

INDEX

A

aaa accounting dot1x command **2-1**
aaa authentication dot1x command **2-3**
aaa authorization network command **2-5, 2-18, 2-24, 2-26, 2-28, 2-30, 2-32, 2-101, 2-243, 2-404, B-7, B-30**
AAA methods **2-3**
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP **2-149**
 MAC, displaying **2-510**
 access list, IPv6 **2-207**
 access map configuration mode **2-268**
 access mode **2-687**
 access ports **2-687**
 ACEs **2-92, 2-344**
 ACLs
 deny **2-90**
 displaying **2-388**
 for non-IP protocols **2-247**
 IP **2-149**
 matching **2-268**
 on Layer 2 interfaces **2-149**
 permit **2-342**
 action command **2-6**
 address aliasing **2-319**
 aggregate-port learner **2-332**
 allowed VLANs **2-707**
 archive download-sw command **2-8**
 archive tar command **2-11**

archive upload-sw command **2-14**
audience **xix**
authentication command bounce-port ignore **2-16**
authentication command disable-port ignore **2-17**
authentication control-direction command **2-18**
authentication event command **2-20**
authentication failed VLAN
 See dot1x auth-fail vlan
authentication fallback command **2-24**
authentication host-mode command **2-26**
authentication mac-move permit command **2-28**
authentication open command **2-30**
authentication order command **2-32**
authentication periodic command **2-34**
authentication port-control command **2-36**
authentication priority command **2-38**
authentication timer command **2-40**
authentication violation command **2-42**
auth-fail max-attempts
 See dot1x auth-fail max-attempts
auth-fail vlan
 See dot1x auth-fail vlan
auth open command **2-30**
auth order command **2-32**
authorization state of controlled port **2-118**
auth timer command **2-40**
autonegotiation of duplex mode **2-129**
auto qos voip command **2-44**

B

BackboneFast, for STP **2-619**
 backup interfaces
 configuring **2-680**
 displaying **2-446**
 boot (boot loader) command **A-2**
 boot config-file command **2-48**
 boot enable-break command **2-49**
 boot helper command **2-50**
 boot helper-config file command **2-51**
 booting
 Cisco IOS image **2-54**
 displaying environment variables **2-400**
 interrupting **2-49**
 manually **2-52**
 boot loader
 accessing **A-1**
 booting
 Cisco IOS image **A-2**
 helper image **2-50**
 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**
 unsetting **A-24**
 files
 copying **A-5**
 deleting **A-6**
 displaying a list of **A-7**

files (continued)
 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 **2-52**
 boot private-config-file command **2-53**
 boot system command **2-54**
 BPDU filtering, for spanning tree **2-620, 2-653**
 BPDU guard, for spanning tree **2-622, 2-653**
 break key detection **2-375**
 broadcast storm control **2-671**

C

cat (boot loader) command **A-4**
 caution, description **xx**
 CDP, enabling protocol tunneling for **2-225**
 channel-group command **2-55**
 channel-protocol command **2-58**
 Cisco SoftPhone
 auto-QoS configuration **2-44**
 trusting packets sent from **2-310**
 CISP
 See Client Information Signalling Protocol
 cisp
 debug platform cisp command **B-30**
 cisp enable command **2-59**
 class command **2-60**
 class-map command **2-62**
 class maps
 creating **2-62**
 defining the match criteria **2-270**
 displaying **2-405**
 class of service
 See CoS

clear dot1x command **2-64**
 clear eap sessions command **2-65**
 clear errdisable interface **2-66**
 clear ipc command **2-67**
 clear ip dhcp snooping database command **2-69**
 clear l2protocol-tunnel counters command **2-68**
 clear lacp command **2-71**
 clear mac address-table command **2-72, 2-73**
 clear nmfp statistics command **2-74**
 clear pagp command **2-75**
 clear port-security command **2-76**
 clear spanning-tree counters command **2-78**
 clear spanning-tree detected-protocols command **2-79**
 clear vmps statistics command **2-80**
 clear vtp counters command **2-81**
 Client Information Signalling Protocol **2-59, 2-101, 2-404, B-7, B-30**
 clusters
 SNMP trap **2-609**
 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 **2-48, 2-53**
 configuring multiple interfaces **2-145**
 config-vlan mode
 commands **2-728**
 description **1-4**
 entering **2-727**
 summary **1-2**
 conventions
 command **xx**
 for examples **xx**
 publication **xx**
 text **xx**
 copy (boot loader) command **A-5**

CoS
 assigning default value to incoming packets **2-280**
 assigning to Layer 2 protocol packets **2-228**
 overriding the incoming value **2-280**
 CoS-to-DSCP map **2-284**
 CPU ASIC statistics, displaying **2-406**
 crashinfo files **2-138**
 critical VLAN **2-21**

D

debug authentication **B-2**
 debug auto qos command **B-4**
 debug backup command **B-6**
 debug cisp command **B-7**
 debug dot1x command **B-8**
 debug dtp command **B-9**
 debug eap command **B-10**
 debug etherchannel command **B-11**
 debug interface command **B-14**
 debug ip dhcp snooping command **B-12**
 debug ip igmp filter command **B-15**
 debug ip igmp max-groups command **B-16**
 debug ip igmp snooping command **B-17**
 debug ip verify source packet command **B-13**
 debug lacp command **B-18**
 debug lldp packets command **B-19**
 debug mac-notification command **B-20**
 debug matm command **B-21**
 debug matm move update command **B-22**
 debug monitor command **B-23**
 debug mvrdbg command **B-24**
 debug nmfp command **B-25**
 debug nvram command **B-26**
 debug pagp command **B-27**
 debug platform acl command **B-28**
 debug platform backup interface command **B-29**
 debug platform cisp command **B-30**
 debug platform cli-redirection main command **B-31**

- debug platform cpu-queues command **B-32**
 debug platform dot1x command **B-34**
 debug platform etherchannel command **B-35**
 debug platform fallback-bridging command **B-36**
 debug platform forw-tcam command **B-37**
 debug platform ip arp inspection command **B-38**
 debug platform ipc command **B-46**
 debug platform ip dhcp command **B-39**
 debug platform ip igmp snooping command **B-40**
 debug platform ip multicast command **B-42**
 debug platform ip unicast command **B-44**
 debug platform led command **B-47**
 debug platform matm command **B-48**
 debug platform messaging application command **B-49**
 debug platform phy command **B-50**
 debug platform pm command **B-52**
 debug platform port-asic command **B-54**
 debug platform port-security command **B-55**
 debug platform qos-acl-tcam command **B-56**
 debug platform remote-commands command **B-57**
 debug platform resource-manager command **B-58**
 debug platform snmp command **B-59**
 debug platform span command **B-60**
 debug platform supervisor-asic command **B-61**
 debug platform sw-bridge command **B-62**
 debug platform tcam command **B-63**
 debug platform udld command **B-66**
 debug platform vlan command **B-67**
 debug pm command **B-68**
 debug port-security command **B-70**
 debug qos-manager command **B-71**
 debug spanning-tree backbonefast command **B-74**
 debug spanning-tree bpdu command **B-75**
 debug spanning-tree bpdu-opt command **B-76**
 debug spanning-tree command **B-72**
 debug spanning-tree mstp command **B-77**
 debug spanning-tree switch command **B-79**
 debug spanning-tree uplinkfast command **B-81**
 debug sw-vlan command **B-82**
 debug sw-vlan ifs command **B-84**
 debug sw-vlan notification command **B-85**
 debug sw-vlan vtp command **B-86**
 debug udld command **B-88**
 debug vqpc command **B-90**
 define interface-range command **2-82**
 delete (boot loader) command **A-6**
 delete command **2-84**
 deny (IPv6) command **2-85**
 deny command **2-90**
 detect mechanism, causes **2-130**
 device manager requirements **xx**
 DHCP snooping
 accepting untrusted packets from edge switch **2-165**
 enabling
 on a VLAN **2-171**
 option 82 **2-163, 2-165**
 trust on an interface **2-169**
 error recovery timer **2-135**
 rate limiting **2-168**
 DHCP snooping binding database
 binding file, configuring **2-161**
 bindings
 adding **2-159**
 deleting **2-159**
 displaying **2-461**
 clearing database agent statistics **2-69**
 database agent, configuring **2-161**
 displaying
 binding entries **2-461**
 database agent status **2-463, 2-465**
 renewing **2-368**
 dir (boot loader) command **A-7**
 directories, deleting **2-84**
 documentation, related **xx**
 document conventions **xx**
 domain name, VTP **2-744**
 dot1x auth-fail max-attempts **2-95**
 dot1x auth-fail vlan **2-97**

dot1x command **2-93**
 dot1x control-direction command **2-99**
 dot1x credentials (global configuration) command **2-101**
 dot1x critical global configuration command **2-102**
 dot1x critical interface configuration command **2-104**
 dot1x default command **2-106**
 dot1x fallback command **2-107**
 dot1x guest-vlan command **2-109**
 dot1x host-mode command **2-111**
 dot1x initialize command **2-112**
 dot1x mac-auth-bypass command **2-113**
 dot1x max-reauth-req command **2-115**
 dot1x max-req command **2-116**
 dot1x pae command **2-117**
 dot1x port-control command **2-118**
 dot1x re-authenticate command **2-120**
 dot1x reauthentication command **2-121**
 dot1x supplicant force-multicast command **2-108**
 dot1x test eapol-capable command **2-122**
 dot1x test timeout command **2-123**
 dot1x timeout command **2-124**
 dot1x violation-mode command **2-127**
 dropping packets, with ACL matches **2-6**
 drop threshold, Layer 2 protocol tunneling **2-225**
 DSCL-to-CoS map **2-284**
 DSCL-to-DSCL-mutation map **2-284**
 DTP **2-688**
 DTP flap
 error detection for **2-130**
 error recovery timer **2-135**
 DTP negotiation **2-692**
 dual IPv4 and IPv6 templates **2-336**
 dual-purpose uplink ports
 selecting the type **2-274**
 duplex command **2-128**
 dynamic-access ports
 configuring **2-676**
 restrictions **2-676**

dynamic ARP inspection
 error detection for **2-130**
 dynamic auto VLAN membership mode **2-687**
 dynamic desirable VLAN membership mode **2-687**
 Dynamic Host Configuration Protocol (DHCP)
 See DHCP snooping
 Dynamic Trunking Protocol
 See DTP

E

EAP-request/identity frame
 maximum number to send **2-116**
 response time before retransmitting **2-124**
 encapsulation methods **2-707**
 environment variables, displaying **2-400**
 errdisable detect cause command **2-130**
 errdisable detect cause small-frame command **2-132**
 errdisable recovery cause small-frame **2-134**
 errdisable recovery command **2-135**
 error conditions, displaying **2-433**
 error disable detection **2-130**
 error-disabled interfaces, displaying **2-446**
 EtherChannel
 assigning Ethernet interface to channel group **2-55**
 creating port-channel logical interface **2-143**
 debug EtherChannel/PAgP, display **B-11**
 debug platform-specific events, display **B-35**
 displaying **2-437**
 enabling Layer 2 protocol tunneling for
 LACP **2-226**
 PAgP **2-226**
 UDLD **2-226**
 interface information, displaying **2-446**
 LACP
 clearing channel-group information **2-71**
 debug messages, display **B-18**
 displaying **2-499**
 modes **2-55**

LACP (continued)

- port priority for hot-standby ports **2-229**

- restricting a protocol **2-58**

- system priority **2-231**

load-distribution methods **2-352**

PAgP

- aggregate-port learner **2-332**

- clearing channel-group information **2-75**

- debug messages, display **B-27**

- displaying **2-562**

- error detection for **2-130**

- error recovery timer **2-135**

- learn method **2-332**

- modes **2-55**

- physical-port learner **2-332**

- priority of interface for transmitted traffic **2-334**

Ethernet controller, internal register display **2-408**

Ethernet statistics, collecting **2-371**

examples, conventions for **xx**

exception crashinfo command **2-138**

extended-range VLANs

- and allowed VLAN list **2-707**

- and pruning-eligible list **2-707**

- configuring **2-727**

extended system ID for STP **2-628**

F

fallback profile command **2-139**

fallback profiles

- displaying **2-440**

file name, VTP **2-744**

files, deleting **2-84**

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

flexible authentication ordering **2-32**

Flex Links

- configuring **2-680**

- configuring preferred VLAN **2-682**

- displaying **2-446**

flowcontrol command **2-141**

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 **2-388**

help (boot loader) command **A-12**

hierarchical policy maps **2-350**

host connection, port configuration **2-686**

host ports, private VLANs **2-690**

I

IEEE 802.1Q trunk ports and native VLANs **2-736**

IEEE 802.1Q tunnel ports

- configuring **2-687**

- displaying **2-420**

- limitations **2-688**

IEEE 802.1x

- and switchport modes **2-688**

- violation error recovery **2-135**

- See also port-based authentication

IEEE 802.1X Port Based Authentication

- enabling guest VLAN supplicant **2-96, 2-107, 2-140**

IGMP filters

- applying **2-174**

- debug messages, display **B-15**

IGMP groups, setting maximum **2-176**

IGMP maximum groups, debugging **B-16**

- IGMP profiles
 creating [2-178](#)
 displaying [2-468](#)
- IGMP snooping
 adding ports as a static member of a group [2-194](#)
 displaying [2-469, 2-474, 2-476](#)
 enabling [2-180](#)
 enabling the configurable-leave timer [2-182](#)
 enabling the Immediate-Leave feature [2-191](#)
 flooding query count [2-188](#)
 interface topology change notification behavior [2-190](#)
 multicast table [2-472](#)
 querier [2-184](#)
 query solicitation [2-188](#)
 report suppression [2-186](#)
 switch topology change notification behavior [2-188](#)
- images
 See software images
- Immediate-Leave feature, MVR [2-321](#)
- Immediate-Leave processing
 IPv6 [2-221](#)
 immediate-leave processing [2-191](#)
- initial configuration
 See getting started guide and hardware installation guide
- interface configuration mode [1-2, 1-4](#)
- interface port-channel command [2-143](#)
- interface range command [2-145](#)
- interface-range macros [2-82](#)
- interfaces
 assigning Ethernet interface to channel group [2-55](#)
 configuring [2-128](#)
 configuring multiple [2-145](#)
 creating port-channel logical [2-143](#)
 debug messages, display [B-14](#)
 disabling [2-605](#)
 displaying the MAC address table [2-522](#)
 restarting [2-605](#)
- interface speed, configuring [2-663](#)
- interface vlan command [2-147](#)
- internal registers, displaying [2-408, 2-416](#)
- Internet Group Management Protocol
 See IGMP
- invalid GBIC
 error detection for [2-130](#)
 error recovery timer [2-135](#)
- ip access-group command [2-149](#)
- ip address command [2-152](#)
- IP addresses, setting [2-152](#)
- IP address matching [2-268](#)
- ip admission command [2-154](#)
- ip admission name proxy http command [2-155](#)
- IP DHCP snooping
 See DHCP snooping
- ip dhcp snooping binding command [2-159](#)
- ip dhcp snooping command [2-158](#)
- ip dhcp snooping database command [2-161](#)
- ip dhcp snooping information option allow-untrusted command [2-165](#)
- ip dhcp snooping information option command [2-163](#)
- ip dhcp snooping information option format remote-id command [2-167](#)
- ip dhcp snooping limit rate command [2-168](#)
- ip dhcp snooping trust command [2-169](#)
- ip dhcp snooping verify command [2-170](#)
- ip dhcp snooping vlan command [2-171](#)
- ip dhcp snooping vlan information option format-type circuit-id string command [2-172](#)
- ip igmp filter command [2-174](#)
- ip igmp max-groups command [2-176, 2-201, 2-203](#)
- ip igmp profile command [2-178](#)
- ip igmp snooping command [2-180](#)
- ip igmp snooping last-member-query-interval command [2-182](#)
- ip igmp snooping querier command [2-184](#)
- ip igmp snooping report-suppression command [2-186](#)
- ip igmp snooping tcn command [2-188](#)
- ip igmp snooping tcn flood command [2-190](#)
- ip igmp snooping vlan immediate-leave command [2-191](#)

ip igmp snooping vlan mrouter command **2-192**
 ip igmp snooping vlan static command **2-194**
 IP multicast addresses **2-318**
 IP phones
 auto-QoS configuration **2-44**
 trusting packets sent from **2-310**
 IP-precedence-to-DSCP map **2-284**
 ip snap forwarding command **2-196**
 ip source binding command **2-197**
 IP source guard
 disabling **2-205**
 displaying
 binding entries **2-478**
 configuration **2-480**
 dynamic binding entries only **2-461**
 enabling **2-205**
 static IP source bindings **2-197**
 ip ssh command **2-199**
 IPv6 access list
 deny conditions **2-85**
 ipv6 access-list command **2-207**
 ipv6 mld snooping command **2-209**
 ipv6 mld snooping last-listener-query count command **2-211**
 ipv6 mld snooping last-listener-query-interval command **2-213**
 ipv6 mld snooping listener-message-suppression command **2-215**
 ipv6 mld snooping robustness-variable command **2-217**
 ipv6 mld snooping tcn command **2-219**
 ipv6 mld snooping vlan command **2-221**
 IPv6 SDM template **2-372**
 ipv6 traffic-filter command **2-223**
 ip verify source command **2-205**

L

l2protocol-tunnel command **2-225**
 l2protocol-tunnel cos command **2-228**
 LACP
 See EtherChannel
 lacp port-priority command **2-229**
 lacp system-priority command **2-231**
 Layer 2 mode, enabling **2-674**
 Layer 2 protocol ports, displaying **2-496**
 Layer 2 protocol-tunnel
 error detection for **2-130**
 error recovery timer **2-135**
 Layer 2 protocol tunnel counters **2-68**
 Layer 2 protocol tunneling error recovery **2-226**
 Layer 2 traceroute
 IP addresses **2-718**
 MAC addresses **2-715**
 Layer 3 mode, enabling **2-674**
 line configuration mode **1-2, 1-5**
 Link Aggregation Control Protocol
 See EtherChannel
 link flap
 error detection for **2-130**
 error recovery timer **2-135**
 link state group command **2-237**
 link state track command **2-239**
 load-distribution methods for EtherChannel **2-352**
 location (global configuration) command **2-233**
 location (interface configuration) command **2-235**
 logging event command **2-240**
 logging file command **2-241**
 logical interface **2-143**
 loopback error
 detection for **2-130**
 recovery timer **2-135**
 loop guard, for spanning tree **2-629, 2-633**

J

jumbo frames

See MTU

M

mab request format attribute 32 command **2-243**
 mac access-group command **2-245**
 MAC access-groups, displaying **2-510**
 MAC access list configuration mode **2-247**
 mac access-list extended command **2-247**
 MAC access lists **2-90**
 MAC addresses
 disabling MAC address learning per VLAN **2-250**
 displaying
 aging time **2-516**
 all **2-514**
 dynamic **2-520**
 MAC address-table move updates **2-525**
 notification settings **2-524, 2-527**
 number of addresses in a VLAN **2-518**
 per interface **2-522**
 per VLAN **2-532**
 static **2-530**
 static and dynamic entries **2-512**
 dynamic
 aging time **2-249**
 deleting **2-72**
 displaying **2-520**
 enabling MAC address notification **2-254**
 enabling MAC address-table move update **2-252**
 matching **2-268**
 static
 adding and removing **2-256**
 displaying **2-530**
 dropping on an interface **2-257**
 tables **2-514**
 mac address notification, debugging **B-20**
 mac address-table aging-time **2-245, 2-268**
 mac address-table aging-time command **2-249**
 mac address-table learning command **2-250**
 mac address-table move update command **2-252**
 mac address-table notification command **2-254**

mac address-table static command **2-256**
 mac address-table static drop command **2-257**
 macro apply command **2-259**
 macro description command **2-262**
 macro global command **2-263**
 macro global description command **2-265**
 macro name command **2-266**
 macros
 adding a description **2-262**
 adding a global description **2-265**
 applying **2-263**
 creating **2-266**
 displaying **2-564**
 interface range **2-82, 2-145**
 specifying parameter values **2-263**
 tracing **2-263**
 manual
 audience **xix**
 purpose of **xix**
 maps
 QoS
 defining **2-284**
 displaying **2-542**
 VLAN
 creating **2-733**
 defining **2-268**
 displaying **2-596**
 match (access-map configuration) command **2-268**
 match (class-map configuration) command **2-270**
 maximum transmission unit
 See MTU
 mdix auto command **2-272**
 MDL snooping
 displaying **2-490**
 media-type command **2-274**
 memory (boot loader) command **A-13**
 mkdir (boot loader) command **A-15**

- MLD snooping
 configuring [2-215, 2-217](#)
 configuring queries [2-211, 2-213](#)
 configuring topology change notification [2-219](#)
 displaying [2-488, 2-492, 2-494](#)
 enabling [2-209](#)
- MLD snooping on a VLAN
 enabling [2-221](#)
- mls qos aggregate-policer command [2-278](#)
- mls qos command [2-276](#)
- mls qos cos command [2-280](#)
- mls qos dscp-mutation command [2-282](#)
- mls qos map command [2-284](#)
- mls qos queue-set output buffers command [2-288](#)
- mls qos queue-set output threshold command [2-290](#)
- mls qos rewrite ip dscp command [2-292](#)
- mls qos srr-queue input bandwidth command [2-294](#)
- mls qos srr-queue input buffers command [2-296](#)
- mls qos-srr-queue input cos-map command [2-298](#)
- mls qos srr-queue input dscp-map command [2-300](#)
- mls qos srr-queue input priority-queue command [2-302](#)
- mls qos srr-queue input threshold command [2-304](#)
- mls qos-srr-queue output cos-map command [2-306](#)
- mls qos srr-queue output dscp-map command [2-308](#)
- mls qos trust command [2-310](#)
- mls qos vlan-based command [2-312](#)
- mode, MVR [2-318](#)
- Mode button, and password recovery [2-375](#)
- modes, commands [1-1](#)
- monitor session command [2-313](#)
- more (boot loader) command [A-16](#)
- MSTP
 displaying [2-577](#)
 interoperability [2-79](#)
 link type [2-631](#)
- MST region
 aborting changes [2-637](#)
 applying changes [2-637](#)
 configuration name [2-637](#)
- MST region (continued)
 configuration revision number [2-637](#)
 current or pending display [2-637](#)
 displaying [2-577](#)
 MST configuration mode [2-637](#)
 VLANs-to-instance mapping [2-637](#)
 path cost [2-639](#)
 protocol mode [2-635](#)
 restart protocol migration process [2-79](#)
 root port
 loop guard [2-629](#)
 preventing from becoming designated [2-629](#)
 restricting which can be root [2-629](#)
 root guard [2-629](#)
 root switch
 affects of extended system ID [2-628](#)
 hello-time [2-642, 2-649](#)
 interval between BDPU messages [2-643](#)
 interval between hello BPDU messages [2-642, 2-649](#)
 max-age [2-643](#)
 maximum hop count before discarding BPDU [2-644](#)
 port priority for selection of [2-645](#)
 primary or secondary [2-649](#)
 switch priority [2-648](#)
 state changes
 blocking to forwarding state [2-655](#)
 enabling BPDU filtering [2-620, 2-653](#)
 enabling BPDU guard [2-622, 2-653](#)
 enabling Port Fast [2-653, 2-655](#)
 forward-delay time [2-641](#)
 length of listening and learning states [2-641](#)
 rapid transition to forwarding [2-631](#)
 shutting down Port Fast-enabled ports [2-653](#)
 state information display [2-576](#)
- MTU
 configuring size [2-712](#)
 displaying global setting [2-584](#)

multicast group address, MVR **2-321**

multicast groups, MVR **2-319**

Multicast Listener Discovery

See MLD

multicast router learning method **2-192**

multicast router ports

IPv6 **2-221**

multicast router ports, configuring **2-192**

multicast storm control **2-671**

multicast VLAN, MVR **2-318**

multicast VLAN registration

See MVR

multiple hosts on authorized port **2-111**

Multiple Spanning Tree Protocol

See MSTP

MVR

and address aliasing **2-319**

configuring **2-318**

configuring interfaces **2-321**

debug messages, display **B-24**

displaying **2-551**

displaying interface information **2-553**

members, displaying **2-555**

mvr (global configuration) command **2-318**

mvr (interface configuration) command **2-321**

mvr vlan group command **2-322**

N

native VLANs **2-707**

native VLAN tagging **2-736**

network-policy (global configuration) command **2-325**

network-policy command **2-324**

network-policy profile (network-policy configuration) command **2-327**

nmsp attachment suppress command **2-331**

nmsp command **2-329**

nonegotiate

DTP messaging **2-692**

nonegotiate, speed **2-663**

non-IP protocols

denying **2-90**

forwarding **2-342**

non-IP traffic access lists **2-247**

non-IP traffic forwarding

denying **2-90**

permitting **2-342**

normal-range VLANs **2-727, 2-732**

note, description **xx**

no vlan command **2-727**

O

online diagnostics

displaying

configured boot-up coverage level **2-420**

current scheduled tasks **2-420**

event logs **2-420**

supported test suites **2-420**

test ID **2-420**

test results **2-420**

test statistics **2-420**

P

PAgP

See EtherChannel

pagp learn-method command **2-332**

pagp port-priority command **2-334**

password, VTP **2-745**

password-recovery mechanism, enabling and disabling **2-375**

permit (IPv6) command **2-336**

permit (MAC access-list configuration) command **2-342**

per-VLAN spanning-tree plus

See STP

physical-port learner **2-332**

PID, displaying **2-459**

- PIM-DVMRP, as multicast router learning method **2-192**
- police aggregate command **2-347**
- police command **2-345**
- policed-DSCP map **2-284**
- policy-map command **2-349**
- policy maps
- applying to an interface **2-378, 2-383**
 - creating **2-349**
 - displaying **2-567**
 - hierarchical **2-350**
 - policers
 - displaying **2-535**
 - for a single class **2-345**
 - for multiple classes **2-278, 2-347**
 - policed-DSCP map **2-284**
 - traffic classification
 - defining the class **2-60**
 - defining trust states **2-720**
 - setting DSCP or IP precedence values **2-381**
- Port Aggregation Protocol
- See EtherChannel
- port-based authentication
- AAA method list **2-3**
 - configuring violation modes **2-127**
 - debug messages, display **B-8**
 - enabling IEEE 802.1x
 - globally **2-93**
 - per interface **2-118**
 - guest VLAN **2-109**
 - host modes **2-111**
 - IEEE 802.1x AAA accounting methods **2-1**
 - initialize an interface **2-112, 2-123**
 - MAC authentication bypass **2-113**
 - manual control of authorization state **2-118**
 - multiple hosts on authorized port **2-111**
 - PAE as authenticator **2-117**
- port-based authentication (continued)
- periodic re-authentication
 - enabling **2-121**
 - time between attempts **2-124**
 - quiet period between failed authentication exchanges **2-124**
 - re-authenticating IEEE 802.1x-enabled ports **2-120**
 - resetting configurable IEEE 802.1x parameters **2-106**
 - switch-to-authentication server retransmission time **2-124**
 - switch-to-client frame-retransmission number **2-115 to 2-116**
 - switch-to-client retransmission time **2-124**
 - test for IEEE 802.1x readiness **2-122**
- port-channel load-balance command **2-352**
- Port Fast, for spanning tree **2-655**
- port ranges, defining **2-82**
- ports, debugging **B-68**
- ports, protected **2-705**
- port security
- aging **2-699**
 - debug messages, display **B-70**
 - enabling **2-694**
 - violation error recovery **2-135**
- port trust states for QoS **2-310**
- port types, MVR **2-321**
- priority-queue command **2-354**
- private-vlan command **2-356**
- private-vlan mapping command **2-359**
- private VLANs
- association **2-703**
 - configuring **2-356**
 - configuring ports **2-690**
 - displaying **2-590**
 - host ports **2-690**
 - mapping
 - configuring **2-703**
 - displaying **2-446**
 - promiscuous ports **2-690**
- privileged EXEC mode **1-2, 1-3**

product identification information, displaying [2-459](#)

promiscuous ports, private VLANs [2-690](#)

protected ports, displaying [2-453](#)

pruning

- VLANs [2-707](#)

- VTP

- displaying interface information [2-446](#)

- enabling [2-745](#)

pruning-eligible VLAN list [2-709](#)

PVST+

- See STP

Q

QoS

- auto-QoS

- configuring [2-44](#)

- debug messages, display [B-4](#)

- displaying [2-396](#)

- class maps

- creating [2-62](#)

- defining the match criteria [2-270](#)

- displaying [2-405](#)

- defining the CoS value for an incoming packet [2-280](#)

- displaying configuration information [2-396, 2-534](#)

- DSCP transparency [2-292](#)

- DSCP trusted ports

- applying DSCP-to-DSCP-mutation map to [2-282](#)

- defining DSCP-to-DSCP-mutation map [2-284](#)

- egress queues

- allocating buffers [2-288](#)

- defining the CoS output queue threshold

- map [2-306](#)

- defining the DSCP output queue threshold map [2-308](#)

- displaying buffer allocations [2-538](#)

- displaying CoS output queue threshold map [2-542](#)

- displaying DSCP output queue threshold map [2-542](#)

egress queues (continued)

- displaying queueing strategy [2-538](#)

- displaying queue-set settings [2-545](#)

- enabling bandwidth shaping and scheduling [2-667](#)

- enabling bandwidth sharing and scheduling [2-669](#)

- limiting the maximum output on a port [2-665](#)

- mapping a port to a queue-set [2-361](#)

- mapping CoS values to a queue and threshold [2-306](#)

- mapping DSCP values to a queue and threshold [2-308](#)

- setting maximum and reserved memory allocations [2-290](#)

- setting WTD thresholds [2-290](#)

enabling [2-276](#)

ingress queues

- allocating buffers [2-296](#)

- assigning SRR scheduling weights [2-294](#)

- defining the CoS input queue threshold map [2-298](#)

- defining the DSCP input queue threshold map [2-300](#)

- displaying buffer allocations [2-538](#)

- displaying CoS input queue threshold map [2-542](#)

- displaying DSCP input queue threshold map [2-542](#)

- displaying queueing strategy [2-538](#)

- displaying settings for [2-536](#)

- enabling the priority queue [2-302](#)

- mapping CoS values to a queue and threshold [2-298](#)

- mapping DSCP values to a queue and threshold [2-300](#)

- setting WTD thresholds [2-304](#)

maps

- defining [2-284, 2-298, 2-300, 2-306, 2-308](#)

- displaying [2-542](#)

- policy maps
- applying an aggregate policer [2-347](#)
 - applying to an interface [2-378, 2-383](#)
 - creating [2-349](#)
 - defining policers [2-278, 2-345](#)
 - displaying policers [2-535](#)
 - displaying policy maps [2-567](#)
 - hierarchical [2-350](#)
 - policed-DSCP map [2-284](#)
 - setting DSCP or IP precedence values [2-381](#)
 - traffic classifications [2-60](#)
 - trust states [2-720](#)
- port trust states [2-310](#)
- queues, enabling the expedite [2-354](#)
- statistics
- in-profile and out-of-profile packets [2-538](#)
 - packets enqueued or dropped [2-538](#)
 - sent and received CoS values [2-538](#)
 - sent and received DSCP values [2-538](#)
- trusted boundary for IP phones [2-310](#)
- VLAN-based [2-312](#)
- quality of service
- See QoS
- querytime, MVR [2-318](#)
- queue-set command [2-361](#)
-
- R**
- radius-server dead-criteria command [2-362](#)
- radius-server host command [2-364](#)
- rapid per-VLAN spanning-tree plus
- See STP
- rapid PVST+
- See STP
- re-authenticating IEEE 802.1x-enabled ports [2-120](#)
- re-authentication
- periodic [2-121](#)
 - time between attempts [2-124](#)
- receiver ports, MVR [2-321](#)
- receiving flow-control packets [2-141](#)
- recovery mechanism
- causes [2-135](#)
 - display [2-66, 2-402, 2-431, 2-435](#)
 - timer interval [2-136](#)
- remote-span command [2-366](#)
- Remote Switched Port Analyzer
- See RSPAN
- rename (boot loader) command [A-17](#)
- renew ip dhcp snooping database command [2-368](#)
- requirements
- device manager [xx](#)
 - reset (boot loader) command [A-18](#)
 - resource templates, displaying [2-572](#)
- restricted VLAN
- See dot1x auth-fail vlan
- rmdir (boot loader) command [A-19](#)
- rmon collection stats command [2-371](#)
- root guard, for spanning tree [2-629](#)
- routed ports
- IP addresses on [2-153](#)
 - number supported [2-153](#)
- RSPAN
- configuring [2-313](#)
 - displaying [2-548](#)
 - filter RSPAN traffic [2-313](#)
 - remote-span command [2-366](#)
 - sessions
 - add interfaces to [2-313](#)
 - displaying [2-548](#)
 - start new [2-313](#)
-
- S**
- sdm prefer command [2-372](#)
- SDM templates
- allowed resources [2-373](#)
 - displaying [2-572](#)
 - dual IPv4 and IPv6 [2-372](#)

- secure ports, limitations **2-696**
 sending flow-control packets **2-141**
 service password-recovery command **2-375**
 service-policy command **2-378**
 set (boot loader) command **A-20**
 set command **2-381**
 setup command **2-383**
 setup express command **2-386**
 show access-lists command **2-388**
 show archive status command **2-391**
 show authentication command **2-392**
 show auto qos command **2-396**
 show boot command **2-400**
 show cable-diagnostics tdr command **2-402**
 show cisp command **2-404**
 show class-map command **2-405**
 show controllers cpu-interface command **2-406**
 show controllers ethernet-controller command **2-408**
 show controllers tcam command **2-416**
 show controller utilization command **2-418**
 show dot1q-tunnel command **2-420**
 show dot1x command **2-421**
 show dtp **2-425**
 show eap command **2-427**
 show env command **2-430**
 show errdisable detect command **2-431**
 show errdisable flap-values command **2-433**
 show errdisable recovery command **2-435**
 show etherchannel command **2-437**
 show fallback profile command **2-440**
 show flowcontrol command **2-442**
 show idprom command **2-444**
 show interfaces command **2-446**
 show interfaces counters command **2-456**
 show inventory command **2-459**
 show ipc command **2-482**
 show ip dhcp snooping binding command **2-461**
 show ip dhcp snooping command **2-460**
 show ip dhcp snooping database command **2-463, 2-465**
 show ip igmp profile command **2-468**
 show ip igmp snooping address command **2-490**
 show ip igmp snooping command **2-469, 2-488**
 show ip igmp snooping groups command **2-472**
 show ip igmp snooping mrouter command **2-474, 2-492**
 show ip igmp snooping querier command **2-476, 2-494**
 show ip source binding command **2-478**
 show ipv6 access-list command **2-486**
 show ip verify source command **2-480**
 show l2protocol-tunnel command **2-496**
 show lacp command **2-499**
 show link state group command **2-506, 2-508**
 show location **2-503**
 show mac access-group command **2-510**
 show mac address-table address command **2-514**
 show mac address-table aging time command **2-516**
 show mac address-table command **2-512**
 show mac address-table count command **2-518**
 show mac address-table dynamic command **2-520**
 show mac address-table interface command **2-522**
 show mac address-table learning command **2-524**
 show mac address-table move update command **2-525**
 show mac address-table notification command **2-73, 2-527, B-22**
 show mac address-table static command **2-530**
 show mac address-table vlan command **2-532**
 show mls qos aggregate-policer command **2-535**
 show mls qos command **2-534**
 show mls qos input-queue command **2-536**
 show mls qos interface command **2-538**
 show mls qos maps command **2-542**
 show mls qos queue-set command **2-545**
 show mls qos vlan command **2-547**
 show monitor command **2-548**
 show mvr command **2-551**
 show mvr interface command **2-553**
 show mvr members command **2-555**
 show network-policy profile command **2-557**
 show nmfp command **2-559**

- show pagp command **2-562**
 show parser macro command **2-564**
 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-31**
 show platform qos command **C-32**
 show platform resource-manager command **C-33**
 show platform snmp counters command **C-35**
 show platform spanning-tree command **C-36**
 show platform stp-instance command **C-37**
 show platform tcam command **C-38**
 show platform vlan command **C-41**
 show policy-map command **2-567**
 show port security command **2-569**
 show sdm prefer command **2-572**
 show setup express command **2-575**
 show spanning-tree command **2-576**
 show storm-control command **2-582**
 show system mtu command **2-584**
 show trust command **2-720**
 show udld command **2-585**
 show version command **2-588**
 show wlan access-map command **2-596**
 show wlan command **2-590**
 show vlan command, fields **2-592**
 show vlan filter command **2-597**
 show vmps command **2-598**
 show vtp command **2-600**
 shutdown command **2-605**
 shutdown threshold, Layer 2 protocol tunneling **2-225**
 shutdown vlan command **2-606**
 small violation-rate command **2-607**
 Smartports macros
 See macros
 SNMP host, specifying **2-613**
 SNMP informs, enabling the sending of **2-609**
 snmp-server enable traps command **2-609**
 snmp-server host command **2-613**
 snmp trap mac-notification change command **2-617**
 SNMP traps
 enabling MAC address notification trap **2-617**
 enabling the MAC address notification feature **2-254**
 enabling the sending of **2-609**
 SoftPhone
 See Cisco SoftPhone
 software images
 deleting **2-84**
 downloading **2-8**
 upgrading **2-8**
 uploading **2-14**
 software version, displaying **2-588**
 source ports, MVR **2-321**
 SPAN
 configuring **2-313**
 debug messages, display **B-23**
 displaying **2-548**
 filter SPAN traffic **2-313**
 sessions
 add interfaces to **2-313**
 displaying **2-548**
 start new **2-313**
 spanning **2-657**
 spanning-tree backbonefast command **2-619**

- spanning-tree bpdufilter command **2-620**
- spanning-tree bpduguard command **2-622**
- spanning-tree cost command **2-624**
- spanning-tree etherchannel command **2-626**
- spanning-tree extend system-id command **2-628**
- spanning-tree guard command **2-629**
- spanning-tree link-type command **2-631**
- spanning-tree loopguard default command **2-633**
- spanning-tree mode command **2-635**
- spanning-tree mst configuration command **2-637**
- spanning-tree mst cost command **2-639**
- spanning-tree mst forward-time command **2-641**
- spanning-tree mst hello-time command **2-642**
- spanning-tree mst max-age command **2-643**
- spanning-tree mst max-hops command **2-644**
- spanning-tree mst port-priority command **2-645**
- spanning-tree mst pre-standard command **2-647**
- spanning-tree mst priority command **2-648**
- spanning-tree mst root command **2-649**
- spanning-tree portfast (global configuration) command **2-653**
- spanning-tree portfast (interface configuration) command **2-655**
- spanning-tree port-priority command **2-651**
- Spanning Tree Protocol
- See STP
- spanning-tree transmit hold-count command **2-657**
- spanning-tree uplinkfast command **2-658**
- spanning-tree vlan command **2-660**
- speed command **2-663**
- srr-queue bandwidth limit command **2-665**
- srr-queue bandwidth shape command **2-667**
- srr-queue bandwidth share command **2-669**
- SSH, configuring version **2-199**
- static-access ports, configuring **2-676**
- statistics, Ethernet group **2-371**
- sticky learning, enabling **2-694**
- storm-control command **2-671**
- STP
- BackboneFast **2-619**
 - counters, clearing **2-78**
 - debug messages, display
 - BackboneFast events **B-74**
 - MSTP **B-77**
 - optimized BPDUs handling **B-76**
 - spanning-tree activity **B-72**
 - switch shim **B-79**
 - transmitted and received BPDUs **B-75**
 - UplinkFast **B-81**
 - detection of indirect link failures **2-619**
 - enabling protocol tunneling for **2-225**
 - EtherChannel misconfiguration **2-626**
 - extended system ID **2-628**
 - path cost **2-624**
 - protocol modes **2-635**
 - root port
 - accelerating choice of new **2-658**
 - loop guard **2-629**
 - preventing from becoming designated **2-629**
 - restricting which can be root **2-629**
 - root guard **2-629**
 - UplinkFast **2-658**
 - root switch
 - affects of extended system ID **2-628, 2-661**
 - hello-time **2-660**
 - interval between BDPU messages **2-660**
 - interval between hello BPDU messages **2-660**
 - max-age **2-660**
 - port priority for selection of **2-651**
 - primary or secondary **2-660**
 - switch priority **2-660**
 - state changes
 - blocking to forwarding state **2-655**
 - enabling BPDUs filtering **2-620, 2-653**
 - enabling BPDU guard **2-622, 2-653**
 - enabling Port Fast **2-653, 2-655**
 - enabling timer to recover from error state **2-135**

- STP (continued)
- state changes (continued)
 - forward-delay time **2-660**
 - length of listening and learning states **2-660**
 - shutting down Port Fast-enabled ports **2-653**
 - state information display **2-576**
 - VLAN options **2-648, 2-660**
- SVIs, creating **2-147**
- SVI status calculation **2-678**
- Switched Port Analyzer
- See SPAN
- switching characteristics
- modifying **2-674**
 - returning to interfaces **2-674**
- switchport access command **2-676**
- switchport autostate exclude command **2-678**
- switchport backup interface command **2-680**
- switchport block command **2-684**
- switchport command **2-674**
- switchport host command **2-686**
- switchport mode command **2-687**
- switchport mode private-vlan command **2-690**
- switchport nonegotiate command **2-692**
- switchport port-security aging command **2-699**
- switchport port-security command **2-694**
- switchport priority extend command **2-701**
- switchport private-vlan command **2-703**
- switchport protected command **2-705**
- switchports, displaying **2-446**
- switchport trunk command **2-707**
- switchport voice vlan command **2-710**
- system message logging, save message to flash **2-241**
- system mtu command **2-712**
- system resource templates **2-372**

- templates, system resources **2-372**
- test cable-diagnostics tdr command **2-714**
- traceroute mac command **2-715**
- traceroute mac ip command **2-718**
- trunking, VLAN mode **2-687**
- trunk mode **2-687**
- trunk ports **2-687**
- trunks, to non-DTP device **2-688**
- trusted boundary for QoS **2-310**
- trusted port states for QoS **2-310**
- tunnel ports, Layer 2 protocol, displaying **2-496**
- type (boot loader) command **A-23**

U

- UDLD
- aggressive mode **2-722, 2-724**
 - debug messages, display **B-88**
 - enable globally **2-722**
 - enable per interface **2-724**
 - error recovery timer **2-135**
 - message timer **2-722**
 - normal mode **2-722, 2-724**
 - reset a shutdown interface **2-726**
 - status **2-585**
- udld command **2-722**
- udld port command **2-724**
- udld reset command **2-726**
- unicast storm control **2-671**
- UniDirectional Link Detection
- See UDLD
- unknown multicast traffic, preventing **2-684**
- unknown unicast traffic, preventing **2-684**
- unset (boot loader) command **A-24**
- upgrading
- software images **2-8**
 - monitoring status of **2-391**
- upgrading information
- See release notes

T

- tar files, creating, listing, and extracting **2-11**
- TDR, running **2-714**

UplinkFast, for STP **2-658**

user EXEC mode **1-2, 1-3**

V

version (boot loader) command **A-26**

VLAN

enabling guest VLAN supplicant **2-96, 2-107**

vlan (global configuration) command **2-727**

vlan (VLAN configuration) command **2-732**

vlan access-map command **2-733**

VLAN access map configuration mode **2-733**

VLAN access maps

actions **2-6**

displaying **2-596**

VLAN-based QoS **2-312**

VLAN configuration

rules **2-730**

saving **2-727**

VLAN configuration mode

commands

VLAN **2-732**

VTP **2-750**

description **1-5**

entering **2-735**

summary **1-2**

vlan database command **2-735**

vlan dot1q tag native command **2-736**

vlan filter command **2-737**

VLAN filters, displaying **2-597**

VLAN ID range **2-727**

VLAN maps

applying **2-737**

creating **2-733**

defining **2-268**

displaying **2-596**

VLAN Query Protocol

See VQP

VLANs

adding **2-727**

configuring **2-727, 2-732**

debug messages, display

ISL **B-85**

VLAN IOS file system error tests **B-84**

VLAN manager activity **B-82**

VTP **B-86**

displaying configurations **2-590**

enabling guest VLAN supplicant **2-140**

extended-range **2-727**

MAC addresses

displaying **2-532**

number of **2-518**

media types **2-730**

normal-range **2-727, 2-732**

private **2-690**

configuring **2-356**

displaying **2-590**

See also private VLANs

restarting **2-606**

saving the configuration **2-727**

shutting down **2-606**

SNMP traps for VTP **2-611, 2-614**

suspending **2-606**

VLAN Trunking Protocol

See VTP

VMPS

configuring servers **2-742**

displaying **2-598**

error recovery timer **2-136**

reconfirming dynamic VLAN assignments **2-739**

vmpls reconfirm (global configuration) command **2-740**

vmpls reconfirm (privileged EXEC) command **2-739**

vmpls retry command **2-741**

vmpls server command **2-742**

voice VLAN

configuring **2-710**

setting port priority **2-701**

VQP

- and dynamic-access ports [2-676](#)
- clearing client statistics [2-80](#)
- displaying information [2-598](#)
- per-server retry count [2-741](#)
- reconfirmation interval [2-740](#)
- reconfirming dynamic VLAN assignments [2-739](#)

VTP

- changing characteristics [2-744](#)

- clearing pruning counters [2-81](#)

- configuring

- domain name [2-744](#)

- file name [2-744](#)

- mode [2-744](#)

- password [2-745](#)

- counters display fields [2-601](#)

- displaying information [2-600](#)

- enabling

- pruning [2-745](#)

- tunneling for [2-225](#)

- Version 2 [2-745](#)

- enabling per port [2-749](#)

- mode [2-744](#)

- pruning [2-745](#)

- saving the configuration [2-727](#)

- statistics [2-600](#)

- status [2-600](#)

- status display fields [2-603](#)

- vtp (global configuration) command [2-744](#)

- vtp (VLAN configuration) command [2-750](#)

- vtp interface configuration command [2-749](#)

- vtp primary command [2-751](#)

X

- XENPAK module serial EERPOM information [2-444](#)