



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 [2-754](#)
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP [2-149](#)
 MAC, displaying [2-527](#)
access list, IPv6 [2-212](#)
access map configuration mode [2-280](#)
access mode [2-697](#)
access ports [2-697](#)
ACEs [2-84, 2-349](#)
ACLs
 deny [2-82](#)
 displaying [2-399](#)
 for non-IP protocols [2-258](#)
 IP [2-149](#)
 matching [2-280](#)
 on Layer 2 interfaces [2-149](#)
 permit [2-347](#)
action command [2-6](#)
address aliasing [2-330](#)
aggregate-port learner [2-335](#)
allowed VLANs [2-716](#)
apply command [2-754](#)
archive download-sw command [2-8](#)

archive tar command [2-11](#)
archive upload-sw command [2-14](#)
arp access-list command [2-16](#)
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 [2-116](#)
autonegotiation of duplex mode [2-128](#)
auto qos voip command [2-18](#)

B

BackboneFast, for STP [2-629](#)
backup interfaces
 configuring [2-691](#)
 displaying [2-462](#)
boot (boot loader) command [A-2](#)
boot auto-download-sw command [2-22](#)
boot config-file command [2-24](#)
boot enable-break command [2-25](#)
boot helper command [2-26](#)
boot helper-config file command [2-27](#)
booting
 Cisco IOS image [2-30](#)
 displaying environment variables [2-408](#)
 interrupting [2-22, 2-25](#)
 manually [2-28](#)

boot loader

- accessing [A-1](#)

- booting

- Cisco IOS image [A-2](#)

- helper image [2-26](#)

- directories

- creating [A-14](#)

- displaying a list of [A-7](#)

- removing [A-18](#)

- displaying

- available commands [A-12](#)

- memory heap utilization [A-13](#)

- version [A-25](#)

- environment variables

- described [A-19](#)

- displaying settings [A-19](#)

- location of [A-20](#)

- setting [A-19](#)

- unsetting [A-23](#)

- files

- copying [A-5](#)

- deleting [A-6](#)

- displaying a list of [A-7](#)

- displaying the contents of [A-4](#), [A-15](#), [A-22](#)

- renaming [A-16](#)

- file system

- formatting [A-10](#)

- initializing flash [A-9](#)

- running a consistency check [A-11](#)

- prompt [A-1](#)

- resetting the system [A-17](#)

- boot manual command [2-28](#)

- boot private-config-file command [2-29](#)

- boot system command [2-30](#)

- BPDU filtering, for spanning tree [2-630](#), [2-664](#)

- BPDU guard, for spanning tree [2-632](#), [2-664](#)

- broadcast storm control [2-682](#)

C

candidate switches

- See clusters

- cat (boot loader) command [A-4](#)

- CDP, enabling protocol tunneling for [2-237](#)

- channel-group command [2-31](#)

- channel-protocol command [2-34](#)

- Cisco SoftPhone

- auto-QoS configuration [2-18](#)

- trusting packets sent from [2-322](#)

- class command [2-35](#)

- class-map command [2-37](#)

- class maps

- creating [2-37](#)

- defining the match criteria [2-282](#)

- displaying [2-412](#)

- class of service

- See CoS

- clear dot1x command [2-39](#)

- clear eap sessions command [2-40](#)

- clear errdisable interface [2-41](#)

- clear ip arp inspection log command [2-42](#)

- clear ip arp inspection statistics command [2-43](#)

- clear ipc command [2-46](#)

- clear ip dhcp snooping database command [2-44](#)

- clear ipv6 dhcp conflict command [2-47](#)

- clear l2protocol-tunnel counters command [2-48](#)

- clear lacp command [2-49](#)

- clear mac address-table command [2-50](#), [2-51](#)

- clear pagp command [2-52](#)

- clear port-security command [2-53](#)

- clear spanning-tree counters command [2-55](#)

- clear spanning-tree detected-protocols command [2-56](#)

- clear vmps statistics command [2-57](#)

- clear vtp counters command [2-58](#)

- cluster commander-address command [2-59](#)

- cluster discovery hop-count command [2-61](#)

- cluster enable command [2-62](#)

- cluster holdtime command [2-64](#)
- cluster member command [2-65](#)
- cluster outside-interface command [2-67](#)
- cluster run command [2-68](#)
- clusters
 - adding candidates [2-65](#)
 - binding to HSRP group [2-69](#)
 - building manually [2-65](#)
 - communicating with
 - devices outside the cluster [2-67](#)
 - members by using Telnet [2-376](#)
 - debug messages, display [B-5](#)
 - displaying
 - candidate switches [2-415](#)
 - debug messages [B-5](#)
 - member switches [2-417](#)
 - status [2-413](#)
 - hop-count limit for extended discovery [2-61](#)
 - HSRP standby groups [2-69](#)
 - redundancy [2-69](#)
 - SNMP trap [2-619](#)
- cluster standby-group command [2-69](#)
- cluster timer command [2-71](#)
- command modes defined [1-1](#)
- commands changed in Cisco IOS Release 12.2(20)SE [1-5](#)
- command switch
 - See clusters
- configuration files
 - password recovery disable considerations [A-1](#)
 - specifying the name [2-24, 2-29](#)
- configuring multiple interfaces [2-145](#)
- config-vlan mode
 - commands [2-740](#)
 - description [1-4](#)
 - entering [2-739](#)
 - summary [1-2](#)
- copy (boot loader) command [A-5](#)

- CoS
 - assigning default value to incoming packets [2-292](#)
 - assigning to Layer 2 protocol packets [2-240](#)
 - overriding the incoming value [2-292](#)

- CoS-to-DSCP map [2-296](#)
- CPU ASIC statistics, displaying [2-419](#)
- crashinfo files [2-138](#)

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 ilpower command [B-11](#)
- debug interface command [B-12](#)
- debug ip dhcp snooping command [B-13](#)
- 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-14](#)
- debug lacp command [B-18](#)
- debug mac-notification command [B-19](#)
- debug matm command [B-20](#)
- debug matm move update command [B-21](#)
- debug monitor command [B-22](#)
- debug mvrdbg command [B-23](#)
- debug nvramp command [B-24](#)
- debug pagp command [B-25](#)
- debug platform acl command [B-26](#)
- debug platform backup interface command [B-27](#)
- debug platform configuration command [B-35](#)
- debug platform cpu-queues command [B-28](#)
- debug platform device-manager command [B-30](#)
- debug platform dot1x command [B-31](#)
- debug platform etherchannel command [B-32](#)

- debug platform fallback-bridging command [B-33](#)
- debug platform forw-tcam command [B-34](#)
- debug platform ip arp inspection command [B-36](#)
- debug platform ip dhcp command [B-37](#)
- debug platform ip igmp snooping command [B-38](#)
- debug platform ip multicast command [B-40](#)
- debug platform ip unicast command [B-42](#)
- debug platform ip wccp command [B-44](#)
- debug platform led command [B-45](#)
- debug platform matm command [B-46](#)
- debug platform messaging application command [B-47](#)
- debug platform phy command [B-48](#)
- debug platform pm command [B-50](#)
- debug platform port-asic command [B-52](#)
- debug platform port-security command [B-53](#)
- debug platform qos-acl-tcam command [B-54](#)
- debug platform remote-commands command [B-55](#)
- debug platform resource-manager command [B-56](#)
- debug platform snmp command [B-57](#)
- debug platform span command [B-58](#)
- debug platform supervisor-asic command [B-59](#)
- debug platform sw-bridge command [B-60](#)
- debug platform team command [B-61](#)
- debug platform uddl command [B-63](#)
- debug platform vlan command [B-64](#)
- debug pm command [B-65](#)
- debug port-security command [B-67](#)
- debug qos-manager command [B-68](#)
- debug spanning-tree backbonefast command [B-71](#)
- debug spanning-tree bpdu command [B-72](#)
- debug spanning-tree bpdu-opt command [B-73](#)
- debug spanning-tree command [B-69](#)
- debug spanning-tree mstp command [B-74](#)
- debug spanning-tree switch command [B-76](#)
- debug spanning-tree uplinkfast command [B-78](#)
- debug sw-vlan command [B-79](#)
- debug sw-vlan ifs command [B-81](#)
- debug sw-vlan notification command [B-82](#)
- debug sw-vlan vtp command [B-84](#)
- debug uddl command [B-86](#)
- debug vqpc command [B-88](#)
- define interface-range command [2-72](#)
- delete (boot loader) command [A-6](#)
- delete command [2-74](#)
- deny (ARP access-list configuration) command [2-75](#)
- deny (IPv6) command [2-77](#)
- deny command [2-82](#)
- detect mechanism, causes [2-129](#)
- DHCP snooping
 - accepting untrusted packets from edge switch [2-177](#)
 - enabling
 - on a VLAN [2-183](#)
 - option 82 [2-175, 2-177](#)
 - trust on an interface [2-181](#)
 - error recovery timer [2-135](#)
 - rate limiting [2-180](#)
- DHCP snooping binding database
 - binding file, configuring [2-173](#)
 - bindings
 - adding [2-171](#)
 - deleting [2-171](#)
 - displaying [2-480](#)
 - clearing database agent statistics [2-44](#)
 - database agent, configuring [2-173](#)
 - displaying
 - binding entries [2-480](#)
 - database agent status [2-482, 2-484](#)
 - renewing [2-380](#)
- dir (boot loader) command [A-7](#)
- directories, deleting [2-74](#)
- domain name, VTP [2-764, 2-768](#)
- dot1x auth-fail max-attempts [2-92](#)
- dot1x auth-fail vlan [2-94](#)
- dot1x command [2-90](#)
- dot1x control-direction command [2-96](#)
- dot1x critical global configuration command [2-98](#)
- dot1x critical interface configuration command [2-100](#)
- dot1x default command [2-102](#)

- dot1x fallback command [2-103](#)
 - dot1x guest-vlan command [2-104](#)
 - dot1x host-mode command [2-107](#)
 - dot1x initialize command [2-109](#)
 - dot1x mac-auth-bypass command [2-110](#)
 - dot1x max-reauth-req command [2-112](#)
 - dot1x max-req command [2-113](#)
 - dot1x multiple-hosts command [2-114](#)
 - dot1x pae command [2-115](#)
 - dot1x port-control command [2-116](#)
 - dot1x re-authenticate command [2-118](#)
 - dot1x re-authentication command [2-119](#)
 - dot1x reauthentication command [2-120](#)
 - dot1x test eapol-capable command [2-121](#)
 - dot1x test timeout command [2-122](#)
 - dot1x timeout command [2-123](#)
 - dot1x violation-mode command [2-126](#)
 - dropping packets, with ACL matches [2-6](#)
 - drop threshold, Layer 2 protocol tunneling [2-237](#)
 - DSCP-to-CoS map [2-296](#)
 - DSCP-to-DSCP-mutation map [2-296](#)
 - DTP [2-698](#)
 - DTP flap
 - error detection for [2-129](#)
 - error recovery timer [2-135](#)
 - DTP negotiation [2-702](#)
 - dual-purpose uplink ports
 - selecting the type [2-286](#)
 - duplex command [2-127](#)
 - dynamic-access ports
 - configuring [2-687](#)
 - restrictions [2-688](#)
 - dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN [2-157](#)
 - define [2-16](#)
 - deny packets [2-75](#)
 - display [2-403](#)
 - permit packets [2-339](#)
 - clear
 - log buffer [2-42](#)
 - statistics [2-43](#)
 - display
 - ARP ACLs [2-403](#)
 - configuration and operating state [2-475](#)
 - log buffer [2-475](#)
 - statistics [2-475](#)
 - trust state and rate limit [2-475](#)
 - enable per VLAN [2-167](#)
 - error detection for [2-129](#)
 - error recovery timer [2-135](#)
 - log buffer
 - clear [2-42](#)
 - configure [2-161](#)
 - display [2-475](#)
 - rate-limit incoming ARP packets [2-159](#)
 - statistics
 - clear [2-43](#)
 - display [2-475](#)
 - trusted interface state [2-163](#)
 - type of packet logged [2-168](#)
 - validation checks [2-165](#)
 - dynamic auto VLAN membership mode [2-697](#)
 - dynamic desirable VLAN membership mode [2-697](#)
 - Dynamic Host Configuration Protocol (DHCP)
 - See DHCP snooping
 - Dynamic Trunking Protocol
 - See DTP
-
- ## E
- EAP-request/identity frame
 - maximum number to send [2-113](#)
 - response time before retransmitting [2-123](#)
 - encapsulation methods [2-716](#)
 - environment variables, displaying [2-408](#)
 - errdisable detect cause command [2-129](#)
 - errdisable detect cause small-frame comand [2-132](#)

errdisable recovery cause small-frame [2-134](#)
 errdisable recovery command [2-135](#)
 error conditions, displaying [2-451](#)
 error disable detection [2-129](#)
 error-disabled interfaces, displaying [2-462](#)
 EtherChannel
 assigning Ethernet interface to channel group [2-31](#)
 creating port-channel logical interface [2-143](#)
 debug EtherChannel/PAgP, display [B-10](#)
 debug platform-specific events, display [B-32](#)
 displaying [2-455](#)
 enabling Layer 2 protocol tunneling for
 LACP [2-238](#)
 PAgP [2-238](#)
 UDLD [2-238](#)
 interface information, displaying [2-462](#)
 LACP
 clearing channel-group information [2-49](#)
 debug messages, display [B-18](#)
 displaying [2-519](#)
 modes [2-31](#)
 port priority for hot-standby ports [2-241](#)
 restricting a protocol [2-34](#)
 system priority [2-243](#)
 load-distribution methods [2-357](#)
 PAgP
 aggregate-port learner [2-335](#)
 clearing channel-group information [2-52](#)
 debug messages, display [B-25](#)
 displaying [2-572](#)
 error detection for [2-129](#)
 error recovery timer [2-135](#)
 learn method [2-335](#)
 modes [2-31](#)
 physical-port learner [2-335](#)
 priority of interface for transmitted traffic [2-337](#)
 Ethernet controller, internal register display [2-421](#)
 Ethernet statistics, collecting [2-383](#)
 exception crashinfo command [2-138](#)

exit command [2-754](#)
 extended discovery of candidate switches [2-61](#)
 extended-range VLANs
 and allowed VLAN list [2-716](#)
 and pruning-eligible list [2-716](#)
 configuring [2-739](#)
 extended system ID for STP [2-638](#)

F

fallback profile command [2-139](#)
 fallback profiles, displaying [2-458](#)
 fan information, displaying [2-447](#)
 file name, VTP [2-764](#)
 files, deleting [2-74](#)
 flash_init (boot loader) command [A-9](#)
 Flex Links
 configuring [2-691](#)
 configuring preferred VLAN [2-693](#)
 displaying [2-462](#)
 flowcontrol command [2-141](#)
 format (boot loader) command [A-10](#)
 forwarding packets, with ACL matches [2-6](#)
 forwarding results, display [C-6](#)
 frame forwarding information, displaying [C-6](#)
 front-end controller, counter and status information [C-8](#)
 fsck (boot loader) command [A-11](#)

G

global configuration mode [1-2, 1-3](#)

H

hardware ACL statistics [2-399](#)
 help (boot loader) command [A-12](#)
 hierarchical policy maps [2-355](#)
 hop-count limit for clusters [2-61](#)

- host connection, port configuration [2-696](#)
 - host ports, private VLANs [2-700](#)
 - Hot Standby Router Protocol
 - See HSRP
 - HSRP
 - binding HSRP group to cluster [2-69](#)
 - standby group [2-69](#)
-
- IEEE 802.1Q trunk ports and native VLANs [2-756](#)
 - IEEE 802.1Q tunnel ports
 - configuring [2-697](#)
 - displaying [2-436](#)
 - limitations [2-698](#)
 - IEEE 802.1x
 - and switchport modes [2-698](#)
 - violation error recovery [2-135](#)
 - See also port-based authentication
 - IEEE 802.1X Port Based Authentication
 - enabling guest VLAN supplicant [2-92, 2-103, 2-140](#)
 - IGMP filters
 - applying [2-186](#)
 - debug messages, display [B-15](#)
 - IGMP groups, setting maximum [2-187](#)
 - IGMP maximum groups, debugging [B-16](#)
 - IGMP profiles
 - creating [2-189](#)
 - displaying [2-487](#)
 - IGMP snooping
 - adding ports as a static member of a group [2-205](#)
 - displaying [2-488, 2-493, 2-495](#)
 - enabling [2-191](#)
 - enabling the configurable-leave timer [2-193](#)
 - enabling the Immediate-Leave feature [2-202](#)
 - flooding query count [2-199](#)
 - interface topology change notification behavior [2-201](#)
 - multicast table [1-5, 2-491](#)
 - querier [2-195](#)
 - query solicitation [2-199](#)
 - report suppression [2-197](#)
 - switch topology change notification behavior [2-199](#)
 - images
 - See software images
 - Immediate-Leave feature, MVR [2-332](#)
 - immediate-leave processing [2-202](#)
 - Immediate-Leave processing, IPv6 [2-233](#)
 - interface configuration mode [1-2, 1-4](#)
 - interface port-channel command [2-143](#)
 - interface range command [2-145](#)
 - interface-range macros [2-72](#)
 - interfaces
 - assigning Ethernet interface to channel group [2-31](#)
 - configuring [2-127](#)
 - configuring multiple [2-145](#)
 - creating port-channel logical [2-143](#)
 - debug messages, display [B-12](#)
 - disabling [2-615](#)
 - displaying the MAC address table [2-539](#)
 - restarting [2-615](#)
 - interface speed, configuring [2-674](#)
 - interface vlan command [2-147](#)
 - internal registers, displaying [2-421, 2-430](#)
 - Internet Group Management Protocol
 - See IGMP
 - invalid GBIC
 - error detection for [2-129](#)
 - error recovery timer [2-135](#)
 - ip access-group command [2-149](#)
 - ip address command [2-152](#)
 - IP addresses, setting [2-152](#)
 - IP address matching [2-280](#)
 - ip admission command [2-154](#)
 - ip admission name proxy http command [2-155](#)
 - ip arp inspection filter vlan command [2-157](#)
 - ip arp inspection limit command [2-159](#)
 - ip arp inspection log-buffer command [2-161](#)
 - ip arp inspection trust command [2-163](#)

ip arp inspection validate command [2-165](#)
 ip arp inspection vlan command [2-167](#)
 ip arp inspection vlan logging command [2-168](#)
 IP DHCP snooping
 See DHCP snooping
 ip dhcp snooping binding command [2-171](#)
 ip dhcp snooping command [2-170](#)
 ip dhcp snooping database command [2-173](#)
 ip dhcp snooping information option allow-untrusted command [2-177](#)
 ip dhcp snooping information option command [2-175](#)
 ip dhcp snooping information option format remote-id command [2-179](#)
 ip dhcp snooping limit rate command [2-180](#)
 ip dhcp snooping trust command [2-181](#)
 ip dhcp snooping verify command [2-182](#)
 ip dhcp snooping vlan command [2-183](#)
 ip dhcp snooping vlan information option format-type circuit-id string command [2-184](#)
 ip igmp filter command [2-186](#)
 ip igmp max-groups command [2-187](#)
 ip igmp profile command [2-189](#)
 ip igmp snooping command [2-191](#)
 ip igmp snooping last-member-query-interval command [2-193](#)
 ip igmp snooping querier command [2-195](#)
 ip igmp snooping report-suppression command [2-197](#)
 ip igmp snooping tcn command [2-199](#)
 ip igmp snooping tcn flood command [2-201](#)
 ip igmp snooping vlan immediate-leave command [2-202](#)
 ip igmp snooping vlan mrouter command [2-203](#)
 ip igmp snooping vlan static command [2-205](#)
 IP multicast addresses [2-329](#)
 IP phones
 auto-QoS configuration [2-18](#)
 trusting packets sent from [2-322](#)
 IP-precedence-to-DSCP map [2-296](#)
 ip source binding command [2-207](#)

IP source guard
 disabling [2-211](#)
 displaying
 binding entries [2-497](#)
 configuration [2-498](#)
 dynamic binding entries only [2-480](#)
 enabling [2-211](#)
 static IP source bindings [2-207](#)
 ip ssh command [2-209](#)
 IPv6 access list, deny conditions [2-77](#)
 ipv6 access-list command [2-212](#)
 ipv6 address dhcp command [2-214](#)
 ipv6 dhcp client request vendor command [2-215](#)
 ipv6 dhcp ping packets command [2-216](#)
 ipv6 dhcp pool command [2-218](#)
 ipv6 dhcp server command [2-220](#)
 ipv6 mld snooping command [2-222](#)
 ipv6 mld snooping last-listener-query count command [2-224](#)
 ipv6 mld snooping last-listener-query-interval command [2-226](#)
 ipv6 mld snooping listener-message-suppression command [2-228](#)
 ipv6 mld snooping robustness-variable command [2-229](#)
 ipv6 mld snooping tcn command [2-231](#)
 ipv6 mld snooping vlan command [2-233](#)
 IPv6 SDM template [2-384](#)
 ipv6 traffic-filter command [2-235](#)
 ip verify source command [2-211](#)

J

jumbo frames
 See MTU

L

l2protocol-tunnel command [2-237](#)
 l2protocol-tunnel cos command [2-240](#)

LACP

See EtherChannel

lacp port-priority command [2-241](#)

lacp system-priority command [2-243](#)

Layer 2 mode, enabling [2-685](#)

Layer 2 protocol ports, displaying [2-517](#)

Layer 2 protocol-tunnel

error detection for [2-129](#)

error recovery timer [2-135](#)

Layer 2 protocol tunnel counters [2-48](#)

Layer 2 protocol tunneling error recovery [2-238](#)

Layer 2 traceroute

IP addresses [2-730](#)

MAC addresses [2-727](#)

Layer 3 mode, enabling [2-685](#)

line configuration mode [1-2, 1-5](#)

Link Aggregation Control Protocol

See EtherChannel

link flap

error detection for [2-129](#)

error recovery timer [2-135](#)

link state group command [2-249](#)

link state track command [2-251](#)

load-distribution methods for EtherChannel [2-357](#)

location (global configuration) command [2-245](#)

location (interface configuration) command [2-247](#)

logging event command [2-252](#)

logging event power-inline-status command [2-253](#)

logging file command [2-254](#)

logical interface [2-143](#)

loopback error

detection for [2-129](#)

recovery timer [2-135](#)

loop guard, for spanning tree [2-639, 2-643](#)

MAC access list configuration mode [2-258](#)

mac access-list extended command [2-258](#)

MAC access lists [2-82](#)

MAC addresses

disabling MAC address learning per VLAN [2-261](#)

displaying

aging time [2-533](#)

all [2-531](#)

dynamic [2-537](#)

MAC address-table move updates [2-542](#)

notification settings [2-541, 2-544](#)

number of addresses in a VLAN [2-535](#)

per interface [2-539](#)

per VLAN [2-548](#)

static [2-546](#)

static and dynamic entries [2-529](#)

dynamic

aging time [2-260](#)

deleting [2-50](#)

displaying [2-537](#)

enabling MAC address notification [2-265](#)

enabling MAC address-table move update [2-263](#)

matching [2-280](#)

static

adding and removing [2-267](#)

displaying [2-546](#)

dropping on an interface [2-268](#)

tables [2-531](#)

MAC address notification, debugging [B-19](#)

mac address-table aging-time [2-256, 2-280](#)

mac address-table aging-time command [2-260](#)

mac address-table learning command [2-261](#)

mac address-table move update command [2-263](#)

mac address-table notification command [2-265](#)

mac address-table static command [2-267](#)

mac address-table static drop command [2-268](#)

macro apply command [2-270](#)

macro description command [2-273](#)

macro global command [2-274](#)

M

mac access-group command [2-256](#)

MAC access-groups, displaying [2-527](#)

- macro global description command [2-277](#)
- macro name command [2-278](#)
- macros
 - adding a description [2-273](#)
 - adding a global description [2-277](#)
 - applying [2-274](#)
 - creating [2-278](#)
 - displaying [2-574](#)
 - interface range [2-72, 2-145](#)
 - specifying parameter values [2-274](#)
 - tracing [2-274](#)
- maps
 - QoS
 - defining [2-296](#)
 - displaying [2-558](#)
 - VLAN
 - creating [2-751](#)
 - defining [2-280](#)
 - displaying [2-607](#)
- match (access-map configuration) command [2-280](#)
- match (class-map configuration) command [2-282](#)
- maximum transmission unit
 - See MTU
- mdix auto command [2-284](#)
- media-type command [2-286](#)
- member switches
 - See clusters
- memory (boot loader) command [A-13](#)
- mkdir (boot loader) command [A-14](#)
- MLD snooping
 - configuring [2-228, 2-229](#)
 - configuring queries [2-224, 2-226](#)
 - configuring topology change notification [2-231](#)
 - displaying [2-507, 2-509, 2-511, 2-513](#)
 - enabling [2-222](#)
- MLD snooping on a VLAN, enabling [2-233](#)
- mls qos aggregate-policer command [2-290](#)
- mls qos command [2-288](#)
- mls qos cos command [2-292](#)
- mls qos dscp-mutation command [2-294](#)
- mls qos map command [2-296](#)
- mls qos queue-set output buffers command [2-300](#)
- mls qos queue-set output threshold command [2-302](#)
- mls qos rewrite ip dscp command [2-304](#)
- mls qos srr-queue input bandwidth command [2-306](#)
- mls qos srr-queue input buffers command [2-308](#)
- mls qos srr-queue input cos-map command [2-310](#)
- mls qos srr-queue input dscp-map command [2-312](#)
- mls qos srr-queue input priority-queue command [2-314](#)
- mls qos srr-queue input threshold command [2-316](#)
- mls qos srr-queue output cos-map command [2-318](#)
- mls qos srr-queue output dscp-map command [2-320](#)
- mls qos trust command [2-322](#)
- mls qos vlan-based command [2-324](#)
- mode, MVR [2-329](#)
- Mode button, and password recovery [2-387](#)
- modes, commands [1-1](#)
- monitor session command [2-325](#)
- more (boot loader) command [A-15](#)
- MSTP
 - displaying [2-589](#)
 - interoperability [2-56](#)
 - link type [2-641](#)
 - MST region
 - aborting changes [2-647](#)
 - applying changes [2-647](#)
 - configuration name [2-647](#)
 - configuration revision number [2-647](#)
 - current or pending display [2-647](#)
 - displaying [2-589](#)
 - MST configuration mode [2-647](#)
 - VLANs-to-instance mapping [2-647](#)
 - path cost [2-649](#)
 - protocol mode [2-645](#)
 - restart protocol migration process [2-56](#)
 - root port
 - loop guard [2-639](#)
 - preventing from becoming designated [2-639](#)

- restricting which can be root [2-639](#)
- root guard [2-639](#)
- root switch
 - affects of extended system ID [2-638](#)
 - hello-time [2-652, 2-660](#)
 - interval between BPDU messages [2-653](#)
 - interval between hello BPDU messages [2-652, 2-660](#)
 - max-age [2-653](#)
 - maximum hop count before discarding BPDU [2-654](#)
 - port priority for selection of [2-656](#)
 - primary or secondary [2-660](#)
 - switch priority [2-659](#)
- state changes
 - blocking to forwarding state [2-666](#)
 - enabling BPDU filtering [2-630, 2-664](#)
 - enabling BPDU guard [2-632, 2-664](#)
 - enabling Port Fast [2-664, 2-666](#)
 - forward-delay time [2-651](#)
 - length of listening and learning states [2-651](#)
 - rapid transition to forwarding [2-641](#)
 - shutting down Port Fast-enabled ports [2-664](#)
- state information display [2-588](#)

MTU

- configuring size [2-724](#)
- displaying global setting [2-596](#)

Multicast Listener Discovery

- See MLD

multicast group address, MVR [2-332](#)

multicast groups, MVR [2-330](#)

Multicast Listener Discovery

- See MLD

multicast router learning method [2-203](#)

multicast router ports, configuring [2-203](#)

multicast router ports, IPv6 [2-233](#)

multicast storm control [2-682](#)

multicast VLAN, MVR [2-329](#)

multicast VLAN registration

- See MVR

Multiple Spanning Tree Protocol

- See MSTP

MVR

- and address aliasing [2-330](#)
- configuring [2-329](#)
- configuring interfaces [2-332](#)
- debug messages, display [B-23](#)
- displaying [2-566](#)
- displaying interface information [2-568](#)
- members, displaying [2-570](#)

mvr (global configuration) command [2-329](#)

mvr (interface configuration) command [2-332](#)

mvr vlan group command [2-333](#)

N

native VLANs [2-716](#)

native VLAN tagging [2-756](#)

Network Admission Control Software Configuration Guide [2-154, 2-156](#)

nonegotiate, speed [2-674](#)

nonegotiating DTP messaging [2-702](#)

non-IP protocols

- denying [2-82](#)
- forwarding [2-347](#)

non-IP traffic access lists [2-258](#)

non-IP traffic forwarding

- denying [2-82](#)
- permitting [2-347](#)

normal-range VLANs [2-739, 2-745](#)

no vlan command [2-739, 2-749](#)

O

online diagnostics

displaying

configured boot-up coverage level [2-434](#)current scheduled tasks [2-434](#)event logs [2-434](#)supported test suites [2-434](#)test ID [2-434](#)test results [2-434](#)test statistics [2-434](#)

global configuration mode

clearing health monitoring diagnostic test schedule [2-42](#)clearing test-based testing schedule [2-87](#)setting health monitoring diagnostic testing [2-42](#)setting test-based testing [2-87](#)setting up health monitoring diagnostic test schedule [2-42](#)setting up test-based testing [2-87](#)health monitoring diagnostic tests, configuring [2-85](#)

scheduled switchover

disabling [2-87](#)enabling [2-87](#)

scheduling

enabling [2-87](#)removing [2-87](#)test interval, setting [2-87](#)permit (MAC access-list configuration) command [2-347](#)

per-VLAN spanning-tree plus

See STP

physical-port learner [2-335](#)PID, displaying [2-474](#)PIM-DVMRP, as multicast router learning method [2-203](#)

PoE

configuring the power budget [2-362](#)configuring the power management mode [2-359](#)displaying controller register values [2-428](#)displaying power management information [2-582](#)logging of status [2-253](#)police aggregate command [2-352](#)police command [2-350](#)policed-DSCP map [2-296](#)policy-map command [2-354](#)

policy maps

applying to an interface [2-389, 2-394](#)creating [2-354](#)displaying [2-577](#)hierarchical [2-355](#)

policers

displaying [2-551](#)for a single class [2-350](#)for multiple classes [2-290, 2-352](#)policed-DSCP map [2-296](#)

traffic classification

defining the class [2-35](#)defining trust states [2-732](#)setting DSCP or IP precedence values [2-392](#)

Port Aggregation Protocol

See EtherChannel

port-based authentication

AAA method list [2-3](#)configuring violation modes [2-126](#)debug messages, display [B-7](#)**P**

PAGP

See EtherChannel

pagp learn-method command [2-335](#)pagp port-priority command [2-337](#)password, VTP [2-764, 2-768](#)password-recovery mechanism, enabling and disabling [2-387](#)permit (ARP access-list configuration) command [2-339](#)permit (IPv6) command [2-341](#)

- enabling IEEE 802.1x
 - globally [2-90](#)
 - per interface [2-116](#)
 - guest VLAN [2-104](#)
 - host modes [2-107](#)
 - IEEE 802.1x AAA accounting methods [2-1](#)
 - initialize an interface [2-109, 2-122](#)
 - MAC authentication bypass [2-110](#)
 - manual control of authorization state [2-116](#)
 - PAE as authenticator [2-115](#)
 - periodic re-authentication
 - enabling [2-120](#)
 - time between attempts [2-123](#)
 - quiet period between failed authentication exchanges [2-123](#)
 - re-authenticating IEEE 802.1x-enabled ports [2-118](#)
 - resetting configurable IEEE 802.1x parameters [2-102](#)
 - switch-to-authentication server retransmission time [2-123](#)
 - switch-to-client frame-retransmission number [2-112 to 2-113](#)
 - switch-to-client retransmission time [2-123](#)
 - test for IEEE 802.1x readiness [2-121](#)
 - port-channel load-balance command [2-357](#)
 - Port Fast, for spanning tree [2-666](#)
 - port ranges, defining [2-72](#)
 - ports, debugging [B-65](#)
 - ports, protected [2-715](#)
 - port security
 - aging [2-709](#)
 - debug messages, display [B-67](#)
 - enabling [2-704](#)
 - violation error recovery [2-135](#)
 - port trust states for QoS [2-322](#)
 - port types, MVR [2-332](#)
 - power information, displaying [2-447](#)
 - power inline command [2-359](#)
 - power inline consumption command [2-362](#)
 - Power over Ethernet
 - See PoE
 - priority-queue command [2-364](#)
 - private-vlan command [2-366](#)
 - private-vlan mapping command [2-369](#)
 - private VLANs
 - association [2-713](#)
 - configuring [2-366](#)
 - configuring ports [2-700](#)
 - displaying [2-602](#)
 - host ports [2-700](#)
 - mapping
 - configuring [2-713](#)
 - displaying [2-462](#)
 - promiscuous ports [2-700](#)
 - privileged EXEC mode [1-2, 1-3](#)
 - product identification information, displaying [2-474](#)
 - promiscuous ports, private VLANs [2-700](#)
 - protected ports, displaying [2-467](#)
 - pruning
 - VLANs [2-716](#)
 - VTP
 - displaying interface information [2-462](#)
 - enabling [2-764, 2-768](#)
 - pruning-eligible VLAN list [2-718](#)
 - PVST+
 - See STP
-
- ## Q
- QoS
 - auto-QoS
 - configuring [2-18](#)
 - debug messages, display [1-5, B-2](#)
 - displaying [2-404](#)
 - class maps
 - creating [2-37](#)
 - defining the match criteria [2-282](#)
 - displaying [2-412](#)
 - defining the CoS value for an incoming packet [2-292](#)
 - displaying configuration information [2-404, 2-550](#)

- DSCP transparency [2-304](#)
- DSCP trusted ports
 - applying DSCP-to-DSCP-mutation map to [2-294](#)
 - defining DSCP-to-DSCP-mutation map [2-296](#)
- egress queues
 - allocating buffers [2-300](#)
 - defining the CoS output queue threshold map [2-318](#)
 - defining the DSCP output queue threshold map [2-320](#)
 - displaying buffer allocations [2-554](#)
 - displaying CoS output queue threshold map [2-558](#)
 - displaying DSCP output queue threshold map [2-558](#)
 - displaying queueing strategy [2-554](#)
 - displaying queue-set settings [2-561](#)
 - enabling bandwidth shaping and scheduling [2-678](#)
 - enabling bandwidth sharing and scheduling [2-680](#)
 - limiting the maximum output on a port [2-676](#)
 - mapping a port to a queue-set [2-371](#)
 - mapping CoS values to a queue and threshold [2-318](#)
 - mapping DSCP values to a queue and threshold [2-320](#)
 - setting maximum and reserved memory allocations [2-302](#)
 - setting WTD thresholds [2-302](#)
- enabling [2-288](#)
- ingress queues
 - allocating buffers [2-308](#)
 - assigning SRR scheduling weights [2-306](#)
 - defining the CoS input queue threshold map [2-310](#)
 - defining the DSCP input queue threshold map [2-312](#)
 - displaying buffer allocations [2-554](#)
 - displaying CoS input queue threshold map [2-558](#)
 - displaying DSCP input queue threshold map [2-558](#)
 - displaying queueing strategy [2-554](#)
 - displaying settings for [2-552](#)
 - enabling the priority queue [2-314](#)
 - mapping CoS values to a queue and threshold [2-310](#)
 - mapping DSCP values to a queue and threshold [2-312](#)
 - setting WTD thresholds [2-316](#)
- maps
 - defining [2-296, 2-310, 2-312, 2-318, 2-320](#)
 - displaying [2-558](#)
- policy maps
 - applying an aggregate policer [2-352](#)
 - applying to an interface [2-389, 2-394](#)
 - creating [2-354](#)
 - defining policers [2-290, 2-350](#)
 - displaying policers [2-551](#)
 - displaying policy maps [2-577](#)
 - hierarchical [2-355](#)
 - policed-DSCP map [2-296](#)
 - setting DSCP or IP precedence values [2-392](#)
 - traffic classifications [2-35](#)
 - trust states [2-732](#)
- port trust states [2-322](#)
- queues, enabling the expedite [2-364](#)
- statistics
 - in-profile and out-of-profile packets [2-554](#)
 - packets enqueued or dropped [2-554](#)
 - sent and received CoS values [2-554](#)
 - sent and received DSCP values [2-554](#)
- trusted boundary for IP phones [2-322](#)
- VLAN-based [2-324](#)
- quality of service
 - See QoS
- querytime, MVR [2-329](#)
- queue-set command [2-371](#)

R

radius-server dead-criteria command [2-372](#)
radius-server host command [2-374](#)
rapid per-VLAN spanning-tree plus
 See STP
rapid PVST+
 See STP
rcommand command [2-376](#)
re-authenticating IEEE 802.1x-enabled ports [2-118](#)
re-authentication
 periodic [2-120](#)
 time between attempts [2-123](#)
receiver ports, MVR [2-332](#)
receiving flow-control packets [2-141](#)
recovery mechanism
 causes [2-135](#)
 display [2-41](#), [2-410](#), [2-449](#), [2-453](#)
 timer interval [2-136](#)
redundancy for cluster switches [2-69](#)
remote-span command [2-378](#)
Remote Switched Port Analyzer
 See RSPAN
rename (boot loader) command [A-16](#)
renew ip dhcp snooping database command [2-380](#)
reset (boot loader) command [A-17](#)
reset command [2-754](#)
resource templates, displaying [2-584](#)
restricted VLAN
 See dot1x auth-fail vlan
rmdir (boot loader) command [A-18](#)
rmon collection stats command [2-383](#)
root guard, for spanning tree [2-639](#)
routed ports
 IP addresses on [2-153](#)
 number supported [2-153](#)

RSPAN

configuring [2-325](#)
displaying [2-564](#)
filter RSPAN traffic [2-325](#)
remote-span command [2-378](#)
sessions
 displaying [2-564](#)

S

scheduled switchover
 disabling [2-87](#)
 enabling [2-87](#)
sdm prefer command [2-384](#)
SDM templates
 allowed resources [2-385](#)
 displaying [2-584](#)
 dual IPv4 and IPv6 [2-384](#)
secure ports, limitations [2-706](#)
sending flow-control packets [2-141](#)
service password-recovery command [2-387](#)
service-policy command [2-389](#)
set (boot loader) command [A-19](#)
set command [2-392](#)
setup command [2-394](#)
setup express command [2-397](#)
show access-lists command [2-399](#)
show archive status command [2-402](#)
show arp access-list command [2-403](#)
show auto qos command [2-404](#)
show boot command [2-408](#)
show cable-diagnostics tdr command [2-410](#)
show changes command [2-754](#)
show class-map command [2-412](#)
show cluster candidates command [2-415](#)
show cluster command [2-413](#)
show cluster members command [2-417](#)
show controllers cpu-interface command [2-419](#)
show controllers ethernet-controller command [2-421](#)

- show controllers power inline command [2-428](#)
- show controllers team command [2-430](#)
- show controller utilization command [2-432](#)
- show current command [2-754](#)
- show dot1q-tunnel command [2-436](#)
- show dot1x command [2-437](#)
- show dtp [2-442](#)
- show eap command [2-444](#)
- show env command [2-447](#)
- show errdisable detect command [2-449](#)
- show errdisable flap-values command [2-451](#)
- show errdisable recovery command [2-453](#)
- show etherchannel command [2-455](#)
- show facility-alarm status [2-458](#)
- show fallback profile command [2-458](#)
- show flowcontrol command [2-460](#)
- show interfaces command [2-462](#)
- show interfaces counters command [2-472](#)
- show inventory command [2-474](#)
- show ip arp inspection command [2-475](#)
- show ipc command [2-500](#)
- show ip dhcp snooping binding command [2-480](#)
- show ip dhcp snooping command [2-479](#)
- show ip dhcp snooping database command [2-482, 2-484](#)
- show ip igmp profile command [2-487](#)
- show ip igmp snooping address command [2-509](#)
- show ip igmp snooping command [2-488, 2-507](#)
- show ip igmp snooping groups command [2-491](#)
- show ip igmp snooping mrouter command [2-493, 2-511](#)
- show ip igmp snooping querier command [2-495, 2-513](#)
- show ip source binding command [2-497](#)
- show ipv6 access-list command [2-504](#)
- show ipv6 dhcp conflict command [2-506](#)
- show ipv6 route updated [2-515](#)
- show ip verify source command [2-498](#)
- show l2protocol-tunnel command [2-517](#)
- show lacp command [2-519](#)
- show link state group command [2-525](#)
- show location [2-523](#)
- show mac access-group command [2-527](#)
- show mac address-table address command [2-531](#)
- show mac address-table aging time command [2-533](#)
- show mac address-table command [2-529](#)
- show mac address-table count command [2-535](#)
- show mac address-table dynamic command [2-537](#)
- show mac address-table interface command [2-539](#)
- show mac address-table learning command [2-541](#)
- show mac address-table move update command [2-542](#)
- show mac address-table notification command [2-51, 2-544, B-21](#)
- show mac address-table static command [2-546](#)
- show mac address-table vlan command [2-548](#)
- show mls qos aggregate-policer command [2-551](#)
- show mls qos command [2-550](#)
- show mls qos input-queue command [2-552](#)
- show mls qos interface command [2-554](#)
- show mls qos maps command [2-558](#)
- show mls qos queue-set command [2-561](#)
- show mls qos vlan command [2-563](#)
- show monitor command [2-564](#)
- show mvr command [2-566](#)
- show mvr interface command [2-568](#)
- show mvr members command [2-570](#)
- show pagp command [2-572](#)
- show parser macro command [2-574](#)
- 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 frontend-controller command [C-8](#)
- show platform igmp snooping command [C-9](#)
- show platform ip multicast command [C-11](#)
- show platform ip unicast command [C-12](#)
- show platform ipv6 unicast command [C-17](#)
- show platform ip wccp command [C-16](#)
- show platform layer4op command [C-19](#)
- show platform mac-address-table command [C-20](#)

- show platform messaging command [C-21](#)
- show platform monitor command [C-22](#)
- show platform mvr table command [C-23](#)
- show platform pm command [C-24](#)
- show platform port-asic command [C-25](#)
- show platform port-security command [C-30](#)
- show platform qos command [C-31](#)
- show platform resource-manager command [C-32](#)
- show platform snmp counters command [C-34](#)
- show platform spanning-tree command [C-35](#)
- show platform stp-instance command [C-36](#)
- show platform team command [C-37](#)
- show platform vlan command [C-40](#)
- show policy-map command [2-577](#)
- show port security command [2-579](#)
- show power inline command [2-582](#)
- show proposed command [2-754](#)
- show sdm prefer command [2-584](#)
- show setup express command [2-587](#)
- show spanning-tree command [2-588](#)
- show storm-control command [2-594](#)
- show system mtu command [2-596](#)
- show trust command [2-732](#)
- show udd command [2-597](#)
- show version command [2-600](#)
- show vlan access-map command [2-607](#)
- show vlan command [2-602](#)
- show vlan command, fields [2-604](#)
- show vlan filter command [2-608](#)
- show vmpls command [2-609](#)
- show vtp command [2-611](#)
- shutdown command [2-615](#)
- shutdown threshold, Layer 2 protocol tunneling [2-237](#)
- shutdown vlan command [2-616](#)
- small violation-rate command [2-617](#)
- Smartports macros
 - See macros
- SNMP host, specifying [2-623](#)
- SNMP informs, enabling the sending of [2-619](#)
- snmp-server enable traps command [2-619](#)
- snmp-server host command [2-623](#)
- snmp trap mac-notification command [2-627](#)
- SNMP traps
 - enabling MAC address notification trap [2-627](#)
 - enabling the MAC address notification feature [2-265](#)
 - enabling the sending of [2-619](#)
- SoftPhone
 - See Cisco SoftPhone
- software images
 - deleting [2-74](#)
 - downloading [2-8](#)
 - upgrading [2-8](#)
 - uploading [2-14](#)
- software version, displaying [2-600](#)
- source ports, MVR [2-332](#)
- SPAN
 - configuring [2-325](#)
 - debug messages, display [B-22](#)
 - displaying [2-564](#)
 - filter SPAN traffic [2-325](#)
 - sessions
 - add interfaces to [2-325](#)
 - displaying [2-564](#)
 - start new [2-325](#)
- spanning-tree backbonefast command [2-629](#)
- spanning-tree bpduguard command [2-630](#)
- spanning-tree bpduguard command [2-632](#)
- spanning-tree cost command [2-634](#)
- spanning-tree etherchannel command [2-636](#)
- spanning-tree extend system-id command [2-638](#)
- spanning-tree guard command [2-639](#)
- spanning-tree link-type command [2-641](#)
- spanning-tree loopguard default command [2-643](#)
- spanning-tree mode command [2-645](#)
- spanning-tree mst configuration command [2-647](#)
- spanning-tree mst cost command [2-649](#)
- spanning-tree mst forward-time command [2-651](#)
- spanning-tree mst hello-time command [2-652](#)

- spanning-tree mst max-age command [2-653](#)
- spanning-tree mst max-hops command [2-654](#)
- spanning-tree mst port-priority command [2-656](#)
- spanning-tree mst pre-standard command [2-658](#)
- spanning-tree mst priority command [2-659](#)
- spanning-tree mst root command [2-660](#)
- spanning-tree portfast (global configuration) command [2-664](#)
- spanning-tree portfast (interface configuration) command [2-666](#)
- spanning-tree port-priority command [2-662](#)
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command [2-668](#)
- spanning-tree uplinkfast command [2-669](#)
- spanning-tree vlan command [2-671](#)
- speed command [2-674](#)
- srr-queue bandwidth limit command [2-676](#)
- srr-queue bandwidth share command [2-680](#)
- SSH, configuring version [2-209](#)
- static-access ports, configuring [2-687](#)
- statistics, Ethernet group [2-383](#)
- sticky learning, enabling [2-704](#)
- storm-control command [2-682](#)
- STP
 - BackboneFast [2-629](#)
 - counters, clearing [2-55](#)
 - debug messages, display
 - BackboneFast events [B-71](#)
 - MSTP [B-74](#)
 - optimized BPDUs handling [B-73](#)
 - spanning-tree activity [B-69](#)
 - switch shim [B-76](#)
 - transmitted and received BPDUs [B-72](#)
 - UplinkFast [B-78](#)
 - detection of indirect link failures [2-629](#)
 - enabling protocol tunneling for [2-237](#)
 - EtherChannel misconfiguration [2-636](#)
 - extended system ID [2-638](#)
 - path cost [2-634](#)
 - protocol modes [2-645](#)
 - root port
 - accelerating choice of new [2-669](#)
 - loop guard [2-639](#)
 - preventing from becoming designated [2-639](#)
 - restricting which can be root [2-639](#)
 - root guard [2-639](#)
 - UplinkFast [2-669](#)
 - root switch
 - affects of extended system ID [2-638, 2-672](#)
 - hello-time [2-671](#)
 - interval between BPDU messages [2-671](#)
 - interval between hello BPDU messages [2-671](#)
 - max-age [2-671](#)
 - port priority for selection of [2-662](#)
 - primary or secondary [2-671](#)
 - switch priority [2-671](#)
 - state changes
 - blocking to forwarding state [2-666](#)
 - enabling BPDU filtering [2-630, 2-664](#)
 - enabling BPDU guard [2-632, 2-664](#)
 - enabling Port Fast [2-664, 2-666](#)
 - enabling timer to recover from error state [2-135](#)
 - forward-delay time [2-671](#)
 - length of listening and learning states [2-671](#)
 - shutting down Port Fast-enabled ports [2-664](#)
 - state information display [2-588](#)
 - VLAN options [2-659, 2-671](#)
- SVIs, creating [2-147](#)
- SVI status calculation [2-689](#)
- Switched Port Analyzer
 - See SPAN
- switching characteristics
 - modifying [2-685](#)
 - returning to interfaces [2-685](#)
- switchport access command [2-687](#)
- switchport autostate exclude command [2-689](#)
- switchport backup interface command [2-691](#)

switchport block command [2-695](#)
 switchport command [2-685](#)
 switchport host command [2-696](#)
 switchport mode command [2-697](#)
 switchport mode private-vlan command [2-700](#)
 switchport nonegotiate command [2-702](#)
 switchport port-security aging command [2-709](#)
 switchport port-security command [2-704](#)
 switchport priority extend command [2-711](#)
 switchport private-vlan command [2-713](#)
 switchport protected command [2-715](#)
 switchports, displaying [2-462](#)
 switchport trunk command [2-716](#)
 switchport voice vlan command [2-719, 2-720](#)
 system env temperature threshold yellow command [2-722](#)
 system message logging [2-253](#)
 system message logging, save message to flash [2-254](#)
 system mtu command [2-724](#)
 system resource templates [2-384](#)

T

tar files, creating, listing, and extracting [2-11](#)
 TDR, running [2-726](#)
 Telnet, using to communicate to cluster switches [2-376](#)
 temperature information, displaying [2-447](#)
 templates, system resources [2-384](#)
 test cable-diagnostics tdr command [2-726](#)
 test relay [2-727](#)
 traceroute mac command [2-727](#)
 traceroute mac ip command [2-730](#)
 trunking, VLAN mode [2-697](#)
 trunk mode [2-697](#)
 trunk ports [2-697](#)
 trunks, to non-DTP device [2-698](#)
 trusted boundary for QoS [2-322](#)
 trusted port states for QoS [2-322](#)
 tunnel ports, Layer 2 protocol, displaying [2-517](#)
 type (boot loader) command [A-22](#)

U

UDLD
 aggressive mode [2-734, 2-736](#)
 debug messages, display [B-86](#)
 enable globally [2-734](#)
 enable per interface [2-736](#)
 error recovery timer [2-135](#)
 message timer [2-734](#)
 normal mode [2-734, 2-736](#)
 reset a shutdown interface [2-738](#)
 status [2-597](#)
 uddl command [2-734](#)
 uddl port command [2-736](#)
 uddl reset command [2-738](#)
 unicast storm control [2-682](#)
 UniDirectional Link Detection
 See UDLD
 unknown multicast traffic, preventing [2-695](#)
 unknown unicast traffic, preventing [2-695](#)
 unset (boot loader) command [A-23](#)
 upgrading
 software images
 downloading [2-8](#)
 monitoring status of [2-402](#)
 UplinkFast, for STP [2-669](#)
 user EXEC mode [1-2, 1-3](#)

V

version (boot loader) command [A-25](#)
 vlan (global configuration) command [2-739](#)
 vlan (VLAN configuration) command [2-745](#)
 vlan access-map command [2-751](#)
 VLAN access map configuration mode [2-751](#)
 VLAN access maps
 actions [2-6](#)
 displaying [2-607](#)
 VLAN-based QoS [2-324](#)

VLAN configuration

- rules [2-742, 2-747](#)
- saving [2-739, 2-749](#)

VLAN configuration mode

- commands
 - VLAN [2-745](#)
 - VTP [2-768](#)
- description [1-5](#)
- entering [2-753](#)
- summary [1-2](#)

vlan database command [2-753](#)

vlan dot1q tag native command [2-756](#)

vlan filter command [2-757](#)

VLAN filters, displaying [2-608](#)

VLAN ID range [2-739, 2-745](#)

VLAN maps

- applying [2-757](#)
- creating [2-751](#)
- defining [2-280](#)
- displaying [2-607](#)

VLAN Query Protocol

See VQP

VLANs

- adding [2-739](#)
- configuring [2-739, 2-745](#)
- debug messages, display
 - ISL [B-82](#)
 - VLAN IOS file system error tests [B-81](#)
 - VLAN manager activity [B-79](#)
 - VTP [B-84](#)
- displaying configurations [2-602](#)
- enabling guest VLAN supplicant [2-92, 2-103, 2-140](#)
- extended-range [2-739](#)
- MAC addresses
 - displaying [2-548](#)
 - number of [2-535](#)
- media types [2-742, 2-747](#)
- normal-range [2-739, 2-745](#)

private [2-700](#)

- configuring [2-366](#)

- displaying [2-602](#)

See also private VLANs

- restarting [2-616](#)

- saving the configuration [2-739](#)

- shutting down [2-616](#)

- SNMP traps for VTP [2-621, 2-624](#)

- suspending [2-616](#)

- variables [2-745](#)

VLAN Trunking Protocol

See VTP

VMPS

- configuring servers [2-762](#)

- displaying [2-609](#)

- error recovery timer [2-136](#)

- reconfirming dynamic VLAN assignments [2-759](#)

vmpls reconfirm (global configuration) command [2-760](#)

vmpls reconfirm (privileged EXEC) command [2-759](#)

vmpls retry command [2-761](#)

vmpls server command [2-762](#)

voice VLAN

- configuring [2-719, 2-720](#)

- setting port priority [2-711](#)

VQP

- and dynamic-access ports [2-688](#)

- clearing client statistics [2-57](#)

- displaying information [2-609](#)

- per-server retry count [2-761](#)

- reconfirmation interval [2-760](#)

- reconfirming dynamic VLAN assignments [2-759](#)

VTP

- changing characteristics [2-764](#)

- clearing pruning counters [2-58](#)

- configuring

- domain name [2-764, 2-768](#)

- file name [2-764](#)

- mode [2-764, 2-768](#)

- password [2-764, 2-768](#)

- counters display fields [2-612](#)
- displaying information [2-611](#)
- enabling
 - pruning [2-764, 2-768](#)
 - tunneling for [2-237](#)
 - Version 2 [2-764, 2-768](#)
- mode [2-764, 2-768](#)
- pruning [2-764, 2-768](#)
- saving the configuration [2-739, 2-749](#)
- statistics [2-611](#)
- status [2-611](#)
- status display fields [2-613](#)
- vtp (global configuration) command [2-764](#)
- vtp (VLAN configuration) command [2-768](#)

