



INDEX

A

aaa accounting dot1x command [2-1](#)
aaa authentication dot1x command [2-3](#)
aaa authorization network command [2-5](#)
AAA methods [2-3](#)
abort command [2-830](#)
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP [2-160](#)
 MAC, displaying [2-580](#)
access list, IPv6 [2-225](#)
access map configuration mode [2-295](#)
access mode [2-770](#)
access ports [2-770](#)
ACEs [2-95](#), [2-365](#)
ACLs
 deny [2-93](#)
 displaying [2-427](#)
 for non-IP protocols [2-273](#)
 IP [2-160](#)
 matching [2-295](#)
 on Layer 2 interfaces [2-160](#)
 permit [2-363](#)
action command [2-6](#)
address aliasing [2-346](#)
aggregate-port learner [2-352](#)
allowed VLANs [2-790](#)

apply command [2-830](#)
archive copy-sw command [2-8](#)
archive download-sw command [2-11](#)
archive tar command [2-15](#)
archive upload-sw command [2-18](#)
arp (boot loader) command [A-2](#)
arp access-list command [2-20](#)
audience [xxi](#)
authentication failed VLAN
 See dot1x auth-fail vlan
auth-fail max-attempts
 See dot1x auth-fail max-attempts
auth-fail vlan
 See dot1x auth-fail vlan
authorization state of controlled port [2-126](#)
autonegotiation of duplex mode [2-137](#)
auto qos voip command [2-22](#)

B

BackboneFast, for STP [2-694](#)
backup interfaces
 configuring [2-765](#)
 displaying [2-502](#)
boot (boot loader) command [A-3](#)
boot auto-copy-sw command [2-27](#)
boot auto-download-sw command [2-28](#)
boot config-file command [2-30](#)
boot enable-break command [2-31](#)
boot helper command [2-32](#)
boot helper-config file command [2-33](#)

- booting
 - Cisco IOS image [2-36](#)
 - displaying environment variables [2-436](#)
 - interrupting [2-31](#)
 - manually [2-34](#)
 - boot loader
 - accessing [A-1](#)
 - booting
 - Cisco IOS image [A-3](#)
 - helper image [2-32](#)
 - directories
 - creating [A-19](#)
 - displaying a list of [A-8](#)
 - removing [A-23](#)
 - displaying
 - available commands [A-13](#)
 - memory heap utilization [A-14](#)
 - version [A-30](#)
 - environment variables
 - described [A-24](#)
 - displaying settings [A-24](#)
 - location of [A-25](#)
 - setting [A-24](#)
 - unsetting [A-28](#)
 - files
 - copying [A-6](#)
 - deleting [A-7](#)
 - displaying a list of [A-8](#)
 - displaying the contents of [A-5, A-20, A-27](#)
 - renaming [A-21](#)
 - file system
 - formatting [A-11](#)
 - initializing flash [A-10](#)
 - running a consistency check [A-12](#)
 - prompt [A-1](#)
 - resetting the system [A-22](#)
 - boot manual command [2-34](#)
 - boot private-config-file command [2-35](#)
 - boot system command [2-36](#)
 - BPDU filtering, for spanning tree [2-695, 2-730](#)
 - BPDU guard, for spanning tree [2-697, 2-730](#)
 - broadcast storm control [2-751](#)
-
- ## C
- candidate switches
 - See clusters
 - cat (boot loader) command [A-5](#)
 - caution, description [xxii](#)
 - CDP, enabling protocol tunneling for [2-251](#)
 - channel-group command [2-38](#)
 - channel-protocol command [2-42](#)
 - Cisco Network Assistant
 - See Network Assistant
 - Cisco SoftPhone
 - auto-QoS configuration [2-22](#)
 - trusting packets sent from [2-336](#)
 - class command [2-43](#)
 - class-map command [2-45](#)
 - class maps
 - creating [2-45](#)
 - defining the match criteria [2-297](#)
 - displaying [2-441](#)
 - class of service
 - See CoS
 - clear dot1x command [2-47](#)
 - clear eap command [2-48](#)
 - clear errdisable interface [2-49](#)
 - clear ip arp inspection log command [2-50](#)
 - clear ip arp inspection statistics command [2-51](#)
 - clear ipc command [2-54](#)
 - clear ip dhcp snooping database command [2-52](#)
 - clear ipv6 dhcp conflict command [2-55](#)
 - clear l2protocol-tunnel counters command [2-56](#)
 - clear lacp command [2-57](#)
 - clear logging onboard command [2-58](#)
 - clear mac address-table command [2-59, 2-60](#)
 - clear pagp command [2-61](#)

- clear port-security command [2-62](#)
 - clear spanning-tree counters command [2-64](#)
 - clear spanning-tree detected-protocols command [2-65](#)
 - clear vmps statistics command [2-66](#)
 - clear vtp counters command [2-67](#)
 - cluster commander-address command [2-68](#)
 - cluster discovery hop-count command [2-70](#)
 - cluster enable command [2-71](#)
 - cluster holdtime command [2-73](#)
 - cluster member command [2-74](#)
 - cluster outside-interface command [2-76](#)
 - cluster requirements [xxii](#)
 - cluster run command [2-77](#)
 - clusters
 - adding candidates [2-74](#)
 - binding to HSRP group [2-78](#)
 - building manually [2-74](#)
 - communicating with
 - devices outside the cluster [2-76](#)
 - members by using Telnet [2-399](#)
 - debug messages, display [B-5](#)
 - displaying
 - candidate switches [2-444](#)
 - debug messages [B-5](#)
 - member switches [2-446](#)
 - status [2-442](#)
 - hop-count limit for extended discovery [2-70](#)
 - HSRP standby groups [2-78](#)
 - redundancy [2-78](#)
 - SNMP trap [2-683](#)
 - cluster standby-group command [2-78](#)
 - cluster timer command [2-80](#)
 - command modes defined [1-2](#)
 - 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 [2-30, 2-35](#)
 - configuring multiple interfaces [2-156](#)
 - config-vlan mode
 - commands [2-816](#)
 - description [1-4](#)
 - entering [2-815](#)
 - summary [1-2](#)
 - conventions
 - command [xxi](#)
 - for examples [xxii](#)
 - publication [xxi](#)
 - text [xxi](#)
 - copy (boot loader) command [A-6](#)
 - copy logging onboard command [2-81](#)
 - CoS
 - assigning default value to incoming packets [2-306](#)
 - assigning to Layer 2 protocol packets [2-254](#)
 - overriding the incoming value [2-306](#)
 - CoS-to-DSCP map [2-310](#)
 - CPU ASIC statistics, displaying [2-448](#)
 - crashinfo files [2-147](#)
-
- ## D
- debug auto qos command [B-2](#)
 - debug backup command [B-4](#)
 - debug cluster command [B-5](#)
 - debug dot1x command [B-7](#)
 - debug dtp command [B-8](#)
 - debug eap command [B-9](#)
 - debug etherchannel command [B-10](#)
 - debug fastethernet command [B-11](#)
 - debug ilpower command [B-12](#)
 - debug interface command [B-15](#)
 - debug ip dhcp snooping command [B-13](#)
 - 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-14](#)
- debug lacp 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 nvram command [B-25](#)
- debug pagp command [B-26](#)
- debug platform acl command [B-27](#)
- debug platform backup interface command [B-29](#)
- debug platform cli-redirect main command [B-30](#)
- debug platform configuration command [B-31, B-39](#)
- debug platform cpu-queues command [B-32](#)
- debug platform device-manager command [B-34](#)
- debug platform dot1x command [B-35](#)
- debug platform etherchannel command [B-36](#)
- debug platform fallback-bridging command [B-37](#)
- debug platform forw-tcam command [B-38](#)
- debug platform ip arp inspection command [B-40](#)
- debug platform ipc command [B-49](#)
- debug platform ip dhcp command [B-41](#)
- debug platform ip igmp snooping command [B-42](#)
- debug platform ip multicast command [B-44](#)
- debug platform ip unicast command [B-46](#)
- debug platform ip wccp command [B-48](#)
- debug platform led command [B-50](#)
- debug platform matm command [B-51](#)
- debug platform messaging application command [B-52](#)
- 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 team command [B-67](#)
- debug platform udd 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-89](#)
- debug sw-vlan vtp command [B-91](#)
- debug udd command [B-93](#)
- debug vqpc command [B-95](#)
- define interface-range command [2-83](#)
- delete (boot loader) command [A-7](#)
- delete command [2-85](#)
- deny (ARP access-list configuration) command [2-86](#)
- deny (IPv6) command [2-88](#)
- deny command [2-93](#)
- detect mechanism, causes [2-138](#)
- device manager requirements [xxii](#)
- DHCP snooping
 - accepting untrusted packets from edge switch [2-188](#)
 - enabling
 - on a VLAN [2-194](#)
 - option 82 [2-186, 2-188](#)
 - trust on an interface [2-192](#)
 - error recovery timer [2-144](#)
 - rate limiting [2-191](#)

- DHCP snooping binding database
 - binding file, configuring [2-184](#)
 - bindings
 - adding [2-182](#)
 - deleting [2-182](#)
 - displaying [2-525](#)
 - clearing database agent statistics [2-52](#)
 - database agent, configuring [2-184](#)
 - displaying
 - binding entries [2-525](#)
 - database agent status [2-527, 2-529](#)
 - renewing [2-407](#)
- Digital Optical Monitoring
 - see DoM
- dir (boot loader) command [A-8](#)
- directories, deleting [2-85](#)
- documentation, related [xxii](#)
- document conventions [xxi](#)
- DoM
 - displaying supported transceivers [2-516](#)
- domain name, VTP [2-842, 2-846](#)
- dot1x auth-fail max-attempts [2-105](#)
- dot1x auth-fail vlan [2-107](#)
- dot1x command [2-103](#)
- dot1x control-direction command [2-109](#)
- dot1x critical global configuration command [2-111](#)
- dot1x critical interface configuration command [2-113](#)
- dot1x default command [2-115](#)
- dot1x fallback command [2-116](#)
- dot1x guest-vlan command [2-117](#)
- dot1x host-mode command [2-119](#)
- dot1x initialize command [2-120](#)
- dot1x mac-auth-bypass command [2-121](#)
- dot1x max-reauth-req command [2-123](#)
- dot1x max-req command [2-124](#)
- dot1x pae command [2-125](#)
- dot1x port-control command [2-126](#)
- dot1x re-authenticate command [2-128](#)
- dot1x reauthentication command [2-129](#)
- dot1x test eapol-capable command [2-130](#)
- dot1x test timeout command [2-131](#)
- dot1x timeout command [2-132](#)
- dot1x violation-mode command [2-135](#)
- dropping packets, with ACL matches [2-6](#)
- drop threshold, Layer 2 protocol tunneling [2-251](#)
- DSCP-to-CoS map [2-310](#)
- DSCP-to-DSCP-mutation map [2-310](#)
- DTP [2-771](#)
- DTP flap
 - error detection for [2-138](#)
 - error recovery timer [2-144](#)
- DTP negotiation [2-775](#)
- dual IPv4 and IPv6 templates [2-358](#)
- duplex command [2-136](#)
- dynamic-access ports
 - configuring [2-761](#)
 - restrictions [2-762](#)
- dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN [2-168](#)
 - define [2-20](#)
 - deny packets [2-86](#)
 - display [2-431](#)
 - permit packets [2-356](#)
 - clear
 - log buffer [2-50](#)
 - statistics [2-51](#)
 - display
 - ARP ACLs [2-431](#)
 - configuration and operating state [2-520](#)
 - log buffer [2-520](#)
 - statistics [2-520](#)
 - trust state and rate limit [2-520](#)
 - enable per VLAN [2-178](#)
 - error detection for [2-138](#)
 - error recovery timer [2-144](#)

- log buffer
 - clear [2-50](#)
 - configure [2-172](#)
 - display [2-520](#)
 - rate-limit incoming ARP packets [2-170](#)
 - statistics
 - clear [2-51](#)
 - display [2-520](#)
 - trusted interface state [2-174](#)
 - type of packet logged [2-179](#)
 - validation checks [2-176](#)
- dynamic auto VLAN membership mode [2-770](#)
- dynamic desirable VLAN membership mode [2-770](#)
- Dynamic Host Configuration Protocol (DHCP)
- See DHCP snooping
- Dynamic Trunking Protocol
- See DTP
-
- ## E
- EAP-request/identity frame
 - maximum number to send [2-124](#)
 - response time before retransmitting [2-132](#)
 - encapsulation methods [2-790](#)
 - environment variables, displaying [2-436](#)
 - errdisable detect cause command [2-138](#)
 - errdisable detect cause small-frame command [2-141](#)
 - errdisable recovery cause small-frame [2-143](#)
 - errdisable recovery command [2-144](#)
 - error conditions, displaying [2-489](#)
 - error disable detection [2-138](#)
 - error-disabled interfaces, displaying [2-501](#)
 - EtherChannel
 - assigning Ethernet interface to channel group [2-38](#)
 - creating port-channel logical interface [2-154](#)
 - debug EtherChannel/PAgP, display [B-10](#)
 - debug platform-specific events, display [B-36](#)
 - displaying [2-492](#)
 - enabling Layer 2 protocol tunneling for
 - LACP [2-252](#)
 - PAgP [2-252](#)
 - UDLD [2-252](#)
 - interface information, displaying [2-501](#)
 - LACP
 - clearing channel-group information [2-57, 2-58](#)
 - debug messages, display [B-19](#)
 - displaying [2-566](#)
 - modes [2-38](#)
 - port priority for hot-standby ports [2-255](#)
 - restricting a protocol [2-42](#)
 - system priority [2-257](#)
 - load-distribution methods [2-373](#)
 - PAgP
 - aggregate-port learner [2-352](#)
 - clearing channel-group information [2-61](#)
 - debug messages, display [B-26](#)
 - displaying [2-626](#)
 - error detection for [2-138](#)
 - error recovery timer [2-144](#)
 - learn method [2-352](#)
 - modes [2-38](#)
 - physical-port learner [2-352](#)
 - priority of interface for transmitted traffic [2-354](#)
 - Ethernet controller, internal register display [2-450, 2-458](#)
 - Ethernet Management port, debugging [B-11](#)
 - Ethernet statistics, collecting [2-409](#)
 - examples, conventions for [xxii](#)
 - exception crashinfo command [2-147, 2-152](#)
 - exit command [2-830](#)
 - extended discovery of candidate switches [2-70](#)
 - extended-range VLANs
 - and allowed VLAN list [2-790](#)
 - and pruning-eligible list [2-790](#)
 - configuring [2-815](#)
 - extended system ID for STP [2-703](#)

F

fallback profile command [2-148](#)
 fallback profiles, displaying [2-495](#)
 fan information, displaying [2-482](#)
 file name, VTP [2-842](#)
 files, deleting [2-85](#)
 flash_init (boot loader) command [A-10](#)
 Flex Links
 configuring [2-765](#)
 displaying [2-502](#)
 flow-based SPAN [2-339](#)
 flowcontrol command [2-150](#)
 format (boot loader) command [A-11](#)
 forwarding packets, with ACL matches [2-6](#)
 forwarding results, display [C-7](#)
 frame forwarding information, displaying [C-7](#)
 front-end controller counter and status information [C-9](#)
 fsck (boot loader) command [A-12](#)
 FSPAN [2-339](#)

G

global configuration mode [1-2, 1-4](#)

H

hardware ACL statistics [2-427](#)
 health monitoring diagnostic tests [2-96](#)
 help (boot loader) command [A-13](#)
 hierarchical policy maps [2-371](#)
 hop-count limit for clusters [2-70](#)
 host connection, port configuration [2-769](#)
 host ports, private VLANs [2-773](#)
 Hot Standby Router Protocol
 See HSRP
 HSRP
 binding HSRP group to cluster [2-78](#)
 standby group [2-78](#)

I

IEEE 802.1Q trunk ports and native VLANs [2-833](#)
 IEEE 802.1Q tunnel ports
 configuring [2-770](#)
 displaying [2-472](#)
 limitations [2-771](#)
 IEEE 802.1x
 and switchport modes [2-771](#)
 violation error recovery [2-144](#)
 See also port-based authentication
 IGMP filters
 applying [2-197](#)
 debug messages, display [B-16](#)
 IGMP groups, setting maximum [2-199](#)
 IGMP maximum groups, debugging [B-17](#)
 IGMP profiles
 creating [2-201](#)
 displaying [2-532](#)
 IGMP snooping
 adding ports as a static member of a group [2-217](#)
 displaying [2-533, 2-538, 2-540](#)
 enabling [2-203](#)
 enabling the configurable-leave timer [2-205](#)
 enabling the Immediate-Leave feature [2-214](#)
 flooding query count [2-211](#)
 interface topology change notification behavior [2-213](#)
 multicast table [2-536](#)
 querier [2-207](#)
 query solicitation [2-211](#)
 report suppression [2-209](#)
 switch topology change notification behavior [2-211](#)
 images
 See software images
 Immediate-Leave processing
 IGMP [2-214](#)
 IPv6 [2-247](#)
 MVR [2-348](#)

- initial configuration
 - See getting started guide and hardware installation guide
- interface configuration mode [1-2, 1-4](#)
- interface port-channel command [2-154](#)
- interface range command [2-156](#)
- interface-range macros [2-83](#)
- interfaces
 - assigning Ethernet interface to channel group [2-38](#)
 - configuring [2-136](#)
 - configuring multiple [2-156](#)
 - creating port-channel logical [2-154](#)
 - debug messages, display [B-15](#)
 - disabling [2-679](#)
 - displaying the MAC address table [2-592](#)
 - restarting [2-679](#)
- interface speed, configuring [2-741](#)
- interface vlan command [2-158](#)
- internal power supplies
 - See power supplies
- internal registers, displaying [2-450, 2-458, 2-463](#)
- Internet Group Management Protocol
 - See IGMP
- invalid GBIC
 - error detection for [2-138](#)
 - error recovery timer [2-144](#)
- ip access-group command [2-160](#)
- ip address command [2-163](#)
- IP addresses, setting [2-163](#)
- IP address matching [2-295](#)
- ip admission command [2-165](#)
- ip admission name proxy http command [2-166](#)
- ip arp inspection filter vlan command [2-168](#)
- ip arp inspection limit command [2-170](#)
- ip arp inspection log-buffer command [2-172](#)
- ip arp inspection trust command [2-174](#)
- ip arp inspection validate command [2-176](#)
- ip arp inspection vlan command [2-178](#)
- ip arp inspection vlan logging command [2-179](#)
- IP DHCP snooping
 - See DHCP snooping
- ip dhcp snooping binding command [2-182](#)
- ip dhcp snooping command [2-181](#)
- ip dhcp snooping database command [2-184](#)
- ip dhcp snooping information option allow-untrusted command [2-188](#)
- ip dhcp snooping information option command [2-186](#)
- ip dhcp snooping information option format remote-id command [2-190](#)
- ip dhcp snooping limit rate command [2-191](#)
- ip dhcp snooping trust command [2-192](#)
- ip dhcp snooping verify command [2-193](#)
- ip dhcp snooping vlan command [2-194](#)
- ip dhcp snooping vlan information option format-type circuit-id string command [2-195](#)
- ip igmp filter command [2-197](#)
- ip igmp max-groups command [2-199](#)
- ip igmp profile command [2-201](#)
- ip igmp snooping command [2-203](#)
- ip igmp snooping last-member-query-interval command [2-205](#)
- ip igmp snooping querier command [2-207](#)
- ip igmp snooping report-suppression command [2-209](#)
- ip igmp snooping tcn command [2-211](#)
- ip igmp snooping tcn flood command [2-213](#)
- ip igmp snooping vlan immediate-leave command [2-214](#)
- ip igmp snooping vlan mrouter command [2-215](#)
- ip igmp snooping vlan static command [2-217](#)
- IP multicast addresses [2-345](#)
- IP phones
 - auto-QoS configuration [2-22](#)
 - trusting packets sent from [2-336](#)
- IP-precedence-to-DSCP map [2-310](#)
- ip snap forwarding command [2-219](#)
- ip source binding command [2-220](#)

IP source guard

- disabling [2-224](#)
- displaying
 - binding entries [2-542](#)
 - configuration [2-544](#)
 - dynamic binding entries only [2-525](#)
- enabling [2-224](#)
- static IP source bindings [2-220](#)

ip ssh command [2-222](#)

IPv4 and IPv6

- port-based trust [2-337](#)

IPv6 access list, deny conditions [2-88](#)

ipv6 access-list command [2-225](#)

ipv6 address dhcp command [2-227](#)

ipv6 dhcp client request vendor command [2-228](#)

ipv6 dhcp ping packets command [2-229](#)

ipv6 dhcp pool command [2-231](#)

ipv6 dhcp server command [2-233](#)

ipv6 mld snooping command [2-235](#)

ipv6 mld snooping last-listener-query count command [2-237](#)

ipv6 mld snooping last-listener-query-interval command [2-239](#)

ipv6 mld snooping listener-message-suppression command [2-241](#)

ipv6 mld snooping robustness-variable command [2-243](#)

ipv6 mld snooping tcn command [2-245](#)

ipv6 mld snooping vlan command [2-247](#)

IPv6 SDM template [2-411](#)

ipv6 traffic-filter command [2-249](#)

ip verify source command [2-224](#)

J

jumbo frames

- See MTU

L

l2protocol-tunnel command [2-251](#)

l2protocol-tunnel cos command [2-254](#)

LACP

- See EtherChannel

lacp port-priority command [2-255](#)

lacp system-priority command [2-257](#)

Layer 2 mode, enabling [2-759](#)

Layer 2 protocol ports, displaying [2-563](#)

Layer 2 protocol-tunnel

- error detection for [2-138](#)
- error recovery timer [2-144](#)

Layer 2 protocol tunnel counters [2-56](#)

Layer 2 protocol tunneling error recovery [2-252](#)

Layer 2 traceroute

- IP addresses [2-806](#)
- MAC addresses [2-803](#)

Layer 3 mode, enabling [2-759](#)

license boot command [2-259](#)

line configuration mode [1-3, 1-5](#)

Link Aggregation Control Protocol

- See EtherChannel

link flap

- error detection for [2-138](#)
- error recovery timer [2-144](#)

link state group command [2-261](#)

link state track command [2-263](#)

load-distribution methods for EtherChannel [2-373](#)

location (global configuration) command [2-264](#)

location (interface configuration) command [2-266](#)

logging event power-inline-status command [2-268](#)

logging file command [2-269](#)

logical interface [2-154](#)

loopback error

- detection for [2-138](#)
- recovery timer [2-144](#)

loop guard, for spanning tree [2-705, 2-709](#)

M

- mac access-group command [2-271](#)
- MAC access-groups, displaying [2-580](#)
- MAC access list configuration mode [2-273](#)
- mac access-list extended command [2-273](#)
- MAC access lists [2-93](#)
- MAC addresses
 - disabling MAC address learning per VLAN [2-276](#)
 - displaying
 - aging time [2-586](#)
 - all [2-584](#)
 - dynamic [2-590](#)
 - MAC address-table move updates [2-595](#)
 - notification settings [2-594, 2-597](#)
 - number of addresses in a VLAN [2-588](#)
 - per interface [2-592](#)
 - per VLAN [2-601](#)
 - static [2-599](#)
 - static and dynamic entries [2-582](#)
 - dynamic
 - aging time [2-275](#)
 - deleting [2-59](#)
 - displaying [2-590](#)
 - enabling MAC address notification [2-280](#)
 - enabling MAC address-table move update [2-278](#)
 - matching [2-295](#)
 - persistent stack [2-749](#)
 - static
 - adding and removing [2-282](#)
 - displaying [2-599](#)
 - dropping on an interface [2-283](#)
 - tables [2-584](#)
- MAC address notification, debugging [B-20](#)
- mac address-table aging-time [2-271, 2-295](#)
- mac address-table aging-time command [2-275](#)
- mac address-table learning command [2-276](#)
- mac address-table move update command [2-278](#)
- mac address-table notification command [2-280](#)
- mac address-table static command [2-282](#)
- mac address-table static drop command [2-283](#)
- MAC frames
 - See MTU
- macro apply command [2-285](#)
- macro description command [2-288](#)
- macro global command [2-289](#)
- macro global description command [2-292](#)
- macro name command [2-293](#)
- macros
 - adding a description [2-288](#)
 - adding a global description [2-292](#)
 - applying [2-289](#)
 - creating [2-293](#)
 - displaying [2-628](#)
 - interface range [2-83, 2-156](#)
 - specifying parameter values [2-289](#)
 - tracing [2-289](#)
- manual
 - audience [xxi](#)
 - purpose of [xxi](#)
- maps
 - QoS
 - defining [2-310](#)
 - displaying [2-611](#)
 - VLAN
 - creating [2-827](#)
 - defining [2-295](#)
 - displaying [2-669](#)
- match (access-map configuration) command [2-295](#)
- match (class-map configuration) command [2-297](#)
- maximum transmission unit
 - See MTU
- mdix auto command [2-300](#)
- member switches
 - See clusters
- memory (boot loader) command [A-14](#)
- mgmt_clr (boot loader) command [A-16](#)
- mgmt_init (boot loader) command [A-17, A-18](#)

- mkdir (boot loader) command [A-19](#)
- MLD snooping
 - configuring [2-241, 2-243](#)
 - configuring queries [2-237, 2-239](#)
 - configuring topology change notification [2-245](#)
 - displaying [2-553, 2-555, 2-557, 2-559](#)
 - enabling [2-235](#)
 - enabling on a VLAN [2-247](#)
- mls qos aggregate-policer command [2-304](#)
- mls qos command [2-302](#)
- mls qos cos command [2-306](#)
- mls qos dscp-mutation command [2-308](#)
- mls qos map command [2-310](#)
- mls qos queue-set output buffers command [2-314](#)
- mls qos queue-set output threshold command [2-316](#)
- mls qos rewrite ip dscp command [2-318](#)
- mls qos srr-queue input bandwidth command [2-320](#)
- mls qos srr-queue input buffers command [2-322](#)
- mls qos-srr-queue input cos-map command [2-324](#)
- mls qos srr-queue input dscp-map command [2-326](#)
- mls qos srr-queue input priority-queue command [2-328](#)
- mls qos srr-queue input threshold command [2-330](#)
- mls qos-srr-queue output cos-map command [2-332](#)
- mls qos srr-queue output dscp-map command [2-334](#)
- mls qos trust command [2-336](#)
- mls qos vlan-based command [2-338](#)
- mode, MVR [2-345](#)
- Mode button, and password recovery [2-414](#)
- modes, commands [1-2](#)
- monitor session command [2-339](#)
- more (boot loader) command [A-20](#)
- MSTP
 - displaying [2-646, 2-647, 2-648](#)
 - interoperability [2-65](#)
 - link type [2-707](#)
 - MST region
 - aborting changes [2-713](#)
 - applying changes [2-713](#)
 - configuration name [2-713](#)
 - configuration revision number [2-713](#)
 - current or pending display [2-713](#)
 - displaying [2-646, 2-647, 2-648](#)
 - MST configuration mode [2-713](#)
 - VLANs-to-instance mapping [2-713](#)
 - path cost [2-715](#)
 - protocol mode [2-711](#)
 - restart protocol migration process [2-65](#)
 - root port
 - loop guard [2-705](#)
 - preventing from becoming designated [2-705](#)
 - restricting which can be root [2-705](#)
 - root guard [2-705](#)
 - root switch
 - affects of extended system ID [2-703](#)
 - hello-time [2-718, 2-726](#)
 - interval between BPDU messages [2-719](#)
 - interval between hello BPDU messages [2-718, 2-726](#)
 - max-age [2-719](#)
 - maximum hop count before discarding BPDU [2-720](#)
 - port priority for selection of [2-722](#)
 - primary or secondary [2-726](#)
 - switch priority [2-725](#)
 - state changes
 - blocking to forwarding state [2-733](#)
 - enabling BPDU filtering [2-695, 2-730](#)
 - enabling BPDU guard [2-697, 2-730](#)
 - enabling Port Fast [2-730, 2-733](#)
 - forward-delay time [2-717](#)
 - length of listening and learning states [2-717](#)
 - rapid transition to forwarding [2-707](#)
 - shutting down Port Fast-enabled ports [2-730](#)
 - state information display [2-645](#)

- MTU
- configuring size [2-799](#)
 - displaying global setting [2-658](#)
 - MAC [2-800](#)
 - system jumbo [2-800](#)
 - system routing [2-800](#)
- Multicast Listener Discovery
- See MLD
- multicast group address, MVR [2-348](#)
- multicast groups, MVR [2-346](#)
- Multicast Listener Discovery
- See MLD
- multicast router learning method [2-215](#)
- multicast router ports, configuring [2-215](#)
- multicast router ports, IPv6 [2-247](#)
- multicast storm control [2-751](#)
- multicast VLAN, MVR [2-345](#)
- multicast VLAN registration
- See MVR
- multiple hosts on authorized port [2-119](#)
- Multiple Spanning Tree Protocol
- See MSTP
- MVR
- and address aliasing [2-346](#)
 - configuring [2-345](#)
 - configuring interfaces [2-348](#)
 - debug messages, display [B-24](#)
 - displaying [2-620](#)
 - displaying interface information [2-622](#)
 - members, displaying [2-624](#)
- mvr (global configuration) command [2-345](#)
- mvr (interface configuration) command [2-348](#)
- mvr vlan group command [2-349](#)
-
- N**
- native VLANs [2-790](#)
- native VLAN tagging [2-833](#)
- Network Assistant requirements [xxii](#)
- nonegotiate
- DTP messaging [2-775](#)
 - speed [2-741](#)
- non-IP protocols
- denying [2-93](#)
 - forwarding [2-363](#)
- non-IP traffic access lists [2-273](#)
- non-IP traffic forwarding
- denying [2-93](#)
 - permitting [2-363](#)
- non-stop forwarding [2-350](#)
- normal-range VLANs [2-815, 2-821](#)
- note, description [xxii](#)
- no vlan command [2-815, 2-825](#)
- nsf command [2-350](#)
-
- O**
- online diagnostics
- configuring health monitoring diagnostic tests [2-96](#)
 - displaying
 - configured boot-up coverage level [2-467](#)
 - current scheduled tasks [2-467](#)
 - event logs [2-467](#)
 - supported test suites [2-467](#)
 - test ID [2-467](#)
 - test results [2-467](#)
 - test statistics [2-467](#)
 - enabling
 - scheduling [2-98](#)
 - syslog messages [2-96](#)

- global configuration mode
 - clearing health monitoring diagnostic test schedule [2-96](#)
 - clearing test-based testing schedule [2-98](#)
 - setting health monitoring diagnostic testing [2-96](#)
 - setting test-based testing [2-98](#)
 - setting up health monitoring diagnostic test schedule [2-96](#)
 - setting up test-based testing [2-98](#)
- removing scheduling [2-98](#)
- scheduled switchover
 - disabling [2-98](#)
 - enabling [2-98](#)
- setting test interval [2-98](#)
- specifying health monitoring diagnostic tests [2-96](#)
- starting testing [2-100](#)

P

PAGP

See EtherChannel

- pagp learn-method command [2-352](#)
- pagp port-priority command [2-354](#)
- password, VTP [2-842, 2-846](#)
- password-recovery mechanism, enabling and disabling [2-414](#)
- permit (ARP access-list configuration) command [2-356](#)
- permit (IPv6) command [2-358](#)
- permit (MAC access-list configuration) command [2-363](#)
- per-VLAN spanning-tree plus
 - See STP
- physical-port learner [2-352](#)
- PID, displaying [2-519](#)
- PIM-DVMRP, as multicast router learning method [2-215](#)

PoE

- configuring the power budget [2-378](#)
- configuring the power management mode [2-375](#)
- displaying controller register values [2-461](#)
- displaying power management information [2-636](#)

- error detection for [2-138](#)
- error recovery timer [2-144](#)
- logging of status [2-268](#)
- monitoring power [2-380](#)
- policing power consumption [2-380](#)

police aggregate command [2-368](#)

police command [2-366](#)

policed-DSCP map [2-310](#)

policy-map command [2-370](#)

policy maps

- applying to an interface [2-416, 2-422](#)
- creating [2-370](#)
- displaying [2-631](#)
- hierarchical [2-371](#)

policers

- displaying [2-604](#)
- for a single class [2-366](#)
- for multiple classes [2-304, 2-368](#)
- policed-DSCP map [2-310](#)

traffic classification

- defining the class [2-43](#)
- defining trust states [2-808](#)
- setting DSCP or IP precedence values [2-420](#)

Port Aggregation Protocol

See EtherChannel

port-based authentication

- AAA method list [2-3](#)
- configuring violation modes [2-135](#)
- debug messages, display [B-7](#)
- enabling guest VLAN supplicant [2-105, 2-116](#)
- enabling IEEE 802.1x
 - globally [2-103](#)
 - per interface [2-126](#)
- guest VLAN [2-117](#)
- host modes [2-119](#)
- IEEE 802.1x AAA accounting methods [2-1](#)
- initialize an interface [2-120, 2-131](#)
- MAC authentication bypass [2-121](#)
- manual control of authorization state [2-126](#)

- multiple hosts on authorized port [2-119](#)
 - PAE as authenticator [2-125](#)
 - periodic re-authentication
 - enabling [2-129](#)
 - time between attempts [2-132](#)
 - quiet period between failed authentication exchanges [2-132](#)
 - re-authenticating IEEE 802.1x-enabled ports [2-128](#)
 - resetting configurable IEEE 802.1x parameters [2-115](#)
 - switch-to-authentication server retransmission time [2-132](#)
 - switch-to-client frame-retransmission number [2-123 to 2-124](#)
 - switch-to-client retransmission time [2-132](#)
 - test for IEEE 802.1x readiness [2-130](#)
 - port-based trust
 - IPv4 and IPv6 [2-337](#)
 - port-channel load-balance command [2-373](#)
 - Port Fast, for spanning tree [2-733](#)
 - port ranges, defining [2-81, 2-83](#)
 - ports, debugging [B-72](#)
 - ports, protected [2-788](#)
 - port security
 - aging [2-782](#)
 - debug messages, display [B-74](#)
 - enabling [2-777](#)
 - violation error recovery [2-144](#)
 - port trust states for QoS [2-336](#)
 - port types, MVR [2-348](#)
 - power information, displaying [2-482](#)
 - power inline command [2-375](#)
 - power inline consumption command [2-378](#)
 - power inline police command [2-380](#)
 - Power over Ethernet
 - See PoE
 - power rps command (user EXEC) [2-383](#)
 - power supply
 - configuring [2-386](#)
 - managing [2-386](#)
 - power supply command [2-386](#)
 - priority-queue command [2-387](#)
 - priority value, stack member [2-655, 2-754](#)
 - private-vlan command [2-389](#)
 - private-vlan mapping command [2-392](#)
 - private VLANs
 - association [2-786](#)
 - configuring [2-389](#)
 - configuring ports [2-773](#)
 - displaying [2-664](#)
 - host ports [2-773](#)
 - mapping
 - configuring [2-786](#)
 - displaying [2-501](#)
 - promiscuous ports [2-773](#)
 - privileged EXEC mode [1-2, 1-3](#)
 - product identification information, displaying [2-519](#)
 - promiscuous ports, private VLANs [2-773](#)
 - protected ports, displaying [2-507](#)
 - pruning
 - VLANs [2-790](#)
 - VTP
 - displaying interface information [2-501](#)
 - enabling [2-842, 2-846](#)
 - pruning-eligible VLAN list [2-792](#)
 - PVST+
 - See STP
-
- ## Q
- QoS
 - auto-QoS
 - configuring [2-22](#)
 - debug messages, display [B-2](#)
 - displaying [2-432](#)
 - class maps
 - creating [2-45](#)
 - defining the match criteria [2-297](#)
 - displaying [2-441](#)
 - defining the CoS value for an incoming packet [2-306](#)

- displaying configuration information [2-432](#), [2-603](#)
- DSCP transparency [2-318](#)
- DSCP trusted ports
 - applying DSCP-to-DSCP-mutation map to [2-308](#)
 - defining DSCP-to-DSCP-mutation map [2-310](#)
- egress queues
 - allocating buffers [2-314](#)
 - defining the CoS output queue threshold map [2-332](#)
 - defining the DSCP output queue threshold map [2-334](#)
 - displaying buffer allocations [2-607](#)
 - displaying CoS output queue threshold map [2-611](#)
 - displaying DSCP output queue threshold map [2-611](#)
 - displaying queueing strategy [2-607](#)
 - displaying queue-set settings [2-614](#)
 - enabling bandwidth shaping and scheduling [2-745](#)
 - enabling bandwidth sharing and scheduling [2-747](#)
 - limiting the maximum output on a port [2-743](#)
 - mapping a port to a queue-set [2-394](#)
 - mapping CoS values to a queue and threshold [2-332](#)
 - mapping DSCP values to a queue and threshold [2-334](#)
 - setting maximum and reserved memory allocations [2-316](#)
 - setting WTD thresholds [2-316](#)
- enabling [2-302](#)
- ingress queues
 - allocating buffers [2-322](#)
 - assigning SRR scheduling weights [2-320](#)
 - defining the CoS input queue threshold map [2-324](#)
 - defining the DSCP input queue threshold map [2-326](#)
 - displaying buffer allocations [2-607](#)
 - displaying CoS input queue threshold map [2-611](#)
 - displaying DSCP input queue threshold map [2-611](#)
 - displaying queueing strategy [2-607](#)
 - displaying settings for [2-605](#)
 - enabling the priority queue [2-328](#)
 - mapping CoS values to a queue and threshold [2-324](#)
 - mapping DSCP values to a queue and threshold [2-326](#)
 - setting WTD thresholds [2-330](#)
- maps
 - defining [2-310](#), [2-324](#), [2-326](#), [2-332](#), [2-334](#)
 - displaying [2-611](#)
- policy maps
 - applying an aggregate policer [2-368](#)
 - applying to an interface [2-416](#), [2-422](#)
 - creating [2-370](#)
 - defining policers [2-304](#), [2-366](#)
 - displaying policers [2-604](#)
 - displaying policy maps [2-631](#)
 - hierarchical [2-371](#)
 - policed-DSCP map [2-310](#)
 - setting DSCP or IP precedence values [2-420](#)
 - traffic classifications [2-43](#)
 - trust states [2-808](#)
- port trust states [2-336](#)
- queues, enabling the expedite [2-387](#)
- statistics
 - in-profile and out-of-profile packets [2-607](#)
 - packets enqueued or dropped [2-607](#)
 - sent and received CoS values [2-607](#)
 - sent and received DSCP values [2-607](#)
- trusted boundary for IP phones [2-336](#)
- VLAN-based [2-338](#)
- quality of service
 - See QoS
- querytime, MVR [2-345](#)
- queue-set command [2-394](#)

R

radius-server dead-criteria command [2-395](#)
radius-server host command [2-397](#)
rapid per-VLAN spanning-tree plus
 See STP
rapid PVST+
 See STP
rcommand command [2-399](#)
re-authenticating IEEE 802.1x-enabled ports [2-128](#)
re-authentication
 periodic [2-129](#)
 time between attempts [2-132](#)
receiver ports, MVR [2-348](#)
receiving flow-control packets [2-150](#)
recovery mechanism
 causes [2-144](#)
 display [2-49, 2-439, 2-487, 2-490](#)
 timer interval [2-145](#)
redundancy for cluster switches [2-78](#)
redundant power supply
 See RPS
reload command [2-401](#)
remote command [2-403](#)
remote-span command [2-405](#)
Remote Switched Port Analyzer
 See RSPAN
rename (boot loader) command [A-21](#)
renew ip dhcp snooping database command [2-407](#)
requirements
 cluster [xxii](#)
 device manager [xxii](#)
 Network Assistant [xxii](#)
reset (boot loader) command [A-22](#)
reset command [2-830](#)
resource templates, displaying [2-641](#)
restricted VLAN
 See dot1x auth-fail vlan
rmdir (boot loader) command [A-23](#)

rmon collection stats command [2-409](#)
root guard, for spanning tree [2-705](#)
routed ports
 IP addresses on [2-164](#)
 number supported [2-164](#)
routing frames
 See MTU
RPS 2300
 configuring [2-383](#)
 managing [2-383](#)
RSPAN
 configuring [2-339](#)
 displaying [2-617](#)
 filter RSPAN traffic [2-339](#)
 remote-span command [2-405](#)
 sessions
 add interfaces to [2-339](#)
 displaying [2-617](#)
 start new [2-339](#)

S

scheduled switchover
 disabling [2-98](#)
 enabling [2-98](#)
SDM mismatch mode [2-412, 2-656](#)
sdm prefer command [2-411](#)
SDM templates
 allowed resources [2-412](#)
 and stacking [2-412](#)
 displaying [2-641](#)
 dual IPv4 and IPv6 [2-411](#)
secure ports, limitations [2-779](#)
sending flow-control packets [2-150](#)
service password-recovery command [2-414](#)
service-policy command [2-416](#)
session command [2-419](#)
set (boot loader) command [A-24](#)
set command [2-420](#)

- setup command [2-422](#)
- setup express command [2-425](#)
- show access-lists command [2-427](#)
- show archive status command [2-430](#)
- show arp access-list command [2-431](#)
- show auto qos command [2-432](#)
- show boot command [2-436](#)
- show cable-diagnostics tdr command [2-439](#)
- show changes command [2-830](#)
- show class-map command [2-441](#)
- show cluster candidates command [2-444](#)
- show cluster command [2-442](#)
- show cluster members command [2-446](#)
- show controllers cpu-interface command [2-448](#)
- show controllers ethernet-controller command [2-450](#)
- show controllers ethernet-controller fastethernet command [2-458](#)
- show controllers power inline command [2-461](#)
- show controllers team command [2-463](#)
- show controller utilization command [2-465](#)
- show current command [2-830](#)
- show dot1q-tunnel command [2-472](#)
- show dot1x command [2-473](#)
- show dtp [2-477](#)
- show eap command [2-479](#)
- show env command [2-482](#)
- show errdisable detect command [2-487](#)
- show errdisable flap-values command [2-489](#)
- show errdisable recovery command [2-490](#)
- show etherchannel command [2-492](#)
- show fallback profile command [2-495](#)
- show flowcontrol command [2-497](#)
- show idprom command [2-499](#)
- show interfaces command [2-501](#)
- show interfaces counters command [2-513](#)
- show interface transceivers command [2-516](#)
- show inventory command [2-519](#)
- show ip arp inspection command [2-520](#)
- show ipc command [2-546](#)
- show ip dhcp snooping binding command [2-525](#)
- show ip dhcp snooping command [2-524](#)
- show ip dhcp snooping database command [2-527, 2-529](#)
- show ip igmp profile command [2-532](#)
- show ip igmp snooping address command [2-555](#)
- show ip igmp snooping command [2-533, 2-553](#)
- show ip igmp snooping groups command [2-536](#)
- show ip igmp snooping mrouter command [2-538, 2-557](#)
- show ip igmp snooping querier command [2-540, 2-559](#)
- show ip source binding command [2-542](#)
- show ipv6 access-list command [2-550](#)
- show ipv6 dhcp conflict command [2-552](#)
- show ipv6 route updated [2-561](#)
- show ip verify source command [2-544](#)
- show l2protocol-tunnel command [2-563](#)
- show lacp command [2-566](#)
- show link state group command [2-570](#)
- show location [2-572](#)
- show location command [2-572](#)
- show logging onboard command [2-575](#)
- show mac access-group command [2-580](#)
- show mac address-table address command [2-584](#)
- show mac address-table aging time command [2-586](#)
- show mac address-table command [2-582](#)
- show mac address-table count command [2-588](#)
- show mac address-table dynamic command [2-590](#)
- show mac address-table interface command [2-592](#)
- show mac address-table learning command [2-594](#)
- show mac address-table move update command [2-595](#)
- show mac address-table notification command [2-60, 2-597, B-22](#)
- show mac address-table static command [2-599](#)
- show mac address-table vlan command [2-601](#)
- show mls qos aggregate-policer command [2-604](#)
- show mls qos command [2-603](#)
- show mls qos input-queue command [2-605](#)
- show mls qos interface command [2-607](#)
- show mls qos maps command [2-611](#)
- show mls qos queue-set command [2-614](#)

- show mls qos vlan command [2-616](#)
- show monitor command [2-617](#)
- show mvr command [2-620](#)
- show mvr interface command [2-622](#)
- show mvr members command [2-624](#)
- show pagp command [2-626](#)
- show parser macro command [2-628](#)
- show platform acl command [C-2](#)
- show platform backup interface command [C-3](#)
- show platform configuration command [C-4](#)
- show platform dl command [C-5](#)
- show platform etherchannel command [C-6](#)
- show platform forward command [C-7](#)
- show platform frontend-controller command [C-9](#)
- show platform igmp snooping command [C-10](#)
- show platform ipc trace command [C-18](#)
- show platform ip multicast command [C-12](#)
- show platform ip unicast command [C-13](#)
- show platform ipv6 unicast command [C-19](#)
- show platform ip wccp command [C-17](#)
- show platform layer4op command [C-21](#)
- show platform mac-address-table command [C-22](#)
- show platform messaging command [C-23](#)
- show platform monitor command [C-24](#)
- show platform mvr table command [C-25](#)
- show platform pm command [C-26](#)
- show platform port-asic command [C-27](#)
- show platform port-security command [C-32](#)
- show platform qos command [C-33](#)
- show platform resource-manager command [C-34](#)
- show platform snmp counters command [C-36](#)
- show platform spanning-tree command [C-37](#)
- show platform stack-manager command [C-39](#)
- show platform stp-instance command [C-38](#)
- show platform tb command [C-41](#)
- show platform tcam command [C-43](#)
- show platform vlan command [C-46](#)
- show policy-map command [2-631](#)
- show port security command [2-633](#)
- show power inline command [2-636](#)
- show proposed command [2-830](#)
- show sdm prefer command [2-641](#)
- show setup express command [2-644](#)
- show spanning-tree command [2-645](#)
- show storm-control command [2-653](#)
- show switch command [2-655](#)
- show system mtu command [2-658](#)
- show trust command [2-808](#)
- show udd command [2-659](#)
- show version command [2-662](#)
- show vlan access-map command [2-669](#)
- show vlan command [2-664](#)
- show vlan command, fields [2-666](#)
- show vlan filter command [2-670](#)
- show vmps command [2-671](#)
- show vtp command [2-674](#)
- shutdown command [2-679](#)
- shutdown threshold, Layer 2 protocol tunneling [2-251](#)
- shutdown vlan command [2-680](#)
- small-frame violation rate command [2-681](#)
- Smartports macros
 - See macros
- SNMP host, specifying [2-688](#)
- SNMP informs, enabling the sending of [2-683](#)
- snmp-server enable traps command [2-683](#)
- snmp-server host command [2-688](#)
- snmp trap mac-notification command [2-692](#)
- SNMP traps
 - enabling MAC address notification trap [2-692](#)
 - enabling the MAC address notification feature [2-280](#)
 - enabling the sending of [2-683](#)
- SoftPhone
 - See Cisco SoftPhone

- software images
 - copying [2-8](#)
 - deleting [2-85](#)
 - downloading [2-11](#)
 - upgrading [2-8, 2-11](#)
 - uploading [2-18](#)
- software version, displaying [2-662](#)
- source ports, MVR [2-348](#)
- SPAN
 - configuring [2-339](#)
 - debug messages, display [B-23](#)
 - displaying [2-617](#)
 - filter SPAN traffic [2-339](#)
 - sessions
 - add interfaces to [2-339](#)
 - displaying [2-617](#)
 - start new [2-339](#)
- spanning-tree backbonefast command [2-694](#)
- spanning-tree bpdupfilter command [2-695](#)
- spanning-tree bpduguard command [2-697](#)
- spanning-tree cost command [2-699](#)
- spanning-tree etherchannel command [2-701](#)
- spanning-tree extend system-id command [2-703](#)
- spanning-tree guard command [2-705](#)
- spanning-tree link-type command [2-707](#)
- spanning-tree loopguard default command [2-709](#)
- spanning-tree mode command [2-711](#)
- spanning-tree mst configuration command [2-713](#)
- spanning-tree mst cost command [2-715](#)
- spanning-tree mst forward-time command [2-717](#)
- spanning-tree mst hello-time command [2-718](#)
- spanning-tree mst max-age command [2-719](#)
- spanning-tree mst max-hops command [2-720](#)
- spanning-tree mst port-priority command [2-722](#)
- spanning-tree mst pre-standard command [2-724](#)
- spanning-tree mst priority command [2-725](#)
- spanning-tree mst root command [2-726](#)
- spanning-tree portfast (global configuration) command [2-730](#)
- spanning-tree portfast (interface configuration) command [2-733](#)
- spanning-tree port-priority command [2-728](#)
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command [2-735](#)
- spanning-tree uplinkfast command [2-736](#)
- spanning-tree vlan command [2-738](#)
- speed command [2-741](#)
- srr-queue bandwidth limit command [2-743](#)
- srr-queue bandwidth shape command [2-745](#)
- srr-queue bandwidth share command [2-747](#)
- SSH, configuring version [2-222](#)
- stack-mac persistent timer command [2-749](#)
- stack member
 - access [2-419](#)
 - number [2-655, 2-757](#)
 - priority value [2-754](#)
 - provisioning [2-755](#)
 - reloading [2-401](#)
- stacks, switch
 - MAC address [2-749](#)
 - provisioning a new member [2-755](#)
 - reloading [2-401](#)
 - stack member access [2-419](#)
 - stack member number [2-655, 2-757](#)
 - stack member priority value [2-655, 2-754](#)
- static-access ports, configuring [2-761](#)
- statistics, Ethernet group [2-409](#)
- sticky learning, enabling [2-777](#)
- storm-control command [2-751](#)
- STP
 - BackboneFast [2-694](#)
 - counters, clearing [2-64](#)
 - 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 BPDUs [B-79](#)
 - UplinkFast [B-85](#)
 - detection of indirect link failures [2-694](#)
 - enabling protocol tunneling for [2-251](#)
 - EtherChannel misconfiguration [2-701](#)
 - extended system ID [2-703](#)
 - path cost [2-699](#)
 - protocol modes [2-711](#)
 - root port
 - accelerating choice of new [2-736](#)
 - loop guard [2-705](#)
 - preventing from becoming designated [2-705](#)
 - restricting which can be root [2-705](#)
 - root guard [2-705](#)
 - UplinkFast [2-736](#)
 - root switch
 - affects of extended system ID [2-703, 2-739](#)
 - hello-time [2-738](#)
 - interval between BPDU messages [2-738](#)
 - interval between hello BPDU messages [2-738](#)
 - max-age [2-738](#)
 - port priority for selection of [2-728](#)
 - primary or secondary [2-738](#)
 - switch priority [2-738](#)
 - state changes
 - blocking to forwarding state [2-733](#)
 - enabling BPDU filtering [2-695, 2-730](#)
 - enabling BPDU guard [2-697, 2-730](#)
 - enabling Port Fast [2-730, 2-733](#)
 - enabling timer to recover from error state [2-144](#)
 - forward-delay time [2-738](#)
 - length of listening and learning states [2-738](#)
 - shutting down Port Fast-enabled ports [2-730](#)
 - state information display [2-645](#)
 - VLAN options [2-725, 2-738](#)
 - SVIs, creating [2-158](#)
 - SVI status calculation [2-763](#)
 - Switched Port Analyzer
 - See SPAN
 - switching characteristics
 - modifying [2-759](#)
 - returning to interfaces [2-759](#)
 - switchport access command [2-761](#)
 - switchport autostate exclude command [2-763](#)
 - switchport backup interface command [2-765](#)
 - switchport block command [2-768](#)
 - switchport command [2-759](#)
 - switchport host command [2-769](#)
 - switchport mode command [2-770](#)
 - switchport mode private-vlan command [2-773](#)
 - switchport nonegotiate command [2-775](#)
 - switchport port-security aging command [2-782](#)
 - switchport port-security command [2-777](#)
 - switchport priority extend command [2-784](#)
 - switchport private-vlan command [2-786](#)
 - switchport protected command [2-788](#)
 - switchports, displaying [2-502](#)
 - switchport trunk command [2-790](#)
 - switchport voice detect [2-793](#)
 - switchport voice vlan command [2-794](#)
 - switch priority command [2-754](#)
 - switch provision command [2-755](#)
 - switch renumber command [2-757](#)
 - system env temperature threshold yellow command [2-797](#)
 - system message logging [2-268](#)
 - system message logging, save message to flash [2-269](#)
 - system mtu command [2-799](#)
 - system resource templates [2-411](#)
-
- ## T
- tar files, creating, listing, and extracting [2-15](#)
 - TDR, running [2-802](#)
 - Telnet, using to communicate to cluster switches [2-399](#)
 - temperature information, displaying [2-482](#)
 - templates, system resources [2-411](#)

test cable-diagnostics tdr command [2-802](#)
 traceroute mac command [2-803](#)
 traceroute mac ip command [2-806](#)
 trunking, VLAN mode [2-770](#)
 trunk mode [2-770](#)
 trunk ports [2-770](#)
 trunks, to non-DTP device [2-771](#)
 trusted boundary for QoS [2-336](#)
 trusted port states for QoS [2-336](#)
 tunnel ports, Layer 2 protocol, displaying [2-563](#)
 type (boot loader) command [A-27](#)

U

UDLD

aggressive mode [2-810, 2-812](#)
 debug messages, display [B-93](#)
 enable globally [2-810](#)
 enable per interface [2-812](#)
 error recovery timer [2-144](#)
 message timer [2-810](#)
 normal mode [2-810, 2-812](#)
 reset a shutdown interface [2-814](#)
 status [2-659](#)
 udd command [2-810](#)
 udd port command [2-812](#)
 udd reset command [2-814](#)
 unicast storm control [2-751](#)
 UniDirectional Link Detection
 See UDLD
 unknown multicast traffic, preventing [2-768](#)
 unknown unicast traffic, preventing [2-768](#)
 unset (boot loader) command [A-28](#)
 upgrading
 copying software images [2-8](#)
 downloading software images [2-11](#)
 software images, monitoring status of [2-430](#)
 upgrading information
 See release notes

UplinkFast, for STP [2-736](#)
 user EXEC mode [1-2, 1-3](#)

V

version (boot loader) command [A-30](#)
 version mismatch mode [2-656](#)
 vlan (global configuration) command [2-815](#)
 vlan (VLAN configuration) command [2-821](#)
 vlan access-map command [2-827](#)
 VLAN access map configuration mode [2-827](#)
 VLAN access maps
 actions [2-6](#)
 displaying [2-669](#)
 VLAN-based QoS [2-338](#)
 VLAN configuration
 rules [2-818, 2-823](#)
 saving [2-815, 2-825](#)
 VLAN configuration mode
 commands
 VLAN [2-821](#)
 VTP [2-846](#)
 description [1-5](#)
 entering [2-829](#)
 summary [1-3](#)
 vlan database command [2-829](#)
 vlan dot1q tag native command [2-833](#)
 vlan filter command [2-835](#)
 VLAN filters, displaying [2-670](#)
 VLAN ID range [2-815, 2-821](#)
 VLAN maps
 applying [2-835](#)
 creating [2-827](#)
 defining [2-295](#)
 displaying [2-669](#)
 VLAN Query Protocol
 See VQP

VLANs

- adding [2-815](#)
- configuring [2-815, 2-821](#)
- debug messages, display
 - ISL [B-89](#)
 - VLAN IOS file system error tests [B-88](#)
 - VLAN manager activity [B-86](#)
 - VTP [B-91](#)
- displaying configurations [2-664](#)
- extended-range [2-815](#)
- MAC addresses
 - displaying [2-601](#)
 - number of [2-588](#)
- media types [2-818, 2-823](#)
- normal-range [2-815, 2-821](#)
- private [2-773](#)
 - configuring [2-389](#)
 - displaying [2-664](#)
 - See also private VLANs
- restarting [2-680](#)
- saving the configuration [2-815](#)
- shutting down [2-680](#)
- SNMP traps for VTP [2-685, 2-689](#)
- suspending [2-680](#)
- variables [2-821](#)

VLAN Trunking Protocol

See VTP

VM mode [2-656](#)

VMPS

- configuring servers [2-840](#)
- displaying [2-671](#)
- error recovery timer [2-145](#)
- reconfirming dynamic VLAN assignments [2-837](#)
- vmmps reconfirm (global configuration) command [2-838](#)
- vmmps reconfirm (privileged EXEC) command [2-837](#)
- vmmps retry command [2-839](#)
- vmmps server command [2-840](#)

voice VLAN

- configuring [2-793, 2-794](#)
- setting port priority [2-784](#)

VQP

- and dynamic-access ports [2-762](#)
- clearing client statistics [2-66](#)
- displaying information [2-671](#)
- per-server retry count [2-839](#)
- reconfirmation interval [2-838](#)
- reconfirming dynamic VLAN assignments [2-837](#)

VTP

- changing characteristics [2-842](#)
- clearing pruning counters [2-67](#)
- configuring
 - domain name [2-842, 2-846](#)
 - file name [2-842](#)
 - mode [2-842, 2-846](#)
 - password [2-842, 2-846](#)
- counters display fields [2-675](#)
- displaying information [2-674](#)
- enabling
 - pruning [2-842, 2-846](#)
 - tunneling for [2-251](#)
 - Version 2 [2-842, 2-846](#)
- mode [2-842, 2-846](#)
- pruning [2-842, 2-846](#)
- saving the configuration [2-815, 2-825](#)
- statistics [2-674](#)
- status [2-674](#)
- status display fields [2-676](#)
- vtp (global configuration) command [2-842](#)
- vtp (VLAN configuration) command [2-846](#)