



INDEX

Numerics

802.1Q trunk ports and native VLANs **2-645**

802.1Q tunnel ports

configuring **2-587**

displaying **2-346**

limitations **2-588**

802.1x

and switchport modes **2-588**

violation error recovery **2-104**

See also port-based authentication

A

aaa accounting dot1x command **2-1**

aaa authentication dot1x command **2-3**

AAA methods **2-3**

abort command **2-643**

access control entries

See ACEs

access control lists

See ACLs

access groups

IP **2-116**

MAC, displaying **2-414**

access map configuration mode **2-199**

access mode **2-587**

access ports **2-587**

ACEs **2-80, 2-261**

ACLs

deny **2-78**

displaying **2-308**

for non-IP protocols **2-180**

IP **2-116**

matching **2-199**

on Layer 2 interfaces **2-116**

permit **2-259**

action command **2-5**

address aliasing **2-248**

aggregate-port learner **2-253**

allowed VLANs **2-606**

apply command **2-643**

archive copy-sw command **2-7**

archive download-sw command **2-10**

archive tar command **2-14**

archive upload-sw command **2-17**

arp access-list command **2-19**

audience **xvii**

authorization state of controlled port **2-92**

autonegotiation of duplex mode **2-101**

auto qos voip command **2-21**

B

BackboneFast, for STP **2-517**

backup interfaces

configuring **2-582**

displaying **2-368**

boot (boot loader) command **A-2**

boot auto-copy-sw command **2-26**

- boot boothlpr command **2-27**
 boot config-file command **2-28**
 boot enable-break command **2-29**
 boot helper command **2-30**
 boot helper-config file command **2-31**
 booting
 Cisco IOS image **2-34**
 displaying environment variables **2-317**
 interrupting **2-29**
 manually **2-32**
 boot loader
 accessing **A-1**
 booting
 Cisco IOS image **A-2**
 helper image **2-30**
 directories
 creating **A-16**
 displaying a list of **A-7**
 removing **A-20**
 displaying
 available commands **A-12**
 memory heap utilization **A-14**
 version **A-27**
 environment variables
 described **A-21**
 displaying settings **A-21**
 location of **A-22**
 setting **A-21**
 unsettting **A-25**
 files
 copying **A-5**
 deleting **A-6**
 displaying a list of **A-7**
 displaying the contents of **A-4, A-17, A-24**
 renaming **A-18**
 boot loader (continued)
 file system
 formatting **A-10**
 initializing flash **A-9**
 running a consistency check **A-11**
 loading helper images **A-13**
 prompt **A-1**
 resetting the system **A-19**
 boot manual command **2-32**
 boot private-config-file command **2-33**
 boot system command **2-34**
 BPDU filtering, for spanning tree **2-518, 2-551**
 BPDU guard, for spanning tree **2-520, 2-551**
 broadcast storm control **2-570**
-
- C**
- candidate switches
 See clusters
- cat (boot loader) command **A-4**
 caution, description **xviii**
 CDP, enabling protocol tunneling for **2-167**
 channel-group command **2-36**
 channel-protocol command **2-40**
 Cisco Network Assistant
 See Network Assistant **xviii**
- Cisco SoftPhone
 auto-QoS configuration **2-21**
 trusting packets sent from **2-239**
- class command **2-41**
 class-map command **2-43**
 class maps
 creating **2-43**
 defining the match criteria **2-201**
 displaying **2-322**
- class of service
 See CoS

- clear ip arp inspection log command **2-45**
 clear ip arp inspection statistics command **2-46**
 clear ipc command **2-48**
 clear ip dhcp snooping database command **2-47**
 clear l2protocol-tunnel counters command **2-49**
 clear lacp command **2-50**
 clear mac address-table command **2-51**
 clear pagp command **2-53**
 clear port-security command **2-54**
 clear spanning-tree counters command **2-56**
 clear spanning-tree detected-protocols command **2-57**
 clear vmps statistics command **2-58**
 clear vtp counters command **2-59**
 cluster commander-address command **2-60**
 cluster discovery hop-count command **2-62**
 cluster enable command **2-63**
 cluster holdtime command **2-65**
 cluster member command **2-66**
 cluster outside-interface command **2-68**
 cluster requirements **xix**
 cluster run command **2-69**
 clusters
 adding candidates **2-66**
 binding to HSRP group **2-70**
 building manually **2-66**
 communicating with
 devices outside the cluster **2-68**
 members by using Telnet **2-282**
 debug messages, display **B-4**
 displaying
 candidate switches **2-325**
 debug messages **B-4**
 member switches **2-327**
 status **2-323**
 hop-count limit for extended discovery **2-62**
 HSRP standby groups **2-70**
 redundancy **2-70**
 SNMP trap **2-507**
 cluster standby-group command **2-70**
 cluster timer command **2-72**
 command modes defined **1-2**
 commands changed in Cisco IOS Release 12.2(18)SE **1-6**
 command switch
 See clusters
 configuration, initial
 See getting started guide and hardware installation guide
 configuration files
 password recovery disable considerations **A-1**
 specifying the name **2-28, 2-33**
 configuring multiple interfaces **2-111**
 config-vlan mode
 commands **2-629**
 description **1-4**
 entering **2-628**
 summary **1-2**
 conventions
 command **xviii**
 for examples **xviii**
 publication **xviii**
 text **xviii**
 copy (boot loader) command **A-5**
 CoS
 assigning default value to incoming packets **2-209**
 assigning to Layer 2 protocol packets **2-170**
 overriding the incoming value **2-209**
 CoS-to-DSCP map **2-213**
 CPU ASIC statistics, displaying **2-330**
-
- D**
- debug auto qos command **B-2**
 debug cluster command **B-4**
 debug dot1x command **B-6**
 debug dtp command **B-8**
 debug etherchannel command **B-9**
 debug ilpower command **B-11**
 debug interface command **B-14**
 debug ip dhcp snooping command **B-12**

- debug ip igmp filter command **B-16**
 debug ip igmp max-groups command **B-17**
 debug ip igmp snooping command **B-18**
 debug ip verify source packet command **B-13**
 debug lacp command **B-19**
 debug mac-notification command **B-20**
 debug matm command **B-21**
 debug monitor command **B-22**
 debug mvrdbg command **B-24**
 debug nvram command **B-25**
 debug pagp command **B-26**
 debug platform acl command **B-27**
 debug platform cli-redirection main command **B-28**
 debug platform configuration command **B-29, B-37**
 debug platform cpu-queues command **B-30**
 debug platform device-manager command **B-32**
 debug platform dot1x command **B-33**
 debug platform etherchannel command **B-34**
 debug platform fallback-bridging command **B-35**
 debug platform forw-tcam command **B-36**
 debug platform ip arp inspection command **B-39**
 debug platform ipc command **B-47**
 debug platform ip dhcp command **B-40**
 debug platform ip igmp snooping command **B-41**
 debug platform ip multicast command **B-43**
 debug platform ip unicast command **B-45**
 debug platform led command **B-48**
 debug platform matm command **B-49**
 debug platform messaging application command **B-51**
 debug platform phy command **B-53**
 debug platform pm command **B-55**
 debug platform port-asic command **B-57**
 debug platform port-security command **B-58**
 debug platform qos-acl-tcam command **B-59**
 debug platform remote-commands command **B-60**
 debug platform resource-manager command **B-61**
 debug platform snmp command **B-62**
 debug platform span command **B-63**
 debug platform stack-manager command **B-64**
 debug platform supervisor-asic command **B-65**
 debug platform sw-bridge command **B-66**
 debug platform tcam command **B-67**
 debug platform udld command **B-70**
 debug platform vlan command **B-71**
 debug pm command **B-72**
 debug port-security command **B-74**
 debug qos-manager command **B-75**
 debug spanning-tree backbonefast command **B-78**
 debug spanning-tree bpdu command **B-79**
 debug spanning-tree bpdu-opt command **B-80**
 debug spanning-tree command **B-76**
 debug spanning-tree mstp command **B-81**
 debug spanning-tree switch command **B-83**
 debug spanning-tree uplinkfast command **B-85**
 debug sw-vlan command **B-86**
 debug sw-vlan ifs command **B-88**
 debug sw-vlan notification command **B-90**
 debug sw-vlan vtp command **B-92**
 debug udld command **B-94**
 debug vqpc command **B-96**
 define interface-range command **2-73**
 delete (boot loader) command **A-6**
 delete command **2-75**
 deny (ARP access-list configuration) command **2-76**
 deny command **2-78**
 detect mechanism, causes **2-102**
 device manager requirements **xviii**
 DHCP snooping
 accepting untrusted packets from edge switch **2-143**
 enabling
 on a VLAN **2-148**
 option 82 **2-141, 2-143**
 trust on an interface **2-146**
 error recovery timer **2-104**
 rate limiting **2-145**

- DHCP snooping binding database
 binding file, configuring **2-138**
 bindings
 adding **2-136**
 deleting **2-136**
 clearing database agent statistics **2-47**
 database agent, configuring **2-138**
 displaying
 binding entries **2-384**
 database agent status **2-386**
 renewing **2-289**
 dir (boot loader) command **A-7**
 directories, deleting **2-75**
 documentation, related **xviii**
 document conventions **xviii**
 domain name, VTP **2-654, 2-658**
 dot1x command **2-81**
 dot1x default command **2-83**
 dot1x guest-vlan command **2-84**
 dot1x host-mode command **2-86**
 dot1x initialize command **2-88**
 dot1x max-req command **2-89, 2-90**
 dot1x multiple-hosts command **2-91**
 dot1x port-control command **2-92**
 dot1x re-authenticate command **2-94**
 dot1x re-authentication command **2-95**
 dot1x reauthentication command **2-96**
 dot1x timeout command **2-98**
 dropping packets, with ACL matches **2-5**
 drop threshold, Layer 2 protocol tunneling **2-167**
 DSCP-to-CoS map **2-213**
 DSCP-to-DSCP-mutation map **2-213**
 DTP **2-588**
 DTP flap
 error detection for **2-102**
 error recovery timer **2-104**
 DTP negotiation **2-592**
 duplex command **2-100**
 dynamic-access ports
 configuring **2-580**
 restrictions **2-581**
 dynamic ARP inspection
 ARP ACLs
 apply to a VLAN **2-121**
 define **2-19**
 deny packets **2-76**
 display **2-312**
 permit packets **2-257**
 clear
 log buffer **2-45**
 statistics **2-46**
 display
 ARP ACLs **2-312**
 configuration and operating state **2-380**
 log buffer **2-380**
 statistics **2-380**
 trust state and rate limit **2-380**
 enable per VLAN **2-131**
 error detection for **2-102**
 error recovery timer **2-104**
 log buffer
 clear **2-45**
 configure **2-125**
 display **2-380**
 rate-limit incoming ARP packets **2-123**
 statistics
 clear **2-46**
 display **2-380**
 trusted interface state **2-127**
 type of packet logged **2-133**
 validation checks **2-129**
 dynamic auto VLAN membership mode **2-587**
 dynamic desirable VLAN membership mode **2-587**
 Dynamic Host Configuration Protocol (DHCP)
 See DHCP snooping
 Dynamic Trunking Protocol
 See DTP

E

EAP-request/identity frame
 maximum number to send **2-90**
 response time before retransmitting **2-98**
 encapsulation methods **2-606**
 environment variables, displaying **2-317**
 errdisable detect cause command **2-102**
 errdisable recovery command **2-104**
 error conditions, displaying **2-357**
 error disable detection **2-102**
 error-disabled interfaces, displaying **2-368**
 EtherChannel
 assigning Ethernet interface to channel group **2-36**
 creating port-channel logical interface **2-109**
 debug EtherChannel/PAgP, display **B-9**
 debug platform-specific events, display **B-34**
 displaying **2-361**
 enabling Layer 2 protocol tunneling for

 LACP **2-168**
 PAgP **2-168**
 UDLD **2-168**

interface information, displaying **2-368**

LACP

 clearing channel-group information **2-50**
 debug messages, display **B-19**
 displaying **2-410**
 modes **2-36**
 port priority for hot-standby ports **2-171**
 restricting a protocol **2-40**
 system priority **2-173**

load-distribution methods **2-269**

PAgP

 aggregate-port learner **2-253**
 clearing channel-group information **2-53**
 debug messages, display **B-26**
 displaying **2-457**
 error detection for **2-102**
 error recovery timer **2-104**

EtherChannel (continued)

 PAgP (continued)
 learn method **2-253**
 modes **2-36**
 physical-port learner **2-253**
 priority of interface for transmitted traffic **2-255**
 Ethernet controller, internal register display **2-332**
 Ethernet statistics, collecting **2-291**
 examples, conventions for **xviii**
 exit command **2-643**
 extended discovery of candidate switches **2-62**
 extended-range VLANs
 and allowed VLAN list **2-606**
 and pruning-eligible list **2-606**
 configuring **2-628**
 extended system ID for STP **2-526**

F

fan information, displaying **2-352**
 file name, VTP **2-654**
 files, deleting **2-75**
 flash_init (boot loader) command **A-9**

Flex Links

 configuring **2-582**
 displaying **2-368**
 flowcontrol command **2-107**
 format (boot loader) command **A-10**
 forwarding packets, with ACL matches **2-5**
 forwarding results, display **C-5**
 frame forwarding information, displaying **C-5**

front-end controller

 counter and status information **C-7**
 fsck (boot loader) command **A-11**

G

global configuration mode **1-2, 1-4**

H

hardware ACL statistics **2-308**
 help (boot loader) command **A-12**
 hierarchical policy maps **2-267**
 hop-count limit for clusters **2-62**
 host connection, port configuration **2-586**
 host ports, private VLANs **2-590**
 Hot Standby Router Protocol

 See HSRP

HSRP

 binding HSRP group to cluster **2-70**
 standby group **2-70**

IGMP filters

 applying **2-149**
 debug messages, display **B-16**

IGMP groups, setting maximum **2-150****IGMP maximum groups, debugging** **B-17****IGMP profiles**

 creating **2-152**
 displaying **2-388**

IGMP snooping

 displaying **2-390, 2-392, 2-397, 2-398**
 enabling **2-154**
 multicast table **1-6, 2-395**
 querier **2-157**
 report suppression **2-159**

images

 See software images

Immediate-Leave feature, MVR **2-250****Immediate-Leave processing** **2-154****initial configuration**

 See getting started guide and hardware installation guide

interface command **2-114****interface configuration mode** **1-2, 1-4****interface port-channel command** **2-109**

interface range command **2-111**
 interface-range macros **2-73**
 interfaces
 assigning Ethernet interface to channel group **2-36**
 configuring **2-100**
 configuring multiple **2-111**
 creating port-channel logical **2-109**
 debug messages, display **B-14**
 disabling **2-505**
 displaying the MAC address table **2-426**
 restarting **2-505**
 interface speed, configuring **2-560**
 internal registers, displaying **2-332, 2-342**
 Internet Group Management Protocol

 See IGMP

invalid GBIC

 error detection for **2-102**
 error recovery timer **2-104**
 ip address command **2-119**
 IP addresses, setting **2-119**
 IP address matching **2-199**
 ip arp inspection filter vlan command **2-121**
 ip arp inspection limit command **2-123**
 ip arp inspection log-buffer command **2-125**
 ip arp inspection trust command **2-127**
 ip arp inspection validate command **2-129**
 ip arp inspection vlan command **2-131**
 ip arp inspection vlan logging command **2-133**
 IP DHCP snooping

 See DHCP snooping

 ip dhcp snooping binding command **2-136**

 ip dhcp snooping command **2-135**

 ip dhcp snooping database command **2-138**

 ip dhcp snooping information option allow-untrusted command **2-143**

 ip dhcp snooping information option command **2-141**

 ip dhcp snooping limit rate command **2-145**

 ip dhcp snooping trust command **2-146**

 ip dhcp snooping verify command **2-147**

- ip dhcp snooping vlan command [2-148](#)
 ip igmp filter command [2-149](#)
 ip igmp max-groups command [2-150](#)
 ip igmp profile command [2-152](#)
 ip igmp snooping command [2-154](#)
 ip igmp snooping querier command [2-157](#)
 ip igmp snooping report-suppression command [2-159](#)
 IP multicast addresses [2-247](#)
 IP phones
 auto-QoS configuration [2-21](#)
 trusting packets sent from [2-239](#)
 IP-precedence-to-DSCP map [2-213](#)
 ip source binding command [2-161](#)
 IP source guard
 disabling [2-165](#)
 displaying
 binding entries [2-400](#)
 configuration [2-401](#)
 dynamic binding entries only [2-384](#)
 enabling [2-165](#)
 static IP source bindings [2-161](#)
 ip ssh command [2-163](#)
 IPv6 SDM template [2-292](#)
 ip verify source command [2-165](#)
-
- J**
- jumbo frames
 See MTU
-
- L**
- l2protocol-tunnel command [2-167](#)
 l2protocol-tunnel cos command [2-170](#)
 LACP
 See EtherChannel
 lacp port-priority command [2-171](#)
 lacp system-priority command [2-173](#)
- Layer 2 mode, enabling [2-578](#)
 Layer 2 protocol ports, displaying [2-407](#)
 Layer 2 protocol-tunnel
 error detection for [2-102](#)
 error recovery timer [2-104](#)
 Layer 2 protocol tunnel counters [2-49](#)
 Layer 2 protocol tunneling error recovery [2-168](#)
 Layer 2 traceroute
 IP addresses [2-619](#)
 MAC addresses [2-616](#)
 Layer 3 mode, enabling [2-578](#)
 line configuration mode [1-3, 1-5](#)
 Link Aggregation Control Protocol
 See EtherChannel
 link flap
 error detection for [2-102](#)
 error recovery timer [2-104](#)
 load_helper (boot loader) command [A-13](#)
 load-distribution methods for EtherChannel [2-269](#)
 logging event power-inline-status command [2-175](#)
 logging file command [2-176](#)
 logical interface [2-109](#)
 loopback error
 detection for [2-102](#)
 recovery timer [2-104](#)
 loop guard, for spanning tree [2-528, 2-532](#)

M

- mac access-group command [2-178](#)
 MAC access-groups, displaying [2-414](#)
 MAC access list configuration mode [2-180](#)
 mac access-list extended command [2-180](#)
 MAC access lists [2-78](#)
 MAC addresses
 displaying
 aging time [2-420](#)
 all [2-418](#)
 dynamic [2-424](#)

MAC addresses (continued)

- displaying (continued)
 - notification settings **2-428**
 - number of addresses in a VLAN **2-422**
 - per interface **2-426**
 - per VLAN **2-432**
 - static **2-430**
 - static and dynamic entries **2-416**
- dynamic
 - aging time **2-182**
 - deleting **2-51**
 - displaying **2-424**
- enabling MAC address notification **2-184**
- matching **2-199**
- persistent stack **2-568**
- static
 - adding and removing **2-186**
 - displaying **2-430**
 - dropping on an interface **2-187**
- tables **2-418**

MAC address notification, debugging **B-20**

mac address-table aging-time **2-178, 2-199**

mac address-table aging-time command **2-182**

mac address-table notification command **2-184**

mac address-table static command **2-186**

mac address-table static drop command **2-187**

macro description command **2-192**

macro global command **2-193**

macro global description command **2-196**

macro name command **2-197**

macros

- adding a description **2-192**
- adding a global description **2-196**
- applying **2-193**
- creating **2-197**
- displaying **2-459**
- interface range **2-73, 2-111**
- specifying parameter values **2-193**
- tracing **2-193**

manual

- audience **xvii**
- purpose of **xvii**

maps

- QoS
 - defining **2-213**
 - displaying **2-442**
- VLAN
 - creating **2-640**
 - defining **2-199**
 - displaying **2-496**

match (access-map configuration) command **2-199**

match (class-map configuration) command **2-201**

maximum transmission unit

- See MTU

mdix auto command **2-203**

member switches

- See clusters

memory (boot loader) command **A-14**

mkdir (boot loader) command **A-16**

mls qos aggregate-policer command **2-207**

mls qos command **2-205**

mls qos cos command **2-209**

mls qos dscp-mutation command **2-211**

mls qos map command **2-213**

mls qos queue-set output buffers command **2-217**

mls qos queue-set output threshold command **2-219**

mls qos srr-queue input bandwidth command **2-223**

mls qos srr-queue input buffers command **2-225**

mls qos-srr-queue input cos-map command **2-227**

mls qos srr-queue input dscp-map command **2-229**

mls qos srr-queue input priority-queue command **2-231**

mls qos srr-queue input threshold command **2-233**

mls qos-srr-queue output cos-map command **2-235**

mls qos srr-queue output dscp-map command **2-237**

mls qos trust command **2-239**

mls qos vlan-based command **2-241**

mode, MVR **2-247**

Mode button, and password recovery **2-296**

- modes, commands **1-2**
 - monitor session command **2-242**
 - more (boot loader) command **A-17**
 - MSTP
 - displaying **2-475**
 - interoperability **2-57**
 - link type **2-530**
 - MST region
 - aborting changes **2-536**
 - applying changes **2-536**
 - configuration name **2-536**
 - configuration revision number **2-536**
 - current or pending display **2-536**
 - displaying **2-475**
 - MST configuration mode **2-536**
 - VLANs-to-instance mapping **2-536**
 - path cost **2-538**
 - protocol mode **2-534**
 - restart protocol migration process **2-57**
 - root port
 - loop guard **2-528**
 - preventing from becoming designated **2-528**
 - restricting which can be root **2-528**
 - root guard **2-528**
 - root switch
 - affects of extended system ID **2-526**
 - hello-time **2-541, 2-547**
 - interval between BPDU messages **2-542**
 - interval between hello BPDU messages **2-541, 2-547**
 - max-age **2-542**
 - maximum hop count before discarding BPDU **2-543**
 - port priority for selection of **2-544**
 - primary or secondary **2-547**
 - switch priority **2-546**
 - state changes
 - blocking to forwarding state **2-553**
 - enabling BPDU filtering **2-518, 2-551**
 - enabling BPDU guard **2-520, 2-551**
 - enabling Port Fast **2-551, 2-553**
 - MSTP (continued)
 - state changes (continued)
 - forward-delay time **2-540**
 - length of listening and learning states **2-540**
 - rapid transition to forwarding **2-530**
 - shutting down Port Fast-enabled ports **2-551**
 - state information display **2-474**
 - MTU
 - configuring size **2-613**
 - displaying global setting **2-485**
 - multicast group address, MVR **2-250**
 - multicast groups, MVR **2-248**
 - multicast router learning method **2-154**
 - multicast router ports, configuring **2-154**
 - multicast storm control **2-570**
 - multicast VLAN, MVR **2-247**
 - multicast VLAN registration
 - See MVR
 - multiple hosts on authorized port **2-86**
 - Multiple Spanning Tree Protocol
 - See MSTP
 - MVR
 - and address aliasing **2-248**
 - configuring **2-247**
 - configuring interfaces **2-250**
 - debug messages, display **B-24**
 - displaying **2-451**
 - displaying interface information **2-453**
 - members, displaying **2-455**
 - mvr (global configuration) command **2-247**
 - mvr (interface configuration) command **2-250**
 - mvr vlan group command **2-251**
-
- N**
- native VLANs **2-606**
 - native VLAN tagging **2-645**
 - Network Assistant requirements **xviii**

- nonegotiate
- DTP messaging **2-592**
 - speed **2-560, 2-561**
- non-IP protocols
- denying **2-78**
 - forwarding **2-259**
- non-IP traffic access lists **2-180**
- non-IP traffic forwarding
- denying **2-78**
 - permitting **2-259**
- normal-range VLANs **2-628, 2-634**
- note, description **xviii**
- no vlan command **2-628, 2-638**
-
- P**
- PAgP
- See EtherChannel
- pagp learn-method command **2-253**
- pagp port-priority command **2-255**
- password, VTP **2-654, 2-658**
- password-recovery mechanism, enabling and disabling **2-296**
- permit (ARP access-list configuration) command **2-257**
- permit command **2-259**
- per-VLAN spanning-tree plus
- See STP
- physical-port learner **2-253**
- PIM-DVMRP, as multicast router learning method **2-154**
- PoE
- configuring the power management mode **2-271**
 - displaying controller register values **2-340**
 - displaying power management information **2-467**
 - logging of status **2-175**
- police aggregate command **2-264**
- police command **2-262**
- policed-DSCP map **2-213**
- policy-map command **2-266**
- policy maps
- applying to an interface **2-298, 2-303**
 - creating **2-266**
 - displaying **2-462**
 - hierarchical **2-267**
 - policers
 - displaying **2-435**
 - for a single class **2-262**
 - for multiple classes **2-207, 2-264**
 - policed-DSCP map **2-213**
 - traffic classification
 - defining the class **2-41**
 - defining trust states **2-621**
 - setting DSCP or IP precedence values **2-301**
- Port Aggregation Protocol
- See EtherChannel
- port-based authentication
- 802.1x AAA accounting methods **2-1**
 - AAA method list **2-3**
 - debug messages, display **B-6**
 - enabling 802.1x
 - globally **2-81**
 - per interface **2-92**
 - guest VLAN **2-84**
 - host modes **2-86**
 - initialize an interface **2-88**
 - manual control of authorization state **2-92**
 - multiple hosts on authorized port **2-86**
 - periodic re-authentication
 - enabling **2-96**
 - time between attempts **2-98**
 - quiet period between failed authentication exchanges **2-98**
 - re-authenticating 802.1x-enabled ports **2-94**
 - resetting configurable 802.1x parameters **2-83**
 - switch-to-authentication server retransmission time **2-98**
 - switch-to-client frame-retransmission number **2-89 to 2-90**
 - switch-to-client retransmission time **2-98**

port-channel load-balance command **2-269**
 Port Fast, for spanning tree **2-553**
 port ranges, defining **2-73**
 ports, debugging **B-72**
 ports, protected **2-604**
 port security
 aging **2-598**
 debug messages, display **B-74**
 enabling **2-594**
 violation error recovery **2-104**
 port trust states for QoS **2-239**
 port types, MVR **2-250**
 power information, displaying **2-352**
 power inline command **2-271**
 Power over Ethernet
 See PoE
 priority-queue command **2-274**
 priority value, stack member **2-482, 2-573**
 private-vlan command **2-276**
 private-vlan mapping command **2-279**
 private VLANs
 association **2-602**
 configuring **2-276**
 configuring ports **2-590**
 displaying **2-491**
 host ports **2-590**
 mapping
 configuring **2-602**
 displaying **2-368**
 promiscuous ports **2-590**
 privileged EXEC mode **1-2, 1-3**
 promiscuous ports, private VLANs **2-590**
 protected ports, displaying **2-373**
 pruning
 VLANs **2-606**
 VTP
 displaying interface information **2-368**
 enabling **2-654, 2-658**
 pruning-eligible VLAN list **2-608**

PVST+
 See STP

Q

QoS
 auto-QoS
 configuring **2-21**
 debug messages, display **1-6, B-2**
 displaying **2-313**
 class maps
 creating **2-43**
 defining the match criteria **2-201**
 displaying **2-322**
 defining the CoS value for an incoming packet **2-209**
 displaying configuration information **2-313, 2-434**
 DSCP trusted ports
 applying DSCP-to-DSCP-mutation map to **2-211**
 defining DSCP-to-DSCP-mutation map **2-213**
 egress queues
 allocating buffers **2-217**
 defining the CoS output queue threshold map **2-235**
 defining the DSCP output queue threshold map **2-237**
 displaying buffer allocations **2-438**
 displaying CoS output queue threshold map **2-442**
 displaying DSCP output queue threshold map **2-442**
 displaying queueing strategy **2-438**
 displaying queue-set settings **2-445, 2-447**
 enabling bandwidth shaping and scheduling **2-564**
 enabling bandwidth sharing and scheduling **2-566**
 limiting the maximum output on a port **2-562**
 mapping a port to a queue-set **2-281**
 mapping CoS values to a queue and threshold **2-235**
 mapping DSCP values to a queue and threshold **2-237**
 setting maximum and reserved memory
 allocations **2-219**
 setting WTD thresholds **2-219**
 enabling **2-205**

QoS (continued)

- ingress queues
 - allocating buffers **2-225**
 - assigning SRR scheduling weights **2-223**
 - defining the CoS input queue threshold map **2-227**
 - defining the DSCP input queue threshold map **2-229**
 - displaying buffer allocations **2-438**
 - displaying CoS input queue threshold map **2-442**
 - displaying DSCP input queue threshold map **2-442**
 - displaying queueing strategy **2-438**
 - displaying settings for **2-436**
 - enabling the priority queue **2-231**
 - mapping CoS values to a queue and threshold **2-227**
 - mapping DSCP values to a queue and threshold **2-229**
 - setting WTD thresholds **2-233**
- maps
 - defining **2-213, 2-227, 2-229, 2-235, 2-237**
 - displaying **2-442**
- policy maps
 - applying an aggregate policer **2-264**
 - applying to an interface **2-298, 2-303**
 - creating **2-266**
 - defining policers **2-207, 2-262**
 - displaying policers **2-435**
 - displaying policy maps **2-462**
 - hierarchical **2-267**
 - policed-DSCP map **2-213**
 - setting DSCP or IP precedence values **2-301**
 - traffic classifications **2-41**
 - trust states **2-621**
- port trust states **2-239**
- queues, enabling the expedite **2-274**
- statistics
 - in-profile and out-of-profile packets **2-438**
 - packets enqueued or dropped **2-438**
 - sent and received CoS values **2-438**
 - sent and received DSCP values **2-438**
- trusted boundary for IP phones **2-239**
- VLAN-based **2-241**

quality of service

- See QoS

querytime, MVR **2-247**

queue-set command **2-281**

R

rapid per-VLAN spanning-tree plus

- See STP

rapid PVST+

- See STP

rcommand command **2-282**

re-authenticating 802.1x-enabled ports **2-94**

re-authentication

- periodic **2-96**
- time between attempts **2-98**

receiver ports, MVR **2-250**

receiving flow-control packets **2-107**

recovery mechanism

- causes **2-104**
- display **2-319, 2-355, 2-359**
- timer interval **2-105**

redundancy for cluster switches **2-70**

reload command **2-284**

remote command **2-286**

remote-span command **2-287**

Remote Switched Port Analyzer

- See RSPAN

rename (boot loader) command **A-18**

renew ip dhcp snooping database command **2-289**

requirements

- cluster **xix**
- device manager **xviii**
- Network Assistant **xviii**

reset (boot loader) command **A-19**

reset command **2-643**

resource templates, displaying **2-470**

rmdir (boot loader) command **A-20**

rmon collection stats command **2-291**

root guard, for spanning tree **2-528**

routed ports

 IP addresses on **2-120**

 number supported **2-120**

RSPAN

 configuring **2-242**

 displaying **2-448**

 filter RSPAN traffic **2-242**

 remote-span command **2-287**

 sessions

 add interfaces to **2-242**

 displaying **2-448**

 start new **2-242**

S

SDM mismatch mode **2-293, 2-483**

sdm prefer command **2-292**

SDM templates

 allowed resources **2-293**

 and stacking **2-293**

 displaying **2-470**

 dual IPv4 and IPv6 **2-292**

 secure ports, limitations **2-595**

 sending flow-control packets **2-107**

 service password-recovery command **2-296**

 service-policy command **2-298**

 session command **2-300**

 set (boot loader) command **A-21**

 set command **2-301**

 setup command **2-303**

 setup express command **2-306**

 show access-lists command **2-308**

 show archive status command **2-311**

 show arp access-list command **2-312**

 show auto qos command **2-313**

 show boot command **2-317**

 show changes command **2-643**

 show class-map command **2-322**

show cluster candidates command **2-325**

show cluster command **2-323**

show cluster members command **2-327**

show controllers cpu-interface command **2-330**

show controllers ethernet-controller command **2-332**

show controllers power inline command **2-340**

show controllers tcam command **2-342**

show controllers utilization command **2-344**

show controller utilization command **2-344**

show current command **2-643**

show dot1q-tunnel command **2-346**

show dot1x command **2-347**

show dtp **2-350**

show env command **2-352**

show errdisable detect command **2-355**

show errdisable flap-values command **2-357**

show errdisable recovery command **2-359**

show etherchannel command **2-361**

show flowcontrol command **2-364**

show idprom command **2-366**

show interfaces command **2-368**

show interfaces counters command **2-377**

show ip arp inspection command **2-380**

show ipc command **2-403**

show ip dhcp snooping binding command **2-384**

show ip dhcp snooping command **2-383**

show ip dhcp snooping database command **2-386**

show ip igmp profile command **2-388**

show ip igmp snooping command **2-390**

show ip igmp snooping command querier detail **2-392, 2-398**

show ip igmp snooping groups command **2-395**

show ip igmp snooping mrouter command **2-397**

show ip igmp snooping querier detail command **2-392, 2-398**

show ip source binding command **2-400**

show ip verify source command **2-401**

show l2protocol-tunnel command **2-407**

show lacp command **2-410**

- show mac access-group command **2-414**
 show mac address-table address command **2-418**
 show mac address-table aging time command **2-420**
 show mac address-table command **2-416**
 show mac address-table count command **2-422**
 show mac address-table dynamic command **2-424**
 show mac address-table interface command **2-426**
 show mac address-table notification command **2-428**
 show mac address-table static command **2-430**
 show mac address-table vlan command **2-432**
 show mls qos aggregate-policer command **2-435**
 show mls qos command **2-434**
 show mls qos input-queue command **2-436**
 show mls qos interface command **2-438**
 show mls qos maps command **2-442**
 show mls qos queue-set command **2-445**
 show mls qos vlan command **2-447**
 show monitor command **2-448**
 show mvr command **2-451**
 show mvr interface command **2-453**
 show mvr members command **2-455**
 show pagp command **2-457**
 show parser macro command **2-459**
 show platform acl command **C-2**
 show platform configuration command **C-3**
 show platform etherchannel command **C-4**
 show platform forward command **C-5**
 show platform frontend-controller command **C-7**
 show platform igmp snooping command **C-8**
 show platform ipc trace command **C-13**
 show platform ip multicast command **C-10**
 show platform ip unicast command **C-11**
 show platform ipv6 unicast command **C-14**
 show platform layer4op command **C-16**
 show platform mac-address-table command **C-17**
 show platform messaging command **C-18**
 show platform monitor command **C-19**
 show platform mvr table command **C-20**
 show platform pm command **C-21**
 show platform port-asic command **C-22**
 show platform port-security command **C-27**
 show platform qos command **C-28**
 show platform resource-manager command **C-29**
 show platform snmp counters command **C-31**
 show platform spanning-tree command **C-32**
 show platform stack-manager command **C-34**
 show platform stp-instance command **C-33**
 show platform tb command **C-36**
 show platform tcam command **C-38**
 show platform vlan command **C-41**
 show policy-map command **2-462**
 show port security command **2-464**
 show power inline command **2-467**
 show proposed command **2-643**
 show sdm prefer command **2-470**
 show setup express command **2-473**
 show spanning-tree command **2-474**
 show storm-control command **2-480**
 show switch command **2-482**
 show system mtu command **2-485**
 show trust command **2-621**
 show udld command **2-486**
 show version command **2-489**
 show vlan access-map command **2-496**
 show vlan command **2-491**
 show vlan command, fields **2-493**
 show vlan filter command **2-497**
 show vmps command **2-498**
 show vtp command **2-501**
 shutdown command **2-505**
 shutdown threshold, Layer 2 protocol tunneling **2-167**
 shutdown vlan command **2-506**
 Smartports macros
 See macros
 SNMP host, specifying **2-511**
 SNMP informs, enabling the sending of **2-507**
 snmp-server enable traps command **2-507**
 snmp-server host command **2-511**

- snmp trap mac-notification command **2-515**
- SNMP traps
- enabling MAC address notification trap **2-515**
 - enabling the MAC address notification feature **2-184**
 - enabling the sending of **2-507**
- SoftPhone
- See Cisco SoftPhone
- software images
- copying **2-7**
 - deleting **2-75**
 - downloading **2-10**
 - upgrading **2-7, 2-10**
 - uploading **2-17**
- software version, displaying **2-489**
- source ports, MVR **2-250**
- SPAN
- configuring **2-242**
 - debug messages, display **B-22**
 - displaying **2-448**
 - filter SPAN traffic **2-242**
 - sessions
 - add interfaces to **2-242**
 - displaying **2-448**
 - start new **2-242**
 - spanning-tree backbonefast command **2-517**
 - spanning-tree bpdufilter command **2-518**
 - spanning-tree bpduguard command **2-520**
 - spanning-tree cost command **2-522**
 - spanning-tree etherchannel command **2-524**
 - spanning-tree extend system-id command **2-526**
 - spanning-tree guard command **2-528**
 - spanning-tree link-type command **2-530**
 - spanning-tree loopguard default command **2-532**
 - spanning-tree mode command **2-534**
 - spanning-tree mst configuration command **2-536**
 - spanning-tree mst cost command **2-538**
 - spanning-tree mst forward-time command **2-540**
 - spanning-tree mst hello-time command **2-541**
 - spanning-tree mst max-age command **2-542**
 - spanning-tree mst max-hops command **2-543**
 - spanning-tree mst port-priority command **2-544**
 - spanning-tree mst priority command **2-546**
 - spanning-tree mst root command **2-547**
 - spanning-tree portfast (global configuration) command **2-551**
 - spanning-tree portfast (interface configuration) command **2-553**
 - spanning-tree port-priority command **2-549**
- Spanning Tree Protocol
- See STP
- spanning-tree uplinkfast command **2-555**
- spanning-tree vlan command **2-557**
- speed command **2-560**
- srr-queue bandwidth limit command **2-562**
 - srr-queue bandwidth shape command **2-564**
 - srr-queue bandwidth share command **2-566**
- SSH, configuring version **2-163**
- stack-mac persistent timer command **2-568**
- stack member
- access **2-300**
 - number **2-482, 2-576**
 - priority value **2-573**
 - provisioning **2-574**
 - reloading **2-284**
- stacks, switch
- MAC address **2-568**
 - provisioning a new member **2-574**
 - reloading **2-284**
 - stack member access **2-300**
 - stack member number **2-482, 2-576**
 - stack member priority value **2-482, 2-573**
- static-access ports, configuring **2-580**
- statistics, Ethernet group **2-291**
- sticky learning, enabling **2-594**
- storm-control command **2-570**

- STP
- BackboneFast **2-517**
 - counters, clearing **2-56**
 - debug messages, display
 - BackboneFast events **B-78**
 - MSTP **B-81**
 - optimized BPDU handling **B-80**
 - spanning-tree activity **B-76**
 - switch shim **B-83**
 - transmitted and received BPDU **B-79**
 - UplinkFast **B-85**
 - detection of indirect link failures **2-517**
 - enabling protocol tunneling for **2-167**
 - EtherChannel misconfiguration **2-524**
 - extended system ID **2-526**
 - path cost **2-522**
 - protocol modes **2-534**
 - root port
 - accelerating choice of new **2-555**
 - loop guard **2-528**
 - preventing from becoming designated **2-528**
 - restricting which can be root **2-528**
 - root guard **2-528**
 - UplinkFast **2-555**
 - root switch
 - affects of extended system ID **2-526, 2-558**
 - hello-time **2-557**
 - interval between BDPU messages **2-557**
 - interval between hello BPDU messages **2-557**
 - max-age **2-557**
 - port priority for selection of **2-549**
 - primary or secondary **2-557**
 - switch priority **2-557**
 - state changes
 - blocking to forwarding state **2-553**
 - enabling BPDU filtering **2-518, 2-551**
 - enabling BPDU guard **2-520, 2-551**
 - enabling Port Fast **2-551, 2-553**
 - enabling timer to recover from error state **2-104**
- STP (continued)
- state changes (continued)
 - forward-delay time **2-557**
 - length of listening and learning states **2-557**
 - shutting down Port Fast-enabled ports **2-551**
 - state information display **2-474**
 - VLAN options **2-546, 2-557**
 - SVIs, creating **2-114**
 - Switched Port Analyzer
 - See SPAN
 - switching characteristics
 - modifying **2-578**
 - returning to interfaces **2-578**
 - switchport access command **2-580**
 - switchport backup interface command **2-582**
 - switchport block command **2-584**
 - switchport command **2-578**
 - switchport host command **2-586**
 - switchport mode command **2-587**
 - switchport mode private-vlan command **2-590**
 - switchport nonegotiate command **2-592**
 - switchport port-security aging command **2-598**
 - switchport port-security command **2-594**
 - switchport priority extend command **2-600**
 - switchport private-vlan command **2-602**
 - switchport protected command **2-604**
 - switchports, displaying **2-368**
 - switchport trunk command **2-606**
 - switchport voice vlan command **2-609**
 - switch priority command **2-573**
 - switch provision command **2-574**
 - switch renumber command **2-576**
 - system env temperature threshold yellow command **2-611**
 - system message logging **2-175**
 - system message logging, save message to flash **2-176**
 - system mtu command **2-613**
 - system resource templates **2-292**

T

tar files, creating, listing, and extracting [2-14](#)
TDR, running [2-615](#)
Telnet, using to communicate to cluster switches [2-282](#)
temperature information, displaying [2-352](#)
templates, system resources [2-292](#)
test cable-diagnostics tdr command [2-615](#)
traceroute mac command [2-616](#)
traceroute mac ip command [2-619](#)
trunking, VLAN mode [2-587](#)
trunk mode [2-587](#)
trunk ports [2-587](#)
trunks, to non-DTP device [2-588](#)
trusted boundary for QoS [2-239](#)
trusted port states for QoS [2-239](#)
tunnel ports, Layer 2 protocol, displaying [2-407](#)
type (boot loader) command [A-24](#)

U

UDLD
aggressive mode [2-623, 2-625](#)
debug messages, display [B-94](#)
enable globally [2-623](#)
enable per interface [2-625](#)
error recovery timer [2-104](#)
message timer [2-623](#)
normal mode [2-623, 2-625](#)
reset a shutdown interface [2-627](#)
status [2-486](#)
udld command [2-623](#)
udld port command [2-625](#)
udld reset command [2-627](#)
unicast storm control [2-570](#)
UniDirectional Link Detection
See UDLD

unknown multicast traffic, preventing [2-584](#)
unknown unicast traffic, preventing [2-584](#)
unset (boot loader) command [A-25](#)
upgrading
software images [2-7, 2-10](#)
monitoring status of [2-311](#)
upgrading information
See release notes
UplinkFast, for STP [2-555](#)
user EXEC mode [1-2, 1-3](#)

V

version (boot loader) command [A-27](#)
version mismatch mode [2-483](#)
vlan (global configuration) command [2-628](#)
vlan (VLAN configuration) command [2-634](#)
vlan access-map command [2-640](#)
VLAN access map configuration mode [2-640](#)
VLAN access maps
actions [2-5](#)
displaying [2-496](#)
VLAN-based QoS [2-241](#)
VLAN configuration
rules [2-631, 2-636](#)
saving [2-628, 2-638](#)
VLAN configuration mode
commands
VLAN [2-634](#)
VTP [2-658](#)
description [1-5](#)
entering [2-642](#)
summary [1-3](#)
vlan database command [2-642](#)
vlan dot1q tag native command [2-645](#)
vlan filter command [2-647](#)
VLAN filters, displaying [2-497](#)
VLAN ID range [2-628, 2-634](#)

- VLAN maps
- applying **2-647**
 - creating **2-640**
 - defining **2-199**
 - displaying **2-496**
- VLAN Query Protocol
- See VQP
- VLANs
- adding **2-628**
 - configuring **2-628, 2-634**
 - debug messages, display
 - ISL **B-90**
 - VLAN IOS file system error tests **B-88**
 - VLAN manager activity **B-86**
 - VTP **B-92**
 - displaying configurations **2-491**
 - extended-range **2-628**
 - MAC addresses
 - displaying **2-432**
 - number of **2-422**
 - media types **2-631, 2-636**
 - normal-range **2-628, 2-634**
 - private **2-590**
 - configuring **2-276**
 - displaying **2-491**
 - See also private VLANs
 - restarting **2-506**
 - saving the configuration **2-628**
 - shutting down **2-506**
 - SNMP traps for VTP **2-509, 2-512**
 - suspending **2-506**
 - variables **2-634**
- VLAN Trunking Protocol
- See VTP
- VM mode **2-483**
- VMPS
- configuring servers **2-652**
 - displaying **2-498**
 - error recovery timer **2-105**
 - reconfirming dynamic VLAN assignments **2-649**
 - vmmps reconfirm (global configuration) command **2-650**
 - vmmps reconfirm (privileged EXEC) command **2-649**
 - vmmps retry command **2-651**
 - vmmps server command **2-652**
 - voice VLAN
 - configuring **2-609**
 - setting port priority **2-600**
- VQP
- and dynamic-access ports **2-581**
 - clearing client statistics **2-58**
 - displaying information **2-498**
 - per-server retry count **2-651**
 - reconfirmation interval **2-650**
 - reconfirming dynamic VLAN assignments **2-649**
- VTP
- changing characteristics **2-654**
 - clearing pruning counters **2-59**
 - configuring
 - domain name **2-654, 2-658**
 - file name **2-654**
 - mode **2-654, 2-658**
 - password **2-654, 2-658**
 - counters display fields **2-502**
 - displaying information **2-501**
 - enabling
 - pruning **2-654, 2-658**
 - tunneling for **2-167**
 - Version 2 **2-654, 2-658**
 - mode **2-654, 2-658**
 - pruning **2-654, 2-658**

VTP (continued)

 saving the configuration [2-628, 2-638](#)

 statistics [2-501](#)

 status [2-501](#)

 status display fields [2-503](#)

 vtp (global configuration) command [2-654](#)

 vtp (VLAN configuration) command [2-658](#)

X

XENPAK module serial EEPROM information [2-336,](#)
[2-366](#)