



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 [2-706](#)
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP [2-132](#)
 MAC, displaying [2-480](#)
access list, IPv6 [2-192](#)
access map configuration mode [2-246](#)
access mode [2-649](#)
access ports [2-649](#)
ACEs [2-83, 2-314](#)
ACLs
 deny [2-81](#)
 displaying [2-364](#)
 for non-IP protocols [2-226](#)
 IP [2-132](#)
 matching [2-246](#)
 on Layer 2 interfaces [2-132](#)
 permit [2-312](#)
action command [2-6](#)
address aliasing [2-295](#)
aggregate-port learner [2-300](#)
allowed VLANs [2-669](#)
apply command [2-706](#)
archive download-sw command [2-8](#)

archive tar command [2-11](#)
archive upload-sw command [2-14](#)
arp access-list command [2-16](#)
audience [xv](#)
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 [2-108](#)
autonegotiation of duplex mode [2-117](#)
auto qos voip command [2-18](#)

B

BackboneFast, for STP [2-583](#)
backup interfaces
 configuring [2-644](#)
 displaying [2-423](#)
boot (boot loader) command [A-2](#)
boot bootlpr command [2-23](#)
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 [2-374](#)
 interrupting [2-25](#)
 manually [2-28](#)

boot loader

- accessing [A-1](#)

- booting

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

- helper image [2-26](#)

- directories

- creating [A-15](#)

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

- removing [A-19](#)

- displaying

- available commands [A-12](#)

- memory heap utilization [A-14](#)

- version [A-26](#)

- environment variables

- described [A-20](#)

- displaying settings [A-20](#)

- location of [A-21](#)

- setting [A-20](#)

- unsetting [A-24](#)

- files

- copying [A-5](#)

- deleting [A-6](#)

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

- displaying the contents of [A-4, A-16, A-23](#)

- renaming [A-17](#)

- file system

- formatting [A-10](#)

- initializing flash [A-9](#)

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

- loading helper images [A-13](#)

- prompt [A-1](#)

- resetting the system [A-18](#)

boot manual command [2-28](#)boot private-config-file command [2-29](#)boot system command [2-30](#)BPDU filtering, for spanning tree [2-584, 2-619](#)BPDU guard, for spanning tree [2-586, 2-619](#)broadcast storm control [2-637](#)**C**

candidate switches

- See clusters

cat (boot loader) command [A-4](#)caution, description [xvi](#)CDP, enabling protocol tunneling for [2-210](#)channel-group command [2-31](#)channel-protocol command [2-34](#)

Cisco Network Assistant

- See Network Assistant [xvi](#)

Cisco SoftPhone

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

- trusting packets sent from [2-286](#)

class command [2-35](#)class-map command [2-37](#)

class maps

- creating [2-37](#)

- defining the match criteria [2-248](#)

- displaying [2-378](#)

class of service

- See CoS

clear dot1x command [2-39](#)clear eap command [2-40](#)clear ip arp inspection log command [2-41](#)clear ip arp inspection statistics command [2-42](#)clear ipc command [2-44](#)clear ip dhcp snooping database command [2-43](#)clear l2protocol-tunnel counters command [2-45](#)clear lacp command [2-46](#)clear mac address-table command [2-47, 2-49](#)clear pagp command [2-50](#)clear port-security command [2-51](#)clear spanning-tree counters command [2-53](#)clear spanning-tree detected-protocols command [2-54](#)clear vmps statistics command [2-55](#)clear vtp counters command [2-56](#)cluster commander-address command [2-57](#)cluster discovery hop-count command [2-59](#)

- cluster enable command [2-60](#)
 - cluster holdtime command [2-62](#)
 - cluster member command [2-63](#)
 - cluster outside-interface command [2-65](#)
 - cluster requirements [xvii](#)
 - cluster run command [2-66](#)
 - clusters
 - adding candidates [2-63](#)
 - binding to HSRP group [2-68](#)
 - building manually [2-63](#)
 - communicating with
 - devices outside the cluster [2-65](#)
 - members by using Telnet [2-341](#)
 - debug messages, display [B-5](#)
 - displaying
 - candidate switches [2-381](#)
 - debug messages [B-5](#)
 - member switches [2-383](#)
 - status [2-379](#)
 - hop-count limit for extended discovery [2-59](#)
 - HSRP standby groups [2-68](#)
 - redundancy [2-68](#)
 - SNMP trap [2-573](#)
 - cluster standby-group command [2-68](#)
 - cluster timer command [2-70](#)
 - command modes defined [1-1](#)
 - commands changed in Cisco IOS Release 12.2(20)SE [1-5](#)
 - 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 [2-24, 2-29](#)
 - configuring multiple interfaces [2-128](#)
 - config-vlan mode
 - commands [2-692](#)
 - description [1-4](#)
 - entering [2-691](#)
 - summary [1-2](#)
 - conventions
 - command [xvi](#)
 - for examples [xvi](#)
 - publication [xvi](#)
 - text [xvi](#)
 - copy (boot loader) command [A-5](#)
 - CoS
 - assigning default value to incoming packets [2-256](#)
 - assigning to Layer 2 protocol packets [2-213](#)
 - overriding the incoming value [2-256](#)
 - CoS-to-DSCP map [2-260](#)
 - CPU ASIC statistics, displaying [2-385](#)
 - crashinfo files [2-123](#)
-
- ## 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-9](#)
 - debug eap command [B-10](#)
 - debug etherchannel command [B-12](#)
 - debug ilpower command [B-14](#)
 - debug interface command [B-17](#)
 - debug ip dhcp snooping command [B-15](#)
 - debug ip igmp filter command [B-19](#)
 - debug ip igmp max-groups command [B-20](#)
 - debug ip igmp snooping command [B-21](#)
 - debug ip verify source packet command [B-16](#)
 - debug lacp command [B-22](#)
 - debug mac-notification command [B-23](#)
 - debug matm command [B-24](#)
 - debug matm move update command [B-25](#)

- debug monitor command [B-26](#)
- debug mvrdbg command [B-28](#)
- debug nvram command [B-29](#)
- debug pagp command [B-30](#)
- debug platform acl command [B-31](#)
- debug platform backup interface command [B-32](#)
- debug platform configuration command [B-40](#)
- debug platform cpu-queues command [B-33](#)
- debug platform device-manager command [B-35](#)
- debug platform dot1x command [B-36](#)
- debug platform etherchannel command [B-37](#)
- debug platform fallback-bridging command [B-38](#)
- debug platform forw-tcam command [B-39](#)
- debug platform ip arp inspection command [B-42](#)
- debug platform ip dhcp command [B-43](#)
- debug platform ip igmp snooping command [B-44](#)
- debug platform ip multicast command [B-46](#)
- debug platform ip unicast command [B-48](#)
- debug platform led command [B-50](#)
- debug platform matm command [B-51](#)
- debug platform messaging application command [B-53](#)
- debug platform phy command [B-54](#)
- debug platform pm command [B-56](#)
- debug platform port-asic command [B-58](#)
- debug platform port-security command [B-59](#)
- debug platform qos-acl-tcam command [B-60](#)
- debug platform remote-commands command [B-61](#)
- debug platform resource-manager command [B-62](#)
- debug platform snmp command [B-63](#)
- debug platform span command [B-64](#)
- debug platform supervisor-asic command [B-65](#)
- debug platform sw-bridge command [B-66](#)
- debug platform tcam command [B-67](#)
- debug platform 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-90](#)
- debug sw-vlan vtp command [B-92](#)
- debug udd command [B-94](#)
- debug vqpc command [B-96](#)
- define interface-range command [2-71](#)
- delete (boot loader) command [A-6](#)
- delete command [2-73](#)
- deny (ARP access-list configuration) command [2-74](#)
- deny (IPv6) command [2-76](#)
- deny command [2-81](#)
- detect mechanism, causes [2-118](#)
- device manager requirements [xvi](#)
- DHCP snooping
 - accepting untrusted packets from edge switch [2-157](#)
 - enabling
 - on a VLAN [2-163](#)
 - option 82 [2-155, 2-157](#)
 - trust on an interface [2-161](#)
 - error recovery timer [2-120](#)
 - rate limiting [2-160](#)
- DHCP snooping binding database
 - binding file, configuring [2-153](#)
 - bindings
 - adding [2-151](#)
 - deleting [2-151](#)
 - displaying [2-439](#)
 - clearing database agent statistics [2-43](#)
 - database agent, configuring [2-153](#)

- DHCP snooping binding database (continued)
 - displaying
 - binding entries [2-439](#)
 - database agent status [2-441](#)
 - renewing [2-345](#)
- dir (boot loader) command [A-7](#)
- directories, deleting [2-73](#)
- documentation, related [xvi](#)
- document conventions [xvi](#)
- domain name, VTP [2-717, 2-721](#)
- dot1x auth-fail max-attempts [2-86](#)
- dot1x auth-fail vlan [2-88](#)
- dot1x command [2-84](#)
- dot1x control-direction command [2-90](#)
- dot1x critical global configuration command [2-92](#)
- dot1x critical interface configuration command [2-94](#)
- dot1x default command [2-96](#)
- dot1x guest-vlan command [2-97](#)
- dot1x host-mode command [2-100](#)
- dot1x initialize command [2-101](#)
- dot1x mac-auth-bypass command [2-102](#)
- dot1x max-reauth-req command [2-104](#)
- dot1x max-req command [2-105](#)
- dot1x multiple-hosts command [2-106](#)
- dot1x pae command [2-107](#)
- dot1x port-control command [2-108](#)
- dot1x re-authenticate command [2-110](#)
- dot1x re-authentication command [2-111](#)
- dot1x reauthentication command [2-112](#)
- dot1x timeout command [2-113](#)
- dropping packets, with ACL matches [2-6](#)
- drop threshold, Layer 2 protocol tunneling [2-210](#)
- DSCP-to-CoS map [2-260](#)
- DSCP-to-DSCP-mutation map [2-260](#)
- DTP [2-650](#)
- DTP flap
 - error detection for [2-118](#)
 - error recovery timer [2-120](#)
- DTP negotiation [2-654](#)
- dual IPv4 and IPv6 templates [2-306](#)
- duplex command [2-116](#)
- dynamic-access ports
 - configuring [2-642](#)
 - restrictions [2-643](#)
- dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN [2-137](#)
 - define [2-16](#)
 - deny packets [2-74](#)
 - display [2-369](#)
 - permit packets [2-304](#)
 - clear
 - log buffer [2-41](#)
 - statistics [2-42](#)
 - display
 - ARP ACLs [2-369](#)
 - configuration and operating state [2-435](#)
 - log buffer [2-435](#)
 - statistics [2-435](#)
 - trust state and rate limit [2-435](#)
 - enable per VLAN [2-147](#)
 - error detection for [2-118](#)
 - error recovery timer [2-120](#)
 - log buffer
 - clear [2-41](#)
 - configure [2-141](#)
 - display [2-435](#)
 - rate-limit incoming ARP packets [2-139](#)
 - statistics
 - clear [2-42](#)
 - display [2-435](#)
 - trusted interface state [2-143](#)
 - type of packet logged [2-148](#)
 - validation checks [2-145](#)
- dynamic auto VLAN membership mode [2-649](#)
- dynamic desirable VLAN membership mode [2-649](#)
- Dynamic Host Configuration Protocol (DHCP)
 - See DHCP snooping

Dynamic Trunking Protocol

See DTP

E

EAP-request/identity frame

maximum number to send [2-105](#)

response time before retransmitting [2-113](#)

encapsulation methods [2-669](#)

environment variables, displaying [2-374](#)

errdisable detect cause command [2-118](#)

errdisable recovery command [2-120](#)

error conditions, displaying [2-414](#)

error disable detection [2-118](#)

error-disabled interfaces, displaying [2-423](#)

EtherChannel

assigning Ethernet interface to channel group [2-31](#)

creating port-channel logical interface [2-126](#)

debug EtherChannel/PAgP, display [B-12](#)

debug platform-specific events, display [B-37](#)

displaying [2-418](#)

enabling Layer 2 protocol tunneling for

LACP [2-211](#)

PAgP [2-211](#)

UDLD [2-211](#)

interface information, displaying [2-423](#)

LACP

clearing channel-group information [2-46](#)

debug messages, display [B-22](#)

displaying [2-474](#)

modes [2-31](#)

port priority for hot-standby ports [2-214](#)

restricting a protocol [2-34](#)

system priority [2-216](#)

load-distribution methods [2-322](#)

EtherChannel (continued)

PAgP

aggregate-port learner [2-300](#)

clearing channel-group information [2-50](#)

debug messages, display [B-30](#)

displaying [2-525](#)

error detection for [2-118](#)

error recovery timer [2-120](#)

learn method [2-300](#)

modes [2-31](#)

physical-port learner [2-300](#)

priority of interface for transmitted traffic [2-302](#)

Ethernet controller, internal register display [2-387](#)

Ethernet statistics, collecting [2-347](#)

examples, conventions for [xvi](#)

exception crashinfo command [2-123](#)

exit command [2-706](#)

extended discovery of candidate switches [2-59](#)

extended-range VLANs

and allowed VLAN list [2-669](#)

and pruning-eligible list [2-669](#)

configuring [2-691](#)

extended system ID for STP [2-592](#)

F

fan information, displaying [2-410](#)

file name, VTP [2-717](#)

files, deleting [2-73](#)

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

Flex Links

configuring [2-644](#)

displaying [2-423](#)

flowcontrol command [2-124](#)

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 [2-364](#)
 help (boot loader) command [A-12](#)
 hierarchical policy maps [2-320](#)
 hop-count limit for clusters [2-59](#)
 host connection, port configuration [2-648](#)
 host ports, private VLANs [2-652](#)
 Hot Standby Router Protocol
 See HSRP
 HSRP
 binding HSRP group to cluster [2-68](#)
 standby group [2-68](#)

I

IEEE 802.1Q trunk ports and native VLANs [2-708](#)
 IEEE 802.1Q tunnel ports
 configuring [2-649](#)
 displaying [2-400](#)
 limitations [2-650](#)
 IEEE 802.1x
 and switchport modes [2-650](#)
 violation error recovery [2-120](#)
 See also port-based authentication
 IEEE 802.1X Port Based Authentication
 enabling guest VLAN supplicant [2-87](#)
 IGMP filters
 applying [2-166](#)
 debug messages, display [B-19](#)

IGMP groups, setting maximum [2-167](#)
 IGMP maximum groups, debugging [B-20](#)
 IGMP profiles
 creating [2-169](#)
 displaying [2-443](#)
 IGMP snooping
 adding ports as a static member of a group [2-185](#)
 displaying [2-444, 2-449, 2-451](#)
 enabling [2-171](#)
 enabling the configurable-leave timer [2-173](#)
 enabling the Immediate-Leave feature [2-182](#)
 flooding query count [2-179](#)
 interface topology change notification behavior [2-181](#)
 multicast table [1-5, 2-447](#)
 querier [2-175](#)
 query solicitation [2-179](#)
 report suppression [2-177](#)
 switch topology change notification behavior [2-179](#)
 images
 See software images
 Immediate-Leave feature, MVR [2-297](#)
 Immediate-Leave processing
 IPv6 [2-206](#)
 immediate-leave processing [2-182](#)
 initial configuration
 See getting started guide and hardware installation guide
 interface configuration mode [1-2, 1-4](#)
 interface port-channel command [2-126](#)
 interface range command [2-128](#)
 interface-range macros [2-71](#)
 interfaces
 assigning Ethernet interface to channel group [2-31](#)
 configuring [2-116](#)
 configuring multiple [2-128](#)
 creating port-channel logical [2-126](#)
 debug messages, display [B-17](#)
 disabling [2-571](#)
 displaying the MAC address table [2-492](#)
 restarting [2-571](#)

- interface speed, configuring [2-629](#)
- interface vlan command [2-130](#)
- internal registers, displaying [2-387, 2-396](#)
- Internet Group Management Protocol
 - See IGMP
- invalid GBIC
 - error detection for [2-118](#)
 - error recovery timer [2-120](#)
- ip access-group command [2-132](#)
- ip address command [2-135](#)
- IP addresses, setting [2-135](#)
- IP address matching [2-246](#)
- ip arp inspection filter vlan command [2-137](#)
- ip arp inspection limit command [2-139](#)
- ip arp inspection log-buffer command [2-141](#)
- ip arp inspection trust command [2-143](#)
- ip arp inspection validate command [2-145](#)
- ip arp inspection vlan command [2-147](#)
- ip arp inspection vlan logging command [2-148](#)
- IP DHCP snooping
 - See DHCP snooping
- ip dhcp snooping binding command [2-151](#)
- ip dhcp snooping command [2-150](#)
- ip dhcp snooping database command [2-153](#)
- ip dhcp snooping information option allow-untrusted command [2-157](#)
- ip dhcp snooping information option command [2-155](#)
- ip dhcp snooping information option format remote-id command [2-159](#)
- ip dhcp snooping limit rate command [2-160](#)
- ip dhcp snooping trust command [2-161](#)
- ip dhcp snooping verify command [2-162](#)
- ip dhcp snooping vlan command [2-163](#)
- ip dhcp snooping vlan information option format-type circuit-id string command [2-164](#)
- ip igmp filter command [2-166](#)
- ip igmp max-groups command [2-167](#)
- ip igmp profile command [2-169](#)
- ip igmp snooping command [2-171](#)
- ip igmp snooping last-member-query-interval command [2-173](#)
- ip igmp snooping querier command [2-175](#)
- ip igmp snooping report-suppression command [2-177](#)
- ip igmp snooping tcn command [2-179](#)
- ip igmp snooping tcn flood command [2-181](#)
- ip igmp snooping vlan immediate-leave command [2-182](#)
- ip igmp snooping vlan mrouter command [2-183](#)
- ip igmp snooping vlan static command [2-185](#)
- IP multicast addresses [2-294](#)
- IP phones
 - auto-QoS configuration [2-18](#)
 - trusting packets sent from [2-286](#)
- IP-precedence-to-DSCP map [2-260](#)
- ip source binding command [2-187](#)
- IP source guard
 - disabling [2-191](#)
 - displaying
 - binding entries [2-453](#)
 - configuration [2-455](#)
 - dynamic binding entries only [2-439](#)
 - enabling [2-191](#)
 - static IP source bindings [2-187](#)
- ip ssh command [2-189](#)
- IPv6 access list
 - deny conditions [2-76](#)
- ipv6 access-list command [2-192](#)
- ipv6 mld snooping command [2-194](#)
- ipv6 mld snooping last-listener-query count command [2-196](#)
- ipv6 mld snooping last-listener-query-interval command [2-198](#)
- ipv6 mld snooping listener-message-suppression command [2-200](#)
- ipv6 mld snooping robustness-variable command [2-202](#)
- ipv6 mld snooping tcn command [2-204](#)
- ipv6 mld snooping vlan command [2-206](#)
- IPv6 SDM template [2-348](#)
- ipv6 traffic-filter command [2-208](#)
- ip verify source command [2-191](#)

J

jumbo frames

See MTU

L

l2protocol-tunnel command [2-210](#)

l2protocol-tunnel cos command [2-213](#)

LACP

See EtherChannel

lacp port-priority command [2-214](#)

lacp system-priority command [2-216](#)

Layer 2 mode, enabling [2-640](#)

Layer 2 protocol ports, displaying [2-471](#)

Layer 2 protocol-tunnel

error detection for [2-118](#)

error recovery timer [2-120](#)

Layer 2 protocol tunnel counters [2-45](#)

Layer 2 protocol tunneling error recovery [2-211](#)

Layer 2 traceroute

IP addresses [2-682](#)

MAC addresses [2-679](#)

Layer 3 mode, enabling [2-640](#)

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

Link Aggregation Control Protocol

See EtherChannel

link flap

error detection for [2-118](#)

error recovery timer [2-120](#)

link state group command [2-218](#)

link state track command [2-220](#)

load_helper (boot loader) command [A-13](#)

load-distribution methods for EtherChannel [2-322](#)

logging event power-inline-status command [2-221](#)

logging file command [2-222](#)

logical interface [2-126](#)

loopback error

detection for [2-118](#)

recovery timer [2-120](#)

loop guard, for spanning tree [2-594, 2-598](#)

M

mac access-group command [2-224](#)

MAC access-groups, displaying [2-480](#)

MAC access list configuration mode [2-226](#)

mac access-list extended command [2-226](#)

MAC access lists [2-81](#)

MAC addresses

displaying

aging time [2-486](#)

all [2-484](#)

dynamic [2-490](#)

MAC address-table move updates [2-494](#)

notification settings [2-496](#)

number of addresses in a VLAN [2-488](#)

per interface [2-492](#)

per VLAN [2-500](#)

static [2-498](#)

static and dynamic entries [2-482](#)

dynamic

aging time [2-228](#)

deleting [2-47](#)

displaying [2-490](#)

enabling MAC address notification [2-231](#)

enabling MAC address-table move update [2-229](#)

matching [2-246](#)

static

adding and removing [2-233](#)

displaying [2-498](#)

dropping on an interface [2-234](#)

tables [2-484](#)

MAC address notification, debugging [B-23](#)

mac address-table aging-time [2-224, 2-246](#)

mac address-table aging-time command [2-228](#)

- mac address-table move update command [2-229](#)
- mac address-table notification command [2-231](#)
- mac address-table static command [2-233](#)
- mac address-table static drop command [2-234](#)
- macro apply command [2-236](#)
- macro description command [2-239](#)
- macro global command [2-240](#)
- macro global description command [2-243](#)
- macro name command [2-244](#)
- macros
 - adding a description [2-239](#)
 - adding a global description [2-243](#)
 - applying [2-240](#)
 - creating [2-244](#)
 - displaying [2-527](#)
 - interface range [2-71, 2-128](#)
 - specifying parameter values [2-240](#)
 - tracing [2-240](#)
- manual
 - audience [xv](#)
 - purpose of [xv](#)
- maps
 - QoS
 - defining [2-260](#)
 - displaying [2-510](#)
 - VLAN
 - creating [2-703](#)
 - defining [2-246](#)
 - displaying [2-560](#)
- match (access-map configuration) command [2-246](#)
- match (class-map configuration) command [2-248](#)
- maximum transmission unit
 - See MTU
- mdix auto command [2-250](#)
- MDL snooping
 - displaying [2-465](#)
- member switches
 - See clusters
- memory (boot loader) command [A-14](#)
- mkdir (boot loader) command [A-15](#)
- MLD snooping
 - configuring [2-200, 2-202](#)
 - configuring queries [2-196, 2-198](#)
 - configuring topology change notification [2-204](#)
 - displaying [2-463, 2-467, 2-469](#)
 - enabling [2-194](#)
- MLD snooping on a VLAN
 - enabling [2-206](#)
- mls qos aggregate-policer command [2-254](#)
- mls qos command [2-252](#)
- mls qos cos command [2-256](#)
- mls qos dscp-mutation command [2-258](#)
- mls qos map command [2-260](#)
- mls qos queue-set output buffers command [2-264](#)
- mls qos queue-set output threshold command [2-266](#)
- mls qos rewrite ip dscp command [2-268](#)
- mls qos srr-queue input bandwidth command [2-270](#)
- mls qos srr-queue input buffers command [2-272](#)
- mls qos-srr-queue input cos-map command [2-274](#)
- mls qos srr-queue input dscp-map command [2-276](#)
- mls qos srr-queue input priority-queue command [2-278](#)
- mls qos srr-queue input threshold command [2-280](#)
- mls qos-srr-queue output cos-map command [2-282](#)
- mls qos srr-queue output dscp-map command [2-284](#)
- mls qos trust command [2-286](#)
- mls qos vlan-based command [2-288](#)
- mode, MVR [2-294](#)
- Mode button, and password recovery [2-352](#)
- modes, commands [1-1](#)
- monitor session command [2-289](#)
- more (boot loader) command [A-16](#)
- MSTP
 - displaying [2-542](#)
 - interoperability [2-54](#)
 - link type [2-596](#)

MSTP (continued)

MST region

- aborting changes [2-602](#)
- applying changes [2-602](#)
- configuration name [2-602](#)
- configuration revision number [2-602](#)
- current or pending display [2-602](#)
- displaying [2-542](#)
- MST configuration mode [2-602](#)
- VLANs-to-instance mapping [2-602](#)

path cost [2-604](#)protocol mode [2-600](#)restart protocol migration process [2-54](#)

root port

- loop guard [2-594](#)
- preventing from becoming designated [2-594](#)
- restricting which can be root [2-594](#)
- root guard [2-594](#)

root switch

- affects of extended system ID [2-592](#)
- hello-time [2-607, 2-615](#)
- interval between BPDU messages [2-608](#)
- interval between hello BPDU messages [2-607, 2-615](#)
- max-age [2-608](#)
- maximum hop count before discarding BPDU [2-609](#)
- port priority for selection of [2-611](#)
- primary or secondary [2-615](#)
- switch priority [2-614](#)

state changes

- blocking to forwarding state [2-621](#)
- enabling BPDU filtering [2-584, 2-619](#)
- enabling BPDU guard [2-586, 2-619](#)
- enabling Port Fast [2-619, 2-621](#)
- forward-delay time [2-606](#)
- length of listening and learning states [2-606](#)
- rapid transition to forwarding [2-596](#)
- shutting down Port Fast-enabled ports [2-619](#)

state information display [2-541](#)

MTU

- configuring size [2-676](#)
- displaying global setting [2-549](#)

Multicast Listener Discovery

See MLD

multicast group address, MVR [2-297](#)multicast groups, MVR [2-295](#)

Multicast Listener Discovery

See MLD

multicast router learning method [2-183](#)

multicast router ports

IPv6 [2-206](#)multicast router ports, configuring [2-183](#)multicast storm control [2-637](#)multicast VLAN, MVR [2-294](#)

multicast VLAN registration

See MVR

multiple hosts on authorized port [2-100](#)

Multiple Spanning Tree Protocol

See MSTP

MVR

- and address aliasing [2-295](#)
- configuring [2-294](#)
- configuring interfaces [2-297](#)
- debug messages, display [B-28](#)
- displaying [2-519](#)
- displaying interface information [2-521](#)
- members, displaying [2-523](#)

mvr (global configuration) command [2-294](#)mvr (interface configuration) command [2-297](#)mvr vlan group command [2-298](#)

Nnative VLANs [2-669](#)native VLAN tagging [2-708](#)Network Assistant requirements [xvi](#)

nonegotiate
 DTP messaging [2-654](#)
 nonegotiate, speed [2-629](#)
 non-IP protocols
 denying [2-81](#)
 forwarding [2-312](#)
 non-IP traffic access lists [2-226](#)
 non-IP traffic forwarding
 denying [2-81](#)
 permitting [2-312](#)
 normal-range VLANs [2-691, 2-697](#)
 note, description [xvi](#)
 no vlan command [2-691, 2-701](#)

P

PAgP

See EtherChannel

pagp learn-method command [2-300](#)
 pagp port-priority command [2-302](#)
 password, VTP [2-717, 2-721](#)
 password-recovery mechanism, enabling and
 disabling [2-352](#)
 permit (ARP access-list configuration) command [2-304](#)
 permit (IPv6) command [2-306](#)
 permit (MAC access-list configuration) command [2-312](#)
 per-VLAN spanning-tree plus
 See STP
 physical-port learner [2-300](#)
 PID, displaying [2-434](#)
 PIM-DVMRP, as multicast router learning method [2-183](#)
 PoE
 configuring the power budget [2-327](#)
 configuring the power management mode [2-324](#)
 displaying controller register values [2-394](#)
 displaying power management information [2-535](#)
 logging of status [2-221](#)
 police aggregate command [2-317](#)
 police command [2-315](#)

policed-DSCP map [2-260](#)
 policy-map command [2-319](#)
 policy maps
 applying to an interface [2-354, 2-359](#)
 creating [2-319](#)
 displaying [2-530](#)
 hierarchical [2-320](#)
 policers
 displaying [2-503](#)
 for a single class [2-315](#)
 for multiple classes [2-254, 2-317](#)
 policed-DSCP map [2-260](#)
 traffic classification
 defining the class [2-35](#)
 defining trust states [2-684](#)
 setting DSCP or IP precedence values [2-357](#)

Port Aggregation Protocol

See EtherChannel

port-based authentication

AAA method list [2-3](#)
 debug messages, display [B-7](#)
 enabling IEEE 802.1x
 globally [2-84](#)
 per interface [2-108](#)
 guest VLAN [2-97](#)
 host modes [2-100](#)
 IEEE 802.1x AAA accounting methods [2-1](#)
 initialize an interface [2-101](#)
 MAC authentication bypass [2-102](#)
 manual control of authorization state [2-108](#)
 multiple hosts on authorized port [2-100](#)
 PAE as authenticator [2-107](#)
 periodic re-authentication
 enabling [2-112](#)
 time between attempts [2-113](#)
 quiet period between failed authentication
 exchanges [2-113](#)
 re-authenticating IEEE 802.1x-enabled ports [2-110](#)
 resetting configurable IEEE 802.1x parameters [2-96](#)

- port-based authentication (continued)
 - switch-to-authentication server retransmission time [2-113](#)
 - switch-to-client frame-retransmission number [2-104 to 2-105](#)
 - switch-to-client retransmission time [2-113](#)
- port-channel load-balance command [2-322](#)
- Port Fast, for spanning tree [2-621](#)
- port ranges, defining [2-71](#)
- ports, debugging [B-72](#)
- ports, protected [2-667](#)
- port security
 - aging [2-661](#)
 - debug messages, display [B-74](#)
 - enabling [2-656](#)
 - violation error recovery [2-120](#)
- port trust states for QoS [2-286](#)
- port types, MVR [2-297](#)
- power information, displaying [2-410](#)
- power inline command [2-324](#)
- power inline consumption command [2-327](#)
- Power over Ethernet
 - See PoE
- priority-queue command [2-329](#)
- private-vlan command [2-331](#)
- private-vlan mapping command [2-334](#)
- private VLANs
 - association [2-665](#)
 - configuring [2-331](#)
 - configuring ports [2-652](#)
 - displaying [2-555](#)
 - host ports [2-652](#)
 - mapping
 - configuring [2-665](#)
 - displaying [2-423](#)
 - promiscuous ports [2-652](#)
- privileged EXEC mode [1-2, 1-3](#)
- product identification information, displaying [2-434](#)
- promiscuous ports, private VLANs [2-652](#)

- protected ports, displaying [2-429](#)
- pruning
 - VLANs [2-669](#)
 - VTP
 - displaying interface information [2-423](#)
 - enabling [2-717, 2-721](#)
- pruning-eligible VLAN list [2-671](#)
- PVST+
 - See STP

Q

- QoS
 - auto-QoS
 - configuring [2-18](#)
 - debug messages, display [1-5, B-2](#)
 - displaying [2-370](#)
 - class maps
 - creating [2-37](#)
 - defining the match criteria [2-248](#)
 - displaying [2-378](#)
 - defining the CoS value for an incoming packet [2-256](#)
 - displaying configuration information [2-370, 2-502](#)
 - DSCP transparency [2-268](#)
 - DSCP trusted ports
 - applying DSCP-to-DSCP-mutation map to [2-258](#)
 - defining DSCP-to-DSCP-mutation map [2-260](#)
 - egress queues
 - allocating buffers [2-264](#)
 - defining the CoS output queue threshold map [2-282](#)
 - defining the DSCP output queue threshold map [2-284](#)
 - displaying buffer allocations [2-506](#)
 - displaying CoS output queue threshold map [2-510](#)
 - displaying DSCP output queue threshold map [2-510](#)
 - displaying queueing strategy [2-506](#)
 - displaying queue-set settings [2-513](#)
 - enabling bandwidth shaping and scheduling [2-633](#)
 - enabling bandwidth sharing and scheduling [2-635](#)
 - limiting the maximum output on a port [2-631](#)

QoS (continued)

egress queues (continued)

- mapping a port to a queue-set [2-336](#)
- mapping CoS values to a queue and threshold [2-282](#)
- mapping DSCP values to a queue and threshold [2-284](#)
- setting maximum and reserved memory allocations [2-266](#)
- setting WTD thresholds [2-266](#)

enabling [2-252](#)

ingress queues

- allocating buffers [2-272](#)
- assigning SRR scheduling weights [2-270](#)
- defining the CoS input queue threshold map [2-274](#)
- defining the DSCP input queue threshold map [2-276](#)
- displaying buffer allocations [2-506](#)
- displaying CoS input queue threshold map [2-510](#)
- displaying DSCP input queue threshold map [2-510](#)
- displaying queueing strategy [2-506](#)
- displaying settings for [2-504](#)
- enabling the priority queue [2-278](#)
- mapping CoS values to a queue and threshold [2-274](#)
- mapping DSCP values to a queue and threshold [2-276](#)
- setting WTD thresholds [2-280](#)

maps

- defining [2-260](#), [2-274](#), [2-276](#), [2-282](#), [2-284](#)
- displaying [2-510](#)

policy maps

- applying an aggregate policer [2-317](#)
- applying to an interface [2-354](#), [2-359](#)
- creating [2-319](#)
- defining policers [2-254](#), [2-315](#)
- displaying policers [2-503](#)
- displaying policy maps [2-530](#)
- hierarchical [2-320](#)
- policed-DSCP map [2-260](#)
- setting DSCP or IP precedence values [2-357](#)
- traffic classifications [2-35](#)
- trust states [2-684](#)

port trust states [2-286](#)

QoS (continued)

- queues, enabling the expedite [2-329](#)
- statistics
 - in-profile and out-of-profile packets [2-506](#)
 - packets enqueued or dropped [2-506](#)
 - sent and received CoS values [2-506](#)
 - sent and received DSCP values [2-506](#)
- trusted boundary for IP phones [2-286](#)
- VLAN-based [2-288](#)

quality of service

See QoS

querytime, MVR [2-294](#)queue-set command [2-336](#)

Rradius-server dead-criteria command [2-337](#)radius-server host command [2-339](#)

rapid per-VLAN spanning-tree plus

See STP

rapid PVST+

See STP

rcommand command [2-341](#)re-authenticating IEEE 802.1x-enabled ports [2-110](#)

re-authentication

periodic [2-112](#)time between attempts [2-113](#)receiver ports, MVR [2-297](#)receiving flow-control packets [2-124](#)

recovery mechanism

causes [2-120](#)display [2-376](#), [2-412](#), [2-416](#)timer interval [2-121](#)redundancy for cluster switches [2-68](#)remote-span command [2-343](#)

Remote Switched Port Analyzer

See RSPAN

rename (boot loader) command [A-17](#)renew ip dhcp snooping database command [2-345](#)

- requirements
 - cluster [xvii](#)
 - device manager [xvi](#)
 - Network Assistant [xvi](#)
 - reset (boot loader) command [A-18](#)
 - reset command [2-706](#)
 - resource templates, displaying [2-537](#)
 - restricted VLAN
 - See dot1x auth-fail vlan
 - rmdir (boot loader) command [A-19](#)
 - rmon collection stats command [2-347](#)
 - root guard, for spanning tree [2-594](#)
 - routed ports
 - IP addresses on [2-136](#)
 - number supported [2-136](#)
 - RSPAN
 - configuring [2-289](#)
 - displaying [2-516](#)
 - filter RSPAN traffic [2-289](#)
 - remote-span command [2-343](#)
 - sessions
 - add interfaces to [2-289](#)
 - displaying [2-516](#)
 - start new [2-289](#)
-
- S**
- sdm prefer command [2-348](#)
 - SDM templates
 - allowed resources [2-349](#)
 - displaying [2-537](#)
 - dual IPv4 and IPv6 [2-348](#)
 - secure ports, limitations [2-658](#)
 - sending flow-control packets [2-124](#)
 - service password-recovery command [2-352](#)
 - service-policy command [2-354](#)
 - set (boot loader) command [A-20](#)
 - set command [2-357](#)
 - setup command [2-359](#)
 - setup express command [2-362](#)
 - show access-lists command [2-364](#)
 - show archive status command [2-367](#)
 - show arp access-list command [2-369](#)
 - show auto qos command [2-370](#)
 - show boot command [2-374](#)
 - show cable-diagnostics tdr command [2-376](#)
 - show changes command [2-706](#)
 - show class-map command [2-378](#)
 - show cluster candidates command [2-381](#)
 - show cluster command [2-379](#)
 - show cluster members command [2-383](#)
 - show controllers cpu-interface command [2-385](#)
 - show controllers ethernet-controller command [2-387](#)
 - show controllers power inline command [2-394](#)
 - show controllers team command [2-396](#)
 - show controller utilization command [2-398](#)
 - show current command [2-706](#)
 - show dot1q-tunnel command [2-400](#)
 - show dot1x command [2-401](#)
 - show dtp [2-405](#)
 - show eap command [2-407](#)
 - show env command [2-410](#)
 - show errdisable detect command [2-412](#)
 - show errdisable flap-values command [2-414](#)
 - show errdisable recovery command [2-416](#)
 - show etherchannel command [2-418](#)
 - show flowcontrol command [2-421](#)
 - show interfaces command [2-423](#)
 - show interfaces counters command [2-432](#)
 - show inventory command [2-434](#)
 - show ip arp inspection command [2-435](#)
 - show ipc command [2-457](#)
 - show ip dhcp snooping binding command [2-439](#)
 - show ip dhcp snooping command [2-438](#)
 - show ip dhcp snooping database command [2-441](#)
 - show ip igmp profile command [2-443](#)
 - show ip igmp snooping address command [2-465](#)
 - show ip igmp snooping command [2-444, 2-463](#)

- show ip igmp snooping groups command [2-447](#)
- show ip igmp snooping mrouter command [2-449, 2-467](#)
- show ip igmp snooping querier command [2-451, 2-469](#)
- show ip source binding command [2-453](#)
- show ipv6 access-list command [2-461](#)
- show ip verify source command [2-455](#)
- show l2protocol-tunnel command [2-471](#)
- show lacp command [2-474](#)
- show link state group command [2-478](#)
- show mac access-group command [2-480](#)
- show mac address-table address command [2-484](#)
- show mac address-table aging time command [2-486](#)
- show mac address-table command [2-482](#)
- show mac address-table count command [2-488](#)
- show mac address-table dynamic command [2-490](#)
- show mac address-table interface command [2-492](#)
- show mac address-table move update command [2-494](#)
- show mac address-table notification command [2-49, 2-496, B-25](#)
- show mac address-table static command [2-498](#)
- show mac address-table vlan command [2-500](#)
- show mls qos aggregate-policer command [2-503](#)
- show mls qos command [2-502](#)
- show mls qos input-queue command [2-504](#)
- show mls qos interface command [2-506](#)
- show mls qos maps command [2-510](#)
- show mls qos queue-set command [2-513](#)
- show mls qos vlan command [2-515](#)
- show monitor command [2-516](#)
- show mvr command [2-519](#)
- show mvr interface command [2-521](#)
- show mvr members command [2-523](#)
- show pagp command [2-525](#)
- show parser macro command [2-527](#)
- 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-16](#)
- show platform layer4op command [C-18](#)
- show platform mac-address-table command [C-19](#)
- show platform messaging command [C-20](#)
- show platform monitor command [C-21](#)
- show platform mvr table command [C-22](#)
- show platform pm command [C-23](#)
- show platform port-asic command [C-24](#)
- show platform port-security command [C-29](#)
- show platform qos command [C-30](#)
- show platform resource-manager command [C-31](#)
- show platform snmp counters command [C-33](#)
- show platform spanning-tree command [C-34](#)
- show platform stp-instance command [C-35](#)
- show platform team command [C-36](#)
- show platform vlan command [C-39](#)
- show policy-map command [2-530](#)
- show port security command [2-532](#)
- show power inline command [2-535](#)
- show proposed command [2-706](#)
- show sdm prefer command [2-537](#)
- show setup express command [2-540](#)
- show spanning-tree command [2-541](#)
- show storm-control command [2-547](#)
- show system mtu command [2-549](#)
- show trust command [2-684](#)
- show udd command [2-550](#)
- show version command [2-553](#)
- show vlan access-map command [2-560](#)
- show vlan command [2-555](#)
- show vlan command, fields [2-557](#)
- show vlan filter command [2-561](#)
- show vmps command [2-563](#)
- show vtp command [2-566](#)
- shutdown command [2-571](#)

- shutdown threshold, Layer 2 protocol tunneling [2-210](#)
- shutdown vlan command [2-572](#)
- Smartports macros
 - See macros
- SNMP host, specifying [2-577](#)
- SNMP informs, enabling the sending of [2-573](#)
- snmp-server enable traps command [2-573](#)
- snmp-server host command [2-577](#)
- snmp trap mac-notification command [2-581](#)
- SNMP traps
 - enabling MAC address notification trap [2-581](#)
 - enabling the MAC address notification feature [2-231](#)
 - enabling the sending of [2-573](#)
- SoftPhone
 - See Cisco SoftPhone
- software images
 - deleting [2-73](#)
 - downloading [2-8](#)
 - upgrading [2-8](#)
 - uploading [2-14](#)
- software version, displaying [2-553](#)
- source ports, MVR [2-297](#)
- SPAN
 - configuring [2-289](#)
 - debug messages, display [B-26](#)
 - displaying [2-516](#)
 - filter SPAN traffic [2-289](#)
 - sessions
 - add interfaces to [2-289](#)
 - displaying [2-516](#)
 - start new [2-289](#)
- spanning [2-623](#)
- spanning-tree backbonefast command [2-583](#)
- spanning-tree bpdudfilter command [2-584](#)
- spanning-tree bpduguard command [2-586](#)
- spanning-tree cost command [2-588](#)
- spanning-tree etherchannel command [2-590](#)
- spanning-tree extend system-id command [2-592](#)
- spanning-tree guard command [2-594](#)
- spanning-tree link-type command [2-596](#)
- spanning-tree loopguard default command [2-598](#)
- spanning-tree mode command [2-600](#)
- spanning-tree mst configuration command [2-602](#)
- spanning-tree mst cost command [2-604](#)
- spanning-tree mst forward-time command [2-606](#)
- spanning-tree mst hello-time command [2-607](#)
- spanning-tree mst max-age command [2-608](#)
- spanning-tree mst max-hops command [2-609](#)
- spanning-tree mst port-priority command [2-611](#)
- spanning-tree mst pre-standard command [2-613](#)
- spanning-tree mst priority command [2-614](#)
- spanning-tree mst root command [2-615](#)
- spanning-tree portfast (global configuration) command [2-619](#)
- spanning-tree portfast (interface configuration) command [2-621](#)
- spanning-tree port-priority command [2-617](#)
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command [2-623](#)
- spanning-tree uplinkfast command [2-624](#)
- spanning-tree vlan command [2-626](#)
- speed command [2-629](#)
- srr-queue bandwidth limit command [2-631](#)
- srr-queue bandwidth shape command [2-633](#)
- srr-queue bandwidth share command [2-635](#)
- SSH, configuring version [2-189](#)
- static-access ports, configuring [2-642](#)
- statistics, Ethernet group [2-347](#)
- sticky learning, enabling [2-656](#)
- storm-control command [2-637](#)

- STP
- BackboneFast [2-583](#)
 - counters, clearing [2-53](#)
 - debug messages, display
 - BackboneFast events [B-78](#)
 - MSTP [B-81](#)
 - optimized BPDUs 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 [2-583](#)
 - enabling protocol tunneling for [2-210](#)
 - EtherChannel misconfiguration [2-590](#)
 - extended system ID [2-592](#)
 - path cost [2-588](#)
 - protocol modes [2-600](#)
 - root port
 - accelerating choice of new [2-624](#)
 - loop guard [2-594](#)
 - preventing from becoming designated [2-594](#)
 - restricting which can be root [2-594](#)
 - root guard [2-594](#)
 - UplinkFast [2-624](#)
 - root switch
 - affects of extended system ID [2-592, 2-627](#)
 - hello-time [2-626](#)
 - interval between BPDU messages [2-626](#)
 - interval between hello BPDU messages [2-626](#)
 - max-age [2-626](#)
 - port priority for selection of [2-617](#)
 - primary or secondary [2-626](#)
 - switch priority [2-626](#)
 - state changes
 - blocking to forwarding state [2-621](#)
 - enabling BPDU filtering [2-584, 2-619](#)
 - enabling BPDU guard [2-586, 2-619](#)
 - enabling Port Fast [2-619, 2-621](#)
 - enabling timer to recover from error state [2-120](#)
- STP (continued)
- state changes (continued)
 - forward-delay time [2-626](#)
 - length of listening and learning states [2-626](#)
 - shutting down Port Fast-enabled ports [2-619](#)
 - state information display [2-541](#)
 - VLAN options [2-614, 2-626](#)
 - SVIs, creating [2-130](#)
 - Switched Port Analyzer
 - See SPAN
 - switching characteristics
 - modifying [2-640](#)
 - returning to interfaces [2-640](#)
 - switchport access command [2-642](#)
 - switchport backup interface command [2-644](#)
 - switchport block command [2-647](#)
 - switchport command [2-640](#)
 - switchport host command [2-648](#)
 - switchport mode command [2-649](#)
 - switchport mode private-vlan command [2-652](#)
 - switchport nonegotiate command [2-654](#)
 - switchport port-security aging command [2-661](#)
 - switchport port-security command [2-656](#)
 - switchport priority extend command [2-663](#)
 - switchport private-vlan command [2-665](#)
 - switchport protected command [2-667](#)
 - switchports, displaying [2-423](#)
 - switchport trunk command [2-669](#)
 - switchport voice vlan command [2-672](#)
 - system env temperature threshold yellow command [2-674](#)
 - system message logging [2-221](#)
 - system message logging, save message to flash [2-222](#)
 - system mtu command [2-676](#)
 - system resource templates [2-348](#)
-
- T**
- tar files, creating, listing, and extracting [2-11](#)
 - TDR, running [2-678](#)

Telnet, using to communicate to cluster switches [2-341](#)
 temperature information, displaying [2-410](#)
 templates, system resources [2-348](#)
 test cable-diagnostics tdr command [2-678](#)
 traceroute mac command [2-679](#)
 traceroute mac ip command [2-682](#)
 trunking, VLAN mode [2-649](#)
 trunk mode [2-649](#)
 trunk ports [2-649](#)
 trunks, to non-DTP device [2-650](#)
 trusted boundary for QoS [2-286](#)
 trusted port states for QoS [2-286](#)
 tunnel ports, Layer 2 protocol, displaying [2-471](#)
 type (boot loader) command [A-23](#)

U

UDLD

aggressive mode [2-686, 2-688](#)
 debug messages, display [B-94](#)
 enable globally [2-686](#)
 enable per interface [2-688](#)
 error recovery timer [2-120](#)
 message timer [2-686](#)
 normal mode [2-686, 2-688](#)
 reset a shutdown interface [2-690](#)
 status [2-550](#)
 udd command [2-686](#)
 udd port command [2-688](#)
 udd reset command [2-690](#)
 unicast storm control [2-637](#)
 UniDirectional Link Detection
 See UDLD
 unknown multicast traffic, preventing [2-647](#)
 unknown unicast traffic, preventing [2-647](#)
 unset (boot loader) command [A-24](#)
 upgrading
 software images [2-8](#)
 monitoring status of [2-367](#)

upgrading information
 See release notes
 UplinkFast, for STP [2-624](#)
 user EXEC mode [1-2](#)

V

version (boot loader) command [A-26](#)
 VLAN
 enabling guest VLAN supplicant [2-87](#)
 vlan (global configuration) command [2-691](#)
 vlan (VLAN configuration) command [2-697](#)
 vlan access-map command [2-703](#)
 VLAN access map configuration mode [2-703](#)
 VLAN access maps
 actions [2-6](#)
 displaying [2-560](#)
 VLAN-based QoS [2-288](#)
 VLAN configuration
 rules [2-694, 2-699](#)
 saving [2-691, 2-701](#)
 VLAN configuration mode
 commands
 VLAN [2-697](#)
 VTP [2-721](#)
 description [1-4](#)
 entering [2-705](#)
 summary [1-2](#)
 vlan database command [2-705](#)
 vlan dot1q tag native command [2-708](#)
 vlan filter command [2-710](#)
 VLAN filters, displaying [2-561](#)
 VLAN ID range [2-691, 2-697](#)
 VLAN maps
 applying [2-710](#)
 creating [2-703](#)
 defining [2-246](#)
 displaying [2-560](#)

VLAN Query Protocol

See VQP

VLANs

adding [2-691](#)

configuring [2-691, 2-697](#)

debug messages, display

ISL [B-90](#)

VLAN IOS file system error tests [B-88](#)

VLAN manager activity [B-86](#)

VTP [B-92](#)

displaying configurations [2-555](#)

extended-range [2-691](#)

MAC addresses

displaying [2-500](#)

number of [2-488](#)

media types [2-694, 2-699](#)

normal-range [2-691, 2-697](#)

private [2-652](#)

configuring [2-331](#)

displaying [2-555](#)

See also private VLANs

restarting [2-572](#)

saving the configuration [2-691](#)

shutting down [2-572](#)

SNMP traps for VTP [2-575, 2-578](#)

suspending [2-572](#)

variables [2-697](#)

VLAN Trunking Protocol

See VTP

VMPS

configuring servers [2-715](#)

displaying [2-563](#)

error recovery timer [2-121](#)

reconfirming dynamic VLAN assignments [2-712](#)

vmpls reconfirm (global configuration) command [2-713](#)

vmpls reconfirm (privileged EXEC) command [2-712](#)

vmpls retry command [2-714](#)

vmpls server command [2-715](#)

voice VLAN

configuring [2-672](#)

setting port priority [2-663](#)

VQP

and dynamic-access ports [2-643](#)

clearing client statistics [2-55](#)

displaying information [2-563](#)

per-server retry count [2-714](#)

reconfirmation interval [2-713](#)

reconfirming dynamic VLAN assignments [2-712](#)

VTP

changing characteristics [2-717](#)

clearing pruning counters [2-56](#)

configuring

domain name [2-717, 2-721](#)

file name [2-717](#)

mode [2-717, 2-721](#)

password [2-717, 2-721](#)

counters display fields [2-567](#)

displaying information [2-566](#)

enabling

pruning [2-717, 2-721](#)

tunneling for [2-210](#)

Version 2 [2-717, 2-721](#)

mode [2-717, 2-721](#)

pruning [2-717, 2-721](#)

saving the configuration [2-691, 2-701](#)

statistics [2-566](#)

status [2-566](#)

status display fields [2-569](#)

vtp (global configuration) command [2-717](#)

vtp (VLAN configuration) command [2-721](#)