



INDEX

A

aaa accounting dot1x command **2-1**
aaa authentication dot1x command **2-3**
aaa authorization network command **2-5**
AAA methods **2-3**
abort command **2-670**
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP **2-113**
 MAC, displaying **2-452**
access list, IPv6 **2-165**
access map configuration mode **2-223**
access mode **2-615**
access ports **2-615**
ACEs **2-58, 2-293**
ACLs
 deny **2-56**
 displaying **2-336**
 for non-IP protocols **2-203**
 IP **2-113**
 matching **2-223**
 on Layer 2 interfaces **2-113**
 permit **2-291**
action command **2-6**
address aliasing **2-274**
aggregate-port learner **2-279**
allowed VLANs **2-635**
apply command **2-670**
archive download-sw command **2-8**

archive tar command **2-11**
archive upload-sw command **2-14**
audience **xvii**
authentication failed VLAN
 See dot1x auth-fail vlan
auth-fail max-attempts
 See dot1x auth-fail max-attempts
auth-fail vlan
 See dot1x auth-fail vlan
authorization state of controlled port **2-82**
autonegotiation of duplex mode **2-92**
auto qos voip command **2-16**

B

BackboneFast, for STP **2-554**
backup interfaces
 displaying **2-389**
boot (boot loader) command **A-2**
boot boothlp command **2-20**
boot config-file command **2-21**
boot enable-break command **2-22**
boot helper command **2-23**
boot helper-config file command **2-24**
booting
 Cisco IOS image **2-27**
 displaying environment variables **2-343**
 interrupting **2-22**
 manually **2-25**
boot loader
 accessing **A-1**
 booting
 Cisco IOS image **A-2**

boot loader (continued)

- helper image **2-23**

directories

- creating **A-15**
- displaying a list of **A-7**
- removing **A-19**

displaying

- available commands **A-12**
- memory heap utilization **A-13**
- version **A-26**

environment variables

- described **A-20**
- displaying settings **A-20**
- location of **A-21**
- setting **A-20**
- unsettting **A-24**

files

- copying **A-5**
- deleting **A-6**
- displaying a list of **A-7**
- displaying the contents of **A-4, A-16, A-23**
- renaming **A-17**

file system

- formatting **A-10**
- initializing flash **A-9**
- running a consistency check **A-11**

resetting the system **A-18**boot manual command **2-25**boot private-config-file command **2-26**boot system command **2-27**

BPDU filtering, for spanning tree **2-555, 2-588**

BPDU guard, for spanning tree **2-557, 2-588**

break key detection **2-323**

broadcast storm control **2-606**

CDP, enabling protocol tunneling for **2-183**

channel-group command **2-28**

channel-protocol command **2-31**

Cisco SoftPhone

- auto-QoS configuration **2-16**
- trusting packets sent from **2-265**

class command **2-32**class-map command **2-34**

class maps

- creating **2-34**
- defining the match criteria **2-225**
- displaying **2-347**

class of service

See CoS

clear dot1x command **2-36**

clear eap sessions command **2-37**

clear errdisable interface **2-38**

clear ipc command **2-39**

clear ip dhcp snooping database command **2-41**

clear l2protocol-tunnel counters command **2-40**

clear lacp command **2-43**

clear mac address-table command **2-44, 2-45**

clear pagp command **2-46**

clear port-security command **2-47**

clear spanning-tree counters command **2-49**

clear spanning-tree detected-protocols command **2-50**

clear vmps statistics command **2-51**

clear vtp counters command **2-52**

clusters

SNMP trap **2-545**

command modes defined **1-1**

configuration, initial

See getting started guide and hardware installation guide

configuration files

password recovery disable considerations **A-1**

specifying the name **2-21, 2-26**

configuring multiple interfaces **2-109**

C

cat (boot loader) command **A-4**

caution, description **xviii**

- config-vlan mode
 commands **2-656**
 description **1-4**
 entering **2-655**
 summary **1-2**
- conventions
 command **xvii**
 for examples **xviii**
 publication **xvii**
 text **xvii**
- copy (boot loader) command **A-5**
- CoS
 assigning default value to incoming packets **2-235**
 assigning to Layer 2 protocol packets **2-186**
 overriding the incoming value **2-235**
- CoS-to-DSCP map **2-239**
- CPU ASIC statistics, displaying **2-348**
- crashinfo files **2-102**
-
- D**
- debug auto qos command **B-2**
 debug backup command **B-4**
 debug dot1x command **B-5**
 debug dtp command **B-6**
 debug eap command **B-7**
 debug etherchannel command **B-8**
 debug interface command **B-11**
 debug ip dhcp snooping command **B-9**
 debug ip igmp filter command **B-12**
 debug ip igmp max-groups command **B-13**
 debug ip igmp snooping command **B-14**
 debug ip verify source packet command **B-10**
 debug lacp command **B-15**
 debug mac-notification command **B-16**
 debug matm command **B-17**
 debug matm move update command **B-18**
 debug monitor command **B-19**
 debug mvrdbg command **B-20**
- debug nvram command **B-21**
 debug pagp command **B-22**
 debug platform acl command **B-23**
 debug platform backup interface command **B-24**
 debug platform cli-redirection main command **B-25**
 debug platform cpu-queues command **B-26**
 debug platform dot1x command **B-28**
 debug platform etherchannel command **B-29**
 debug platform fallback-bridging command **B-30**
 debug platform forw-tcam command **B-31**
 debug platform ip arp inspection command **B-32**
 debug platform ipc command **B-40**
 debug platform ip dhcp command **B-33**
 debug platform ip igmp snooping command **B-34**
 debug platform ip multicast command **B-36**
 debug platform ip unicast command **B-38**
 debug platform led command **B-41**
 debug platform matm command **B-42**
 debug platform messaging application command **B-43**
 debug platform phy command **B-44**
 debug platform pm command **B-46**
 debug platform port-asic command **B-48**
 debug platform port-security command **B-49**
 debug platform qos-acl-tcam command **B-50**
 debug platform remote-commands command **B-51**
 debug platform resource-manager command **B-52**
 debug platform snmp command **B-53**
 debug platform span command **B-54**
 debug platform supervisor-asic command **B-55**
 debug platform sw-bridge command **B-56**
 debug platform tcam command **B-57**
 debug platform udld command **B-60**
 debug platform vlan command **B-61**
 debug pm command **B-62**
 debug port-security command **B-64**
 debug qos-manager command **B-65**
 debug spanning-tree backbonefast command **B-68**
 debug spanning-tree bpdu command **B-69**
 debug spanning-tree bpdu-opt command **B-70**

- debug spanning-tree command **B-66**
 debug spanning-tree mstp command **B-71**
 debug spanning-tree switch command **B-73**
 debug spanning-tree uplinkfast command **B-75**
 debug sw-vlan command **B-76**
 debug sw-vlan ifs command **B-78**
 debug sw-vlan notification command **B-79**
 debug sw-vlan vtp command **B-80**
 debug udld command **B-82**
 debug vqpc command **B-84**
 define interface-range command **2-53**
 delete (boot loader) command **A-6**
 delete command **2-55**
 deny command **2-56**
 detect mechanism, causes **2-93**
 device manager requirements **xviii**
DHCP snooping
 accepting untrusted packets from edge switch **2-128**
 enabling
 on a VLAN **2-134**
 option 82 **2-126, 2-128**
 trust on an interface **2-132**
 error recovery timer **2-99**
 rate limiting **2-131**
DHCP snooping binding database
 binding file, configuring **2-124**
 bindings
 adding **2-122**
 deleting **2-122**
 displaying **2-404**
 clearing database agent statistics **2-41**
 database agent, configuring **2-124**
 displaying
 binding entries **2-404**
 database agent status **2-406, 2-408**
 renewing **2-317**
dir (boot loader) command **A-7**
directories, deleting **2-55**
documentation, related **xviii**
 document conventions **xvii**
 domain name, VTP **2-681, 2-685**
 dot1x auth-fail max-attempts **2-61**
 dot1x auth-fail vlan **2-63**
 dot1x command **2-59**
 dot1x control-direction command **2-65**
 dot1x critical global configuration command **2-67**
 dot1x critical interface configuration command **2-69**
 dot1x default command **2-71**
 dot1x fallback command **2-72**
 dot1x guest-vlan command **2-73**
 dot1x host-mode command **2-75**
 dot1x initialize command **2-76**
 dot1x mac-auth-bypass command **2-77**
 dot1x max-reauth-req command **2-79**
 dot1x max-req command **2-80**
 dot1x pae command **2-81**
 dot1x port-control command **2-82**
 dot1x re-authenticate command **2-84**
 dot1x reauthentication command **2-85**
 dot1x test eapol-capable command **2-86**
 dot1x test timeout command **2-87**
 dot1x timeout command **2-88**
 dropping packets, with ACL matches **2-6**
 drop threshold, Layer 2 protocol tunneling **2-183**
 DSCP-to-CoS map **2-239**
 DSCP-to-DSCP-mutation map **2-239**
 DTP **2-616**
 DTP flap
 error detection for **2-93**
 error recovery timer **2-99**
 DTP negotiation **2-620**
 dual IPv4 and IPv6 templates **2-285**
 dual-purpose uplink ports
 selecting the type **2-229**
 duplex command **2-91**
 dynamic-access ports
 configuring **2-611**
 restrictions **2-611**

dynamic ARP inspection

 ARP ACLs

 permit packets **2-283**

 error detection for **2-93**

dynamic auto VLAN membership mode **2-615**

dynamic desirable VLAN membership mode **2-615**

Dynamic Host Configuration Protocol (DHCP)

 See DHCP snooping

Dynamic Trunking Protocol

 See DTP

E

EAP-request/identity frame

 maximum number to send **2-80**

 response time before retransmitting **2-88**

encapsulation methods **2-635**

environment variables, displaying **2-343**

errdisable detect cause command **2-93**

errdisable detect cause small-frame command **2-96**

errdisable recovery cause small-frame **2-98**

errdisable recovery command **2-99**

error conditions, displaying **2-375**

error disable detection **2-93**

error-disabled interfaces, displaying **2-389**

EtherChannel

 assigning Ethernet interface to channel group **2-28**

 creating port-channel logical interface **2-107**

 debug EtherChannel/PAgP, display **B-8**

 debug platform-specific events, display **B-29**

 displaying **2-379**

 enabling Layer 2 protocol tunneling for

 LACP **2-184**

 PAgP **2-184**

 UDLD **2-184**

 interface information, displaying **2-389**

 LACP

 clearing channel-group information **2-43**

 debug messages, display **B-15**

EtherChannel (continued)

 displaying **2-442**

 modes **2-28**

 port priority for hot-standby ports **2-187**

 restricting a protocol **2-31**

 system priority **2-189**

 load-distribution methods **2-301**

 PAgP

 aggregate-port learner **2-279**

 clearing channel-group information **2-46**

 debug messages, display **B-22**

 displaying **2-497**

 error detection for **2-93**

 error recovery timer **2-99**

 learn method **2-279**

 modes **2-28**

 physical-port learner **2-279**

 priority of interface for transmitted traffic **2-281**

 Ethernet controller, internal register display **2-350**

 Ethernet statistics, collecting **2-319**

 examples, conventions for **xviii**

 exception crashinfo command **2-102**

 exit command **2-670**

 extended-range VLANs

 and allowed VLAN list **2-635**

 and pruning-eligible list **2-635**

 configuring **2-655**

 extended system ID for STP **2-563**

F

fallback profile command **2-103**

fallback profiles

 displaying **2-382**

file name, VTP **2-681**

files, deleting **2-55**

flash_init (boot loader) command **A-9**

Flex Links

 displaying **2-389**

flowcontrol command **2-105**
 format (boot loader) command **A-10**
 forwarding packets, with ACL matches **2-6**
 forwarding results, display **C-6**
 frame forwarding information, displaying **C-6**
 fsck (boot loader) command **A-11**

G

global configuration mode **1-2, 1-3**

H

hardware ACL statistics **2-336**
 help (boot loader) command **A-12**
 hierarchical policy maps **2-299**
 host connection, port configuration **2-614**
 host ports, private VLANs **2-618**

I

IEEE 802.1Q trunk ports and native VLANs **2-672**
 IEEE 802.1Q tunnel ports
 configuring **2-615**
 displaying **2-362**
 limitations **2-616**
 IEEE 802.1x
 and switchport modes **2-616**
 violation error recovery **2-99**
 See also port-based authentication
 IEEE 802.1X Port Based Authentication
 enabling guest VLAN supplicant **2-62, 2-72, 2-104**
 IGMP filters
 applying **2-137**
 debug messages, display **B-12**
 IGMP groups, setting maximum **2-139**
 IGMP maximum groups, debugging **B-13**

IGMP profiles
 creating **2-141**
 displaying **2-411**
 IGMP snooping
 adding ports as a static member of a group **2-157**
 displaying **2-412, 2-417, 2-419**
 enabling **2-143**
 enabling the configurable-leave timer **2-145**
 enabling the Immediate-Leave feature **2-154**
 flooding query count **2-151**
 interface topology change notification behavior **2-153**
 multicast table **2-415**
 querier **2-147**
 query solicitation **2-151**
 report suppression **2-149**
 switch topology change notification behavior **2-151**
 images
 See software images
 Immediate-Leave feature, MVR **2-276**
 Immediate-Leave processing
 IPv6 **2-179**
 immediate-leave processing **2-154**
 initial configuration
 See getting started guide and hardware installation guide
 interface configuration mode **1-2, 1-4**
 interface port-channel command **2-107**
 interface range command **2-109**
 interface-range macros **2-53**
 interfaces
 assigning Ethernet interface to channel group **2-28**
 configuring **2-91**
 configuring multiple **2-109**
 creating port-channel logical **2-107**
 debug messages, display **B-11**
 disabling **2-541**
 displaying the MAC address table **2-464**
 restarting **2-541**
 interface speed, configuring **2-598**

- interface vlan command **2-111**
 internal registers, displaying **2-350, 2-358**
 Internet Group Management Protocol
 See IGMP
 invalid GBIC
 error detection for **2-93**
 error recovery timer **2-99**
 ip access-group command **2-113**
 ip address command **2-116**
 IP addresses, setting **2-116**
 IP address matching **2-223**
 ip admission command **2-118**
 ip admission name proxy http command **2-119**
 IP DHCP snooping
 See DHCP snooping
 ip dhcp snooping binding command **2-122**
 ip dhcp snooping command **2-121**
 ip dhcp snooping database command **2-124**
 ip dhcp snooping information option allow-untrusted command **2-128**
 ip dhcp snooping information option command **2-126**
 ip dhcp snooping information option format remote-id command **2-130**
 ip dhcp snooping limit rate command **2-131**
 ip dhcp snooping trust command **2-132**
 ip dhcp snooping verify command **2-133**
 ip igmp snooping vlan command **2-134**
 ip dhcp snooping vlan information option format-type circuit-id string command **2-135**
 ip igmp filter command **2-137**
 ip igmp max-groups command **2-139**
 ip igmp profile command **2-141**
 ip igmp snooping command **2-143**
 ip igmp snooping last-member-query-interval command **2-145**
 ip igmp snooping querier command **2-147**
 ip igmp snooping report-suppression command **2-149**
 ip igmp snooping tcn command **2-151**
 ip igmp snooping tcn flood command **2-153**
 ip igmp snooping vlan immediate-leave command **2-154**
 ip igmp snooping vlan mrouter command **2-155**
 ip igmp snooping vlan static command **2-157**
 IP multicast addresses **2-273**
 IP phones
 auto-QoS configuration **2-16**
 trusting packets sent from **2-265**
 IP-precedence-to-DSCP map **2-239**
 ip snap forwarding command **2-159**
 ip source binding command **2-160**
 IP source guard
 disabling **2-164**
 displaying
 binding entries **2-421**
 configuration **2-423**
 dynamic binding entries only **2-404**
 enabling **2-164**
 static IP source bindings **2-160**
 ip ssh command **2-162**
 ipv6 access-list command **2-165**
 ipv6 mld snooping command **2-167**
 ipv6 mld snooping last-listener-query count command **2-169**
 ipv6 mld snooping last-listener-query-interval command **2-171**
 ipv6 mld snooping listener-message-suppression command **2-173**
 ipv6 mld snooping robustness-variable command **2-175**
 ipv6 mld snooping tcn command **2-177**
 ipv6 mld snooping vlan command **2-179**
 IPv6 SDM template **2-320**
 ipv6 traffic-filter command **2-181**
 ip verify source command **2-164**
-
- J**
- jumbo frames
 See MTU

L

l2protocol-tunnel command **2-183**
 l2protocol-tunnel cos command **2-186**
 LACP
 See EtherChannel
 lacp port-priority command **2-187**
 lacp system-priority command **2-189**
 Layer 2 mode, enabling **2-609**
 Layer 2 protocol ports, displaying **2-439**
 Layer 2 protocol-tunnel
 error detection for **2-93**
 error recovery timer **2-99**
 Layer 2 protocol tunnel counters **2-40**
 Layer 2 protocol tunneling error recovery **2-184**
 Layer 2 traceroute
 IP addresses **2-646**
 MAC addresses **2-643**
 Layer 3 mode, enabling **2-609**
 line configuration mode **1-2, 1-5**
 Link Aggregation Control Protocol
 See EtherChannel
 link flap
 error detection for **2-93**
 error recovery timer **2-99**
 link state group command **2-195**
 link state track command **2-197**
 load-distribution methods for EtherChannel **2-301**
 location (global configuration) command **2-191**
 location (interface configuration) command **2-193**
 logging event command **2-198**
 logging file command **2-199**
 logical interface **2-107**
 loopback error
 detection for **2-93**
 recovery timer **2-99**
 loop guard, for spanning tree **2-564, 2-568**

M

mac access-group command **2-201**
 MAC access-groups, displaying **2-452**
 MAC access list configuration mode **2-203**
 mac access-list extended command **2-203**
 MAC access lists **2-56**
 MAC addresses
 displaying
 aging time **2-458**
 all **2-456**
 dynamic **2-462**
 MAC address-table move updates **2-466**
 notification settings **2-468**
 number of addresses in a VLAN **2-460**
 per interface **2-464**
 per VLAN **2-472**
 static **2-470**
 static and dynamic entries **2-454**
 dynamic
 aging time **2-205**
 deleting **2-44**
 displaying **2-462**
 enabling MAC address notification **2-208**
 enabling MAC address-table move update **2-206**
 matching **2-223**
 static
 adding and removing **2-210**
 displaying **2-470**
 dropping on an interface **2-211**
 tables **2-456**
 mac address notification, debugging **B-16**
 mac address-table aging-time **2-201, 2-223**
 mac address-table aging-time command **2-205**
 mac address-table move update command **2-206**
 mac address-table notification command **2-208**
 mac address-table static command **2-210**
 mac address-table static drop command **2-211**
 macro apply command **2-213**

- macro description command **2-216**
 macro global command **2-217**
 macro global description command **2-220**
 macro name command **2-221**
 macros
 adding a description **2-216**
 adding a global description **2-220**
 applying **2-217**
 creating **2-221**
 displaying **2-499**
 interface range **2-53, 2-109**
 specifying parameter values **2-217**
 tracing **2-217**
 manual
 audience **xvii**
 purpose of **xvii**
 maps
 QoS
 defining **2-239**
 displaying **2-482**
 VLAN
 creating **2-667**
 defining **2-223**
 displaying **2-531**
 match (access-map configuration) command **2-223**
 match (class-map configuration) command **2-225**
 maximum transmission unit
 See MTU
 mdix auto command **2-227**
 MDL snooping
 displaying **2-433**
 media-type command **2-229**
 memory (boot loader) command **A-13**
 mkdir (boot loader) command **A-15**
 MLD snooping
 configuring **2-173, 2-175**
 configuring queries **2-169, 2-171**
 configuring topology change notification **2-177**
 displaying **2-431, 2-435, 2-437**
MLD snooping (continued)
 enabling **2-167**
 MLD snooping on a VLAN
 enabling **2-179**
 mls qos aggregate-policer command **2-233**
 mls qos command **2-231**
 mls qos cos command **2-235**
 mls qos dscp-mutation command **2-237**
 mls qos map command **2-239**
 mls qos queue-set output buffers command **2-243**
 mls qos queue-set output threshold command **2-245**
 mls qos rewrite ip dscp command **2-247**
 mls qos srr-queue input bandwidth command **2-249**
 mls qos srr-queue input buffers command **2-251**
 mls qos-srr-queue input cos-map command **2-253**
 mls qos srr-queue input dscp-map command **2-255**
 mls qos srr-queue input priority-queue command **2-257**
 mls qos srr-queue input threshold command **2-259**
 mls qos-srr-queue output cos-map command **2-261**
 mls qos srr-queue output dscp-map command **2-263**
 mls qos trust command **2-265**
 mls qos vlan-based command **2-267**
 mode, MVR **2-273**
 Mode button, and password recovery **2-323**
 modes, commands **1-1**
 monitor session command **2-268**
 more (boot loader) command **A-16**
 MSTP
 displaying **2-512**
 interoperability **2-50**
 link type **2-566**
 MST region
 aborting changes **2-572**
 applying changes **2-572**
 configuration name **2-572**
 configuration revision number **2-572**
 current or pending display **2-572**
 displaying **2-512**
 MST configuration mode **2-572**

MSTP (continued)

VLANs-to-instance mapping **2-572**
 path cost **2-574**
 protocol mode **2-570**
 restart protocol migration process **2-50**
 root port
 loop guard **2-564**
 preventing from becoming designated **2-564**
 restricting which can be root **2-564**
 root guard **2-564**
 root switch
 affects of extended system ID **2-563**
 hello-time **2-577, 2-584**
 interval between BDPU messages **2-578**
 interval between hello BPDU messages **2-577, 2-584**
 max-age **2-578**
 maximum hop count before discarding BPDU **2-579**
 port priority for selection of **2-580**
 primary or secondary **2-584**
 switch priority **2-583**
 state changes
 blocking to forwarding state **2-590**
 enabling BPDU filtering **2-555, 2-588**
 enabling BPDU guard **2-557, 2-588**
 enabling Port Fast **2-588, 2-590**
 forward-delay time **2-576**
 length of listening and learning states **2-576**
 rapid transition to forwarding **2-566**
 shutting down Port Fast-enabled ports **2-588**
 state information display **2-511**

MTU

configuring size **2-640**
 displaying global setting **2-519**

Multicast Listener Discovery

See MLD

multicast group address, MVR **2-276**
 multicast groups, MVR **2-274**

Multicast Listener Discovery

See MLD

multicast router learning method **2-155**

multicast router ports

 IPv6 **2-179**

multicast router ports, configuring **2-155**

multicast storm control **2-606**

multicast VLAN, MVR **2-273**

multicast VLAN registration

 See MVR

multiple hosts on authorized port **2-75**

Multiple Spanning Tree Protocol

 See MSTP

MVR

 and address aliasing **2-274**

 configuring **2-273**

 configuring interfaces **2-276**

 debug messages, display **B-20**

 displaying **2-491**

 displaying interface information **2-493**

 members, displaying **2-495**

 mvr (global configuration) command **2-273**

 mvr (interface configuration) command **2-276**

 mvr vlan group command **2-277**

N

native VLANs **2-635**

native VLAN tagging **2-672**

nonegotiate

 DTP messaging **2-620**

nonegotiate, speed **2-598**

non-IP protocols

 denying **2-56**

 forwarding **2-291**

non-IP traffic access lists **2-203**

non-IP traffic forwarding

 denying **2-56**

 permitting **2-291**

normal-range VLANs **2-655, 2-661**

note, description **xviii**

no vlan command **2-655, 2-665**

O

online diagnostics

displaying

configured boot-up coverage level **2-362**

current scheduled tasks **2-362**

event logs **2-362**

supported test suites **2-362**

test ID **2-362**

test results **2-362**

test statistics **2-362**

P

PAgP

See EtherChannel

pagp learn-method command **2-279**

pagp port-priority command **2-281**

password, VTP **2-681, 2-685**

password-recovery mechanism, enabling and disabling **2-323**

permit (ARP access-list configuration) command **2-283**

permit (IPv6) command **2-285**

permit (MAC access-list configuration) command **2-291**

per-VLAN spanning-tree plus

See STP

physical-port learner **2-279**

PID, displaying **2-401**

PIM-DVMRP, as multicast router learning method **2-155**

police aggregate command **2-296**

police command **2-294**

policed-DSCP map **2-239**

policy-map command **2-298**

policy maps

applying to an interface **2-326, 2-331**

policy maps (continued)

creating **2-298**

displaying **2-502**

hierarchical **2-299**

policers

displaying **2-475**

for a single class **2-294**

for multiple classes **2-233, 2-296**

policed-DSCP map **2-239**

traffic classification

defining the class **2-32**

defining trust states **2-648**

setting DSCP or IP precedence values **2-329**

Port Aggregation Protocol

See EtherChannel

port-based authentication

AAA method list **2-3**

debug messages, display **B-5**

enabling IEEE 802.1x

globally **2-59**

per interface **2-82**

guest VLAN **2-73**

host modes **2-75**

IEEE 802.1x AAA accounting methods **2-1**

initialize an interface **2-76, 2-87**

MAC authentication bypass **2-77**

manual control of authorization state **2-82**

multiple hosts on authorized port **2-75**

PAE as authenticator **2-81**

periodic re-authentication

enabling **2-85**

time between attempts **2-88**

quiet period between failed authentication exchanges **2-88**

re-authenticating IEEE 802.1x-enabled ports **2-84**

resetting configurable IEEE 802.1x parameters **2-71**

switch-to-authentication server retransmission time **2-88**

switch-to-client frame-retransmission number **2-79 to 2-80**

policy maps (continued)

switch-to-client retransmission time **2-88**
 test for IEEE 802.1x readiness **2-86**
 port-channel load-balance command **2-301**
 Port Fast, for spanning tree **2-590**
 port ranges, defining **2-53**
 ports, debugging **B-62**
 ports, protected **2-633**
 port security
 aging **2-627**
 debug messages, display **B-64**
 enabling **2-622**
 violation error recovery **2-99**
 port trust states for QoS **2-265**
 port types, MVR **2-276**
 priority-queue command **2-303**
 private-vlan command **2-305**
 private-vlan mapping command **2-308**
 private VLANs
 association **2-631**
 configuring **2-305**
 configuring ports **2-618**
 displaying **2-525**
 host ports **2-618**
 mapping
 configuring **2-631**
 displaying **2-389**
 promiscuous ports **2-618**
 privileged EXEC mode **1-2, 1-3**
 product identification information, displaying **2-401**
 promiscuous ports, private VLANs **2-618**
 protected ports, displaying **2-395**
 pruning
 VLANs **2-635**
 VTP
 displaying interface information **2-389**
 enabling **2-681, 2-685**
 pruning-eligible VLAN list **2-637**
 PVST+

See STP

Q

QoS
 auto-QoS
 configuring **2-16**
 debug messages, display **B-2**
 displaying **2-340**
 class maps
 creating **2-34**
 defining the match criteria **2-225**
 displaying **2-347**
 defining the CoS value for an incoming packet **2-235**
 displaying configuration information **2-340, 2-474**
 DSCP transparency **2-247**
 DSCP trusted ports
 applying DSCP-to-DSCP-mutation map to **2-237**
 defining DSCP-to-DSCP-mutation map **2-239**
 egress queues
 allocating buffers **2-243**
 defining the CoS output queue threshold map **2-261**
 defining the DSCP output queue threshold map **2-263**
 displaying buffer allocations **2-478**
 displaying CoS output queue threshold map **2-482**
 displaying DSCP output queue threshold map **2-482**
 displaying queueing strategy **2-478**
 displaying queue-set settings **2-485**
 enabling bandwidth shaping and scheduling **2-602**
 enabling bandwidth sharing and scheduling **2-604**
 limiting the maximum output on a port **2-600**
 mapping a port to a queue-set **2-310**
 mapping CoS values to a queue and threshold **2-261**

QoS (continued)

mapping DSCP values to a queue and threshold **2-263**
 setting maximum and reserved memory allocations **2-245**
 setting WTD thresholds **2-245**
 enabling **2-231**
 ingress queues
 allocating buffers **2-251**
 assigning SRR scheduling weights **2-249**
 defining the CoS input queue threshold map **2-253**
 defining the DSCP input queue threshold map **2-255**
 displaying buffer allocations **2-478**
 displaying CoS input queue threshold map **2-482**
 displaying DSCP input queue threshold map **2-482**
 displaying queueing strategy **2-478**
 displaying settings for **2-476**
 enabling the priority queue **2-257**
 mapping CoS values to a queue and threshold **2-253**
 mapping DSCP values to a queue and threshold **2-255**
 setting WTD thresholds **2-259**
 maps
 defining **2-239, 2-253, 2-255, 2-261, 2-263**
 displaying **2-482**
 policy maps
 applying an aggregate policer **2-296**
 applying to an interface **2-326, 2-331**
 creating **2-298**
 defining policers **2-233, 2-294**
 displaying policers **2-475**
 displaying policy maps **2-502**
 hierarchical **2-299**
 policed-DSCP map **2-239**
 setting DSCP or IP precedence values **2-329**
 traffic classifications **2-32**
 trust states **2-648**

QoS (continued)

port trust states **2-265**
 queues, enabling the expedite **2-303**
 statistics
 in-profile and out-of-profile packets **2-478**
 packets enqueued or dropped **2-478**
 sent and received CoS values **2-478**
 sent and received DSCP values **2-478**
 trusted boundary for IP phones **2-265**
 VLAN-based **2-267**
 quality of service
 See QoS
 querytime, MVR **2-273**
 queue-set command **2-310**

R

radius-server dead-criteria command **2-311**
 radius-server host command **2-313**
 rapid per-VLAN spanning-tree plus
 See STP
 rapid PVST+
 See STP
 re-authenticating IEEE 802.1x-enabled ports **2-84**
 re-authentication
 periodic **2-85**
 time between attempts **2-88**
 receiver ports, MVR **2-276**
 receiving flow-control packets **2-105**
 recovery mechanism
 causes **2-99**
 display **2-38, 2-345, 2-373, 2-377**
 timer interval **2-100**
 remote-span command **2-315**
 Remote Switched Port Analyzer
 See RSPAN
 rename (boot loader) command **A-17**
 renew ip dhcp snooping database command **2-317**

- requirements
 device manager **xviii**
 reset (boot loader) command **A-18**
 reset command **2-670**
 resource templates, displaying **2-507**
 restricted VLAN
 See dot1x auth-fail vlan
 rmdir (boot loader) command **A-19**
 rmon collection stats command **2-319**
 root guard, for spanning tree **2-564**
 routed ports
 IP addresses on **2-117**
 number supported **2-117**
 RSPAN
 configuring **2-268**
 displaying **2-488**
 filter RSPAN traffic **2-268**
 remote-span command **2-315**
 sessions
 add interfaces to **2-268**
 displaying **2-488**
 start new **2-268**
-
- S**
- sdm prefer command **2-320**
 SDM templates
 allowed resources **2-321**
 displaying **2-507**
 dual IPv4 and IPv6 **2-320**
 secure ports, limitations **2-624**
 sending flow-control packets **2-105**
 service password-recovery command **2-323**
 service-policy command **2-326**
 set (boot loader) command **A-20**
 set command **2-329**
 setup command **2-331**
 setup express command **2-334**
 show access-lists command **2-336**
- show archive status command **2-339**
 show auto qos command **2-340**
 show boot command **2-343**
 show cable-diagnostics tdr command **2-345**
 show changes command **2-670**
 show class-map command **2-347**
 show controllers cpu-interface command **2-348**
 show controllers ethernet-controller command **2-350**
 show controllers team command **2-358**
 show controller utilization command **2-360**
 show current command **2-670**
 show dot1q-tunnel command **2-362**
 show dot1x command **2-363**
 show dtp **2-367**
 show eap command **2-369**
 show env command **2-372**
 show errdisable detect command **2-373**
 show errdisable flap-values command **2-375**
 show errdisable recovery command **2-377**
 show etherchannel command **2-379**
 show fallback profile command **2-382**
 show flowcontrol command **2-384**
 show idprom command **2-386**
 show interfaces command **2-389**
 show interfaces counters command **2-398**
 show inventory command **2-401**
 show ipc command **2-425**
 show ip dhcp snooping binding command **2-404**
 show ip dhcp snooping command **2-403**
 show ip dhcp snooping database command **2-406, 2-408**
 show ip igmp profile command **2-411**
 show ip igmp snooping address command **2-433**
 show ip igmp snooping command **2-412, 2-431**
 show ip igmp snooping groups command **2-415**
 show ip igmp snooping mrouter command **2-417, 2-435**
 show ip igmp snooping querier command **2-419, 2-437**
 show ip source binding command **2-421**
 show ipv6 access-list command **2-429**
 show ip verify source command **2-423**

- show l2protocol-tunnel command **2-439**
 show lacp command **2-442**
 show link state group command **2-448, 2-450**
 show location **2-446**
 show mac access-group command **2-452**
 show mac address-table address command **2-456**
 show mac address-table aging time command **2-458**
 show mac address-table command **2-454**
 show mac address-table count command **2-460**
 show mac address-table dynamic command **2-462**
 show mac address-table interface command **2-464**
 show mac address-table move update command **2-466**
 show mac address-table notification command **2-45, 2-468, B-18**
 show mac address-table static command **2-470**
 show mac address-table vlan command **2-472**
 show mls qos aggregate-policer command **2-475**
 show mls qos command **2-474**
 show mls qos input-queue command **2-476**
 show mls qos interface command **2-478**
 show mls qos maps command **2-482**
 show mls qos queue-set command **2-485**
 show mls qos vlan command **2-487**
 show monitor command **2-488**
 show mvr command **2-491**
 show mvr interface command **2-493**
 show mvr members command **2-495**
 show pagp command **2-497**
 show parser macro command **2-499**
 show platform acl command **C-2**
 show platform backup interface command **C-3**
 show platform configuration command **C-4**
 show platform etherchannel command **C-5**
 show platform forward command **C-6**
 show platform igmp snooping command **C-8**
 show platform ipc trace command **C-15**
 show platform ip multicast command **C-10**
 show platform ip unicast command **C-11**
 show platform ipv6 unicast command **C-16**
 show platform layer4op command **C-18**
 show platform mac-address-table command **C-19**
 show platform messaging command **C-20**
 show platform monitor command **C-21**
 show platform mvr table command **C-22**
 show platform pm command **C-23**
 show platform port-asic command **C-24**
 show platform port-security command **C-30**
 show platform qos command **C-31**
 show platform resource-manager command **C-32**
 show platform snmp counters command **C-34**
 show platform spanning-tree command **C-35**
 show platform stp-instance command **C-36**
 show platform tcam command **C-37**
 show platform vlan command **C-40**
 show policy-map command **2-502**
 show port security command **2-504**
 show proposed command **2-670**
 show sdm prefer command **2-507**
 show setup express command **2-510**
 show spanning-tree command **2-511**
 show storm-control command **2-517**
 show system mtu command **2-519**
 show trust command **2-648**
 show udld command **2-520**
 show version command **2-523**
 show vlan access-map command **2-531**
 show vlan command **2-525**
 show vlan command, fields **2-527**
 show vlan filter command **2-532**
 show vmps command **2-533**
 show vtp command **2-536**
 shutdown command **2-541**
 shutdown threshold, Layer 2 protocol tunneling **2-183**
 shutdown vlan command **2-542**
 small violation-rate command **2-543**
 Smartports macros
 See macros
 SNMP host, specifying **2-548**

- SNMP informs, enabling the sending of **2-545**
 snmp-server enable traps command **2-545**
 snmp-server host command **2-548**
 snmp trap mac-notification command **2-552**
 SNMP traps
 enabling MAC address notification trap **2-552**
 enabling the MAC address notification feature **2-208**
 enabling the sending of **2-545**
 SoftPhone
 See Cisco SoftPhone
 software images
 deleting **2-55**
 downloading **2-8**
 upgrading **2-8**
 uploading **2-14**
 software version, displaying **2-523**
 source ports, MVR **2-276**
 SPAN
 configuring **2-268**
 debug messages, display **B-19**
 displaying **2-488**
 filter SPAN traffic **2-268**
 sessions
 add interfaces to **2-268**
 displaying **2-488**
 start new **2-268**
 spanning **2-592**
 spanning-tree backbonefast command **2-554**
 spanning-tree bpdufilter command **2-555**
 spanning-tree bpduguard command **2-557**
 spanning-tree cost command **2-559**
 spanning-tree etherchannel command **2-561**
 spanning-tree extend system-id command **2-563**
 spanning-tree guard command **2-564**
 spanning-tree link-type command **2-566**
 spanning-tree loopguard default command **2-568**
 spanning-tree mode command **2-570**
 spanning-tree mst configuration command **2-572**
 spanning-tree mst cost command **2-574**
 spanning-tree mst forward-time command **2-576**
 spanning-tree mst hello-time command **2-577**
 spanning-tree mst max-age command **2-578**
 spanning-tree mst max-hops command **2-579**
 spanning-tree mst port-priority command **2-580**
 spanning-tree mst pre-standard command **2-582**
 spanning-tree mst priority command **2-583**
 spanning-tree mst root command **2-584**
 spanning-tree portfast (global configuration) command **2-588**
 spanning-tree portfast (interface configuration) command **2-590**
 spanning-tree port-priority command **2-586**
 Spanning Tree Protocol
 See STP
 spanning-tree transmit hold-count command **2-592**
 spanning-tree uplinkfast command **2-593**
 spanning-tree vlan command **2-595**
 speed command **2-598**
 srr-queue bandwidth limit command **2-600**
 srr-queue bandwidth shape command **2-602**
 srr-queue bandwidth share command **2-604**
 SSH, configuring version **2-162**
 static-access ports, configuring **2-611**
 statistics, Ethernet group **2-319**
 sticky learning, enabling **2-622**
 storm-control command **2-606**
 STP
 BackboneFast **2-554**
 counters, clearing **2-49**
 debug messages, display
 BackboneFast events **B-68**
 MSTP **B-71**
 optimized BPDU handling **B-70**
 spanning-tree activity **B-66**
 switch shim **B-73**
 transmitted and received BPDU **B-69**
 UplinkFast **B-75**
 detection of indirect link failures **2-554**

STP (continued)

- enabling protocol tunneling for **2-183**
 - EtherChannel misconfiguration **2-561**
 - extended system ID **2-563**
 - path cost **2-559**
 - protocol modes **2-570**
 - root port
 - accelerating choice of new **2-593**
 - loop guard **2-564**
 - preventing from becoming designated **2-564**
 - restricting which can be root **2-564**
 - root guard **2-564**
 - UplinkFast **2-593**
 - root switch
 - affects of extended system ID **2-563, 2-596**
 - hello-time **2-595**
 - interval between BDPU messages **2-595**
 - interval between hello BPDU messages **2-595**
 - max-age **2-595**
 - port priority for selection of **2-586**
 - primary or secondary **2-595**
 - switch priority **2-595**
 - state changes
 - blocking to forwarding state **2-590**
 - enabling BPDU filtering **2-555, 2-588**
 - enabling BPDU guard **2-557, 2-588**
 - enabling Port Fast **2-588, 2-590**
 - enabling timer to recover from error state **2-99**
 - forward-delay time **2-595**
 - length of listening and learning states **2-595**
 - shutting down Port Fast-enabled ports **2-588**
 - state information display **2-511**
 - VLAN options **2-583, 2-595**
 - SVIs, creating **2-111**
 - Switched Port Analyzer
 - See SPAN
 - switching characteristics
 - modifying **2-609**
 - returning to interfaces **2-609**
 - switchport access command **2-611**
 - switchport block command **2-613**
 - switchport command **2-609**
 - switchport host command **2-614**
 - switchport mode command **2-615**
 - switchport mode private-vlan command **2-618**
 - switchport nonegotiate command **2-620**
 - switchport port-security aging command **2-627**
 - switchport port-security command **2-622**
 - switchport priority extend command **2-629**
 - switchport private-vlan command **2-631**
 - switchport protected command **2-633**
 - switchports, displaying **2-389**
 - switchport trunk command **2-635**
 - switchport voice vlan command **2-638**
 - system message logging, save message to flash **2-199**
 - system mtu command **2-640**
 - system resource templates **2-320**
-
- T**
- tar files, creating, listing, and extracting **2-11**
 - TDR, running **2-642**
 - templates, system resources **2-320**
 - test cable-diagnostics tdr command **2-642**
 - traceroute mac command **2-643**
 - traceroute mac ip command **2-646**
 - trunking, VLAN mode **2-615**
 - trunk mode **2-615**
 - trunk ports **2-615**
 - trunks, to non-DTP device **2-616**
 - trusted boundary for QoS **2-265**
 - trusted port states for QoS **2-265**
 - tunnel ports, Layer 2 protocol, displaying **2-439**
 - type (boot loader) command **A-23**

U

UDLD

aggressive mode **2-650, 2-652**
 debug messages, display **B-82**
 enable globally **2-650**
 enable per interface **2-652**
 error recovery timer **2-99**
 message timer **2-650**
 normal mode **2-650, 2-652**
 reset a shutdown interface **2-654**
 status **2-520**

udld command **2-650**udld port command **2-652**udld reset command **2-654**unicast storm control **2-606**

UniDirectional Link Detection

See UDLD

unknown multicast traffic, preventing **2-613**

unknown unicast traffic, preventing **2-613**

unset (boot loader) command **A-24**

upgrading

software images **2-8**

monitoring status of **2-339**

upgrading information

See release notes

UplinkFast, for STP **2-593**user EXEC mode **1-2, 1-3****V**version (boot loader) command **A-26**

VLAN

enabling guest VLAN supplicant **2-62, 2-72**

vlan (global configuration) command **2-655**

vlan (VLAN configuration) command **2-661**

vlan access-map command **2-667**

VLAN access map configuration mode **2-667**

VLAN access maps

actions **2-6**
 displaying **2-531**

VLAN-based QoS **2-267**

VLAN configuration
 rules **2-658, 2-663**
 saving **2-655, 2-665**

VLAN configuration mode

commands
 VLAN **2-661**
 VTP **2-685**
 description **1-5**
 entering **2-669**
 summary **1-2**

vlan database command **2-669**vlan dot1q tag native command **2-672**vlan filter command **2-674**VLAN filters, displaying **2-532**VLAN ID range **2-655, 2-661**

VLAN maps

applying **2-674**
 creating **2-667**
 defining **2-223**
 displaying **2-531**

VLAN Query Protocol

See VQP

VLANs

adding **2-655**
 configuring **2-655, 2-661**
 debug messages, display

ISL **B-79**

VLAN IOS file system error tests **B-78**

VLAN manager activity **B-76**

VTP **B-80**

displaying configurations **2-525**

enabling guest VLAN supplicant **2-104**

extended-range **2-655**

MAC addresses

displaying **2-472**

VLANs (continued)

- number of **2-460**
- media types **2-658, 2-663**
- normal-range **2-655, 2-661**
- private **2-618**
 - configuring **2-305**
 - displaying **2-525**
- See also private VLANs
- restarting **2-542**
- saving the configuration **2-655**
- shutting down **2-542**
- SNMP traps for VTP **2-546, 2-549**
- suspending **2-542**
- variables **2-661**

VLAN Trunking Protocol

See VTP

VMPS

- configuring servers **2-679**
- displaying **2-533**
- error recovery timer **2-100**
- reconfirming dynamic VLAN assignments **2-676**
- vmps reconfirm (global configuration) command** **2-677**
- vmps reconfirm (privileged EXEC) command** **2-676**
- vmps retry command** **2-678**
- vmps server command** **2-679**
- voice VLAN
 - configuring **2-638**
 - setting port priority **2-629**

VQP

- and dynamic-access ports **2-611**
- clearing client statistics **2-51**
- displaying information **2-533**
- per-server retry count **2-678**
- reconfirmation interval **2-677**
- reconfirming dynamic VLAN assignments **2-676**

VTP

- changing characteristics **2-681**
- clearing pruning counters **2-52**
- configuring

VTP (continued)

- domain name **2-681, 2-685**
- file name **2-681**
- mode **2-681, 2-685**
- password **2-681, 2-685**
- counters display fields **2-537**
- displaying information **2-536**
- enabling
 - pruning **2-681, 2-685**
 - tunneling for **2-183**
 - Version 2 **2-681, 2-685**
- mode **2-681, 2-685**
- pruning **2-681, 2-685**
- saving the configuration **2-655, 2-665**
- statistics **2-536**
- status **2-536**
- status display fields **2-538**
- vtp (global configuration) command** **2-681**
- vtp (VLAN configuration) command** **2-685**

X

- XENPAK module serial EERPOM information** **2-386**

