



INDEX

A

aaa accounting dot1x command **1**
aaa authentication dot1x command **3**
aaa authorization network command **5, 22, 28, 30, 32, 34, 36, 140, 286, 443, 7, 34**
AAA methods **3**
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP **193**
 MAC, displaying **551**
access mode **725**
access ports **725**
ACEs **125, 376**
ACLs
 deny **123**
 displaying **426**
 for non-IP protocols **290**
 IP **193**
 on Layer 2 interfaces **193**
 permit **374**
address aliasing **353**
aggregate-port learner **368**
allowed VLANs **740**
archive copy-sw command **6**
archive download-sw command **9**
archive tar command **13**
archive upload-sw command **16**
arp access-list command **18**
authentication command bounce-port ignore **20**

authentication command disable-port ignore **21**
authentication control-direction command **22**
authentication event command **24**
authentication failed VLAN
 See dot1x auth-fail vlan
authentication fallback command **28**
authentication host-mode command **30**
authentication mac-move permit command **32**
authentication open command **34**
authentication order command **36**
authentication periodic command **38**
authentication port-control command **40**
authentication priority command **42**
authentication timer command **44**
authentication violation command **46**
auth-fail max-attempts
 See dot1x auth-fail max-attempts
auth-fail vlan
 See dot1x auth-fail vlan
auth open command **34**
auth order command **36**
authorization state of controlled port **158**
auth timer command **44**
autonegotiation of duplex mode **170**
auto qos classify command **48**
auto qos trust command **51**
auto qos video command **54**
auto qos voip command **57**

B

BackboneFast, for STP **651**
backup interfaces

- configuring [718](#)
 - displaying [493](#)
 - boot (boot loader) command [2](#)
 - boot auto-copy-sw command [63](#)
 - boot config-file command [65](#)
 - boot enable-break command [66](#)
 - boot helper command [67](#)
 - boot helper-config file command [68](#)
 - booting
 - Cisco IOS image [71](#)
 - displaying environment variables [439](#)
 - interrupting [66](#)
 - manually [69](#)
 - boot loader
 - accessing [1](#)
 - booting
 - Cisco IOS image [2](#)
 - helper image [67](#)
 - directories
 - creating [14](#)
 - displaying a list of [7](#)
 - removing [18](#)
 - displaying
 - available commands [12](#)
 - memory heap utilization [13](#)
 - version [25](#)
 - environment variables
 - described [19](#)
 - displaying settings [19](#)
 - location of [20](#)
 - setting [19](#)
 - unsetting [23](#)
 - files
 - copying [5](#)
 - deleting [6](#)
 - displaying a list of [7](#)
 - displaying the contents of [4, 15, 22](#)
 - renaming [16](#)
 - file system
 - formatting [10](#)
 - initializing flash [9](#)
 - running a consistency check [11](#)
 - prompt [1](#)
 - resetting the system [17](#)
 - boot manual command [69](#)
 - boot private-config-file command [70](#)
 - boot system command [71](#)
 - BPDU filtering, for spanning tree [652, 686](#)
 - BPDU guard, for spanning tree [654, 686](#)
 - broadcast storm control [707](#)
-
- C**
- candidate switches
 - See clusters
 - cat (boot loader) command [4](#)
 - channel-group command [73](#)
 - channel-protocol command [76](#)
 - Cisco IP camera
 - auto-QoS configuration [54](#)
 - Cisco SoftPhone
 - auto-QoS configuration [57](#)
 - trusting packets sent from [345](#)
 - Cisco Telepresence System
 - auto-QoS configuration [54](#)
 - CISP
 - See Client Information Signalling Protocol
 - cisp
 - debug platform cisp command [34](#)
 - cisp enable command [77](#)
 - class command [78](#)
 - class-map command [81](#)
 - class maps
 - creating [81](#)
 - defining the match criteria [302](#)
 - displaying [444](#)
 - class of service
 - See CoS

- clear dot1x command **84**
 clear eap sessions command **85**
 clear errdisable interface **86**
 clear ip arp inspection log command **83**
 clear ip arp inspection statistics command **87**
 clear ip dhcp snooping database command **88**
 clear lacp command **90**
 clear logging onboard command **91**
 clear mac address-table command **92, 94**
 clear nmfp statistics command **95**
 clear pagp command **96**
 clear port-security command **97**
 clear psp counter **99**
 clear psp counter command **99**
 clear spanning-tree counters command **100**
 clear spanning-tree detected-protocols command **101**
 clear vmps statistics command **102**
 clear vtp counters command **103**
 Client Information Signalling Protocol **77, 140, 443, 7, 34**
 cluster commander-address command **104**
 cluster discovery hop-count command **106**
 cluster enable command **107**
 cluster holdtime command **108**
 cluster member command **109**
 cluster outside-interface command **111**
 cluster run command **112**
 clusters
 adding candidates **109**
 binding to HSRP group **113**
 building manually **109**
 communicating with
 devices outside the cluster **111**
 members by using Telnet **400**
 debug messages, display **8**
 displaying
 candidate switches **447**
 debug messages **8**
 member switches **449**
 status **445**
 hop-count limit for extended discovery **106**
 HSRP standby groups **113**
 redundancy **113**
 SNMP trap **641**
 cluster standby-group command **113**
 cluster timer command **115**
 command modes defined **2**
 command switch
 See clusters
 configuration files
 password recovery disable considerations **1**
 specifying the name **65, 70**
 configuring multiple interfaces **190**
 config-vlan mode
 commands **762**
 entering **761**
 copy (boot loader) command **5**
 copy logging onboard command **116**
 CoS
 assigning default value to incoming packets **313**
 overriding the incoming value **313**
 CoS-to-DSCP map **317**
 CPU ASIC statistics, displaying **451**
 crashinfo files **181**
 critical VLAN **25**
-
- D**
- debug authentication **2**
 debug auto qos command **4**
 debug backup command **6**
 debug cisp command **7**
 debug cluster command **8**
 debug dot1x command **10**
 debug dtp command **12**
 debug eap command **13**
 debug etherchannel command **14**
 debug ilpower command **15**
 debug interface command **16**

- debug ip dhcp snooping command **17**
 debug ip igmp filter command **19**
 debug ip igmp max-groups command **20**
 debug ip igmp snooping command **21**
 debug ip verify source packet command **18**
 debug lacp command **22**
 debug lldp packets command **23**
 debug mac-notification command **24**
 debug matm command **25**
 debug matm move update command **26**
 debug monitor command **27**
 debug mvrdbg command **28**
 debug nmfp command **29**
 debug nvram command **30**
 debug pagp command **31**
 debug platform acl command **32**
 debug platform backup interface command **33**
 debug platform cisp command **34**
 debug platform cli-redirection main command **35**
 debug platform configuration command **36, 42**
 debug platform cpu-queues command **37**
 debug platform dot1x command **39**
 debug platform etherchannel command **40**
 debug platform forw-tcam command **41**
 debug platform ip arp inspection command **43**
 debug platform ip dhcp command **44**
 debug platform ip igmp snooping command **45**
 debug platform ip source-guard command **47**
 debug platform led command **48**
 debug platform matm command **49**
 debug platform messaging application command **50**
 debug platform phy command **51**
 debug platform pm command **53**
 debug platform port-asic command **55**
 debug platform port-security command **56**
 debug platform qos-acl-tcam command **57**
 debug platform resource-manager command **58**
 debug platform snmp command **59**
 debug platform span command **60**
 debug platform stack-manager command **61**
 debug platform supervisor-asic command **62**
 debug platform sw-bridge command **63**
 debug platform tcam command **64**
 debug platform udld command **66**
 debug platform vlan command **67**
 debug pm command **68**
 debug port-security command **70**
 debug qos-manager command **71**
 debug spanning-tree backbonefast command **74**
 debug spanning-tree bpdu command **75**
 debug spanning-tree bpdu-opt command **76**
 debug spanning-tree command **72**
 debug spanning-tree mstp command **77**
 debug spanning-tree switch command **79**
 debug spanning-tree uplinkfast command **81**
 debug sw-vlan command **82**
 debug sw-vlan ifs command **84**
 debug sw-vlan notification command **85**
 debug sw-vlan vtp command **87**
 debug udld command **89**
 debug vqpc command **91**
 define interface-range command **118**
 delete (boot loader) command **6**
 delete command **120**
 deny (ARP access-list configuration) command **121**
 deny command **123**
 detect mechanism, causes **172**
 DHCP snooping
 accepting untrusted packets from edge switch **224**
 enabling
 on a VLAN **229**
 option 82 **222, 224**
 trust on an interface **227**
 error recovery timer **178**
 rate limiting **226**
 DHCP snooping binding database
 binding file, configuring **220**
 bindings

- adding **218**
- deleting **218**
- clearing database agent statistics **88**
- database agent, configuring **220**
- renewing **408**
- dir (boot loader) command **7**
- directories, deleting **120**
- domain name, VTP **771**
- dot1x auth-fail max-attempts **134**
- dot1x auth-fail vlan **136**
- dot1x command **132**
- dot1x control-direction command **138**
- dot1x credentials (global configuration) command **140**
- dot1x critical global configuration command **141**
- dot1x critical interface configuration command **143**
- dot1x default command **145**
- dot1x fallback command **146**
- dot1x guest-vlan command **147**
- dot1x host-mode command **149**
- dot1x initialize command **151**
- dot1x mac-auth-bypass command **152**
- dot1x max-reauth-req command **154**
- dot1x max-req command **156**
- dot1x pae command **157**
- dot1x port-control command **158**
- dot1x re-authenticate command **160**
- dot1x reauthentication command **161**
- dot1x supplicant force-multicast command **162**
- dot1x test eapol-capable command **163**
- dot1x test timeout command **164**
- dot1x timeout command **165**
- dot1x violation-mode command **168**
- DSCP-to-CoS map **317**
- DSCP-to-DSCP-mutation map **317**
- DTP **726**
- DTP flap
 - error detection for **172**
 - error recovery timer **178**
- DTP negotiation **727**
- dual-purpose uplink ports
 - displaying configurable options **496**
 - displaying the active media **500**
 - selecting the type **305**
- duplex command **169**
- dynamic-access ports
 - configuring **716**
 - restrictions **717**
- dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN **201**
 - define **18**
 - deny packets **121**
 - display **430**
 - permit packets **372**
 - clear
 - log buffer **83**
 - statistics **87**
 - display
 - ARP ACLs **430**
 - configuration and operating state **504**
 - log buffer **504**
 - statistics **504**
 - trust state and rate limit **504**
 - enable per VLAN **211**
 - log buffer
 - clear **83**
 - configure **205**
 - display **504**
 - rate-limit incoming ARP packets **203**
 - statistics
 - clear **87**
 - display **504**
 - trusted interface state **207**
 - type of packet logged **212**
 - validation checks **209**
- dynamic auto VLAN membership mode **725**
- dynamic desirable VLAN membership mode **725**
- Dynamic Host Configuration Protocol (DHCP)

See DHCP snooping
Dynamic Trunking Protocol
 See DTP

E

EAP-request/identity frame
 maximum number to send **156**
 response time before retransmitting **165**
environment variables, displaying **439**
epm access-control open **171**
errdisable detect cause command **172**
errdisable detect cause small-frame comand **175**
errdisable recovery cause small-frame **177**
errdisable recovery command **178**
error conditions, displaying **483**
error disable detection **172**
error-disabled interfaces, displaying **493**

EtherChannel

 assigning Ethernet interface to channel group **73**
 creating port-channel logical interface **188**
 debug EtherChannel/PAgP, display **14**
 debug platform-specific events, display **40**
 displaying **486**
 interface information, displaying **493**

LACP

 clearing channel-group information **90, 91**
 debug messages, display **22**
 displaying **538**
 modes **73**
 port priority for hot-standby ports **271**
 restricting a protocol **76**
 system priority **273**

load-distribution methods **383**

PAgP

 aggregate-port learner **368**
 clearing channel-group information **96**
 debug messages, display **31**
 displaying **593**

error detection for **172**
error recovery timer **178**
learn method **368**
modes **73**
physical-port learner **368**
priority of interface for transmitted traffic **370**

Ethernet controller, internal register display **453**
Ethernet controller, stackport information **459**
Ethernet statistics, collecting **411**
exception crashinfo command **181, 186**
extended discovery of candidate switches **106**
extended-range VLANs
 and allowed VLAN list **740**
 and pruning-eligible list **740**
 configuring **761**
extended system ID for STP **660**

F

fallback profile command **182**
fallback profiles, displaying **489**
fan information, displaying **480**
file name, VTP **771**
files, deleting **120**
flash_init (boot loader) command **9**
flexible authentication ordering **36**

Flex Links

 configuring **718**
 configuring preferred VLAN **720**
 displaying **493**

flowcontrol command **184**
format (boot loader) command **10**
fsck (boot loader) command **11**

G

global configuration mode **2, 4**

H

hardware ACL statistics **426**
 help (boot loader) command **12**
 hierarchical policy maps **382**
 hop-count limit for clusters **106**
 host connection, port configuration **724**
 Hot Standby Router Protocol
 See HSRP
 HSRP
 binding HSRP group to cluster **113**
 standby group **113**

I

IEEE 802.1x
 and switchport modes **726**
 violation error recovery **178**
 See also port-based authentication
 IEEE 802.1X Port Based Authentication
 enabling guest VLAN supplicant **135, 146, 183**
 IGMP filters
 applying **232**
 debug messages, display **19**
 IGMP groups, setting maximum **233**
 IGMP maximum groups, debugging **20**
 IGMP profiles
 creating **235**
 displaying **516**
 IGMP snooping
 adding ports as a static member of a group **251**
 displaying **517**
 enabling **237**
 enabling the configurable-leave timer **239**
 enabling the Immediate-Leave feature **248**
 flooding query count **245**
 interface topology change notification behavior **247**
 querier **241**
 query solicitation **245**
 report suppression **243**
 switch topology change notification behavior **245**
 images
 See software images
 Immediate-Leave feature, MVR **355**
 immediate-leave processing **248**
 Immediate-Leave processing, IPv6 **269**
 interface configuration mode **3, 4**
 interface port-channel command **188**
 interface range command **190**
 interface-range macros **118**
 interfaces
 assigning Ethernet interface to channel group **73**
 configuring **169**
 configuring multiple **190**
 creating port-channel logical **188**
 debug messages, display **16**
 disabling **637**
 displaying the MAC address table **560**
 restarting **637**
 interface speed, configuring **696**
 interface vlan command **192**
 internal registers, displaying **453, 459, 465**
 Internet Group Management Protocol
 See IGMP
 invalid GBIC
 error detection for **172**
 error recovery timer **178**
 ip access-group command **193**
 ip address command **195**
 IP addresses, setting **195**
 ip admission command **197**
 ip admission name proxy http command **199**
 ip arp inspection filter vlan command **201**
 ip arp inspection limit command **203**
 ip arp inspection log-buffer command **205**
 ip arp inspection trust command **207**
 ip arp inspection validate command **209**
 ip arp inspection vlan command **211**

ip arp inspection vlan logging command **212**
 ip device tracking command **216**
 ip device tracking probe command **214**
 IP DHCP snooping
 See DHCP snooping
 ip dhcp snooping binding command **218**
 ip dhcp snooping command **217**
 ip dhcp snooping database command **220**
 ip dhcp snooping information option allow-untrusted command **224**
 ip dhcp snooping information option command **222**
 ip dhcp snooping limit rate command **226**
 ip dhcp snooping trust command **227**
 ip dhcp snooping verify command **228**
 ip dhcp snooping vlan command **229**
 ip dhcp snooping vlan information option format-type circuit-id string command **230**
 ip igmp filter command **232**
 ip igmp max-groups command **233**
 ip igmp profile command **235**
 ip igmp snooping command **237**
 ip igmp snooping last-member-query-interval command **239**
 ip igmp snooping querier command **241**
 ip igmp snooping report-suppression command **243**
 ip igmp snooping tcn command **245**
 ip igmp snooping tcn flood command **247**
 ip igmp snooping vlan immediate-leave command **248**
 ip igmp snooping vlan mrouter command **249**
 ip igmp snooping vlan static command **251**
 IP multicast addresses **352**
 IP phones
 auto-QoS configuration **57**
 trusting packets sent from **345**
 IP-precedence-to-DSCP map **317**
 ip source binding command **253**
 IP source guard
 disabling **256**
 enabling **256**
 static IP source bindings **253**

ip ssh command **255**
 ipv6 mld snooping command **257**
 ipv6 mld snooping last-listener-query count command **259**
 ipv6 mld snooping last-listener-query-interval command **261**
 ipv6 mld snooping listener-message-suppression command **263**
 ipv6 mld snooping robustness-variable command **265**
 ipv6 mld snooping tcn command **267**
 ipv6 mld snooping vlan command **269**
 IPv6 SDM template **412**
 ip verify source command **256**

J

jumbo frames

 See MTU

L

LACP

 See EtherChannel

lacp port-priority command **271**

lacp system-priority command **273**

Layer 2 traceroute

 IP addresses **751**

 MAC addresses **748**

line configuration mode **3,5**

Link Aggregation Control Protocol

 See EtherChannel

link flap

 error detection for **172**

 error recovery timer **178**

link state group command **275**

link state track command **277**

load-distribution methods for EtherChannel **383**

location (global configuration) command **278**

location (interface configuration) command **280**

logging event command **282**
 logging event power-inline-status command **283**
 logging file command **284**
 logical interface **188**
 loopback error
 detection for **172**
 recovery timer **178**
 loop guard, for spanning tree **662, 666**

M

mab request format attribute 32 command **286**
 mac access-group command **288**
 MAC access-groups, displaying **551**
 MAC access list configuration mode **290**
 mac access-list extended command **290**
 MAC access lists **123**
 MAC addresses
 disabling MAC address learning per VLAN **293**
 displaying
 dynamic **558**
 notification settings **563**
 number of addresses in a VLAN **557**
 per interface **560**
 per VLAN **567**
 static **565**
 static and dynamic entries **552**
 dynamic
 aging time **292**
 deleting **92**
 displaying **558**
 enabling MAC address notification **297**
 enabling MAC address-table move update **295**
 persistent stack **704**
 static
 adding and removing **299**
 displaying **565**
 dropping on an interface **300**
 MAC address notification, debugging **24**

mac address-table aging-time **288**
 mac address-table aging-time command **292**
 mac address-table learning command **293**
 mac address-table move update command **295**
 mac address-table notification command **297**
 mac address-table static command **299**
 mac address-table static drop command **300**
 macros
 interface range **118, 190**
 maps
 QoS
 defining **317**
 match (class-map configuration) command **302**
 maximum transmission unit
 See MTU
 mdix auto command **304**
 media-type (interface configuration) command **305**
 media-type rj45 (line configuration) command **307**
 member switches
 See clusters
 memory (boot loader) command **13**
 mkdir (boot loader) command **14**
 MLD snooping
 configuring **263, 265**
 configuring queries **259, 261**
 configuring topology change notification **267**
 displaying **528**
 enabling **257**
 MLD snooping on a VLAN, enabling **269**
 mls qos aggregate-policer command **311**
 mls qos command **309**
 mls qos cos command **313**
 mls qos dscp-mutation command **315**
 mls qos map command **317**
 mls qos queue-set output buffers command **321**
 mls qos queue-set output threshold command **323**
 mls qos queue-set stack buffers command **325**
 mls qos rewrite ip dscp command **327**
 mls qos srr-queue input bandwidth command **329**

- mls qos srr-queue input buffers command **331**
- mls qos-srr-queue input cos-map command **333**
- mls qos srr-queue input dscp-map command **335**
- mls qos srr-queue input priority-queue command **337**
- mls qos srr-queue input threshold command **339**
- mls qos-srr-queue output cos-map command **341**
- mls qos srr-queue output dscp-map command **343**
- mls qos trust command **345**
- mode, MVR **352**
- Mode button, and password recovery **414**
- modes, commands **2**
- monitor session command **347**
- more (boot loader) command **15**
- MSTP
 - displaying **610**
 - interoperability **101**
 - link type **664**
 - MST region
 - aborting changes **669**
 - applying changes **669**
 - configuration name **669**
 - configuration revision number **669**
 - current or pending display **669**
 - displaying **610**
 - MST configuration mode **669**
 - VLANs-to-instance mapping **669**
 - path cost **671**
 - protocol mode **667**
 - restart protocol migration process **101**
 - root port
 - loop guard **662**
 - preventing from becoming designated **662**
 - restricting which can be root **662**
 - root guard **662**
 - root switch
 - affects of extended system ID **660**
 - hello-time **674, 682**
 - interval between BDPU messages **675**
 - interval between hello BPDU messages **674, 682**
- max-age **675**
- maximum hop count before discarding BPDU **676**
- port priority for selection of **678**
- primary or secondary **682**
- switch priority **681**
- state changes
 - blocking to forwarding state **688**
 - enabling BPDU filtering **652, 686**
 - enabling BPDU guard **654, 686**
 - enabling Port Fast **686, 688**
 - forward-delay time **673**
 - length of listening and learning states **673**
 - rapid transition to forwarding **664**
 - shutting down Port Fast-enabled ports **686**
 - state information display **609**
- MTU
 - configuring size **745**
 - displaying global setting **620**
- Multicase Listener Discovery
 - See MLD
- multicast group address, MVR **355**
- multicast groups, MVR **353**
- Multicast Listener Discovery
 - See MLD
- multicast router learning method **249**
- multicast router ports, configuring **249**
- multicast router ports, IPv6 **269**
- multicast storm control **707**
- multicast VLAN, MVR **353**
- multicast VLAN registration
 - See MVR
- Multiple Spanning Tree Protocol
 - See MSTP
- MVR
 - and address aliasing **353**
 - configuring **352**
 - configuring interfaces **355**
 - debug messages, display **28**

displaying **584**
 displaying interface information **585**
 members, displaying **587**
 mvr (global configuration) command **352**
 mvr (interface configuration) command **355**
 mvr vlan group command **356**

N

native VLANs **740**
 Network Admission Control Software Configuration Guide **198, 200**
 network-policy (global configuration) command **359**
 network-policy command **358**
 network-policy profile (network-policy configuration) command **361**
 nmsp attachment suppress command **364**
 nmsp command **363**
 no authentication logging verbose **365**
 no dot1x logging verbose **366**
 no mab logging verbose **367**
 nonegotiate, speed **696**
 nonelecting DTP messaging **727**
 non-IP protocols
 denying **123**
 forwarding **374**
 non-IP traffic access lists **290**
 non-IP traffic forwarding
 denying **123**
 permitting **374**
 normal-range VLANs **761**
 no vlan command **761**

O

online diagnostics
 displaying
 configured boot-up coverage level **469**
 current scheduled tasks **469**

event logs **469**
 supported test suites **469**
 test ID **469**
 test results **469**
 test statistics **469**
 global configuration mode
 clearing health monitoring diagnostic test schedule **87**
 setting health monitoring diagnostic testing **87**
 setting up health monitoring diagnostic test schedule **87**
 health monitoring diagnostic tests, configuring **126**
 testing, starting **130**

P

PAgP
 See EtherChannel
 pagp learn-method command **368**
 pagp port-priority command **370**
 password, VTP **772**
 password-recovery mechanism, enabling and disabling **414**
 permit (ARP access-list configuration) command **372**
 permit (MAC access-list configuration) command **374**
 per-VLAN spanning-tree plus
 See STP
 physical-port learner **368**
 PIM-DVMRP, as multicast router learning method **249**
 PoE
 configuring the power budget **387**
 configuring the power management mode **384**
 displaying controller register values **463**
 displaying power management information **598**
 logging of status **283**
 monitoring power **389**
 policing power consumption **389**
 police aggregate command **379**
 police command **377**

- policed-DSCP map **317**
- policy-map command **381**
- policy maps
 - applying to an interface **416, 421**
 - creating **381**
 - hierarchical **382**
 - policers
 - displaying **570**
 - for a single class **377**
 - for multiple classes **311, 379**
 - policed-DSCP map **317**
 - traffic classification
 - defining the class **78**
 - defining trust states **753**
 - setting DSCP or IP precedence values **419**
- Port Aggregation Protocol
 - See EtherChannel
- port-based authentication
 - AAA method list **3**
 - configuring violation modes **168**
 - debug messages, display **10**
 - enabling IEEE 802.1x
 - globally **132**
 - per interface **158**
 - guest VLAN **147**
 - host modes **149**
 - IEEE 802.1x AAA accounting methods **1**
 - initialize an interface **151, 164**
 - MAC authentication bypass **152**
 - manual control of authorization state **158**
 - PAE as authenticator **157**
 - periodic re-authentication
 - enabling **161**
 - time between attempts **165**
 - quiet period between failed authentication exchanges **165**
 - re-authenticating IEEE 802.1x-enabled ports **160**
 - resetting configurable IEEE 802.1x parameters **145**
- switch-to-authentication server retransmission time **165**
- switch-to-client frame-retransmission number **154 to 156**
- switch-to-client retransmission time **165**
- test for IEEE 802.1x readiness **163**
- port-channel load-balance command **383**
- Port Fast, for spanning tree **688**
- port ranges, defining **116, 118**
- ports, debugging **68**
- ports, protected **738**
- port security
 - aging **734**
 - debug messages, display **70**
 - enabling **729**
 - violation error recovery **178**
- port trust states for QoS **345**
- port types, MVR **355**
- power information, displaying **480**
- power inline command **384**
- power inline consumption command **387**
- power inline police command **389**
- Power over Ethernet
 - See PoE
- priority-queue command **392**
- priority value, stack member **617**
- privileged EXEC mode **2, 3**
- protected ports, displaying **498**
- pruning
 - VLANs **740**
 - VTP
 - displaying interface information **493**
 - enabling **772**
- pruning-eligible VLAN list **741**
- psp **394**
- psp command **394**
- PVST+
 - See STP

Q**QoS**

- auto-QoS
 - configuring [57](#)
 - debug messages, display [4](#)
- auto-QoS trust
 - configuring [51](#)
- auto-QoS video
 - configuring [54](#)
- class maps
 - creating [81](#)
 - defining the match criteria [302](#)
 - displaying [444](#)
 - defining the CoS value for an incoming packet [313](#)
 - displaying configuration information [569](#)
 - DSCP transparency [327](#)
 - DSCP trusted ports
 - applying DSCP-to-DSCP-mutation map to [315](#)
 - defining DSCP-to-DSCP-mutation map [317](#)
 - egress queues
 - allocating buffers [321](#)
 - defining the CoS output queue threshold map [341](#)
 - defining the DSCP output queue threshold map [343](#)
 - displaying buffer allocations [572](#)
 - displaying CoS output queue threshold map [577](#)
 - displaying DSCP output queue threshold map [577](#)
 - displaying queueing strategy [572](#)
 - displaying queue-set settings [580](#)
 - enabling bandwidth shaping and scheduling [700](#)
 - enabling bandwidth sharing and scheduling [702](#)
 - limiting the maximum output on a port [698](#)
 - mapping a port to a queue-set [395](#)
 - mapping CoS values to a queue and threshold [341](#)
 - mapping DSCP values to a queue and threshold [343](#)
 - ingress queues
 - allocating buffers [331](#)
 - assigning SRR scheduling weights [329](#)
 - defining the CoS input queue threshold map [333](#)
 - defining the DSCP input queue threshold map [335](#)
 - displaying buffer allocations [572](#)
 - displaying CoS input queue threshold map [577](#)
 - displaying DSCP input queue threshold map [577](#)
 - displaying queueing strategy [572](#)
 - displaying settings for [571](#)
 - enabling the priority queue [337](#)
 - mapping CoS values to a queue and threshold [333](#)
 - mapping DSCP values to a queue and threshold [335](#)
 - setting WTD thresholds [339](#)
 - maps
 - defining [317, 333, 335, 341, 343](#)
 - policy maps
 - applying an aggregate policer [379](#)
 - applying to an interface [416, 421](#)
 - creating [381](#)
 - defining policers [311, 377](#)
 - displaying policers [570](#)
 - hierarchical [382](#)
 - policed-DSCP map [317](#)
 - setting DSCP or IP precedence values [419](#)
 - traffic classifications [78](#)
 - trust states [753](#)
 - port trust states [345](#)
 - queues, enabling the expedite [392](#)
 - statistics
 - in-profile and out-of-profile packets [572](#)
 - packets enqueued or dropped [572](#)
 - sent and received CoS values [572](#)

sent and received DSCP values **572**
 trusted boundary for IP phones **345**
 quality of service
 See QoS
 querytime, MVR **352**
 queue-set command **395**

R

radius-server dead-criteria command **396**
 radius-server host command **398**
 rapid per-VLAN spanning-tree plus
 See STP
 rapid PVST+
 See STP
 rcommand command **400**
 re-authenticating IEEE 802.1x-enabled ports **160**
 re-authentication
 periodic **161**
 time between attempts **165**
 receiver ports, MVR **355**
 receiving flow-control packets **184**
 recovery mechanism
 causes **178**
 display **86, 441, 482, 484**
 timer interval **179**
 redundancy for cluster switches **113**
 reload command **402**
 remote command **404**
 remote-span command **406**
 Remote Switched Port Analyzer
 See RSPAN
 rename (boot loader) command **16**
 renew ip dhcp snooping database command **408**
 reset (boot loader) command **17**
 resource templates, displaying **605**
 restricted VLAN
 See dot1x auth-fail vlan
 rmdir (boot loader) command **18**

rmon collection stats command **411**
 root guard, for spanning tree **662**
 RSPAN
 configuring **347**
 filter RSPAN traffic **347**
 remote-span command **406**

S

SDM mismatch mode **618**
 sdm prefer command **412**
 SDM templates
 displaying **605**
 dual IPv4 and IPv6 **412**
 secure ports, limitations **731**
 sending flow-control packets **184**
 service password-recovery command **414**
 service-policy command **416**
 session command **418**
 set (boot loader) command **19**
 set command **419**
 setup command **421**
 setup express command **424**
 show access-lists command **426**
 show archive status command **429**
 show arp access-list command **430**
 show authentication command **431**
 show auto qos command **435**
 show boot command **439**
 show cable-diagnostics tdr command **441**
 show cisp command **443**
 show class-map command **444**
 show cluster candidates command **447**
 show cluster command **445**
 show cluster members command **449**
 show controllers cpu-interface command **451**
 show controllers ethernet-controller command **453**
 show controllers power inline command **463**
 show controllers team command **465**

show controller utilization command **467**
 show dot1x command **472**
 show dtp **476**
 show eap command **478**
 show env command **480**
 show errdisable detect command **482**
 show errdisable flap-values command **483**
 show errdisable recovery command **484**
 show etherchannel command **486**
 show fallback profile command **489**
 show flowcontrol command **491**
 show interfaces command **493**
 show interfaces counters command **501**
 show inventory command **503**
 show ip arp inspection command **504**
 show ip dhcp snooping binding command **509**
 show ip dhcp snooping command **508**
 show ip dhcp snooping database command **511, 513**
 show ip igmp profile command **516**
 show ip igmp snooping command **517, 528**
 show ip igmp snooping groups command **520**
 show ip igmp snooping mrouter command **522**
 show ip igmp snooping querier command **523**
 show ip source binding command **525**
 show ipv6 route updated **536**
 show ip verify source command **526**
 show lacp command **538**
 show link state group command **542**
 show logging onboard command **546**
 show mac access-group command **551**
 show mac address-table address command **554**
 show mac address-table aging time command **555**
 show mac address-table command **552**
 show mac address-table count command **557**
 show mac address-table dynamic command **558**
 show mac address-table interface command **560**
 show mac address-table move update command **562**
 show mac address-table notification command **94, 563, 26**
 show mac address-table static command **565**
 show mac address-table vlan command **567**
 show mls qos aggregate-policer command **570**
 show mls qos command **569**
 show mls qos input-queue command **571**
 show mls qos interface command **572**
 show mls qos maps command **577**
 show mls qos queue-set command **580**
 show mls qos vlan command **581**
 show monitor command **582**
 show mvr command **584**
 show mvr interface command **585**
 show mvr members command **587**
 show network-policy profile command **589**
 show nmfp command **590**
 show pagp command **593**
 show platform acl command **2**
 show platform backup interface command **3**
 show platform etherchannel command **4**
 show platform forward command **5**
 show platform frontend-controller command **7**
 show platform igmp snooping command **8**
 show platform ip unicast command **9**
 show platform layer4op command **10**
 show platform mac-address-table command **11**
 show platform messaging command **12**
 show platform monitor command **13**
 show platform mvr table command **14**
 show platform pm command **15**
 show platform port-asic command **16**
 show platform port-security command **21**
 show platform qos command **22**
 show platform resource-manager command **23**
 show platform snmp counters command **25**
 show platform spanning-tree command **26**
 show platform stack manager command **28**
 show platform stp-instance command **27**
 show platform tb command **31**
 show platform tcam command **33**
 show platform vlan command **35**

- show policy-map command **595**
- show port security command **596**
- show power inline command **598**
- show psp config **603**
- show psp config command **603**
- show psp statistics **604**
- show psp statistics command **604**
- show sdm prefer command **605**
- show setup express command **608**
- show spanning-tree command **609**
- show storm-control command **615**
- show switch command **617**
- show system mtu command **620**
- show trust command **753**
- show udld command **621**
- show version command **624**
- show vlan command **626**
- show vlan command, fields **627**
- show vmps command **629**
- show vtp command **631**
- shutdown command **637**
- shutdown vlan command **638**
- small violation-rate command **639**
- SNMP host, specifying **645**
- SNMP informs, enabling the sending of **641**
- snmp-server enable traps command **641**
- snmp-server host command **645**
- snmp trap mac-notification change command **649**
- SNMP traps
 - enabling MAC address notification trap **649**
 - enabling the MAC address notification feature **297**
 - enabling the sending of **641**
- SoftPhone
 - See Cisco SoftPhone
- software images
 - copying **6**
 - deleting **120**
 - downloading **9**
 - upgrading **6, 9**
- uploading **16**
- software version, displaying **624**
- source ports, MVR **355**
- SPAN
 - configuring **347**
 - debug messages, display **27**
 - filter SPAN traffic **347**
 - sessions
 - add interfaces to **347**
 - start new **347**
 - spanning-tree backbonefast command **651**
 - spanning-tree bpdufilter command **652**
 - spanning-tree bpduguard command **654**
 - spanning-tree cost command **656**
 - spanning-tree etherchannel command **658**
 - spanning-tree extend system-id command **660**
 - spanning-tree guard command **662**
 - spanning-tree link-type command **664**
 - spanning-tree loopguard default command **666**
 - spanning-tree mode command **667**
 - spanning-tree mst configuration command **669**
 - spanning-tree mst cost command **671**
 - spanning-tree mst forward-time command **673**
 - spanning-tree mst hello-time command **674**
 - spanning-tree mst max-age command **675**
 - spanning-tree mst max-hops command **676**
 - spanning-tree mst port-priority command **678**
 - spanning-tree mst pre-standard command **680**
 - spanning-tree mst priority command **681**
 - spanning-tree mst root command **682**
 - spanning-tree portfast (global configuration) command **686**
 - spanning-tree portfast (interface configuration) command **688**
 - spanning-tree port-priority command **684**
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command **690**
- spanning-tree uplinkfast command **691**

- spanning-tree vlan command **693**
 speed command **696**
 srr-queue bandwidth limit command **698**
 srr-queue bandwidth share command **702**
 SSH, configuring version **255**
 stack-mac persistent timer command **704**
 stack member
 access **418**
 number **617, 714**
 provisioning **712**
 reloading **402**
 stacks, switch
 disabling a member **710**
 enabling a member **710**
 MAC address **704**
 provisioning a new member **712**
 reloading **402**
 stack member access **418**
 stack member number **617, 714**
 stack member priority value **617**
 static-access ports, configuring **716**
 statistics, Ethernet group **411**
 sticky learning, enabling **729**
 storm-control command **707**
 STP
 BackboneFast **651**
 counters, clearing **100**
 debug messages, display
 BackboneFast events **74**
 MSTP **77**
 optimized BPDUs handling **76**
 spanning-tree activity **72**
 switch shim **79**
 transmitted and received BPDUs **75**
 UplinkFast **81**
 detection of indirect link failures **651**
 EtherChannel misconfiguration **658**
 extended system ID **660**
 path cost **656**
 protocol modes **667**
 root port
 accelerating choice of new **691**
 loop guard **662**
 preventing from becoming designated **662**
 restricting which can be root **662**
 root guard **662**
 UplinkFast **691**
 root switch
 affects of extended system ID **660, 694**
 hello-time **693**
 interval between BDPU messages **693**
 interval between hello BPDU messages **693**
 max-age **693**
 port priority for selection of **684**
 primary or secondary **693**
 switch priority **693**
 state changes
 blocking to forwarding state **688**
 enabling BPDU filtering **652, 686**
 enabling BPDU guard **654, 686**
 enabling Port Fast **686, 688**
 enabling timer to recover from error state **178**
 forward-delay time **693**
 length of listening and learning states **693**
 shutting down Port Fast-enabled ports **686**
 state information display **609**
 VLAN options **681, 693**
 Switched Port Analyzer
 See SPAN
 switchport access command **716**
 switchport backup interface command **718**
 switchport block command **722**
 switchport host command **724**
 switchport mode command **725**
 switchport nonegotiate command **727**
 switchport port-security aging command **734**
 switchport port-security command **729**
 switchport priority extend command **736**

switchport protected command **738**
 switchports, displaying **493**
 switchport trunk command **740**
 switchport voice vlan command **743**
 switch priority command **710**
 switch provision command **712**
 switch renumber command **714**
 system message logging **283**
 system message logging, save message to flash **284**
 system mtu command **745**
 system resource templates **412**

T

tar files, creating, listing, and extracting **13**
 TDR, running **747**
 Telnet, using to communicate to cluster switches **400**
 temperature information, displaying **480**
 templates, system resources **412**
 test cable-diagnostics tdr command **747**
 traceroute mac command **748**
 traceroute mac ip command **751**
 trunking, VLAN mode **725**
 trunk mode **725**
 trunk ports **725**
 trunks, to non-DTP device **726**
 trusted boundary for QoS **345**
 trusted port states for QoS **345**
 type (boot loader) command **22**

U

UDLD
 aggressive mode **755, 757**
 debug messages, display **89**
 enable globally **755**
 enable per interface **757**
 error recovery timer **178**

message timer **755**
 normal mode **755, 757**
 reset a shutdown interface **759**
 status **621**
 udld command **755**
 udld port command **757**
 udld reset command **759**
 unicast storm control **707**
 UniDirectional Link Detection
 See UDLD
 unknown multicast traffic, preventing **722**
 unknown unicast traffic, preventing **722**
 unset (boot loader) command **23**
 upgrading
 software images
 copying **6**
 downloading **9**
 monitoring status of **429**
 UplinkFast, for STP **691**
 usb-inactivity-timeout (console configuration) command **760**
 user EXEC mode **2, 3**

V

version (boot loader) command **25**
 version mismatch mode **617**
 vlan (global configuration) command **761**
 VLAN configuration
 rules **764**
 saving **761**
 VLAN configuration mode
 description **5**
 summary **3**
 VLAN ID range **761**
 VLAN Query Protocol
 See VQP
 VLANs
 adding **761**

configuring **761**
 debug messages, display
 ISL **85**
 VLAN IOS file system error tests **84**
 VLAN manager activity **82**
 VTP **87**
 displaying configurations **626**
 enabling guest VLAN supplicant **135, 146, 183**
 extended-range **761**
 MAC addresses
 displaying **567**
 number of **557**
 media types **763**
 normal-range **761**
 restarting **638**
 saving the configuration **761**
 shutting down **638**
 SNMP traps for VTP **643, 646**
 suspending **638**

VLAN Trunking Protocol
 See VTP

VM mode **617**

VMPS
 configuring servers **769**
 displaying **629**
 error recovery timer **179**
 reconfirming dynamic VLAN assignments **766**

vmpls reconfirm (global configuration) command **767**
 vmpls reconfirm (privileged EXEC) command **766**
 vmpls retry command **768**
 vmpls server command **769**

voice VLAN
 configuring **743**
 setting port priority **736**

VQP
 and dynamic-access ports **717**
 clearing client statistics **102**
 displaying information **629**
 per-server retry count **768**

reconfirmation interval **767**
 reconfirming dynamic VLAN assignments **766**

VTP
 changing characteristics **771**
 clearing pruning counters **103**
 configuring
 domain name **771**
 file name **771**
 mode **771**
 password **772**
 counters display fields **632**
 displaying information **631**
 enabling
 pruning **772**
 Version 2 **772**
 enabling per port **776**
 mode **771**
 pruning **772**
 saving the configuration **761**
 statistics **631**
 status **631**
 status display fields **634**
 vtp (global configuration) command **771**
 vtp interface configuration) command **776**
 vtp primary command **777**

