options
		1 - enable
vlan-id	InterfaceTable_VlanID	

Command Modes:

Enable

Examples:

The following example displays all interfaces configuration

```
(config-voip)# interface network-if display
---- network-if-0 ----
  application-type (oamp-media-control)
  mode (ipv4-manual)
  ip-address (10.4.60.62)
  prefix-length (16)
  gateway (10.4.0.1)
  vlan-id (1)
  name (O+M+C)
  primary-dns (0.0.0.0)
  secondary-dns (0.0.0.0)
  underlying-if ()
```

The following example configures interface 3 with an IP address 10.5.0.1

```
(config-voip)# interface network-if 3
(network-if-3)# ip-address 10.5.0.3
```

23.2.2 interface vlan

This command selects a data-like configuration syntax for VoIP interface configuration.

Syntax:

The syntax of this command includes the following variations:

```
interface vlan <vlan id>
```

The command syntax format is described below:

Arguments	Description
vlan id	Defines a valid VLAN interface ID in the range of 1 and 255.

Command Modes:

Enable

Examples:

The following example selects VLAN 1 as the interface to configure.

```
(config-voip)# interface vlan 1
```

23.2.3 application-type

This command defines the application type on the specified Layer 3 interface.

Syntax:

```
application-type <type>
```

The command's syntax format is described below:

Arguments	Description
type	Defines the application type - Control, Media or OAMP

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the control application type for interface VLAN 3.

```
(config-voip)# interface vlan 3
(conf-if-vlan 3)# application-type control
```

23.2.4 ip-address

This command defines the primary IP address on the specified Layer 3 interface.

Syntax:

```
ip-address <ip address> <subnet mask>
```

The command's syntax format is described below:

Arguments	Description
ip address	Defines a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).
subnet mask	Defines the subnet mask that corresponds to a range of IP addresses. Subnet masks should be expressed in dotted decimal notation (e.g., 255.255.255.0).

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the IP address of 10.4.2.3 255.255.0.0 for interface VLAN 3.

```
(config-voip)# interface vlan 3
(conf-if-vlan 3)# ip-address 10.5.0.1 255.255.0.0
```

23.2.5 ip gateway

This command defines the gateway IP address on the specified Layer 3 interface.

Syntax:

```
ip gateway <ip address>
```

The command's syntax format is described below:

Arguments	Description
ip address	Defines a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the gateway IP address 10.4.0.1 for interface VLAN 3.

```
(config-voip)# interface vlan 3
(conf-if-vlan 3)# ip gateway 10.4.0.1
```

23.2.6 ip name-server

This command defines the DNS relay (remote) server's address on the interface.

Syntax:

```
ip name-server <first ip address> [second ip address]
```

The command's syntax format is described below:

Arguments	Description
first ip address	Defines the primary DNS server address. Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (e.g., 10.1.2.3).
second ip address	Defines the secondary DNS server address. This field is not required when specifying a single IP address. Defines a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (e.g., 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines DNS relay servers 10.4.1.1 and 10.4.1.2 on interface VLAN 1.

```
(config-voip)# interface vlan 3
(conf-if-vlan 3)# ip name-server 10.4.1.1 10.4.1.2
```

23.2.7 desc

This command sets the description on the specified interface.

Syntax:

```
desc <string>
```

The command's syntax format is described below:

Arguments	Description
string	Defines the interface description\name using an alphanumerical string (up to 16 characters).

Defaults:

NA

Note:

- Use inverted commas when using the space character as part of the description.
- The string is limited to 16 characters.

Command Modes:

Enable

Examples:

The following example sets the description on VLAN 3.

```
(config-voip)# interface vlan 3
(conf-if-vlan 3)# desc Media3
```

23.3 Ethernet Device Table Commands

The following describes the Ethernet Device Table commands.

23.3.1 interface network-dev

This command displays and configures the network device table settings.

Syntax:

The syntax of this command includes the following variations:

```
interface network-dev display
interface network-dev <index>
```

The command syntax format is described below:

Arguments	Description
display	Displays all network interfaces configuration.
index	Defines the interface index between 0 and 15.

Configuration Parameters

Parameter Name	Configuration Parameter Name	Options
name		
vlan-id		

Command Modes:

Enable

Example:

The following example displays network device table settings.

```
(config-voip)# interface network-dev display
  vlan-id (1)
  name (vlan 1)
```

23.4 Static Routing Commands

The following describes the Static Routing commands.

23.4.1 routing static

This command displays and configures the static routing table.

Syntax:

The syntax of this command includes the following variations:

```
routing static display
routing static <index>
description
destination
gateway
interface-name
prefix-length
```

The command syntax format is described below:

Arguments	Description
display	Displays all static routes configuration.
<index>	Defines the Static index between 1 and 15.

Parameter Name	Configuration Parameter Name
description	StaticRouteTable_Description
gateway	StaticRouteTable_Gateway
destination	StaticRouteTable_Destination
interface-name	StaticRouteTable_InterfaceName
prefix-length	StaticRouteTable_PrefixLength

Command Modes:

Enable

Examples:

The following example displays all static routes configuration.

```
(config-voip)# routing static display
---- static-0 ----
  interface-name (O+M+C)
  destination (10.21.0.0)
  prefix-length (16)
  gateway (10.4.0.1)
  description (desc1)
```

The following example configures a static route for subnet 1.1.0.0/16 default gateway 10.4.0.1 for an interface named MEDIA

```
(config-voip)# routing static 3
(static-3)# interface-name MEDIA
(static-3)# destination 1.1.0.0
(static-3)# prefix-length 16
(static-3)# gateway 10.4.0.1
(static-3)# interface-name MEDIA
```

23.5 Quality of Service (QoS) Commands

The following describes the Quality of Service commands.

23.5.1 qos vlan-mapping

This command displays and configures QoS vlan mapping.

Syntax:

The syntax of this command includes the following variations:

```
qos vlan-mapping display
qos vlan-mapping <index>
diff-serv
vlan-priority

qos application-mapping
bronze-qos
control-qos
gold-qos
media-qos
```

The command syntax format is described below:

Arguments	Description
display	Displays all static routes configuration.
<index>	Defines the Static index between 1 and 15.

Parameter Name	Configuration Parameter Name
diff-serv	DiffServToVlanPriority_DiffServ
vlan-priority	DiffServToVlanPriority_VlanPriority
bronze-qos	vlanBronzeServiceClassDiffServ
control-qos	vlanPremiumServiceClassControlDiffServ
gold-qos	vlanGoldServiceClassDiffServ
media-qos	vlanPremiumServiceClassMediaDiffServ

For a description of these parameters, refer to the *User's Manual*.

Examples:

The following example displays all qos vlan mapping configuration.

```
(config-voip)# qos vlan-mapping display
```

The following example sets the DiffServ value for the Bronze service class content (OAM&P).

```
(config-voip)# qos application-mapping
(app-map)# bronze-qos 46
```

The following example maps DiffServ value of 46 to vlan priority 5

```
(config-voip)# qos vlan-mapping 3
(vlan-mapping-3)# diff-serv 46
(vlan-mapping-3)# vlan-priority 5
```

23.5.2 qos application mapping

This command sets the differentiated services application mapping.

Syntax:

The syntax of this command includes the following variations:

```
qos application-mapping
<parameter>     <value>
```

The command syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ bronze-qos ▪ control-qos ▪ defaults ▪ gold-qos ▪ media-qos For a description of these parameters, refer to the *User's Manual*.

Examples:

The following example sets the DiffServ value for the Bronze service class content (OAM&P).

```
(config-voip)# qos application-mapping
(app-map)# bronze-qos 46
```

23.6 Domain Name Server (DNS) Commands

The following describes the DNS commands.

23.6.1 voip-network dns-to-ip

This command defines the voip-network dns-to-ip table.

Syntax:

```
voip-network dns dns-to-ip <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ domain-name ▪ first-ip-address ▪ second-ip-address ▪ third-ip-address ▪ fourth-ip-address For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the first IP address.

```
(config-voip)# voip-network dns dns-to-ip 1
(dns-to-ip-1)# first-ip-address 10.12.3.105
```

23.6.2 voip-network srv2ip

This command defines the voip-network srv2ip table.

Syntax:

```
voip-network dns srv2ip <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dns-name-1 ▪ dns-name-2 ▪ dns-name-3 ▪ domain-name ▪ port-1 ▪ port-2 ▪ port-3 ▪ priority-1 ▪ priority-2 ▪ priority-3 ▪ transport-type ▪ weight-1 ▪ weight-2 ▪ weight-3 For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the First IP address.

```
(config-voip)# voip-network dns srv2ip 5
(srv2ip-5)# port-1 10
```

24 Time Division Multiplexing (TDM) Commands

The following describes the TDM commands

24.1 tdm

The following defines how to enter TDM commands.

Syntax:

```
tdm
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ bus-type ▪ clock-source ▪ defaults ▪ idle-abcd-pattern . ▪ idle-pcm-pattern ▪ pcm-law-select ▪ pstn-bus-auto-clock ▪ pstn-bus-auto-clock-reverting ▪ tdm-bus-local-reference For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example selects the type of PCM companding law in the input/output TDM bus.

```
(config-voip)# tdm
(tdm)# set pcm-law-select alaw
```

24.2 configure voip tdm

This command enables the tdm set of commands

Syntax:

The syntax of this command includes the following variations:

```
configure voip tdm
```

Command Modes:

Enable

Examples:

The following example enables the tdm set of commands.

```
# configure voip tdm
```

25 Security Commands

The following describes the Security commands

25.1 Firewall Commands

The following describes the Firewall commands

25.1.1 access-list

This command displays and configures the Network access list table - Internal Firewall.

Syntax:

The syntax of this command includes the following variations:

```
access-list <index>
<parameter>     <value>
```

The command syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ allow-type ▪ byte-burst ▪ byte-rate ▪ defaults ▪ end-port ▪ network-interface-name ▪ packet-size ▪ prefixLen ▪ protocol ▪ source-ip ▪ src-port ▪ start-port ▪ use-specific-interface For a description of these parameters, refer to the *User's Manual*.

Command Modes:

Enable

Examples:

The following example sets the byte rate to 10 bytes per second.

```
(config-voip)# access-list 1
(access-list-1)# byte-rate 10
```

This page is intentionally left blank.

26 PSTN Commands

The following describes the PSTN commands

26.1 interface

This command enters a specific PSTN interface (e1-t1 or bri) configuration.

Syntax:

The syntax of this command includes the following variations:

```
interface e1-t1 <slot/port>
interface bri <slot/port>
set <parameter> <value>
```

Arguments	Description
slot	Defines the module slot index as shown on the front panel.
port	Defines the port index within the selected module.

Parameter Name	Configuration Parameter Name	Enum Names in CLI
protocol	PSTNTrunkProtocolType	
framing	PSTNFramingMethod	EXTENDED_SUPER_FRAME/0 SUPER_FRAME/1 E1_FRAMING_DDF/a E1_FRAMING_MFF_CRC4/b E1_FRAMING_MFF_CRC4_EXT/c T1_FRAMING_F4/A T1_FRAMING_F12/B T1_FRAMING_ESF/C T1_FRAMING_ESF_CRC6/D T1_FRAMING_F72/E T1_FRAMING_ESF_CRC6_JT/F
line-code	PSTNLineCode	B8ZS/0 AMI/1 HDB3/2
clock-master	PSTNClockMaster	CLOCK_MASTER_OFF/0 CLOCK_MASTER_ON/1
clock-priority	AutoClockTrunkPriority	
cas-channel-index	CasChannelIndex	

Parameter Name	Configuration Parameter Name	Enum Names in CLI
cas-delimiters-types	CASDelimitersPaddingUsage	
cas-dial-plan-name	CasTrunkDialPlanName	
cas-table-index	PSTNCASTableIndex	
isdn-termination-side	ISDNTerminationSide	USER_TERMINATION_SIDE/0 NETWORK_TERMINATION_SIDE/1
isdn-bits-cc-behavior	PSTNISDNGeneralCCBehavior	
isdn-bits-incoming-calls-behavior	PSTNISDNInCallsBehavior	
isdn-bits-outgoing-calls-behavior	PSTNISDNOutCallsBehavior	
isdn-bits-ns-behavior	PSTNISDNI_behavior	
isdn-bits-ns-extension-behavior	ISDNNSBehaviour2	
isdn-nfas-dchannel-type	PSTNDChConfig	DCH_CONFIG_PRIMARY/0 DCH_CONFIG_BACKUP/1 DCH_CONFIG_NFAS/2
isdn-nfas-group-number	PSTNTrunkConfigNfasGroupNumber	
isdn-nfas-interface-id	PSTNISDNNfasInterfaceId	
isdn-layer2-mode	BriLayer2Mode	BRI_L2_MODE_P2P/0 BRI_L2_MODE_P2MP/1
line-build-out-loss	PSTNLineBuildOutLOSS	0DB/0 -7.5DB/1 -15DB/2 -22.5DB/3
line-build-out-overwrite	PSTNLineBuildOutOVERWRITE	NO_OVER_WRITE/0 OVER_WRITE/1
line-build-out-xpm0	PSTNLineBuildOutXPM0	
line-build-out-xpm1	PSTNLineBuildOutXPM1	
line-build-out-xpm2	PSTNLineBuildOutXPM2	

Command Modes:

Enable

Note:

In order to change a PSTN interface configuration, do the following:

- Enter the interface configuration (e.g. interface e1-t1 0/0)
- Set the configuration parameters (e.g. set protocol 1)
- Activate the configuration. This can be done in two ways:
  - Using the activate command
  - Exit the interface configuration

Examples:

The following example enters a specific PSTN interface e1-t1 and bri.

```
# configure voip
(config-voip)# interface e1-t1 0/0
(config-voip)# interface bri 1/2
```

This page is intentionally left blank.

27 Media Commands

The following describes the Media commands.

27.1 Voice Commands

The following defines how to configure Voice settings.

27.1.1 media voice-processing

This command enables the media voice-processing parameters.

Syntax:

```
media voice-processing <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ AGC-disable-fast-adaptation ▪ AGC-enable ▪ AGC-gain-slope ▪ AGC-max-gain ▪ AGC-min-gain ▪ AGC-redirection ▪ AGC-target-energy ▪ defaults ▪ echo-canceller-NLP-mode ▪ echo-canceller-aggressive-NLP ▪ echo-canceller-enable ▪ echo-canceller-freeze ▪ echo-canceller-hybrid-loss ▪ high-pass-filter-enable ▪ idle-pcm-pattern ▪ input-gain ▪ jitter-buffer-minimum-delay ▪ jitter-buffer-optimization-factor ▪ max-echo-canceller-length ▪ silence-compression-mode ▪ voice-volume For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example activates the AGC (Automatic Gain Control).

```
(config-voip)# media voice-processing 1
(media-voice-processing)# AGC-enable on
```

27.1.2 media voice-processing codecs

This command enables the media voice-processing codecs parameters.

Syntax:

```
media voice-processing codecs <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameter: ▪ G726-voice-payload-format For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the G.726 voice payload format to "regular".

```
(config-voip)# media voice-processing codecs
(media-voice-processing-codecs)# G726-voice-payload-format regular
```

27.2 Fax/Modem/Caller ID Commands

The following defines how to configure Fax/Modem.

27.2.1 media fax-modem

This command configures media fax-modem parameters.

Syntax:

```
# media fax-modem
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ CNG-detector-mode ▪ TTY-transport-type ▪ V21-modem-transport-type ▪ V22-modem-transport-type ▪ V23-modem-transport-type ▪ V32-modem-transport-type ▪ V34-fax-transport-type ▪ V34-modem-transport-type ▪ bell-modem-transport-type ▪ defaults ▪ enable-fax-modem-inband-network-detection ▪ fax-cng-mode ▪ fax-modem-telephony-events-mode ▪ fax-transport-mode ▪ fax-vbd-behvr For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example determines the fax CNG tone detector mode.

```
(config-voip)# media fax-modem
(media-fax-modem-T38)# CNG-detector-mode T38-relay
```

27.2.2 media fax-modem t38

This command configures media fax-modem t38 parameters.

Syntax:

```
# media fax-modem t38
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ ECM-mode ▪ defaults ▪ enhanced-redundancy-depth ▪ max-rate ▪ redundancy-depth ▪ version ▪ volume For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables ECM (Error Correction Mode) during T.38 Fax Relay

```
(config-voip)# media fax-modem t38
(media-fax-modem)# ECM-mode on
```

27.2.3 media fax-modem V1501

This command configures the V1501 configuration.

Syntax:

```
# media fax-modem V1501
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ SPRT-transport-channel0-max-payload-size ▪ SPRT-transport-channel2-max-payload-size ▪ SPRT-transport-channel2-max-window-size ▪ SPRT-transport-channel3-max-payload-size ▪ SSE-redundancy-depth ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the V.150.1 SPRT transport Channel 0 maximum payload size to 140.

```
(config-voip)# media fax-modem V1501
(media-fax-modem-V1501)# SPRT-transport-channel0-max-payload-size 140
```

27.2.4 media fax-modem bypass

This command configures the bypass configuration.

Syntax:

```
# media fax-modem bypass
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ NSE-mode ▪ basic-packet-interval ▪ coder ▪ defaults ▪ fax-bypass-output-gain ▪ jitter-buffer-minimum-delay ▪ modem-bypass-output-gain ▪ packing-factor For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Fax/Modem bypass coder.

```
(config-voip)# media fax-modem bypass
(media-fax-modem-bypass)# coder G711-alaw
```

27.3 RTP/RTCP Commands

The following defines how to configure RTP/RTCP settings.

27.3.1 media RTP-RTCP

This command configures the RTP/RTCP configuration.

Syntax:

```
media RTP-RTCP
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ CAS-transport-type ▪ RTP-redundancy-depth ▪ broken-connection-event-activation-mode ▪ broken-connection-event-timeout ▪ connection-establishment-notification-mode ▪ defaults ▪ disable-NAT-traversal ▪ disable-RTCP-randomization ▪ no-operation-enable ▪ no-operation-interval ▪ number-of-SID-coefficients For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the ABCD signaling transport type over IP.

```
(config-voip)# media RTP-RTCP
(media-RTP-RTCP)# CAS-transport-type events-only
```

27.3.2 media RTP-payload-types

This command sets the RTP default payload types.

Syntax:

```
media RTP-payload-types
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ NSE-payload-type ▪ RTP-redundancy-payload-type ▪ defaults ▪ fax-bypass-payload-type ▪ modem-bypass-payload-type ▪ no-operation-payload-type ▪ telephony-events-payload-type-rx ▪ telephony-events-payload-type-tx For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the transmitted No Operation packets RTP Payload type.

```
(config-voip)# media RTP-payload-types
(media-RTP-payload-types)# no-operation-payload-type 96
```

27.4 IP Media Commands

The following describes the DNS commands

27.4.1 ip-media ip-media-settings

This command defines IP Media / IP-Media-Settings mode.

Syntax:

```
ip-media ip-media-settings <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ anncmnt-id ▪ beep-on-conf ▪ com-noise-gen-nego ▪ conf-dtmf-clamping ▪ conf-dtmf-reporting ▪ conf-id ▪ defaults ▪ enable-vxml ▪ monitor-id ▪ mscml-id ▪ netann-annc-id ▪ play-from-id ▪ record-to-id ▪ transcoding-id ▪ tone-id For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines IP Media / IP-Media-Settings mode.

```
(config-voip)# ip-media ip-media-settings
(sip-ip-media-setting)# beep-on-conf on
```

27.4.2 media IPM-detectors

This command configures the IP Media detectors configuration.

Syntax:

```
media IPM-detectors
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ IPM-detectors-enable ▪ answer-detector-activity-delay ▪ answer-detector-enable ▪ answer-detector-redirection ▪ answer-detector-sensitivity ▪ answer-detector-silence-time ▪ defaults ▪ energy-detector-enable ▪ energy-detector-redirection ▪ energy-detector-sensitivity ▪ energy-detector-threshold For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the DSP IP Media Detectors.

```
(config-voip)# media IPM-detectors
(media-IPM-detectors)# IPM-detectors-enable enable
```

27.5 Media Realm Commands

The following defines how to configure Media Realm settings.

27.5.1 media realm

This command sets the Media Realm parameters.

Syntax:

```
media realm <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ ipv4if ▪ ipv6if ▪ is-default ▪ media-realm-transrate-ratio ▪ name ▪ port-range-end ▪ port-range-start ▪ session-leg For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the number of media sessions associated with the range of ports.

```
(config-voip)# media realm 1
(realm-1)# set session-leg 10
```

27.6 General Media Commands

The following describes the General Media commands.

27.6.1 media general

This command sets general media capabilities.

Syntax:

```
media general
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ DSP-version-template-number ▪ defaults ▪ media-channels For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the DSP IP Media Detectors.

```
(config-voip)# media general
(media-IPM-detectors)# IPM-detectors-enable enable
```

.

27.7 Media Security Commands

The following describes the Media Security commands

27.7.1 media security

This command sets the Media Security parameters.

Syntax:

```
media security <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ aria-protocol-support ▪ rtcp-encryption-disable-tx ▪ rtp-authentication-disable-tx ▪ rtp-encryption-disable-tx ▪ srtp-tx-packet-mki-size ▪ defaults ▪ inbound-media-latch-mode ▪ media-sec-bhvior ▪ media-security-enable ▪ offer-srtp-cipher ▪ symmetric-mki For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the Media Security protocol (SRTP).

```
(config-voip)# media security
(media-security)# media-security-enable on
```

28 QoE Commands

The following defines how to configure Quality of Experience (QoE) settings.

28.1 media qoe

This command sets (QoE) media parameters.

Syntax:

```
media qoe
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ defaults ▪ voice-quality-monitoring-enable For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the **voice-quality-monitoring-enable** parameter.

```
(config-voip)# media qoe
(media-QoE)# voice-quality-monitoring-enable full
```

28.2 media bw-management

This command defines bandwidth utilization threshold profiles.

Syntax:

```
media bw-management {index|realm index|display}
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
realm index	Defines the realm index.
display	Displays the configuration.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example displays bandwidth utilization threshold profiles.

```
(config-voip)# media bw-management display
```

28.3 media qoe-rules

This command defines the threshold of QoE parameters.

Syntax:

```
media qoe-rules {index|realm index|display}
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
realm index	Defines the realm index.
display	Displays the configuration.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example displays the configuration.

```
(config-voip)# media qoe-rules display
```

28.4 qoe media-enhancement

This command defines a Media Enhancement profile, which assigns a specific action if a color-coded threshold is crossed (green to yellow, and yellow to red).

Syntax:

```
qoe media-enhancement {index|display|new}
```

The command's syntax format is described below:

Arguments	Description
index	Defines the index. The range is 0-100.
display	Displays the configuration.
new	Adds a new line in the first available index.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines a Media Enhancement profile.

```
(config-voip)# qoe media-enhancement display
```

28.5 qoe media-enhancement-rules

This command defines action rules for the Media Enhancement profile.

Syntax:

```
qoe media-enhancement-rules {index|media-enhancement
index|display}
```

The command's syntax format is described below:

Arguments	Description
index	Defines the index. The range is [0-100] / [0-101]
media-enhancement index	Defines the media-enhancement configuration. The range is [0-100].
display	Displays the configuration.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines action rules for the Media Enhancement profile.

```
(config-voip)# qoe media-enhancement-rules 1/10
```

This page is intentionally left blank.

29 Applications Enabling Commands

The commands below enable the following applications:

- Cloud Resilience Package (CRP)
- IP to IP Gateway (IP2IP)
- Stand-Alone Survivability (SAS)
- Session Border Control (SBC)

29.1 appli-enabling

The following command enables SBC/SAS/IP2IP.

Syntax:

```
appli-enabling
```

Command Modes:

Enable

Examples:

The following example enables SBC/SAS/IP2IP.

```
(config-voip)# appli-enabling
```

29.2 enable-crp

The following command enables the CRP application.

Syntax:

```
enable-crp {on|off}
```

The command's syntax format is described below:

Arguments	Description
on	Enables the CRP application.
off	Disables the CRP application.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the CRP application.

```
(config-voip)# appli-enabling
(sip-application-enabling)# enable-crp on
```

29.3 enable-sas

The following command enables the SAS application.

Syntax:

```
enable-sas {on|off}
```

The command's syntax format is described below:

Arguments	Description
on	Enables the SAS application.
off	Disables the SAS application.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the SAS application.

```
(config-voip)# appli-enabling
(sip-application-enabling)# enable-sas on
```

29.4 enable-sbc

The following command enables the SBC application.

Syntax:

```
enable-sbc {on|off}
```

The command's syntax format is described below:

Arguments	Description
on	Enables the SBC application.
off	Disables the SBC application.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the SBC application.

```
(config-voip)# appli-enabling
(sip-application-enabling)# enable-sbc on
```

29.5 enable-ip2ip

The following command enables the IP-to-IP (gateway) application.

Syntax:

```
enable-ip2ip {on|off}
```

The command's syntax format is described below:

Arguments	Description
on	Enables the IP-to-IP application.
off	Disables the IP-to-IP application.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the ip2ip (gateway) application.

```
(config-voip)# appli-enabling
(sip-application-enabling)# enable-sbc on
```

This page is intentionally left blank.

30 VoIP Network Commands

These commands define the SIP VoIP network.

30.1 voip-network realm

This command sets the SIP VoIP network parameters.

Syntax:

```
voip-network realm <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ ipv4if ▪ ipv6if ▪ is-default ▪ media-realm-transrate-ratio ▪ name ▪ port-range-end ▪ port-range-start ▪ session-leg For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Note:

This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000, and Mediant SW.

Command Modes:

Enable

Examples:

The following example sets the number of media sessions associated with the range of ports.

```
(config-voip)# voip-network realm 1
(realm-1)# session-leg 10
```

30.2 voip-network srd

This command defines the SRD table.

Syntax:

```
voip-network srd <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ block-un-reg-users ▪ defaults ▪ enable-un-auth-registrs ▪ intra-srd-media-anchoring ▪ max-reg-users ▪ media-realm-name ▪ name For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Maximum Registered Users number to 500.

```
(config-voip)# voip-network srd 1
(srd-1)# max-reg-users 500
```

30.3 voip-network sip-interface

This command defines the SIP Interface table.

Syntax:

```
voip-network sip-interface <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ application-type ▪ defaults ▪ interface-name ▪ message-policy ▪ network-interface ▪ srd ▪ tcp-port ▪ tls-mutual-auth ▪ tls-port ▪ udp-port For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Note:

- The network interface should be taken from: interface network-if (name)
- This command is applicable to Mediant 500, Mediant 8xx, Mediant 1000B, Mediant 2600, Mediant 4000 and Mediant SW.

Command Modes:

Enable

Examples:

The following example sets the SRD to 1.

```
(config-voip)# voip-network sip-interface 1
(sip-interface-1)# srd 1
```

30.4 voip-network ip-group

This command defines the ip-group table.

Syntax:

```
voip-network ip-group <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ always-use-route-table ▪ always-use-source-addr ▪ authentication-method-list ▪ authentication-mode ▪ bandwidth-profile ▪ classify-by-proxy-set ▪ contact-user ▪ defaults ▪ description ▪ dst-uri-input ▪ enable-sbc-client-forking ▪ enable-survivability ▪ inbound-mesg-manipulation-set ▪ ip-profile-id ▪ local-host-name ▪ max-num-of-reg-users ▪ media-enhancement-profile ▪ media-realm-name ▪ outbound-mesg-manipulation-set ▪ password ▪ proxy-set-id ▪ qoe-profile ▪ re-routing-mode ▪ registration-mode ▪ routing-mode ▪ serving-ip-group-id ▪ sip-group-name ▪ src-uri-input ▪ srd ▪ type ▪ username ▪ uui-format For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the ip-group table.

```
(config-voip)# voip-network ip-group 1
(ip-group-1)# contact-user john_brown
```

30.5 voip-network proxy-ip

This command defines the proxy-ip table.

Syntax:

```
voip-network proxy-ip <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ proxy-address ▪ proxy-set-id ▪ transport-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the IP address in the proxy-ip table.

```
(config-voip)# voip-network proxy-ip 5
(proxy-ip-5)# proxy-address 1.5.20.103
```

30.6 voip-network proxy-set

This command defines the proxy-set table.

Syntax:

```
voip-network proxy-set <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ classification-input ▪ defaults ▪ dns-resolve-method ▪ is-proxy-hot-swap ▪ proxy-enable-keep-alive ▪ proxy-keep-alive-time ▪ proxy-load-balancing-method ▪ proxy-name ▪ proxy-redundancy-mode ▪ srd-id For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Classification Input to "ip-only".

```
(config-voip)# voip-network proxy-set 1
(proxy-set-1)# classification-input ip-only
```

30.7 voip-network NATTranslation

This command sets the NAT Translation table.

Syntax:

```
voip-network NATTranslation <index>
<parameter> <value>
```

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ SourceIPInterfaceName ▪ TargetIPAddress ▪ SourceStartPort ▪ SourceEndPort ▪ TargetStartPort ▪ TargetEndPort ▪ TargetIPAddress For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

This example configures a NAT rule to translate IP address 10.13.4.70 to the public IP 100.222.4.5:

```
(config-voip)# voip-network NATTranslation 0
(NATTranslation-0)# SourceIPInterfaceName VOIP
(NATTranslation-0)# TargetIPAddress 10.13.4.70
```

30.8 always-use-source-address

This command enables the device to always send SIP requests and responses to the source IP address received in the previous SIP message.

Syntax:

```
always-use-source-address {yes|no}
```

Defaults:

NA

Command Modes:

Enable

Examples:

This example enables the device to always send SIP requests and responses to the source IP address.

```
(config-voip)# voip-network ip-group new
(ip-group-0)# always-use-source-addr yes
```

This page is intentionally left blank.

31 SIP Definition Commands

The following describes the configuration of SIP parameters.

31.1 SIP General Parameter Commands

31.1.1 account

This command defines the Account table.

Syntax:

```
# sip-definition account <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ application-type ▪ contact-user ▪ defaults ▪ host-name ▪ password ▪ register ▪ served-ip-group ▪ served-trunk-group ▪ serving-ip-group ▪ user-name For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the username in the Account table.

```
(config-voip)# sip-definition account 1
(account-1)# set user-name jsmith
```

31.1.2 account setting

This command defines the SIP Definitions account settings.

Syntax:

```
sip-definition account-setting
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ set aaa-indications ▪ accounting-port ▪ accounting-server-ip ▪ defaults ▪ enable ▪ radius-accounting For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the username in the Account table.

```
(config-voip)# sip-definition account-setting
(sip-def-account-setting)# set enable on
```

31.1.3 advanced settings

This command defines advanced SIP settings.

Syntax:

```
sip-definition advanced-settings
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ set 1st-call-rbt-id ▪ FarEndDisconnectSilenceMethod ▪ FarEndDisconnectSilencePeriod ▪ amd-beep-detection ▪ broken-connection-event-timeout ▪ busy-out ▪ call-pickup-key ▪ call-transfer-using-reinvites ▪ calls-cut-through ▪ cdr-report-level ▪ cdr-srvr-ip-adrr ▪ current-disc ▪ debug-level ▪ defaults ▪ delay-after-reset ▪ delay-b4-did-wink ▪ delayed-offer ▪ dflt-release-cse ▪ did-wink-enbl ▪ digit-delivery-2ip ▪ digit-delivery-2tel ▪ digit-pttrn-on-conn ▪ disc-broken-conn ▪ disc-on-silence-det ▪ e911-callback-timeout ▪ e911-gateway ▪ emerg-calls-regrt-t-out ▪ enum-resolution ▪ fax-re-routing ▪ filter-calls-to-ip ▪ graceful-bsy-out-t-out ▪ ip-security ▪ ip-to-ip-transfer-mode ▪ ldap-primary-key ▪ ldap-private-nm-attr ▪ ldap-secondary-key

Arguments	Description
	▪ max-nb-of-act-calls ▪ media-cdr-rprt-level ▪ microsoft-ext ▪ mx-call-duration ▪ network-isdn-xfer ▪ oos-behavior ▪ polarity-rvrsl ▪ prog-ind-2ip ▪ pstn-alert-timeout ▪ qos-statistics-in-release-msg ▪ reanswer-time ▪ reliable-conn-persistent ▪ rep-calling-w-redir ▪ replace-nb-sign-w-esc ▪ sas-emerg-nb ▪ single-dsp-transcoding ▪ src-hdr-4-called-nb ▪ t38-fax-mx-buff ▪ tel-to-ip-call-forking-mode ▪ user-inf-usage ▪ x-channel-header For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the usage of the User Info file.

```
(config-voip)# sip-definition advanced-settings
(sip-def-adv-setting)# set user-inf-usage on
```

31.1.4 general settings

This command defines the SIP Definitions general settings.

Syntax:

```
sip-definition general-settings
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ 183-msg-behavior ▪ 3xx-behavior ▪ ShouldRegister ▪ anonymous-mode ▪ app-sip-transport-type ▪ asserted-identity-m ▪ ch-select-mode ▪ comfort-tone ▪ contact-restriction ▪ defaults ▪ det-fax-on-ans-tone ▪ disp-name-as-src-nb ▪ early-media ▪ enable-gruu ▪ enable-sips ▪ fax-sig-method ▪ forking-handling ▪ hist-info-hdr ▪ min-session-expires ▪ mult-ptime-format ▪ nat-ip-addr ▪ np-n-type-to-rpi-hdr ▪ p-associated-uri-hdr ▪ p-charging-vector ▪ phone-in-from-hdr ▪ play-bsy-tone-2tel ▪ play-rbt-2ip ▪ play-rbt2tel ▪ prack-mode ▪ reason-header ▪ remote-party-id ▪ rtp-only-mode ▪ sdp-session-owner ▪ semi-att-transfer ▪ session-exp-method ▪ session-expires-time

Arguments	Description
	▪ sip-dst-port ▪ sip-max-rtx ▪ sip-tcp-local-port ▪ sip-tls-local-port ▪ sip-udp-local-port ▪ src-nb-as-disp-name ▪ src-nb-preference ▪ t1-re-tx-time ▪ t2-re-tx-time ▪ tcp-conn-reuse ▪ tcp-timeout ▪ tel2ip-no-ans-timeout ▪ uri-for-assert-id ▪ use-tgrp-inf ▪ user-agent-info ▪ user=phone-in-url ▪ usr-def-subject ▪ voicemail-uri For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example disables the 'user=phone-in-url' parameter.

```
(config-voip)# sip-definition general-setting
(sip-def-gnrl-setting)# set user=phone-in-url disable
```

32 Configuring In-band Signaling Commands

The following defines how to configure In-band Signaling settings.

32.1 media in-band-signaling

This command configures the media in-band-signaling table.

Syntax:

The syntax of this command includes the following variations:

```
media in-band-signaling
<parameter>     <value>
```

The command syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ COT-detector-enable ▪ CPT-detector-frequency-deviation ▪ DTMF-detector-enable ▪ DTMF-generation-twist ▪ DTMF-transport-type ▪ DTMF-volume ▪ IBS-detection-redirection ▪ MF-transport-type ▪ MFR1-detector-enable ▪ MFR2-backward-detector-enable ▪ MFR2-forward-detector-enable ▪ NTT-DID-signaling-form ▪ SIT-detector-enable ▪ UDT-detector-frequency-deviation ▪ call-progress-detector-enable ▪ caller-ID-transport-type ▪ caller-ID-type ▪ defaults ▪ digit-hangover-time-rx ▪ digit-hangover-time-tx ▪ telephony-events-max-duration ▪ user-defined-tones-detector-enable For a description of these parameters, refer to the *User's Manual*.

Command Modes:

Enable

Examples:

The following example enables COT (Continuity Tones) detection and generation.

```
(config-voip)# media in-band-signaling
(media-in-band-signaling)# COT-detector-enable on
```

32.2 Advanced Parameter Commands

The following describes the commands configuring advanced SIP features.

32.2.1 advanced settings

This command defines advanced SIP settings.

Syntax:

```
sip-definition advanced-settings
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ 1st-call-rbt-id ▪ 3xx-use-alt-route ▪ amd-beep-detection ▪ broken-connection-event-timeout ▪ busy-out ▪ call-pickup-key ▪ call-transfer-using-reinvites ▪ calls-cut-through ▪ cdr-report-level ▪ cdr-srvr-ip-adrr ▪ current-disc ▪ debug-level ▪ defaults ▪ delay-after-reset ▪ delay-b4-did-wink ▪ delayed-offer ▪ dflt-release-cse ▪ did-wink-enbl ▪ digit-delivery-2ip ▪ digit-delivery-2tel ▪ digit-pttrn-on-conn ▪ disc-broken-conn ▪ disc-on-silence-det ▪ e911-callback-timeout ▪ e911-gateway ▪ emerg-calls-regrt-t-out ▪ enum-resolution ▪ farenddisconnectsilencemethod ▪ farenddisconnectsilenceperiod ▪ fax-re-routing ▪ filter-calls-to-ip ▪ forking-delay-time-invite ▪ graceful-bsy-out-t-out

Arguments	Description
	▪ ip-security ▪ ip-to-ip-transfer-mode ▪ ldap-primary-key ▪ ldap-private-nm-attr ▪ ldap-secondary-key ▪ max-nb-of-act-calls ▪ media-cdr-rprt-level ▪ microsoft-ext ▪ mx-call-duration ▪ network-isdn-xfer ▪ oos-behavior ▪ polarity-rvrsl ▪ prog-ind-2ip ▪ pstn-alert-timeout ▪ qos-statistics-in-release-msg ▪ reanswer-time ▪ reliable-conn-persistent ▪ rep-calling-w-redir ▪ replace-nb-sign-w-esc ▪ sas-emerg-nb ▪ single-dsp-transcoding ▪ sip-nat-detect ▪ src-hdr-4-called-nb ▪ t38-fax-mx-buff ▪ tel-to-ip-call-forking-mode ▪ user-inf-usage ▪ x-channel-header For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the usage of the User Info file.

```
(config-voip)# sip-definition advanced-settings
(sip-def-adv-setting)# user-inf-usage on
```

32.2.2 enbl-non-inv-408

This command enables not sending a SIP 408 (Request Timeout) in response to non-INVITE requests, to comply with RFC 4320/4321. By default and in certain circumstances such as a timeout expiry, the device sends a SIP 408 Request Timeout in response to non-INVITE requests (e.g., REGISTER).

Syntax:

The syntax of this command includes the following variations:

```
enbl-non-inv-408 {on|off}
```

Command Modes:

Enable

Examples:

The following example enables not sending a SIP 408 (Request Timeout) in response to non-INVITE requests.

```
(config-voip)# sip-definition advanced-settings
(sip-def-adv-setting)# enbl-non-inv-408 on
```

32.2.3 net-node-id

This command defines the network Node Identifier of the device.

Syntax:

The syntax of this command includes the following variations:

```
net-node-id value
```

The command's syntax format is described below:

Arguments	Description
value	Defines the Network Node Identifier of the device. The range is 0 – 32767. [0] – Disable – Does not create User UI header.

Note:

- The default value is 0.
- To enable this command, set this parameter to any value other than 0.
- This command is applicable to Mediant 500, Mediant 8xx, Mediant 3000, Mediant 2600, Mediant 4000 and Mediant SW.

Command Modes:

Enable

Examples:

The following example defines the network Node Identifier as 10.

```
(config-voip)# sip-definition advanced-settings
(sip-def-adv-setting)# net-node-id 10
```

32.3 Account Table Commands

The following describes the Account Table commands.

32.3.1 account

This command defines the Account table.

Syntax:

```
# sip-definition account <index>
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ application-type ▪ contact-user ▪ defaults ▪ host-name ▪ password ▪ register ▪ served-ip-group ▪ served-trunk-group ▪ serving-ip-group ▪ user-name For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the username in the Account table.

```
(config-voip)# sip-definition account 1
(account-1)# user-name jsmith
```

32.3.2 account setting

This command defines the SIP Definitions account settings.

Syntax:

```
sip-definition account-setting
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ aaa-indications ▪ accounting-port ▪ accounting-server-ip ▪ defaults ▪ enable ▪ radius-accounting For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the username in the Account table.

```
(config-voip)# sip-definition account-setting
(sip-def-account-setting)# enable on
```

32.4 SIP Proxy and Registration Commands

The following describes the SIP Proxy and Registration commands.

32.4.1 proxy and registration

This command defines proxy and registration settings.

Syntax:

```
sip-definition proxy-and-registration
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ always-use-proxy ▪ authentication-mode ▪ challenge-caching ▪ cnonce-4-auth ▪ defaults ▪ dns-query ▪ enable-proxy ▪ enable-registration ▪ fallback-to-routing ▪ gw-name ▪ gw-registration-name ▪ ip-addrr-rgstrr ▪ mutual-authentication ▪ nb-of-rtx-b4-hot-swap ▪ password-4-auth ▪ prefer-routing-table ▪ proxy-dns-query ▪ proxy-ip-lst-rfrsh-time ▪ proxy-name ▪ re-registration-timing ▪ redundancy-mode ▪ redundant-routing-m ▪ reg-on-conn-failure ▪ reg-on-invite-fail ▪ registrar-name ▪ registrar-transport ▪ registration-retry-time ▪ registration-time ▪ registration-time-thres ▪ rte-tbl-4-host-names ▪ set-oos-on-reg-failure ▪ sip-rerouting-mode

Arguments	Description
	▪ subscription-mode ▪ use-gw-name-for-opt ▪ user-name-4-auth For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the gateway name to 'gateway1'.

```
(config-voip)# sip-definition proxy-and-registration
(sip-def-proxy-and-reg)# gw-name gateway1
```

32.5 Message Policy and Manipulation Commands

The following describes the Message Policy and Manipulation commands

32.5.1 sbc message-policy

This command defines the sbc message policy table.

Syntax:

```
sbc message-policy <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ body-list ▪ body-list-type ▪ defaults ▪ max-body-length ▪ max-header-length ▪ max-message-length ▪ max-num-bodies ▪ max-num-headers ▪ method-list ▪ method-list-type ▪ send-rejection For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the maximum header length to 100.

```
(config-voip)# sbc message-policy 1
(message-policy-1)# max-header-length 100
```

32.5.2 manipulations message-manipulations

This command defines the message manipulations table.

Syntax:

```
sbc manipulations message-manipulations <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ action-subject ▪ action-type ▪ action-value ▪ condition ▪ defaults ▪ manipulation-set-id ▪ message-type ▪ row-role For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Action Type to 'remove-prefix'.

```
(config-voip)# sbc manipulations message-manipulations 2
(message-manipulations-2)# action-type remove-prefix
```

33 Coders and Profiles Commands

The following describes the Coders and Profiles commands.

33.1 coders-and-profiles coders-group

This command defines the Coders Group table.

Syntax:

The syntax of this command includes the following variations:

```
coders-and-profiles coders-group-<0-10> <index>
<parameter>     <value>
```

The command syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ defaults ▪ name ▪ p-time ▪ payload-type ▪ rate ▪ silence-suppression For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines the Coders Group 0 table and sets the name.

```
(config-voip)# coders-and-profiles coders-group-0 1
(coders-group-0-1)# name C_group_1
```

33.2 coders-and-profiles ip-profile

This command defines the IP Profile table.

Syntax:

The syntax of this command includes the following variations:

```
coders-and-profiles ip-profile <index>
<parameter>     <value>
```

Arguments	Description
parameter value	Sets the following table parameters: ▪ amd-max-greeting-time ▪ amd-max-post-silence-greeting-time ▪ amd-sensitivity-level ▪ amd-sensitivity-parameter-suit ▪ add-ie-in-setup ▪ cng-mode ▪ call-limit ▪ coders-group-id ▪ copy-dst-to-redirect-number ▪ disconnect-on-broken-connection ▪ early-media ▪ echo-canceller ▪ enable-early-183 ▪ enable-hold ▪ enable-qsig-tunneling ▪ enable-symmetric-mki ▪ fax-sig-method ▪ first-tx-dtmf-option ▪ generate-srtp-keys ▪ input-gain ▪ ip-preference ▪ is-dtmf-used ▪ jitter-buffer-minimum-delay ▪ jitter-buffer-optimization-factor ▪ media-ip-version-preference ▪ media-security-behavior ▪ mki-size ▪ nse-mode ▪ play-rbt-to-ip ▪ play-held-tone ▪ profile-name ▪ prog-ind-to-ip ▪ reliable-heldtone-source ▪ remote-base-udp-port ▪ remote-hold-format ▪ rtp-redundancy-depth ▪ rtp-ip-diffserv ▪ rx-dtmf-option

Arguments	Description
	▪ sbc-2833dtmf-payload ▪ sbc-allowed-coders-group-id ▪ sbc-allowed-coders-mode ▪ sbc-allowed-media-types ▪ sbc-allowed-video-coders-group-id ▪ sbc-alternative-dtmf-method ▪ sbc-assert-identity ▪ sbc-diversion-mode ▪ sbc-enforce-mki-size ▪ sbc-ext-coders-group-id ▪ sbc-fax-coders-group-id ▪ sbc-fax-answer-mode ▪ sbc-fax-behavior ▪ sbc-fax-offer-mode ▪ sbc-history-info-mode ▪ sbc-media-security-behavior ▪ sbc-jitter-compensation ▪ sbc-play-rbt-to-transferee ▪ sbc-prack-mode ▪ sbc-preferred-ptime ▪ sbc-rfc2833-behavior ▪ sbc-rmt-3xx-behavior ▪ sbc-rmt-can-play-ringback ▪ sbc-rmt-delayed-offer ▪ sbc-rmt-early-media-resp ▪ sbc-rmt-early-media-rtp ▪ sbc-rmt-early-media-supp ▪ sbc-rmt-mltple-18x-supp ▪ sbc-rmt-renegotiate-on-fax-detect ▪ sbc-rmt-refer-behavior ▪ sbc-rmt-replaces-behavior ▪ sbc-rmt-re-invite-supp ▪ sbc-rmt-rfc3960-supp ▪ sbc-rmt-ringback-src-rel ▪ sbc-rmt-update-supp ▪ sbc-rtcp-mode ▪ sbc-rtp-red-behav ▪ sbc-sdp-ptime-ans ▪ sbc-session-expires-mode ▪ sbc-use-silence-supp ▪ sce ▪ second-tx-dtmf-option ▪ signaling-diffserv ▪ transcoding-mode ▪ voice-volume ▪ vxx-transport-type ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example defines enables the echo canceller.

```
(config-voip)# coders-and-profiles ip-profile 1
(ip-profile-1)# echo-canceller enable
```

33.3 coders-and-profiles tel-profile

This command defines the Tel Profile table.

Syntax:

```
coders-and-profiles tel-profile <index>
<parameter>     <value>
```

Arguments	Description
parameter value	Sets the following table parameters: ▪ call-priority-mode ▪ coders-group-id ▪ current-disconnect ▪ defaults ▪ dial-plan-index ▪ digit-delivery ▪ digital-cut-through ▪ disconnect-on-busy-tone ▪ dtmf-volume ▪ early-media ▪ echo-canceller ▪ echo-canceller-nlp-mode ▪ enable-911-psap ▪ enable-agc ▪ enable-did-wink ▪ enable-voice-mail-delay ▪ fax-sig-method ▪ flash-hook-period ▪ fxo-double-answer ▪ input-gain ▪ IsFaxUsed ▪ is-two-stage-dial ▪ jitter-buffer-minimum-delay ▪ jitter-buffer-optimization-factor ▪ mwi-analog-lamp ▪ mwi-display ▪ polarity-rvrsl ▪ profile-name ▪ prog-ind-to-ip ▪ rtp-ip-diffserv ▪ signaling-diffserv ▪ swap-teltoip-phone-numbers ▪ tel-preference ▪ time-for-reorder-tone ▪ voice-volume For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the DTMF volume.

```
(config-voip)# coders-and-profiles tel-profile 1
(tel-profile-1)# DtmfVolume 10
```

34 Gateway and IP to IP Commands

The following defines gateway commands:

34.1 interface fxs-fxo

This command enters a specific analog interface (FXS or FXO) configuration.

Syntax:

The syntax of this command includes the following variations:

```
interface fxs-fxo <slot/port>
<parameter> <value>
```

The command syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ bellcore-callerid-type-one-sub-standard ▪ bellcore-vmwi-type-one-standard ▪ caller-id-type ▪ caller-id-timing-mode ▪ current-disconnect-duration ▪ default-linepolarity-state ▪ defaults ▪ disable-analog-auto-calibration ▪ enable-analog-dc-remover ▪ enable-fxo-current-limit ▪ etsi-callerid-type-one-sub-standard ▪ etsi-vmwi-type-one-standard ▪ far-end-disconnect-type ▪ flash-hook-period ▪ fxo-country-coefficients ▪ fxo-dc-termination ▪ fxs-country-coefficients ▪ fxs-rx-gain-control ▪ fxs-tx-gain-control ▪ metering-on-time ▪ metering-type ▪ min-flash-hook-time ▪ mwi-indication-type ▪ polarity-reversal-type ▪ rx-gain-control ▪ time-to-sample-analog-line-voltage ▪ trk-xfer-mode-type For a description of these parameters, refer to the *User's Manual*.

Command Modes:

Enable

Related Commands:

```
show voip interface fxs-fxo
```

The above commands give the user the interface status, main PM parameters and main configuration parameters.

Examples:

This example sets the metering method for charging pulses.

```
(config-system)# interface fxs-fxo
(fxs-fxo)# metering-type 12-kHz-sinusoidal-bursts
```

The following example enters a specific analog interface configuration.

```
# show voip interface fxs-fxo
Module in slot 1, Ports type is FXS
Port 1 status:
  Chip Revision: 2
  Hook state(1- off hook, 0- onhook): 0
  Message Waiting Indication: 0
  Ring:0
  Reversal Polarity:0
  Tx Gain Control: 0db
  Rx Gain Control: 0db
Port configuration:
Various timing parameters:
  WinkTime 200 ms
  CurrentDisconnectDuration 900 ms
  FlashHookPeriod 700 ms
  MinFlashHookTime 300 ms
Caller ID and MWI parameters:
  Primary Caller ID and MWI type is 0
  AnalogCallerIDTimingMode is CallerID transferred between first
and second rings
  BellcoreCallerIDTypeOneSubStandard is 0
  ETSICallerIDTypeOneSubStandard is 0
  ETSIVMWITypeOneStandard is 0
  BellcoreVMWITypeOneStandard is 0
Various signal indications parameters:
  PolarityReversalType is 0
  MeteringType is 0
  LifeLineType is acLifeLineType_Hardware_Only
Country Coefficients is set to USA
```

34.1.1 analog-port-enable

This command provides the user the ability to enable / disable the analog port (FXS or FXO).

Syntax:

The syntax of this command includes the following variations:

```
analog-port-enable [x/y] {on|off}
```

The command syntax format is described below:

Arguments	Description
x/y	Defines the port / module.

Command Modes:

Enable

Note:

This command is applicable to **Mediant 500**, **Mediant 500L**, **Mediant 800** and **Mediant 850**.

Examples:

This example disables Port 2 on Module 1.

```
(config-voip)# interface fxs-fxo
(fxs-fxo)# analog-port-enable 1/2 off
```

34.2 Analog

The following describes the Analog commands.

34.2.1 authentication

This command defines the analog gateway authentication settings.

Syntax:

```
# gw analoggw authentication <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ username ▪ password ▪ defaults ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the userid to "user1".

```
(config-voip)# gw analoggw authentication 1
(authentication-1)# set username user1
```

34.2.2 automatic-dialing

This command defines the automatic-dialing settings.

Syntax:

```
# gw analoggw automatic-dialing <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ auto-dial-status ▪ defaults ▪ dst-number ▪ hotline-dialtone-duration ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the hotline-dialtone-duration to 18.

```
(config-voip)# gw analoggw automatic-dialing 2
(automatic-dialing-2)# set hotline-dialtone-duration 18
```

34.2.3 caller-display-info

This command defines the caller-display-info settings.

Syntax:

```
# gw analoggw caller-display-info <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ display-string ▪ presentation ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the display string to "user1ab".

```
(config-voip)# gw analoggw caller-display-info 3
(caller-display-info-3)# set display-string user1ab
```

34.2.4 call-forward

This command defines the call-forward settings.

Syntax:

```
# gw analoggw call-forward <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ destination ▪ no-reply-time ▪ type ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the call forward type condition to "on busy".

```
(config-voip)# gw analoggw call-forward 3
(caller-display-info-3)# set type on-busy
```

34.2.5 call-waiting

This command defines the call-waiting settings.

Syntax:

```
# gw analoggw call-waiting <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ enable-call-waiting ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the call-waiting feature.

```
(config-voip)# gw analoggw call-waiting 4
(call-waiting-4)# set enable-call-waiting enable
```

34.2.6 enable-caller-id

This command defines the enable-caller-id settings.

Syntax:

```
# gw analoggw enable-caller-id <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ caller-id ▪ defaults ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual.*

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the enable-caller-id feature.

```
(config-voip)# gw analoggw enable-caller-id 2
(enable-caller-id-2)# set caller-id enable
```

34.2.7 enable-did

This command enables the DID table.

Syntax:

```
# gw analoggw enable-did <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ did ▪ defaults ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual.*

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the DID table.

```
(config-voip)# gw analoggw enable-did 2
(enable-caller-id-2)# set did enable
```

34.2.8 charge-code

This command defines the analog gateway chargecode settings.

Syntax:

```
# gw analoggw charge-code <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ end-time-1 ▪ end-time-2 ▪ end-time-3 ▪ end-time-4 ▪ pulse-interval-1 ▪ pulse-interval-2 ▪ pulse-interval-3 ▪ pulse-interval-4 ▪ pulses-on-answer-1 ▪ pulses-on-answer-2 ▪ pulses-on-answer-3 ▪ pulses-on-answer-4 ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the pulse interval.

```
(config-voip)# gw analoggw chargecode 1
(chargecode-1)# set endtime1 pulsinterval1 20
```

34.2.9 fxo-setting

This command defines the fxo settings.

Syntax:

```
# gw analoggw fxo-setting
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ answer-supervision ▪ defaults ▪ dialing-mode ▪ disc-on-bsy-tone-c ▪ disc-on-dial-tone ▪ fxo-autodial-play-bsytn ▪ fxo-dbl-ans ▪ guard-time-btwn-calls ▪ reorder-tone-duration ▪ ring-detection-tout ▪ rings-b4-det-callerid ▪ snd-mtr-msg-2ip ▪ time-wait-b4-dialing ▪ waiting-4-dial-tone For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the wait for dial tone before initiating an outgoing call to the PBX/PSTN (FXO one-stage dialing mode).

```
(config-voip)# gw analoggw fxo-setting
(gw-analogGW-fxo)# set waiting-4-dial-tone enable
```

34.2.10 keypad-features

This command defines the keypad features settings.

Syntax:

```
gw analoggw keypad-features
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ blind-transfer ▪ caller-id-restriction-act ▪ cw-act ▪ cw-deact ▪ defaults ▪ fwd-busy-or-no-ans ▪ fwd-deactivate ▪ fwd-dnd ▪ fwd-no-answer ▪ fwd-on-busy ▪ fwd-unconditional ▪ hotline-act ▪ hotline-deact ▪ id-restriction-deact ▪ port ▪ port-type ▪ reject-anony-call-activate ▪ reject-anony-call-deactivate For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Key pad pattern for rejecting anonymous calls.

```
(config-voip)# gw analoggw keypad-features
(gw-analgw-keypad) # set KeyRejectAnonymousCall 2345
```

34.2.11 metering-tones

This command defines the metering tones.

Syntax:

```
# gw analoggw metering-tones
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ gen-mtr-tones ▪ metering-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the metering method for charging pulses.

```
(config-voip)# gw analoggw metering-tones
(gw-analgw-mtrtone)*# set metering-type 16-kHz-sinusoidal-bursts
```

34.2.12 gen-mtr-tones

This command determines the method used to configure the metering tones that are generated to the Tel side.

Syntax:

```
gen-mtr-tones {disable|internal-table|sip-interval-provided|sip-raw-data-incr-provided|sip-raw-data-provided}
```

The command's syntax format is described below:

Arguments	Description
disable	This is the default value. Metering tones are not generated.
internal-table	Metering tones are generated according to the device's Charge Code table.
sip-interval-provided	This is the proprietary method of TELES Communications Corporation. Periodic generation of AOC-D and AOC-E toward PSTN. The time interval is calculated according to the scale and tariff provided in the proprietary formatted file included in SIP INFO messages, which is always sent before 200 0K.
sip-raw-data-incr-provided	
sip-raw-data-provided	This is the proprietary method of Cirpack. When receiving AOC-D in raw format, provided in the header of SIP INFO messages, the device parses AOC-D raw data in order to obtain the number of units. This number is sent in the Facility message with AOC-D. In addition, the device stores the latest number of units in order to send them in AOC-E IE when the call is disconnected.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the method of generating metering tones.

```
(config-voip)# gw analoggw metering-tones
(gw-analgw-mtrtone)# gen-mtr-tones disable
```

34.2.13 reject-anonymous-calls

This command defines the reject-anonymous-calls.

Syntax:

```
gw analoggw reject-anonymous-calls
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ reject-calls ▪ port ▪ port-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables reject-anonymous calls.

```
(config-voip)# gw analoggw reject-anonymous-calls 5
(reject-anonymous-calls-5)# set reject-calls enable
```

34.2.14 tone-index

This command defines the Tone Index table.

Syntax:

```
# gw analoggw tone-index
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ default ▪ dst-prefix ▪ fxs-port-first ▪ fxs-port-last ▪ priority ▪ src-prefix For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Priority Index to "1".

```
(config-voip)# gw analoggw tone-index 1
(tone-index-1)# set priority 1
```

34.3 Digital

The following describes the Digital commands.

34.3.1 digital-gw-parameters

This command defines the digital gateway parameters.

Syntax:

```
gw digitalgw digital-gw-parameters
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ add-ie-in-setup ▪ add-pref-to-redir-nb ▪ b-ch-negotiation ▪ blind-xfer-add-prefix ▪ blind-xfer-disc-tmo ▪ cp-dst-nb-2-redir-nb ▪ defaults ▪ dflt-call-prio ▪ dflt-cse-map-isdn2sip ▪ dig-oos-behavior ▪ disc-on-bsy-tone-c ▪ disc-on-bsy-tone-i ▪ dscp-4-mlpp-flsh ▪ dscp-4-mlpp-flsh-ov ▪ dscp-4-mlpp-flsh-ov-ov ▪ dscp-4-mlpp-immed ▪ dscp-for-mlpp-prio ▪ dscp-for-mlpp-rtn ▪ epn-as-cpn-ip2tel ▪ epn-as-cpn-tel2ip ▪ etsi-diversion ▪ fax-rerouting-delay ▪ fax-rerouting-mode ▪ format-dst-phone-number ▪ ignore-bri-los-alarm ▪ isdn-facility-trace ▪ isdn-tnl-ip2tel ▪ isdn-tnl-tel2ip ▪ isdn-trsfr-on-conn ▪ mfcr2-category ▪ mlpp-dflt-namespace ▪ mlpp-dflt-srv-domain ▪ mlpp-norm-ser-dmn

Arguments	Description
	▪ ni2-cpc ▪ np-n-ton-2-redirnb ▪ play-l-rbt-isdn-trsfr ▪ preemp-tone-dur ▪ PSTNReserved3 ▪ qsig-path-replacement ▪ qsig-tunneling ▪ rmv-calling-name ▪ rmv-cli-when-restr ▪ send-local-datetime-connect ▪ send-screen-to-ip ▪ send-screen-to-isdn ▪ swap-rdr-n-called-nb ▪ tdm-tunneling ▪ tel-to-ip-dflt-redir-rsn ▪ trkgrps-to-snd-ie ▪ trunk-status-reporting ▪ usr2usr-hdr-frmt ▪ uui-ie-for-ip2tel ▪ uui-ie-for-tel2ip ▪ xfer-cap-for-data-calls ▪ xfer-prefix-ip2tel For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the gateway to maintain a permanent RTP connection.

```
(config-voip)# gw digitalgw digital-gw-parameters
(gw-digitalGW-params)# set tdm-tunneling on
```

34.3.2 isdn-supp-serv

This command defines the ISDN Supplementary Services table.

Syntax:

```
gw digitalgw isdn-supp-serv <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ caller-id-enable ▪ caller-id-number ▪ defaults ▪ module ▪ phone-number ▪ port ▪ presentation-restricted ▪ user-id ▪ user-password For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the user password in the ISDN Supplementary Services to 'abc123'.

```
(config-voip)# gw digitalgw isdn-supp-serv 1
(isdn-supp-serv-1)# set user-password abc123
```

34.3.3 rp-network-domains

This command defines the Resource Priority Network Domains table.

Syntax:

```
gw digitalgw rp-network-domains <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ name For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the name of the Resource Priority Network Domains table to 'RPN1'.

```
(config-voip)# gw digitalgw rp-network-domains 1
(rp-network-domains-1)# set name RPN1
```

34.4 DTMF and Supplementary

The following describes the DTMF and Supplementary commands.

34.4.1 dtmf-and-suppl dtmf-and-dialing

This command defines the DTMF and supplementary parameters.

Syntax:

```
gw dtmf-and-suppl dtmf-and-dialing
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dflt-dest-nb ▪ dial-plan-index ▪ digitmapping ▪ dt-duration ▪ hook-flash-option ▪ hotline-dt-dur ▪ isdn-tx-overlap ▪ min-dg-b4-routing ▪ mxdig-b4-dialing ▪ rfc-2833-in-sdp ▪ special-digit-rep ▪ special-digits ▪ telephony-events-payload-type-tx ▪ time-btwn-dial-digs For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables ISDN Overlap IP to Tel Dialing.

```
(config-voip)# gw dtmf-and-suppl dtmf-and-dialing
(gw-dtmf-and-dial)# set isdn-tx-overlap on
```

34.4.2 dtmf-and-suppl supplementary-services

This command defines the dtmf and supplementary parameters.

Syntax:

```
gw dtmf-and-suppl supplementary-services
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ 3w-conf-mode ▪ 3w-conf-nonalloc-prts ▪ as-subs-ipgroupid ▪ blind-transfer ▪ call-forward ▪ call-hold-remnd-rng ▪ call-prio-mode ▪ call-waiting ▪ caller-ID-type ▪ cfe-ring-tone-id ▪ conf-id ▪ defaults ▪ reminder-ring ▪ enable-3w-conf ▪ enable-caller-id ▪ enable-mwi ▪ enable-transfer ▪ flash-key-seq-style ▪ flash-key-seq-tmout ▪ held-timeout ▪ hold ▪ hold-format ▪ hold-to-isdn ▪ hook-flash-code ▪ mlpp-diffserv ▪ music-on-hold ▪ mwi-analog-lamp ▪ mwi-display ▪ mwi-srvr-ip-addr ▪ mwi-srvr-transp-type ▪ mwi-subs-expr-time ▪ mwi-subs-ipgrpid ▪ mwi-subs-rtry-time ▪ mx-3w-conf-onboard ▪ nb-of-cw-ind ▪ nrt-sub-retry-time

Arguments	Description
	▪ nrt-subscription ▪ precedence-ringing ▪ send-all-cdrs-on-rtrv ▪ should-subscribe ▪ sttr-tone-duration ▪ subscribe-to-mwi ▪ time-b4-cw-ind ▪ time-between-cw ▪ transfer-prefix ▪ waiting-beep-dur For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the Call Waiting tone beep length (msec).

```
(config-voip)# gw dtmf-and-suppl supplementary-services
(gw-suppl-serv)# set waiting-beep-dur 180
```

34.5 Hunt or Trunk Group

The following describes the Hunt or Trunk group commands.

34.5.1 hunt-or-trunk-group trunk-group

This command defines the hunt-or-trunk-group Trunk Group table.

Syntax:

```
gw hunt-or-trunk-group trunk-group <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ activate ▪ defaults ▪ display ▪ exit ▪ first-b-channel ▪ first-phone-number ▪ first-trunk-id ▪ help ▪ history ▪ last-b-channel ▪ last-trunk-id ▪ list ▪ module ▪ pwd ▪ quit ▪ tel-profile-id ▪ trunk-group-id ▪ do For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the first-phone-number to '123-345-567'.

```
(config-voip)# gw hunt-or-trunk-group trunk-group 4
(trunk-group-4)# set first-phone-number 123-345-567
```

34.5.2 hunt-or-trunk-group trunk-group-setting

This command defines the Hunt or Trunk Group Settings table.

Syntax:

```
gw hunt trunk-group-setting <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ channel-select-mode ▪ contact-user ▪ defaults ▪ gateway-name ▪ mwi-interrogation-type ▪ registration-mode ▪ serving-ip-group ▪ trunk-group-id ▪ trunk-group-name For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Registration Mode to 'per-account'.

```
(config-voip)# gw hunt-or-trunk-group trunk-group-setting 4
(trunk-group-setting-4)# set registration-mode per-account
```

34.6 Manipulations

The following commands define manipulations.

34.6.1 cause-map-isdn2sip

This command defines the cause-map-isdn2sip settings.

Syntax:

```
gw manipulations cause-map-isdn2sip <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ q850-causes ▪ sip-response For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the ISDN Release Cause to "2".

```
(config-voip)# gw manipulations cause-map-isdn2sip  1
(cause-map-isdn2sip-1)# set q850-causes 2
```

34.6.2 cause-map-sip2isdn

This command defines the cause-map-sip2isdn settings.

Syntax:

```
gw manipulations cause-map-sip2isdn <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ q850-causes ▪ sip-response For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the SIP response to "2".

```
(config-voip)# gw manipulations cause-map-sip2isdn 1
(cause-map-sip2isdn-1)# set sip-response 2
```

34.6.3 dst-number-map-ip2tel

This command defines the dst-number-map-ip2tel settings.

Syntax:

```
gw manipulations dst-number-map-ip2tel <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-host-prefix ▪ dst-prefix ▪ npi ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ remove-from-left ▪ remove-from-right ▪ src-host-prefix ▪ src-ip-address ▪ src-prefix ▪ suffix-to-add ▪ ton For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the source IP address.

```
(config-voip)# gw manipulations dst-number-map-ip2tel 2
(dst-number-map-ip2tel-2)# set src-ip-address 12.10.4.120
```

34.6.4 dst-number-map-tel2ip

This command defines the dst-number-map-tel2ip settings.

Syntax:

```
gw manipulations dst-number-map-tel2ip <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-ip-group-id ▪ dst-prefix ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ remove-from-left ▪ remove-from-right ▪ src-ip-group-id ▪ src-prefix ▪ src-trunk-group-id ▪ suffix-to-add For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the Destination Prefix.

```
(config-voip)# gw manipulations dst-number-map-tel2ip 10
(NumberMapTel2Ip-10)# set dst-prefix 02
```

34.6.5 src-number-map-ip2tel

This command defines the src-number-map-ip2tel settings.

Syntax:

```
gw manipulations src-number-map-ip2tel <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-host-prefix ▪ dst-prefix ▪ is-presentation-restricted ▪ npi ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ remove-from-left ▪ remove-from-right ▪ src-host-prefix ▪ src-ip-address ▪ src-prefix ▪ suffix-to-add ▪ ton For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets is-presentation-restricted to 'restricted'.

```
(config-voip)# gw manipulations src-number-map-ip2tel 20
(src-number-map-ip2tel-20)# set is-presentation-restricted
restricted
```

34.6.6 src-number-map-tel2ip

This command defines the src-number-map-Tel2Ip settings.

Syntax:

```
# gw manipulations src-number-map-tel2ip <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-prefix ▪ is-presentation-restricted ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ remove-from-left ▪ remove-from-right ▪ src-ip-group-id ▪ src-prefix ▪ src-trunk-group-id ▪ suffix-to-add For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the Stripped Digits From Left to be '5'.

```
(config-voip)# gw manipulations src-number-map-Tel2Ip  18
(src-number-map-tel2ip-18)# set remove-from-left 5
```

34.6.7 calling-name-map-ip2tel

This command defines the calling-name-map-ip2tel settings.

Syntax:

```
# gw manipulations calling-name-map-ip2tel <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ calling-name-prefix ▪ defaults ▪ dst-host-prefix ▪ dst-prefix ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ remove-from-left ▪ remove-from-right ▪ src-host-prefix ▪ src-ip-address ▪ src-prefix ▪ suffix-to-add For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the suffix to add.

```
(config-voip)# gw manipulations calling-name-map-ip2tel 1
(calling-name-map-ip2tel-1)# set suffix-to-add xxyy
```

34.6.8 calling-name-map-tel2ip

This command defines the calling-name-map-tel2ip settings.

Syntax:

```
# gw manipulations calling-name-map-tel2ip <index>
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ calling-name-prefix ▪ defaults ▪ dst-prefix ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ remove-from-left ▪ remove-from-right ▪ src-ip-group-id ▪ src-prefix ▪ src-trunk-group-id ▪ suffix-to-add For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the source prefix to be 'abcd'.

```
(config-voip)# gw manipulations calling-name-map-tel2ip 5
(calling-name-map-tel2ip-5)# set src-prefix abcd
```

34.6.9 general-setting

This command defines the general settings.

Syntax:

```
# gw manipulations general-setting
# set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<parameter> <value>	Sets the following table parameters: ▪ add-ph-cntxt-as-pref ▪ defaults ▪ ip2tel-redir-reason ▪ prfm-ip-to-tel-dst-map ▪ prfm-ip-to-tel-src-map ▪ tel-to-ip-dflt-redir-rsn ▪ tel2ip-redir-reason For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables the parameter to add the phone context to src/dest phone number as a prefix.

```
(config-voip)# gw manipulations general-setting
(gw-manipul-gnrl-setting)# set add-ph-cntxt-as-pref on
```

34.6.10 phone-context-table

This command defines the phone context table.

Syntax:

```
gw manipulations phone-context-table <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ context ▪ defaults ▪ npi ▪ ton For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the context table string to 'abcd'.

```
(config-voip)# gw manipulations phone-context-table 1
(phone-context-table-1)# set context abcd
```

34.6.11 redirect-number-map-ip2tel

This command defines the redirect-number-map-ip2tel table.

Syntax:

```
gw manipulations redirect-number-map-ip2tel <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-host-prefix ▪ dst-prefix ▪ is-presentation-restricted ▪ npi ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ redirect-prefix ▪ remove-from-left ▪ remove-from-right ▪ src-host-prefix ▪ src-ip-address ▪ suffix-to-add ▪ ton For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the number of digits to leave.

```
(config-voip)# gw manipulations redirect-number-map-ip2tel 1
(redirect-number-map-ip2tel-1)# set LeaveFromRight 5
```

34.6.12 redirect-number-map-tel2ip

This command defines the redirect-number-map-tel2ip table.

Syntax:

```
gw manipulations redirect-number-map-tel2ip <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-prefix ▪ is-presentation-restricted ▪ num-of-digits-to-leave ▪ prefix-to-add ▪ redirect-prefix ▪ remove-from-left ▪ remove-from-right ▪ src-ip-group-id ▪ src-trunk-group-id ▪ suffix-to-add For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the destination prefix.

```
(config-voip)# gw manipulations redirect-number-map-tel2ip 8
(redirect-number-map-tel2ip-8)# set DestinationPrefix abcd
```

34.7 Routing

The following commands define gw routing commands.

34.7.1 gw routing alt-route-cause-tel2ip

This command defines the AltRouteCauseTel2IP table.

Syntax:

```
gw routing alt-route-cause-tel2ip <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ release-cause For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the release-cause to "1".

```
(config-voip)# gw routing alt-route-cause-tel2ip 5
(alt-route-cause-tel2ip-5)# set release-cause 1
```

34.7.2 gw routing alt-route-cause-ip2tel

This command defines the AltRouteCauseIP2Tel table.

Syntax:

```
gw routing alt-route-cause-ip2tel <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ release-cause For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the release-cause to "2".

```
(config-voip)# gw routing alt-route-cause-ip2tel 4
(alt-route-cause-ip2tel-4)# set release-cause 2
```

34.7.3 gw routing fwd-on-bsy-trk-dst

This command defines the ForwardOnBusyTrunkDest table.

Syntax:

```
gw routing fwd-on-bsy-trk-dst <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ forward-dst ▪ trunk-group-id For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the forward destination to "LTP1".

```
(config-voip)# gw routing fwd-on-bsy-trk-dst 1
(fwd-on-bsy-trk-dst-1)# set forward-dst LTP1
```

34.7.4 gw routing general-setting

This command defines the ForwardOnBusyTrunkDest table.

Syntax:

```
gw routing general-setting <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ alt-routing-tel2ip ▪ alt-rte-tel2ip-keep-alive ▪ alt-rte-tel2ip-method ▪ alt-rte-tel2ip-mode ▪ alt-rte-tone-duration ▪ defaults ▪ empty-dst-w-bch-nb ▪ ip2tel-rmv-rte-tbl ▪ ip2tel-rte-mode ▪ mx-pkt-loss-4-alt-rte ▪ npi-n-ton-to-cld-nb ▪ npi-n-ton-to-cng-nb ▪ src-ip-addr-input ▪ src-manipulation ▪ tel2ip-rte-mode ▪ trk-id-as-prefix ▪ trkgrpid-prefix For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the forward destination to "LTP1".

```
(config-voip)# gw routing general-setting 1
(gw-routing-gnrlsetting)# set alt-routing-tel2ip enable
```

34.7.5 gw routing ip2tel-routing

This command defines the ip2tel-routing table.

Syntax:

```
gw routing ip2tel-routing <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ dst-host-prefix ▪ dst-phone-prefix ▪ ip-profile-id ▪ src-host-prefix ▪ src-ip-address ▪ src-ip-group-id ▪ src-phone-prefix ▪ src-srd-id ▪ trunk-group-id ▪ trunk-id For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets ip-profile-id to "10".

```
(config-voip)# gw routing ip2tel-routing 1
(ip2tel-routing-1)# set ip-profile-id 10
```

34.7.6 gw routing tel2ip-routing

This command defines the tel2ip-routing table.

Syntax:

```
gw routing tel2ip-routing <index>
set <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ charge-code ▪ cost-group-id ▪ defaults ▪ dst-host-prefix ▪ dst-ip-address ▪ dst-ip-group-id ▪ dst-phone-prefix ▪ dst-port ▪ dst-srd ▪ forking-group ▪ ip-profile-id ▪ src-host-prefix ▪ src-ip-group-id ▪ src-phone-prefix ▪ src-trunk-group-id ▪ transport-type For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets ip-profile-id to "20".

```
(config-voip)# gw routing tel2ip-routing 8
(tel2ip-routing-8)# set ip-profile-id 20
```

This page is intentionally left blank.

35 SBC Commands

The following defines SBC commands.

35.1 General Settings

The following defines SBC General Setting commands.

35.1.1 sbc general-setting

This command defines the general settings.

Syntax:

```
sbc general-setting
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
parameter value	Sets the following table parameters: ▪ auth-chlng-mthd ▪ auth-qop ▪ defaults ▪ gw-direct-route-prefix ▪ lifetime-of-nonce ▪ media-channels ▪ min-session-expires ▪ sbc-dialog-info-network ▪ sbc-fax-detection-timeout ▪ sbc-gruu-mode ▪ sbc-media-sync ▪ sbc-no-arelt-timeout ▪ sbc-preferences ▪ sbc-rgstr-time ▪ sbc-sess-exp-time ▪ sbc-subs-try ▪ transcoding-mode ▪ unclassified-calls For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the number of channels associated with media services (announcements, conferencing).

```
(config-voip)# sbc general-setting
(sbc-gnrl-setting)# media-channels 10
```

35.1.2 sbc-rtcpxr-report-mode

This command enables the sending of RTCP-XR reports of QoE metrics at the end of each call session (i.e., after a SIP BYE). The RTCP-XR is sent in the SIP PUBLISH message..

Syntax:

```
sbc-rtcpxr-report-mode {not_sent|sent-when-call-ended}
```

Note:

This command is applicable to Mediant E-SBC.

Command Modes:

Enable

Examples:

The following example enables the sending of RTCP-XR reports of QoE metrics at the end of each call session.

```
(config-voip)# sip-definition advanced-settings
(sip-def-adv-setting)# sbc-rtcpxr-report-mode sent-when-call-ended
```

35.1.3 sbc-server-auth-mode

This command defines whether authentication of the SIP client is done locally (by the device) or by the RADIUS server.

Syntax:

```
sbc-server-auth-mode {local_mode|remote_server|sterman}
```

The command's syntax format is described below:

Arguments	Description
local_mode	Defines that local authentication is performed.
remote_server	Defines that authentication is performed remotely at an RFC 5090 compliant server.
sterman	Defines that authentication is performed according to *draft-sterman-aaa-sip-01*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables local authentication.

```
(config-voip)# sbc general-setting
(sbc-gnrl-setting)# sbc-server-auth-mode local_mode
```

35.1.4 sbc-usr-reg-grace-time

This command provides support for adding extra time (graceful time) to the expiration timer of registered users in the device's Users Registration database.

Syntax:

```
sbc-usr-reg-grace-time <time in seconds>
```

The command's syntax format is described below:

Arguments	Description
time in seconds	Defines that local authentication is performed.
remote_server	Defines that authentication is performed remotely at an RFC 5090 compliant server.
sterman	Defines that authentication is performed according to *draft-sterman-aaa-sip-01*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example adds extra time to the expiration timer.

```
(config-voip)# sbc general-setting
(sbc-gnrl-setting)# sbc-usr-reg-grace-time 100
```

35.2 Admission Control

The following describes the Admission Control commands.

35.2.1 sbc-admission-control

This command defines the sbc-admission-control table.

Syntax:

```
sbc sbc-admission-control <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
Index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ ip-group-id ▪ limit ▪ limit-per-user ▪ limit-type ▪ max-burst ▪ rate ▪ request-direction ▪ request-type ▪ srd-id For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Limit Type to 'srd'.

```
(config-voip)# sbc sbc-admission-control 1
(sbc-admission-control-1)# limit-type srd
```

35.3 Allowed Coders Group

The following describes the Allowed Coders commands.

35.3.1 allowed-coders-group

This command defines the allowed-coders-group.

Syntax:

```
sbc allowed-coders-group AllowedCodersGroup<0-4> <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
Index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ name ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the name in the coder's group.

```
(config-voip)# sbc allowed-coders-group AllowedCodersGroup0 1
(AllowedCodersGroup0-1)# name j_brown
```

35.4 Routing SBC

The following commands describe Routing.

35.4.1 classification

This command defines the classification table.

Syntax:

```
# sbc routing classification <index>
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
parameter value	Sets the following table parameters: ▪ action-type ▪ defaults ▪ dst-host-prefix ▪ dst-user-name-prefix ▪ message-condition ▪ src-host-prefix ▪ src-ip-address ▪ src-ip-group-id ▪ src-port ▪ src-srd-id ▪ src-transport-type ▪ src-user-name-prefix For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Action Type to 'allow'.

```
(config-voip)# sbc routing classification 1
(classification-1)# action-type allow
```

35.4.2 condition-table

This command defines the condition table.

Syntax:

```
# sbc routing condition-table <index>
# <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
parameter value	Sets the following table parameters: ▪ condition ▪ description ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the description for the routing condition.

```
(config-voip)# sbc routing condition-table 1
(condition-table-1)# description Maintable 1
```

35.4.3 ip2ip-routing

This command defines the ip2ip-routing table.

Syntax:

```
sbc routing ip2ip-routing <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ alt-route-options ▪ cost-group ▪ defaults ▪ dst-address ▪ dst-host ▪ dst-ip-group-id ▪ dst-port ▪ dst-srd-id ▪ dst-transport-type ▪ dst-type ▪ dst-user-name-prefix ▪ group-policy ▪ message-condition ▪ re-route-ip-group-id ▪ request-type ▪ src-host ▪ src-ip-group-id ▪ src-user-name-prefix ▪ trigger For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Request Type to 'invite'.

```
(config-voip)# sbc routing ip2ip-routing 1
(ip2ip-routing-1)# request-type invite
```

35.4.4 sbc-alternative-routing-reasons

This command defines the sbc-alternative-routing-reasons table.

Syntax:

```
sbc routing sbc-alternative-routing-reasons <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ ReleaseCause ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Release Cause to '1'.

```
(config-voip)# sbc routing sbc-alternative-routing-reasons 1
(sbc-alternative-routing-reasons-1)# ReleaseCause 1
```

35.5 Manipulations SBC

The following describes the Manipulation SBC commands.

35.5.1 manipulations ip-inbound-manipulation

This command defines the inbound manipulations table.

Syntax:

```
sbc manipulations ip-inbound-manipulation <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ dst-host ▪ dst-user-name-prefix ▪ is-additional-manipulation ▪ leave-from-right ▪ manipulated-uri ▪ prefix-to-add ▪ purpose ▪ remove-from-left ▪ remove-from-right ▪ request-type ▪ src-host ▪ src-ip-group-id ▪ src-user-name-prefix ▪ suffix-to-add For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the number of channels associated with media services (announcements, conferencing).

```
(config-voip)# sbc manipulations ip-inbound-manipulation 1
(ip-inbound-manipulation-1) # media-channels 10
```

35.5.2 manipulations ip-outbound-manipulation

This command defines the outbound manipulations table.

Syntax:

```
sbc manipulations ip-outbound-manipulation <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ dst-host ▪ dst-ip-group-id ▪ dst-user-name-prefix ▪ is-additional-manipulation ▪ leave-from-right ▪ manipulated-uri ▪ prefix-to-add ▪ privacy-restriction-mode ▪ re-route-ip-group-id ▪ remove-from-left ▪ remove-from-right ▪ request-type ▪ src-host ▪ src-ip-group-id ▪ src-user-name-prefix ▪ suffix-to-add ▪ trigger For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Request Type to 'all'.

```
(config-voip)# sbc manipulations ip-outbound-manipulation 1
(ip-outbound-manipulation-1)# request-type all
```

This page is intentionally left blank.

36 Cloud Resilience Package (CRP) Commands

The following describes how to configure the Cloud Resilience Package.

36.1 crp-emerg-nb

This command defines emergency numbers for the CRP application. The device routes these calls received from the SIP server (IP Group 2) directly to the PSTN (IP Group 3). Up to four emergency numbers can be configured, where each number can include up to four digits.

Syntax:

```
crp {num1[,num2, num3, num4]}
```

Command Modes:

Enable

Examples:

The following example defines an emergency number.

```
(config-voip)# sbc general-setting
(sbc-gnrl-setting)# set crp-emerg-nb 911
```

This page is intentionally left blank.

37 SAS Commands

The following describes the SAS commands.

37.1 sasregistrationmanipulation

This command enables the SAS Registration Manipulation feature.

Syntax:

```
sas sasregistrationmanipulation <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ leave-from-right ▪ remove-from-right For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enables five digits from the right of the phone number, to be left for registration manipulation.

```
(config-voip) # sas sasregistrationmanipulation 0
(SASRegistrationManipulation-0)# leave-from-right 5
```

37.2 stand-alone-survivability

This command enables the Stand Alone Survivability feature.

Syntax:

```
sas stand-alone-survivability
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ defaults ▪ enable-enum ▪ rdcy-sas-proxy-set ▪ record-route ▪ sas-binding-mode ▪ sas-block-unreg-usrs ▪ sas-connection-reuse ▪ sas-contact-replace ▪ sas-default-gw-ip ▪ sas-emerg-nb ▪ sas-emerg-prefix ▪ sas-inb-manipul-md ▪ sas-local-sip-tcp-port ▪ sas-local-sip-tls-port ▪ sas-local-sip-udp-port ▪ sas-proxy-set ▪ sas-registration-time ▪ sas-subscribe-resp ▪ sas-survivability For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the survivability mode.

```
(config-voip) # sas stand-alone-survivability
(sip-sas-setting)# sas-survivability
```

38 IP Media Commands

The following describes the IP Media commands.

38.1 voice-streaming ivr

The following defines how to configure Voice Streaming settings.

Syntax:

```
voice-streaming ivr
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
<index>	Defines the table row index.
<parameter> <value>	Sets the following table parameters: ▪ allow-url-as-alias ▪ defaults ▪ enable ▪ enable-force-update ▪ play-coder ▪ profile ▪ record-coder ▪ use-aps-bundle For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example selects the profile for the Advanced Audio Syntax specification.

```
(config-voip)# voice-streaming ivr
(vs-ivr)# profile h2489
```

This page is intentionally left blank.

39 Services Commands

The following defines how to configure Services settings

39.1 SIP Recording

The following commands enable SIP-recording general settings.

39.1.1 enable-sip-rec

This command enables SIP recording functionality.

Syntax:

```
enable-sip-rec {on|off}
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enable SIP-recording general settings.

```
(config-voip)# services sip-recording general-setting
(sip-record-general-setting)# enable-sip-rec on
```

39.1.2 siprec-server-dest-username

This command defines the Recording Server (SRS) Destination Username.

Syntax:

```
siprec-server-dest-username <string>
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enable sip-recording general settings.

```
(config-voip)# services sip-recording general-setting
(sip-record-general-setting)# siprec-server-dest-username
siprecserv
```

39.1.3 sip-rec-routing

This command provides support for SIP-based media recording of call sessions and deines the calls to record.

Syntax:

```
services sip-recording sip-rec-routing {index|display|new}
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
display	Displays the configuration.
new	Adds a new line in first available index.

Note:

This command is applicable to the following products: Mediant 500, Mediant 8xx, Mediant 3000, Mediant 2600, and Mediant 4000.

Command Modes:

Enable

Examples:

The following example enable SIP-recording general settings.

```
(config-voip)# services sip-recording sip-rec-routing display
 sip-rec-routing 0
  recorded-ip-group-id 1
  recorded-src-prefix "*"
  recorded-dst-prefix "*"
  peer-ip-group-id -1
  peer-trunk-group-id -1
  caller peer-party
  srs-ip-group-id 3
```

39.2 LDAP

The following describes the Lightweight Directory Access Protocol (LDAP) commands.

39.2.1 ldap

This command defines the LDAP server table.

Syntax:

```
ldap <parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
Index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ ldapserverip ▪ cache ▪ defaults ▪ enable ▪ password ▪ search-dns ▪ search-dns-in-parallel ▪ server-domain-name ▪ server-max-respond-time ▪ server-port For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets LDAP server IP address.

```
(config-voip)# ldap
(ldap)# ldapserverip 10.5.5.12
```

39.2.2 ldap-servers-search-dns

This command defines the full path (i.e., distinguished name / DN) to the objects in the Active Directory where the query is done. Up to three DNs can be configured per LDAP server.

Syntax:

```
ldap-servers-search-dns {[0-1]/[0-5]|[0-1]|display}
```

Defaults:

NA

Command Modes:

Enable

Examples:

The following is an example of using this command.

```
(config-voip)# ldap
(ldap)# ldap-servers-search-dns display
```

39.3 Least Cost Routing

The following describes the Least Cost Routing commands.

39.3.1 services least-cost-routing cost-group-time-bands

This command enables the cost-group-time-bands table.

Syntax:

```
services least-cost-routing cost-group-time-bands <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ connection-cost ▪ cost-group ▪ defaults ▪ end-time ▪ minute-cost ▪ start-time ▪ timeband-index For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the Start Time for this timeband in ddd:hh:mm format.

```
(config-voip)# services least-cost-routing cost-group-time-bands 9
(cost-group-time-bands-9)# start-time Mon:08:00
```

39.3.2 services least-cost-routing routing-rule-groups

This command enables the routing-rule-groups table.

Syntax:

```
services least-cost-routing routing-rule-groups <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
Index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ defaults ▪ lcr-call-length ▪ lcr-default-cost ▪ lcr-enable For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the average call length used for Least Cost Routing calculations to 10000.

```
(config-voip)# services least-cost-routing routing-rule-groups 9
(routing-rule-groups-0)# lcr-call-length 10000
```

39.3.3 services least-cost-routing cost-group

This command enables the cost-group table.

Syntax:

```
services least-cost-routing cost-group <index>
<parameter> <value>
```

The command's syntax format is described below:

Arguments	Description
Index	Defines the table row index.
parameter value	Sets the following table parameters: ▪ cost-group-name ▪ default-connection-cost ▪ default-minute-cost ▪ defaults For a description of these parameters, refer to the *User's Manual*.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the cost-group-name to "cgroup1".

```
(config-voip)# services least-cost-routing cost-group 1
(cost-group-1)# cost-group-name cgroup1
```

Part IV

Data-Router Commands

40 Introduction

This part describes the commands located under the **configure data** mode. To access these commands, enter "**`configure data`**" at the Enabled mode prompt.

Note: This part is applicable only to the device's MSBR product line.

This page is intentionally left blank.

41 WAN Access Commands

41.1 General WAN Commands

41.1.1 interface

This command enters a specific interface configuration. Use the **no** form of this command to delete a specific interface.

Syntax:

The syntax of this command can include the following variations:

```
interface atm <group/subinterface[.vlanID[.vlanID]]>
interface bvi <bridge interface>
interface cellular <slot/port>
interface dot1radio <wifi interface>
interface dsl <slot/port>
interface e1 <slot/port>
interface efm [<slot/port>.vlanID}
interface fastEthernet <slot/port>
interface fiber <slot/port> [.vlanID][.vlanID]>
interface gigabitEthernet <slot/port[.vlanID]>
interface gigabitEthernet <slot/port>
interfcae gpon  [slot/port.vlanID]
interfcae gre  <Tunnel GRE ID>
interface ipip <Tunnel IPIP ID>
interface l2tp <L2TP ID>
interface loopback <Loopback interface ID>
interface multilink <Multilink interface ID>
interface serial <slot/port>
interface shdsl <slot/port>
interface pppoe <PPPoE interface ID>
interface pptp <PPTP ID>
interface t1 <slot/port>
interface vlan <vlanID>
interface vti <VTI interface ID>
```

The command's syntax format is described below:

Arguments	Description
slot	Defines the module slot index as shown on the front panel.
port	Defines the port index within the selected module.
atm	Defines the DSL group and subinterface number, separated by a slash (e.g., 0/0), (Vlan ID and second vlanID are optional).
bridge interface	Defines the Bridge Virtual Interface for Layer 3.
bvi	Defines the BVI bridge interface (1-255).
dot1radio	Defines the Wi-Fi interface (1-4).
dsl	Defines the ADSL/VDSL interface and slot/port.
e1	Defines the E1 slot and port.
efm	Defines the EFM interface slot and port (Vlan ID is optional).
fastEthernet	Defines the FastEthernet interface slot and port.
fiber interface	Defines the fibre interface (Vlan ID and second vlanID are optional).
gpon interface	Defines the GPON Interface.
l2tp id	Defines the L2TP ID (0 - 99).
loopback interface id	Defines the Loopback interface ID (1 - 20).
multilink interface id	Defines the Multilink interface ID (0 - 255).
pppoe	Defines the PPPoE interface ID (0 - 7).
pptp	Defines the PPTP ID (0 - 99).
serial <slot/port>	Defines the serial interface slot/port.
shdsl	Defines the SHDSL interface slot/port.
t1	Defines the T1 slot and port.
tunnel gre id	Defines the Tunnel GRE ID (1 - 255).
vti	Defines the VTI interface (1-255).
vlanID (VLAN interface)	Defines the VLAN ID for Layer 3 interfaces available via the LAN switch.
vlanID	Defines the VLAN ID for a Layer 3 sub interface.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example enters a specific interface configuration for the VLAN 6 menu.

```
(config-data)#interface vlan 6
```

The following example configures a bridge interface.

```
(config-data)#interface bvi 10
```

41.1.1.1 interface vti

This command defines the VTI interface.

Syntax:

```
interface vti <vti interface id>
```

The command's syntax format is described below:

Arguments	Description
vti interface id	Defines the VTI interface ID (1-255).

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the VTI interface.

```
(config-data)#interface vti 10
```

41.1.1.2 interface vlan

This command defines the VLAN ID.

Syntax:

```
interface vlan <vlan id>
```

The command's syntax format is described below:

Arguments	Description
vlan id	Defines the VLAN ID {1-3999[.vlanID}.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the VLAN ID.

```
(config-data)#interface vlan 200.100
```

41.1.1.3 interface t1

This command defines the T1 interface slot and port.

Syntax:

```
interface t1 [slot/port]
```

The command's syntax format is described below:

Arguments	Description
t1	Defines the T1 interface slot and port.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the T1 slot and port.

```
(config-data)#interface t1 2/2
```

41.1.1.4 interface serial

This command defines the serial interface slot and port.

Syntax:

```
interface serial [slot/port]
```

The command's syntax format is described below:

Arguments	Description
[slot/port]	Defines the serial interface slot and port.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the serial slot and port.

```
(config-data)#interface serial 2/2
```

41.1.1.5 interface loopback

This command defines the loopback interface identifier.

Syntax:

```
interface loopback <loopback interface id>
```

The command's syntax format is described below:

Arguments	Description
loopback interface id	Defines the loopback interface identifier (1-20).

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the loopback interface identifier.

```
(config-data)#interface loopback 10
```

41.1.1.6 interface multilink

This command defines the multilink interface identifier.

Syntax:

```
interface multilink <multilink interface id>
```

The command's syntax format is described below:

Arguments	Description
multilink interface id	Defines the multilink interface identifier (0-255).

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the multilink interface identifier.

```
(config-data)#interface multilink 100
```

41.1.1.7 interface gpon

This command defines the Gigabit Passive Optical Network (GPON) interface.

Syntax:

```
interface gpon [slot/port.vlanID]
```

The command's syntax format is described below:

Arguments	Description
slot/port.vlanID	Defines the GPON interface.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the GPON interface.

```
(config-data)#interface gpon 1/3.2
```

41.1.1.8 interface gigabitethernet

This command defines the GigabitEthernet interface slot and port.

Syntax:

```
interface gpon [slot/port.vlanID]
```

The command's syntax format is described below:

Arguments	Description
slot/port[.vlanID[.vlanID]]	Defines the GigabitEthernet interface slot and port (Vlan ID and second vlanID are optional).

Defaults:

NA

Command Modes:

Enable

Example:

- The following example enters a specific interface configuration for the WAN Interface menu.

```
(config-data)#interface gigabitEthernet 0/0
```

- The following example enters a specific interface configuration for the sub-Interface 3 menu.

```
(config-data)#interface gigabitEthernet 0/0.3
```

- The following example enters a specific interface configuration for the GigabitEthernet Physical Port 3 menu.

```
(config-data)#interface gigabitEthernet 4/3
```

41.1.1.9 interface fastethernet

This command defines the FastEthernet interface slot and port.

Syntax:

```
interface fastethernet [slot/port]
```

The command's syntax format is described below:

Arguments	Description
slot/port[.vlanID[.vlanID]]	Defines the FastEthernet interface slot and port.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enters a specific interface configuration for the FastEthernet Physical Port 3 menu.

```
(config-data)#interface fastEthernet 5/3
```

41.1.1.10 interface efm

This command defines the EFM interface slot and port.

Syntax:

```
interface efm [slot/port.vlanID]
```

The command's syntax format is described below:

Arguments	Description
slot/port.vlanID	Defines the EFM interface slot and port.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the EFM interface slot and port.

```
(config-data)#interface efm 5/3.1
```

41.1.1.11 interface e1

This command defines the E1 interface slot and port.

Syntax:

```
interface E1 [slot/port]
```

The command's syntax format is described below:

Arguments	Description
slot/port.vlanID	Defines the E1 interface slot and port.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the E1 interface slot and port.

```
(config-data)#interface e1 5/3
```

41.1.1.12 interface bvi

This command defines the BVI bridge interface.

Syntax:

```
interface bvi [bridge interface id]
```

The command's syntax format is described below:

Arguments	Description
bridge interface ID	Defines the BVI bridge interface.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures a bridge interface.

```
(config-data)#interface bvi 10
```

41.1.1.13 interface pppoe

This command creates a PPP-over-Ethernet (RFC 2516) interface.

Syntax:

The syntax of this command can include the following variations:

```
interface pppoe <PPPoE Interface ID>
```

The command's syntax format is described below:

Arguments	Description
PPPoE Interface ID	Defines the PPPoE Interface ID in the range of 0-7.

Defaults:

NA

Command Modes:

Enable

Example:

The following example creates a PPP-over-Ethernet interface.

```
(config-data)# interface pppoe 2
```

41.1.2 ip address

This command defines the primary IP address on the specified Layer 3 interface. Use the **no** form of this command to remove a configured IP address.

Syntax:

```
ip address <ip address> <subnet mask>
```

The command's syntax format is described below:

Arguments	Description
ip address	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).
<subnet mask>	Specifies the subnet mask that corresponds to a range of IP addresses. Subnet masks should be expressed in dotted decimal notation (e.g., 255.255.255.0).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the IP address of 10.4.2.3 255.255.0.0 on VLAN 6.

```
(conf-if-VLAN 6)#ip address 10.4.2.3  255.255.0.0
```

41.1.3 vrrp

This command provides for automatic assignment of available routers to participating hosts. This increases the availability and reliability of routing paths through automatic default gateway selections on a LAN.
The protocol achieves this by creating virtual routers, comprised of master and backup routers. VRRP routers use multicast to notify its presence in the LAN (never forwarding outside of the LAN).

VRRP is based on RFC 2338, 3768.

Syntax:

```
vrrp <VRID> ip <ip address>
vrrp <VRID> ip <ip address> secondary
vrrp <VRID> priority <priority>
vrrp <VRID> preempt
vrrp <VRID> advertisement-timer <time in seconds>
```

The command's syntax format is described below:

Arguments	Description
ip address	Sets the primary IP address for the VRID.
secondary	Sets secondary IP address for the VRID.
priority	Sets the priority for VRID. The range is 1-254.
preempt	Sets preemption for lower priority Master.
time in seconds	Sets interval timer for advertising the Master VRID

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how this command can be used.

```
# configure data
(config-data)# interface VLAN 1
(conf-if-VLAN 1)# vrrp 1 ip 10.100.1
(conf-if-VLAN 1)# vrrp 1 prioity 200
```

41.1.4 description

This command sets the description on the specified interface.

Syntax:

```
description <string>
```

The command's syntax format is described below:

Arguments	Description
string	Specifies the interface description using an alphanumerical string (up to 255 characters).

Defaults:

NA

Note:

- Use inverted commas when using the space character as part of the description.
- The string is limited to 255 characters.

Command Modes:

Enable

Example:

The following example sets the description on VLAN 6.

```
(conf-if-VLAN 6)# description vlan 6 interface
```

41.1.5 duplex

This command configures the duplex mode on the specified Layer 2 interface.

Syntax:

The syntax of this command can include the following variations:

```
duplex half
duplex full
duplex auto
```

The command's syntax format is described below:

Arguments	Description
half	Forces half duplex operation.
full	Forces full duplex operation.
auto	Enables AUTO duplex configuration.

Defaults:

Duplex is set to auto.

Command Modes:

Enable

Example:

The following example forces full duplex operation on GigabitEthernet 4/2.

```
(conf-if-GE 4/2)# duplex full
```

41.1.6 bind

This command binds VoIP applications (SIP & RTP) to a specific WAN interface.

Syntax:

The syntax of this command includes the following variations:

```
bind interface <ifname> <slot/port.vlanId> oamp
bind source-address interface <ifname> <slot/port.vlanId> oamp
bind vrf string oamp
bind vrf all-vrfs
```

The command's syntax format is described below:

Arguments	Description
all-vrfs	Enables to bind command to applications (e.g., OAMP).

ifname	Interface Type	Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Note:

This command automatically sets up port forwarding & static NAT rules for VOIP traffic. See Media realm and SIP interface for port definition.

Command Modes:

Enable

Related Commands:

bind

Example:

The following example will automatically create the necessary firewall rules to enable SIP signaling & RTP on the WAN interface GigabitEthernet 0/0. Ports should be pre-configured via Media realm and SIP interface.

```
(config-system)# bind interface gigabitethernet 0/0 oamp
```

41.2 Cellular 3G Modem Configuration Commands

This section defines Cellular 3G Modem Configuration.

41.2.1 interface cellular 0/0

On Mediant 800 MSBR devices with the appropriate hardware revision, this command allows defining an Internet connection via a cellular 3G modem connected to the USB port.

The command creates the cellular interface and enters the "conf-cellular" CLI context, where additional settings are available.

Syntax:

The syntax of this command is:

```
interface cellular 0/0
```

Defaults:

By default, the cellular interface is not configured.

Note:

The **shutdown**, **route default**, **napt**, **ppp user**, **ppp authentication** commands are applicable in the "conf-cellular" CLI context.

Command Modes:

Enable

Example:

The following example defines a cellular interface:

```
(config-data)# interface cellular 0/0
```

41.2.2 ppp authentication

This command defines the supported authentication protocols for PPP over cellular interface. For disabling authentication protocol use the command "`no ppp authentication <protocol>`".

Syntax:

The syntax of this command includes the following variations:

```
ppp authentication <protocol>
```

The command syntax format is described below:

Arguments	Description
pap	Defines the Password Authentication Protocol as PPP authentication protocol.
chap	Defines the Challenge Handshake Authentication Protocol as PPP authentication protocol.
ms-chap	Defines the Microsoft Challenge Handshake Authentication Protocol as PPP authentication protocol.
ms-chap2	Defines the Microsoft Challenge Handshake Authentication Protocol 2 as PPP authentication protocol.

Defaults:

All 4 authentication protocols are set as ON.

You can disable some protocol using "`no ppp authentication <protocol>`" command

Command Modes:

Enable

Example:

The following example disables the authentication protocol.

```
(conf-cellular)# no ppp authentication chap
```

41.2.3 apn

This command sets the Access Point Name (APN) used by the cellular interface.
This command is available in the “conf-cellular” configuration context.

Syntax:
The syntax of this command is:

```
apn <apn-string>
```

Defaults:
The default APN is “uinternet”.

Command Modes:
Enable

Example:
The following example sets the APN:

```
(conf-cellular)# apn internetg
```

41.2.4 phone

This command sets the telephone number (dial-string) used by the cellular interface.
This command is available in the “conf-cellular” configuration context.

Syntax:
The syntax of this command is:

```
phone <phone-string>
```

Defaults:
The default phone number is “*99#”.

Command Modes:
Enable

Example:
The following example sets the phone number:

```
(conf-cellular)# phone *99#
```

41.2.5 initstr

This command sets the initialization string for the cellular modem and is available in the "conf-cellular" configuration context.

Syntax:

The syntax of this command is:

```
initstr <init-string>
```

Defaults:

The default initialization string is "AT&F".

Command Modes:

Enable

Example:

The following example sets the initialization string:

```
(conf-cellular)# initstr ATC0D0
```

41.2.6 tty

This command selects the serial instance (TTY) for the cellular modem. Most modems provide multiple serial interfaces for diagnostic purposes, usually only one is appropriate for Internet access.

Setting "**tty first**" will use the first responsive serial interface. Setting "**tty last**" will use the highest numbered interface (default). Alternatively, a serial interface can be selected by number.

The recommended setting for **Sierra Wireless 308** modems is "tty 2".

The recommended setting for **Huawei E160 / E182E** modems is "tty 0".

The recommended setting for all other modems is the default "tty last".

This command is available in the "conf-cellular" configuration context.

Syntax:

The syntax of this command is:

```
tty <tty-value>
```

The commands syntax format is described below:

Arguments	Description
<tty-value>	Defines the "first", "last" or a number between 0 and 11. If set to **first**, the first responsive serial interface is used. If set to **last**, the highest numbered interface is used.

Defaults:

The default TTY value is "last".

Command Modes:

Enable

Example:

The following example sets the TTY instance:

```
(conf-cellular)# tty 0
```

41.2.7 pin

This command sets the 4-digit Personal Identification Number (PIN) code required for the SIM card installed in the modem.

Use the "no" form of this command to remove the PIN.

This command is available in the “conf-cellular” configuration context.

Syntax:

The syntax of this command is:

```
pin <code>
```

Defaults:

The default setting is "no pin".

Command Modes:

Enable

Example:

The following example sets the PIN code:

```
(conf-cellular)# pin 1234
```

41.2.8 backup monitoring

This command selects which of the device's other interfaces, needs to be monitored.

This command configures the cellular 3G connection in “backup” mode, where the connection is initiated only if another interface goes down.

To return to “primary” mode – where the cellular 3G connection is always up – use the “no” form of this command.

This command is available in the “conf-cellular” configuration context.

Syntax:

The syntax of this command is:

```
backup monitoring <if-type> <if-index>
```

The commands syntax format is described below:

Arguments	Description
if-type	Defines the Interface Type, e.g. GigabitEthernet or ATM
if-index	Defines the Interface Index, e.g. 0/0

Defaults:

The default operation mode is *primary WAN*, i.e. “no backup monitoring”.

Command Modes:

Enable

Example:

The following example sets cellular backup mode:

```
(conf-cellular)# backup monitoring GigabitEthernet 0/0
```

41.2.9 sms

This command provides support for sending an SMS text message through a 3G cellular connection. Cellular connectivity is achieved by attaching a third-party, 3G cellular modem to the device's USB port.

Syntax:

```
sms <mobile number> "<message text>"
```

The command's syntax format is described below:

Arguments	Description
<mobile number>	Defines the destination phone number.
<message text>	Defines the message text which can include up to 127 characters and must be enclosed in double quotes (").

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sends a text message to a mobile phone.

```
(config-data)# interface cellular 0/0
(conf-cellular)# shutdown
(conf-cellular)# sms 0546342171 "Hello John Doe!"
```

41.3 ADSL/VDSL Commands

The following describes ADSL/VDSL commands.

41.3.1 interface DSL 0/0

Asymmetric Digital Subscriber Line (ADSL) and VDSL (Very high-speed DSL) are popular WAN access technologies using copper wire pairs.

On appropriate hardware variants of the device, this command defines the physical properties of the ADSL/VDSL interface.

Once the physical layer is configured:

- For ADSL, proceed to ATM interfaces using the command "**interface atm**".
- For VDSL, proceed to configure WAN Ethernet using the command "**interface GigabitEthernet 0/0**".

Syntax:

The syntax of this command is:

```
interface dsl <slot>/<port>
```

The commands syntax format is described below:

Arguments	Description
<slot>	Defines the location of the ADSL hardware mezzanine. Must be 0.
<port>	Defines the location of the ADSL hardware mezzanine. Must be 0.

Defaults:

By default, the DSL interface is not defined.

Command Modes:

Enable.

Example:

The example below describes how to define the DSL interface.

```
(config data)# interface dsl 0/0
```

41.3.2 mode

This command selects the DSL mode of operation (ADSL or VDSL).

Syntax:

The syntax of this command is:

```
mode {adsl|vdsl}
```

The commands syntax format is described below:

Arguments	Description
adsl	Selects ADSL access technology.
vdsl	Selects VDSL access technology.

Defaults:

The default setting is ATM.

Command Modes:

Enable

Example:

The following example defines an ADSL interface:

```
(conf-shdsl)# mode adsl
```

41.4 Fiber Optic Commands

The commands below describes Fiber Optic.

41.4.1 interface fiber

This command enters a specific interface configuration. Use the **no** form of this command to delete a specific interface.

Syntax:

The syntax of this command can include the following variations:

```
interface fiber <slot/port>
interface fiber <slot/port[.vlanID]>
```

The command's syntax format is described below:

Arguments	Description
slot	Defines the module slot index as shown on the front panel.
port	Defines the port index within the selected module.
vlanID	Defines the VLAN ID for a Layer 3 sub interface.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enters a specific interface configuration for the WAN Interface menu.

```
(config-data)#interface fiber 0/3
```

The following example enters a specific interface configuration for the sub-Interface 3 menu.

```
(config-data)#interface fiber 0/3.3
```

41.5 SHDSL Commands

The commands below describes SHDSL.

41.5.1 interface SHDSL 0/0

Symmetric High-speed Digital Subscriber Line (SHDSL, sometimes called G.SHDSL) is a popular WAN access technology using copper wire pairs.

The purpose of this command is to configure physical-layer properties of SHDSL, such as the number of wire-pairs in use. See the sub-commands "**mode**" and "**group**" for additional information.

Once the physical layer is configured, proceed to ATM interfaces using the command "**interface atm**".

Note: The commands described in Sections 40 on page 689 to Section 42.3 on page 825 are also applicable to the SHDSL interface.

Syntax:

The syntax of this command is:

```
interface shdsl <slot>/<port>
```

The commands syntax format is described below:

Arguments	Description
slot	Defines the location of the SHDSL hardware mezzanine. Must be 0.
port	Defines the location of the SHDSL hardware mezzanine.

Defaults:

The system will attempt to detect the correct configuration automatically, by sensing line connectivity and negotiating connection parameters with the Internet Service Provider.

Command Modes:

Enable

Example:

The example below describes how to define the SHDSL interface.

```
(config-data)# interface shdsl 0/0
```

41.5.2 mode

This command selects the SHDSL mode of operation (ATM or EFM).

Syntax:

The syntax of this command is:

```
interface shdsl 0/0
    mode {atm|efm}
```

The commands syntax format is described below:

Arguments	Description
Atm	Selects ATM mode of operation.
Efm	Selects Ethernet-in-the-First-Mile (EFM) operation.

Defaults:

The default setting is ATM.

Command Modes:

Enable

Example:

The following example defines ATM on the SHDSL interface:

```
(conf-shdsl)# mode atm
```

41.5.3 group

This command defines an SHDSL group of wires. Use the "**no**" form of this command to delete a previously-defined group.

Syntax:

The syntax of this command is:

```
interface shdsl 0/0
    [no] group <group-id>
```

The commands syntax format is described below:

Arguments	Description
<group-id>	Defines the range as 0 to 3.

Defaults:

By default, four SHDSL groups are defined, each with a single wire-pair; the system will attempt to detect changes on the physical medium and adapt configuration accordingly.

Command Modes:

Enable

Example:

The following example defines one group:

```
(conf-shdsl)# group 0
```

41.5.4 pairs

This command selects the wire-pairs which participate in an SHDSL group.

Syntax:

The syntax of this command is:

```
interface shdsl 0/0
    group <group-id>
          pairs <list of wire-pair numbers>
```

The commands syntax format is described below:

Arguments	Description	
	Defines the wire-pair numbers (0 to 3), separated by commas. Examples:	
list of wire-pair numbers	pairs 0	Defines a simple two-wire connection using the first wire pair.
	pairs 0,1	Defines a multiple pair (m-pair) connection using wire pairs.
	pairs 0,1,2,3	Defines a multiple pair (m-pair) connection using all four wire-pairs. Pair 0 is the master pair for this group.

Defaults:

By default, four SHDSL groups are defined, each with a single wire-pair; the system will attempt to detect changes on the physical medium and adapt configuration accordingly.

Command Modes:

Enable

Example:

The following example defines a group of two wire-pairs:

```
(conf-shdsl-0)# pairs 0,1
```

41.5.5 termination

This command selects the type of line termination on an SHDSL group.

Syntax:

The syntax of this command is:

```
interface shdsl 0/0
    group <group-id>
          termination {cpe|co}
```

The commands syntax format is described below:

Arguments	Description
cpe	Selects STU-R mode (SHDSL Remote Terminal)
co	Selects STU-C mode (SHDSL Central Office Terminal) **Note:** CO mode is unsupported and available for diagnostic purposes only; the system cannot be used as a DSLAM.

Defaults:

The default is CPE mode.

Command Modes:

Enable

Example:

The following example defines CPE mode:

```
(conf-shdsl-0)# termination cpe
```

41.5.6 linerate

This command selects the line rate of each wire-pair in an SHDSL group.

Syntax:

The syntax of this command can include the following variations:

```
interface shdsl 0/0
    group <group-id>
          linerate auto
          linerate kbps <min-rate> <max-rate>
```

The commands syntax format is described below:

Arguments	Description
auto	Automatically negotiates the Line rate. Up to 5696 Kbps per wire-pair.
<min-rate>	Defines the minimum line rate in kilobits per second. The lowest supported rate is 432 Kbps.
<max-rate>	Defines the maximum line rate in kilobits per second. The highest supported rate is 5696 Kbps.

Defaults:

The default is setting is **auto**.

Command Modes:

Enable

Example:

The following example selects automatic line rate:

```
(conf-shdsl-0)# linerate auto
```

41.5.7 annex

This command selects the regional annex (as defined in ITU-T recommendation G.991.2) for an SHDSL group.

Note: Annex F is identical to Annex A, with extended line rates up to 5696 Kbps. Similarly, Annex G is identical to Annex B with extended line rates up to 5696 Kbps.

Syntax:

The syntax of this command is:

```
interface shdsl 0/0
    group <group-id>
          annex {a|b}
```

The commands syntax format is described below:

Arguments	Description
a	Selects G.991.2 regional annex A / F.
b	Selects G.991.2 regional annex B / G.

Defaults:

The default setting is **annex a**.

Command Modes:

Enable

Example:

The following example selects regional annex A:

```
(conf-shdsl-0)# annex a
```

41.5.8 interface atm

This command defines an ATM sub-interface for Internet access over SHDSL. An ATM sub-interface provides IP services over a Permanent Virtual Circuit (PVC) defined by the ATM network administrator.

Syntax:

The syntax of this command is:

```
interface atm <group-id>/<sub-id>
```

The commands syntax format is described below:

Arguments	Description
group-id	Defines the number of the SHDSL group (0-3) defined by the "**group**" command.
sub-id	Defines the sub-interface number (0 to 7). **Note:** The system supports up to a total of eight ATM interfaces in all SHDSL groups.

Defaults:

By default, no ATM interfaces are defined.

Command Modes:

Enable

Example:

The following example defines an ATM interface:

```
(config-data)# interface atm 0/0
```

41.5.9 pvc

This command defines the Permanent Virtual Circuit (PVC) associated with an ATM sub-interface.

Syntax:

The syntax of this command is:

```
interface atm <group-id>/<sub-id>
    pvc <vpi>/<vci>
```

The commands syntax format is described below:

Arguments	Description
<vpi>	Defines the Virtual Path Identifier code (0 to 256).
<vci>	Defines the Virtual Connection Identifier code (32 to 65535).

Defaults:

By default, no ATM interfaces are defined.

Command Modes:

Enable

Example:

The following example defines an ATM interface with VPI 8, VCI 48:

```
(conf-atm0/0)# pvc 8/48
```

41.5.10 encapsulation

This command defines the type of IP encapsulation used on an ATM sub-interface.

Syntax:

The syntax of this command includes the following variations:

```
interface atm <group-id>/<sub-id>
    encapsulation {ipoa|ethoa|pppoa}-{mux|snap}
    encapsulation pppoe
    encapsulation pppoe-mux
```

The commands syntax format is described below:

Arguments	Description
ipoa	Selects the **IP-over-ATM**, in RFC 2684 "*Routed*" mode.
ethoa	Selects the **Ethernet-over-ATM**, in RFC 2684 "*Bridged*" mode.
pppoa	Selects **PPP over ATM** client (defined in RFC 2364)
snap	Selects **AAL5 LLC/SNAP** mode. A LLC header is used to describe the type of payload transmitted
mux	Selects **AAL5 VC-multiplexed** mode, data is not prepended with an LLC header
pppoe	Selects **PPPoE over ATM** in LLC/SNAP mode (i.e., PPPoE client on top of **ethoa-snap** encapsulation)
pppoe-mux	Selects **PPPoE over ATM** in VC-multiplexed mode (PPPoE client on top of **ethoa-mux** encapsulation)

Defaults:

By default, no ATM interfaces are defined.

Command Modes:

Enable

Example:

The following example defines an ATM interface with RFC 2684 "*Routed*" encapsulation, with LLC/SNAP headers:

```
(conf-atm0/0)# encapsulation ipoa-snap
```

41.5.11 ubr / cbr / vbr

This command defines the ATM service class for an ATM sub-interface.

Syntax:

The syntax of this command includes the following variations:

```
interface atm <group-id>/<sub-id>
    ubr <peak-kbps>
    cbr <peak-kbps>
    vbr <peak-kbps> <sustained-kbps> <burst-cells>
```

The commands syntax format is described below:

Arguments	Description
ubr	Defines Unspecified Bit Rate; no bandwidth is reserved for this interface. Traffic may be limited by a peak rate.
cbr	Defines Constant Bit Rate; bandwidth is reserved according to the specified rate. Traffic cannot exceed the specified rate.
vbr	Defines Variable Bit Rate; bandwidth is reserved according to the configured sustained rate. Traffic may exceed the sustained rate up to the peak rate, but is further limited by a maximum number of burst cells.
<peak-kbps>	Defines the Maximum data rate in kilobits per second
<sustained-kbps>	Defines the Sustained data rate in kilobits per second
<burst-cells>	Defines the maximum number of cells allowed in excess of the sustained rate

Defaults:

The default setting is **UBR** with unlimited traffic rate.

Command Modes:

Enable

Example:

The following example defines an ATM interface with a constant bit-rate traffic class, allowing bandwidth of 4 megabits per second:

```
(conf-atm0/0)# cbr 4096
```

41.5.12 ppp user

This command defines the PPPoA / PPPoE username and password for an ATM sub-interface.

Syntax:

The syntax of this command is:

```
interface atm <group-id>/<sub-id>
ppp user <username> pass <password>
```

The commands syntax format is described below:

Arguments	Description
<username>	Defines the PPP user name.
<password>	Defines the PPP password.

Defaults:

This command has no defaults.

Command Modes:

Enable

Example:

The following example defines a PPPoA ATM interface:

```
(conf-atm0/0)# ppp user admin pass 12345
```

41.5.13 T1 WAN Commands

This section describes the commands for the T1 WAN interface. The T1 WAN interface is one of three WAN interfaces of the Mediant 500 MSBR, Mediant 800 MSBR and Mediant 1000 MSBR.

The other WAN interfaces are SHDSL (see Section 41.5 on page 725) and the Ethernet WAN interface (see the relevant sections above).

The T1 WAN interface supports up to two physical T1 ports; 0 and 1.

This section includes the following topics:

- T1 Physical Interfaces. See below.
- Serial Interfaces. See Section 41.5.15 on page 747.
- Multilink Interfaces (MLP over T1 WAN). See Section 41.5.16 on page 762.

The commands described in the above (Sections 40 on page 689 to Section 42.3 on page 825) are also applicable to the T1 WAN interface.

41.5.14 T1 Physical Interfaces

This section describes the WAN T1 Physical Interface commands.

Note: You can configure the WAN T1 physical interface and the WAN serial interface on the same physical WAN port, where the same identifier <slot>-<port> is specified for both interfaces. In the examples described in this section and in section 41.5.15 on page 747, <slot> / <port> is specified as either '0/0' and '0/1'.

41.5.14.1 channel-group

This command specifies the active TDM slots within the T1 frames.

Syntax:

The syntax of this command can include the following variations:

```
channel-group <slot number>,<slot number>
channel-group <slot number>-<slot number>
```

The command's syntax format is described below:

Arguments	Description
<slot number>	Defines the slot number within the range 1-24.

Defaults:

By default all slots are active → 1-24.

Command Modes:

Enable

Example:

The following example sets active slots 2, 4 and 17, 18, 19 on t1 port 0/0.

```
(conf-if-t1 0/0)# channel-group 2, 4, 17-19
```

41.5.14.2 clock-source

This command specifies the clock source on the current T1 interface.

Syntax:

The syntax of this command is:

```
clock-source <source>
```

The command's syntax format is described below:

Arguments	Description
<source>	Defines the source of the clock: ▪ 'internal' – clock is taken locally from WIC itself ▪ 'line' – clock is taken from the line i.e., from the remote side

Defaults:

By default, the clock source is 'line'.

Command Modes:

Enable

Example:

The following example sets clock source to the internally generated on T1 Port 0/1:

```
(conf-if-t1 0/1)# clock-source internal
```

41.5.14.3 framing-method

This command specifies the framing method on the current T1 interface.

Syntax:

The syntax of this command is:

```
framing-method <framing mode>
```

The command's syntax format is described below:

Arguments	Description
<framing mode>	Defines the framing method: ▪ 'esf' – extended super frame (F24) ▪ 'sf' – superframe (D4)

Defaults:

By default, the framing method is 'esf'.

Command Modes:

Enable

Example:

The following example sets the framing method to superframe (D4) on t1 port 0/0:

```
(conf-if-t1 0/0)# framing-method sf
```

41.5.14.4 line-code

This command specifies the line coding on the current T1 interface.

Syntax:

The syntax of this command is:

```
line-code <line code>
```

The command's syntax format is described below:

Arguments	Description
<line code>	Defines the line code: ▪ 'ami' – Alternate Mark Inversion encoding ▪ 'b8zs' – Bipolar Eight Zero Substitution encoding

Defaults:

By default, the framing method is 'bz8s'.

Command Modes:

Enable

Example:

The following example sets the line code to 'ami' on t1 port 0/1:

```
(conf-if-t1 0/1)# line-code ami
```

41.5.14.5 line-buildout-loss

This command specifies the buildout loss on the current T1 interface.

Syntax:

The syntax of this command is:

```
line-buildout-loss <loss>
```

The command's syntax format is described below:

Arguments	Description
<loss>	Defines the line buildout loss [dB]: ▪ 0 dB ▪ -7.5 dB ▪ -15 dB ▪ -22.5 dB

Defaults:

By default, the line buildout loss is 0 dB.

Command Modes:

Enable

Example:

The following example sets the line buildout loss to -7.5 dB on t1 port 0/0:

```
(conf-if-t1 0/0)# line-buildout-loss -7.5
```

41.5.14.6 max-cable-loss

This command specifies the loss due to cable length on the current T1 interface.

Syntax:

The syntax of this command is:

```
max-cable-loss <loss>
```

The command's syntax format is described below:

Arguments	Description
<loss>	Defines the cable loss [dB]: ▪ 0.6 dB – Cable length 0-133ft ▪ 1.2 dB – Cable length 134-266ft ▪ 1.8 dB – Cable length 267-399ft ▪ 2.4 dB – Cable length 400-533ft ▪ 3 dB – Cable length 534-655ft

Defaults:

By default, the maximum cable loss is 0.6 dB.

Command Modes:

Enable

Example:

The following example sets the cable loss to 3 dB on T1 Port 0/1:

```
(conf-if-t1 0/1)# max-cable-loss 3
```

41.5.14.7 loopback

This command specifies loopback on the current T1 WAN interface.

Syntax:

The syntax of this command is:

```
loopback <traffic source> <loopback location>
loopback <traffic source> <loopback location> <timeout>
```

The command's syntax format is described below:

Arguments	Description
<traffic source>	Defines the traffic source to be looped back: ▪ 'remote' – loopback ingress traffic. ▪ 'local' – loopback egress traffic.
<loopback location>	Defines where the loop is performed in the T1 WAN Interface: ▪ 'line' – loop is done in the csu.
<timeout>	On the local loopback only. Specifies the timeout (in seconds) after the local loopback releases. Default timeout is 180 seconds.

Defaults:

By default, there is no loopback.

Command Modes:

Enable

Example:

The following example set the remote line loopback on T1 Port 0/0.

```
(conf-if-t1 0/0)# loopback remote line
```

41.5.14.8 ber-test

This command specifies the Bit Error Rate test on the current T1 WAN interface.

Syntax:

The syntax for this command includes several variations:

```
ber-test <channels group> <error rate> <pattern type>
ber-test <channels group> <error rate> <pattern type> <timeout>
ber-test <channels group> <error rate> <pattern type> forever
```

The command's syntax format is described below:

Arguments	Description
<channels group>	▪ Specifies the slot number within the range 1-24, on which the BER test runs. (See **channel-group** command for examples).
<error rate>	Specifies the rate of injected errors to the BER interface: ▪ 0 – no errors injected. ▪ 1 – inject errors in rate of 10^{-1}. ▪ 2 – inject errors in rate of 10^{-2}. ▪ 3 – inject errors in rate of 10^{-3}. ▪ 4 – inject errors in rate of 10^{-4}. ▪ 5 – inject errors in rate of 10^{-5}. ▪ 6 – inject errors in rate of 10^{-6}. ▪ 7 – inject errors in rate of 10^{-7}.
<pattern type>	Specifies the pattern type: ▪ '1-2' - select 01 Sequence as BER pattern ▪ '1-4' - select 0001 Sequence as BER pattern ▪ '1-8' - select 00000001 Sequence as BER pattern ▪ '3-24' - select 3 '1's with 21 '0's Sequence as BER pattern ▪ 'all-0' - select all 0 Sequence as BER pattern ▪ 'all-1' - select all 1 Sequence as BER pattern ▪ 'qrss' - select Quasi-Random Signal Sequence as BER pattern
<timeout>	Specifies the time that the BER test will run for, in seconds. The default value is 180 seconds. For running the BER test with no time limitation, select the '*forever*' value for this field.

Defaults:

By default, the BER test is not active.

Note:

- This command is supported on the T1-WAN interface only.
- The user needs to make a loopback at the FarEnd, in order to have synchronous BER test patterns.
- Running the BER test with an error rate of 10^{-1} might cause the data not to synchronize. So the BER won`t count bits or errors.

Command Modes:

Enable

Example:

The following example starts the BER test for Channels 1-20 and Channel 22, with error rate of 10^{-3} and pattern type QRSS, which has no timeout:

```
(conf-if-t1 0/0)# ber-test 1-20, 22 3 qrss forever
```

The following example starts the BER test for Channels 1,2 and 10-15, no errors injected, pattern type 3-24, and default timeout (180 seconds):

```
(conf-if-t1 0/0)# ber-test 1, 2, 10-15 0 3-24
```

41.5.15 Serial Interfaces

This section describes the WAN serial interface commands.

Note: You can configure the WAN serial interface and the WAN T1 physical interface on the same physical WAN port, where the same identifier <slot>-<port> is specified for both interfaces. In the examples described in this section and in section **41.5.14** on page 737, <slot> / <port> is specified as either '0/0' and '0/1'.

41.5.15.1 serial-protocol

This command specifies the encapsulating protocol on the serial interface.

Syntax:

The syntax of this command is as follows:

```
serial-protocol <protocol>
```

The command's syntax format is described below:

Arguments	Description
protocol *bundle id parameter is for mlp only.	Defines the encapsulating protocol: ▪ 'hdlc' – set hdlc protocol ▪ 'ppp' – set ppp protocol ▪ 'mlp' – set multilink ppp protocol and associates the serial interface to a logical bundle id.

Defaults:

By default, there is no encapsulating protocol set on the serial interface.

Command Modes:

Enable

Example:

The following example sets PPP as the encapsulating protocol on the serial interface 0/0:

```
(conf-if-serial 0/0)#serial-protocol ppp
```

To remove the protocol, type 'no' at the prefix of the command.

The following example sets HDLC as the encapsulating protocol on the serial interface 0/0:

```
(conf-if-serial 0/0)#serial-protocol hdlc
```

To remove the protocol, type 'no' at the prefix of the command.

The following example sets MLP as the encapsulating protocol on the serial interface 0/1 and associates the serial interface to a logical bundle identified by id 0:

```
(conf-if-serial 0/1)#serial-protocol mlp 0
```

To remove the protocol, type 'no' at the command prefix.

41.5.15.2 ip address (HDLC over T1)

This command specifies the IP address and subnet mask of the HDLC serial interface.

Syntax:

The syntax of this command is as follows:

```
ip address <a.b.c.d> <e.f.g.h>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the static local IP address set on this HDLC serial interface.
e.f.g.h	Defines the static subnet mask set on this HDLC serial interface.

Defaults:

By default, the IP address is 1.1.1.1 and the subnet mask is 255.255.255.0.

Command Modes:

Enable

Example:

The following example sets IP address 223.4.5.6 on HDLC encapsulated serial interface 0/0:

```
(conf-if-serial-hdlc 0/0)# ip address 223.4.5.6 255.255.255.252
```

41.5.15.3 ip dns-server (HDLC over T1)

This command specifies the primary and secondary DNS servers to be used by this HDLC serial interface.

Syntax:

The syntax of this command is as follows:

```
ip dns-server <a.b.c.d> [e.f.g.h]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the IP address of the primary DNS server.
e.f.g.h	Defines the IP address of the secondary DNS server.

Defaults:

By default, no DNS servers are defined for the HDLC serial interface.

Command Modes:

Enable

Example:

The following example sets IP address 223.4.5.6 on the HDLC encapsulated serial interface 0/0:

```
(conf-if-serial-hdlc 0/0)# ip dns-server 10.1.1.10 10.1.1.11
```

41.5.15.4 ip mtu (HDLC over T1)

This command specifies the maximum transfer unit value to be used by this HDLC serial interface.

Syntax:

The syntax of this command is as follows:

```
ip mtu <mode> <value>
```

The command's syntax format is described below:

Arguments	Description
<mode>	Defines the mtu mode to be used: ▪ 'automatic' – Sets to default value 1500 bytes. ▪ 'manual' – Sets manually according to the following value.
<value>	Defines the MTU in manual mode (68-1500).

Defaults:

By default the mtu is set to 1500 bytes.

Command Modes:

Enable

Example:

The following example sets the mtu to 1400 bytes:

```
(conf-if-serial-hdlc 0/0)# ip mtu manual 1400
```

41.5.15.5 ip address (PPP over T1)

This command specifies the IP addressing mode of the PPP serial interface.

Syntax:

The syntax of this command is:

```
ip address <mode> <a.b.c.d> <e.f.g.h>
```

The command's syntax format is described below:

Arguments	Description
Mode	Defines the PPP IP addressing modes: ▪ 'automatic' – IP address will be accepted from peer during IPCP negotiation. ▪ 'manual' – set local static IP address and optional subnet mask. ▪ 'unnumbered' – use unnumbered mode (PPP serial interface uses LAN interface ip address).
a.b.c.d	Defines the static local IP address set on this PPP serial interface – relevant for manual mode only.
e.f.g.h	Defines the optional static subnet mask set on this PPP serial interface - relevant for manual mode only.

Defaults:

By default the IP addressing is automatic.

Command Modes:

Enable

Example:

The following example sets IP address 223.4.5.6 on PPP encapsulated serial interface 0/0:

```
(conf-if-serial-ppp 0/0)# ip address manual 223.4.5.6
```

The following example sets IP addressing mode to automatic on PPP encapsulated serial interface 0/0:

```
(conf-if-serial-ppp 0/0)# ip address automatic
```

41.5.15.6 ip dns-server (PPP over T1)

This command specifies the primary and secondary DNS servers to be used by this PPP serial interface.

Syntax:

The syntax of this command is as follows:

```
ip dns-server <mode> <a.b.c.d> <e.f.g.h>
```

The command's syntax format is described below:

Arguments	Description
mode	Defines the DNS servers addressing modes: ▪ 'automatic' – DNS servers' IP addresses will be accepted from peer during PPP negotiation. ▪ 'manual' – set static DNS servers' IP address
a.b.c.d	Defines the IP address of the primary DNS server - relevant only for manual mode.
e.f.g.h	Defines the IP address of the optional secondary DNS server- relevant only for manual mode.

Defaults:

By default no DNS servers are defined for the PPP serial interface.

Command Modes:

Enable

Example:

The following example sets the static DNS servers' IP addresses on the PPP encapsulated serial interface 0/0:

```
(conf-if-serial-ppp 0/0)# ip dns-server manual 10.1.1.10 10.1.1.11
```

41.5.15.7 ip mtu (PPP over T1)

This command specifies the maximum transfer unit value to be used by this PPP serial interface.

Syntax:

The syntax of this command is as follows:

```
ip mtu <mode> <value>
```

The command's syntax format is described below:

Arguments	Description
mode	Defines the MTU mode to be used: ▪ 'automatic' – Set to default value 1500 bytes. ▪ 'manual' – Set manually according to following value.
value	Defines the MTU in manual mode (68-1500).

Defaults:

By default, the MTU is set to 1500 bytes.

Command Modes:

Enable

Example:

The following example sets the mtu to 1400 bytes:

```
(conf-if-serial-ppp 0/0)# ip mtu manual 1400
```

41.5.15.8 authentication chap (PPP/MLP over T1)

This command enables Challenge Handshake Authentication Protocol (CHAP) to be used by this PPP/MLP serial interface.

Syntax:

The syntax of this command is as follows:

```
authentication chap
```

The command's syntax format is described below:

Arguments	Description
'no' at prefix of command	Disables CHAP on this PPP/MLP serial interface.

Defaults:

By default CHAP is enabled

Command Modes:

Enable

Example:

The following example enables CHAP:

```
(conf-if-serial-ppp 0/0)# authentication chap
```

41.5.15.9 authentication pap (PPP/MLP over T1)

This command enables Password Authentication Protocol (PAP) to be used by this PPP/MLP serial interface.

Syntax:

The syntax of this command is as follows:

```
authentication pap
```

The command's syntax format is described below:

Arguments	Description
'no' at prefix of command	Disables PAP on this PPP/MLP serial interface.

Defaults:

By default, PAP is enabled.

Command Modes:

Enable

Example:

The following example enables PAP on the MLP serial interface 0/0:

```
(conf-if-serial-mlp 0/0)# authentication pap
```

41.5.15.10 authentication ms-chap (PPP/MLP over T1)

This command enables Microsoft Challenge Handshake Authentication Protocol (MS-CHAP) to be used by this PPP/MLP serial interface

Syntax:

The syntax of this command is as follows:

```
authentication ms-chap
```

The command's syntax format is described below:

Arguments	Description
'no' at prefix of command	Disables MS-CHAP on this PPP/MLP serial interface.

Defaults:

By default, MS-CHAP is enabled.

Command Modes:

Enable

Example:

The following example enables MS-CHAP:

```
(conf-if-serial-ppp 0/0)# authentication ms-chap
```

41.5.15.11 authentication ms-chap2 (PPP/MLP over T1)

This command enables Microsoft Challenge Handshake Authentication Protocol Version 2 (MS-CHAP2) to be used by this PPP/MLP serial interface.

Syntax:

The syntax of this command is as follows:

```
authentication ms-chap2
```

The command's syntax format is described below:

Arguments	Description
'no' at prefix of command	Disables MS-CHAP2 on this PPP/MLP serial interface.

Defaults:

By default, MS-CHAP2 is enabled.

Command Modes:

Enable

Example:

The following example describes MS-CHAP2:

```
(conf-if-serial-ppp 0/0)# authentication ms-chap2
```

41.5.15.12 authentication username (PPP/MLP over T1)

This command sets the username to be used by this PPP/MLP serial interface during the authentication phase of the PPP negotiation.

Syntax:

The syntax of this command is as follows:

```
authentication username <username>
```

The command's syntax format is described below:

Arguments	Description
username	Defines the username string

Defaults:

By default, the username is set to 'user'.

Command Modes:

Enable

Example:

The following example sets the username on the PPP serial interface 0/0:

```
(conf-if-serial-ppp 0/0)# authentication username JohnA
```

41.5.15.13 authentication password (PPP/MLP over T1)

This command sets the password to be used by this PPP/MLP serial interface during the authentication phase of the PPP negotiation.

Syntax:

The syntax of this command is as follows:

```
authentication password <password>
```

The command's syntax format is described below:

Arguments	Description
<password>	Defines the password string

Defaults:

By default, password is set to 'password'.

Command Modes:

Enable

Example:

The following example sets the password on the MLP serial interface 0/1:

```
(conf-if-serial-mlp 0/1)# authentication password qwerty
```

41.5.15.14 multilink bundle-id (MLP over T1)

This command associates the current MLP serial interface to a virtual bundle id. Setting more than one serial interface to the same bundle id bonds both interfaces under the same virtual bundle.

Note: You can configure an identical virtual bundle for the MLP over T1 serial WAN interface and the Multilink WAN interface, where <bundle-id> is specified for both interfaces. In the example below and in the example in Section 41.5.16.2 on page 763, <bundle-id> is specified as '8'.

Syntax:

The syntax of this command is as follows:

```
multilink bundle-id <id>
```

The command's syntax format is described below:

Arguments	Description
<id>	Defines the bundle-id (0-255).

Defaults:

No default value exists; you must specify a bundle id.

Command Modes:

Enable

Example:

The following example associates a MLP serial interface 0/1 to logical bundle 0:

```
(conf-if-serial-mlp 0/1)#multilink bundle-id 8
```

41.5.16 Multilink Interfaces (MLP over T1 WAN)

This section describes the Multilink interfaces commands. The multilink interface holds all relevant data characteristics for a virtual bundle of MLP interface/s.

41.5.16.1 napt

This command sets the NAPT (Network Address Port Translation) on the Multilink interface.

Syntax:

The syntax of this command is as follows:

```
napt
```

Defaults:

By default T1 interfaces use NAPT.

Command Modes:

Enable

Example:

The following example sets the Multilink interface 0 to use NAPT:

```
(conf-if-multilink 0)#napt
```

41.5.16.2 ppp bundle-id

This command associates the current multilink interface with a virtual bundle id number.

Note: You can configure an identical virtual bundle for the multilink WAN interface and the MLP over T1 serial WAN interface, where the identifier <bundle-id> is specified for both interfaces. In the example below and in the example in Section 41.5.15.14 on page 761, <bundle-id> is specified as '8'.

Syntax:

The syntax of this command is as follows:

```
ppp bundle-id <id>
```

The command's syntax format is described below:

Arguments	Description
<id>	Defines the bundle-id (0-255).

Defaults:

By default, the bundle id is set to the multilink interface number.

Command Modes:

Enable

Example:

The following example associates a multilink interface 1 with virtual bundle id 8:

```
(conf-if-multilink 1)# ppp bundle-id 8
```

41.5.16.3 ppp fragments-enable

This command will cause each transmitted packet to be fragmented among the virtual bundle's serial interfaces, thus reaching maximum bandwidth utilization.

Syntax:

The syntax of this command is as follows:

```
ppp fragments-enable
```

The command's syntax format is described below:

Arguments	Description
'no' at prefix of command	Disables fragmentation on this multilink interface.

Defaults:

By default, fragmentation is disabled.

Command Modes:

Enable

Example:

The following example enables fragmentation on interface multilink 0:

To disable fragmentation, type 'no' at the command prefix.

```
(conf-if-multilink 0)# fragments-enable
```

41.5.16.4 ppp mrru

This command sets the maximum reconstructed receive unit that is negotiated during the ppp session setup.

Syntax:

The syntax of this command is as follows:

```
ppp mrru <size>
```

The command's syntax format is described below:

Arguments	Description
<size>	Defines the mru size (68-1500).

Defaults:

By default, mrru is set to 1500 bytes.

Command Modes:

Enable

Example:

The following example sets the mrru to 500 bytes on multilink interface 1:

```
(conf-if-multilink 1)# ppp mrru 500
```

41.5.16.5 ip address

This command specifies the IP addressing mode of this multilink interface.

Syntax:

The syntax of this command is as follows:

```
ip address <mode> <a.b.c.d> <e.f.g.h>
```

The command's syntax format is described below:

Arguments	Description
mode	Defines the MLP IP addressing modes as follows: ▪ 'automatic' – IP address will be accepted from peer during PPP negotiation. ▪ 'manual' – set local static IP address and optional subnet mask. ▪ 'unnumbered' – use unnumbered mode (MLP serial interface uses LAN interface ip address).
a.b.c.d	Defines the static local IP address set on this MLP multilink interface – relevant for manual mode only.
e.f.g.h	Defines the optional static subnet mask set on this MLP multilink interface - relevant for manual mode only.

Defaults:

By default the IP addressing is automatic.

Command Modes:

Enable

Example:

The following example sets the IP address 223.4.5.6 on multilink interface 0:

```
(conf-if-multilink 0)# ip address manual 223.4.5.6
```

The following example sets the IP addressing mode to automatic on multilink interface 0:

```
(conf-if-multilink 0)# ip address automatic
```

41.5.16.6 ip dns-server

This command specifies the primary and secondary DNS servers to be used by this multilink interface.

Syntax:

The syntax of this command is as follows:

```
ip dns-server <mode> <a.b.c.d> <e.f.g.h>
```

The command's syntax format is described below:

Arguments	Description
mode	The DNS servers addressing modes are: ▪ 'automatic' – DNS servers' IP addresses will be accepted from peer during PPP negotiation. ▪ 'manual' – Sets static DNS servers' IP address
a.b.c.d	Specifies the IP address of the primary DNS server - relevant only for the manual mode.
e.f.g.h	Specifies the IP address of the optional secondary DNS server- relevant only for the manual mode.

Defaults:

By default, no DNS servers are defined for the multilink interface.

Command Modes:

Enable

Example:

The following example sets static DNS servers' IP addresses on multilink interface 0:

```
(conf-if-multilink 0)# ip dns-server manual 10.1.1.10 10.1.1.11
```

41.6 Backup Group Commands

The commands below describe Backup Group.

41.6.1 backup-group

A backup group defines a set of interfaces so that only one of the interfaces is active at any given moment. Other interfaces in the group are automatically disabled.

By default, the interface marked as "priority 1" will be activated; if the active interface loses connectivity, the device attempts to bring up the next interface in the group. As soon as the higher-priority interface regains connectivity, the lower-priority interface will be disabled.

To associate interfaces with a backup group, use the "**backup monitoring group**" command in interface context.

Syntax:

The syntax of this command can include the following variations:

```
backup-group <group-name> [ primary-wan ]
  description <desc-text>
  exit
```

The commands syntax format is described below:

Arguments	Description
group-name	Defines the name of the backup group.
primary-wan	Marks the group as controlling the primary WAN connection. This setting affects SIP connectivity; when the primary WAN interface changes, registration will be performed via the new interface. This is an optional field.
desc-text	A description of the backup group.

Defaults:

By default, no backup groups are defined.

Command Modes:

Enable

Example:

The following example defines a backup group:

```
(config-data)# backup-group abc primary-wan
(backup-group)# description WAN-group
```

41.6.2 backup monitoring group

This command associates an interface with a backup group. Interfaces in a backup group are automatically enabled and disabled based on the connectivity status of other interfaces in the group. See the command "**backup-group**" for additional information.

To remove an interface from a backup group, use the "**no**" form of this command.

Syntax:

The syntax of this command is:

```
backup monitoring group <group-name> priority {1|2|3}
```

The command syntax format is described below:

Arguments	Description
group-name	Name of the backup group (defined by the **backup-group** command).
1, 2, 3	Sets the interface priority in the backup group.

Defaults:

By default, interfaces are not associated with a backup group.

Command Modes:

This command is available in *interface configuration* context.

Example:

The following example associates an interface with a backup group:

```
(conf-atm0/0)# backup monitoring group abc priority 1
```

This page is intentionally left blank.

42 Layer-2 (LAN) Commands

42.1 Wi-Fi Commands

The following describes Wi-Fi commands.

42.1.1 radio shutdown

This command provides support for enabling or disabling Wi-Fi functionality.
The **no radio** shutdown disables the Wi-Fi interface.

Syntax:

The syntax of this command can include the following variations:

```
radio shutdown
no radio shutdown
```

Defaults:

This command is applicable to Mediant 500 and Mediant 800/B MSBR.

Command Modes:

Enable

Example:

The following example enables Wi-Fi functionality on the device.

```
(config-data)# radio shutdown
```

42.2 Data Services Commands

The following describes Data Services commands.

42.2.1 DNS Server

The following describes the DNS Server commands.

42.2.1.1 ip dns server

This command enables the DNS server on all Layer 3 interfaces. Use the **no** form of this command to disable the DNS server on all Layer 3 interfaces.

Syntax:

```
ip dns server all auto
ip dns server all static
no ip dns server all auto
```

The command's syntax format is described below:

Arguments	Description
auto	Automatically sets the DNS server address by the response from the DHCP server. The interface must be set to obtain IP addresses from DHCP.
static	Statically sets the DNS server address by the configuration.

Defaults:

NA

Related Commands:

ip host

The **ip dns server** command is also available from the interface configuration sub-directory. See **dns-server** on page 797.

Command Modes:

Enable

Example:

The following example enables a static DNS server for all Layer 3 interfaces:

```
(config-data)# ip dns server all static
```

42.2.1.2 ip host

This command adds an entry to the IP hostname table for all Layer 3 interfaces. Use the **no** form of this command to delete an entry from the IP Hostname table for all Layer 3 interfaces.

The following are the relevant specifications:

- RFC 1034
- RFC 1035
- RFC 2782 (SRV)
- RFC 3403 (NAPTR)

Syntax:

```
ip host <name> <ip address> <ttl>
ip host <name> srv <priority> <weight> <port> <target> <ttl>
ip host <name> naptr <order> <preference> <flags> regexp <regexp>
<ttl>
ip host <name> naptr <order> <preference> <flags> service
<service> regexp <regexp> <ttl>
ip host <name> naptr <order> <preference> <flags> service
<service> replacement <replacement> <ttl>
```

The command's syntax format is described below:

Arguments	Description
name	Specifies the name of the host. Up to 63 characters.
ip address	Specifies the host's IPv4 (dotted decimal notation) or IPv6 address.
ttl	Defines Time-To-Live in seconds, range 0-2147483647.
priority	Defines the priority – a non-negative number with a range 0-65535.
weight	Defines the weight – a non-negative number with a range 0-65535.
port	Non-negative number, range 0-65535.
target	Domain name, up to 256 characters.
order	Non-negative number, range 0-65535.
preference	Non-negative number, range 0-65535.
flags	Currently four flags are defined: "S", "A", "U", and "P" (character-string).
service	Up to 64 characters and must start with an alphabetic (character-string).
regexp	Up to 256 characters (character-string).
replacement	Domain name, up to 256 characters.

Defaults:

NA

Related Commands:

ip dns server

Command Modes:

Enable

Examples:

The following example adds an entry with name 'abcd' and ip address '10.44.1.1' to the IP Hostname table for all Layer 3 interfaces:

```
(config data)# ip host abcd 10.44.1.1 3600
```

The following example (taken from RFC 2782) for adding SRV entry to the DNS server table for all Layer 3 interfaces:

```
(config data)# ip host _foobar._tcp srv 0 1 9 old-slow-
box.example.com 3600
```

The following example (taken from RFC 3403) for adding NAPTR entry to the DNS server table for all Layer 3 interfaces:

```
(config data)# ip host example.com naptr 100 50 A service
z3950+N2L+N2C replacement cidserver.example.com 3600
```

42.2.1.3 ip flow-export

This command defines the host/port to send flow statistics to. IP flow (NetFlow) is a feature that gives the ability to collect IP network traffic. The NetFlow records are generated from the firewall statistics. Since the NetFlow information is taken from the firewall, you must activate firewall capabilities on the monitored interface.

Syntax:

```
ip flow-export enable
ip flow-export destination <a.b.c.d> <port>
ip flow-export version <version number> enable
ip flow-export source-address interface <interface name>
<interface-id>
```

The command's syntax format is described below:

Arguments	Description
enable	Enables IP flow statistics.
destination	Specifies the NetFlow Destination server IP address.
port	Defines the NetFlow server port number (1-65535). The default port is 2055.
source-address	Sets the source of the NetFlow packets. If not specified, the source will be set according to the routing table interface.
version number	Enables NetFlow version number (5 or 9).
a.b.c.d	Defines the Netflow IP address.

Interface Name	Interface Type	Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables IP flow statistics.

```
(config-data)# ip flow-export enable
```

42.2.1.4 ip fastpath

This command defines Acceleration settings.

Syntax:

```
ip fastpath unilateral-timeout <seconds>
```

The command's syntax format is described below:

Arguments	Description
seconds	Defines Timeout in seconds (0 means connections will never time out).

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the connections so that they don't time out.

```
(config-data)# ip fastpath unilateral-timeout 0
```

42.2.1.5 dns-view

This command defines a DNS view.

Syntax:

```
dns-view <view name>
```

The command's syntax format is described below:

Arguments	Description
view name	Defines the DNS view name.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines a DNS view.

```
(config-data)# dns-view view1
```

42.2.1.6 set server address

This command defines the DNS server to where the queries matching this DNS view are forwarded.

Syntax:

```
# set server address <server ip address>
```

The command's syntax format is described below:

Arguments	Description
server ip address	Defines the *server IP address* which is one of the device's DNS server's IP address (configured as part of an interface properties); otherwise, the device will not forward to it.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the DNS server to where the queries matching this DNS view are forwarded.

```
(config-data)# dns-view view1
(dns-view-view1)# set server interface 1.10.1.1
```

42.2.1.7 match source-address

This command defines the DNS queries by source address for the DNS view.

Syntax:

```
# match source address <source IP address of DNS query> <source
netmask of DNS query>
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the DNS queries by source address for the DNS view.

```
(config-data)# dns-view view1
(dns-view-view1)# match source address 1.1.1.1 12.1.1.1
```

42.2.1.8 set server interface

This command defines the interface associated with the DNS server.

Syntax:

```
# set server interface <interface name> <slot / port /ID>
```

The command's syntax format is described below:

Arguments	Description
<interface name>	Defines the *interface name* which is the name of the interface that is configured with the desired DNS server (static or dynamic). This allows configuration of name servers received dynamically by DHCP or PPP.

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the interface.

```
(config-data)# dns-view view1
(dns-view-view1)# set server interface gigabitethernet 0/0
```

42.2.1.9 ip name-server

This command defines the DNS relay server's address on all Layer 3 interfaces. Use the **no** form of this command to the undefined DNS relay server's address on all Layer 3 interfaces.

Syntax:

```
ip name-server <first ip address> all
ip name-server <first ip address> [<second ip address>|all]
```

The command's syntax format is described below:

Arguments	Description
first ip address	Specifies the primary DNS server address. Specifies a valid IPv4 (dotted-decimal notation) or IPv6 address.
second ip address	Specifies the secondary DNS server address. This field is not required when specifying a single IP address. It specifies a valid IPv4 (dotted-decimal notation) or IPv6 address.
all	Apply to all interfaces.

Defaults:

NA

Related Commands:

This command is also available from the interface configuration sub-directory.

Command Modes:

Enable

Example:

The following example defines DNS relay servers 10.4.1.1 and 10.4.1.2 for all Layer 3 interfaces:

```
(config data)# ip name-server 10.4.1.1 10.4.1.2
```

42.2.1.10 ip max-conn

This command defines the maximum number of firewall connections per IP address.

Syntax:

```
ip max-conn <number>
```

The command's syntax format is described below:

Arguments	Description
number	Sets the maximum number of firewall connections per IP address. (200-20000)

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the maximum number of firewall connections per IP address to 500:

```
(config data)# ip max-conn 500
```

42.2.2 DHCP Server

The following describes DHCP Server commands.

42.2.2.1 ip dhcp-server

This command enables the specified address of the DHCP relay server to be used on the specified interface or on all Layer 3 interfaces. It also provides support for the device to act as a DHCP server for Lync-enabled IP phones, by supporting DHCP Options 120 and 43. DHCP Option 120 enables SIP clients to discover a domain name system (DNS) FQDN (Fully-Qualified Domain Name) of a SIP server (SIP Server Discovery). For detailed information on DHCP Option 120, see RFC 3361. DHCP Option 43 enables devices to discover the Microsoft Lync Server Certificate Provisioning service. For detailed information on how to configure DHCP Option 120 and DHCP Option 43, see http://technet.microsoft.com/en-us/library/gg412828%28v=ocs.14%29.aspx.

Use the **no** form of this command to disable the address of the DHCP relay server on a specific interface or on all Layer 3 interfaces.

Note: Not all the commands in this section have a **no** form. See the details in the commands syntax below. The **no** form for the **ip dhcp-server** <ip address> command is used to disable the DHCP relay server.

Syntax:

```
# ip dhcp-server <ip address>{<interface> <interface ID>}
# ip dhcp-server all <interface> <interface ID>

# no ip dhcp-server <ip address>

# ip dhcp-server network <first ip address> <last ip address>
<subnet mask>
# ip dhcp-server dns-server <dns ip address>
# ip dhcp-server netbios-name-server <wins ip address>
# ip dhcp-server lease <days> <hours> <minutes>

# ip dhcp-server boot-file-name <boot file name>
# no ip dhcp-server boot-file-name

# ip dhcp-server domain-name <domain name>
# no ip dhcp-server domain-name

# ip dhcp-server netbios-node-type <wins node type>
# no ip dhcp-server netbios-node-type

# ip dhcp-server ntp-server <ntp ip address>
# ip dhcp-server tftp-server <tftp ip address>

# ip dhcp-server tftp-server-name <tftp name>
# no ip dhcp-server tftp-server-name
```

```
# ip dhcp-server time-offset <time offset>
# no ip dhcp-server time-offset

# ip dhcp-server provide-host-name
# no ip dhcp-server provide-host-name

# ip dhcp-server sip-server <FQDN of SIP server – Option 120)
# ip dhcp-server lync-cert-provisioning <Microsoft Lync Server
Certificate Provisioning service – Option 43>
```

The command's syntax format is described below:

Arguments	Description
ip address	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). Specifies a valid IPv4 address for the DHCP relay server.
first ip address last ip address subnet mask	Specifies the address pool of the DHCP relay server (valid IPv4 address). IP addresses should be expressed in dotted decimal notation.
dns ip address	Specifies a valid IPv4 address for the dns server. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). This parameter is optional.
wins ip address	Specifies a valid IPv4 address for wins server. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). This parameter is optional.
days hours minutes	Specifies the number of days and/or hours and/or minutes for server leases. This parameter is optional (default is 1 hour).
boot file name	Specifies the name of the configuration file that the DHCP client should download from the TFTP server. This parameter is optional. (BOOTP / DHCP Option 67).
domain name	Specifies the domain name that client should use when resolving hostnames via DNS. This parameter is optional. (BOOTP / DHCP Option 15).
wins node type	Specifies the NetBIOS (WINS) node type (i.e. 1 = B-node, 2 = P-node, 4 = M-node, 8 = H-node). This parameter is optional. (BOOTP / DHCP Option 46).
ntp ip address	Specifies a valid IPv4 address for NTP server. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). This parameter is optional. (BOOTP / DHCP Option 42).
tftp ip address	Specifies a valid IPv4 address for TFTP server. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). This parameter is optional. (BOOTP / DHCP Option 150).

Arguments	Description
tftp name	Specifies a TFTP server name. This parameter is optional. (BOOTP / DHCP Option 66).
time offset	Specifies the offset of the client's subnet in seconds from Coordinated Universal Time (UTC). A positive offset indicates a location east of the zero meridian and a negative offset indicates a location west of the zero meridian. This parameter is optional. (BOOTP / DHCP Option 2).
tr069-acs-server-name	Supports sending a DHCP response with the URL of an Auto-Configuration Server (ACS) in reply to a DHCP request received from a client with the "dslforum.org" string in the Vendor Class Identifier (DHCP option 60). The device sends the URL in the Vendor Specific Information (DHCP option 43). This is applicable when the device is configured as a DHCP server and is used for TR-069 provisioning. **Note:** This is only applicable to MSBR devices.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Related Commands:

This command is also available from the interface configuration sub-directory.

Command Modes:

Enable

Example:

- The following example configures the DHCP relay address of 10.1.2.3 on VLAN 5:

```
# config data
(config-data)# ip dhcp-server 10.1.2.3 vlan 5
```

- The following is an example of how to use tr069-acs-server-name parameter.

```
# config data
(config-data)# interface vlan 10
(conf-if-VLAN 10)# ip dhcp-server tr069-acs-server-name  srv_1
```

42.2.2.2 option

This command configures the Dynamic Host Configuration Protocol (DHCP) Server options. Use the **no form** of this command to remove the options.

Syntax:

The syntax of this command can include the following variations:

```
option <DHCP option code> {ascii string|hex string|ip address}
no option code <DHCP option code>
```

The command's syntax format is described below:

Arguments	Description
DHCP option code	Defines the DHCP option code.
ascii string	Defines an NVT ASCII character string. ASCII character strings that contain white space must be deliminated by quotation marks.
hex string	Defines dotted-hexadecimal data. Each byte in hexadecimal character strings is two hexadecimal digits - each byte can be separated by a period, colon, or white space.
ip address	Defines an IP address.

Defaults:

The default instance number is 0.

Command Modes:

DHCP pool configuration

Related Commands:

ip dhcp pool

Usage Guidelines:

DHCP provides a framework for passing configuration information to hosts on a TCP/IP network. Configuration parameters and other control information are carried in tagged data items that are stored in the options field of the DHCP message. The data items themselves are also called options. The current set of DHCP options are documented in RFC 2131, Dynamic Host Configuration Protocol.

Examples:

The following example configures DHCP Option 19, which specifies whether the client should configure its IP layer for packet forwarding. A value of "0" means disable IP forwarding; a value of "1" means enable IP forwarding. IP forwarding is enabled in the following example:

```
(config-data)# ip dhcp pool gigabitethernet 0/0
# option code 19 hex 01
```

The following example configures DHCP option 72, which specifies the World Wide Web servers for DHCP clients. World Wide Web servers 172.16.3.252 and 172.16.3.253 are configured in the following example:

```
# option code 72 ip 172.16.3.252 172.16.3.253
```

42.2.2.3 service dhcp

This command enables the DHCP server on the specified interface or on all Layer 3 interfaces. Use the **no** form of this command to disable DHCP server on a specific interface or on all Layer 3 interfaces.

Syntax:

```
service dhcp all
service dhcp gigabitethernet [slot/port.vlanID]
service dhcp vlan <vlan id>
```

The command's syntax format is described below:

Arguments	Description
All	Enables/disables all interfaces.
slot/port.vlanID	Defines the GigabitEthernet interface slot and port (Vlan ID is optional).
vlan id	Defines the VLAN interface.

Defaults:

All interfaces are disabled.

Note:

This command enables/disables the DHCP server created via the "ip dhcp pool" command.

Related Commands:

Ip dhcp pool

The **service dhcp** command is also available from the interface configuration sub-directory. See section 42.2.3.5 on page 795.

Command Modes:

Enable

Example:

The following example enables the DHCP server on VLAN 5:

```
(config data)# service dhcp vlan 5
```

42.2.3 DHCP Client

The following describes DHCP Client commands

42.2.3.1 ip address dhcp

This command enables a DHCP client on the specified interface. Use the **no** form of this command to disable DHCP client functionality.

Syntax:

```
ip address dhcp
no ip address dhcp
```

No arguments exist for this command.

Defaults:

NA

Note:

The interface's IP address will be acquired via DHCP.

Command Modes:

Enable

Example:

The following example configures a DHCP client on VLAN 6.

```
(config-data)# interface vlan 6
(conf-if-VLAN 6)# ip address dhcp
```

42.2.3.2 ip dhcp-client class-id

This command enables configuration of DHCP option 60 “vendor class identifier” to be sent by the client.

Syntax:

The syntax of this command includes the following variations:

```
ip dhcp-client class-id <string>
```

The command syntax format is described below:

Arguments	Description
string	The “vendor class id” string (option 60) to be sent in the DHCP negotiation.

Defaults:

Option 60 is not sent by default

Command Modes:

Enable

Related Commands:

ip address dhcp

Example:

The following example configures a new vlan interface, enables dhcp and sets vendor class string to “MSBR”.

```
(config-data)# interface vlan 3
(conf-if-VLAN 3)# ip address dhcp
(conf-if-VLAN 3)# ip dhcp-client class-id “MSBR”
(conf-if-VLAN 3)# no shutdown
(conf-if-VLAN 3)# exit
```

42.2.3.3 ip dhcp-client default-route

This command configures the device to accept the gateway received via DHCP as the default route on this interface.

Use the “no” form of this command to disregard the gateway received via DHCP.

Syntax:

The syntax of this command includes the following variations:

```
ip dhcp-client default-route track <track id>
```

The command syntax format is described below:

Arguments	Description
default-route	Defines the gateway received via DHCP as the default route on this interface.
track id	Defines a track ID, the default route depends on. The range is 1-100.

Defaults:

no ip dhcp-client default-route

Command Modes:

Enable

Related Commands:

ip address dhcp

Example:

The following example configures a new vlan interface, enables dhcp & default gateway

```
(config-data)# interface vlan 3
(conf-if-VLAN 3)# ip address dhcp
(conf-if-VLAN 3)# ip dhcp-client default-route track 1
(conf-if-VLAN 3)# no shutdown
(conf-if-VLAN 3)# exit
```

42.2.3.4 ip dhcp-source-address

This command allows the user to configure the DHCP relay source address. This command is valid only in case of DHCP relay (remote).

Syntax:

The syntax of this command includes the following variations:

```
ip dhcp-source-address all <ip address>
ip dhcp-source-address <interface name> <ip address>
```

The command syntax format is described below:

Arguments	Description
ip address	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). Specifies a valid IPv4 address for the DHCP relay source address.
all	Enables all interfaces.
interface name	Defines the interface naming on the *interface* command. Enables the specified interface.

Defaults:

NA

Functional notes

The address should be of one of the local interfaces.

Command Modes:

Enable

Related Commands:

The *dhcp-source-address* parameter takes effect only when the DHCP Relay server is configured. See the *ip dhcp-server* command on page 784.

Example:

The following example configures vlan 5 to relay DHCP requests to 10.5.5.11, source address on the relayed packets will be set to 10.4.4.11:

```
(config-data)# ip dhcp-server 10.5.5.11 vlan 5
(config-data)# ip dhcp-source-address vlan 5 10.4.4.11
```

42.2.3.5 ip dhcp pool

This command assigns a pool on a specified interface and enters the pool configuration.

Syntax:

The syntax of this command can include the following variations:

```
ip dhcp pool <interface name> <interface ID>
```

The command's syntax format is described below:

Arguments	Description
<interface name>	Defines interface naming on the *interface* command.

Interface Name	Interface Type	Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Related Commands

service dhcp

The **ip dhcp pool** command is also available from the interface configuration sub-directory. See *ip dhcp-server* on page 784.

Command Modes:

Enable

Example:

The following example enters IP DHCP POOL on VLAN 5.

```
(config data)# ip dhcp pool vlan 5
```

42.2.3.5.1boot-file-name

This command defines the name of the configuration file that the DHCP client should download from the TFTP server on the specified interface.

Syntax:

```
boot-file-name <boot file name>
no boot-file-name
```

The command's syntax format is described below:

Arguments	Description
boot file name	Specifies the name of the configuration file that the DHCP client should download from the TFTP server. This parameter is optional. (BOOTP / DHCP Option 67).

Defaults:

NA

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example sets the name of the configuration file that should be downloaded.

```
(dhcp-conf-VLAN 5)# boot-file-name my-config
```

The following example clears this parameter.

```
(dhcp-conf-VLAN 5)# no boot-file-name
```

42.2.3.5.2domain-name

This command defines the domain name that client should use when resolving hostnames via DNS on the specified interface.

Syntax:

```
domain-name <domain name>
no domain-name
```

The command's syntax format is described below:

Arguments	Description
domain name	Specifies the domain name that client should use when resolving hostnames via DNS. This parameter is optional. (BOOTP / DHCP Option 15).

Defaults:

NA

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example sets the domain name.

```
(dhcp-conf-VLAN 5)# domain-name domain.name.com
```

The following example clears the domain name.

```
(dhcp-conf-VLAN 5)# no domain-name
```

42.2.3.5.3 dns-server

This command defines the DNS servers for the DHCP pool on the specified interface.

Syntax:

```
dns-server <ip address>
```

The command's syntax format is described below:

Arguments	Description
<ip address>	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Example:

The following example enters the ip dhcp pool on VLAN 5 and sets the DNS server to 10.1.2.3.

```
(dhcp-conf-VLAN 5)#dns-server 10.1.2.3
```

42.2.3.5.4lease

This command defines the address lease time assigned to the DHCP pool on the specified interface.

Syntax:

```
lease <days> [hours] [minutes]
```

The command's syntax format is described below:

Arguments	Description
<days>	Sets the number of days (mandatory). Range is 0 to 365.
<hours>	Sets the number of hours. Range is 0 to 23.
<minutes>	Sets the number of minutes. Range is 0 to 59.

Defaults:

By default, the lease time is set to 1 hour.

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Command Modes:

Enable

Example:

The following example enters ip dhcp pool on VLAN 5 and sets the lease time to 5 hours and 15 minutes.

```
(dhcp-conf-VLAN 5)# lease 0 5 15
```

42.2.3.5.5netbios-name-server

This command defines a NetBIOS Windows Internet Naming Service (WINS) name servers assigned to the DHCP pool on the specified interface.

Syntax:

```
netbios-name-server <ip address>
```

The command's syntax format is described below:

Arguments	Description
<ip address>	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (e.g., 10.1.2.3).

Defaults:

NA

Related Commands

This command is also available from the interface configuration sub-directory. See *ip dhcp-server* on page 784.

Command Modes:

Enable

Example:

The following example enters ip dhcp pool on VLAN 5 and sets the NetBIOS name server to 10.1.2.3.

```
(dhcp-conf-VLAN 5)# netbios-name-server 10.1.2.3
```

42.2.3.5.6 netbios-node-type

This command specifies the NetBIOS (WINS) node type (i.e. 1 = B-node, 2 = P-node, 4 = M-node, 8 = H-node) on the specified interface.

Syntax:

```
netbios-node-type <wins node type>
no netbios-node-type
```

The command's syntax format is described below:

Arguments	Description
<wins node type>	Specifies the NetBIOS (WINS) node type (i.e. 1 = B-node, 2 = P-node, 4 = M-node, 8 = H-node). This parameter is optional. (BOOTP / DHCP Option 46).

Defaults:

NA

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example sets the WINS note type to B-node (= 1).

```
(dhcp-conf-VLAN 5)# netbios-node-type 1
```

The following example clears this parameter.

```
(dhcp-conf-VLAN 5)# no netbios-node-type
```

42.2.3.5.7 network

This command defines the network address and mask for the DHCP pool. This command is mandatory for assigning dhcp pool on the interface.

Syntax:

```
network <first ip> <last ip> <mask>
```

The command's syntax format is described below:

Arguments	Description
<first ip>	First IP address in the range for this pool. Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).
<last ip>	Last IP address in the range for this pool. Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).
<mask>	Specifies the subnet mask that corresponds to a range of IP addresses. Subnet masks should be expressed in dotted decimal notation (for example, 255.255.255.0).

Defaults:

NA

Related Commands

This command is also available from the interface configuration sub-directory.

Command Modes:

Enable

Example:

The following example enters ip dhcp pool on VLAN 5 and sets the Network addresses and mask for the pool.

```
(dhcp-conf-VLAN 5)#network 10.4.60.1 10.4.60.5 255.255.0.0
```

42.2.3.5.8 override-router-address

This command overrides the router address assigned to the DHCP pool on the specified interface.

Syntax:

The syntax of this command includes the following variations:

```
override-router-address <IP Address>
```

The command syntax format is described below:

Arguments	Description
<ip address>	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (e.g., 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.

Examples:

The following example overrides the router address to 10.1.2.3.

```
(dhcp-conf-VLAN 5)# override-router-address 10.1.2.3
```

42.2.3.5.9 provide-host-name

This command enables the device to provide host name if not specified by client on the specified interface. Use the **no** form of this command to disable this behavior.

Syntax:

```
provide-host-name
no provide-host-name
```

Defaults:

The device provides host name if not specified by the client.

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example will enable the device to provide a host name.

```
(dhcp-conf-VLAN 5)# provide-host-name
```

The following example disables this behavior.

```
(dhcp-conf-VLAN 5)# no provide-host-name
```

42.2.3.5.10 tftp-server

This command defines a TFTP server assigned to the DHCP pool on the specified interface.

Syntax:

```
tftp-server <tftp ip address>
```

The command's syntax format is described below:

Arguments	Description
tftp ip address	Specifies a valid IPv4 address for TFTP server. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3). This parameter is optional. (BOOTP / DHCP Option 150).

Defaults:

NA

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example sets the TFTP server IP address.

```
(dhcp-conf-VLAN 5)# tftp-server 10.4.4.1
```

42.2.3.5.11 tftp-server-name

This command defines a TFTP server name assigned to the DHCP pool on the specified interface.

Syntax:

```
tftp-server-name <tftp name>
no tftp-server-name
```

The command's syntax format is described below:

Arguments	Description
tftp name	Specifies a TFTP server name. This parameter is optional. (BOOTP / DHCP Option 66).

Defaults

NA

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See *ip dhcp-server* on page 784.

Example:

The following example sets the TFTP server name.

```
(dhcp-conf-VLAN 5)# tftp-server-name servername
```

The following example clears the TFTP server name.

```
(dhcp-conf-VLAN 5)# no tftp-server-name
```

42.2.3.5.12 time-offset

This command defines the offset of the client's subnet in seconds from Coordinated Universal Time (UTC) on the specified interface.

Syntax:

```
time-offset <time offset>
no time-offset
```

The command's syntax format is described below:

Arguments	Description
time offset	Specifies the offset of the client's subnet in seconds from Coordinated Universal Time (UTC). A positive offset indicates a location east of the zero meridian and a negative offset indicates a location west of the zero meridian. This parameter is optional. (BOOTP / DHCP Option 2).

Defaults:

NA

Functional notes

NA

Command Modes:

Enable

Related Commands:

This command is also available from the interface configuration sub-directory.
See ip dhcp-server on page 784.

Example:

The following example sets the offset time to 500 seconds.

```
(dhcp-conf-VLAN 5)# time-offset 500
```

The following example removes this parameter.

```
(dhcp-conf-VLAN 5)# no time-offset
```

42.2.3.6 service dhcp

This command enables the DHCP server on the interface. Use the **no** form of this command to disable the DHCP server.

Syntax:

```
service dhcp
no service dhcp
```

Defaults:

The DHCP server is disabled.

Note:

This command enables/disables the DHCP server created via the **ip dhcp pool** and **ip dhcp-server** commands.

Related Commands

ip dhcp pool, Ip dhcp-server

The **service dhcp** command is also available from the main data configuration directory (see *ip dhcp pool* on page 795 and *ip dhcp-server* on page 784).

Command Modes:

Enable

Example:

The following example enables the DHCP server on VLAN 5:

```
(conf-if-VLAN 5)# service dhcp
```

42.2.4 shutdown

This command disables the specified interface. Use the **no** form of this command to enable the interface.

Syntax:

```
shutdown
no shutdown
```

No arguments exist for this command.

Defaults:

When creating a new interface, it is disabled by default.

Command Modes:

Enable

Example:

The following example enables VLAN 6.

```
(conf-if-VLAN 6)# no shutdown
```

42.2.5 mtu

This command configures the Maximum Transmission Unit (MTU) on the specified interface.

Syntax:

The syntax of this command can include the following variations:

```
mtu auto
mtu dhcp
mtu <mtu value>
```

The command's syntax format is described below:

Arguments	Description
auto	Sets MTU automatically.
dhcp	Sets MTU by DHCP.
mtu value	Sets the MTU value. Range is 68 to 1500.

Defaults:

MTU is set to auto (usually 1500).

Command Modes:

Enable

Example:

The following example sets the MTU value to 770 bytes on VLAN 6.

```
(config-data)# interface vlan 6
(conf-if-VLAN 6)# mtu 770
```

42.2.6 mss

This command configures the Maximum Segment Size (MSS) on the specified interface.

Syntax:

The syntax of this command can include the following variations:

```
mss auto
mss dhcp
mss <mss value>
```

The command's syntax format is described below:

Arguments	Description
auto	Sets MSS automatically.
dhcp	Sets MSS by DHCP.
mss value	Sets the MSS value. Range is 68 to 1500.

Defaults:

MSS is set to auto (usually 1500).

Command Modes:

Enable

Example:

The following example sets the MSS value to 770 bytes on VLAN 6.

```
(config-data)# interface vlan 6
(conf-if-VLAN 6)# mss 770
```

42.2.6.1 ip tcp adjust-mss

This command configures the Maximum Segment Size (MSS) on the payload section of a TCP packet, on GRE and IPIP tunnels.

Syntax:

The syntax of this command can include the following variations:

```
ip tcp adjust-mss <mss value>
```

The command's syntax format is described below:

Arguments	Description
mss value	Sets the MSS value. Range is 0- 65535.

Note:

- mss-value of 0 indicates that no MSS has been set.

Command Modes:

Enable

Example:

The following example configures the tunnel interface.

```
# configure data
(config-data)# interface gre 1
(conf-if-GRE 1)# ip tcp adjust-mss 500
```

42.2.7 speed

This command configures the speed on the specified switchport interface.

Syntax:

The syntax of this command can include the following variations:

```
speed 10
speed 100
speed auto
```

The command's syntax format is described below:

Arguments	Description
10	Forces 10 Mbps operation.
100	Forces 100 Mbps operation.
auto	Automatically detects switchport speed.

Defaults:

Speed is set to auto.

Command Modes:

Enable

Example:

The following example sets the speed to 100 on GigabitEthernet 4/2.

```
(conf-if-GE 4/2)# speed 100
```

42.2.8 Switch Port Interface Commands

The following describes Switch Port Interface commands.

42.2.8.1 switchport mode

This command configures the VLAN Trunking mode.

Syntax:

The syntax of this command can include the following variations:

```
switchport mode access
switchport mode trunk
switchport mode transparent
```

The command's syntax format is described below:

Arguments	Description
access	Sets the port to access mode.
trunk	Sets the port to trunk mode.
transparent	Set the port to transparent mode (Q-in-Q)

Defaults:

Switchport mode is set to trunk.

Command Modes:

Enable

Example:

The following example sets the switchport mode to static access on GigabitEthernet 4/2:

```
(config-data)# interface gigabitethernet 0/1
(conf-if-GE 0/1)# switchport mode access
```

42.2.8.2 switchport access vlan

This command configures the specified switch port interface as a static-access member of a VLAN.

Syntax:

```
switchport access vlan <vlan id>
```

The command's syntax format is described below:

Arguments	Description
<vlan id>	Defines a valid VLAN interface ID. Range is 1 to 3999.

Defaults:

A single VLAN interface is available (VLAN 1).

Note:

If the port is in the trunk mode, this command will not alter the switchport mode to 'Access'. Instead it will save the value to be applied when the port does switch to Access mode.

Command Modes:

Enable

Related Commands

switchport mode

Example:

The following example sets the switchport mode to static access and makes the GigabitEthernet interface 4/2 port a member of VLAN 3:

```
(config-data)# interface gigabitethernet 4/2
(conf-if-GE 4/2)# switchport access vlan 3
```

42.2.8.3 switchport trunk allowed vlan

This command is used to configure the VLANs available on the trunk (when the interface is in trunking mode).

Syntax:

The syntax of this command can include the following variations:

```
switchport trunk allowed vlan add <vlan id>
switchport trunk allowed vlan remove <vlan id>
```

The command's syntax format is described below:

Arguments	Description
add	Adds an entry to the list of allowed VLANs.
remove	Removes an entry from the list of allowed VLANs.
<vlan id>	Specifies a valid VLAN interface ID. Range is 1 to 3999.

Defaults:

NA

Note:

VLAN ID values range from 1 to 3999.

Command Modes:

Enable

Related Commands

switchport mode

Example:

The following example adds VLAN 3 to the VLAN trunk defined for GigabitEthernet 4/2:

```
(conf-if-GE 4/2)# switchport trunk allowed vlan add 3
```

42.2.8.4 switchport trunk native vlan

This command sets the native VLAN to the interface when set to Trunking mode.

Syntax:

```
switchport trunk native vlan <vlan id>
```

The command's syntax format is described below:

Arguments	Description
<vlan id>	Specifies a valid VLAN interface ID. Range is 1 to 3999.

Defaults:

This is set to VLAN 1 (the default VLAN).

Note:

- VLAN ID values range from 1 to 3999.
- Configure which VLAN the interface uses as its native VLAN when in Trunking mode. Packets from this VLAN leaving the interface will not be tagged with the VLAN number. Any untagged packets received on the interface are considered to be tagged with VLAN ID.

Command Modes:

Enable

Related Commands

switchport mode

Example:

The following example sets the native VLAN on GigabitEthernet 4/2 to 3.

```
(config-data)# interface gigabitethernet 4/2
(conf-if-GE 4/2)# switchport trunk native vlan 3
```

42.2.9 network

This command allows selecting whether an interface is logically part of the LAN or part of the WAN.

QoS and NAPT functions handle traffic routed **from LAN** interfaces **to WAN** interfaces; port forwarding rules (static NAPT) work only on WAN interfaces; and the default firewall policy prevents inbound packets from WAN interfaces unless solicited by an active connection.

Syntax:

The syntax of this command is:

```
network {lan|wan}
```

The command syntax format is described below:

Arguments	Description
lan	Define a LAN interface.
wan	Define a WAN interface.

Defaults:

VLAN interfaces default to LAN; all other interfaces default to WAN.

Command Modes:

This command is available in *interface configuration* context.

Example:

The following example defines a LAN interface:

```
(config-data)# interface atm 0/0
(conf-atm0/0)# network lan
```

42.2.10 IP Destination Reachability

The following describes IP Destination Reachability commands.

42.2.10.1 track

This command is used to define a tracking destination to be used by static routes or other configured elements. The configured track is testing the reachability of the defined destination through the defined source interface by sending probe packets to the destination and wait for replies.

Syntax:

```
track <track id> {icmpecho | icmp6echo} <destination address>
<source interface> <interface ID> [source-ip-interface
<interface>] [interval <value>] [retries <value>]
```

The command's syntax format is described below:

Arguments	Description
icmpecho	Tracking is done by sending ICMP probes and monitors the replies.
icmpv6echo	Tracking is done by sending ICMPv6 probes and monitors the replies
track id	Defines the track identifier to be used by other entities.
track protocol type	Defines the reachability by sending ping packets of either IPv4 or IPv6 (currently only probe type).
destination address	Defines the ip address of the tracked destination in the format of a.b.c.d for IPv4 and X:X::X:X for IPv6.
source interface	Defines the interface name and ID.
source IP interface	Defines an interface whose IP address is used as the source ip address for the probes.
interval <value>	Defines the option to define interval between probes in seconds Range is 1-3600. (Default value is 5 seconds).
retries <value>	Defines the option to define retries of probes before track state is moved to "down". Range is 0 – 20. (Default value is 3).

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]

Interface Type (ifname)		Interface ID
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

N/A

Command Modes:

Enable

Related Commands:

show data track brief, ip route

Examples:

- The following example defines Track ID 5 for destination 10.30.4.5 from interface GigabitEthernet 0/0.

```
(config-data)# track 5 icmpecho 10.30.4.5 GigabitEthernet 0/0
```

- The following example defines Track ID 5 for destination 10.30.4.5 from interface GigabitEthernet 0/0 and source ip address of interface loopback 1.

```
(config-data)# track 5 IcmpEcho 10.30.4.5 GigabitEthernet 0/0
source-ip-interface loopback 1
```

- Some more examples using this command.

```
# show data track brief
Track    Type               State    Max round trip time (m.s)
1        ICMP reachability  Up       37
```

- Get the time of up to last 10 Track states:

```
# show data track 1 history

Track history:  New state    Date and Time [MM-DD-
YYYY@hh:mm:ss]
                Up                          08-28-
2015@18:17:40
                Down                        08-28-
2015@18:25:30
                Up                          08-28-2015@18:26:2
```

42.2.10.2 bfd neighbor

This command is used to define a BFD neighbor.

Syntax:

The syntax of this command is:

```
bfd neighbor <neighbor id> <ip address> <interface ID> interval
<value> min_rx <value> multiplier <value> [multihop]
```

Argument	Description
neighbor id	(1-20) Neighbor identifier
ip address	Address of the remote BFD device
interface id	Name and number of the outgoing interface
interval	(200-30000) Desired interval for outgoing bfd messages in milliseconds. The interval will be increased if the remote system requires it.
min_rx	(200-30000) Minimal interval between bfd messages in milliseconds. The remote system will use this interval for sending messages in case its interval is lower.
multiplier	(1-20) Maximum number of packets that can be missed before the session status is considered down.
multihop	Set the neighbor to multihop mode in case the remote device is not on the local LAN.

Defaults:

N/A

Command Modes:

Enable

Related Commands:

show data bfd neighbors, ip route

Example:

The following example configures a BFD neighbor with ip address 192.168.0.100 on vlan 1

```
(config-data)# bfd neighbor 1 192.168.0.100 vlan 1 interval 200
min_rx 200 multiplier 3
```

42.2.11 ip reassembly

This command defragments received fragmented IP packets from an interface and then reassembles the packets before forwarding them. The Wireshark packet analyzer is typically used to identify fragmented frames.

This capability is applied per interface and therefore, the CLI command must be set for the relevant IP interface. By default, this capability is disabled per interface.

Syntax:

The syntax of this command can include the following variations:

```
ip reassembly
no ip reassembly
```

Note:

This command is only applicable to Mediant MSBR devices.

Command Modes:

Enable

Example:

The following is an example of how this command can be used.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ip reassembly
```

42.2.12 service tcp keepalives

This command controls the tcp keepalive functionality of newly created sockets.

Syntax:

The syntax of this command can include the following variations:

```
service tcp keepalives enable
service tcp keepalives interval <interval>
service tcp keepalives probe <probe>
service tcp keepalives time <time>
```

The command syntax format is described below:

Arguments	Description
enable	Enables the TCP keepalive. The default value is "Disabled".
interval	Defines the interval between sub sequential keepalive probes in seconds. The default value is 75 seconds. The range is1-65355.
probe	Defines the number of unacknowledged probes to send before considering the connection inactive and notifying the application layer. The default value is 9 probes. The range is 1-65355.
time	Defines the interval between the last data packet sent and the first keepalive probe. The default value is 7200 seconds. The range is 1-65355.

Note:

This command is only applicable to Mediant MSBR devices. The default values are active only if keepalive is enabled.

Command Modes:

Enable

Example:

The following example enables tcp keepalives.

```
(config-data)# service tcp keepalives enable
```

42.3 Port Monitoring Commands

Port monitoring allows the user to reflect traffic from each Ethernet LAN port to any other single LAN or microprocessor port. Monitoring of traffic is useful when trying to analyze the traffic or when debugging network problems. The Mediant 800 MSBR and Mediant 1000 MSBR allow monitoring of egress traffic, ingress traffic, or both directions.

42.3.1 port-monitor

This command configures source ports. This is performed after you have chosen your destination port.

Syntax:

The syntax of this command can include the following variations:

```
port-monitor <type> <slot/port> <direction>
```

Arguments	Description
Type	Defines the source Interface type FastEthernet/GigabitEthernet.
slot/port	Defines the source Interface slot number and port number.
direction	Defines the monitoring direction - Ingress/Egress/Both.

Example:

The following example defines a key to a peer ip.

```
(conf-if-GE 4/3)# port-monitor GigabitEthernet 4/1 ingress
(conf-if-GE 4/3)# port-monitor FastEthernet 5/2 egress
(conf-if-GE 4/3)# port-monitor GigabitEthernet 4/4 both-direction
```

42.4 Spanning Tree Commands

The section below describes Spanning Tree commands.

42.4.1 Spanning Tree General Commands

The sub-section below describes Spanning Tree General commands.

42.4.1.1 spanning-tree

This command enables / disables the spanning tree in the system.

Syntax:

```
spanning-tree
no spanning-tree
```

No arguments exist for this command.

Command Modes:

Enable

Example:

The following example enables the spanning-tree:

```
(config data)# spanning-tree
```

42.4.1.2 spanning-tree priority

This command sets the priority of the device.

Syntax:

```
spanning-tree priority <value>
```

Arguments	Description
<value>	The range is 0 - 61440 in multiples of 4096

Defaults:

32768

Note:

Under configure terminal.

Command Modes:

Enable

Example:

This example sets the device priority to 4096.

```
(config data)# spanning-tree priority 4096
```

42.4.1.3 spanning-tree hello-time

This command sets the hello_time spanning-tree parameter of the device.

Syntax:

```
spanning-tree hello-time <value>
```

Arguments	Description
<value>	The range is 1-10 seconds.

Defaults:

2 seconds

Note:

Under configure terminal

Command Modes:

Enable

Example:

This example sets the hello-time to 1 second:

```
(config data)# spanning-tree hello-time 1
```

42.4.1.4 spanning-tree max-age

This command sets the maximum-age spanning-tree parameter of the device.

Syntax:

```
spanning-tree max-age <value>
```

Arguments	Description
<value>	The range is 6 - 40 seconds.

Defaults:

20 seconds

Note:

Under configure terminal

(FORWARD_DELAY-1)X2 >= MAX_AGE

Command Modes:

Enable

Example:

This example sets the max-age to 10:

```
(config data)# spanning-tree max-age 10
```

42.4.1.5 spanning-tree forward-delay

This command sets the forward-delay spanning-tree parameter of the device.

Syntax:

```
spanning-tree forward-delay <value>
```

Arguments	Description
<value>	Defines the time set in the range of 4 – 30 seconds.

Defaults:

15 seconds

Note:

- Under configure terminal
- (FORWARD_DELAY-1)X2 >= MAX_AGE

Command Modes:

Enable

Example:

To set the device forward-delay to 5:

```
(config data)# spanning-tree forward-delay 5
```

42.4.2 Spanning Tree Interface Commands

The sub-section below describes Spanning Tree Interface commands.

42.4.2.1 spanning-tree

This command enables/disables the spanning tree on a specific interface.

Syntax:

```
spanning-tree
no spanning-tree
```

No arguments exist for this command.

Defaults:

NA

Note:

Under configure terminal

Command Modes:

Enable

Examples:

To enable the spanning-tree on interface 5/1:

```
(conf-if-FE 5/1)# spanning-tree
```

To disable the spanning-tree on interface 5/1:

```
(conf-if-FE 5/1)# no spanning-tree
```

42.4.2.2 spanning-tree priority

This command sets the priority of the interface.

Syntax:

```
spanning-tree priority <value>
```

Arguments	Description
<value>	Sets the value in the range of 0-240. Must be a multiple of 16.

Defaults:

NA

Note:

Under configure terminal

Command Modes:

Enable

Example:

This example sets the device priority to 16.

```
(conf-if-FE 5/1)# spanning-tree priority 16
```

42.4.2.3 spanning-tree cost

This command sets the cost of the interface.

Syntax:

```
spanning-tree cost <value>
```

Arguments	Description
<value>	Defines the value in the range of 1-200,000,000.

Defaults:

NA

Note:

Under configure terminal

Command Modes:

Enable

Example:

This example sets the unit cost to 10000:

```
(conf-if-FE 5/1)# spanning-tree cost 10000
```

42.4.2.4 spanning-tree edge

This command sets the edge configuration of the interface.

Syntax:

```
spanning-tree edge auto
spanning-tree edge enable
spanning-tree edge disable
```

Arguments	Description
auto/enable/disable	Defines the value as: • auto – auto detect • enable – enable edge • disable – disable edge

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the unit edge to 'auto':

```
(conf-if-FE 5/1)# spanning-tree edge auto
```

42.4.2.5 spanning-tree point-to-point

This command sets the point-to-point configuration of the interface.

Syntax:

```
spanning-tree point-to-point auto
spanning-tree point-to-point enable
spanning-tree point-to-point disable
```

Arguments	Description
auto/enable/disable	Defines the value as: • auto – auto detect • enable – enable point-to-point • disable – disable point-to-point

Defaults:

NA

Note:

Under configure terminal.

Command Modes:

Enable

Example:

This example sets the unit point-to-point to auto:

```
(conf-if-FE 5/1)# spanning-tree point-to-point auto
```

42.5 LLDP and LLDP-MED Commands

The Link Layer Discovery Protocol (LLDP) is a Layer-2 protocol that advertises or discovers neighbors on IEEE 802 local area networks.

LLDP for Media Endpoint Devices (LLDP-MED) is an extension to LLDP that functions between endpoint devices and network devices.

42.5.1 lldp run

This command enables LLDP on LAN ports.

Syntax:

The syntax of this command can include the following variations:

```
lldp run
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables LLDP on LAN ports:

```
(config-data)# lldp run
```

42.5.2 lldp holdtime

This command sets the aging timeout for LLDP peers.

Syntax:

The syntax of this command can include the following variations:

```
lldp holdtime <seconds>
```

Arguments	Description
seconds	Sets the aging timeout for LLDP peers in seconds.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the aging timeout for LLDP peers to 10 seconds:

```
(config-data)# lldp holdtime 10
```

42.5.3 lldp location

This command sets the device's location.

Syntax:

The syntax of this command can include the following variations:

```
lldp location civic
lldp location coordinate
lldp location elin <ELIN emergency number>
lldp location none
```

Arguments	Description
location	Use one of the following: ▪ civic Use RFC 4776 civic address ▪ coordinate Use RFC3825 coordinate information ▪ elin Use ELIN emergency number ▪ none No location information

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables the use of the RFC 4776 civic address:

```
(config-data)# lldp location civic
```

42.5.4 lldp network-policy

This command sets the LLDP network policy.

Syntax:

The syntax of this command can include the following variations:

```
lldp network-policy profile <profile number>
```

Arguments	Description
profile number	Defines the profile number (1-4).

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the LLDP network policy profile to 1:

```
(config-data)# lldp network-policy profile 1
```

42.5.5 lldp timer

This command sets LLDP transmission interval.

Syntax:

The syntax of this command can include the following variations:

```
lldp timer <transmission interval>
```

Arguments	Description
transmission interval	Defines the transmission interval in seconds.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the LLDP transmission interval to 10 seconds:

```
(config-data)# lldp timer 10
```

43 Layer-3 Commands

43.1 IPv6 Commands

This version provides support for IPv6 (voice and data-routing functionalities) on the MSBR product series. This support is provided only if the Software License Key installed on the device includes the new Feature Key "IPv6" for enabling IPv6.

43.1.1 ipv6 enable

This command provides support for enabling IPv6 per data-router interface. When the IPv6 feature is included in the Software License Key, IPv6 is disabled per interface, by default. An IPv6-disabled interface will not have global IPv6 addresses enabled, nor will it have link-local addresses.

The `show data ipv6 route` command does not display routes of IPv6 interfaces that are disabled, but the interface is displayed by the `show running config` command. Configuration of IPv6 addresses can be done at any stage, but will only be active if IPv6 is enabled on the required interface.

Syntax:

```
# ipv6 enable
# no ipv6 enable
```

Note:

- This command is only applicable to MSBR devices.
- IPv6 support is available only if the installed Software License Key contains the IPv6 Feature Key. This flag does not replace the need of the Feature Key.
- By default, all data interfaces begin with IPv6 disabled.

Command Modes:

Enable

Example:

The following example enables IPv6.

```
(config-data)# interface gigabitethernet 0/0
(config-if-GE 0/0)# ipv6 address 2010:18::40:81/640
(config-if-GE 0/0)# ipv6 enable
```

43.1.2 IPv6 Static Routes Commands

The following describes IPV6 Static Routes commands.

43.1.2.1 ipv6 route

This command provides support for configuring IPv6 static routes (destination prefix).

Syntax:

```
ipv6 route vrf <VRF anme> <IPv6 destination address>/<prefix>
<IPv6 gateway address> <interface name> <interface ID> [<distance
value>] [track <track ID>]

ipv6 route <IPv6 destination address>/<prefix> [<IPv6 gateway
address>] <interface name> <interface ID> [<distance value>]
[track <track ID>]
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the *vrf* name.
IPv6 destination address	Defines an IPv6 address as X:X::X:X or hostname.
distance value	Defines the priority (0 - 255) of the route in the routing table. The smaller the value, the higher the priority of the route.
track id	Defines the option to make the route dependable on the configured track. (1-100)
a.b.c.d	Defines the IP address.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Interface		Description
a.b.c.d		Defines the IP address.

Note:

- This command is only applicable to MSBR devices.
- IPv6 support is available only if the installed Software License Key contains the IPv6 Feature Key.

Command Modes:

Enable

Example:

- The following example configures an IPv6 static route.

```
(config-data)# ipv6 route 2001:10::/64 2050:8::
GigabitEthernet 0/0 1
```

- The IPv6 static route can be displayed using the regular `show running-config` command or the following new IPv6 command:

```
# show data ipv6 route [<ipv6-address[prefix]>] [connected]
[kernel] [static] [summary]
```

43.1.2.2 ipv6 access-list

This command adds an access list entry.

Syntax:

```
# ipv6 access-list resequence <ipv6 access-list name> <starting
rule number> <step size>

# ipv6 access-list extended <extended IPv6 access-list number>

# ipv6 access-list <access-list ID> {deny|permit} <protocol>
<address1> <address2>

# ipv6 access-list <access-list ID> {deny|permit} <protocol>
<address1> <address2> <port desc>

# ipv6 access-list <access-list ID> {deny|permit} <protocol>
<address1> <address2> <port desc> <postacl>
```

The command's syntax format is described below:

Arguments	Description
starting rule number	Defines the starting rule number [1-2147483647].
step size	Defines the step size.
protocol	Can be any of the following: • tcp • udp • ah • esp • gre • icmp • igmp • ipv6 • [0-255] ipv6 protocol number
address1	Can be any of the following: • any - any host • host – single host • local • A:B:C::D/P - Defines the network IPv6 address and prefix.
address2	Can be any of the following: • any • host • local • A:B:C::D/P - Defines the network IPv6 address and prefix • eq • range

Arguments	Description
port desc	Can be any of the following: • eq - Defines a single port • range - Defines a range of ports • dscp - Match by Differentiated Services Code Point value and mask • established - Accept connection • log - Log matches • stateless - Accept packet
port number	Defines the port number [1-65535].
extended IPv6 access-list number	Defines the extended IPv6 access-list number in number (100-9999) or word format.
postacl	• dscp - Match by Differentiated Services Code Point value and mask • established - Accept connection • log - Log matches • stateless - Accept packet

Note:
This command is only applicable to MSBR devices.

Command Modes:
Enable

Example:
The following example adds an access list entry.

```
(config-data)# ipv6 access-list extended 100
```

43.1.3 Acquiring IPv6 Address from DHCPv6 Server

43.1.3.1 ipv6 address dhcp

This command provides support for configuring the device as a DHCPv6 client to obtain an IPv6 address from a DHCPv6 server, according to RFC 3315. The device as a DHCPv6 client also supports the *Rapid Commit* option. This option lets the device quickly obtain configuration parameters from the DHCP server through a rapid two-message exchange (solicit, reply), instead of the usual four-message exchange (solicit, advertise, request, reply).

Use **no ipv6 address** to disable this command.

Syntax:

```
# ipv6 address dhcp [rapid-commit]
# no ipv6 address
```

Note:

- This command is only applicable to MSBR devices.
- The installed Software License Key must contain the IPv6 Feature Key.
- Rapid Commit must be supported and enabled on the DHCP server as well.
- The received IPv6 address can be viewed using the `show data interfaces <interface>` command.

Command Modes:

Enable

Example:

The following example configures the device as a DHCPv6 client.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 address dhcp
```

43.1.4 Acquiring IPv6 Address from Router Advertisement

43.1.4.1 ipv6 address autoconfig

This command provides support for automatically acquiring an IPv6 address using stateless auto-configuration on a specified WAN interface. This is instead of using a DHCPv6 server for acquiring an IPv6 address.

Syntax:

```
# ipv6 address autoconfig
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example automatically acquires an IPv6 address.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 address autoconfig
```

43.1.5 IPv6 Router Advertisement Daemon Commands

This command provides support for the Router Advertisement Daemon for automatic configuration of IPv6 addresses, according to RFC 4861. The IPv6 Router Advertisement (RA) implements link-local advertisements of IPv6 router addresses and IPv6 routing prefixes, using the Neighbor Discovery Protocol (NDP), as specified in RFC 4861. The RA process is used for stateless auto-configuration of network hosts on IPv6 networks.

43.1.5.1 ipv6 nd managed-config-flag

This command sets the advertised "Managed address configuration" flag, which indicates hosts should use DHCPv6 for address configuration.

The **no** option sets the value to default (0).

Syntax:

```
# ipv6 nd managed-config-flag
# no ipv6 nd managed-config-flag
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sets the advertised "Managed address configuration" flag.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd managed-config-flag
```

43.1.5.2 ipv6 nd other-config-flag

This command sets the advertised "Other configuration" flag (indicating hosts should use DHCPv6 for non-IPv6 address, e.g., NTP address). The **no** option sets the value to the default (0).

Syntax:

```
# ipv6 nd other-config-flag
# no ipv6 nd other-config-flag
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sets the advertised "Other configuration" flag.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd other-config-flag
```

43.1.5.3 ipv6 nd ns-interval

This command sets the advertised “Retrans Timer” (interval between retransmitted Neighbor Solicitation messages) value. The **no** option disables retransmit advertisements.

Syntax:

```
# ipv6 nd ns-interval <1000-3600000 msec>
# no ipv6 nd ns-interval
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sets the advertised "Retrans Timer" value.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd ns-interval 1000
```

43.1.5.4 ipv6 nd reachable-time

This command sets the advertised “Reachability time” (time a neighbor is considered reachable after receiving a reachability confirmation) value. The **no** option sets the value to default (0).

Syntax:

```
# ipv6 nd reachable-time <0-3600000 msec>
# no ipv6 nd reachable-time
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sets the advertised “Reachability time" value.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd reachable-time 2000
```

43.1.5.5 ipv6 nd router-preference

This command sets advertised “Router preference” value. The **no** option sets the value to default (Medium).

Syntax:

```
# ipv6 nd router-preference {High|Low|Medium (default)}
# no ipv6 nd router-preference
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sets the advertised “Router preference" value.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd router-preference High
```

43.1.5.6 ipv6 nd ra

The **no** version of this command removes the RA parameters from the database.

Syntax:

```
# no ipv6 nd ra
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example removes the RA parameters from the database.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# no ipv6 nd ra
```

43.1.5.7 ipv6 nd ra suppress

This command suppresses IPv6 Router Advertisements. The **no** version of this command enables IPv6 Router Advertisements.

Syntax:

```
#  ipv6 nd ra suppress
#  no ipv6 nd ra suppress
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example suppresses IPv6 Router Advertisements.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd ra suppress
```

43.1.5.8 ipv6 nd ra lifetime

This command sets the advertised “Router Lifetime” value.

Syntax:

```
#  ipv6 nd ra lifetime <0-9000 sec (default 1800)>
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example sets the advertised “Router Lifetime” value.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd ra lifetime 5000
```

43.1.5.9 ipv6 nd ra interval

This command sets the IPv6 Router Advertisement minimum / maximum interval.

Syntax:

```
# ipv6 nd ra interval <4-1800 sec>
# ipv6 nd ra interval <4-1800 sec> <[3-(0.75*MaxRAInterval) sec]>
```

Note:

- This command is only applicable to MSBR devices.
- The minimum interval is set to 0.33 x maximum interval.

Command Modes:

Enable

Example:

The following example sets the IPv6 Router Advertisement maximum interval..

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd ra interval 180
```

43.1.5.10 ipv6 nd prefix

This command sets the IPv6 prefix. Use the **no** form of this command to remove the prefix from database.

Syntax:

```
# ipv6 nd prefix <prefix> <valid lifetime> <preferred lifetime>
<no-advertise> <on-link|off-link> <no-autoconfig|autonomous>

# no ipv6 nd prefix
```

The command's syntax format is described below:

Arguments	Description
<prefix>	Configures the IPv6 Routing Prefix Advertisement
<valid lifetime>	The valid range is 0-4294967295 seconds (default 86400). It can have the symbolic value of 'infinity'.
<preferred lifetime>	The valid range is 0-4294967295 seconds (default 14400). It can have the symbolic value of 'infinity'.
<off-link>	Do not use prefix for on-link determination
<no-autoconfig>	Do not use prefix for auto-configuration

Note:

- This command is only applicable to MSBR devices.
- The IPv6 prefix must be /64.
- The *off-link* and *no-autoconfig* parameters can appear in any combination. Both parameters can have the symbolic 'infinity' value.

Command Modes:

Enable

Example:

The following example sets the IPv6 prefix.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd prefix 8/64 10000 50000 on-link
autonomous
```

43.1.5.11 ipv6 nd prefix <X:X::X:X> no-advertise

This command saves this prefix, but does not advertise it. The **no** option means the device advertises the prefix (default):

Syntax:

```
# ipv6 nd prefix <X:X::X:X> no-advertise
# no ipv6 nd prefix
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example saves the IPv6 prefix but does not advertise it.

```
(config-data)# interface gigabitethernet 0/0
(conf-if-GE 0/0)# ipv6 nd prefix 0:1::2:5 no advertise
```

43.1.6 QoS Commands

The QoS Configuration commands include the following:

43.1.6.1 bandwidth (queue)

This command sets the maximum bandwidth of a queue.

Syntax:

```
bandwidth <minimum bandwidth in kbps>
bandwidth <minimum bandwidth in kbps> <maximum bandwidth in kbps>
bandwidth percent <minimum bandwidth in percent>
bandwidth percent <minimum bandwidth in percent> <maximum
bandwidth in percent>
```

The command's syntax format is described below:

Arguments	Description
minimum bandwidth in kbps	Defines the minimum bandwidth of the queue in kbps.
maximum bandwidth in kbps	Defines the maximum bandwidth of the queue in kbps.
minimum bandwidth in percent	Defines the minimum bandwidth of the queue in percent (0-100).
maximum bandwidth in percent	Defines the maximum bandwidth of the queue in percent (0-100).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the wan output service map default queue minimum bandwidth to 60 percent of bandwidth and maximum bandwidth to 80 percent of bandwidth.

```
(conf-s-map-q)# bandwidth percent 60 80
```

43.1.6.2 bandwidth (service-map)

This command sets the maximum bandwidth of a service-map.

Syntax:

```
bandwidth <bandwidth in kbps>
bandwidth unlimited
bandwidth automatic
```

The command's syntax format is described below:

Arguments	Description
< bandwidth in kbps >	Defines the maximum bandwidth of the service-map.
unlimited	Defines the bandwidth is unlimited.
automatic	Defines the bandwidth is set automatically.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the wan output service map maximum bandwidth to 100000 kbps.

```
(conf-s-map)# bandwidth 100000
```

43.1.6.3 qos match-map

This command enters a specific match-map configuration. Use the **no** form of this command to delete a specific match-map.

Syntax:

The syntax of this command can include the following variations:

```
qos match-map input <match-map name>
qos match-map output <match-map name>
qos match-map input <match-map name> <interface type> <interface ID>
qos match-map output <match-map name> <interface type> <interface ID>
```

The command's syntax format is described below:

Arguments	Description
match-map name	Defines the name of the match map to configure
interface name	Defines the interface naming on the *interface* command. If not chosen, **match-map** will apply to all interfaces.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example enters a specific match-map input configuration that will apply to all interfaces.

```
(config data)# qos match-map input sip_incoming
```

The following example enters a specific match-map input configuration that will apply only to the vlan 7 interface.

```
(config-data)# qos match-map output sip_outgoing vlan 7
```

43.1.6.4 match priority

This command defines the priority to match on the specified match-map. Use the **no** form of this command to remove a match priority.

Syntax:

```
match priority <priority value>
```

The command's syntax format is described below:

Arguments	Description
priority value	Defines a priority value to match (0-7).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the priority 5 match-map to match traffic with priority value 5.

```
# configure data
(config-data)# qos match-map input qqq
(conf-m-map)# match priority 5
```

43.1.6.5 match precedence

This command defines the precedence to match on the specified match-map.
Use the **no** form of this command to remove a match precedence.

Syntax:

The syntax of this command includes the following variations:

```
match precedence routine
match precedence priority
match precedence network
match precedence internet
match precedence immediate
match precedence flash-override
match precedence flash
match precedence critical
match precedence <precedence value>
```

The command syntax format is described below:

Arguments	Description
routine	Matches packets with routine precedence (0).
priority	Matches packets with priority precedence (1).
network	Matches packets with network control precedence (7).
internet	Matches packets with internetwork control precedence (6).
immediate	Matches packets with immediate precedence (2).
flash-override	Matches packets with flash override precedence (4).
flash	Matches packets with flash precedence (3).
critical	Matches packets with critical precedence (5).
<precedence value>	Defines the precedence value (0-7).

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the precedence match-map to match traffic with flash precedence (3):

```
(conf-m-map)# match precedence flash
```

43.1.6.6 match length packet

This command defines the packet length to match on the specified match-map. Use the **no** form of this command to remove a match packet length.

Syntax:

The syntax of this command includes the following variations:

```
match length packet <min packet length> <max packet length>
```

The command syntax format is described below:

Arguments	Description
min packet length	Defines the minimum packet length in bytes to match.
max packet length	Defines the maximum packet length in bytes to match.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the match-map to match traffic with packet length between 40 to 150 bytes.

```
(conf-m-map)# match length packet 40 150
```

43.1.6.7 match length data

This command defines the data length to match on the specified match-map. Use the **no** form of this command to remove a match data length.

Syntax:

The syntax of this command includes the following variations:

```
match length data <min data length> <max data length>
```

The command syntax format is described below:

Arguments	Description
min data length	Defines the minimum data length in bytes to match.
max data length	Defines the maximum data length in bytes to match.

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the match-map to match traffic with data length between 40 to 150 bytes.

```
(conf-m-map)# match length data 40 150
```

43.1.6.8 match dscp

This command defines the dscp to match on the specified match-map. Use the **no** form of this command to remove a match dscp.

Syntax:

```
match dscp ef
match dscp default
match dscp cs7
match dscp cs6
match dscp cs5
match dscp cs4
match dscp cs3
match dscp cs2
match dscp cs1
match dscp af43
match dscp af42
match dscp af41
match dscp af33
match dscp af32
match dscp af31
match dscp af23
match dscp af22
match dscp af21
match dscp af13
match dscp af12
match dscp af11
match dscp <dscp value>
```

The command's syntax format is described below:

Arguments	Description
ef	Matches packets with EF dscp (101110)
default	Matches packets with default dscp (000000)
cs7	Matches packets with CS7(precedence 7) dscp (111000)
cs6	Matches packets with CS6(precedence 6) dscp (110000)
cs5	Matches packets with CS5(precedence 5) dscp (101000)
cs4	Matches packets with CS4(precedence 4) dscp (100000)
cs3	Matches packets with CS3(precedence 3) dscp (011000)
cs2	Matches packets with CS2(precedence 2) dscp (010000)
cs1	Matches packets with CS1(precedence 1) dscp (001000)
af43	Matches packets with AF43 dscp (100110)
af42	Matches packets with AF42 dscp (100100)
af41	Matches packets with AF41 dscp (100010)

Arguments	Description
af33	Matches packets with AF33 dscp (011110)
af32	Matches packets with AF32 dscp (011100)
af31	Matches packets with AF31 dscp (011010)
af23	Matches packets with AF23 dscp (010110)
af22	Matches packets with AF22 dscp (010100)
af21	Matches packets with AF21 dscp (010010)
af13	Matches packets with AF13 dscp (001110)
af12	Matches packets with AF12 dscp (001100)
af11	Matches packets with AF11 dscp (001010)
dscp value	Defines the differentiated services codepoint value (0-63).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the dscp match-map to match traffic with AF31 dscp (011010).

```
(conf-m-map)# match dscp af31
```

43.1.6.9 match any

This command configures the specified match-map to match any packet.

Syntax:

```
match any
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the match-map to match any packet.

```
(conf-m-map)# match any
```

43.1.6.10 match access-list

This command defines the access-list to match on the specified match-map. Use the **no** form of this command to remove a match access list.

Syntax:

```
match access-list <access-list name>
```

The command's syntax format is described below:

Arguments	Description
< access-list >	Defines the name of the access-list this match-map should match.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the sip_incoming match-map to match traffic from access-list acl_sip.

```
(conf-m-map)# match access-list acl_sip
```

43.1.6.11 set queue

This command defines the queue to set on the specified match-map. Use the **no** form of this command to remove a set queue.

Syntax:

```
set queue <queue name>
```

The command's syntax format is described below:

Arguments	Description
queue name	Defines the queue name that all traffic that matches this match-map belongs to.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the sip_incoming match-map to belong to the sip_queue queue.

```
# configure data
(config-data)# qos match-map input mmap3
(conf-m-map)# set queue sip_queue
```

43.1.6.12 qos service-map

This command enters a specific service-map configuration.

Syntax:

The syntax of this command can include the following variations:

```
qos service-map lan input
qos service-map lan output
qos service-map gigabitethernet <slot/port> {input|output}
qos service-map atm <slot/port> {input|output}
qos service-map cellular <slot/port> {input|output}
qos service-map efm <slot/port> {input|output}
qos service-map serial <slot/port> {input|output}
qos service-map multilink <1-255> {input|output}
qos service-map fiber <slot/port> {input|output}
```

The command's syntax format is described below:

Arguments	Description
input	Defines inbound traffic
output	Defines outgoing traffic
slot/port	Defines the interface slot and port

Defaults:

NA

Command Modes:

Enable

Example:

The following example enters a LAN output service map.

```
(config-data)# qos service-map lan output
```

43.1.6.13 qos priority-retain

This command, when enabled, does not adjust 802.1p priority bits per the DSCP values.

Syntax:

The syntax of this command can include the following variations:

```
qos priority-retain
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example does not adjust 802.1p priority bits per the DSCP values.

```
(config-data)# qos priority-retain
```

43.1.6.14 set precedence

This command defines the precedence to set on the specified match-map. Use the **no** form of this command to remove a set precedence.

Syntax:

The syntax of this command includes the following variations:

```
set precedence routine
set precedence priority
set precedence network
set precedence internet
set precedence immediate
set precedence flash-override
set precedence flash
set precedence critical
set precedence <precedence value>
```

The command syntax format is described below:

Arguments	Description
routine	Matches packets with routine precedence (0).
priority	Matches packets with priority precedence (1).
network	Matches packets with network control precedence (7).
internet	Matches packets with internetwork control precedence (6).
immediate	Matches packets with immediate precedence (2).
flash-override	Matches packets with flash override precedence (4).
flash	Matches packets with flash precedence (3).
critical	Matches packets with critical precedence (5).
precedence value	Defines the Precedence value (0-7).

Defaults:

NA

Command Modes:

Enable

Examples:

The following example configures the precedence match-map to set traffic that matches this match-map to the flash precedence (3):

```
# configure data
(config-data)# qos match-map input mmap2
(conf-m-map)# set precedence flash
```

43.1.6.15 set dscp

This command defines the dscp to set on the specified match-map. Use the **no** form of this command to remove a set dscp.

Syntax:

```
set dscp ef
set dscp default
set dscp cs7
set dscp cs6
set dscp cs5
set dscp cs4
set dscp cs3
set dscp cs2
set dscp cs1
set dscp af43
set dscp af42
set dscp af41
set dscp af33
set dscp af32
set dscp af31
set dscp af23
set dscp af22
set dscp af21
set dscp af13
set dscp af12
set dscp af11
set dscp <dscp value>
```

The command's syntax format is described below:

Arguments	Description
ef	Matches packets with EF dscp (101110).
default	Matches packets with default dscp (000000).
cs7	Matches packets with CS7(precedence 7) dscp (111000).
cs6	Matches packets with CS6(precedence 6) dscp (110000).
cs5	Matches packets with CS5(precedence 5) dscp (101000).
cs4	Matches packets with CS4(precedence 4) dscp (100000).
cs3	Matches packets with CS3(precedence 3) dscp (011000).
cs2	Matches packets with CS2(precedence 2) dscp (010000).
cs1	Matches packets with CS1(precedence 1) dscp (001000).
af43	Matches packets with AF43 dscp (100110).
af42	Matches packets with AF42 dscp (100100).
af41	Matches packets with AF41 dscp (100010).

Arguments	Description
af33	Matches packets with AF33 dscp (011110).
af32	Matches packets with AF32 dscp (011100).
af31	Matches packets with AF31 dscp (011010).
af23	Matches packets with AF23 dscp (010110).
af22	Matches packets with AF22 dscp (010100).
af21	Matches packets with AF21 dscp (010010).
af13	Matches packets with AF13 dscp (001110).
af12	Matches packets with AF12 dscp (001100).
af11	Matches packets with AF11 dscp (001100).
< dscp value>	Defines the differentiated services codepoint value (0-63).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the dscp match-map to set traffic that matches this match-map to the AF31 dscp (011010):

```
# configure data
(config-data)# qos match-map input mmap2
(conf-m-map)# set dscp af31
```

43.1.6.16 set priority

This command defines the priority to set on the specified match-map. Use the **no** form of this command to remove a set priority.

Syntax:

```
set priority <priority value>
```

The command's syntax format is described below:

Arguments	Description
< priority value>	Defines the priority value. The range is between 0-7.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the match-map priority value to 5.

```
# configure data
(config-data)# qos match-map input mmap3
(conf-m-map)# set priority 5
```

43.1.6.17 policy

This command defines the policy of the specified queue.

Syntax:

```
policy fairness
policy fifo
policy random-detect
policy strict-priority
```

The command's syntax format is described below:

Arguments	Description
fairness	Defines that the queue is configured with fairness policy.
fifo	Defines that the queue is configured with first in first out policy.
random-detect	Defines that the queue is configured with random early detection policy.
strict-priority	Defines that the queue is configured with strict scheduling priority policy.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the wan output service map policy to fifo.

```
(conf-s-map-q)# policy fifo
```

43.1.6.18 priority

This command defines the priority to set on the specified queue.

Syntax:

```
priority <priority value>
```

The command's syntax format is described below:

Arguments	Description
priority value	Defines the priority value in the range of 0 to 7.

Defaults:

NA

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example configures the wan output service map priority to 4.

```
(conf-s-map-q)# priority 4
```

43.1.6.19 queue

This command enters a specific queue configuration. Use the **no** form of this command to delete a specific queue.

Syntax:

```
queue <queue name>
queue default
```

The command's syntax format is described below:

Arguments	Description
queue name	Defines the name of the queue to configure.
default	Defines the behavior of traffic when it doesn't match any queue.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enters a wan output service map queue called sip_wan_outgoing configuration menu.

```
(conf-s-map)# queue sip_wan_outgoing
```

The following example enters a lan output service map default queue configuration menu.

```
(conf-s-map)# queue default
```

43.1.6.20 priority

This command provides support for scenarios where the device is used as a bridging device (Layer 2) and IEEE 802.1p priority marking for the bridged traffic is required. When this is used, outgoing packets belonging to a specified VLAN interface are marked with the configured priority value.

Syntax:

```
priority <priority level>
```

The command's syntax format is described below:

Arguments	Description
priority level	Defines the priority level which can be any value from 0 (lowest) through 7 (highest).

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the priority level to "7".

```
(config-data)# interface vlan 1
(conf-if-VLAN 1)# priority 7
```

43.2 Data Routing Commands

Each routing protocol is available only if it is included in the Feature key supplied with the system.

Border Gateway Protocol (BGP) is the main routing protocol of the Internet. It is used to distribute routing information among Autonomous Systems. (For more information, refer to the protocol's RFC at http://www.ietf.org/rfc/rfc1771.txt).

Open Shortest Path First Protocol (OSPF) is an Interior Gateway Protocol (IGP) used to distribute routing information within a single Autonomous System. (For more information, refer to the protocol's RFC at http://www.ietf.org/rfc/rfc2328.txt.)

The feature's routing engine is based on the Quagga GNU routing software package. By using the BGP and OSPF protocols, this routing engine enables the device to exchange routing information with other routers within and outside an Autonomous System.

43.2.1 Static Routing Commands

Static Routing occurs when the router uses pre-defined, user-configured routing entries to forward traffic. Static routes are usually manually configured by the network administrator and added to the routing table.

A common use of static routes is for providing an instruction on how to forward traffic when no other route exists.

Static routes have a much lower administrative distance in the system than the dynamic routing protocols, and in most scenarios are prioritized over the dynamic routes.

43.2.1.1 ip route ip address

This command configures routing rules.

Syntax:

The syntax of this command can include several variations. The most common are:

```
ip route <ip address> <ip destination mask> [next-hop ip address]
<interface> <interface ID> [<distance value>] [track <track id>]
[bfd-neighbor <neighbor ID>]
```

The command's syntax format is described below:

Arguments	Description
ip address	Defines IP Destination prefix in the format of a.b.c.d.
ip destination mask	Defines the IP Destination prefix mask.
interface	Defines source interface name and id.
metric	Defines option to define metric value.
distance value	Defines the distance value for this route (0-255).
track	Defines the track to be used for this route.
track id	Defines the track ID (1-100).
a.b.c.d	Defines the IP address

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example adds a route to 10.20.0.0/16 through gateway 10.10.0.1 and interface vlan 1:

```
(config-data)# ip route 10.20.0.0 255.255.0.0 10.10.0.1 vlan 1
```

The following example adds a track dependent route:

```
(config-data)# ip route 10.30.5.0 255.255.255.0 10.8.0.1 vlan 4
track 2
```

43.2.1.2 ip route source

This command configures source-based routing to specific destinations. Source-based routing can include VLANs.

Syntax:

The syntax of this command can include several variations. The most common are:

```
ip route source  <IP source prefix> <IP source prefix mask>
destination <IP destination prefix> <IP destination prefix mask>
[next-hop ip address] <interface> <interface id> [<distance
value>] [track <track id>] [bfd-neighbor <neighbor ID>]

ip route source  <IP source prefix with prefix length> destination
<IP destination prefix/prefix length> [next-hop ip address]
<interface> <interface id> [<distance value>] [track <track id>]
[bfd-neighbor <neighbor ID>] [output-vrf <vrf_id>]
```

The command's syntax format is described below:

Arguments	Description
ip source prefix	Defines the IP source prefix (a.b.c.d).
ip source prefix mask	Defines the IP source prefix mask (a.b.c.d).
ip destination prefix	Defines the ip destination prefix (a.b.c.d)
ip destination prefix mask	Defines the IP source prefix mask (a.b.c.d).
distance value	Defines the distance value for this route (0-255).
track id	Defines the track ID (1-100).
a.b.c.d	Defines the IP address.
output-vrf	Defines the output vrf name.
bfd-neighbor	Defines the ID of a BFD neighbor to attach the route to.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Note:

- Source-based routing must not be configured with dynamic route protocols.
- This command is applicable to Mediant MSBR devices.

Command Modes:

Enable

Example:

The following are examples of how this command can be used:

```
(config-data) # ip route source 10.3.0.0 10.3.1.1 destination
0.0.0.0 10.3.4.1. 10.4.5.0 gre 18 track 10
```

43.2.1.3 ip route vrf

This command adds static route to VRF table.

Syntax:

The syntax of this command can include several variations. The most common are:

ip route vrf <VRF name> <IP destination prefix> <IP destination prefix mask> [next-hop ip address] <interface> <interface ID> [<metric value>] [**track** <track ID>] [**bfd-neighbor** <neighbor ID>] [**output-vrf** <name>] [**description** <string>]

This syntax describes a route that depends also on the source prefix of the packets:

```
ip route vrf <VRF name> source <IP source prefix>|local-voip
destination <IP destination prefix> [<gateway>] <interface type>
<interface ID> [<metric value>] [track <track ID>] [output-vrf
<name>] [description <string>]
```

The command's syntax format is described below:

Arguments	Description
IP source prefix	Defines the IP source prefix (a.b.c.d).
IP destination prefix	Defines IP Destination prefix in the format of a.b.c.d.
IP destination prefix mask	Defines the IP Destination prefix mask.
interface	Defines source interface name and id.
metric value	Defines the metric value for this route (0-255).
track	Defines the track to be used for this route.
track id	Defines the track ID (1-100).
output-vrf	Defines the output VRF.
description	Defines the description.
bfd-neighbor	Defines the ID of a BFD neighbor to attach the route to.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how this command can be used:

```
(config-data)# ip route vrf abcd 10.20.0.0 255.255.0.0 bvi 1 track
10
```

43.2.1.4 ip redirects

This command enables Internet Control Message Protocol (ICMP) Redirect messages configuration.

Syntax:

The syntax of this command can include several variations. The most common are:

```
ip redirects send
ip redirects receive
```

Arguments	Description
receive	Enables receiving ICMP Redirect messages.
send	Enables sending ICMP Redirect messages.

The command's syntax format is described below:

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables the receiving of ICMP Redirect messages:

```
(config-data)# ip redirects receive
```

43.2.1.5 ip port-triggering

This command enables the tftp and l2tp port-triggering.

Syntax:

The syntax of this command can include several variations. The most common are:

```
ip port-triggering {l2tp|tftp}
```

Arguments	Description
l2tp	Enables l2tp port-triggering.
tftp	Enables tftp port-triggering.

The command's syntax format is described below:

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables l2tp port-triggering:

```
(config-data)# ip port-triggering l2tp
```

43.2.1.6 ip port-map

This command enables Application-Level Gateway (ALG) configuration commands.

Syntax:

The syntax of this command can include several variations. The most common are:

```
ip port-map sip disable
ip port-map sip <start_dest_port> [end_dest_port]
ip port-map rtsp disable
ip port-map rtsp <start_dest_port> [end_dest_port]
ip port-map pptp disable
ip port-map pptp <start_dest_port> [end_dest_port]
ip port-map msn disable
ip port-map msn <start_dest_port> [end_dest_port]
ip port-map mgcp disable
ip port-map mgcp <start_dest_port> [end_dest_port]
ip port-map l2tp disable
ip port-map l2tp <start_dest_port> [end_dest_port]
ip port-map ike disable
ip port-map ike <start_dest_port> [end_dest_port]
ip port-map h323_ras disable
ip port-map h323_ras <start_dest_port> [end_dest_port]
ip port-map h323_cs disable
ip port-map h323_cs <start_dest_port> [end_dest_port]
ip port-map ftp disable
ip port-map ftp <start_dest_port> [end_dest_port]
ip port-map dns disable
ip port-map dns <start_dest_port> [end_dest_port]
ip port-map dhcpv6 disable
ip port-map dhcp disable
ip port-map aim disable
ip port-map aim <start_dest_port> [end_dest_port]
```

Arguments	Description
start_dest_port	Defines the Destination Port (1-65535).
end_dest_port	Defines the End Destination Port (1-65535).

The command's syntax format is described below:

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how this command is used:

```
(config-data)# ip port-map sip 1000 1200
```

43.2.2 Dynamic Routing Commands

The following commands relate to Dynamic Routing.

43.2.2.1 router bgp vrf

This command enables a BGP protocol process with the specified *asn*.

Syntax:

The syntax of this command can include the following variations:

```
router bgp [vrf <VRF name>] ASnumber [view <viewname>]
no router bgp asn
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.
ASnumber	Defines the Autonomous System number (1 - 65355).
viewname	Defines the viewname.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables the BGP protocol process with the specified ASnumber.

```
(config data)# router bgp vrf qwsa 100 view vname
```

43.2.2.2 ip as-path

This command defines a new as-path access list.

Syntax:

The syntax of this command can include the following variations:

```
ip as-path [vrf <VRF name>]  access-list word {permit|deny} line
ip as-path access-list word {permit|deny}line

no ip as-path access-list word
no ip as-path access-list word {permit|deny}line
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.
word	Defines the regular expression access list name.
permit	Specifies packets to forward.
deny	Specifies packets to reject.
line	Defines regular expression to match the BGP as-path.

Defaults:

NA

Command Modes:

Enable

Example:

This example defines a new as-path access list.

```
(config data) # ip as-path access-list acc_list1 permit line 1
```

43.2.2.3 ip community-list

This command adds a community list entry.

Syntax:

The syntax of this command can include the following variations:

```
ip community-list [vrf <VRF name>] <community list number
standard> {permit|deny} [AA:NN]
ip community-list <community list number expanded> {permit|deny}
line
ip community-list expanded name {permit|deny} line
ip community-list standard name {permit|deny} [AA:NN]
no ip community-list community-option
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.
community list number standard	Defines community list number standard [1-99]
community list number expanded	Defines community list number expanded [100-500]
expanded	Adds an expanded community list entry.
standard	Adds a standard community list entry.
name	Defines a community list name.
line	Defines an ordered list as a regular expression.
permit	Specifies a community to accept.
deny	Specifies a community to reject.

Defaults:

NA

Command Modes:

Enable

Example:

This example adds a community list entry.

```
(config data) # ip community-list standard comm1 permit
```

43.2.2.4 ip extcommunity-list standard

This command defines a new standard extcommunity-list.

Syntax:

The syntax of this command can include the following variations:

```
ip extcommunity-list standard name {permit|deny} [AA:NN][AA:NN]
[AA:NN][AA:NN]
no ip extcommunity-list name
no ip extcommunity-list standard name
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF table name.
name	Defines a community list name.
permit	Specifies a community to accept.
deny	Specifies a community to reject.
AA:NN	Defines the extended community attribute in 'rt aa:nn_or_IPaddr:nn' OR 'soo aa:nn_or_IPaddr:nn' format.

Defaults:

NA

Command Modes:

Enable

Example:

This example defines a new standard extcommunity-list.

```
(config data) ip extcommunity-list standard comm1 permit
```

43.2.2.5 ip extcommunity-list vrf

This command defines a new standard extcommunity-list, associated with a defined VRF. To delete the extended community list, use the **no** form of this command.

Syntax:

The syntax of this command can include the following variations:

```
ip extcommunity-list vrf <VRF name> <standard list number>
{permit|deny} [AA:NN]

ip extcommunity-list vrf <VRF name> standard <extended list name>
{permit|deny} [AA:NN][AA:NN][AA:NN][AA:NN]

ip extcommunity-list vrf <VRF name> <expanded list number>
{permit|deny} [line]

ip extcommunity-list vrf <VRF name> expanded <extended list name>
{permit|deny} [line]

no ip extcommunity-list <VRF name> <standard list number>
{permit|deny} [AA:NN]

no ip extcommunity-list <VRF name> <extended list name>
{permit|deny} [line]

no ip extcommunity-list <VRF name> expanded <extended list name>
{permit|deny} [line]

no ip extcommunity-list <VRF name> standard <extended list name>
{permit|deny} [AA:NN]
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF table name.
name	Defines a community list name.
standard list number	Defines a standard list number from 1 to 99 that identifies one or more permit or deny groups of extended communities.
expanded list number	Defines an expanded list number from 100 to 500 that identifies one or more permit or deny groups of extended communities.
extended list name	Defines Extended Community list name.
permit	Specifies a community to accept.
deny	Specifies a community to reject.
AA:NN	Defines the extended community attribute in 'rt aa:nn_or_IPaddr:nn' OR 'soo aa:nn_or_IPaddr:nn' format.
line	Defines an ordered list as a regular-expression.

Defaults:

NA

Command Modes:

Enable

Example:

This example defines a new standard extcommunity-list.

```
(config data) ip extcommunity-list vrf VRF_list1 18 permit 2
```

43.2.2.6 ip extcommunity-list expanded

This command defines a new expanded extcommunity-list.

Syntax:

The syntax of this command can include the following variations:

```
ip extcommunity-list expanded name {permit|deny} line
ip extcommunity-list number-range-1 {permit|deny} line
ip extcommunity-list number-range-2 {permit|deny} line
ip extcommunity-list number-range-1 {permit|deny} [AA:NN][AA:NN]
[AA:NN][AA:NN]
no ip extcommunity-list expanded name
```

The command's syntax format is described below:

Arguments	Description
name	Defines a community list name.
permit	Specifies a community to accept.
deny	Specifies a community to reject.
line	Defines a string expression of extended communities attribute.
number-range-1	Defines a community number in AA:NN format or internet|local-AS, no-advertise, no-export - (1 - 99)
number-range-2	Defines a community number in AA:NN format or internet|local-AS, no-advertise, no-export - (100 - 500)
AA:NN	Defines the extended community attribute in 'rt aa:nn_or_IPaddr:nn' OR 'soo aa:nn_or_IPaddr:nn' format.

Defaults:

NA

Command Modes:

Enable

Example:

This example defines a new expanded extcommunity-list.

```
(config data) # ip extcommunity-list expanded commname permit
```

43.2.2.7 ip pim

This command configures Protocol Independent Multicast (PIM).

Syntax:

The syntax of this command can include the following variations:

Sets static RP address for router, should be configured on all related PIM routers.

```
ip pim rp-address <ip> group <Multicast group prefix>
```

Sets router to be a candidate RP, chosen by priority.

Sets router to be a candidate RP, Advertising Interval in seconds.

When the interface is used, the RP candidate will be set to interface IP.

```
ip pim rp-candidate {IP|Interface} priority <0-255> time <0-3600>
```

Sets router to be a BSR candidate, chosen by priority when Interface is used – the BSR candidate will be set to interface IP.

```
ip pim bsr-candidate {IP|Interface}  priority <0-255>
```

Sets threshold for moving to shortest path tree between the multicast server and the client.

- **infinity** - Never switch to shortest path
- **packets** – Move to shortest path tree when number of packets threshold was crossed during the specified interval
- **rate** - Move to shortest path tree when packet rate threshold was crossed during the specified interval

```
ip pim spt-threshold infinity
OR
ip pim spt-threshold packets <number of packets> interval <sec>
OR
ip pim spt-threshold rate <kpps> interval <sec>
```

Defaults:

NA

Command Modes:

Enable

Example:

This is an example of how this command can be used.

```
(config data) ip pim rp-address 10.12.15.91 group 100.1012.15
```

43.2.2.8 ip prefix-list

This command configures the IPv4 prefix-based filtering mechanism.

Syntax:

The syntax of this command includes the following variations:

```
ip prefix-list <prefix list name> {permit|deny}  [a.b.c.d/m|any]
ip prefix-list <prefix list name> description
ip prefix-list <prefix list name> seq <seqnumber> [permit|deny]
[a.b.c.d/m|any]
ip prefix-list <prefix list name> [vrf <VRF name>] [seq <prefix-
list seq number>] {permit|deny}<prefix to filter> [le <len>] [ge
<len>]
no ip prefix-list <name>
```

The command syntax format is described below:

Arguments	Description
a.b.c.d/m	Defines the IP prefix network/length.
any	Defines any prefix match.
description	Defines up to 80 characters describing this prefix-list.
VRF name	Defines the *vrf* name.
prefix list name	Defines the name of a prefix list.
seqnumber	Defines the sequence number. Range is [1-4294967295].
deny	Specifies the packets to reject.
permit	Specifies the packets to accept.
le <len>	The prefix list is applied if the prefix length is less than or equal to the **le** prefix length. Not used if "prefix to filter" is set to "any" (0-32).
ge <len>	The prefix list is applied if the prefix length is greater than or equal to the **ge** prefix length. Not used if "prefix to filter" is set to "any"(0-32).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures prefix-based filtering mechanism

```
(config-data)# ip prefix-list iplist permit any
```

43.2.2.9 ipv6 prefix-list

This command configures the IPv6 prefix-based filtering mechanism.

Syntax:

The syntax of this command includes the following variations:

```
ipv6 prefix-list <prefix list name> {deny|permit} [X:X::X:X/M] [le
<maximum prefix length> ] [ge <minimum prefix length>]

ipv6 prefix-list <prefix list name> {deny|permit} any

ipv6 prefix-list <prefix list name> description <description
field>

ipv6 prefix-list <prefix list name> seq <seqnumber> {deny|permit}
[X:X::X:X/M] [le <maximum prefix length> ] [ge <minimum prefix
length>]

ipv6 prefix-list <prefix list name> seq <seqnumber>
{deny|permit}any

ipv6 prefix-list <prefix list name> vrf <VRF table name>
{deny|permit} [X:X::X:X/M] [le <maximum prefix length> ] [ge
<minimum prefix length>]

ipv6 prefix-list <prefix list name> vrf <VRF table name>
{deny|permit} any

ipv6 prefix-list <prefix list name> vrf <VRF table name>
description <description field>

ipv6 prefix-list <prefix list name> vrf <VRF table name> [seq
<prefix-list seq number>] {deny|permit} [X:X::X:X/M] [le <maximum
prefix length>] [ge <minimum prefix length>]

ipv6 prefix-list <prefix list name> vrf <VRF table name> [seq
<prefix-list seq number>] {deny|permit} any

ipv6 prefix-list sequence-number [vrf <VRF table name>]
```

The command syntax format is described below:

Arguments	Description
a.b.c.d/m	Defines the IP prefix network/length.
any	Defines any prefix match.
description	Defines up to 80 characters describing this prefix-list.
VRF name	Defines the *vrf* name.
prefix list name	Defines the name of a prefix list.

Arguments	Description
seqnumber	Defines the sequence number. Range is [1-4294967295].
deny	Specifies the packets to reject.
permit	Specifies the packets to accept.
le <len>	The prefix list is applied if the prefix length is less than or equal to the **le** prefix length. Not used if "prefix to filter" is set to "any".
ge <len>	The prefix list is applied if the prefix length is greater than or equal to the **ge** prefix length. Not used if "prefix to filter" is set to "any".

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures prefix-based filtering mechanism

```
(config-data)# ip prefix-list iplist permit any
```

43.2.2.10 key chain

This command configures the key string for RIPv2 authentication

Syntax:

The syntax of this command includes the following variations:

```
key chain <name> [vrf <VRF name>]
no router <name>
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the *vrf* name.
key chain name	Defines the key chain name.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the key string for RIPv2 authentication.

```
(config-data)# key chain kcname
```

43.2.2.11 router-id

This command specifies the router ID (as an IP address)

Syntax:

The syntax of this command includes the following variations:

```
router-id <a.b.c.d> [vrf <vrf name>]
no ip router-id
```

The command syntax format is described below:

Arguments	Description
a.b.c.d	Defines the local IP address
VRF name	Defines the *vrf* name (up to 64 bytes).

Defaults:

NA

Command Modes:

Enable

Example:

The following example specifies the router ID as an IP address.

```
(config-data)# router-id 10.15.4.12
```

43.2.2.12 aggregate-address

This command specifies an aggregate address for both IPv4 and IPV6.

Syntax:

The syntax of this command can include the following variations:

```
aggregate-address a.b.c.d/M
aggregate-address a.b.c.d/m summary-only
aggregate-address a.b.c.d/m summary-only as-set
aggregate-address a.b.c.d/m as-set
aggregate-address a.b.c.d/m as-set summary-only
aggregate-address a.b.c.d a.b.c.d
aggregate-address a.b.c.d a.b.c.d summary-only
aggregate-address a.b.c.d a.b.c.d summary-only as-set
aggregate-address a.b.c.d a.b.c.d as-set
aggregate-address a.b.c.d a.b.c.d as-set summary-only
aggregate-address x:x::x:x/m
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines an IPv4 IP address or subnet mask.
a.b.c.d/m	Defines an IPv4 IP address/network prefix.
x:x::x:x/m	Defines an IPv6 aggregate address.
as-set	Resulting routes include As Set.
summary-only	Defines aggregated routes are not announced.

Defaults:

NA

Command Modes:

Enable

Example:

The following example specifies an aggregate address.

```
# configure data
(config-data)# router bgp 1
(conf-router)# aggregate-address 10.21.3.150 255.255.0.0
```

43.2.2.13 redistribute kernel

This command redistributes the kernel route to the BGP process.

Syntax:

The syntax of this command can include the following variations:

```
redistribute kernel
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes the kernel route to the BGP process.

```
(config-data)# router bgp 1
(conf-router)# redistribute kernel
```

43.2.2.14 bgp scan-time

This command configures the background scanner interval.

Syntax:

The syntax of this command can include the following variations:

```
bgp scan-time <scanner interval>
```

The command's syntax format is described below:

Arguments	Description
scanner interval	Defines the scanner interval in seconds (5-60).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the background scanner interval to 20 seconds.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp scan-time (20)
```

43.2.2.15 bgp router-id

This command overrides the configured router identifier.

Syntax:

The syntax of this command can include the following variations:

```
bgp router-id a.b.c.d
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the manually configured router identifier.

Defaults:

NA

Command Modes:

Enable

Example:

The following example overrides the configured router identifier.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp router-id 10.13.12.2
```

43.2.2.16 bgp log-neighbor-changes

This command logs BGP neighbor status changes (up or down) and resets for troubleshooting network connectivity problems.

Syntax:

The syntax of this command can include the following variations:

```
bgp log-neighbor-changes
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example logs BGP neighbor status changes.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp log-neighbor-changes
```

43.2.2.17 bgp graceful-restart

This command defines graceful restart capability parameters.

Syntax:

The syntax of this command can include the following variations:

```
bgp graceful-restart [stalepath-time <delay value>]
```

The command's syntax format is described below:

Arguments	Description
delay value	Defines the delay value in seconds [1-3600].

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines graceful restart capability parameters.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp graceful-restart
```

43.2.2.18 bgp fast-external-failover

This command immediately resets a session if a link to a directly connected external peer goes down.

Syntax:

The syntax of this command can include the following variations:

```
bgp fast-external-failover
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example resets a session if a link to a directly connected external peer goes down.

.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp fast-external-failover
```

43.2.2.19 bgp enforce-first-as

This command configures a BGP routing process to remove updates received from external BGP peers that do not list their Autonomous System (AS) number as the first AS path segment in the AS_PATH attribute of the incoming route.

Syntax:

The syntax of this command can include the following variations:

```
bgp enforce-first-as
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example is an example of how this command is used.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp enforce-first-as
```

43.2.2.20 bgp deterministic-med

This command selects the best Multi_Exit_Disc (MED) path from paths advertised from the neighboring AS.

Syntax:

The syntax of this command can include the following variations:

```
bgp deterministic-med
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example is an example of how this command is used.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp deterministic-med
```

43.2.2.21 bgp default local-preference

This command configures the default local preference value.

Syntax:

The syntax of this command can include the following variations:

```
bgp default local-preference {ipv4-unicast|local-preference <local preference value>}
```

The command syntax format is described below:

Arguments	Description
local preference value	Defines the default local preference value [0-4294967295].

Defaults:

NA

Command Modes:

Enable

Example:

The following example defines the default local preference value.

.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp default local-preference 100
```

43.2.2.22 bgp dampening

This command enables route-flap dampening. Flapping routes trigger instability in the routing table. Routers running BGP have a mechanism designed to reduce the destabilizing effect of flapping routes.

Syntax:

The syntax of this command can include the following variations:

```
bgp dampening
bgp dampening <half life time>
bgp dampening [<half life time>] <re-use limit> [<start suppress>
<suppress duration>
```

The command syntax format is described below:

Arguments	Description
half life time	Defines the amount of time that must pass to decrease the penalty by one half [1-45].
re-use limit	Defines the value to start reusing a route [1 – 20000]. This value is compared to the penalty value to resolve route reusability. If the penalty is greater than the suppress limit, the route is suppressed. Otherwise, it is reused.
start suppress	Defines the value that specifies the penalty that will be used if a route is suppressed [1 – 20000].
suppress duration	Defines the maximum duration in minutes that a route will be suppressed [1-255].

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how this command is used.

.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp dampening 1 1000 1000 100
```

43.2.2.23 bgp confederation peers

This command splits an autonomous system into smaller autonomous systems or combines several autonomous systems into one.

Syntax:

The syntax of this command can include the following variations:

```
bgp confederation peers <AS number>
bgp confederation peers <AS number> [<AS number>]
[<AS number>][<AS number>]
```

The command syntax format is described below:

Arguments	Description
AS number	Defines the Autonomous System numbers for BGP peers that belong to the confederation [1-65535].

Defaults:

NA

Command Modes:

Enable

Example:

The following example specifies four other confederations as members of autonomous system 2.

```
# configure data
(config-data)# router bgp 2
(conf-router)# bgp confederation identifier 6518 65020 65022
65024
```

43.2.2.24 bgp confederation identifier

This command splits an autonomous system into smaller autonomous systems or combines several autonomous systems into one.

Syntax:

The syntax of this command can include the following variations:

```
bgp confederation identifier <AS number>
```

The command syntax format is described below:

Arguments	Description
AS number	Defines the Autonomous System numbers for BGP peers that belong to the confederation [1-65535].

Defaults:

NA

Command Modes:

Enable

Example:

The following example specifies confederation 200 belongs to autonomous system 18.

```
# configure data
(config-data)# router bgp 200
(conf-router)# bgp confederation identifier 18
```

43.2.2.25 bgp router-id

This command specifies the router-ID.

Syntax:

The syntax of this command can include the following variations:

```
bgp router-id a.b.c.d
no bgp router-id
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the Router Identifier.

Defaults:

Router identifier value is selected as the largest IP address of the interfaces.

Command Modes:

Enable

Example:

The following example sets the Router Identifier.

```
(config data) # bgp router-id 10.13.22.130
```

43.2.2.26 bgp cluster-id

This command configures the Route-Reflector Cluster-id.

Syntax:

The syntax of this command can include the following variations:

```
bgp cluster-id [a.b.c.d|Cluster id number]
no bgp cluster-id
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the Route-Reflector Cluster-id in IP address format.
Cluster ID Number	Defines the Route-Reflector Cluster-id as 32 bit quantity - Range [1-4294967295]

Defaults:

Router identifier value is selected as the largest IP address of the interfaces.

Command Modes:

Enable

Example:

The following example sets the Cluster ID.

```
(config-data)# router bgp 1
(conf-router)# bgp cluster-id 10.13.22.130
```

43.2.2.27 bgp client-to-client reflection

This command configures client-to-client route reflection.

Syntax:

The syntax of this command can include the following variations:

```
bgp client-to-client reflection
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures client-to-client route reflection.

```
(config data) # bgp client-to-client reflection
```

43.2.2.28 bgp bestpath as-path

This command specifies that the length of confederation path sets and sequences that should be taken into account during the BGP best path decision process.

Syntax:

The syntax of this command can include the following variations:

```
bgp bestpath as-path {confed|ignore}
```

The command's syntax format is described below:

Arguments	Description
confed	Compare path lengths including confederation sets & sequences in selecting a route.
ignore	Ignores *as-path* length when selecting a router.

Defaults:

NA

Command Modes:

Enable

Example:

The following example ignores as-path length in selecting a router.

```
(config data) # bgp bestpath as-path ignore
```

43.2.2.29 bgp bestpath compare-routerid

This command compares the router-id for identical EBGP paths.

Syntax:

The syntax of this command can include the following variations:

```
bgp bestpath compare-routerid
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example compares the router-id for identical EBGP paths.

```
(config data) # bgp bestpath compare-routerid
```

43.2.2.30 bgp bestpath med confed

This command allows BGP to select the best path when multiple BGP routes to the same destination exist.

Syntax:

The syntax of this command can include the following variations:

```
bgp bestpath med confed [missing-as-worst]
```

The command's syntax format is described below:

Arguments	Description
missing-as-worst	Treats the missing MED as the least preferred one.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use the command.

```
(config data) # bgp med confed missing-as-worst
```

43.2.2.31 bgp bestpath med missing-as-worst

This command treats the missing Multi Exit Discriminator (MED) attribute in a path as having a value of infinity and as the least preferred one.

Syntax:

The syntax of this command can include the following variations:

```
bgp bestpath med missing-as-worst [confed]
```

The command's syntax format is described below:

Arguments	Description
confed	Compares MEDs among confederation paths.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use the command.

```
(config data) # bgp bestpath med missing-as-worst confed
```

43.2.2.32 bgp always-compare-med

This command allows comparing MEDs from different neighbors.

Syntax:

The syntax of this command can include the following variations:

```
bgp always-compare-med
```

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use the command.

```
(config data) # bgp always-compare-med
```

43.2.2.33 distance

This command defines an administrative distance.

Syntax:

The syntax of this command can include the following variations:

```
distance <admin distance> <a.b.c.d/M>
```

The command's syntax format is described below:

Arguments	Description
admin distance	Defines the Administrative Distance [1-255].
a.b.c.d/M	Defines the IP source prefix.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the Administrative Distance to 90.

```
(config data) # distance 90
```

43.2.2.34 distance bgp

This command allows the use of external, internal, and local administrative distances that could be a better route than other external, internal, or local routes to a node.

Syntax:

The syntax of this command can include the following variations:

```
distance bgp <external distance> <internal distance> <local routes>
```

The command's syntax format is described below:

Arguments	Description
external distance	Defines distance for routes external to the AS [1-255].
internal distance	Defines distance for routes internal to the AS [1-255].
local routes	Defines distance for local routes [1-255].

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config data) # distance bgp 200 200 100
```

43.2.2.35 redistribute static

This command redistributes the static route to the BGP process.

Syntax:

The syntax of this command can include the following variations:

```
redistribute static
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes the static route to the BGP process.

```
(config-data)# router bgp 1
(conf-router)# redistribute static
```

43.2.2.36 redistribute connected

This command redistributes the connected route to the BGP process.

Syntax:

The syntax of this command can include the following variations:

```
redistribute connected
redistribute connected route-map <Pointer to route-map entries>
```

The command's syntax format is described below:

Arguments	Description
pointer to route-map entries	Defines the Router Identifier.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes the connected route to the BGP process.

```
(config-data)# router bgp 1
(conf-router)# redistribute connected
```

43.2.2.37 redistribute ospf

This command redistributes the OSPF route to the BGP process.

Syntax:

The syntax of this command can include the following variations:

```
redistribute ospf [metric <metric value>] [route-map <string>]
redistribute ospf [route-map <string>] [metric <metric value>]
```

The command's syntax format is described below:

Arguments	Description
metric value	Defines the metric value [0-4294967295].
route-map string	Defines the Route Map reference.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes the OSPF route to the BGP process.

```
(config-data)# router bgp 1
(conf-router)# redistribute ospf
```

43.2.2.38 neighbor remote-as

This command creates a new neighbor who's remote *-as* is **as number**. This command must be the first command used when configuring a neighbor.

Note: In all **neighbor** commands, the **neighbor ip-address/word** maybe described as *peer*.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|x:x::x:x} remote-as <AS number>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|x:x::x:x	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
AS number	Defines the AS number <1-65535>.
peer	Defines this field as an IPv4 address.

Defaults:

NA

Command Modes:

Enable

Example:

In the following example, the router in AS-1, is trying to peer with AS-2 at 10.0.0.1.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.0.0.1 remote-as 2
```

43.2.2.39 neighbor shutdown

This command shuts down the peer.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|x:x::x:x} shutdown
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|x:x::x:x	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

In the following example, the peer is shutdown.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.30.5.118 shutdown
```

43.2.2.40 neighbor enforce-multihop

This command enforces BGP neighbors to perform a multihop.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|x:x::x:x}  enforce-multihop
neighbor string enforce-multihop
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.21.5.120 enforce-multihop
```

43.2.2.41 neighbor dont-capability-negotiate

This command allows not to perform capability negotiation.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} dont-capability-negotiate
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.21.5.120 dont-capability-negotiate
```

43.2.2.42 neighbor disable-connected-check

This command enables one-hop away EBGP peer using a loopback address.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X}  disable-connected-check
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.21.5.120 disable-connected-check
```

43.2.2.43 neighbor ebgp-multihop

This command allows *ebgp* neighbors that are not on directly connected networks.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} ebgp-multihop
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

The following example allows an ebgp neighbor.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.21.5.120 ebgp-multihop
```

43.2.2.44 neighbor description

This command sets the description of the peer.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} description line
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
line	Defines the neighbor description (up to 80 characters).

Defaults:

NA

Command Modes:

Enable

Example:

This following example sets the description of the peer

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.5.20.110 description main server
```

43.2.2.45 neighbor version

This command set the BGP version to match a neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} version version
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
version	Defines the version. It can be either 4 or 4-. BGP version 4- is similar but the neighbor speaks the old Internet-Draft revision 00's Multiprotocol Extensions for BGP-4.

Default

4

Command Modes:

Enable

Example:

In the following example, the BGP version is set.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.5.20.110 version 4
```

43.2.2.46 neighbor interface ifname

This command sets up the ifname of the interface used for the connection. This command is deprecated and may be removed in a future release. Its use should be avoided.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} interface ifname
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} interface ifname
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
Ifname	Defines an Interface name

Defaults:

NA

Command Modes:

Enable

Example:

This example sets up the ifname of the interface used for the connection.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.5.20.100 interface vlan 4
```

43.2.2.47 neighbor next-hop-self

This command specifies an announced route's next hop as being equivalent to the address of the bgp router.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} next-hop-self
no neighbor peer next-hop-self
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies an announced route's next hop.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.12.50.103 next-hop-self
```

43.2.2.48 neighbor update-source

This command specifies the IPv4 source address to use for the BGP session to this neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} update-source
<interface> <interface ID>
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} update-source
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies the IPv4 source address to use.

```
(config-data)# router bgp 1
(conf-router)# neighbor 192.168.0.1 update-source vlan2
```

43.2.2.49 neighbor unsuppress-map

This command selectively advertises routes that were previously suppressed by the *aggregate-address* command.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} unsuppress-map <map name>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
map name	Defines the name of the route map.
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This is an example of how this command can be used.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.118 unsuppress-map gmap
```

43.2.2.50 neighbor transparent-nexthop

This command is used to keep the nexthop value of the route, even if the peer is an external BGP peer.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} transparent-nexthop
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This is an example of how this command can be used.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.11 transparent-nexthop
```

43.2.2.51 neighbor transparent-as

This command is used to specify not to append your AS path number even if the peer is an external BGP peer.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} transparent-as
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This is an example of how this command can be used.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.11 transparent-as
```

43.2.2.52 neighbor timers

This command sets the timers for a specific BGP neighbor. Keepalive messages are sent by a router to inform another router that the BGP connection between the two is still active.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} timers connect <timer>
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X}  timers <keepalive>
<holdtime>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
timer	Defines the connect timer (0-65535).
keepalive	Defines the frequency (in seconds) with which keepalive messages are sent to its peer (0–65535).
holdtime	Defines the interval (in seconds) after not receiving a keepalive message (0-65535).

Defaults:

NA

Command Modes:

Enable

Example:

This is an example of how this command can be used.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.118 timers connect 500
```

43.2.2.53 neighbor soft-reconfiguration inbound

This command allows inbound soft reconfiguration for a neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} soft-reconfiguration inbound
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
string	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This is an example of how this command can be used.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.118 soft-reconfiguration inbound
```

43.2.2.54 neighbor default-originate

This command announces default routes to the peer. The BGPD's default is to not announce the default route (0.0.0.0/0) even it is in the routing table.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X}  default-originate
[route map <route map name>]
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} default-originate
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor	Defines the neighbor tag.
route map name	Defines the route map name.

Defaults:

NA

Command Modes:

Enable

Example:

This example announces default routes to the peer.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.118 default-originate
```

43.2.2.55 neighbor capability route-refresh

This command advertises the route-refresh capability to this neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} capability route-refresh|dynamic
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} capability orf prefix-list {both|receive|send}
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} default-originate
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor string	Defines the neighbor tag.
route-refresh	Advertises the route-refresh capability to this neighbor.
dynamic	Advertises the dynamic capability to this neighbor.
orf	Advertises the Outbound Route Filter (ORF) capability to the peer.
prefix-list	Advertises the prefix list ORF capability to this neighbor.
both	Enables the capability to SEND and RECEIVE the ORF to/from this neighbor.
receive	Enables the capability to SEND the ORF to this neighbor.
send	Enables the capability to RECEIVE the ORF from this neighbor

Defaults:

NA

Command Modes:

Enable

Example:

This example announces default routes to the peer.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.118 capability route-refresh
```

43.2.2.56 neighbor port

This command defines the neighbor's BGP port.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} port <port number>
no neighbor a.b.c.d port <port number>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
port number	Defines the port number (0 – 65535).

Defaults:

NA

Command Modes:

Enable

Example:

This example defines the neighbor's BGP port.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.14.3.118 port 100
```

43.2.2.57 neighbor send-community

This command sends the community attribute to the neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} send-community
{both|stabdard|extended}
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} send-community
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
both	Sends standard and extended community attributes.
standard	Sends standard community attributes.
extended	Sends extended community attributes.

Defaults:

NA

Command Modes:

Enable

Example:

This example sends the community attribute to this neighbor.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.3.111 send-community
```

43.2.2.58 neighbor route-server-client

This command configures a neighbor as a Route Server client.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} route-server-client
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example configures a neighbor as a Route Server client.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.3.111 route-server-client
```

43.2.2.59 neighbor route-reflector-client

This command configures a neighbor as a Route Reflector client.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} route-reflector-client
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example configures a neighbor as a Route Reflector client.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.3.111 route-reflector-client
```

43.2.2.60 neighbor remove-private-AS

This command removes the private AS number from outbound updates.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} remove-private-AS
neighbor string remove-private-AS
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example removes the private AS number from outbound updates.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.3.111 remove-private-AS
```

43.2.2.61 neighbor weight

This command specifies a default weight value for the neighbor's routes.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} weight weight
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} weight weight
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
weight	Defines the weight value in the range of 0 – 65535.

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies a default weight value for the neighbor's routes.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.110 weight 1000
```

43.2.2.62 neighbor passive

This command enables open messages not to be sent to this neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} passive
neighbor string passive
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example enables open messages not to be sent to this neighbor.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.110 passive
```

43.2.2.63 neighbor password

This command sets the password for the secured BGP session.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag> | a.b.c.d | X:X::X:X} [password
String]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d | X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
password string	Defines password for a neighbor.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets a password for a secured session with neighor 10.15.5.110.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.110 password 12345678
```

43.2.2.64 neighbor override-capability

This command enables the override capability negotiation result.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} override-capability
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example enables the override capability negotiation result.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.110 override-capability
```

43.2.2.65 neighbor maximum-prefix

This command specifies a maximum number of prefixes accepted from this peer.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} <prefix limit>
[<threshold>] [restart <restart interval>|warning-only]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
prefix limit	Defines the maximum number of prefix limits (1 – 4294967295).
threshhold	Defines the threshold value (%) at which to generate a warning message.
restart interval	Defines the restart interval in minutes (1-65535).
warning only	Enables to only give a warning message when the limit has exceeded.

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies the maximum number of prefixes accepted from this peer.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.110 maximum-prefix 10000
```

43.2.2.66 neighbor route-map name

This command applies a route-map on the neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} route-map name
{in|out|export|import}
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
name	Defines the name of the route-map.
in	Applies a map to incoming routes.
out	Applies a map to outbound routes.
export	Applies a map to routes coming from the route-server client.
import	Applies a map to routes going into the client's table.

Defaults:

NA

Command Modes:

Enable

Example:

This example applies a route-map on the neighbor.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.12.5.101 route-map routename in import
```

43.2.2.67 neighbor peer-group

This command joins a specific peer to peer group word.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} peer-group <peer group name>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
peer group name	Defines the peer group name.

Defaults:

NA

Command Modes:

Enable

Example:

This example joins a specific peer to group1.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.12.5.101 peer-group group1
```

43.2.2.68 neighbor local-as

This command specifies a local Autonomous System number.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} local-as <AS number>
[no-prepend]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
AS number	Defines a local AS number (1-65535).
no-prepend	Does not prepend local-as to updates from BGP peers.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the router to not prepend the Autonomous System number 200 to routes that are received from external peers.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.12.5.10 remote-as 100
(conf-router)# neighbor 10.12.5.10 local-as 200 no-prepend
```

43.2.2.69 neighbor interface

This command defines the Layer 3 interface.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} interface <if name>
<interface ID>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.12.5.10 interface gre 100
```

43.2.2.70 neighbor strict-capability-match

This command strictly compares negotiation match.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} strict-capability-match
neighbor peer {<neighbor tag>|a.b.c.d|X:X::X:X} strict-capability-match
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

This example strictly compares negotiation match.

```
(config-data)# router bgp 1
(conf-router)# neighbor 15.13.4.15 strict-capability-match
```

43.2.2.71 neighbor attribute-unchanged

This command allows for the BGP attribute to be propagated unchanged to this neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
[[as-path] [med] [next-hop]]
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
[[as-path] [next-hop] [med]]
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
[[next-hop] [as-path][med]]
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
[[next-hop] [med] [as-path]]
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
[[med] [next-hop] [as-path]]
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} attribute-unchanged
[[med] [as-path] [next-hop]]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
as-path	Defines the AS-path attribute.
next-hop	Defines the Next Hop attribute.
med	Defines the Med attribute.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 15.13.4.15 attribute-unchanged
```

43.2.2.72 neighbor allowas-in

This command specifies the number of times that the AS path of a received route may contain the recipient BGP speaker's AS number and still be accepted.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} allowas-in [<number>]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
number	Defines the number of occurrences of the AS number (1-10)

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 15.13.4.15 allowas-in 5
```

43.2.2.73 neighbor advertisement-interval

This command defines the minimum interval between sending BGP routing updates.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} advertisement-interval
<time>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
time	Defines the time in seconds (0-600).

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the minimum interval between sending BGP routing updates to 100.

```
(config-data)# router bgp 1
(conf-router)# neighbor 15.13.4.15 advertisement-interval 100
```

43.2.2.74 neighbor activate

This command enables the Address Family for the neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} activate
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# neighbor 15.13.4.15 activate
```

43.2.2.75 neighbor prefix-list name

This command specifies a prefix-list for the peer.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X} prefix-list name
{in|out}
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
in	Filters incoming updates.
out	Filters outgoing updates.
name	Defines the name of the prefix list in string format.

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies a prefix-list for the peer.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.110 prefix-list plist in
```

43.2.2.76 neighbor filter-list name

This command establishes BGP filters.

Syntax:

The syntax of this command can include the following variations:

```
neighbor {<neighbor tag>|a.b.c.d|X:X::X:X}  filter-list name
[in|out]

The command's syntax format is described below:
```

Arguments	Description
a.b.c.d|X:X::X:X	Defines the IP address of the neighbor (IPv4 or IPv6).
neighbor tag	Defines the neighbor tag.
in	Filters incoming updates.
out	Filters outgoing updates.
name	Defines the as-path access list name.

Defaults:

NA

Command Modes:

Enable

Example:

This example establishes BGP filters.

```
(config-data)# router bgp 1
(conf-router)# neighbor 10.15.5.100 filter-list flist in
```

43.2.2.77 network

This command enables the Address Family for the neighbor.

Syntax:

The syntax of this command can include the following variations:

```
network a.b.c.d [backdoor][[mask <network mask>][route-map <route-map name>]
network a.b.c.d/m [backdoor][route-map <route-map name>]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the IP address of the network.
a.b.c.d/M	Defines the IP prefix network/length.
backdoor	Enables a BGP backdoor route.
mask	Enables a network mask.
route-map	Enables a route-map to modify the attributes.
route-map name	Defines the name of the route-map.
network mask	Defines a network mask in the format of a.b.c.d .

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how to use this command.

```
(config-data)# router bgp 1
(conf-router)# network 15.13.4.15 backdoor
```

43.2.2.78 BGP Protocol

The following commands relate to BGP Protocol.

43.2.2.78.1 Route Map Configuration

BGP Route Map Configuration includes the following commands:

43.2.2.78.1.1 route-map

This command configures the order entry in route map name with a match policy of "permit" or "deny".

Syntax:

The syntax of this command includes the following variations:

```
route-map <route map name> [vrf <VRF name>] {deny|permit} <order
or sequence number of route map>
no route-map <route map name>
```

The command syntax format is described below:

Arguments	Description
VRF name	Defines the vrf name.
Route map name	Defines the Route Map name.
order or sequence number of route map	Defines the sequence to insert into/delete from existing route-map entry. Range is [1-65535].

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the order entry in route map rmname.

```
(config-data)# route-map rmname permit 1
```

43.2.2.78.1.2 route-map-static

This command configures the static route-map.

Syntax:

The syntax of this command includes the following variations:

```
route-map-static <static route-map tag>
```

The command syntax format is described below:

Arguments	Description
static route-map tag	Defines the static route-map tag.

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the static route-map.

```
(config-data)# route-map-static srmap
```

43.2.2.78.1.3 match as-path

This command defines the AS path access-list name.

Syntax:

The syntax of this command can include the following variations:

```
match as-path word
```

The command's syntax format is described below:

Arguments	Description
word	Defines the as-path access-list name.

Defaults:

NA

Command Modes:

Enable

Example:

This example defines the AS path access-list name.

```
(config-data)# route-map rmap permit 1
(conf-router)# match as-path spname
```

43.2.2.78.1.4 set as-path prepend

This command sets the as-path prepend string for the BGP as-path attribute.

Syntax:

The syntax of this command can include the following variations:

```
set as-path prepend as-path
```

The command's syntax format is described below:

Arguments	Description
as-path	Defines the as-number in the range of 1 – 65535.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the as-path prepend string for the BGP as-path attribute.

```
(config-data)# route-map qqq permit 1
(conf-route-map)# set as-path prepend 1
```

43.2.2.79 OSPFv2 Protocol

The following describes OSPF Version 2 protocol commands.

43.2.2.79.1 General Configuration

OSPF Version 2 is a routing protocol which is described in RFC 2328. OSPF is an IGP (Interior Gateway Protocol). Compared with RIP, OSPF can provide scalable network support and faster convergence times. OSPF is widely used in large networks such as ISP (Internet Service Provider) backbone and networks.

OSPF General Configuration includes the following commands:

43.2.2.79.1.1 router ospf

This command enables or disables the OSPF process.

Syntax:

The syntax of this command can include the following variations:

```
router ospf [vrf <VRF name>]
no router ospf
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables the OSPF process.

```
(config-data)# router ospf
```

43.2.2.79.2 OSPF Router Configuration

OSPF Router Configuration includes the following commands:

43.2.2.79.2.1 ospf router-id

This command sets the router-ID of the OSPF process.

Syntax:

The syntax of this command can include the following variations:

```
ospf router-id a.b.c.d
no ospf router-id
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the Router-ID in IP address format.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets router-ID of the OSPF process.

```
(config-data)# router ospf
(conf-router)# ospf router-id 10.24.5.100
```

43.2.2.79.2.2 ospf abr-type

This command sets the ospf abr-type.

Syntax:

The syntax of this command can include the following variations:

```
ospf abr-type type
no ospf abr-type type
```

The command's syntax format is described below:

Arguments	Description
no	Disables the router-ID of the OSPF process.
type	Refers to abr-type ▪ cisco (according to cisco implementation) ▪ ibm (according to IBM implementation) ▪ shortcut (shortcut abr) ▪ standard (standard behavior RFC 2328) **Note:** "Cisco" and "IBM" types are equivalent.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the ospf abr-type according to the IBM implementation.

```
(config-data)# router ospf
(conf-router)# ospf abr-type ibm
```

43.2.2.79.2.3 ospf rfc1583compatibility

This command enables the rfc1583compatibility flag.

Syntax:

The syntax of this command can include the following variations:

```
ospf rfc1583compatibility
no ospf rfc1583compatibility
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables the rfc1583compatibility flag.

```
(config-data)# router ospf
(conf-router)# ospf rfc1583compatibility
```

43.2.2.79.2.4 log-adjacency-changes

This command configures OSPF to log changes in adjacency.

Syntax:

The syntax of this command can include the following variations:

```
log-adjacency-changes [detail]
no log-adjacency-changes [detail]
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures OSPF to log changes in adjacency.

```
(config-data)# router ospf
(conf-router) # log-adjacency-changes detail
```

43.2.2.79.2.5 passive-interface

This command suppresses routing updates on an interface.

Syntax:

The syntax of this command can include the following variations:

```
passive-interface GigabitEthernet <slot/port[.vlanID]>
passive-interface GigabitEthernet <slot/port>
passive-interface vlan <vlanID>
no passive-interface interface
```

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example suppresses routing updates on an interface.

```
(config-data)# router ospf
(conf-router)# passive-interface GigabitEthernet 0/0.4
```

43.2.2.79.2.6 timers throttle spf

This command sets the initial delay, the *initial-holdtime* and the *maximum-holdtime* between when SPF is calculated and the event which triggered the calculation.

Syntax:

The syntax of this command can include the following variations:

```
timers throttle spf delay initial-holdtime max-holdtime
no timers throttle spf
```

The command's syntax format is described below:

Arguments	Description
delay	Defines a number between 0 – 600000 delay in milliseconds from 1st change received until SPF calculation.
initial-holdtime	Defines the initial holdtime between 0 – 600000 in milliseconds between consecutive SPF calculation.
maximum-holdtime	Defines the maximum holdtime between 0 – 600000 in milliseconds.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the delay to 200 ms, the initial holdtime is set to 400 ms and the maximum holdtime is set to 10 seconds.

```
(config-data)# router ospf
(conf-router) # timers throttle spf 200 400 10000
```

43.2.2.79.2.7 max-metric router-lsa

This command sets the time (seconds) to advertise self as stub-router.

Syntax:

The syntax of this command can include the following variations:

```
max-metric router-lsa {on-startup|on-shutdown} number
max-metric router-lsa administrative
no max-metric router-lsa [on-startup|on-shutdown|administrative]
```

The command's syntax format is described below:

Arguments	Description
on-startup	Defines the time (seconds) to advertise self as stub-router.
on-shutdown	Defines the time (seconds) to wait till full shutdown.
number	Defines the time (seconds) in the range of 5 – 86400.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the time (seconds) to advertise self as stub-router.

```
(config-data) router ospf
(conf-router) # max-metric router-lsa administrative
```

43.2.2.79.2.8 auto-cost reference-bandwidth

This command sets the reference bandwidth for cost calculations, where this bandwidth is considered equivalent to an OSPF cost of 1, specified in Mbits/s.

Syntax:

The syntax of this command can include the following variations:

```
auto-cost reference-bandwidth number
no auto-cost reference-bandwidth
```

The command's syntax format is described below:

Arguments	Description
number	Defines the reference bandwidth in terms of megabits per second in the range of 1 – 4294967.

Defaults:

100Mbit/s (i.e. a link of bandwidth 100Mbit/s or higher will have a cost of 1. Cost of lower bandwidth links will be scaled with reference to this cost).

Command Modes:

Enable

Example:

The following example sets the reference bandwidth for cost calculations.

```
(config-data)# router ospf
(conf-router) # auto-cost reference-bandwidth 1000
```

43.2.2.79.2.9 network

This command specifies the OSPF enabled interface(s). If the interface has an address from range 192.168.1.0/24 then the command below enables ospf on this interface so the router can provide network information to the other ospf routers via this interface.

Syntax:

The syntax of this command can include the following variations:

```
network a.b.c.d/m area a.b.c.d
network a.b.c.d/m area number
no network a.b.c.d/m area a.b.c.d
no network a.b.c.d/m area number
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d/M	Defines the OSPF network prefix.
area a.b.c.d	Defines the OSPF area ID in IP address format.
number	Defines the OSPF area ID as a decimal value in the range of 0 – 4294967295.

Defaults:

NA

Command Modes:

Enable

Example:

If the interface has an address from range 192.168.1.0/24, then the command below enables ospf on this interface so that the router can provide network information to the other ospf routers via this interface.

```
(config-data)# router ospf
(conf-router) # network 192.168.1.0/24 area 0.0.0.0
```

43.2.2.79.2.10 area

This command summarizes intra-area paths from specified area in one Type-3 summary-LSA announced to other areas.

Syntax:

The syntax of this command can include the following variations:

```
area a.b.c.d range a.b.c.d/m
area number range a.b.c.d/m
no area a.b.c.d  range a.b.c.d /m
no area number range a.b.c.d/m
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the OSPF area ID as a decimal value in the range of 0 – 4294967295.
range	Summarizes routes matching address/mask (border routers only).
a.b.c.d/M	Defines the area range prefix.

Defaults:

NA

Command Modes:

Enable

Example:

This example summarizes intra-area paths from the specified area in one Type-3 summary-LSA announced to other areas.

```
(config-data)# router ospf
(conf-router)# area 0.0.0.10 range 10.0.0.0/8
```

43.2.2.79.2.11 area ip-address|number range a.b.c.d/m not-advertise

This command filters intra area paths which are not advertised in other areas.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address a.b.c.d range a.b.c.d/m not-advertise
area number number range a.b.c.d/m not-advertise
no area peer range a.b.c.d/m not-advertise
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format
number	Defines the OSPF area ID as a decimal value. Range is in between 0 – 4294967295.
a.b.c.d/M	Defines the area range prefix.
not-advertise	Defines not to advertise this range.

Defaults:

NA

Command Modes:

Enable

Example:

This example filters intra area paths and is not advertised into other areas.

```
(config-data)# router ospf
(conf-router)# area ip-address 10.21.5.100 range 10.0.0.0/8 not-
advertise
```

43.2.2.79.2.12 area ip-address|number range a.b.c.d/m substitute a.b.c.d/M

This command substitutes a summarized prefix with another prefix.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address a.b.c.d range a.b.c.d/m substitute a.b.c.d/m
area number number range a.b.c.d/m substitute a.b.c.d/m
no area a.b.c.d range a.b.c.d/m substitute a.b.c.d/m
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the OSPF area ID as a decimal value. The range is 0 – 4294967295.
a.b.c.d/m	Defines the area range prefix.
substitute	Announces the area range as another prefix.
a.b.c.d/m	Announces network prefix instead of range.

Defaults:

NA

Command Modes:

Enable

Example:

This example substitutes a summarized prefix with another prefix.

```
(config-data)# router ospf
(conf-router)# area ip-address 10.5.10.105 range 10.0.0.0/8
substitute 11.0.0.0/8
```

43.2.2.79.2.13 area ip-address|number shortcut

This command configures the area as Shortcut capable.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address a.b.c.d shortcut {default|enable|disable}
area number <number> shortcut
no area ip-address a.b.c.d shortcut
no area number <number> shortcut
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the OSPF area ID as a decimal value in the range of 0 – 4294967295.
default	Sets the default shortcutting behavior
enable	Enables shortcutting through the area
disable	Disables shortcutting through the area

Defaults:

NA

Command Modes:

Enable

Example:

This example configures the area as Shortcut capable.

```
(config-data)# router ospf
(conf-router)# area number 1000 shortcut enable
```

43.2.2.79.2.14 area ip-address|number stub

This command configures the area to be a stub area.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address a.b.c.d stub
area number number stub
no area ip-address a.b.c.d stub
no area number number stub
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
Number	Defines the OSPF area ID as a decimal value in the range of 0 – 4294967295.

Defaults:

NA

Command Modes:

Enable

Example:

This example configures the area to be a stub area.

```
(config-data)# router ospf
(conf-router)# area number 1000 stub
```

43.2.2.79.2.15 area ip-address|number stub no-summary

This command prevents an OSPFD ABR from injecting inter-area summaries into the specified stub area.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address <a.b.c.d> stub no-summary
area number number stub no-summary
no area ip-address <a.b.c.d> stub no-summary
no area number number stub no-summary
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format
number	Defines the OSPF area ID as a decimal value in the range of 0 – 4294967295.
no-summary	Determines not to inject inter-area routes into the stub.

Defaults:

NA

Command Modes:

Enable

Example:

This example prevents an OSPFD ABR from injecting inter-area summaries into the specified stub area.

```
(config-data)# router ospf
(conf-router)# area number 1000 stub no-summary
```

43.2.2.79.2.16 area ip-address|number default-cost

This command sets the cost of default-summary LSAs announced to stubby areas.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address <a.b.c.d> default-cost <0-16777215>
area number number default-cost <0-16777215>
no area ip-address <a.b.c.d> default-cost <0-16777215>
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the OSPF area ID as a decimal value in the range of 0 – 4294967295.
<0-16777215>	Defines the stub's advertised default summary cost.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the cost of default-summary LSAs announced to stubby areas.

```
(config-data)# router ospf
(conf-router)# area number 2000 default-cost 1000
```

43.2.2.79.2.17 area ip-address|number filter-list prefix NAME in/out

This command filters Type-3 summary-LSAs to/from area using prefix lists.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address <a.b.c.d>  filter-list prefix NAME in
area ip-address <a.b.c.d> filter-list prefix NAME out
area number number filter-list prefix NAME in
area number number filter-list prefix NAME out
no area ip-address <a.b.c.d> filter-list prefix NAME in
no area ip-address <a.b.c.d> filter-list prefix NAME out
no area number number filter-list prefix NAME in
no area number number filter-list prefix NAME out
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the range of the area number 0 – 4294967295.
prefix	Filters prefixes between OSPF areas.
NAME	Defines the IP prefix list name.
in	Filters networks – sent out to this area
out	Filters networks – sent out from this area

Defaults:

NA

Command Modes:

Enable

Example:

This example filters Type-3 summary-LSAs to/from area using prefix lists.

```
(config-data)# router ospf
(conf-router)# area number 1000 filter-list prefix NAME in
```

43.2.2.79.2.18 area ip-address|number authentication

This command specifies that simple password authentication should be used for the given area.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address <a.b.c.d> authentication
area number number authentication
no area ip-address <a.b.c.d> authentication
no area number number authentication
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the area number in the range of 0 – 4294967295.

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies that simple password authentication should be used for the given area.

```
(config-data)# router ospf
(conf-router)# area number 1000 authentication
```

43.2.2.79.2.19 area ip-address|number authentication message-digest

This command specifies that OSPF packets must be authenticated with MD5 HMACs within the given area.

Syntax:

The syntax of this command can include the following variations:

```
area ip-address <a.b.c.d> authentication message-digest
area number number authentication message-digest
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPF area in IP address format.
number	Defines the area number in the range of 0 – 4294967295.

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies that OSPF packets must be authenticated with MD5 HMACs within the given area.

```
(config-data)# router ospf
(conf-router)# area number 1000 authentication message-digest
```

43.2.2.79.2.20 redistribute kernel

This command redistributes routes of the specified protocol or kind into OSPF.

Syntax:

The syntax of this command can include the following variations:

```
redistribute kernel
redistribute kernel route-map
redistribute kernel metric-type {1|2}
redistribute kernel metric-type {1|2} route-map word
redistribute kernel metric <0-16777214>
redistribute kernel metric-type {1|2} metric <0-16777214> metric
<0-16777214> route-map word
no redistribute kernel
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric for redistributed routes
metric-type	Defines the OSPF exterior metric type for registered routes
1|2	Sets the OSPF exterior type - 1- metric, 2-metrics
word	Describes the pointer to route-map entries

Defaults:

NA

Command Modes:

Enable

Example:

This example redistributes routes of the specified protocol or kind into OSPF.

```
(config-data)# router ospf
(conf-router)# redistribute kernel
```

43.2.2.79.2.21 redistribute rip

This command redistributes information from RIP.

Syntax:

The syntax of this command can include the following variations:

```
redistribute rip [metric <default metric>] [route-map <pointer>]
redistribute rip [route-map <pointer>][metric <default metric>]
no redistribute rip
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric for redistributed routes.
default metric	Defines the default metric [0-4294967295].
route-map	Defines the route map reference.
pointer	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

This example redistributes routes from RIP.

```
(config-data)# router bgp 3
(conf-router)# redistribute rip
```

43.2.2.79.2.22 redistribute connected

This command redistributes routes of the specified protocol or kind into OSPF.

Syntax:

The syntax of this command can include the following variations:

```
redistribute connected
redistribute connected route-map
redistribute connected metric-type {1|2}
redistribute connected metric-type {1|2} route-map word
redistribute connected metric <0-16777214>
redistribute connected metric-type {1|2} metric <0-16777214>
metric <0-16777214> route-map word
no redistribute connected
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric for redistributed routes.
metric-type	Defines the OSPF exterior metric type for registered routes.
1|2	Sets the OSPF exterior type - 1- metric, 2-metrics.
word	Describes the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

This example redistributes routes of the specified protocol or kind into OSPF.

```
(config-data)# router ospf
(conf-router)# redistribute connected
```

43.2.2.79.2.23 redistribute static

This command redistributes routes of the specified protocol or kind into OSPF.

Syntax:

The syntax of this command can include the following variations:

```
redistribute static
redistribute static route-map
redistribute static metric-type {1|2}
redistribute static metric-type {1|2} route-map word
redistribute static metric <0-16777214>
redistribute static metric-type {1|2} metric <0-16777214> metric
<0-16777214> route-map word
no redistribute static
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric for redistributed routes.
Metric-type	Defines the OSPF exterior metric type for registered routes.
1|2	Sets the OSPF exterior type - 1- metric, 2-metrics.
word	Describes the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

This example redistributes routes of the specified protocol or kind into OSPF.

```
(config-data)# router ospf
(conf-router)# redistribute static
```

43.2.2.79.2.24 redistribute bgp

This command redistributes routes of the specified protocol or kind into OSPF.

Syntax:

The syntax of this command can include the following variations:

```
redistribute bgp
redistribute bgp route-map
redistribute bgp metric-type {1|2}
redistribute bgp metric-type {1|2} route-map word
redistribute bgp metric <0-16777214>
redistribute bgp metric-type {1|2}  metric <0-16777214> metric
<0-16777214> route-map word
no redistribute bgp
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric for redistributed routes
Metric-type	Defines the OSPF exterior metric type for registered routes
1|2	Sets the OSPF exterior type - 1- metric, 2-metrics
word	Describes the pointer to route-map entries

Defaults:

NA

Command Modes:

Enable

Example:

This example redistributes routes of the specified protocol or kind into OSPF.

```
(config-data)# router ospf
(conf-router)# redistribute bgp
```

43.2.2.79.2.25 timers bgp

This command adjusts the BGP routing timers.

Syntax:

The syntax of this command can include the following variations:

```
timers bgp <keepalive interval> <hold time>
```

The command's syntax format is described below:

Arguments	Description
keepalive interval	Defines the Keepalive interval [0-65535].
hold time	Defines the Hold time.

Defaults:

NA

Command Modes:

Enable

Example:

This example adjusts the BGP routing timer.

```
(config-data)# router bgp 3
(conf-router)# timers bgp 100 200
```

43.2.2.79.2.26 default-information originate

This command originates an AS-External (type-5) LSA describing a default route into all external routing capable areas, of the specified metric and metric type.

Syntax:

The syntax of this command can include the following variations:

```
default-information originate
default-information originate metric <0-16777214>
default-information originate metric <0-16777214> metric-type
{1|2}
default-information originate metric <0-16777214> metric-type
(1|2) route-map              word
default-information originate always
default-information originate always metric <0-16777214>
default-information originate always metric <0-16777214> metric-
type {1|2}
default-information originate always metric <0-16777214> metric-
type {1|2}route-map word
no default-information originate
```

The command's syntax format is described below:

Arguments	Description
always	Sets always advertise default route.

Defaults:

NA

Command Modes:

Enable

Example:

This command distributes a default route.

```
(config-data)# router ospf
(conf-router) # default-information originate
```

43.2.2.79.2.27 default-metric

This command sets the metric of redistributed routes.

Syntax:

The syntax of this command can include the following variations:

```
default-metric <0-16777214>
no default-metric
```

The command's syntax format is described below:

Arguments	Description
<0-16777214>	Defines the default metric.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the metric of redistributed routes to 1000.

```
(config-data)# router ospf
(conf-router)# default-metric 1000
```

43.2.2.79.2.28 distance

This command defines an OSPF administrative distance.

Syntax:

The syntax of this command can include the following variations:

```
distance <1-255>
no distance <1-255>
distance ospf {intra-area|inter-area|external} <1-255>
no distance ospf
```

The command's syntax format is described below:

Arguments	Description
<1-255>	Defines the administrative distance.

Defaults:

NA

Command Modes:

Enable

Example:

This example defines an OSPF administrative distance of 100.

```
(config-data)# router ospf
(conf-router)# distance 100
```

43.2.2.79.3 OSPF Interface Configuration

OSPF Interface Configuration includes the following commands:

43.2.2.79.3.1 ip ospf authentication-key auth_key

This command sets the OSPF authentication key to a simple password. After setting AUTH_KEY, all OSPF packets are authenticated.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf authentication-key auth_key
no ip ospf authentication-key
```

The command's syntax format is described below:

Arguments	Description
auth_key	Defines the OSPF password (key).

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the OSPF authentication key to a simple password.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf authentication-key passx
```

43.2.2.79.3.2 ip ospf authentication message-digest

This command specifies that MD5 HMAC authentication must be used on this interface.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf authentication message-digest
```

Defaults:

NA

Command Modes:

Enable

Example:

This example specifies that MD5 HMAC authentication must be used on this interface.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf authentication message-digest
```

43.2.2.79.3.3 ip ospf message-digest-key KEYID md5 KEY

This command sets the OSPF authentication key to a cryptographic password.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf message-digest-key KEYID md5 KEY
no ip ospf message-digest-key
```

The command's syntax format is described below:

Arguments	Description
KEYID	Defines the KEYID in the range of 1 – 255.
KEY	Defines the OSPF password.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the OSPF authentication key to a cryptographic password.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf message-digest-key 100 md5 ABCD1234
```

43.2.2.79.3.4 ip ospf cost

This command sets the link cost for the specified interface.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf cost number
no ip ospf cost
```

The command's syntax format is described below:

Arguments	Description
number	Defines the cost in the range of 1 – 65535.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the link cost for the specified interface.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf cost 1000
```

43.2.2.79.3.5 ip ospf dead-interval

This command sets the number of seconds for RouterDeadInterval timer value used for Wait Timer and Inactivity Timer.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf dead-interval number
ip ospf dead-interval minimal hello-multiplier <2-20>
no ip ospf dead-interval
```

The command's syntax format is described below:

Arguments	Description
number	Defines the seconds in the range of 1- 65535.
<2-20>	Defines the number of hellos to send each second.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the number of seconds for RouterDeadInterval timer value to 1000.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf dead-interval 1000
```

43.2.2.79.3.6 ip ospf hello-interval

This command sets the number of seconds for HelloInterval timer value.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf hello-interval number
no ip ospf hello-interval
```

The command's syntax format is described below:

Arguments	Description
number	Defines the number of seconds in the range of 1- 65535.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets HelloInterval timer value to 1000 seconds.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf hello-interval 1000
```

43.2.2.79.3.7 ip ospf network

This command explicitly sets the network type for the specified interface.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf network {broadcast|non-broadcast|point-to-multipoint
|point-to-point}
no ip ospf network
```

The command's syntax format is described below:

Arguments	Description
broadcast	Specifies the OSPF broadcast multi-access network.
non-broadcast	Specifies the OSPF NMBA network.
point-to-multipoint	Specifies the OSPF point-to-multipoint network.
point-to-point	Specifies the OSPF point-to-point network.

Defaults:

NA

Command Modes:

Enable

Example:

This example explicitly sets the network type for the specified interface.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf network point-to-point
```

43.2.2.79.3.8 ip ospf priority

This command sets the RouterPriority integer value.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf priority number
no ip ospf priority
```

The command's syntax format is described below:

Arguments	Description
number	Defines the priority value in the range of 0-255.

Defaults:

1

Command Modes:

Enable

Example:

This example sets the RouterPriority integer value to 100.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf priority 100
```

43.2.2.79.3.9 ip ospf retransmit-interval

This command sets the number of seconds for RxmtInterval timer value. This value is used when retransmitting Database Description and Link State Request packets.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf retransmit-interval number
no ip ospf retransmit interval
```

The command's syntax format is described below:

Arguments	Description
number	Defines the number of seconds for the RxmtInterval timer value. Range is 1 – 65535.

Defaults:

5 seconds

Command Modes:

Enable

Example:

This example sets the number of seconds for RxmtInterval timer value to 1000.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf retransmit-interval 1000
```

43.2.2.79.3.10 ip ospf transmit-delay

This command sets the number of seconds for InfTransDelay value.

Syntax:

The syntax of this command can include the following variations:

```
ip ospf transmit-delay number
no ip ospf transmit-delay
```

The command's syntax format is described below:

Arguments	Description
number	Defines number of seconds for the InfTransDelay value in the range of <1-65535>.

Defaults:

1 second

Command Modes:

Enable

Example:

This example sets the number of seconds for InfTransDelay value to 1000.

```
(config-data)# interface vlan1
(conf-if-VLAN 1)# ip ospf transmit-delay 1000
```

43.2.2.80 OSPF6 Protocol

The following describes OSPF Version 6 protocol commands.

43.2.2.80.1 router ospf6

This command enables or disables the OSPF6 process.

Syntax:

The syntax of this command can include the following variations:

```
router ospf6 [vrf <VRF name>]
no router ospf
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables the OSPF6 process.

```
(config-data)# router ospf6
```

43.2.2.80.2 area

This command filters OSPFv6 area parameters.

Syntax:

The syntax of this command can include the following variations:

```
area a.b.c.d filter-list prefix <ipv6 prefix-list name> {in|out}
area a.b.c.d range [X:X::X:X/M] [advertise|not-advertise]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the OSPFv6 area in IP address format.
filter-list	Filter networks between OSPFv6 areas.
prefix	Filter prefixes between OSPFv6 areas.
ipv6 prefix-list name	Defines the name of an IPv6 prefix-list
range	Defines the configured address range.
in	The IPv6 prefix list is applied to IPv6 prefixes advertised **to** the relevant area **from** other areas.
out	The IPv6 prefix list is applied to IPv6 prefixes advertised **out** of the relevant area **to** other areas.
advertise	Set the address range status to "advertise" and generates a Type 3 summary link-state advertisement (LSA). **(Optional)**
not-advertise	Set the address range status to "DoNotAdvertise". The Type 3 summary LSA is suppressed, and the component networks remain hidden from the other networks. **(Optional)**

Defaults:

NA

Command Modes:

Enable

Example:

This example filters intra area paths and is not advertised into other areas.

```
(config-data)# router ospf6
(conf-router)# area ip-address 10.21.5.100 range 10:0::0:0/8 not-advertise
```

43.2.2.80.3 interface

This command selects an interface to configure.

Syntax:

The syntax of this command can include the following variations:

```
interface <interface name> <interface ID> area a.b.c.d
```

The command's syntax format is described below:

Arguments	Description
area	Defines the OSPF6 area ID.
interface name	Defines the interface name as one of the following: ▪ **bvi:** Bridge interface ▪ **cellular:** Cellular 3G interface ▪ **gigabitethernet:** Gigabit Ethernet interface ▪ **gre:** GRE tunnel interface ▪ **ipip:** IPIP tunnel interface ▪ **l2tp:** L2TP tunnel interface ▪ **loopback:** PPPoE interface ▪ **pppoe:** PPPoE interface ▪ **pptp:** PPTP tunnel interface ▪ **vlan:** VLAN interface ▪ **vti:** VTI tunnel interface
a.b.c.d	Defines the OSPFv6 area in IP address format.

Defaults:

NA

Command Modes:

Enable

Example:

This example selects an interface to configure.

configure data

```
(config-data)# router ospf6
(conf-router)# interface gre 1 area 10.21.5.100
```

43.2.2.80.4 redistribute

This command redistributes routes of the specified protocol or kind into OSPF6.

Syntax:

The syntax of this command can include the following variations:

```
redistribute {bgp|connected|kernel|ripng|static} [route-map
<route-map name>]
```

The command's syntax format is described below:

Arguments	Description
bgp	Redistributes the bgp route.
connected	Redistributes the connected route.
kernel	Redistributes the kernel route.
ripng	Redistributes the ripng route.
static	Redistributes the static route.
route-map name	Defines the route-map name.

Defaults:

NA

Command Modes:

Enable

Example:

This example redistributes the kernel route of the specified protocol or kind into OSPF6.

```
# configure data
(config-data)# router ospf
(conf-router)# redistribute kernel
```

43.2.2.81 Routing Information Protocol (RIP)

The following commands relate to Routing Information Protocol.

43.2.2.81.1 General Configuration

RIP General Configuration includes the following commands:

43.2.2.81.1.1 router rip

This command enables IPv4 RIP.

Syntax:

The syntax of this command can include the following variations:

```
router rip [vrf <VRF name>]
no router rip
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables RIP configuration mode.

```
(config-data)# router rip
```

43.2.2.81.1.2 router ripng

This command enables IPv6 RIPng.

Syntax:

The syntax of this command can include the following variations:

```
router ripng [vrf <VRF name>]
no router ripng
```

The command's syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables RIPng configuration mode.

```
(config-data)# router ripng
```

43.2.2.81.1.3 passive-interface

This command sets the specified interface to passive mode. On passive mode interfaces, all receiving packets are processed as normal and *ripd* does not send either multicast or unicast RIP packets except to RIP neighbors specified with the **neighbor** command. The interface may be specified as 'default' to make *ripd* default to *passive* on all interfaces. The default is to be passive on all interfaces.

Syntax:

The syntax of this command can include the following variations:

```
passive-interface {ifname|default}
no passive-interface ifname
```

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the specified interface to passive mode.

```
(config-data)# router rip
(conf-router)# passive-interface vlan 2
```

43.2.2.81.1.4 ip split-horizon

This command controls the split-horizon on the interface. A Split horizon is a way of preventing a routing loop in a network. Information about the routing for a specific packet is never sent back in the direction from which it was received.

Default is **ip split-horizon**. If you don't perform split-horizon on the interface, please specify **no ip split-horizon**.

Syntax:

The syntax of this command can include the following variations:

```
ip split-horizon
no ip split-horizon
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets split horizon on the VLAN 2 interface.

```
(config-data)# interface vlan 2
(conf-if VLAN 2)# ip split-horizon
```

43.2.2.81.2 RIP – Router Configuration

RIP Router Configuration includes the following commands:

43.2.2.81.2.1 network network

This command sets the RIP enable interface by *network*. The interfaces which have addresses matching the network are enabled. This group of commands either enables or disables RIP interfaces between numbers of a specified network address. For example, if the network for 10.0.0.0/24 is RIP enabled, this would result in all the addresses from 10.0.0.0 to 10.0.0.255 being enabled for RIP.

The **no network** command disables RIP for the specified network.

Syntax:

The syntax of this command can include the following variations:

```
network network a.b.c.d/m
no network network
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d/m	Defines the IP prefix network/length

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the RIP enable interface by *network*.

```
(conf-router)# network network 10.4.4.10/16
```

43.2.2.81.2.2 network ifname

This command sets a RIP enabled interface by *ifname*. Both the sending and receiving of RIP packets will be enabled on the port specified in the network *ifname* command.

The **no network** *ifname* command disables RIP on the specified interface.

Syntax:

The syntax of this command can include the following variations:

```
network ifname
no network ifname
```

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the RIP enable interface by *ifname*.

```
(conf-router)# network vlan 1
```

43.2.2.81.2.3 neighbor a.b.c.d

This command is used to specify neighbors when a neighbor can't process multicast. In some cases, not all routers are able to understand multicasting, where packets are sent to a network or a group of addresses. In a situation where a neighbor cannot process multicast packets, it is necessary to establish a direct link between routers. The neighbor command allows the network administrator to specify a router as a RIP neighbor.

The **no neighbor a.b.c.d** command will disable the RIP neighbor.

Syntax:

The syntax of this command can include the following variations:

```
neighbor a.b.c.d
no neighbor a.b.c.d
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the neighbor address.

Defaults:

NA

Command Modes:

Enable

Example:

The following example specifies a neighbor.

```
(conf-router)# neighbor 10.4.4.4
```

43.2.2.81.2.4 version version

This command sets the RIP version number.

Syntax:

The syntax of this command can include the following variations:

```
version version
no version
```

The command's syntax format is described below:

Arguments	Description
version	Defines the RIP version number – "1" or "2"

Defaults:

- "2" for send
- Both "1" and "2" for receive

Command Modes:

Enable

Example:

The following example sets RIP Version 2.

```
(conf-router) # version 2
```

43.2.2.81.2.5 redistribute kernel

This command redistributes routing information from kernel route entries into the RIP tables. The **no redistribute kernel** disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute kernel
redistribute kernel metric <0-16>
redistribute kernel route-map [route-map]
no redistribute kernel
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the Metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes IPv4 routing information from kernel route entries.

```
# configure data
(config-data)# router rip
(conf-router)# redistribute kernel
```

43.2.2.81.2.6 redistribute static

This command redistributes routing information from static route entries into the RIP tables. The **no redistribute static** command disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute static
redistribute static metric <metric value>
redistribute static route-map [route-map]
no redistribute static
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value (0 - 4294967295).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes routing information from static route entries.

```
# configure data
(config-data)# router ospf
(conf-router) # redistribute static
```

43.2.2.81.2.7 redistribute connected

This command redistributes connected routes into the RIP tables.

The **no redistribute connected** command disables the connected routes in the RIP tables. The connected route on a RIP- enabled interface is announced by default.

Syntax:

The syntax of this command can include the following variations:

```
redistribute connected
redistribute connected [metric <metric value>]
redistribute connected [route-map [route-map]]
no redistribute connected
```

The command's syntax format is described below:

Arguments	Description
metric value	Defines the default metric value [0-4294967295].
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes connected routes into the RIP tables.

```
(conf-router) # redistribute connected
```

43.2.2.81.2.8 redistribute ospf

This command redistributes routing information from ospf route entries into the RIP tables. **no redistribute ospf** disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute ospf
redistribute ospf metric <default metric>
redistribute ospf route-map [route-map]
no redistribute ospf
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value [0-4294967295].
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes ospf routes into the RIP tables.

```
(conf-router) # redistribute ospf
```

43.2.2.81.2.9 redistribute bgp

This command redistributes routing information from bgp route entries into the RIP tables. **no redistribute bgp** disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute bgp
redistribute bgp metric <0-16>
redistribute bgp route-map [route-map]
no redistribute bgp
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes bgp routes into the RIP tables.

```
(conf-router) # redistribute bgp
```

43.2.2.81.2.10 default-information originate

This command distributes a default route.

Syntax:

The syntax of this command can include the following variations:

```
default-information originate
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example distributes a default route.

```
(conf-router)# default-information originate
```

43.2.2.81.2.11 distribute-list prefix

This command filters the RIP path and can apply access-lists to a chosen interface.

Syntax:

The syntax of this command can include the following variations:

```
distribute-list prefix [WORD] {in|out} ifname
```

The command's syntax format is described below:

Arguments	Description
WORD	Prefix list name

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example filters the RIP path for input packets of vlan 1.

```
(conf-router)# distribute-list prefix prefix1 in vlan 1
```

43.2.2.81.2.12 distance

This command sets the default RIP distance to a specified value.

Syntax:

The syntax of this command can include the following variations:

```
distance <1-255> [a.b.c.d/m]
no distance <1-255> [a.b.c.d/m]
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d/m	Defines the IP prefix network/length.

Defaults:

120

Command Modes:

Enable

Example:

The following example sets the default RIP distance to 150.

```
(conf-router)# distance 150
```

43.2.2.81.2.13 timers basic

This command configures timers in the RIP protocol.

The `no timers` basic command resets the timers to the default settings listed below.

Syntax:

The syntax of this command can include the following variations:

```
timers basic [5-2147483647]
no timers basic
```

The command's syntax format is described below:

Arguments	Description
5-2147483647	Defines the Routing Table update timer value in seconds.

Defaults:

The default Routing table update timer value in seconds is 30.

Command Modes:

Enable

Example:

The following example updates the timer value to 50 seconds.

```
(conf-router)# timers basic 50
```

43.2.2.81.3 RIP – Interface Configuration

RIP Interface Configuration includes the following commands:

43.2.2.81.3.1 ip rip split-horizon

This command controls the split-horizon on the interface.

Syntax:

The syntax of this command can include the following variations:

```
ip rip split-horizon [poisoned-reverse]
no ip rip split-horizon
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the split-horizon on VLAN 1.

```
(conf-if-VLAN 1)# ip rip split-horizon
```

43.2.2.81.3.2 ip rip send version version

This interface command overrides the global rip version setting and selects which version of RIP packets are sent on this interface.

Syntax:

The syntax of this command can include the following variations:

```
ip rip send version version
```

The command's syntax format is described below:

Arguments	Description
version	Defines the RIP version number – "1" or "2".

Defaults:

Send packets according to the global version (Version 2).

Command Modes:

Enable

Example:

The following example sets RIP Version 2 to send packets with.

```
(conf-if-VLAN 1)# ip rip send version 2
```

43.2.2.81.3.3 ip rip receive version version

This command overrides the global RIP version setting and selects which version of RIP packets are accepted on this interface.

Syntax:

The syntax of this command can include the following variations:

```
ip rip receive version version
```

The command's syntax format is described below:

Arguments	Description
version	Defines the RIP version number – "1" or "2".

Defaults:

Accept packets according to the global setting (1 and 2)

Command Modes:

Enable

Example:

The following example sets RIP Version 2 to receive packets with.

```
(conf-if-VLAN 1)# ip rip receive version 2
```

43.2.2.81.3.4 ip rip authentication mode md5

This command sets the interface with RIPv2 MD5 authentication.

Syntax:

The syntax of this command can include the following variations:

```
ip rip authentication mode md5
no ip rip authentication mode md5
```

Defaults:

Command Modes:

Enable

Example:

The following example sets the interface with RIPv2 MD5 authentication.

```
(conf-if-VLAN 1)# ip rip authentication mode md5
```

43.2.2.81.3.5 ip rip authentication mode text

This command sets the interface with RIPv2 simple password authentication.

Syntax:

The syntax of this command can include the following variations:

```
ip rip authentication mode text
no ip rip authentication mode text
```

Defaults:

Command Modes:

Enable

Example:

The following example sets the interface with RIPv2 simple text authentication.

```
(conf-if-VLAN 1)# ip rip authentication mode text
```

43.2.2.81.3.6 ip rip authentication string

This command sets the authentication string.

Syntax:

The syntax of this command can include the following variations:

```
ip rip authentication string string
no ip rip authentication mode string
```

The command's syntax format is described below:

Arguments	Description
string	Defines the authentication string which must be less than 16 characters.

Defaults:

Command Modes:

Enable

Example:

The following example sets the authentication string.

```
(conf-if-VLAN 1)# ip rip authentication string ripauthent
```

43.2.2.81.3.7 ip rip authentication key-chain

This command sets the authentication key-chain.

Syntax:

The syntax of this command can include the following variations:

```
ip rip authentication key-chain key-chain
no ip rip authentication key-chain key-chain
```

The command's syntax format is described below:

Arguments	Description
key-chain	Defines the name of the key chain.

Defaults:

Command Modes:

Enable

Example:

The following example sets the authentication key-chain.

```
(conf-if-VLAN 1)# ip rip authentication key-chain 120
```

43.2.2.81.4 RIP Route Map Configuration

RIP Route Map Configuration includes the following commands:

43.2.2.81.4.1 match community

This command matches a BGP community list.

Syntax:

The syntax of this command can include the following variations:

```
match community {<comm list std number>|<comm list exp number>
|<comm list name>}
```

The command's syntax format is described below:

Arguments	Description
comm list std number	Defines the community list number (standard). Range is 1-99.
comm list exp number	Defines the community list number (expanded). Range is 100-500.
comm list name	Defines the community list name.

Command Modes:

Enable

Example:

The following example matches a BGP community list.

```
(config-data)# route-map ww permit 1
(conf-route-map)# match community commlist1
```

43.2.2.81.4.2 match extcommunity

This command matches BGP/VPN extended community list.

Syntax:

The syntax of this command can include the following variations:

```
match extcommunity {<comm list std number>|<comm list exp number>
|<comm list name>}
```

The command's syntax format is described below:

Arguments	Description
comm list std number	Defines the extended community list number (standard). Range is 1-99.
comm list exp number	Defines the extended community list number (expanded). Range is 100-500.
comm list name	Defines the extended community list name.

Defaults:

Command Modes:

Enable

Example:

The following example matches a BGP/VPN extended community list.

```
(config-data)# route-map ww permit 1
(conf-route-map)# match extcommunity 1
```

43.2.2.81.4.3 match interface ifname

This command matches values from the routing table.

Syntax:

The syntax of this command can include the following variations:

```
match interface ifname
```

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

Command Modes:

Enable

Example:

The following example matches values from vlan 1.

```
(conf-route-map)# match interface vlan 1
```

43.2.2.81.4.4 match ip address prefix-list [WORD]

This command matches the IP address of the route.

Syntax:

The syntax of this command can include the following variations:

```
match ip address prefix-list plistname
```

The command's syntax format is described below:

Arguments	Description
plistname	Defines the prefix list string.

Defaults:

Command Modes:

Enable

Example:

The following example matches entries of prefix-lists.

```
(conf-route-map)# match ip address prefix-list plist
```

43.2.2.81.4.5 match ip next-hop

This command matches the next-hop address of a route.

Syntax:

The syntax of this command can include the following variations:

```
match ip next-hop prefix-list plistname
```

The command's syntax format is described below:

Arguments	Description
plistname	Defines the prefix-list string.

Defaults:

Command Modes:

Enable

Example:

The following example matches the next-hop address of a route.

```
(conf-route-map)# match ip next-hop prefix-list plist
```

43.2.2.81.4.6 match metric

This command matches the metric value of RIP updates.

Syntax:

The syntax of this command can include the following variations:

```
match metric <0-4294967295>
```

Defaults:

Command Modes:

Enable

Example:

The following example matches the metric value of 100000.

```
(conf-route-map)# match metric 100000
```

43.2.2.81.4.7 set comm-list

This command sets the BGP community list (for deletion).

Syntax:

The syntax of this command can include the following variations:

```
set comm-list {<comm list std number>|<comm list exp number>
|<comm list name>}
```

The command's syntax format is described below:

Arguments	Description
comm list std number	Defines the community list number (standard). Range is 1-99.
comm list exp number	Defines the community list number (expanded). Range is 100-500.
comm list name	Defines the community list name.

Defaults:

Command Modes:

Enable

Example:

The following example sets a BGP community list.

```
(config-data)# route-map ww permit 1
(conf-route-map)# set comm-list 100
```

43.2.2.81.4.8 set ip next-hop

This command sets the next hop value in the RIPv2 protocol.

Syntax:

The syntax of this command can include the following variations:

```
set ip next-hop a.b.c.d
```

The command's syntax format is described below:

Arguments	Description
a.b.c.d	Defines the IP address.

Defaults:

Command Modes:

Enable

Example:

The following example sets the next hop to 10.4.4.28.

```
(conf-route-map)# set ip next-hop 10.4.4.28
```

43.2.2.81.4.9 set metric

This command sets a metric value for matched routes when sending an announcement.

Syntax:

The syntax of this command can include the following variations:

```
set metric <0-4294967295>
```

Defaults:

Command Modes:

Enable

Example:

The following example sets the metric value to 150000.

```
(conf-route-map)# match metric 150000
```

43.2.2.81.4.10 redistribute connected

This command redistributes connected routes into the RIPng tables.

The **no redistribute connected** command disables the connected routes in the RIP tables. The connected route on a RIP- enabled interface is announced by default.

Syntax:

The syntax of this command can include the following variations:

```
redistribute connected
redistribute connected metric <0-16>
redistribute connected route-map [route-map]
no redistribute connected
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes connected routes into the RIPng tables.

```
# configure data
(config-data)# router ripng
(conf-router)# redistribute connected
```

43.2.2.81.5 RIPng

RIPng Router Configuration includes the following commands:

43.2.2.81.5.1 default-information originate

This command distributes a default route.

Syntax:

The syntax of this command can include the following variations:

```
default-information originate
```

Defaults:

NA

Command Modes:

Enable

Example:

The following example distributes a default route.

```
# configure data
(config-data)# router ripng
(conf-router)# default-information originate
```

43.2.2.81.5.2 default-metric

This command sets the metric of redistributed routes.

Syntax:

The syntax of this command can include the following variations:

```
default-metric <0-16777214>
no default-metric
```

The command's syntax format is described below:

Arguments	Description
<0-16777214>	Defines the default metric.

Defaults:

NA

Command Modes:

Enable

Example:

This example sets the metric of redistributed routes to 1000.

```
# configure data
(config-data)# router ripng
(conf-router)# default-metric 1000
```

43.2.2.81.5.3 distribute-list prefix

This command filters the RIP path and can apply access-lists to a chosen interface.

Syntax:

The syntax of this command can include the following variations:

```
distribute-list prefix [WORD] {in|out} ifname
```

The command's syntax format is described below:

Arguments	Description
WORD	Prefix list name

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example filters the RIP path for input packets of vlan 1.

```
# configure data
(config-data)# router ripng
(conf-router)# distribute-list prefix prefix1 in vlan 1
```

43.2.2.81.5.4 network ifname

This command enables RIPng on a specified interface or network.

Syntax:

The syntax of this command can include the following variations:

```
network ifname/[X:X::X:X/M]
no network ifname/[X:X::X:X/M]
```

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
[X:X::X:X/M]	IPv6 prefix network/length, e.g., 3ffe::/16	
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the RIP enable interface by *ifname*.

```
# configure data
(config-data)# router ripng
(conf-router)# network vlan 1
```

43.2.2.81.5.5 passive-interface

This command suppresses routing updates on an interface.

Syntax:

The syntax of this command can include the following variations:

```
passive-interface ifname
no passive-interface ifname
```

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[Slot/Port.VLAN ID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

```
The following example sets the specified interface to passive
mode.
# configure data
(config-data)# router rip
(conf-router)# passive-interface vlan 1
```

43.2.2.81.5.6 route

This command sets up a static route.

Syntax:

The syntax of this command can include the following variations:

```
route <route map tag> deny <sequence>
route <route map tag> permit <sequence>
route <route map tag> vrf <VRF table> deny|permit <sequence>
```

The command's syntax format is described below:

Arguments	Description
route map tag	Defines the route map tag.
deny	Route map denies set operations.
permit	Route map permits set operations.
vrf	Associate with the defined VRF.
VRF table	Defines the VRF table name.
sequence	Defines the sequence to insert to/delete from an existing route-map entry. Range is 1-65535.

The command's syntax format is described below:

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[Slot/Port.VLAN ID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how this command can be used.

```
# configure data
(config-data)# router ripng
(conf-router)# route AAAtag deny 10
```

43.2.2.81.5.7 route-map

This command sets up a route-map.

Syntax:

The syntax of this command can include the following variations:

```
route <rmap_name> in|out <ifname>
```

The command's syntax format is described below:

Arguments	Description
rmap_name	Defines the route map name.
in	Defines the route map for input filtering.
out	Defines the route map for output filtering.

Defaults:

NA

Command Modes:

Enable

Example:

The following is an example of how this command can be used.

```
# configure data
(config-data)# router ripng
(conf-router)# route AAAmap in vlan 2
```

43.2.2.81.5.8 timers basic

This command configures timers in the RIPng protocol.

Syntax:

The syntax of this command can include the following variations:

```
timers basic <routing_table_timer> <routing_timeout_timer>
<garbage_collection_timer>
```

The command's syntax format is described below:

Arguments	Description
routing_table_timer	Defines the Routing Table Update Timer value in seconds. Range is 5-2147483647.
routing_timeout_timer	Defines the Routing Information Timeout Timer. Range is 0-65535.
garbage_collection_timer	Defines the Garbage Collection Timer. Range is 0-65535.

Defaults:

- The default Routing Table Update Timer value in seconds is 30.
- The default Routing Timeout Timer value in seconds is 180.
- The default Garbage Collection Timer.value in seconds is 120.

Command Modes:

Enable

Example:

The following example updates the Routing Table Update Timer, Routing Timeout Timer, and Garbage Collection Timer.values to 50 seconds each.

```
# configure data
(config-data)# router ripng
(conf-router)# timers basic 50 50 50
```

43.2.2.81.5.9 redistribute bgp

This command redistributes routing information from bgp route entries into the RIPng tables. The **no redistribute bgp** disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute bgp
redistribute bgp metric <0-16>
redistribute bgp route-map [route-map]
no redistribute bgp
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes bgp routes into the RIPng tables.

```
# configure data
(config-data)# router ripng
(conf-router)# redistribute bgp
```

43.2.2.81.5.10 redistribute kernel

This command redistributes routing information from kernel route entries into the RIPng tables. The **no redistribute kernel** disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute kernel
redistribute kernel metric <0-16>
redistribute kernel route-map [route-map]
no redistribute kernel
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the Metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes IPv6 routing information from kernel route entries.

```
# configure data
(config-data)# router ripng
(conf-router)# redistribute kernel
```

43.2.2.81.5.11 redistribute ospf6

This command redistributes routing information from ospf6 route entries into the RIPng tables. The **no redistribute ospf6** command disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute ospf6
redistribute ospf6 metric <0-16>
redistribute ospf6  route-map [route-map]
no redistribute ospf6
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes ospf6 routes into the RIPng tables.

```
# configure data
(config-data)# router ripng
(conf-router)# redistribute ospf6
```

43.2.2.81.5.12 redistribute static

This command redistributes routing information from static route entries into the RIPng tables. The **no redistribute static** command disables the routes.

Syntax:

The syntax of this command can include the following variations:

```
redistribute static
redistribute static metric <0-16>
redistribute static route-map [route-map]
no redistribute static
```

The command's syntax format is described below:

Arguments	Description
metric	Defines the metric value (0 -16).
route-map	Defines the pointer to route-map entries.

Defaults:

NA

Command Modes:

Enable

Example:

The following example redistributes routing information from static route entries.

```
# configure data
(config-data)# router ripng
(conf-router)# redistribute static
```

43.2.2.82 Virtual Routing and Forwarding (VRF) Commands

These commands implement dynamic routing protocols (BGP, OSPF and RIP) with Virtual Routing and Forwarding (VRF) tagging. One BGP, one OSPF, and one RIP protocol can be enabled per VRF table. Up to five dynamic routing protocols can be enabled in all defined VRF tables.

43.2.2.82.1 ip vrf

This command enables a dynamic routing protocol on a VRF.

Syntax:

The syntax of this command includes the following variations:

```
ip vrf <vrf-name> {enable bgp|ospf|rip]
no ip vrf <vrf-name>
```

The command syntax format is described below:

Arguments	Description
vrf-name	Defines the *vrf* name (up to 64 bytes).

Defaults:

NA

Note:

- Up to 32 VRF's may be defined.
- A vrf which is associated with interfaces cannot be deleted (need first to disassociate the interfaces).

Command Modes:

Enable

Related Commands:

ip route vrf, ip vrf forwarding, show ip vrf

Example:

The following example defines a vrf called XXIP.

```
(config-data)# ip vrf XXIP
```

43.2.2.82.2 ip vrf forwarding

This command associates an interface with a given vrf.

Syntax:

The syntax of this command includes the following variations:

```
ip vrf forwarding <string>
no ip vrf forwarding
```

The command syntax format is described below:

Arguments	Description
string	Defines the VRF name.

Defaults:

Interface is not associated with vrf.

Note:

- This command is supported on all MSBR devices.
- The maximum number of interfaces per vrf is 20.
- The following interfaces are supported:
  - GigabitEthernet
  - cellular
  - gre
  - ipip
  - atm
  - pppoe
  - multilink
  - vlan

Command Modes:

Enable

Related Commands:

ip vrf, show ip vrf

Example:

The following example associate interface VLAN 4 with vrf data:

```
# configure data
(config-data)# interface vlan 4
(conf-if-VLAN 4)# ip vrf forwarding data
```

43.2.2.82.3 ip route vrf

The command adds a static route into a VRF.

Syntax:

The syntax of this command can include several interface types. The most common are as follows:

```
ip route vrf <vrf table name> <ip address> <prefix  mask> [gw ip
address] ifname <slot/port.VlanId> [metric value] [track <track
id>] [bfd-neighbor <neighbor ID>]  [output-vrf <name>]
[description <string>]

ip route [vrf <vrf table name>] source <ip source prefix> <prefix
mask> destination <ip destination prefix> <ip destination prefix
mask> <slot/port.VlanId> [metric value] [track <track id>]
```

This syntax describes a route that depends also on the source prefix of the packets:

```
ip route vrf <VRF name> source <IP source prefix>|local-voip
destination <IP destination prefix> [<gateway>] <interface type>
<interface ID> [<metric value>] [track <track ID>] [output-vrf
<name>] [description <string>]
```

Arguments	Description
vrf table name	Defines the VRF table name.
source	Routes all packets with a source from the local generated VoIP application (SIP and media) and configured destination according to the router rule.
IP destination prefix	Defines the IP destination prefix in a.b.c.d format.
IP destination prefix mask	Defines the IP destination prefix mask in a.b.c.d format.
metric value	Defines the metric value for this route (0-255).
track	Defines the track to be used for this route.
track id	Defines the Track ID (1-100).
output-vrf	Adds the ability to route traffic received by one VRF from some other VRF. It is configured with the output-vrf option added to the static route configuration.
description	Defines the description.
bfd-neighbor	Defines the ID of a BFD neighbor to attach the route to.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot	[SLOT/PORT.VLANID]

Interface Type (ifname)		Interface ID
	and port (VLAN ID is optional)	
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

N/A

Note:

A route that points to an interface that is not associated with the given vrf will be disabled.

Command Modes:

Enable

Related Commands:

ip vrf, show ip route vrf, show data ip

Example:

The following example route packets received by vrf VOIP1, with destination prefix 10.4.0.0 from interface gi 0/0 (which belongs to vrf VOIP2) to the next hop 10.5.0.1:

```
(config-data)# ip route vrf VOIP1 10.4.0.0 255.255.0.0 10.5.0.1 gi
0/0 output-vrf VOIP2
```

43.3 GRE and IPIP Tunnel Interface Commands

The section describes the GRE and IPIP Tunnel Interface commands.

43.3.1 interface gre|ipip

This command enters a specific WAN tunnel interface configuration. Use the **no** form of this command to delete the interface.

Syntax:

The syntax of this command can include the following variations:

```
interface gre <greID>
interface ipip <ipipID>
```

The command syntax format is described below:

Arguments	Description
greID	Assigns a **gre** tunnel interface id in the range of 1-255.
ipipID	Assigns an **ipip** tunnel interface id in the range of 1-255.

Defaults:

NA

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example enters a gre id 6 tunnel interface configuration:

```
(config data)# interface gre 6
```

43.3.1.1 napt

This command sets the NAPT (Network Address Port Translation) on the specified tunnel interface. Use the **no** form of this command to set route mode.

Syntax:

The syntax of this command can include the following variations:

```
napt
```

Defaults:

By default, napt is used.

Command Modes:

Enable

Example:

The following example sets the NAPT on GRE 6.

```
# configure data
(config-data)# interface gre 6
(conf-if-GRE 6)# napt
```

43.3.1.2 ip address

This command defines the local IP address of the specified tunnel interface. Use the **no** form of this command to remove a configured IP address.

Syntax:

The syntax of this command can include the following variations:

```
ip address <ip address>
```

The command's syntax format is described below:

Arguments	Description
ip address	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the IP address of 10.4.2.3 on interface GRE 6.

```
# configure data
(config-data)# interface gre 6
(conf-if-GRE 6)# ip address 10.4.2.3
```

43.3.1.3 tunnel destination

This command defines the destination IP address of the specified tunnel interface. Use the **no** form of this command to remove a configured IP address.

Syntax:

The syntax of this command can include the following variations:

```
tunnel destination <ip address>
```

The command's syntax format is described below:

Arguments	Description
ip address	Specifies a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the tunnel destination IP address of 10.4.2.50 on interface GRE 6.

```
(config-data)# interface gre 6
(conf-if-GRE 6)# tunnel destination 10.4.2.50
```

This page is intentionally left blank.

44 Security

The following describes Security commands.

44.1 ip synflood-protection

This command enables TCP SYN-flood protection.

Syntax:

The syntax of this command includes the following variations:

```
ip synflood-protection {enable|rate}
```

The command syntax format is described below:

Arguments	Description
enable	Enables this command.
rate	Defines the rate The rate (your number is multiples by ten)

Defaults:

NA

Command Modes:

Enable

Example:

The following example enables TCP SYN-flood protection.

```
(config-data)# ip synflood-protection enable
```

44.2 VPN Commands

The following describes VPN commands.

44.2.1 IPSec (crypto)

The sub-section below describes the IPSec commands.

44.2.1.1 crypto isakmp key

This command, when used in global configuration mode, configures a preshared authentication key. To delete a preshared authentication key, use the **no form** of this command.

Syntax:

The syntax of this command can include the following variations:

```
crypto isakmp key <key-string> address <peer-address>
no crypto isakmp key <key-string> address <peer-address>
```

The command's syntax format is described below:

Arguments	Description
<key-string>	Specifies the preshared key. Use any combination of alphanumeric characters up to 20 bytes. This preshared key must be identical at both peers.
address	Use this keyword if the remote peer Internet Security Association Key Management Protocol (ISAKMP) identity was set with its IP address.
peer-address	Specifies the IP address of the remote peer.

Defaults:

There is no default preshared authentication key.

Command Modes:

crypto isakmp key are defined in enabled configuration mode.

Example:

The following example defines a key to a peer ip.

```
(config-data)# crypto isakmp key 123456 address 100.100.100.2
```

44.2.1.2 crypto isakmp policy

This command, when used in global configuration mode, defines an Internet Key Exchange (IKE) policy. IKE policies define a set of parameters to be used during the IKE negotiation. To delete an IKE policy, use the **no form** of this command.

This command invokes the Internet Security Association Key Management Protocol (ISAKMP) policy configuration (config-isakmp) command mode. While in the ISAKMP policy configuration command mode, some of the commands for which you can specify parameters, are as follows:

- encryption
- hash
- authentication
- group
- lifetime

To exit **config-isakmp** command mode, type 'exit'.

You can configure multiple IKE policies on each peer participating in IPSec. When the IKE negotiation begins, it tries to find a common policy configured on both peers.

Syntax:

The syntax of this command can include the following variations:

```
crypto isakmp policy <id>
no crypto isakmp policy <id>
```

The commands syntax format is described below:

Arguments	Description
id	Uniquely identifies the IKE policy

This command puts you into the *config-isakmp command* mode.

```
(config-isakmp)# authentication <pre-share>
(config-isakmp)# encryption <enc-alg>
(config-isakmp)# hash <auth-alg>
(config-isakmp)# lifetime <second>
(config-isakmp)# group {1|2|3}
```

Arguments	Description
pre-share	Specifies the authentication method.
enc-alg	Specifies the encryption algorithm within an IKE policy. Accepted transform values are described in the "algorithms table".
auth-alg	Specifies the hash algorithm within an IKE policy. Accepted transform values are described in the "algorithms table".
second	Specifies the lifetime of an IKE SA.

Arguments	Description
1|2|3	Specifies the Diffie-Hellman group identifier within an IKE policy.

Table 44-1: Algorithms Table

Algorithms type	Arguments	Description
enc-alg	esp-des	Defines ESP with the 56-bit DES encryption algorithm.
	esp-3des	Defines ESP with the 168-bit DES encryption algorithm (3DES or Triple DES).
	esp-aes 128	Defines ESP with the 128-bit AES encryption algorithm.
	esp-aes 192	Defines ESP with the 192-bit AES encryption algorithm.
	esp-aes 256	Defines ESP with the 256-bit AES encryption algorithm.
auth-alg	esp-sha-hmac	Defines ESP with the SHA (HMAC variant) authentication algorithm.
	esp-md5-hmac	Defines ESP with the MD5 (HMAC variant) authentication algorithm.

Defaults:

This command has no defaults.

Command Modes:

crypto isakmp key are defined in enabled configuration mode.

Example:

The following example demonstrates how to configure an IKE policy:

```
(config data)# crypto isakmp policy 50
```

44.2.1.3 crypto ipsec profile

This command configures an IPSec policy profile. To delete a IPSec policy profile, use the **no form** of this command.

Syntax:

The syntax of this command can include the following variations:

```
crypto ipsec profile <profile name>
no crypto ipsec profile
```

The command's syntax format is described below:

Arguments	Description
profile name	Defines the profile name.

Command Modes:

The **crypto isakmp key** is defined in enabled configuration mode.

Example:

The following example configures an IPSec policy profile.

```
(config-data)# crypto ipsec profile p1name
```

44.2.1.4 crypto ipsec transform-set

This command, when used in global configuration mode, defines a transform set as acceptable combination of security protocols and algorithms. To delete a transform set, use the **no** form of this command.

Syntax:

The syntax of this command can include the following variations:

```
crypto ipsec transform-set <transform-set-name>
<transform> <transform>
no crypto ipsec transform-set <transform-set-name>
```

The commands syntax format is described below:

Arguments	Description
`transform-set-name`	Specifies the name of the transform set to create (or modify).
`transform`	Specifies two "transforms". These transforms define the IPSec security protocols and algorithms. Accepted transform values are described in the "transform table".

Table 44-2: Transform Table

Transform Type	Transform	Description
ESP Encryption Transform	esp-des	Defines ESP with the 56-bit DES encryption algorithm.
	esp-3des	Defines ESP with the 168-bit DES encryption algorithm (3DES or Triple DES).
	esp-aes	Defines ESP with the 128-bit AES encryption algorithm.
	esp-nul	Defines null encryption algorithm.
ESP Authentication Transform	esp-md5-hmac	Defines ESP with the MD5 (HMAC variant) authentication algorithm.
	esp-sha-hmac	Defines ESP with the SHA (HMAC variant) authentication algorithm.
AH Transform	ah-md5-hmac	Defines AH with the MD5 (HMAC variant) authentication algorithm.
	ah-sha-hmac	Defines AH with the SHA (HMAC variant) authentication algorithm.

This command puts you into the **cfg-crypto-trans** command mode

```
(cfg-crypto-trans)# mode <encapsulation-type>
```

Arguments	Description
encapsulation-type	Specifies the mode for a transform set: either tunnel or transport mode. If neither tunnel nor transport is specified, the default (tunnel mode) is assigned.

Defaults:

This command has no defaults.

Command Modes:

crypto ipsec transform-set are defined in enabled configuration mode.

Example:

The following example demonstrates how to configure a transform set:

```
(config data)# crypto ipsec transform-set abc esp-3des esp-sha-hmac
```

44.2.1.5 crypto map

To create or modify a crypto map entry and enter the crypto map configuration mode, use the crypto map global configuration command. To delete a crypto map entry or set, use the **no** form of this command.

Syntax:

The syntax of this command can include the following variations:

```
crypto map <map-name> <index> ipsec-isakmp
no crypto map <map-name> <index> ipsec-isakmp
```

Arguments	Description
map-name	Name that identifies the crypto map set
index	Uniquely number assigned to a crypto map entry

This command puts you into the config-crypto-map command mode:

```
(config-crypto-map)# set peer <peer-ip>
(config-crypto-map)# set transform-set <set-name>
(config-crypto-map)# set pfs {group1|group2|group5|same}
(config-crypto-map)# set security-association lifetime seconds <#>
(config-crypto-map)# match address <acl-name>
```

Arguments	Description
peer-ip	Specifies an IPSec peer in a crypto map entry.
set-name	Specifies which transform sets can be used with the crypto map entry. The set-name will be compare with all transform-sets prefix
group1|group2| group5|same	Specifies that IPSec should ask for PFS when requesting new SAs for this crypto map entry, or that IPSec requires PFS when receiving requests for new SAs: ▪ group1 - Diffie-Hellman group 1 ▪ group2 - Diffie-Hellman group 2 ▪ group5 - Diffie-Hellman group 5 ▪ same - Same Diffie-Hellman group as phase 1
#	Specifies the lifetime of an IPSec SA.
acl-name	Specifies an extended access list for a crypto map entry. Only the first entry in the access list will be considered.

Defaults:

IPSec SA lifetime default is 28800 seconds.

Command Modes:

crypto map defined in enabled configuration mode.

Example:

The following example demonstrates how to configure a crypto map:

```
(config data)# crypto map LAN_VPN 20 ipsec-isakmp
```

44.2.2 L2TP and PPTP Tunnel Interface Commands

The following describes the L2TP and PPTP Tunnel Interface commands.

44.2.2.1 description

This command sets the description on the specified tunnel interface.

Syntax:

```
description <string>
```

The command's syntax format is described below:

Arguments	Description
string	Specifies the interface description using an alphanumerical string (up to 255 characters).

Defaults:

NA

Note:

- Use inverted commas when using the space character as part of the description.
- The string is limited to 255 characters.

Command Modes:

Enable

Example:

The following example sets the description on L2TP 3.

```
(conf-if-L2TP 3)# description L2TP 3 interface
```

44.2.2.2 firewall enable

This command enables the firewall protection on the specified tunnel interface. Use the **no** form of this command to disable the firewall.

Syntax:

The syntax of this command can include the following variations:

```
firewall enable
```

Defaults:

By default, firewall is enabled.

Command Modes:

Enable

Example:

The following example enables the firewall on l2tp.

```
# configure data
(config-data)# interface l2tp 1
(conf-if-L2TP 6)# firewall enable
```

44.2.2.3 lcp-echo

This command configures the interface echo parameters. The echo is needed to keep the fw state alive, otherwise it is deleted after two minutes idle time and the connection will be blocked. This configuration will make ppp discover broken link in (interval x fails) seconds.

Syntax:

The syntax of this command includes the following variations:

```
lcp-echo <interval> <fails>
```

The command syntax format is described below:

Arguments	Description
interval	Defines the interval in seconds (default value is 6 seconds).
fails	Defines the number of failed intervals to discover broken link (default value is 5 intervals).

Defaults:

NA

Command Modes:

Enable

Examples:

The following example sets the echo interval and fails parameters to 10 and 5 respectively on L2TP 6:

```
(conf-if-L2TP 6)# lcp-echo 10 5
```

44.2.2.4 interface l2tp|pptp

This command enters a specific WAN ppp tunnel interface configuration. Use the **no** form of this command to delete the interface.

Syntax:

The syntax of this command includes the following variations:

```
interface l2tp <ID>
interface pptp <ID>
```

The command syntax format is described below:

Arguments	Description
ID	Assigns the tunnel interface id in the range of 0-99.

Defaults:

NA

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example enters an l2tp id 5 tunnel interface configuration:

```
(config data)# interface l2tp 5
```

44.2.2.5 mtu

This command configures the interface Maximum Transmission Unit (MTU) on the specified tunnel interface.

Syntax:

The syntax of this command can include the following variations:

```
mtu auto
mtu <mtu value>
```

The command's syntax format is described below:

Arguments	Description
auto	Sets MTU automatically.
value	Sets MTU value in the range of 68 to 1500.

Defaults:

MTU is set to auto (usually 1476).

Command Modes:

Enable

Example:

The following example sets the MTU value to 770 bytes on l2tp 6.

```
(conf-if-L2TP 6)# mtu 770
```

44.2.2.6 napt

This command sets the NAPT (Network Address Port Translation) on the specified tunnel interface. Use the **no** form of this command to set route mode.

Syntax:

The syntax of this command can include the following variations:

```
napt
```

Defaults:

By default, NAPT is used.

Command Modes:

Enable

Example:

The following example sets napt on l2tp 6.

```
(conf-if-L2TP 6)# napt
```

44.2.2.7 ppp user

This command defines the ppp username and password on the specified tunnel interface.

Syntax:

The syntax of this command can include the following variations:

```
ppp user <username> pass <password>
```

The command's syntax format is described below:

Arguments	Description
Username	Defines the ppp username.
password	Defines the ppp password.

Defaults:

NA

Command Modes:

Enable

Example:

The following example sets the username and password on interface l2tp 6.

```
(conf-if-L2TP 6)# ppp user admin pass 1234
```

44.2.2.8 ppp authentication pap|chap|ms-chap|ms-chap-v2

This command enables several authentication protocols on the ppp protocol of the specified tunnel interface. Use the **no** form of this command to disable a specific authentication protocol.

Syntax:

The syntax of this command can include the following variations:

```
ppp authentication pap
ppp authentication chap
ppp authentication ms-chap
ppp authentication ms-chap-v2
```

The command's syntax format is described below:

Arguments	Description
pap	Defines the Password Authentication Protocol.
chap	Defines the Challenge Handshake Authentication Protocol.
ms-chap	Defines the Microsoft Challenge Handshake Authentication Protocol.
ms-chap-v2	Defines the Microsoft Challenge Handshake Authentication Protocol - Version 2.

Defaults:

By default, all protocols are enabled.

Command Modes:

Enable

Example:

The following example disable the pap protocol on interface l2tp 3.

```
(conf-if-L2TP 3)# no ppp authentication pap
```

44.2.2.9 shutdown

This command disables the specified interface. Use the **no** form of this command to enable the interface.

Syntax:

```
shutdown
no shutdown
```

No arguments exist for this command.

Defaults:

When creating a new interface, it is disabled by default.

Command Modes:

Enable

Example:

The following example enables L2TP 3.

```
# configure data
(config data) # interface l2tp 3
(conf-if-L2TP 3)# no shutdown
```

44.2.2.10 tunnel destination

This command defines the end point host/ip address of the specified tunnel interface. Use the **no** form of this command to remove a configured IP address.

Syntax:

```
tunnel destination <host name>
```

The command's syntax format is described below:

Arguments	Description
host name	Specifies a host name or a valid IPv4 address. IP addresses should be expressed in dotted decimal notation (for example, 10.1.2.3).

Defaults:

NA

Command Modes:

Enable

Example:

The following example configures the tunnel destination IP address of 10.4.2.50 on interface PPTP 6.

```
(conf-if-PPTP 6)# tunnel destination 10.4.2.50
```

44.2.3 l2tp-server

This command defines the L2TP VPN server.

Syntax:

The syntax of this command includes the following variations:

```
l2tp-server
```

Command Modes:

Enable

Example:

The following example defines the L2TP VPN server:

```
(config data)# l2tp-server
no ppp encryption
     ip range 192.168.0.70 192.168.0.80
     ipsec key 123456
     no shutdown
     exit
```

44.2.4 pptp-server

This command enables the Point-to-Point Tunneling Protocol (PPTP) VPN server.

Syntax:

The syntax of this command includes the following variations:

```
pptp-server
```

Command Modes:

Enable

Example:

The following example defines the L2TP VPN server:

```
(config data)# pptp-server
```

44.2.5 vpn-users

This command defines a VPN user.

Syntax:

The syntax of this command includes the following variations:

```
vpn-users
```

Command Modes:

Enable

Example:

The following example defines a VPN user:

```
(config data)# vpn-users
(conf-vpnusers)user tom pass testpass
```

44.3 Port Security based on MAC Address

The following provides support for port access security based on MAC address. Only clients whose MAC addresses are defined for the device's port interface are allowed access to the port.

44.3.1 authentication static

This command defines a MAC address to allow access to one of the device's interfaces.

Syntax:

The syntax of this command can include the following variations:

```
# authentication static [mac <MAC address as
xx:xx:xx:xx:xx:xx>|auto]
# no authentication static [mac <MAC address as
xx:xx:xx:xx:xx:xx>|auto]
```

The commands syntax format is described below:

Arguments	Description
auto	Enables the device to authorize the first MAC address to access the Ethernet port.

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example defines a MAC address to allow access to one of the device's interfaces:

```
(config-data)# interface GigabitEthernet 0/1
(config-if-GE 0/1)# authentication static mac 01:23:45:67:89:ab
```

44.4 Access Control List (ACL) Commands

The following describes ACL commands.

44.4.1 access-list

Access lists are used in several system components for classifying IP traffic based on parameters such as addresses, protocols and ports. The primary usage of access lists is for filtering unwanted traffic on the system's interfaces.

Access list processing is sequential; for each traffic flow, the list is scanned from the top until a matching rule is found. When configuring an access list, rules should be entered in appropriate order.

To attach an access list to an IP interface, see the "**access-group**" command documentation.

To remove an access list, use the "**no**" format of the command.

Syntax:

The syntax of this command can include the following variations:

```
access-list <acl-id> {permit|deny} <protocol> <source-selector>
<dest-selector> <dscp-option> <options>
```

For compatibility purposes, access lists numbered 1-99 and 1300-1999 are defined as limited ("basic") access lists. These access lists cannot contain protocol and port definitions.

The commands syntax format is described below:

Arguments	Description
`acl-id`	Defines the Access List name identifier for this access list. It can be a number or a name.
`permit|deny`	Defines the access to the packet: • **`permit`** - Allows access to packets that match the criteria defined. • **`deny`** - Blocks access to packets that match the source and destination IP addresses and service ports defined.
`protocol`	Defines a traffic protocol: • **`tcp`** • **`udp`** • **`icmp`** • **`igmp`** • **`esp`** • **`ah`** • **`gre`** • **`ip`** • *ip protocol number [0 – 255]*

`source-selector`
 	
`dest-selector`
	Defines the source address and destination address of packets sent or received by the device.
	Select an address or a name from the list to apply the rule on the corresponding host, or **Any** to apply the rule on all the device's LAN hosts.
	Select traffic by IP addresses and ports, in one of the following formats:
	• **`any`** - Defines all traffic.
	▪ **`host`** a.b.c.d - Defines Traffic to/from single host, specified by the IP address.
	▪ **`local-`** Defines the Local IP address.
	▪ *a.b.c.d* - Traffic to/from a subnet, specified by an IP address and a mask (e.g., 0.0.255.255).
	Note:
	The **`eq`** and **`range`** parameters are only used if `<protocol>` is set to "tcp" or "udp".
	▪ **`eq`** `<port>` **`-`** Defines traffic to/from a single port.
	▪ **`range`** `<start> <end>` `-` Defines traffic to/from multiple ports, specified by range.
	If the port selector is not defined, the rule will match all ports.

`dscp-option`	Defines the packets by matching the Differentiated Services Code Point (DSCP) field of the IP header. The format of this option is: **`dscp`** `<c>` **`mask`** `<m>` The packet's DSCP value is compared to <c> under bit mask <m> (both must be specified in hexadecimal). For example: **`dscp`** `10` **`mask`** `3F`

`options`	Defines one or more of the following options: ▪ **`stateless`** - Traffic matching is stateless, i.e., it does not keep track of the connection state. ▪ **`log`** - Traffic matching this rule will be logged.

Defaults:

The default access list behavior is "deny", i.e. if a flow doesn't match any of the rules it is assumed to be unwanted traffic.

Related Commands:

SNMP Community strings can be associated with an ACL rule using the *snmp-acl* command.

Command Modes:

Enable

Example:

The following example defines an access list which allows all TCP connections originating in a full subnet, with the exception of a single host:

```
(config-data)# access-list 2001 deny tcp host 10.31.4.50 any
(config-data)# access-list 2001 permit tcp 10.31.0.0 0.0.255.255
any stateless
```

44.4.2 ip access-list extended

This command provides support for assigning an extended IP access-list number.

Syntax:

The syntax of this command can include the following variations:

```
ip access-list extended <access list id>
```

The command syntax format is described below:

Arguments	Description
access list id	Defines the extended IP access-list number. The range is 100-9999.

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example defines an extended Access List with an access list number ID.

```
(config-data)# ip access-list extended 18
```

44.4.3 ip access-list standard

This command provides support for assigning a sequence number (ID) to an IP Access List rule and re-sorting the order of rules within an Access List.

Syntax:

The syntax of this command can include the following variations:

```
ip access-list standard <access list id>
```

The command syntax format is described below:

Arguments	Description
access list id	Defines the standard IP access-list number. The range is 1-99.

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example defines an Access List with an access list number ID.

```
(config-data)# ip access-list standard 18
```

44.4.4 <rule id> deny|permit

This command defines a rule with a rule number for the Access List.

Syntax:

The syntax of this command can include the following variations:

```
<rule id> {permit|deny} <rule options… >
```

The command syntax format is described below:

Arguments	Description
rule id	Defines the Rule ID. The range is 1 to 2147483647.

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example defines a rule with a rule number for the Access List.

```
(config-data)# ip access-list standard 1
(config-std-nacl)# 1 permit any
```

44.4.5 ip access-list resequence

This command re-sequences rule numbering of a specific Access List.

Syntax:

The syntax of this command can include the following variations:

```
ip access-list resequence <access list id> <starting rule number>
<step increment>
```

The command syntax format is described below:

Arguments	Description
access list id	Defines the Starting Rule Number. The range is 1-2147483647.

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example shows a configuration of Access List ID 1 with two rules (numbers 10 and 20):

```
(config-data)# ip access-list standard 1
(config-std-nacl)# 10 permit any
(config-std-nacl)# 20 permit host 3.3.3.3
```

To change the order of the rules so that the first rule is assigned number 100 and subsequent rules are assigned numbers incremented by 50:

```
(config-data)# ip access-list resequence 1 100 50
```

To view the rules and their changed sequence numbers:

```
# show data access-lists
…
Standard IP access list 1
1 100 permit  any   (0 matches)
1 150 permit  host 3.3.3.3   (0 matches)
```

44.4.6 ip access-group

This command associates an access list with an IP interface. Refer to the "access-list" command documentation for more information.

To remove an access list association, use the **no** format of the command.

Syntax:

The syntax of this command can include the following variations:

```
ip access-group <acl-id> in
ip access-group <acl-id> out
no ip access-group <acl-id>
```

The commands syntax format is described below:

Arguments	Description
<acl-id>	Identifies the access list to use (number or name).
in	The access list will control inbound traffic on the interface.
out	The access list will control outbound traffic on the interface.

Defaults:

The default setting for IP interfaces is no access-group, i.e. unlimited traffic.

Command Modes:

This command is issued in interface context.

Example:

The following example associates an access list with a VLAN interface:

```
(conf-if-VLAN 1)# ip access-group 2001 in
```

44.5 Firewall Commands

The following describes the Firewall commands.

44.5.1 firewall enable

This command enables the firewall protection on the specified tunnel interface. Use the **no** form of this command to disable the firewall.

Syntax:

The syntax of this command can include the following variations:

```
firewall enable
```

Defaults:

By default, firewall is enabled.

Command Modes:

Enable

Example:

The following example enables the firewall on GRE 6.

```
# configure data
(config-data)# interface gre 6
(conf-if-GRE 6)# firewall enable
```

44.5.2 mtu

This command configures the interface Maximum Transmission Unit (MTU) on the specified tunnel interface.

Syntax:

The syntax of this command can include the following variations:

```
mtu auto
mtu <mtu value>
```

The command's syntax format is described below:

Arguments	Description
auto	Sets MTU automatically.
mtu value	Sets MTU value. Range is between 68 and 1500.

Defaults:

By default, MTU is set to auto (usually 1476).

Command Modes:

Enable

Example:

The following example sets the MTU value to 770 bytes on GRE 6.

```
# configure data
(config-data)# interface gre 6
(conf-if-GRE 6)# mtu 770
```

44.5.3 desc

This command sets the description on the specified tunnel interface.

Syntax:

```
desc <string>
```

The command's syntax format is described below:

Arguments	Description
string	Specifies the interface description using an alphanumerical string (up to 255 characters).

Defaults:

NA

Note:

- Use inverted commas when using the space character as part of the description.
- The string is limited to 255 characters.

Command Modes:

Enable

Example:

The following example sets the description on GRE 6.

```
# configure data
(config-data)# interface gre 6
(conf-if-GRE 6)# desc gre 6 interface
```

44.5.4 shutdown

This command disables the specified tunnel interface. Use the **no** form of this command to enable the interface.

Syntax:

```
shutdown
no shutdown
```

No arguments exist for this command.

Defaults:

When creating a new interface, it is disabled by default.

Command Modes:

Enable

Example:

The following example enables GRE 6.

```
# configure data
(config-data)# interface gre 6
(conf-if-GRE 6)# no shutdown
```

44.6 NAT Commands

The following describes NAT commands.

44.6.1 ip nat inside source

NAT port-forwarding exposes a LAN service (IP address and port) to WAN users. The command creates a static translation rule, which maps a WAN port (on one or all WAN interfaces) to a LAN service.

The same command can be used to create static NAT entries for LAN hosts; in this case an access-list is used to define the LAN devices and an IP address pool defines the WAN addresses to be used.

To remove a port-forwarding rule, use the **no** format of the command.

Syntax:

The syntax of this command can include the following variations:

```
ip nat inside source static {tcp|udp} <lan-ip> <lan-port> <wan-ip>
<wan-port>
ip nat inside source static {tcp|udp} <lan-ip> <lan-port> <wan-ip>
range <wan-port-start> <wan-port-end>
ip nat inside source static {tcp|udp} <lan-ip> <lan-port> <if-
name> <wan-port>
ip nat inside source static {tcp|udp} <lan-ip> <lan-port> <if-
name> range <wan-port-start> <wan-port-end>
ip nat inside source static {tcp|udp} <lan-ip> same <wan-ip> <wan-
port>
ip nat inside source static {tcp|udp} <lan-ip> same <wan-ip> range
<wan-port-start> <wan-port-end>
ip nat inside source static {tcp|udp} <lan-ip> same <if-name>
<wan-port>
ip nat inside source static {tcp|udp} <lan-ip> same <if-name>
range <wan-port-start> <wan-port-end>
ip nat inside source static ip <lan-ip> <wan-ip>
ip nat inside source static ip <lan-ip> <if-name>
ip nat inside source static gre <lan-ip> <wan-ip>
ip nat inside source list <acl-name> interface <if-name>
ip nat inside source list <acl-name> interface <if-name> pool
<pool-name>
ip nat inside source list <acl-name> interface <if-name> pool
<pool-name> port <wan-port-start> <wan-port-end>
```

The commands syntax format is described below:

Arguments	Description
tcp	Defines forwarding for a TCP port.
udp	Defines forwarding for a UDP port.
lan-ip	Defines the IP address of LAN service host.
same	Sets the LAN port the same as the WAN port.
lan-port	Defines the port number (1-65535) of the LAN service.
wan-ip	Defines the WAN interface for this rule. Specify the IP address or 0.0.0.0 for all WAN interfaces.
wan-port	Defines the port number on WAN interface.
range	Performs port forwarding on a range of ports, rather than a single port.
acl-name	Access-list defining the LAN hosts affected by the NAT rule.
if-name	WAN interface name and index, to which NAT will be performed.
pool-name	IP address pool to be used on the WAN interface.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

No port forwarding and NAT rules are defined.

Command Modes:

Enable

Example:

The following example defines a port forwarding rule:

```
(config-data)# ip nat inside source static tcp 192.168.0.7 80
0.0.0.0 8080
```

44.6.2 ip nat inside destination

This command defines a load-balancing configuration, where several LAN hosts are handling access requests from the WAN.

To remove the NAT configuration, use the **no** format of the command.

Syntax:

The syntax of this command can include the following variations:

```
ip nat inside destination <ip-addr> port <port-num> pool <pool-name>
```

The commands syntax format is described below:

Arguments	Description
ip-addr	Defines the global IP address (WAN side).
port-num	Defines the port number on the WAN IP address.
pool-name	Defines the LAN hosts pool, which must be configured with the "ip nat pool <pool-name> rotary" command.

Defaults:

No NAT rules are defined.

Command Modes:

Enable

Example:

The following example defines a NAT setup where a number of LAN hosts are handling requests to a single WAN port:

```
(config-data)# ip nat inside destination 212.36.145.5 port 8000
pool lanpool
```

44.6.3 ip nat pool

This command defines a collection of IP addresses to be used for NAT purposes.
To remove a pool, use the **no** format of the command.

Syntax:

The syntax of this command can include the following variations:

```
ip nat pool <pool-name> <start-ip> <end-ip>
ip nat pool <pool-name> <start-ip> <end-ip> rotary
```

The commands syntax format is described below:

Arguments	Description
pool-name	Defines the name of the pool.
start-ip	Defines the starting IP address of the NAT address pool.
end-ip	Defines the last IP address of the NAT address pool.
rotary	Indicates that the pool refers to LAN hosts participating in a load-balancing scheme. See "ip nat inside destination" for additional information.

Defaults:

No NAT pools are defined.

Command Modes:

Enable

Example:

The following example defines a NAT pool consisting of one global IP address:

```
(config-data)# ip nat pool scarlet 212.34.156.1 212.34.156.1
```

44.6.4 ip nat translation

This command controls the life-time of dynamic NAT translations.

Syntax:

The syntax of this command can include the following variations:

```
ip nat translation udp-timeout <seconds>
ip nat translation tcp-timeout <seconds>
ip nat translation icmp-timeout <seconds>
```

The commands syntax format is described below:

Arguments	Description
<seconds>	Defines the number of seconds after which an idle NAT translation will expire.

Defaults:

By default, UDP timeout is 120 seconds; TCP timeout is 432000 seconds (5 days); ICMP timeout is 6 seconds.

Command Modes:

Enable

Example:

The following example defines the lifetime of idle UDP connections:

```
(config-data)# ip nat translation udp-timeout 360
```

44.7 802.1x LAN Port-based Authentication Commands

The 802.1x commands provide the support for functioning as an IEEE 802.1X authenticator. IEEE 802.1X (EAP-over-LAN, or EAPOL) is a standard for port-level security on secure Ethernet switches (wired or wireless). When equipment is connected to a secure port, no traffic is allowed until the identity of the equipment is authenticated.

44.7.1 dot.1x lan-authentication enable

This command enables 802.1X LAN port authentication. The **no** version of this command disables the command.

Syntax:

The syntax of this command can include the following variations:

```
dot1x lan-authentication enable
no dot1x lan-authentication enable
```

Command Modes:

Enable

Example:

The following example enables 802.1 X LAN port authentication.

```
(config-data)# dot1x lan-authentication enable
```

44.7.2 dot1x radius-server

This command defines the RADIUS server for 802.1X authentication.

Syntax:

The syntax of this command can include the following variations:

```
dot1x radius-server host <a.b.c.d> auth-port <UDP port> key
<shared secret value>
dot1x radius-server host <a.b.c.d> auth-port <UDP port> obscured-
key <shared secret value>

dot1x radius-server local
```

The command syntax format is described below:

Arguments	Description
a.b.c.d	Defines the RADIUS server IP address.
UDP port	Defines the UDP port to use.
shared secret value	Defines the shared secret value string.
key	Defines a shared secret.
obscured-key	Copies a shared secret from existing configuration.

Command Modes:

Enable

Example:

The following example defines an external RADIUS server.

```
(config-data)# dot1x radius-server host 10.3.4.250 auth-port 1812
key 123456
```

44.7.3 dot1x reauth-time

This command enables each port to be re-authenticated after a user-defined interval (in seconds), following a successful authentication.

Syntax:

The syntax of this command can include the following variations:

```
dot1x reauth-time <seconds>
```

The command syntax format is described below:

Arguments	Description
seconds	Defines the time to re-authenticate, in seconds.

Command Modes:

Enable

Example:

The following example defines the time to re-authenticate in 3600.

```
(config-data)# dot1x reauth-time 3600
```

44.7.4 authentication dot1x

This command determines which client (based on MAC address) is allowed through a specific port after 802.1X authentication succeeds.

Syntax:

The syntax of this command can include the following variations:

```
authentication dot1x {single-host|multi-host}
```

The command syntax format is described below:

Arguments	Description
single-host	Allows only the MAC address that successfully passed 802.1x authentication.
multi-host	Any MAC address is allowed after 802.1x authentication succeeds.

Note:

The command is relevant for LAN interfaces only.

Command Modes:

Enable

Example:

The following is an example using this command.

```
(config-data)# interface GigabitEthernet 0/1
(conf-if-GE 0/1)# authentication dot1x single-host
```

44.8 802.1X On-board RADIUS Server Authentication Commands

The commands below provide support for an on-board RADIUS server that can be used for 802.1X wired (LAN) and wireless (Wi-Fi Protected Access II / WPA2) authentication. This supports both password-based authentication and certificate-based authentication.

44.8.1 dot1x local-user

This command defines the username and password.

Syntax:

The syntax of this command can include the following variations:

```
# dot1x local-user <username> obscured-password <password text>
# dot1x local-user <username> password <password text>
```

The command syntax format is described below:

Arguments	Description
obscured-password	Copy the password from an existing configuration.
password	Enter password in plain text.
password text	Defines the actual password.

Command Modes:

Enable

Example:

The following example defines the username and password.

```
(config-data)# dot1x local-user MD password 1234
```

44.8.2 interface dot11radio

This command defines the Wi-Fi interface.

Syntax:

The syntax of this command can include the following variations:

```
# interface dot11radio <number>
```

Command Modes:

Enable

Example:

The following example defines the Wi-Fi interface.

```
(config-data)# interface dot11radio 1
```

44.8.3 security 802.1x

This command enables on-board RADIUS server for 802.1X security.

Syntax:

The syntax of this command can include the following variations:

```
# security 802.1x radius server local
```

Command Modes:

Enable

Example:

The following example enables on-board RADIUS server for 802.1X security.

```
(config-data)# interface dot11radio 1
(config-if-dot11radio 1)# security 802.1x radius server local
```

44.8.4 security wpa

This command enables Wi-Fi security mode.

Syntax:

The syntax of this command can include the following variations:

```
# security wpa mode 802.1x
```

Command Modes:

Enable

Example:

The following example enables Wi-Fi security mode.

```
(config-data)# interface dot11radio 1
(config-if-dot11radio 1) # security wpa mode 802.1x
```

44.8.5 security mode

This command defines Wi-Fi security mode to WPA2.

Syntax:

The syntax of this command can include the following variations:

```
# security mode wpa2
```

Command Modes:

Enable

Example:

The following example defines Wi-Fi security mode to WPA2.

```
(config-data)# interface dot11radio 1
(config-if-dot11radio 1)# security mode wpa2
```

44.8.6 no shutdown

This command enables the interface.

Syntax:

The syntax of this command can include the following variations:

```
# no shutdown
```

Command Modes:

Enable

Example:

The following example enables the interface.

```
(config-data)# interface dot11radio 1
(config-if-dot11radio 1)# no shutdown
```

44.9 Ethernet Commands

The following describes Ethernet commands.

44.9.1 ethernet l2tunnel

This command enables tunneling for different Layer-2 protocols.

Syntax:

The syntax of this command can include the following variations:

```
# ethernet l2tunnel {cdp|dtp|hex <hex protocol>|
lacp|lldp|pagp|pvst-plus|stp|udld|vtp}
```

The command syntax format is described below:

Arguments	Description
hex protocol	Hexadecimal protocol number
cdp	Cisco Discovery Protocol
dtp	Dynamic Trunking Protocol
hex	Ethernet protocol type in hexadecimal
lacp	Link Aggregation Control Protocol
lldp	Link Layer Discovery Protocol
pagp	Port Aggregation Protocol
pvst-plus	Per-VLAN Spanning Tree Plus
stp	Spanning-Tree Protocol
udld	UniDirectional Link Detection
vtp	VLAN Trunking Protocol

Command Modes:

Enable

Example:

The following example enables tunneling for cdp.

```
(config-data)# ethernet l2tunnel cdp
```

44.9.2 ethernet cfm

This command enables tunneling for IEEE 802.1ag Ethernet Connectivity Fault Management (CFM) protocols.

Syntax:

The syntax of this command can include the following variations:

```
# ethernet cfm aging-time <time in minutes>
# ethernet cfm debounce <packet number>
# ethernet cfm mep
```

The command syntax format is described below:

Arguments	Description
aging-time	Sets the remote MEP aging time
time in minutes	Defines the actual aging time in minutes [1-9999].
debounce	Sets the status-reflection debounce counter.
packet number	Defines the number of port-down packets to receive before blocking ports.

Command Modes:

Enable

Example:

The following example enables tunneling for cdp.

```
(config-data)# ethernet l2tunnel cdp
```

44.10 TACACS+ Commands

TACACS+ is a security protocol for centralized username and password verification. The following describes the TACACS+ commands.

44.10.1 tacacs-server

This command provides support for communicating with a TACACS+ server through the device's WAN interface.

Syntax:

The syntax of this command is:

```
tacacs-server timeout <seconds>
tacacs-server source data source-address interface <Interface ID>
tacacs-server source data interface <Interface ID>
tacacs-server source data vrf <vrfname>
tacacs-server source voip
tacacs-server port <port-number>
tacacs-server obscured-key <string>
tacacs-server host <host-ip>
tacacs-server key <string>
```

The commands syntax format is described below:

Arguments	Description
VRF name	Defines the VRF name.
host-ip	Specifies the IP address of the TACACS+ server in the format a.b.c.d. **Note:** Up to two TACACS+ servers may be defined.
port-num	Specifies the TCP port number for the TACACS+ service.
password	Specifies the shared secret between the TACACS+ server and the device.
seconds	Specifies how much time to wait for a TACACS+ response before failing the authentication.
obscured-key	Copies the TACACS+ shared secret from an existing configuration.

Interface Type (ifname)		Interface ID
gigabitethernet	GigabitEthernet interface slot and port (VLAN ID is optional)	[SLOT/PORT.VLANID]
cellular	Cellular interface ID	0/0
gre	Tunnel GRE ID	[1-255]
ipip	Tunnel IPIP ID	[1-255]
l2tp	L2TP ID	[0-99]
pppoe	PPPoE interface ID	[1-3]
pptp	PPTP ID	[0-99]
vlan	Vlan ID	[1-3999]
loopback	Loopback ID	[1-5]
bvi	Bridge interface	[1-255]

Defaults:

By default, no TACACS+ servers are defined.
The default TCP port is 49.
The default timeout is 5 seconds.
The default key is “MSBR”.

Note:

This command is applicable to Mediant MSBR devices.

Command Modes:

Enable

Example:

The example below configures a TACACS+ server.

```
(config-data)# tacacs-server host 192.168.1.55
(config-data)# tacacs-server key Rumble
```

44.10.2 aaa authentication login tacacs+

This command enables usage of a TACACS+ server on the network to verify access to the device's Command-Line Interface.

To disable TACACS+ and return to local username/password verification, use the no form of this command.

Syntax:

The syntax of this command is:

```
aaa authentication login tacacs+
aaa authentication login tacacs+ local
```

The commands syntax format is described below:

Arguments	Description
local	Specifies that if the TACACS+ server does not respond, password verification should fall back to locally-defined values.

Defaults:

TACACS+ is disabled.

Command Modes:

Enable

Example:

The example below describes how to enable TACACS+ usage.

```
# configure data
(config-data)# aaa authentication login tacacs+
```

The example below configures authorization and authentication in the MSBR to work with TACACS+:

```
# configure data
(config-data)# aaa authentication login tacacs+
(config-data)# aaa authorization command tacacs+
(config-data)# tacacs-server host 192.162.0.199
(config-data)# tacacs-server key P@ssw0rd
```

44.10.3 aaa accounting exec start-stop tacacs+

This command enables TACACS+ for CLI session accounting.
To disable TACACS+ session accounting, use the "no" form of this command.

Syntax:
The syntax of this command is:

```
aaa accounting exec start-stop tacacs+
```

Defaults:
TACACS+ is disabled.

Command Modes:
Enable

Example:
The example below enables TACACS+ usage for session accounting.

```
(config-data)# aaa accounting exec start-stop tacacs+
```

44.10.4 aaa accounting command start-stop tacacs+

This command enables reporting of CLI start/stop times to a TACACS+ server on the network.

To disable TACACS+ command accounting, use the "no" form of this command.

Syntax:

The syntax of this command is:

```
aaa accounting command start-stop tacacs+
```

Defaults:

TACACS+ is disabled.

Command Modes:

Enable

Example:

The example below enables TACACS+ usage for command accounting.

```
(config-data)# aaa accounting command start-stop tacacs+
```

44.10.5 aaa authorization command tacacs+

This command enables usage of a TACACS+ server on the network to authorize each CLI command entered.

To disable TACACS+ per-command authorization, use the "no" form of this command.

Syntax:

The syntax of this command is:

```
aaa authorization command tacacs+
```

Defaults:

TACACS+ is disabled.

Command Modes:

Enable

Example:

The example below enables TACACS+ usage for per-command authorization.

```
(config-data)# aaa authorization command tacacs+
```

44.10.6 aaa authorization enable if-authenticated tacacs+

This command enters Enabled mode automatically if authenticated by TACACS+.

Syntax:

The syntax of this command is:

```
aaa authorization enable if-authenticated tacacs+
```

Defaults:

TACACS+ is disabled.

Command Modes:

Enable

Example:

The example below enters Enabled mode automatically if authenticated by TACACS+.

```
(config-data)# aaa authorization enable if-authenticated tacacs+
```

45 Performance Monitoring Commands

The following describes commands for monitoring performance.

45.1 pm sample-interval

This command configures sample intervals for performance monitoring (PM) statistics.

Syntax:

```
# pm sample-interval seconds <first sample interval in seconds>
# pm sample-interval minutes <second sample interval in minutes>
```

Note:

This command is only applicable to MSBR devices.

Command Modes:

Enable

Example:

The following example configures the sample interval to 20 seconds.

```
(config-data)# pm sample-interval seconds 20>
```

AudioCodes

CLI Reference Guide

www.audiocodes.com