



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, 2-124, 2-452, B-30](#)
AAA methods [2-3](#)
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP [2-175](#)
 MAC, displaying [2-555](#)
access list, IPv6 [2-249](#)
access map configuration mode [2-310](#)
access ports [2-721](#)
ACEs [2-110, 2-391](#)
ACLs
 deny [2-108](#)
 displaying [2-435](#)
 for non-IP protocols [2-289](#)
 IP [2-175](#)
 matching [2-310](#)
 on Layer 2 interfaces [2-175](#)
 permit [2-389](#)
action command [2-6](#)
address aliasing [2-361](#)
archive download-sw command [2-8](#)
archive tar command [2-11](#)
archive upload-sw command [2-14](#)
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 [2-142](#)
auth timer command [2-40](#)
autonegotiation of duplex mode [2-153](#)
auto qos classify command [2-44](#)
auto qos trust command [2-47](#)
auto qos video command [2-50](#)
auto qos voip command [2-53](#)

B

BackboneFast, for STP [2-653](#)
backup interfaces
 configuring [2-714](#)

- boot (boot loader) command [A-2](#)
- boot config-file command [2-59](#)
- boot enable-break command [2-60](#)
- boot helper command [2-61](#)
- boot helper-config file command [2-62](#)
- booting
 - Cisco IOS image [2-65](#)
 - displaying environment variables [2-448](#)
 - interrupting [2-60](#)
 - manually [2-63](#)
- boot loader
 - accessing [A-1](#)
 - booting
 - Cisco IOS image [A-2](#)
 - helper image [2-61](#)
 - 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
 - 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](#)
 - 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 [2-63](#)
- boot private-config-file command [2-64](#)
- boot system command [2-65](#)
- BPDU filtering, for spanning tree [2-654, 2-687](#)
- BPDU guard, for spanning tree [2-656, 2-687](#)
- break key detection [2-423](#)
- broadcast storm control [2-705](#)

C

- cat (boot loader) command [A-4](#)
- CDP, enabling protocol tunneling for [2-267](#)
- channel-group command [2-66](#)
- channel-protocol command [2-69](#)
- cisp
 - debug platform cisp command [B-30](#)
- cisp enable command [2-70](#)
- class command [2-71](#)
- class-map command [2-74](#)
- class maps
 - creating [2-74](#)
 - defining the match criteria [2-312](#)
 - displaying [2-453](#)
- class of service
 - See CoS
- clear dot1x command [2-76](#)
- clear eap sessions command [2-77](#)
- clear errdisable interface [2-78](#)
- clear ip arp inspection log command [2-79](#)
- clear ip arp inspection statistics command [2-80](#)
- clear ipc command [2-82](#)
- clear ip dhcp snooping database command [2-81, 2-84](#)
- clear l2protocol-tunnel counters command [2-83](#)
- clear lacp command [2-86](#)
- clear mac address-table command [2-87, 2-88](#)
- clear nmsp statistics command [2-89](#)
- clear pagp command [2-90](#)
- clear port-security command [2-91](#)
- clear psp counter [2-93](#)

clear psp counter command [2-93](#)
 clear spanning-tree counters command [2-94](#)
 clear spanning-tree detected-protocols command [2-95](#)
 clear vmpls statistics command [2-96](#)
 clear vtp counters command [2-97](#)
 Client Information Signalling Protocol [2-70, 2-452, B-7, B-30](#)
 clusters
 displaying
 status [2-454](#)
 command modes defined [1-1](#)
 configuration files
 password recovery disable considerations [A-1](#)
 specifying the name [2-59, 2-64](#)
 configuring multiple interfaces [2-171](#)
 config-vlan mode
 commands [2-762](#)
 entering [2-761](#)
 copy (boot loader) command [A-5](#)
 CoS
 assigning default value to incoming packets [2-322](#)
 assigning to Layer 2 protocol packets [2-270](#)
 overriding the incoming value [2-322](#)
 CPU ASIC statistics, displaying [2-456](#)
 crashinfo files [2-164](#)

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 nmsp 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 team command [B-63](#)
- debug platform udd 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 udd command [B-88](#)
- debug vqpc command [B-90](#)
- define interface-range command [2-98](#)
- delete (boot loader) command [A-6](#)
- delete command [2-100](#)
- deny (ARP access-list configuration) command [2-101](#)
- deny (IPv6) command [2-103](#)
- deny command [2-108](#)
- DHCP snooping
 - accepting untrusted packets from edge switch [2-207](#)
 - enabling
 - on a VLAN [2-213](#)
 - option 82 [2-205, 2-207](#)
 - trust on an interface [2-211](#)
 - rate limiting [2-210](#)
- DHCP snooping binding database
 - binding file, configuring [2-203](#)
 - bindings
 - adding [2-201](#)
 - deleting [2-201](#)
 - displaying [2-512](#)
 - clearing database agent statistics [2-81, 2-84](#)
 - database agent, configuring [2-203](#)
 - displaying
 - binding entries [2-512](#)
 - database agent status [2-514, 2-516](#)
 - renewing [2-416](#)
- dir (boot loader) command [A-7](#)
- directories, deleting [2-100](#)
- dot1x auth-fail max-attempts [2-118](#)
- dot1x auth-fail vlan [2-120](#)
- dot1x command [2-116](#)
- dot1x control-direction command [2-122](#)
- dot1x credentials (global configuration) command [2-124](#)
- dot1x critical global configuration command [2-125](#)
- dot1x critical interface configuration command [2-127](#)
- dot1x default command [2-129](#)
- dot1x fallback command [2-130](#)
- dot1x guest-vlan command [2-132](#)
- dot1x host-mode command [2-134](#)
- dot1x initialize command [2-135](#)
- dot1x mac-auth-bypass command [2-136](#)
- dot1x max-reauth-req command [2-138](#)
- dot1x max-req command [2-140](#)
- dot1x pae command [2-141](#)
- dot1x port-control command [2-142](#)
- dot1x re-authenticate command [2-144](#)
- dot1x reauthentication command [2-145](#)
- dot1x supplicant force-multicast command [2-131](#)
- dot1x test eapol-capable command [2-146](#)
- dot1x test timeout command [2-147](#)
- dot1x timeout command [2-148](#)
- dot1x violation-mode command [2-151](#)
- dropping packets, with ACL matches [2-6](#)
- DTP [2-722](#)
- DTP negotiation [2-726](#)
- dual IPv4 and IPv6 templates [2-383](#)
- dual-purpose uplink ports

- selecting the type [2-316](#)
- duplex command [2-152](#)
- dynamic-access ports
 - configuring [2-710](#)
 - restrictions [2-711](#)
- dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN [2-187](#)
 - deny packets [2-101](#)
 - display [2-439](#)
 - permit packets [2-381](#)
 - clear
 - log buffer [2-79](#)
 - statistics [2-80](#)
 - display
 - ARP ACLs [2-439](#)
 - configuration and operating state [2-508](#)
 - enable per VLAN [2-197](#)
 - log buffer
 - clear [2-79](#)
 - configure [2-191](#)
 - rate-limit incoming ARP packets [2-189](#)
 - statistics
 - clear [2-80](#)
 - trusted interface state [2-193](#)
 - type of packet logged [2-198](#)
 - validation checks [2-195](#)
- Dynamic Host Configuration Protocol (DHCP)
 - See DHCP snooping
- Dynamic Trunking Protocol
 - See DTP

E

- EAP-request/identity frame
 - maximum number to send [2-140](#)
- encapsulation methods [2-741](#)
- environment variables, displaying [2-448](#)
- epm access-control open [2-154](#)
- errdisable detect cause command [2-155](#)
- errdisable detect cause small-frame command [2-158](#)
- errdisable recovery cause small-frame [2-160](#)
- errdisable recovery command [2-161](#)
- error conditions, displaying [2-483](#)
- error disable detection [2-155](#)
- EtherChannel
 - assigning Ethernet interface to channel group [2-66](#)
 - creating port-channel logical interface [2-169](#)
 - debug EtherChannel/PAgP, display [B-11](#)
 - debug platform-specific events, display [B-35](#)
 - displaying [2-486](#)
 - enabling Layer 2 protocol tunneling for
 - LACP [2-268](#)
 - PAgP [2-268](#)
 - UDLD [2-268](#)
- LACP
 - clearing channel-group information [2-86](#)
 - debug messages, display [B-18](#)
 - displaying [2-547](#)
 - port priority for hot-standby ports [2-271](#)
 - restricting a protocol [2-69](#)
 - system priority [2-273](#)
- load-distribution methods [2-399](#)
- PAgP
 - aggregate-port learner [2-377](#)
 - clearing channel-group information [2-90](#)
 - debug messages, display [B-27](#)
 - displaying [2-594](#)
 - learn method [2-377](#)
 - physical-port learner [2-377](#)
 - priority of interface for transmitted traffic [2-379](#)
- Ethernet controller, internal register display [2-458](#)
- Ethernet statistics, collecting [2-419](#)
- exception crashinfo command [2-164](#)
- extended-range VLANs
 - and allowed VLAN list [2-741](#)
 - and pruning-eligible list [2-741](#)
 - configuring [2-761](#)

extended system ID for STP [2-662](#)

F

fallback profile command [2-165](#)

fallback profiles

displaying [2-489](#)

files, deleting [2-100](#)

flash_init (boot loader) command [A-9](#)

flexible authentication ordering [2-32](#)

Flex Links

configuring [2-714](#)

configuring preferred VLAN [2-716](#)

flowcontrol command [2-167](#)

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 [1-3](#)

H

health monitoring diagnostic tests

configuring [2-111](#)

help (boot loader) command [A-12](#)

hierarchical policy maps [2-397](#)

host connection, port configuration [2-720](#)

host ports, private VLANs [2-724](#)

I

IEEE 802.1Q trunk ports and native VLANs [2-768](#)

IEEE 802.1Q tunnel ports

displaying [2-470](#)

limitations [2-722](#)

IEEE 802.1x

and switchport modes [2-722](#)

See also port-based authentication

IEEE 802.1X Port Based Authentication

enabling guest VLAN supplicant [2-119, 2-130](#)

IGMP filters

debug messages, display [B-15](#)

IGMP groups, setting maximum [2-218](#)

IGMP maximum groups, debugging [B-16](#)

IGMP profiles

displaying [2-519](#)

IGMP snooping

adding ports as a static member of a group [2-236](#)

displaying [2-520, 2-525, 2-526](#)

enabling [2-222](#)

enabling the configurable-leave timer [2-224](#)

enabling the Immediate-Leave feature [2-233](#)

interface topology change notification behavior [2-232](#)

multicast table [2-523](#)

querier [2-226](#)

report suppression [2-228](#)

switch topology change notification behavior [2-230](#)

images

See software images

immediate-leave processing [2-233](#)

interface configuration mode [1-4](#)

interface port-channel command [2-169](#)

interface range command [2-171](#)

interface-range macros [2-98](#)

interfaces

assigning Ethernet interface to channel group [2-66](#)

configuring [2-152](#)

configuring multiple [2-171](#)

creating port-channel logical [2-169](#)

debug messages, display [B-14](#)

disabling [2-639](#)

displaying the MAC address table [2-563](#)

restarting [2-639](#)

- interface speed, configuring [2-697](#)
- interface vlan command [2-173](#)
- internal registers, displaying [2-458, 2-466](#)
- Internet Group Management Protocol
 - See IGMP
- ip access-group command [2-175](#)
- ip address command [2-178](#)
- IP addresses, setting [2-178](#)
- ip admission command [2-180](#)
- ip admission name proxy http command [2-181](#)
- ip arp inspection filter vlan command [2-187](#)
- ip arp inspection limit command [2-189](#)
- ip arp inspection log-buffer command [2-191](#)
- ip arp inspection trust command [2-193](#)
- ip arp inspection validate command [2-195](#)
- ip arp inspection vlan command [2-197](#)
- ip arp inspection vlan logging command [2-198](#)
- ip device tracking command [2-183](#)
- ip device tracking probe command [2-185](#)
- IP DHCP snooping
 - See DHCP snooping
- ip dhcp snooping binding command [2-201](#)
- ip dhcp snooping command [2-200](#)
- ip dhcp snooping database command [2-203](#)
- ip dhcp snooping information option allow-untrusted command [2-207](#)
- ip dhcp snooping information option command [2-205](#)
- ip dhcp snooping information option format remote-id command [2-209](#)
- ip dhcp snooping limit rate command [2-210](#)
- ip dhcp snooping trust command [2-211](#)
- ip dhcp snooping verify command [2-212](#)
- ip dhcp snooping vlan command [2-213](#)
- ip dhcp snooping vlan information option format-type circuit-id string command [2-214](#)
- ip igmp filter command [2-216](#)
- ip igmp max-groups command [2-218, 2-243, 2-245](#)
- ip igmp profile command [2-220](#)
- ip igmp snooping command [2-222](#)
- ip igmp snooping last-member-query-interval command [2-224](#)
- ip igmp snooping querier command [2-226](#)
- ip igmp snooping report-suppression command [2-228](#)
- ip igmp snooping tcn command [2-230](#)
- ip igmp snooping tcn flood command [2-232](#)
- ip igmp snooping vlan immediate-leave command [2-233](#)
- ip igmp snooping vlan mrouter command [2-234](#)
- ip igmp snooping vlan static command [2-236](#)
- ip snap forwarding command [2-238](#)
- ip source binding command [2-239](#)
- IP source guard
 - disabling [2-247](#)
 - displaying
 - binding entries [2-528](#)
 - configuration [2-529](#)
 - dynamic binding entries only [2-512](#)
 - enabling [2-247](#)
 - static IP source bindings [2-239](#)
- ip ssh command [2-241](#)
- IPv6 access list
 - deny conditions [2-103](#)
- ipv6 access-list command [2-249](#)
- ipv6 mld snooping command [2-251](#)
- ipv6 mld snooping last-listener-query count command [2-253](#)
- ipv6 mld snooping last-listener-query-interval command [2-255](#)
- ipv6 mld snooping listener-message-suppression command [2-257](#)
- ipv6 mld snooping robustness-variable command [2-259](#)
- ipv6 mld snooping tcn command [2-261](#)
- ipv6 mld snooping vlan command [2-263](#)
- ipv6 traffic-filter command [2-265](#)
- ip verify source command [2-247](#)

J

- jumbo frames
 - See MTU

L

l2protocol-tunnel command [2-267](#)
 l2protocol-tunnel cos command [2-270](#)
 lacp port-priority command [2-271](#)
 lacp system-priority command [2-273](#)
 Layer 2 mode, enabling [2-708](#)
 Layer 2 protocol ports, displaying [2-545](#)
 Layer 2 protocol tunnel counters [2-83](#)
 Layer 2 protocol tunneling error recovery [2-268](#)
 Layer 2 traceroute
 IP addresses [2-752](#)
 MAC addresses [2-749](#)
 Layer 3 mode, enabling [2-708](#)
 line configuration mode [1-4](#)
 link state group command [2-279](#)
 link state track command [2-281](#)
 load-distribution methods for EtherChannel [2-399](#)
 location (global configuration) command [2-275](#)
 location (interface configuration) command [2-277](#)
 logging event command [2-282](#)
 logging file command [2-283](#)
 logical interface [2-169](#)
 loop guard, for spanning tree [2-663, 2-667](#)

M

mab request format attribute 32 command [2-285](#)
 mac access-group command [2-287](#)
 MAC access-groups, displaying [2-555](#)
 MAC access list configuration mode [2-289](#)
 mac access-list extended command [2-289](#)
 MAC access lists [2-108](#)
 MAC addresses
 disabling MAC address learning per VLAN [2-292](#)
 displaying
 aging time [2-559](#)
 all [2-558](#)
 dynamic [2-562](#)

 MAC address-table move updates [2-565](#)
 notification settings [2-564, 2-566](#)
 number of addresses in a VLAN [2-561](#)
 per interface [2-563](#)
 per VLAN [2-570](#)
 static [2-568](#)
 static and dynamic entries [2-556](#)
 dynamic
 deleting [2-87](#)
 displaying [2-562](#)
 enabling MAC address notification [2-296](#)
 enabling MAC address-table move update [2-294](#)
 static
 adding and removing [2-298](#)
 displaying [2-568](#)
 dropping on an interface [2-299](#)
 tables [2-558](#)
 mac address notification, debugging [B-20](#)
 mac address-table aging-time [2-310](#)
 mac address-table aging-time command [2-291](#)
 mac address-table learning command [2-292](#)
 mac address-table move update command [2-294](#)
 mac address-table notification command [2-296](#)
 mac address-table static command [2-298](#)
 mac address-table static drop command [2-299](#)
 macro apply command [2-301](#)
 macro description command [2-304](#)
 macro global command [2-305](#)
 macro global description command [2-307](#)
 macro name command [2-308](#)
 macros
 creating [2-308](#)
 displaying [2-596](#)
 interface range [2-98](#)
 maps
 QoS
 defining [2-326](#)
 displaying [2-578](#)
 VLAN

- creating [2-766](#)
 - defining [2-310](#)
 - displaying [2-629](#)
- match (access-map configuration) command [2-310](#)
- match (class-map configuration) command [2-312](#)
- maximum transmission unit
 - See MTU
- mdix auto command [2-314](#)
- MDL snooping
 - displaying [2-539](#)
- media-type command [2-316](#)
- memory (boot loader) command [A-13](#)
- mkdir (boot loader) command [A-15](#)
- MLD snooping
 - configuring [2-257, 2-259](#)
 - configuring queries [2-253, 2-255](#)
 - configuring topology change notification [2-261](#)
 - displaying [2-537, 2-541, 2-543](#)
 - enabling [2-251](#)
- MLD snooping on a VLAN
 - enabling [2-263](#)
- mls qos aggregate-policer command [2-320](#)
- mls qos command [2-318](#)
- mls qos cos command [2-322](#)
- mls qos dscp-mutation command [2-324](#)
- mls qos map command [2-326](#)
- mls qos queue-set output buffers command [2-330](#)
- mls qos queue-set output threshold command [2-332](#)
- mls qos rewrite ip dscp command [2-334](#)
- mls qos srr-queue input bandwidth command [2-336](#)
- mls qos srr-queue input buffers command [2-338](#)
- mls qos-srr-queue input cos-map command [2-340](#)
- mls qos srr-queue input dscp-map command [2-342](#)
- mls qos srr-queue input priority-queue command [2-344](#)
- mls qos srr-queue input threshold command [2-346](#)
- mls qos-srr-queue output cos-map command [2-348](#)
- mls qos srr-queue output dscp-map command [2-350](#)
- mls qos trust command [2-352](#)
- mls qos vlan-based command [2-354](#)
- Mode button, and password recovery [2-423](#)
- modes, commands [1-1](#)
- monitor session command [2-355](#)
- more (boot loader) command [A-16](#)
- MSTP
 - interoperability [2-95](#)
 - link type [2-665](#)
 - MST region
 - aborting changes [2-671](#)
 - applying changes [2-671](#)
 - configuration name [2-671](#)
 - configuration revision number [2-671](#)
 - current or pending display [2-671](#)
 - MST configuration mode [2-671](#)
 - VLANs-to-instance mapping [2-671](#)
 - path cost [2-673](#)
 - protocol mode [2-669](#)
 - restart protocol migration process [2-95](#)
 - root port
 - loop guard [2-663](#)
 - preventing from becoming designated [2-663](#)
 - restricting which can be root [2-663](#)
 - root guard [2-663](#)
 - root switch
 - affects of extended system ID [2-662](#)
 - hello-time [2-676](#)
 - interval between BDPU messages [2-677](#)
 - interval between hello BPDU messages [2-676](#)
 - max-age [2-677](#)
 - maximum hop count before discarding BPDU [2-678](#)
 - port priority for selection of [2-679](#)
 - primary or secondary [2-683](#)
 - state changes
 - blocking to forwarding state [2-689](#)
 - enabling BPDU filtering [2-654, 2-687](#)
 - enabling BPDU guard [2-656, 2-687](#)
 - enabling Port Fast [2-687, 2-689](#)
 - forward-delay time [2-675](#)

- length of listening and learning states [2-675](#)
- rapid transition to forwarding [2-665](#)
- shutting down Port Fast-enabled ports [2-687](#)
- state information display [2-609](#)

MTU

- configuring size [2-746](#)
- displaying global setting [2-617](#)

multicast groups, MVR [2-361](#)

Multicast Listener Discovery

See MLD

- multicast router learning method [2-234](#)
- multicast router ports, configuring [2-234](#)
- multicast storm control [2-705](#)
- multicast VLAN, MVR [2-360](#)
- multicast VLAN registration

See MVR

multiple hosts on authorized port [2-134](#)

Multiple Spanning Tree Protocol

See MSTP

MVR

- and address aliasing [2-361](#)
- configuring [2-360](#)
- configuring interfaces [2-363](#)
- debug messages, display [B-24](#)
- displaying [2-585](#)
- displaying interface information [2-586](#)
- members, displaying [2-588](#)

mvr (global configuration) command [2-360](#)

mvr (interface configuration) command [2-363](#)

mvr vlan group command [2-364](#)

N

native VLAN tagging [2-768](#)

network-policy (global configuration) command [2-367](#)

network-policy command [2-366](#)

network-policy profile (network-policy configuration) command [2-369](#)

nmosp attachment suppress command [2-373](#)

nmosp command [2-371](#)

no authentication logging verbose [2-374](#)

no dot1x logging verbose [2-375](#)

no mab logging verbose [2-376](#)

nonegotiate

- DTP messaging [2-726](#)

nonegotiate, speed [2-697](#)

non-IP protocols

- denying [2-108](#)

- forwarding [2-389](#)

non-IP traffic access lists [2-289](#)

non-IP traffic forwarding

- denying [2-108](#)

- permitting [2-389](#)

normal-range VLANs [2-761](#)

no vlan command [2-761](#)

O

online diagnostics

configuring

- health monitoring diagnostic tests [2-111](#)

enabling

- syslog messages [2-111](#)

global configuration mode

- clearing health monitoring diagnostic test schedule [2-111](#)

- setting health monitoring diagnostic testing [2-111](#)

- setting up health monitoring diagnostic test schedule [2-111](#)

specifying

- health monitoring diagnostic tests [2-111](#)

starting testing [2-115](#)

P

pagp learn-method command [2-377](#)

pagp port-priority command [2-379](#)

- password-recovery mechanism, enabling and disabling [2-423](#)
- permit (ARP access-list configuration) command [2-381](#)
- permit (IPv6) command [2-383](#)
- permit (MAC access-list configuration) command [2-389](#)
- per-VLAN spanning-tree plus
 - See STP
- PID, displaying [2-507](#)
- police aggregate command [2-394](#)
- police command [2-392](#)
- policy-map command [2-396](#)
- policy maps
 - applying to an interface [2-425, 2-430](#)
 - creating [2-396](#)
 - displaying [2-599](#)
 - hierarchical [2-397](#)
- policers
 - displaying [2-573](#)
 - for a single class [2-392](#)
 - for multiple classes [2-320, 2-394](#)
- traffic classification
 - defining the class [2-71](#)
 - defining trust states [2-754](#)
 - setting DSCP or IP precedence values [2-428](#)
- port-based authentication
 - AAA method list [2-3](#)
 - configuring violation modes [2-151](#)
 - debug messages, display [B-8](#)
 - enabling IEEE 802.1x
 - globally [2-116](#)
 - per interface [2-142](#)
 - guest VLAN [2-132](#)
 - host modes [2-134](#)
 - IEEE 802.1x AAA accounting methods [2-1](#)
 - initialize an interface [2-135, 2-147](#)
 - MAC authentication bypass [2-136](#)
 - manual control of authorization state [2-142](#)
 - multiple hosts on authorized port [2-134](#)
 - PAE as authenticator [2-141](#)
 - periodic re-authentication
 - enabling [2-145](#)
 - re-authenticating IEEE 802.1x-enabled ports [2-144](#)
 - resetting configurable IEEE 802.1x parameters [2-129](#)
 - switch-to-client frame-retransmission number [2-138 to 2-140](#)
 - test for IEEE 802.1x readiness [2-146](#)
- port-channel load-balance command [2-399](#)
- Port Fast, for spanning tree [2-689](#)
- ports, debugging [B-68](#)
- ports, protected [2-739](#)
- port security
 - aging [2-733](#)
 - debug messages, display [B-70](#)
 - enabling [2-728](#)
- port trust states for QoS [2-352](#)
- priority-queue command [2-401](#)
- private-vlan command [2-403](#)
- private-vlan mapping command [2-406](#)
- private VLANs
 - association [2-737](#)
 - configuring [2-403](#)
 - configuring ports [2-724](#)
 - host ports [2-724](#)
 - mapping
 - configuring [2-737](#)
 - promiscuous ports [2-724](#)
- privileged EXEC mode [1-3](#)
- product identification information, displaying [2-507](#)
- promiscuous ports, private VLANs [2-724](#)
- pruning-eligible VLAN list [2-743](#)
- psp [2-408](#)
- psp command [2-408](#)
- PVST+
 - See STP

Q

QoS

- auto-QoS
 - configuring [2-53](#)
 - debug messages, display [B-4](#)
 - displaying [2-444](#)
- auto-QoS trust
 - configuring [2-47](#)
- auto-QoS video
 - configuring [2-50](#)
- class maps
 - creating [2-74](#)
 - defining the match criteria [2-312](#)
 - displaying [2-453](#)
- defining the CoS value for an incoming packet [2-322](#)
- displaying configuration information [2-444](#), [2-572](#)
- DSCP transparency [2-334](#)
- DSCP trusted ports
 - applying DSCP-to-DSCP-mutation map to [2-324](#)
- egress queues
 - allocating buffers [2-330](#)
 - defining the CoS output queue threshold map [2-348](#)
 - defining the DSCP output queue threshold map [2-350](#)
 - displaying queue-set settings [2-581](#)
 - enabling bandwidth shaping and scheduling [2-701](#)
 - enabling bandwidth sharing and scheduling [2-703](#)
 - limiting the maximum output on a port [2-699](#)
 - mapping a port to a queue-set [2-409](#)
 - mapping DSCP values to a queue and threshold [2-350](#)
 - setting maximum and reserved memory allocations [2-332](#)
 - setting WTD thresholds [2-332](#)
- enabling [2-318](#)
- ingress queues
 - allocating buffers [2-338](#)
 - assigning SRR scheduling weights [2-336](#)
 - defining the CoS input queue threshold map [2-340](#)
 - defining the DSCP input queue threshold map [2-342](#)
 - displaying settings for [2-574](#)
 - enabling the priority queue [2-344](#)
 - mapping CoS values to a queue and threshold [2-340](#)
 - mapping DSCP values to a queue and threshold [2-342](#)
 - setting WTD thresholds [2-346](#)
- maps
 - defining [2-326](#), [2-340](#), [2-342](#), [2-348](#), [2-350](#)
 - displaying [2-578](#)
- policy maps
 - applying an aggregate policer [2-394](#)
 - applying to an interface [2-425](#), [2-430](#)
 - creating [2-396](#)
 - defining policers [2-320](#), [2-392](#)
 - displaying policers [2-573](#)
 - displaying policy maps [2-599](#)
 - hierarchical [2-397](#)
 - setting DSCP or IP precedence values [2-428](#)
 - traffic classifications [2-71](#)
 - trust states [2-754](#)
- port trust states [2-352](#)
- queues, enabling the expedite [2-401](#)
- VLAN-based [2-354](#)
- quality of service
 - See QoS
- queue-set command [2-409](#)

R

- radius-server dead-criteria command [2-410](#)
- radius-server host command [2-412](#)
- rapid per-VLAN spanning-tree plus
 - See STP
- rapid PVST+
 - See STP
- re-authenticating IEEE 802.1x-enabled ports [2-144](#)

- re-authentication
 - periodic [2-145](#)
- receiving flow-control packets [2-167](#)
- recovery mechanism
 - display [2-450, 2-481, 2-484](#)
- remote-span command [2-414](#)
- Remote Switched Port Analyzer
 - See RSPAN
- rename (boot loader) command [A-17](#)
- renew ip dhcp snooping database command [2-416](#)
- reset (boot loader) command [A-18](#)
- resource templates, displaying [2-605](#)
- restricted VLAN
 - See dot1x auth-fail vlan
- rmdir (boot loader) command [A-19](#)
- rmon collection stats command [2-419](#)
- root guard, for spanning tree [2-663](#)
- routed ports
 - IP addresses on [2-179](#)
 - number supported [2-179](#)
- RSPAN
 - configuring [2-355](#)
 - displaying [2-583](#)
 - filter RSPAN traffic [2-355](#)
 - remote-span command [2-414](#)
 - sessions
 - add interfaces to [2-355](#)
 - displaying [2-583](#)
 - start new [2-355](#)
- service-policy command [2-425](#)
- set (boot loader) command [A-20](#)
- set command [2-428](#)
- setup command [2-430](#)
- setup express command [2-433](#)
- show access-lists command [2-435](#)
- show archive status command [2-438](#)
- show arp access-list command [2-439](#)
- show authentication command [2-440](#)
- show auto qos command [2-444](#)
- show boot command [2-448](#)
- show cable-diagnostics tdr command [2-450](#)
- show cisp command [2-452](#)
- show class-map command [2-453](#)
- show cluster command [2-454](#)
- show controllers cpu-interface command [2-456](#)
- show controllers ethernet-controller command [2-458](#)
- show controllers tcam command [2-466](#)
- show controller utilization command [2-468](#)
- show dot1q-tunnel command [2-470](#)
- show dot1x command [2-471](#)
- show dtp [2-475](#)
- show eap command [2-477](#)
- show env command [2-480](#)
- show errdisable detect command [2-481](#)
- show errdisable flap-values command [2-483](#)
- show errdisable recovery command [2-484](#)
- show etherchannel command [2-486](#)
- show fallback profile command [2-489](#)
- show flowcontrol command [2-491](#)
- show idprom command [2-493](#)
- show interfaces command [2-495](#)
- show interfaces counters command [2-504](#)
- show inventory command [2-507](#)
- show ip arp inspection command [2-508](#)
- show ipc command [2-531](#)
- show ip dhcp snooping binding command [2-512](#)
- show ip dhcp snooping command [2-511](#)
- show ip dhcp snooping database command [2-514, 2-516](#)

S

- sdm prefer command [2-420](#)
- SDM templates
 - allowed resources [2-421](#)
 - displaying [2-605](#)
- secure ports, limitations [2-730](#)
- sending flow-control packets [2-167](#)
- service password-recovery command [2-423](#)

- show ip igmp profile command [2-519](#)
- show ip igmp snooping address command [2-539](#)
- show ip igmp snooping command [2-520, 2-537](#)
- show ip igmp snooping groups command [2-523](#)
- show ip igmp snooping mrouter command [2-525, 2-541](#)
- show ip igmp snooping querier command [2-526, 2-543](#)
- show ip source binding command [2-528](#)
- show ipv6 access-list command [2-535](#)
- show ip verify source command [2-529](#)
- show l2protocol-tunnel command [2-545](#)
- show lacp command [2-547](#)
- show link state group command [2-553](#)
- show location [2-551](#)
- show mac access-group command [2-555](#)
- show mac address-table address command [2-558](#)
- show mac address-table aging time command [2-559](#)
- show mac address-table command [2-556](#)
- show mac address-table count command [2-561](#)
- show mac address-table dynamic command [2-562](#)
- show mac address-table interface command [2-563](#)
- show mac address-table learning command [2-564](#)
- show mac address-table move update command [2-565](#)
- show mac address-table notification command [2-88, 2-566, B-22](#)
- show mac address-table static command [2-568](#)
- show mac address-table vlan command [2-570](#)
- show mls qos aggregate-policer command [2-573](#)
- show mls qos command [2-572](#)
- show mls qos input-queue command [2-574](#)
- show mls qos interface command [2-575](#)
- show mls qos maps command [2-578](#)
- show mls qos queue-set command [2-581](#)
- show mls qos vlan command [2-582](#)
- show monitor command [2-583](#)
- show mvr command [2-585](#)
- show mvr interface command [2-586](#)
- show mvr members command [2-588](#)
- show network-policy profile command [2-590](#)
- show nmsp command [2-591](#)
- show pagp command [2-594](#)
- show parser macro command [2-596](#)
- 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-14](#)
- show platform ip multicast command [C-9](#)
- show platform ip unicast command [C-10](#)
- show platform ipv6 unicast command [C-15](#)
- show platform layer4op command [C-17](#)
- show platform mac-address-table command [C-18](#)
- show platform messaging command [C-19](#)
- show platform monitor command [C-20](#)
- show platform mvr table command [C-21](#)
- show platform pm command [C-22](#)
- show platform port-asic command [C-23](#)
- show platform port-security command [C-28](#)
- show platform qos command [C-29](#)
- show platform resource-manager command [C-30](#)
- show platform snmp counters command [C-32](#)
- show platform spanning-tree command [C-33](#)
- show platform stp-instance command [C-34](#)
- show platform team command [C-35](#)
- show platform vlan command [C-38](#)
- show policy-map command [2-599](#)
- show port security command [2-600](#)
- show psp config [2-603](#)
- show psp config command [2-603](#)
- show psp statistics [2-604](#)
- show psp statistics command [2-604](#)
- show sdm prefer command [2-605](#)
- show setup express command [2-608](#)
- show spanning-tree command [2-609](#)
- show storm-control command [2-615](#)
- show system mtu command [2-617](#)
- show uddl command [2-618](#)

- show version command [2-621](#)
- show vlan access-map command [2-629](#)
- show vlan command [2-623](#)
- show vlan command, fields [2-625](#)
- show vlan filter command [2-630](#)
- show vmpls command [2-631](#)
- show vtp command [2-634](#)
- shutdown command [2-639](#)
- shutdown vlan command [2-640](#)
- small violation-rate command [2-641](#)
- Smartports macros
 - See macros
- SNMP host, specifying [2-647](#)
- SNMP informs, enabling the sending of [2-643](#)
- snmp-server enable traps command [2-643](#)
- snmp-server host command [2-647](#)
- snmp trap mac-notification change command [2-651](#)
- SNMP traps
 - enabling MAC address notification trap [2-651](#)
 - enabling the MAC address notification feature [2-296](#)
 - enabling the sending of [2-643](#)
- software images
 - downloading [2-8](#)
 - upgrading [2-8](#)
 - uploading [2-14](#)
- software version, displaying [2-621](#)
- SPAN
 - configuring [2-355](#)
 - debug messages, display [B-23](#)
 - displaying [2-583](#)
 - filter SPAN traffic [2-355](#)
 - sessions
 - add interfaces to [2-355](#)
 - displaying [2-583](#)
 - start new [2-355](#)
- spanning [2-691](#)
- spanning-tree backbonefast command [2-653](#)
- spanning-tree bpdupfilter command [2-654](#)
- spanning-tree bpduguard command [2-656](#)
- spanning-tree cost command [2-658](#)
- spanning-tree etherchannel command [2-660](#)
- spanning-tree extend system-id command [2-662](#)
- spanning-tree guard command [2-663](#)
- spanning-tree link-type command [2-665](#)
- spanning-tree loopguard default command [2-667](#)
- spanning-tree mode command [2-669](#)
- spanning-tree mst configuration command [2-671](#)
- spanning-tree mst cost command [2-673](#)
- spanning-tree mst forward-time command [2-675](#)
- spanning-tree mst hello-time command [2-676](#)
- spanning-tree mst max-age command [2-677](#)
- spanning-tree mst max-hops command [2-678](#)
- spanning-tree mst port-priority command [2-679](#)
- spanning-tree mst pre-standard command [2-681](#)
- spanning-tree mst priority command [2-682](#)
- spanning-tree mst root command [2-683](#)
- spanning-tree portfast (global configuration) command [2-687](#)
- spanning-tree portfast (interface configuration) command [2-689](#)
- spanning-tree port-priority command [2-685](#)
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command [2-691](#)
- spanning-tree uplinkfast command [2-692](#)
- spanning-tree vlan command [2-694](#)
- speed command [2-697](#)
- srr-queue bandwidth limit command [2-699](#)
- srr-queue bandwidth shape command [2-701](#)
- srr-queue bandwidth share command [2-703](#)
- SSH, configuring version [2-241](#)
- static-access ports, configuring [2-710](#)
- statistics, Ethernet group [2-419](#)
- storm-control command [2-705](#)
- STP
 - BackboneFast [2-653](#)
 - counters, clearing [2-94](#)
 - 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 [2-653](#)
- enabling protocol tunneling for [2-267](#)
- EtherChannel misconfiguration [2-660](#)
- extended system ID [2-662](#)
- path cost [2-658](#)
- protocol modes [2-669](#)
- root port
 - accelerating choice of new [2-692](#)
 - loop guard [2-663](#)
 - preventing from becoming designated [2-663](#)
 - restricting which can be root [2-663](#)
 - root guard [2-663](#)
 - UplinkFast [2-692](#)
- root switch
 - affects of extended system ID [2-662, 2-695](#)
 - port priority for selection of [2-685](#)
- state changes
 - blocking to forwarding state [2-689](#)
 - enabling BPDU filtering [2-654, 2-687](#)
 - enabling BPDU guard [2-656, 2-687](#)
 - enabling Port Fast [2-687, 2-689](#)
 - shutting down Port Fast-enabled ports [2-687](#)
- state information display [2-609](#)
- VLAN options [2-682, 2-694](#)
- SVIs, creating [2-173](#)
- SVI status calculation [2-712](#)
- Switched Port Analyzer
 - See SPAN
- switching characteristics
 - modifying [2-708](#)
 - returning to interfaces [2-708](#)
- switchport access command [2-710](#)

- switchport autostate exclude command [2-712](#)
- switchport backup interface command [2-714](#)
- switchport block command [2-718](#)
- switchport command [2-708](#)
- switchport host command [2-720](#)
- switchport mode command [2-721](#)
- switchport mode private-vlan command [2-724](#)
- switchport nonegotiate command [2-726](#)
- switchport port-security aging command [2-733](#)
- switchport port-security command [2-728](#)
- switchport priority extend command [2-735](#)
- switchport private-vlan command [2-737](#)
- switchport protected command [2-739](#)
- switchport trunk command [2-741](#)
- switchport voice vlan command [2-744](#)
- system message logging, save message to flash [2-283](#)
- system mtu command [2-746](#)
- system resource templates [2-420](#)

T

- tar files, creating, listing, and extracting [2-11](#)
- TDR, running [2-748](#)
- templates, system resources [2-420](#)
- test cable-diagnostics tdr command [2-748](#)
- traceroute mac command [2-749](#)
- traceroute mac ip command [2-752](#)
- trunk mode [2-721](#)
- trunk ports [2-721](#)
- trunks, to non-DTP device [2-722](#)
- trust command [2-754](#)
- trusted port states for QoS [2-352](#)
- tunnel ports, Layer 2 protocol, displaying [2-545](#)
- type (boot loader) command [A-23](#)

U

- UDLD

- aggressive mode [2-756, 2-758](#)
- debug messages, display [B-88](#)
- enable globally [2-756](#)
- enable per interface [2-758](#)
- message timer [2-756](#)
- normal mode [2-756, 2-758](#)
- reset a shutdown interface [2-760](#)
- status [2-618](#)
- udld command [2-756](#)
- udld port command [2-758](#)
- udld reset command [2-760](#)
- unicast storm control [2-705](#)
- UniDirectional Link Detection
 - See UDLD
- unknown multicast traffic, preventing [2-718](#)
- unknown unicast traffic, preventing [2-718](#)
- unset (boot loader) command [A-24](#)
- upgrading
 - software images [2-8](#)
 - monitoring status of [2-438](#)
- UplinkFast, for STP [2-692](#)
- user EXEC mode [1-2](#)

V

- version (boot loader) command [A-26](#)
- VLAN
 - enabling guest VLAN supplicant [2-119, 2-130](#)
 - vlan (global configuration) command [2-761](#)
 - vlan access-map command [2-766](#)
 - VLAN access map configuration mode [2-766](#)
 - VLAN access maps
 - actions [2-6](#)
 - displaying [2-629](#)
 - VLAN-based QoS [2-354](#)
 - VLAN configuration
 - rules [2-764](#)
 - saving [2-761](#)
 - VLAN configuration mode
 - description [1-4](#)
 - vlan dot1q tag native command [2-768](#)
 - vlan filter command [2-769](#)
 - VLAN filters, displaying [2-630](#)
 - VLAN maps
 - creating [2-766](#)
 - defining [2-310](#)
 - displaying [2-629](#)
 - VLAN Query Protocol
 - See VQP
 - VLANs
 - adding [2-761](#)
 - configuring [2-761](#)
 - debug messages, display
 - ISL [B-85](#)
 - VLAN IOS file system error tests [B-84](#)
 - VLAN manager activity [B-82](#)
 - VTP [B-86](#)
 - displaying configurations [2-623](#)
 - extended-range [2-761](#)
 - MAC addresses
 - displaying [2-570](#)
 - number of [2-561](#)
 - media types [2-764](#)
 - normal-range [2-761](#)
 - private [2-724](#)
 - configuring [2-403](#)
 - See also private VLANs
 - restarting [2-640](#)
 - saving the configuration [2-761](#)
 - shutting down [2-640](#)
 - suspending [2-640](#)
 - VLAN Trunking Protocol
 - See VTP
 - VMPS
 - configuring servers [2-774](#)
 - displaying [2-631](#)
 - reconfirming dynamic VLAN assignments [2-771](#)
 - vmmps reconfirm (global configuration) command [2-772](#)

vmps reconfirm (privileged EXEC) command [2-771](#)

vmps retry command [2-773](#)

vmps server command [2-774](#)

voice VLAN

 configuring [2-744](#)

 setting port priority [2-735](#)

VQP

 and dynamic-access ports [2-711](#)

 clearing client statistics [2-96](#)

 displaying information [2-631](#)

 per-server retry count [2-773](#)

 reconfirmation interval [2-772](#)

 reconfirming dynamic VLAN assignments [2-771](#)

VTP

 changing characteristics [2-776](#)

 clearing pruning counters [2-97](#)

 counters display fields [2-635](#)

 displaying information [2-634](#)

 enabling

 tunneling for [2-267](#)

 enabling per port [2-781](#)

 saving the configuration [2-761](#)

 status display fields [2-637](#)

vtp (global configuration) command [2-776](#)

vtp interface configuration command [2-781](#)

vtp primary command [2-782](#)

X

XENPAK module serial EERPOM information [2-493](#)