



## INDEX

---

### A

aaa accounting dot1x command **1**  
aaa authentication dot1x command **3**  
aaa authorization network command **5, 16, 20, 22, 24, 26, 96, 394, 5, 28**  
AAA methods **3**  
abort command **730**  
access control entries  
    See ACEs  
access control lists  
    See ACLs  
access groups  
    IP **153**  
        MAC, displaying **501**  
access list, IPv6 **209**  
access map configuration mode **268**  
access mode **676**  
access ports **676**  
ACEs **87, 342**  
ACLs  
    deny **85**  
    displaying **383**  
    for non-IP protocols **247**  
    IP **153**  
    matching **268**  
    on Layer 2 interfaces **153**  
    permit **340**  
action command **6**  
address aliasing **317**  
aggregate-port learner **330**  
allowed VLANs **696**  
apply command **730**

archive download-sw command **8**  
archive tar command **11**  
archive upload-sw command **14**  
authentication control-direction command **16**  
authentication event command **18**  
authentication failed VLAN  
    See dot1x auth-fail vlan  
authentication fallback command **20**  
authentication host-mode command **22**  
authentication open command **24**  
authentication order command **26**  
authentication periodic command **28**  
authentication port-control command **30**  
authentication priority command **32**  
authentication timer command **34**  
authentication violation command **36**  
auth-fail max-attempts  
    See dot1x auth-fail max-attempts  
auth-fail vlan  
    See dot1x auth-fail vlan  
auth open command **24**  
auth order command **26**  
authorization state of controlled port **112**  
auth timer command **34**  
autonegotiation of duplex mode **123**  
auto qos voip command **38**

---

### B

BackboneFast, for STP **609**  
backup interfaces  
    configuring **670**  
    displaying **439**

- boot (boot loader) command **2**  
 boot config-file command **42**  
 boot enable-break command **43**  
 boot helper command **44**  
 boot helper-config file command **45**  
 booting  
   Cisco IOS image **48**  
   displaying environment variables **392**  
   interrupting **43**  
   manually **46**  
 boot loader  
   accessing **1**  
   booting  
     Cisco IOS image **2**  
     helper image **44**  
 directories  
   creating **15**  
   displaying a list of **7**  
   removing **19**  
 displaying  
   available commands **12**  
   memory heap utilization **13**  
   version **26**  
 environment variables  
   described **20**  
   displaying settings **20**  
   location of **21**  
   setting **20**  
   unsettling **24**  
 files  
   copying **5**  
   deleting **6**  
   displaying a list of **7**  
   displaying the contents of **4, 16, 23**  
   renaming **17**  
 boot loader (continued)  
   file system  
     formatting **10**  
     initializing flash **9**  
     running a consistency check **11**  
     resetting the system **18**  
 boot manual command **46**  
 boot private-config-file command **47**  
 boot system command **48**  
 BPDU filtering, for spanning tree **610, 643**  
 BPDU guard, for spanning tree **612, 643**  
 break key detection **373, 1**  
 broadcast storm control **661**
- 
- C**
- cat (boot loader) command **4**  
 CDP, enabling protocol tunneling for **227**  
 channel-group command **49**  
 channel-protocol command **52**  
 Cisco SoftPhone  
   auto-QoS configuration **38**  
   trusting packets sent from **308**  
 CISP  
   See Client Information Signalling Protocol  
 cisp  
   debug platform cisp command **28**  
 cisp enable command **53**  
 class command **54**  
 class-map command **56**  
 class maps  
   creating **56**  
   defining the match criteria **270**  
   displaying **395**  
 class of service  
   See CoS  
 clear dot1x command **58**  
 clear eap sessions command **59**  
 clear energywise neighbors command **60**

- clear errdisable interface **61**  
 clear ipc command **62**  
 clear ip dhcp snooping database command **64**  
 clear l2protocol-tunnel counters command **63**  
 clear lacp command **66**  
 clear mac address-table command **67, 68**  
 clear nmfp statistics command **69**  
 clear pagp command **70**  
 clear port-security command **71**  
 clear spanning-tree counters command **73**  
 clear spanning-tree detected-protocols command **74**  
 clear vmps statistics command **75**  
 clear vtp counters command **76**  
 Client Information Signalling Protocol **53, 96, 394, 5, 28**  
 clusters  
   SNMP trap **599**  
 command modes defined **1**  
 configuration files  
   password recovery disable considerations **1**  
   specifying the name **42, 47**  
 configuring multiple interfaces **149**  
 config-vlan mode  
   commands **716**  
   description **4**  
   entering **715**  
   summary **2**  
 copy (boot loader) command **5**  
 CoS  
   assigning default value to incoming packets **278**  
   assigning to Layer 2 protocol packets **230**  
   overriding the incoming value **278**  
 CoS-to-DSCP map **282**  
 CPU ASIC statistics, displaying **396**  
 crashinfo files **142**
- 
- D**
- debug auto qos command **2**  
 debug backup command **4**  
   debug cisp command **5**  
   debug dot1x command **6**  
   debug dtp command **7**  
   debug eap command **8**  
   debug etherchannel command **9**  
   debug interface command **12**  
   debug ip dhcp snooping command **10**  
   debug ip igmp filter command **13**  
   debug ip igmp max-groups command **14**  
   debug ip igmp snooping command **15**  
   debug ip verify source packet command **11**  
   debug lacp command **16**  
   debug lldp packets command **17**  
   debug mac-notification command **18**  
   debug matm command **19**  
   debug matm move update command **20**  
   debug monitor command **21**  
   debug mvrdbg command **22**  
   debug nmfp command **23**  
   debug nvram command **24**  
   debug pagp command **25**  
   debug platform acl command **26**  
   debug platform backup interface command **27**  
   debug platform cisp command **28**  
   debug platform cli-redirection main command **29**  
   debug platform cpu-queues command **30**  
   debug platform dot1x command **32**  
   debug platform etherchannel command **33**  
   debug platform fallback-bridging command **34**  
   debug platform forw-tcam command **35**  
   debug platform ip arp inspection command **36**  
   debug platform ipc command **44**  
   debug platform ip dhcp command **37**  
   debug platform ip igmp snooping command **38**  
   debug platform ip multicast command **40**  
   debug platform ip unicast command **42**  
   debug platform led command **45**  
   debug platform matm command **46**  
   debug platform messaging application command **47**

- debug platform phy command **48**  
 debug platform pm command **50**  
 debug platform port-asic command **52**  
 debug platform port-security command **53**  
 debug platform qos-acl-tcam command **54**  
 debug platform remote-commands command **55**  
 debug platform resource-manager command **56**  
 debug platform snmp command **57**  
 debug platform span command **58**  
 debug platform supervisor-asic command **59**  
 debug platform sw-bridge command **60**  
 debug platform tcam command **61**  
 debug platform udld command **64**  
 debug platform vlan command **65**  
 debug pm command **66**  
 debug port-security command **68**  
 debug qos-manager command **69**  
 debug spanning-tree backbonefast command **72**  
 debug spanning-tree bpdu command **73**  
 debug spanning-tree bpdu-opt command **74**  
 debug spanning-tree command **70**  
 debug spanning-tree mstp command **75**  
 debug spanning-tree switch command **77**  
 debug spanning-tree uplinkfast command **79**  
 debug sw-vlan command **80**  
 debug sw-vlan ifs command **82**  
 debug sw-vlan notification command **83**  
 debug sw-vlan vtp command **84**  
 debug udld command **86**  
 debug vqpc command **88**  
 define interface-range command **77**  
 delete (boot loader) command **6**  
 delete command **79**  
 deny (IPv6) command **80**  
 deny command **85**  
 detect mechanism, causes **134**  
 DHCP snooping  
     accepting untrusted packets from edge switch **168**  
     enabling  
         on a VLAN **174**  
         option 82 **166, 168**  
         trust on an interface **172**  
     error recovery timer **139**  
     rate limiting **171**  
 DHCP snooping binding database  
     binding file, configuring **164**  
     bindings  
         adding **162**  
         deleting **162**  
         displaying **452**  
     clearing database agent statistics **64**  
     database agent, configuring **164**  
     displaying  
         binding entries **452**  
         database agent status **454, 456**  
         renewing **366**  
 dir (boot loader) command **7**  
 directories, deleting **79**  
 domain name, VTP **740, 744**  
 dot1x auth-fail max-attempts **90**  
 dot1x auth-fail vlan **92**  
 dot1x command **88**  
 dot1x control-direction command **94**  
 dot1x credentials (global configuration) command **96**  
 dot1x critical global configuration command **97**  
 dot1x critical interface configuration command **99**  
 dot1x default command **101**  
 dot1x fallback command **102**  
 dot1x guest-vlan command **103**  
 dot1x host-mode command **105**  
 dot1x initialize command **106**  
 dot1x mac-auth-bypass command **107**  
 dot1x max-reauth-req command **109**  
 dot1x max-req command **110**  
 dot1x pae command **111**

- dot1x port-control command **112**  
 dot1x re-authenticate command **114**  
 dot1x reauthentication command **115**  
 dot1x test eapol-capable command **116**  
 dot1x test timeout command **117**  
 dot1x timeout command **118**  
 dot1x violation-mode command **121**  
 dropping packets, with ACL matches **6**  
 drop threshold, Layer 2 protocol tunneling **227**  
 DSCP-to-CoS map **282**  
 DSCP-to-DSCP-mutation map **282**  
 DTP **677**  
 DTP flap  
   error detection for **134**  
   error recovery timer **139**  
 DTP negotiation **681**  
 dual IPv4 and IPv6 templates **334**  
 duplex command **122**  
 dynamic-access ports  
   configuring **666**  
   restrictions **666**  
 dynamic ARP inspection  
   error detection for **134**  
 dynamic auto VLAN membership mode **676**  
 dynamic desirable VLAN membership mode **676**  
 Dynamic Host Configuration Protocol (DHCP)  
   See DHCP snooping  
 Dynamic Trunking Protocol  
   See DTP
- 
- E**
- EAP-request/identity frame  
   maximum number to send **110**  
   response time before retransmitting **118**  
 encapsulation methods **696**  
 energywise (global configuration) command **124, 126**  
 energywise domain command **128**  
 energywise query command **130**
- environment variables, displaying **392**  
 errdisable detect cause command **134**  
 errdisable detect cause small-frame command **136**  
 errdisable recovery cause small-frame **138**  
 errdisable recovery command **139**  
 error conditions, displaying **426**  
 error disable detection **134**  
 error-disabled interfaces, displaying **439**  
 EtherChannel  
   assigning Ethernet interface to channel group **49**  
   creating port-channel logical interface **147**  
   debug EtherChannel/PAgP, display **9**  
   debug platform-specific events, display **33**  
   displaying **430**  
   enabling Layer 2 protocol tunneling for  
     LACP **228**  
     PAgP **228**  
     UDLD **228**  
   interface information, displaying **439**  
   LACP  
     clearing channel-group information **66**  
     debug messages, display **16**  
     displaying **490**  
     modes **49**  
     port priority for hot-standby ports **231**  
     restricting a protocol **52**  
     system priority **233**  
   load-distribution methods **350**  
   PAgP  
     aggregate-port learner **330**  
     clearing channel-group information **70**  
     debug messages, display **25**  
     displaying **552**  
     error detection for **134**  
     error recovery timer **139**  
     learn method **330**  
     modes **49**  
     physical-port learner **330**  
     priority of interface for transmitted traffic **332**

Ethernet controller, internal register display **398**

Ethernet statistics, collecting **369**

exception crashinfo command **142**

exit command **730**

extended-range VLANs

- and allowed VLAN list **696**

- and pruning-eligible list **696**

- configuring **715**

extended system ID for STP **618**

---

## F

fallback profile command **143**

fallback profiles

- displaying **433**

file name, VTP **740**

files, deleting **79**

flash\_init (boot loader) command **9**

flexible authentication ordering **26**

Flex Links

- configuring **670**

- configuring preferred VLAN **672**

- displaying **439**

flowcontrol command **145**

format (boot loader) command **10**

forwarding packets, with ACL matches **6**

forwarding results, display **6**

frame forwarding information, displaying **6**

fsck (boot loader) command **11**

---

## G

global configuration mode **2, 3**

---

## H

hardware ACL statistics **383**

help (boot loader) command **12**

hierarchical policy maps **348**

host connection, port configuration **675**

host ports, private VLANs **679**

---

**I**

IEEE 802.1Q trunk ports and native VLANs **732**

IEEE 802.1Q tunnel ports

- configuring **676**

- displaying **409**

- limitations **677**

IEEE 802.1x

- and switchport modes **677**

- violation error recovery **139**

- See also port-based authentication

IEEE 802.1X Port Based Authentication

- enabling guest VLAN supplicant **91, 102, 144**

IGMP filters

- applying **177**

- debug messages, display **13**

IGMP groups, setting maximum **179**

IGMP maximum groups, debugging **14**

IGMP profiles

- creating **181**

- displaying **459**

IGMP snooping

- adding ports as a static member of a group **197**

- displaying **460, 465, 467**

- enabling **183**

- enabling the configurable-leave timer **185**

- enabling the Immediate-Leave feature **194**

- flooding query count **191**

- interface topology change notification behavior **193**

- multicast table **463**

- querier **187**

- query solicitation **191**

- report suppression **189**

- switch topology change notification behavior **191**

- images  
 See software images
- Immediate-Leave feature, MVR **319**
- Immediate-Leave processing  
 IPv6 **223**  
 immediate-leave processing **194**  
 interface configuration mode **2, 4**  
 interface port-channel command **147**  
 interface range command **149**  
 interface-range macros **77**
- interfaces  
 assigning Ethernet interface to channel group **49**  
 configuring **122**  
 configuring multiple **149**  
 creating port-channel logical **147**  
 debug messages, display **12**  
 disabling **595**  
 displaying the MAC address table **513**  
 restarting **595**
- interface speed, configuring **653**
- interface vlan command **151**
- internal registers, displaying **398, 405**
- Internet Group Management Protocol  
 See IGMP
- invalid GBIC  
 error detection for **134**  
 error recovery timer **139**
- ip access-group command **153**
- ip address command **156**
- IP addresses, setting **156**
- IP address matching **268**
- ip admission command **158**
- ip admission name proxy http command **159**
- IP DHCP snooping  
 See DHCP snooping
- ip dhcp snooping binding command **162**
- ip dhcp snooping command **161**
- ip dhcp snooping database command **164**
- ip dhcp snooping information option allow-untrusted command **168**  
 ip dhcp snooping information option command **166**  
 ip dhcp snooping information option format remote-id command **170**  
 ip dhcp snooping limit rate command **171**  
 ip dhcp snooping trust command **172**  
 ip dhcp snooping verify command **173**  
 ip dhcp snooping vlan command **174**  
 ip dhcp snooping vlan information option format-type circuit-id string command **175**  
 ip igmp filter command **177**  
 ip igmp max-groups command **179, 204, 206**  
 ip igmp profile command **181**  
 ip igmp snooping command **183**  
 ip igmp snooping last-member-query-interval command **185**  
 ip igmp snooping querier command **187**  
 ip igmp snooping report-suppression command **189**  
 ip igmp snooping tcn command **191**  
 ip igmp snooping tcn flood command **193**  
 ip igmp snooping vlan immediate-leave command **194**  
 ip igmp snooping vlan mrouter command **195**  
 ip igmp snooping vlan static command **197**  
 IP multicast addresses **316**  
 IP phones  
 auto-QoS configuration **38**  
 trusting packets sent from **308**
- IP-precedence-to-DSCP map **282**
- ip snap forwarding command **199**
- ip source binding command **200**
- IP source guard  
 disabling **208**  
 displaying  
 binding entries **469**  
 configuration **471**  
 dynamic binding entries only **452**  
 enabling **208**  
 static IP source bindings **200**
- ip ssh command **202**

IPv6 access list  
 deny conditions **80**  
 ipv6 access-list command **209**  
 ipv6 mld snooping command **211**  
 ipv6 mld snooping last-listener-query count command **213**  
 ipv6 mld snooping last-listener-query-interval command **215**  
 ipv6 mld snooping listener-message-suppression command **217**  
 ipv6 mld snooping robustness-variable command **219**  
 ipv6 mld snooping tcn command **221**  
 ipv6 mld snooping vlan command **223**  
 IPv6 SDM template **370**  
 ipv6 traffic-filter command **225**  
 ip verify source command **208**

**J**

jumbo frames  
 See MTU

**L**

l2protocol-tunnel command **227**  
 l2protocol-tunnel cos command **230**  
 LACP  
 See EtherChannel  
 lacp port-priority command **231**  
 lacp system-priority command **233**  
 Layer 2 mode, enabling **664**  
 Layer 2 protocol ports, displaying **487**  
 Layer 2 protocol-tunnel  
 error detection for **134**  
 error recovery timer **139**  
 Layer 2 protocol tunnel counters **63**  
 Layer 2 protocol tunneling error recovery **228**

Layer 2 traceroute  
 IP addresses **706**  
 MAC addresses **703**  
 Layer 3 mode, enabling **664**  
 line configuration mode **2, 5**  
 Link Aggregation Control Protocol  
 See EtherChannel  
 link flap  
 error detection for **134**  
 error recovery timer **139**  
 link state group command **239**  
 link state track command **241**  
 load-distribution methods for EtherChannel **350**  
 location (global configuration) command **235**  
 location (interface configuration) command **237**  
 logging event command **242**  
 logging file command **243**  
 logical interface **147**  
 loopback error  
 detection for **134**  
 recovery timer **139**  
 loop guard, for spanning tree **619, 623**

**M**

mac access-group command **245**  
 MAC access-groups, displaying **501**  
 MAC access list configuration mode **247**  
 mac access-list extended command **247**  
 MAC access lists **85**  
 MAC addresses  
 disabling MAC address learning per VLAN **250**

MAC addresses (continued)

- displaying
  - aging time **507**
  - all **505**
  - dynamic **511**
  - MAC address-table move updates **516**
  - notification settings **515, 518**
  - number of addresses in a VLAN **509**
  - per interface **513**
  - per VLAN **522**
  - static **520**
  - static and dynamic entries **503**
- dynamic
  - aging time **249**
  - deleting **67**
  - displaying **511**
- enabling MAC address notification **254**
- enabling MAC address-table move update **252**
- matching **268**
- static
  - adding and removing **256**
  - displaying **520**
  - dropping on an interface **257**
- tables **505**

mac address notification, debugging **18**

mac address-table aging-time **245, 268**

mac address-table aging-time command **249**

mac address-table learning command **250**

mac address-table move update command **252**

mac address-table notification command **254**

mac address-table static command **256**

mac address-table static drop command **257**

macro apply command **259**

macro description command **262**

macro global command **263**

macro global description command **265**

macro name command **266**

macros
 

- adding a description **262**
- adding a global description **265**
- applying **263**
- creating **266**
- displaying **554**
- interface range **77, 149**
- specifying parameter values **263**
- tracing **263**

maps

QoS
 

- defining **282**
- displaying **532**

VLAN
 

- creating **727**
- defining **268**
- displaying **585**

match (access-map configuration) command **268**

match (class-map configuration) command **270**

maximum transmission unit

See MTU

mdix auto command **272**

MDL snooping
 

- displaying **481**

memory (boot loader) command **13**

mkdir (boot loader) command **15**

MLD snooping
 

- configuring **217, 219**
- configuring queries **213, 215**
- configuring topology change notification **221**
- displaying **479, 483, 485**
- enabling **211**

MLD snooping on a VLAN
 

- enabling **223**

mls qos aggregate-policer command **276**

mls qos command **274**

mls qos cos command **278**

mls qos dscp-mutation command **280**

mls qos map command **282**

mls qos queue-set output buffers command **286**  
 mls qos queue-set output threshold command **288**  
 mls qos rewrite ip dscp command **290**  
 mls qos srr-queue input bandwidth command **292**  
 mls qos srr-queue input buffers command **294**  
 mls qos-srr-queue input cos-map command **296**  
 mls qos srr-queue input dscp-map command **298**  
 mls qos srr-queue input priority-queue command **300**  
 mls qos srr-queue input threshold command **302**  
 mls qos-srr-queue output cos-map command **304**  
 mls qos srr-queue output dscp-map command **306**  
 mls qos trust command **308**  
 mls qos vlan-based command **310**  
 mode, MVR **316**  
 Mode button, and password recovery **373**  
 modes, commands **1**  
 monitor session command **311**  
 more (boot loader) command **16**  
 MSTP  
     displaying **566**  
     interoperability **74**  
     link type **621**  
     MST region  
         aborting changes **627**  
         applying changes **627**  
         configuration name **627**  
         configuration revision number **627**  
         current or pending display **627**  
         displaying **566**  
         MST configuration mode **627**  
         VLANs-to-instance mapping **627**  
     path cost **629**  
     protocol mode **625**  
     restart protocol migration process **74**  
     root port  
         loop guard **619**  
         preventing from becoming designated **619**  
         restricting which can be root **619**  
     root guard **619**

MSTP (continued)  
     root switch  
         affects of extended system ID **618**  
         hello-time **632, 639**  
         interval between BDPU messages **633**  
         interval between hello BPDU messages **632, 639**  
         max-age **633**  
         maximum hop count before discarding BPDU **634**  
         port priority for selection of **635**  
         primary or secondary **639**  
         switch priority **638**  
     state changes  
         blocking to forwarding state **645**  
         enabling BPDU filtering **610, 643**  
         enabling BPDU guard **612, 643**  
         enabling Port Fast **643, 645**  
         forward-delay time **631**  
         length of listening and learning states **631**  
         rapid transition to forwarding **621**  
         shutting down Port Fast-enabled ports **643**  
         state information display **565**  
 MTU  
     configuring size **701**  
     displaying global setting **573**  
 multicast group address, MVR **319**  
 multicast groups, MVR **317**  
 Multicast Listener Discovery  
     See MLD  
 multicast router learning method **195**  
 multicast router ports  
     IPv6 **223**  
 multicast router ports, configuring **195**  
 multicast storm control **661**  
 multicast VLAN, MVR **316**  
 multicast VLAN registration  
     See MVR  
 multiple hosts on authorized port **105**

Multiple Spanning Tree Protocol

See MSTP

MVR

- and address aliasing [317](#)
- configuring [316](#)
- configuring interfaces [319](#)
- debug messages, display [22](#)
- displaying [541](#)
- displaying interface information [543](#)
- members, displaying [545](#)
- mvr (global configuration) command [316](#)
- mvr (interface configuration) command [319](#)
- mvr vlan group command [320](#)

**N**

- native VLANs [696](#)
- native VLAN tagging [732](#)
- network-policy (global configuration) command [323](#)
- network-policy command [322](#)
- network-policy profile (network-policy configuration) command [325](#)
- nmsp attachment suppress command [329](#)
- nmsp command [327](#)
- nonegotiate
  - DTP messaging [681](#)
  - nonegotiate, speed [653](#)
- non-IP protocols
  - denying [85](#)
  - forwarding [340](#)
- non-IP traffic access lists [247](#)
- non-IP traffic forwarding
  - denying [85](#)
  - permitting [340](#)
- normal-range VLANs [715, 721](#)
- no vlan command [715, 725](#)

**O**

- online diagnostics
  - displaying
    - configured boot-up coverage level [409](#)
    - current scheduled tasks [409](#)
    - event logs [409](#)
    - supported test suites [409](#)
    - test ID [409](#)
    - test results [409](#)
    - test statistics [409](#)

**P**

- PAgP
  - See EtherChannel
- pagp learn-method command [330](#)
- pagp port-priority command [332](#)
- password, VTP [740, 744](#)
- password-recovery mechanism, enabling and disabling [373](#)
- permit (IPv6) command [334](#)
- permit (MAC access-list configuration) command [340](#)
- per-VLAN spanning-tree plus
  - See STP
- physical-port learner [330](#)
- PID, displaying [450](#)
- PIM-DVMRP, as multicast router learning method [195](#)
- police aggregate command [345](#)
- police command [343](#)
- policed-DSCP map [282](#)
- policy-map command [347](#)
- policy maps
  - applying to an interface [375, 380](#)
  - creating [347](#)
  - displaying [557](#)
  - hierarchical [348](#)

- policy maps (continued)
  - policers
    - displaying **525**
    - for a single class **343**
    - for multiple classes **276, 345**
    - policed-DSCP map **282**
  - traffic classification
    - defining the class **54**
    - defining trust states **708**
    - setting DSCP or IP precedence values **378**
- Port Aggregation Protocol
  - See EtherChannel
- port-based authentication
  - AAA method list **3**
  - configuring violation modes **121**
  - debug messages, display **6**
  - enabling IEEE 802.1x
    - globally **88**
    - per interface **112**
  - guest VLAN **103**
  - host modes **105**
  - IEEE 802.1x AAA accounting methods **1**
  - initialize an interface **106, 117**
  - MAC authentication bypass **107**
  - manual control of authorization state **112**
  - multiple hosts on authorized port **105**
  - PAE as authenticator **111**
  - periodic re-authentication
    - enabling **115**
    - time between attempts **118**
  - quiet period between failed authentication exchanges **118**
  - re-authenticating IEEE 802.1x-enabled ports **114**
  - resetting configurable IEEE 802.1x parameters **101**
  - switch-to-authentication server retransmission time **118**
  - switch-to-client frame-retransmission number **109 to 110**
  - switch-to-client retransmission time **118**
  - test for IEEE 802.1x readiness **116**
- port-channel load-balance command **350**
- Port Fast, for spanning tree **645**
- port ranges, defining **77**
- ports, debugging **66**
- ports, protected **694**
- port security
  - aging **688**
  - debug messages, display **68**
  - enabling **683**
  - violation error recovery **139**
- port trust states for QoS **308**
- port types, MVR **319**
- priority-queue command **352**
- private-vlan command **354**
- private-vlan mapping command **357**
- private VLANs
  - association **692**
  - configuring **354**
  - configuring ports **679**
  - displaying **579**
  - host ports **679**
  - mapping
    - configuring **692**
    - displaying **439**
  - promiscuous ports **679**
- privileged EXEC mode **2, 3**
- product identification information, displaying **450**
- promiscuous ports, private VLANs **679**
- protected ports, displaying **445**
- pruning
  - VLANs **696**
  - VTP
    - displaying interface information **439**
    - enabling **740, 744**
  - pruning-eligible VLAN list **698**
- PVST+
  - See STP

**Q****QoS**

## auto-QoS

- configuring [38](#)
- debug messages, display [2](#)
- displaying [388](#)

## class maps

- creating [56](#)
- defining the match criteria [270](#)
- displaying [395](#)

defining the CoS value for an incoming packet [278](#)displaying configuration information [388, 524](#)DSCP transparency [290](#)

## DSCP trusted ports

- applying DSCP-to-DSCP-mutation map to [280](#)
- defining DSCP-to-DSCP-mutation map [282](#)

## egress queues

- allocating buffers [286](#)
- defining the CoS output queue threshold map [304](#)
- defining the DSCP output queue threshold map [306](#)
- displaying buffer allocations [528](#)
- displaying CoS output queue threshold map [532](#)
- displaying DSCP output queue threshold map [532](#)
- displaying queueing strategy [528](#)
- displaying queue-set settings [535](#)
- enabling bandwidth shaping and scheduling [657](#)
- enabling bandwidth sharing and scheduling [659](#)
- limiting the maximum output on a port [655](#)
- mapping a port to a queue-set [359](#)
- mapping CoS values to a queue and threshold [304](#)
- mapping DSCP values to a queue and threshold [306](#)
- setting maximum and reserved memory allocations [288](#)
- setting WTD thresholds [288](#)
- enabling [274](#)

## QoS (continued)

## ingress queues

- allocating buffers [294](#)
- assigning SRR scheduling weights [292](#)
- defining the CoS input queue threshold map [296](#)
- defining the DSCP input queue threshold map [298](#)
- displaying buffer allocations [528](#)
- displaying CoS input queue threshold map [532](#)
- displaying DSCP input queue threshold map [532](#)
- displaying queueing strategy [528](#)
- displaying settings for [526](#)
- enabling the priority queue [300](#)
- mapping CoS values to a queue and threshold [296](#)
- mapping DSCP values to a queue and threshold [298](#)
- setting WTD thresholds [302](#)

## maps

- defining [282, 296, 298, 304, 306](#)
- displaying [532](#)

## policy maps

- applying an aggregate policer [345](#)
- applying to an interface [375, 380](#)
- creating [347](#)
- defining policers [276, 343](#)
- displaying policers [525](#)
- displaying policy maps [557](#)
- hierarchical [348](#)
- policed-DSCP map [282](#)
- setting DSCP or IP precedence values [378](#)
- traffic classifications [54](#)
- trust states [708](#)
- port trust states [308](#)
- queues, enabling the expedite [352](#)
- statistics
  - in-profile and out-of-profile packets [528](#)
  - packets enqueued or dropped [528](#)
  - sent and received CoS values [528](#)
  - sent and received DSCP values [528](#)

## QoS (continued)

trusted boundary for IP phones **308**

VLAN-based **310**

## quality of service

See QoS

querytime, MVR **316**

queue-set command **359**

**R**

radius-server dead-criteria command **360**

radius-server host command **362**

rapid per-VLAN spanning-tree plus

See STP

rapid PVST+

See STP

re-authenticating IEEE 802.1x-enabled ports **114**

## re-authentication

periodic **115**

time between attempts **118**

receiver ports, MVR **319**

receiving flow-control packets **145**

## recovery mechanism

causes **139**

display **61, 424, 428**

timer interval **140**

remote-span command **364**

Remote Switched Port Analyzer

See RSPAN

rename (boot loader) command **17**

renew ip dhcp snooping database command **366**

reset (boot loader) command **18**

reset command **730**

resource templates, displaying **562**

## restricted VLAN

See dot1x auth-fail vlan

rmdir (boot loader) command **19**

rmon collection stats command **369**

root guard, for spanning tree **619**

## routed ports

IP addresses on **157**

number supported **157**

## RSPAN

configuring **311**

displaying **538**

filter RSPAN traffic **311**

remote-span command **364**

## sessions

add interfaces to **311**

displaying **538**

start new **311**

**S**

sdm prefer command **370**

## SDM templates

allowed resources **371**

displaying **562**

dual IPv4 and IPv6 **370**

secure ports, limitations **685**

sending flow-control packets **145**

service password-recovery command **373**

service-policy command **375**

set (boot loader) command **20**

set command **378**

setup command **380**

show access-lists command **383**

show archive status command **386**

show authentication command **387**

show auto qos command **388**

show boot command **392**

show changes command **730**

show cisp command **394**

show class-map command **395**

show controllers cpu-interface command **396**

show controllers ethernet-controller command **398**

show controllers tcam command **405**

show controller utilization command **407**

show current command **730**  
 show dot1q-tunnel command **409**  
 show dot1x command **410**  
 show dtp **414**  
 show eap command **416**  
 show energywise command **419**  
 show env command **423**  
 show errdisable detect command **424**  
 show errdisable flap-values command **426**  
 show errdisable recovery command **428**  
 show etherchannel command **430**  
 show fallback profile command **433**  
 show flowcontrol command **435**  
 show idprom command **437**  
 show interfaces command **439**  
 show interfaces counters command **447**  
 show inventory command **450**  
 show ipc command **473**  
 show ip dhcp snooping binding command **452**  
 show ip dhcp snooping command **451**  
 show ip dhcp snooping database command **454, 456**  
 show ip igmp profile command **459**  
 show ip igmp snooping address command **481**  
 show ip igmp snooping command **460, 479**  
 show ip igmp snooping groups command **463**  
 show ip igmp snooping mrouter command **465, 483**  
 show ip igmp snooping querier command **467, 485**  
 show ip source binding command **469**  
 show ipv6 access-list command **477**  
 show ip verify source command **471**  
 show l2protocol-tunnel command **487**  
 show lacp command **490**  
 show link state group command **497, 499**  
 show location **494**  
 show mac access-group command **501**  
 show mac address-table address command **505**  
 show mac address-table aging time command **507**  
 show mac address-table command **503**  
 show mac address-table count command **509**  
 show mac address-table dynamic command **511**  
 show mac address-table interface command **513**  
 show mac address-table learning command **515**  
 show mac address-table move update command **516**  
 show mac address-table notification command **68, 518, 20**  
 show mac address-table static command **520**  
 show mac address-table vlan command **522**  
 show mls qos aggregate-policer command **525**  
 show mls qos command **524**  
 show mls qos input-queue command **526**  
 show mls qos interface command **528**  
 show mls qos maps command **532**  
 show mls qos queue-set command **535**  
 show mls qos vlan command **537**  
 show monitor command **538**  
 show mvr command **541**  
 show mvr interface command **543**  
 show mvr members command **545**  
 show network-policy profile command **547**  
 show nmsp command **549**  
 show pagp command **552**  
 show parser macro command **554**  
 show platform acl command **2**  
 show platform backup interface command **3**  
 show platform configuration command **4**  
 show platform etherchannel command **5**  
 show platform forward command **6**  
 show platform igmp snooping command **8**  
 show platform ipc trace command **15**  
 show platform ip multicast command **10**  
 show platform ip unicast command **11**  
 show platform ipv6 unicast command **16**  
 show platform layer4op command **18**  
 show platform mac-address-table command **19**  
 show platform messaging command **20**  
 show platform monitor command **21**  
 show platform mvr table command **22**  
 show platform pm command **23**  
 show platform port-asic command **24**

- show platform port-security command **29**  
 show platform qos command **30**  
 show platform resource-manager command **31**  
 show platform snmp counters command **33**  
 show platform spanning-tree command **34**  
 show platform stp-instance command **35**  
 show platform tcam command **36**  
 show platform vlan command **39**  
 show policy-map command **557**  
 show port security command **559**  
 show proposed command **730**  
 show sdm prefer command **562**  
 show spanning-tree command **565**  
 show storm-control command **571**  
 show system mtu command **573**  
 show trust command **708**  
 show udld command **574**  
 show version command **577**  
 show vlan access-map command **585**  
 show vlan command **579**  
 show vlan command, fields **581**  
 show vlan filter command **586**  
 show vmps command **587**  
 show vtp command **590**  
 shutdown command **595**  
 shutdown threshold, Layer 2 protocol tunneling **227**  
 shutdown vlan command **596**  
 small violation-rate command **597**  
 Smartports macros  
     See macros  
 SNMP host, specifying **603**  
 SNMP informs, enabling the sending of **599**  
 snmp-server enable traps command **599**  
 snmp-server host command **603**  
 snmp trap mac-notification command **607**  
 SNMP traps  
     enabling MAC address notification trap **607**  
     enabling the MAC address notification feature **254**  
     enabling the sending of **599**  
 SoftPhone  
     See Cisco SoftPhone  
 software images  
     deleting **79**  
     downloading **8**  
     upgrading **8**  
     uploading **14**  
 software version, displaying **577**  
 source ports, MVR **319**  
 SPAN  
     configuring **311**  
     debug messages, display **21**  
     displaying **538**  
     filter SPAN traffic **311**  
     sessions  
         add interfaces to **311**  
         displaying **538**  
         start new **311**  
 spanning **647**  
 spanning-tree backbonefast command **609**  
 spanning-tree bpdufilter command **610**  
 spanning-tree bpduguard command **612**  
 spanning-tree cost command **614**  
 spanning-tree etherchannel command **616**  
 spanning-tree extend system-id command **618**  
 spanning-tree guard command **619**  
 spanning-tree link-type command **621**  
 spanning-tree loopguard default command **623**  
 spanning-tree mode command **625**  
 spanning-tree mst configuration command **627**  
 spanning-tree mst cost command **629**  
 spanning-tree mst forward-time command **631**  
 spanning-tree mst hello-time command **632**  
 spanning-tree mst max-age command **633**  
 spanning-tree mst max-hops command **634**  
 spanning-tree mst port-priority command **635**  
 spanning-tree mst pre-standard command **637**  
 spanning-tree mst priority command **638**  
 spanning-tree mst root command **639**

- spanning-tree portfast (global configuration) command **643**
- spanning-tree portfast (interface configuration) command **645**
- spanning-tree port-priority command **641**
- Spanning Tree Protocol
- See STP
- spanning-tree transmit hold-count command **647**
- spanning-tree uplinkfast command **648**
- spanning-tree vlan command **650**
- speed command **653**
- srr-queue bandwidth limit command **655**
- srr-queue bandwidth shape command **657**
- srr-queue bandwidth share command **659**
- SSH, configuring version **202**
- static-access ports, configuring **666**
- statistics, Ethernet group **369**
- sticky learning, enabling **683**
- storm-control command **661**
- STP
- BackboneFast **609**
  - counters, clearing **73**
  - debug messages, display
    - BackboneFast events **72**
    - MSTP **75**
    - optimized BPDUs handling **74**
    - spanning-tree activity **70**
    - switch shim **77**
    - transmitted and received BPDUs **73**
    - UplinkFast **79**  - detection of indirect link failures **609**
  - enabling protocol tunneling for **227**
  - EtherChannel misconfiguration **616**
  - extended system ID **618**
  - path cost **614**
  - protocol modes **625**
- STP (continued)
- root port
- accelerating choice of new **648**
  - loop guard **619**
  - preventing from becoming designated **619**
  - restricting which can be root **619**
  - root guard **619**
  - UplinkFast **648**
- root switch
- affects of extended system ID **618, 651**
  - hello-time **650**
  - interval between BDPU messages **650**
  - interval between hello BPDU messages **650**
  - max-age **650**
  - port priority for selection of **641**
  - primary or secondary **650**
  - switch priority **650**
- state changes
- blocking to forwarding state **645**
  - enabling BPDU filtering **610, 643**
  - enabling BPDU guard **612, 643**
  - enabling Port Fast **643, 645**
  - enabling timer to recover from error state **139**
  - forward-delay time **650**
  - length of listening and learning states **650**
  - shutting down Port Fast-enabled ports **643**
  - state information display **565**
  - VLAN options **638, 650**
- SVIs, creating **151**
- SVI status calculation **668**
- Switched Port Analyzer
- See SPAN
- switching characteristics
- modifying **664**
  - returning to interfaces **664**
- switchport access command **666**
- switchport autostate exclude command **668**
- switchport backup interface command **670**
- switchport block command **674**

switchport command **664**  
 switchport host command **675**  
 switchport mode command **676**  
 switchport mode private-vlan command **679**  
 switchport nonegotiate command **681**  
 switchport port-security aging command **688**  
 switchport port-security command **683**  
 switchport priority extend command **690**  
 switchport private-vlan command **692**  
 switchport protected command **694**  
 switchports, displaying **439**  
 switchport trunk command **696**  
 switchport voice vlan command **699**  
 system message logging, save message to flash **243**  
 system mtu command **701**  
 system resource templates **370**

**T**

tar files, creating, listing, and extracting **11**  
 templates, system resources **370**  
 traceroute mac command **703**  
 traceroute mac ip command **706**  
 trunking, VLAN mode **676**  
 trunk mode **676**  
 trunk ports **676**  
 trunks, to non-DTP device **677**  
 trusted boundary for QoS **308**  
 trusted port states for QoS **308**  
 tunnel ports, Layer 2 protocol, displaying **487**  
 type (boot loader) command **23**

**U**

UDLD  
 aggressive mode **710, 712**  
 debug messages, display **86**  
 enable globally **710**

UDLD (continued)  
 enable per interface **712**  
 error recovery timer **139**  
 message timer **710**  
 normal mode **710, 712**  
 reset a shutdown interface **714**  
 status **574**  
 udld command **710**  
 udld port command **712**  
 udld reset command **714**  
 unicast storm control **661**  
 UniDirectional Link Detection  
     See UDLD  
 unknown multicast traffic, preventing **674**  
 unknown unicast traffic, preventing **674**  
 unset (boot loader) command **24**  
 upgrading  
     software images **8**  
     monitoring status of **386**  
 UplinkFast, for STP **648**  
 user EXEC mode **2, 3**

**V**

version (boot loader) command **26**  
 VLAN  
     enabling guest VLAN supplicant **91, 102**  
     vlan (global configuration) command **715**  
     vlan (VLAN configuration) command **721**  
     vlan access-map command **727**  
     VLAN access map configuration mode **727**  
     VLAN access maps  
         actions **6**  
         displaying **585**  
     VLAN-based QoS **310**  
     VLAN configuration  
         rules **718, 723**  
         saving **715, 725**

VLAN configuration mode

  commands

    VLAN **721**

    VTP **744**

  description **5**

  entering **729**

  summary **2**

vlan database command **729**

vlan dot1q tag native command **732**

vlan filter command **733**

VLAN filters, displaying **586**

VLAN ID range **715, 721**

VLAN maps

  applying **733**

  creating **727**

  defining **268**

  displaying **585**

VLAN Query Protocol

  See VQP

VLANs

  adding **715**

  configuring **715, 721**

  debug messages, display

    ISL **83**

    VLAN IOS file system error tests **82**

    VLAN manager activity **80**

    VTP **84**

  displaying configurations **579**

  enabling guest VLAN supplicant **144**

  extended-range **715**

  MAC addresses

    displaying **522**

    number of **509**

  media types **718, 723**

  normal-range **715, 721**

  private **679**

    configuring **354**

    displaying **579**

  See also private VLANs

VLANs (continued)

  restarting **596**

  saving the configuration **715**

  shutting down **596**

  SNMP traps for VTP **601, 604**

  suspending **596**

  variables **721**

VLAN Trunking Protocol

  See VTP

VMPS

  configuring servers **738**

  displaying **587**

  error recovery timer **140**

  reconfirming dynamic VLAN assignments **735**

  vmps reconfirm (global configuration) command **736**

  vmps reconfirm (privileged EXEC) command **735**

  vmps retry command **737**

  vmps server command **738**

  voice VLAN

    configuring **699**

    setting port priority **690**

VQP

  and dynamic-access ports **666**

  clearing client statistics **75**

  displaying information **587**

  per-server retry count **737**

  reconfirmation interval **736**

  reconfirming dynamic VLAN assignments **735**

VTP

  changing characteristics **740**

  clearing pruning counters **76**

  configuring

    domain name **740, 744**

    file name **740**

    mode **740, 744**

    password **740, 744**

  counters display fields **591**

  displaying information **590**

VTP (continued)

enabling

    pruning [740, 744](#)

    tunneling for [227](#)

    Version 2 [740, 744](#)

mode [740, 744](#)

pruning [740, 744](#)

saving the configuration [715, 725](#)

statistics [590](#)

status [590](#)

status display fields [592](#)

vtp (global configuration) command [740](#)

vtp (VLAN configuration) command [744](#)

---

## X

XENPAK module serial EERPOM information [437](#)