



INDEX

A

- aaa accounting dot1x command [2-1](#)
- aaa authentication dot1x command [2-3](#)
- aaa authorization network command [2-5, 2-22, 2-27, 2-29, 2-31, 2-33, 2-126, 2-460, B-5, B-30](#)
- AAA methods [2-3](#)
- abort command [2-838](#)
- access control entries
 - See ACEs
- access control lists
 - See ACLs
- access groups
 - IP [2-183](#)
 - MAC, displaying [2-590](#)
- access list, IPv6 [2-252](#)
- access map configuration mode [2-319](#)
- access mode [2-780](#)
- access ports [2-780](#)
- ACEs [2-110, 2-393](#)
- ACLs
 - deny [2-108](#)
 - displaying [2-442](#)
 - for non-IP protocols [2-297](#)
 - IP [2-183](#)
 - matching [2-319](#)
 - on Layer 2 interfaces [2-183](#)
 - permit [2-391](#)
- action command [2-6](#)
- aggregate-port learner [2-380](#)
- allowed VLANs [2-800](#)
- apply command [2-838](#)
- archive copy-sw command [2-8](#)
- archive download-sw command [2-11](#)
- archive tar command [2-15](#)
- archive upload-sw command [2-18](#)
- arp (boot loader) command [A-2](#)
- arp access-list command [2-20](#)
- authentication control-direction command [2-22](#)
- authentication event command [2-24](#)
- authentication failed VLAN
 - See dot1x auth-fail vlan
- authentication fallback command [2-27](#)
- authentication host-mode command [2-29](#)
- authentication open command [2-31](#)
- authentication order command [2-33](#)
- authentication periodic command [2-35](#)
- authentication port-control command [2-37](#)
- authentication priority command [2-39](#)
- authentication timer command [2-41](#)
- authentication violation command [2-43](#)
- auth-fail max-attempts
 - See dot1x auth-fail max-attempts
- auth-fail vlan
 - See dot1x auth-fail vlan
- auth open command [2-31](#)
- auth order command [2-33](#)
- authorization state of controlled port [2-142](#)
- auth timer command [2-41](#)
- autonegotiation of duplex mode [2-151](#)
- auto qos voip command [2-45](#)

B

BackboneFast, for STP [2-703](#)

backup interfaces

- configuring [2-775](#)
- displaying [2-513](#)

boot (boot loader) command [A-3](#)

boot auto-copy-sw command [2-49](#)

boot auto-download-sw command [2-51](#)

boot config-file command [2-53](#)

boot enable-break command [2-54](#)

boot helper command [2-55](#)

boot helper-config file command [2-56](#)

booting

- Cisco IOS image [2-59](#)
- displaying environment variables [2-455](#)
- interrupting [2-54](#)
- manually [2-57](#)

boot loader

- accessing [A-1](#)
- booting
 - Cisco IOS image [A-3](#)
 - helper image [2-55](#)
- directories
 - creating [A-19](#)
 - displaying a list of [A-8](#)
 - removing [A-23](#)
- displaying
 - available commands [A-13](#)
 - memory heap utilization [A-14](#)
 - version [A-30](#)
- environment variables
 - described [A-24](#)
 - displaying settings [A-24](#)
 - location of [A-25](#)
 - setting [A-24](#)
 - unsetting [A-28](#)

boot loader (continued)

- files
 - copying [A-6](#)
 - deleting [A-7](#)
 - displaying a list of [A-8](#)
 - displaying the contents of [A-5, A-20, A-27](#)
 - renaming [A-21](#)
- file system
 - formatting [A-11](#)
 - initializing flash [A-10](#)
 - running a consistency check [A-12](#)
- prompt [A-1](#)
- resetting the system [A-22](#)

boot manual command [2-57](#)

boot private-config-file command [2-58](#)

boot system command [2-59](#)

BPDU filtering, for spanning tree [2-704, 2-738](#)

BPDU guard, for spanning tree [2-706, 2-738](#)

broadcast storm control [2-759](#)

C

cat (boot loader) command [A-5](#)

CDP, enabling protocol tunneling for [2-278](#)

channel-group command [2-61](#)

channel-protocol command [2-65](#)

Cisco SoftPhone

- auto-QoS configuration [2-45](#)
- trusting packets sent from [2-360](#)

CISP

- See Client Information Signalling Protocol

cisp

- debug platform cisp command [B-30](#)

cisp enable command [2-66](#)

class command [2-67](#)

class-map command [2-69](#)

- class maps
 - creating [2-69](#)
 - defining the match criteria [2-321](#)
 - displaying [2-461](#)
- class of service
 - See CoS
- clear dot1x command [2-71](#)
- clear eap command [2-72](#)
- clear energywise neighbors command [2-73](#)
- clear errdisable interface [2-74](#)
- clear ip arp inspection log command [2-75](#)
- clear ip arp inspection statistics command [2-76](#)
- clear ipc command [2-81](#)
- clear ip dhcp snooping database command [2-77, 2-79](#)
- clear ipv6 dhcp conflict command [2-82](#)
- clear l2protocol-tunnel counters command [2-83](#)
- clear lacp command [2-84](#)
- clear logging command [2-85](#)
- clear mac address-table command [2-86, 2-87](#)
- clear nmsp statistics command [2-88](#)
- clear pagp command [2-89](#)
- clear port-security command [2-90](#)
- clear spanning-tree counters command [2-92](#)
- clear spanning-tree detected-protocols command [2-93](#)
- clear vmpls statistics command [2-94](#)
- clear vtp counters command [2-95](#)
- Client Information Signalling Protocol [2-66, 2-126, 2-460, B-5, B-30](#)
- command modes defined [1-2](#)
- configuration files
 - password recovery disable considerations [A-1](#)
 - specifying the name [2-53, 2-58](#)
- configuring multiple interfaces [2-179](#)
- config-vlan mode
 - commands [2-824](#)
 - description [1-5](#)
 - entering [2-823](#)
 - summary [1-2](#)
- copy (boot loader) command [A-6](#)

- copy logging onboard command [2-96](#)
- CoS
 - assigning default value to incoming packets [2-330](#)
 - assigning to Layer 2 protocol packets [2-281](#)
 - overriding the incoming value [2-330](#)
- CoS-to-DSCP map [2-334](#)
- CPU ASIC statistics, displaying [2-462](#)
- crashinfo files [2-170](#)

D

- debug auto qos command [B-2](#)
- debug backup command [B-4](#)
- debug cisp command [B-5](#)
- debug dot1x command [B-6](#)
- debug dtp command [B-7](#)
- debug eap command [B-8](#)
- debug etherchannel command [B-9](#)
- debug fastethernet command [B-10](#)
- debug interface command [B-13](#)
- debug ip dhcp snooping command [B-11](#)
- debug ip igmp filter command [B-14](#)
- debug ip igmp max-groups command [B-15](#)
- debug ip igmp snooping command [B-16](#)
- debug ip verify source packet command [B-12](#)
- debug lacp command [B-17](#)
- debug lldp packets 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 nmsp command [B-24](#)
- debug nvram command [B-25](#)
- debug pagp command [B-26](#)
- debug platform acl command [B-27](#)
- debug platform backup interface command [B-29](#)
- debug platform cisp command [B-30](#)
- debug platform cli-redirection main command [B-31](#)

- debug platform configuration command [B-32](#)
- 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 ip arp inspection command [B-39](#)
- debug platform ipc command [B-48](#)
- debug platform ip dhcp command [B-40](#)
- debug platform ip igmp snooping command [B-41](#)
- debug platform ip multicast command [B-43](#)
- debug platform ip unicast command [B-45](#)
- debug platform ip wccp command [B-47](#)
- debug platform led command [B-49](#)
- debug platform matm command [B-50](#)
- debug platform messaging application command [B-51](#)
- debug platform phy command [B-52](#)
- debug platform pm command [B-54](#)
- debug platform port-asic command [B-56](#)
- debug platform port-security command [B-57](#)
- debug platform qos-acl-tcam command [B-58](#)
- debug platform remote-commands command [B-59](#)
- debug platform resource-manager command [B-60](#)
- debug platform snmp command [B-61](#)
- debug platform span command [B-62](#)
- debug platform stack-manager command [B-63](#)
- debug platform supervisor-asic command [B-64](#)
- debug platform sw-bridge command [B-65](#)
- debug platform tcam command [B-66](#)
- debug platform udd command [B-69](#)
- debug platform vlan command [B-70](#)
- debug pm command [B-71](#)
- debug port-security command [B-73](#)
- debug qos-manager command [B-74](#)
- debug spanning-tree backbonefast command [B-77](#)
- debug spanning-tree bpdu command [B-78](#)
- debug spanning-tree bpdu-opt command [B-79](#)
- debug spanning-tree command [B-75](#)
- debug spanning-tree mstp command [B-80](#)
- debug spanning-tree switch command [B-82](#)
- debug spanning-tree uplinkfast command [B-84](#)
- debug sw-vlan command [B-85](#)
- debug sw-vlan ifs command [B-87](#)
- debug sw-vlan notification command [B-88](#)
- debug sw-vlan vtp command [B-90](#)
- debug udd command [B-92](#)
- debug vqpc command [B-94](#)
- define interface-range command [2-98](#)
- delete (boot loader) command [A-7](#)
- delete command [2-100](#)
- deny (ARP access-list configuration) command [2-101](#)
- deny (IPv6) command [2-103](#)
- deny command [2-108](#)
- detect mechanism, causes [2-162](#)
- DHCP snooping
 - accepting untrusted packets from edge switch [2-211](#)
 - enabling
 - on a VLAN [2-217](#)
 - option 82 [2-209, 2-211](#)
 - trust on an interface [2-215](#)
 - error recovery timer [2-166](#)
 - rate limiting [2-214](#)
- DHCP snooping binding database
 - binding file, configuring [2-207](#)
 - bindings
 - adding [2-205](#)
 - deleting [2-205](#)
 - displaying [2-535](#)
 - clearing database agent statistics [2-77, 2-79](#)
 - database agent, configuring [2-207](#)
 - displaying
 - binding entries [2-535](#)
 - database agent status [2-537, 2-539](#)
 - renewing [2-421](#)
- dir (boot loader) command [A-8](#)
- directories, deleting [2-100](#)
- domain name, VTP [2-849, 2-853](#)
- dot1x auth-fail max-attempts [2-120](#)

- dot1x auth-fail vlan [2-122](#)
- dot1x command [2-118](#)
- dot1x control-direction command [2-124](#)
- dot1x credentials (global configuration) command [2-126](#)
- dot1x critical global configuration command [2-127](#)
- dot1x critical interface configuration command [2-129](#)
- dot1x default command [2-131](#)
- dot1x fallback command [2-132](#)
- dot1x guest-vlan command [2-133](#)
- dot1x host-mode command [2-135](#)
- dot1x initialize command [2-136](#)
- dot1x mac-auth-bypass command [2-137](#)
- dot1x max-reauth-req command [2-139](#)
- dot1x max-req command [2-140](#)
- dot1x pae command [2-141](#)
- dot1x port-control command [2-142](#)
- dot1x re-authenticate command [2-144](#)
- dot1x reauthentication command [2-145](#)
- dot1x timeout command [2-146](#)
- dot1x violation-mode command [2-148](#)
- dropping packets, with ACL matches [2-6](#)
- drop threshold, Layer 2 protocol tunneling [2-278](#)
- DSCP-to-CoS map [2-334](#)
- DSCP-to-DSCP-mutation map [2-334](#)
- DTP [2-781](#)
- DTP flap
 - error detection for [2-162](#)
 - error recovery timer [2-166](#)
- DTP negotiation [2-785](#)
- dual IPv4 and IPv6 templates [2-386](#)
- duplex command [2-150](#)
- dynamic-access ports
 - configuring [2-771](#)
 - restrictions [2-772](#)
- dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN [2-191](#)
 - define [2-20](#)
 - deny packets [2-101](#)
 - display [2-446](#)
 - permit packets [2-384](#)
 - clear
 - log buffer [2-75](#)
 - statistics [2-76](#)
 - display
 - ARP ACLs [2-446](#)
 - configuration and operating state [2-530](#)
 - log buffer [2-530](#)
 - statistics [2-530](#)
 - trust state and rate limit [2-530](#)
 - enable per VLAN [2-201](#)
 - error detection for [2-162](#)
 - error recovery timer [2-166](#)
 - log buffer
 - clear [2-75](#)
 - configure [2-195](#)
 - display [2-530](#)
 - rate-limit incoming ARP packets [2-193](#)
 - statistics
 - clear [2-76](#)
 - display [2-530](#)
 - trusted interface state [2-197](#)
 - type of packet logged [2-202](#)
 - validation checks [2-199](#)
- dynamic auto VLAN membership mode [2-780](#)
- dynamic desirable VLAN membership mode [2-780](#)
- Dynamic Host Configuration Protocol (DHCP)
 - See DHCP snooping
- Dynamic Trunking Protocol
 - See DTP

E

EAP-request/identity frame

- maximum number to send [2-140](#)
- response time before retransmitting [2-146](#)

encapsulation methods [2-800](#)

energywise (global configuration) command [2-152, 2-154](#)

energywise domain command [2-156](#)

energywise query command [2-158](#)

environment variables, displaying [2-455](#)

errdisable detect cause command [2-162](#)

errdisable detect cause small-frame command [2-164](#)

errdisable recovery cause small-frame [2-169](#)

errdisable recovery command [2-166](#)

error conditions, displaying [2-501](#)

error disable detection [2-162](#)

error-disabled interfaces, displaying [2-513](#)

EtherChannel

assigning Ethernet interface to channel group [2-61](#)

creating port-channel logical interface [2-177](#)

debug EtherChannel/PAgP, display [B-9](#)

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

displaying [2-504](#)

enabling Layer 2 protocol tunneling for

LACP [2-279](#)

PAgP [2-279](#)

UDLD [2-279](#)

interface information, displaying [2-513](#)

LACP

clearing channel-group information [2-84, 2-85](#)

debug messages, display [B-17](#)

displaying [2-576](#)

modes [2-61](#)

port priority for hot-standby ports [2-282](#)

restricting a protocol [2-65](#)

system priority [2-284](#)

load-distribution methods [2-401](#)

PAgP

aggregate-port learner [2-380](#)

EtherChannel (continued)

clearing channel-group information [2-89](#)

debug messages, display [B-26](#)

displaying [2-641](#)

error detection for [2-162](#)

error recovery timer [2-166](#)

learn method [2-380](#)

modes [2-61](#)

physical-port learner [2-380](#)

priority of interface for transmitted traffic [2-382](#)

Ethernet controller, internal register display [2-464, 2-471](#)

Ethernet Management port, debugging [B-10](#)

Ethernet statistics, collecting [2-425](#)

exception crashinfo command [2-170, 2-175](#)

exit command [2-838](#)

extended-range VLANs

and allowed VLAN list [2-800](#)

and pruning-eligible list [2-800](#)

configuring [2-823](#)

extended system ID for STP [2-712](#)

F

fallback profile command [2-171](#)

fallback profiles, displaying [2-507](#)

fan information, displaying [2-497](#)

file name, VTP [2-849](#)

files, deleting [2-100](#)

flash_init (boot loader) command [A-10](#)

flexible authentication ordering [2-33](#)

Flex Links

configuring [2-775](#)

displaying [2-513](#)

flowcontrol command [2-173](#)

format (boot loader) command [A-11](#)

forwarding packets, with ACL matches [2-6](#)

forwarding results, display [C-7](#)

frame forwarding information, displaying [C-7](#)

front-end controller counter and status information [C-9](#)
 fsck (boot loader) command [A-12](#)

G

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

H

hardware ACL statistics [2-442](#)
 health monitoring diagnostic tests [2-111](#)
 help (boot loader) command [A-13](#)
 hierarchical policy maps [2-399](#)
 host connection, port configuration [2-779](#)
 host ports, private VLANs [2-783](#)

I

IEEE 802.1Q trunk ports and native VLANs [2-840](#)
 IEEE 802.1Q tunnel ports
 configuring [2-780](#)
 displaying [2-483](#)
 limitations [2-781](#)
 IEEE 802.1x
 and switchport modes [2-781](#)
 violation error recovery [2-166](#)
 See also port-based authentication
 IGMP filters
 applying [2-220](#)
 debug messages, display [B-14](#)
 IGMP groups, setting maximum [2-222](#)
 IGMP maximum groups, debugging [B-15](#)
 IGMP profiles
 creating [2-224](#)
 displaying [2-542](#)
 IGMP snooping
 adding ports as a static member of a group [2-240](#)
 displaying [2-543, 2-548, 2-550](#)

enabling [2-226](#)
 enabling the configurable-leave timer [2-228](#)
 enabling the Immediate-Leave feature [2-237](#)
 flooding query count [2-234](#)
 interface topology change notification behavior [2-236](#)
 multicast table [2-546](#)
 querier [2-230](#)
 query solicitation [2-234](#)
 report suppression [2-232](#)
 switch topology change notification behavior [2-234](#)
 images
 See software images
 Immediate-Leave processing
 IGMP [2-237](#)
 IPv6 [2-274](#)
 MVR [2-370](#)
 interface configuration mode [1-2, 1-4](#)
 interface port-channel command [2-177](#)
 interface range command [2-179](#)
 interface-range macros [2-98](#)
 interfaces
 assigning Ethernet interface to channel group [2-61](#)
 configuring [2-150](#)
 configuring multiple [2-179](#)
 creating port-channel logical [2-177](#)
 debug messages, display [B-13](#)
 disabling [2-689](#)
 displaying the MAC address table [2-602](#)
 restarting [2-689](#)
 interface speed, configuring [2-749](#)
 interface vlan command [2-181](#)
 internal registers, displaying [2-464, 2-471, 2-474](#)
 Internet Group Management Protocol
 See IGMP
 invalid GBIC
 error detection for [2-162](#)
 error recovery timer [2-166](#)
 ip access-group command [2-183](#)
 ip address command [2-186](#)

- IP addresses, setting [2-186](#)
- IP address matching [2-319](#)
- ip admission command [2-188](#)
- ip admission name proxy http command [2-189](#)
- ip arp inspection filter vlan command [2-191](#)
- ip arp inspection limit command [2-193](#)
- ip arp inspection log-buffer command [2-195](#)
- ip arp inspection trust command [2-197](#)
- ip arp inspection validate command [2-199](#)
- ip arp inspection vlan command [2-201](#)
- ip arp inspection vlan logging command [2-202](#)
- IP DHCP snooping
 - See DHCP snooping
- ip dhcp snooping binding command [2-205](#)
- ip dhcp snooping command [2-204](#)
- ip dhcp snooping database command [2-207](#)
- ip dhcp snooping information option allow-untrusted command [2-211](#)
- ip dhcp snooping information option command [2-209](#)
- ip dhcp snooping information option format remote-id command [2-213](#)
- ip dhcp snooping limit rate command [2-214](#)
- ip dhcp snooping trust command [2-215](#)
- ip dhcp snooping verify command [2-216](#)
- ip dhcp snooping vlan command [2-217](#)
- ip dhcp snooping vlan information option format-type circuit-id string command [2-218](#)
- ip igmp filter command [2-220](#)
- ip igmp max-groups command [2-222, 2-247, 2-249](#)
- ip igmp profile command [2-224](#)
- ip igmp snooping command [2-226](#)
- ip igmp snooping last-member-query-interval command [2-228](#)
- ip igmp snooping querier command [2-230](#)
- ip igmp snooping report-suppression command [2-232](#)
- ip igmp snooping tcn command [2-234](#)
- ip igmp snooping tcn flood command [2-236](#)
- ip igmp snooping vlan immediate-leave command [2-237](#)
- ip igmp snooping vlan mrouter command [2-238](#)
- ip igmp snooping vlan static command [2-240](#)
- IP multicast addresses [2-367](#)
- IP phones
 - auto-QoS configuration [2-45](#)
 - trusting packets sent from [2-360](#)
- IP-precedence-to-DSCP map [2-334](#)
- ip snap forwarding command [2-242](#)
- ip source binding command [2-243](#)
- IP source guard
 - disabling [2-251](#)
 - displaying
 - binding entries [2-552](#)
 - configuration [2-554](#)
 - dynamic binding entries only [2-535](#)
 - enabling [2-251](#)
 - static IP source bindings [2-243](#)
- ip ssh command [2-245](#)
- IPv6 access list, deny conditions [2-103](#)
- ipv6 access-list command [2-252](#)
- ipv6 address dhcp command [2-254](#)
- ipv6 dhcp client request vendor command [2-255](#)
- ipv6 dhcp ping packets command [2-256](#)
- ipv6 dhcp pool command [2-258](#)
- ipv6 dhcp server command [2-260](#)
- ipv6 mld snooping command [2-262](#)
- ipv6 mld snooping last-listener-query count command [2-264](#)
- ipv6 mld snooping last-listener-query-interval command [2-266](#)
- ipv6 mld snooping listener-message-suppression command [2-268](#)
- ipv6 mld snooping robustness-variable command [2-270](#)
- ipv6 mld snooping tcn command [2-272](#)
- ipv6 mld snooping vlan command [2-274](#)
- IPv6 SDM template [2-426](#)
- ipv6 traffic-filter command [2-276](#)
- ip verify source command [2-251](#)

J

jumbo frames

See MTU

L

l2protocol-tunnel command [2-278](#)

l2protocol-tunnel cos command [2-281](#)

LACP

See EtherChannel

lacp port-priority command [2-282](#)

lacp system-priority command [2-284](#)

Layer 2 mode, enabling [2-769](#)

Layer 2 protocol ports, displaying [2-573](#)

Layer 2 protocol-tunnel

error detection for [2-162](#)

error recovery timer [2-166](#)

Layer 2 protocol tunnel counters [2-83](#)

Layer 2 protocol tunneling error recovery [2-279](#)

Layer 2 traceroute

IP addresses [2-814](#)

MAC addresses [2-811](#)

Layer 3 mode, enabling [2-769](#)

line configuration mode [1-3, 1-6](#)

Link Aggregation Control Protocol

See EtherChannel

link flap

error detection for [2-162](#)

error recovery timer [2-166](#)

link state group command [2-286](#)

link state track command [2-288](#)

load-distribution methods for EtherChannel [2-401](#)

location (global configuration) command [2-289](#)

location (interface configuration) command [2-291](#)

logging file command [2-293](#)

logical interface [2-177](#)

loopback error

detection for [2-162](#)

recovery timer [2-166](#)

loop guard, for spanning tree [2-714, 2-718](#)

M

mac access-group command [2-295](#)

MAC access-groups, displaying [2-590](#)

MAC access list configuration mode [2-297](#)

mac access-list extended command [2-297](#)

MAC access lists [2-108](#)

MAC addresses

disabling MAC address learning per VLAN [2-300](#)

displaying

aging time [2-596](#)

all [2-594](#)

dynamic [2-600](#)

MAC address-table move updates [2-605](#)

notification settings [2-604, 2-607](#)

number of addresses in a VLAN [2-598](#)

per interface [2-602](#)

per VLAN [2-611](#)

static [2-609](#)

static and dynamic entries [2-592](#)

dynamic

aging time [2-299](#)

deleting [2-86](#)

displaying [2-600](#)

enabling MAC address notification [2-304](#)

enabling MAC address-table move update [2-302](#)

matching [2-319](#)

persistent stack [2-757](#)

static

adding and removing [2-306](#)

displaying [2-609](#)

dropping on an interface [2-307](#)

tables [2-594](#)

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

- mac address-table aging-time [2-295, 2-319](#)
- mac address-table aging-time command [2-299](#)
- mac address-table learning command [2-300](#)
- mac address-table move update command [2-302](#)
- mac address-table notification command [2-304](#)
- mac address-table static command [2-306](#)
- mac address-table static drop command [2-307](#)
- MAC frames
 - See MTU
- macro apply command [2-309](#)
- macro description command [2-312](#)
- macro global command [2-313](#)
- macro global description command [2-316](#)
- macro name command [2-317](#)
- macros
 - adding a description [2-312](#)
 - adding a global description [2-316](#)
 - applying [2-313](#)
 - creating [2-317](#)
 - displaying [2-643](#)
 - interface range [2-98, 2-179](#)
 - specifying parameter values [2-313](#)
 - tracing [2-313](#)
- maps
 - QoS
 - defining [2-334](#)
 - displaying [2-621](#)
 - VLAN
 - creating [2-835](#)
 - defining [2-319](#)
 - displaying [2-680](#)
- match (access-map configuration) command [2-319](#)
- match (class-map configuration) command [2-321](#)
- maximum transmission unit
 - See MTU
- mdix auto command [2-324](#)
- memory (boot loader) command [A-14](#)
- mgmt_clr (boot loader) command [A-16](#)
- mgmt_init (boot loader) command [A-17, A-18](#)
- mkdir (boot loader) command [A-19](#)
- MLD snooping
 - configuring [2-268, 2-270](#)
 - configuring queries [2-264, 2-266](#)
 - configuring topology change notification [2-272](#)
 - displaying [2-563, 2-565, 2-567, 2-569](#)
 - enabling [2-262](#)
 - enabling on a VLAN [2-274](#)
- mls qos aggregate-policer command [2-328](#)
- mls qos command [2-326](#)
- mls qos cos command [2-330](#)
- mls qos dscp-mutation command [2-332](#)
- mls qos map command [2-334](#)
- mls qos queue-set output buffers command [2-338](#)
- mls qos queue-set output threshold command [2-340](#)
- mls qos rewrite ip dscp command [2-342](#)
- mls qos srr-queue input bandwidth command [2-344](#)
- mls qos srr-queue input buffers command [2-346](#)
- mls qos srr-queue input cos-map command [2-348](#)
- mls qos srr-queue input dscp-map command [2-350](#)
- mls qos srr-queue input priority-queue command [2-352](#)
- mls qos srr-queue input threshold command [2-354](#)
- mls qos srr-queue output cos-map command [2-356](#)
- mls qos srr-queue output dscp-map command [2-358](#)
- mls qos trust command [2-360](#)
- mls qos vlan-based command [2-362](#)
- mode, MVR [2-367](#)
- Mode button, and password recovery [2-429](#)
- modes, commands [1-2](#)
- monitor session command [2-363](#)
- more (boot loader) command [A-20](#)
- MSTP
 - displaying [2-657](#)
 - interoperability [2-93](#)
 - link type [2-716](#)

MSTP (continued)

MST region

- aborting changes [2-722](#)
- applying changes [2-722](#)
- configuration name [2-722](#)
- configuration revision number [2-722](#)
- current or pending display [2-722](#)
- displaying [2-657](#)
- MST configuration mode [2-722](#)
- VLANs-to-instance mapping [2-722](#)

path cost [2-724](#)protocol mode [2-720](#)restart protocol migration process [2-93](#)

root port

- loop guard [2-714](#)
- preventing from becoming designated [2-714](#)
- restricting which can be root [2-714](#)
- root guard [2-714](#)

root switch

- affects of extended system ID [2-712](#)
- hello-time [2-727, 2-734](#)
- interval between BPDU messages [2-728](#)
- interval between hello BPDU messages [2-727, 2-734](#)
- max-age [2-728](#)
- maximum hop count before discarding BPDU [2-729](#)
- port priority for selection of [2-730](#)
- primary or secondary [2-734](#)
- switch priority [2-733](#)

state changes

- blocking to forwarding state [2-741](#)
- enabling BPDU filtering [2-704, 2-738](#)
- enabling BPDU guard [2-706, 2-738](#)
- enabling Port Fast [2-738, 2-741](#)
- forward-delay time [2-726](#)
- length of listening and learning states [2-726](#)
- rapid transition to forwarding [2-716](#)
- shutting down Port Fast-enabled ports [2-738](#)

MSTP (continued)

- state information display [2-656](#)

MTU

- configuring size [2-808](#)
- displaying global setting [2-669](#)

Multicast Listener Discovery

See MLD

multicast group address, MVR [2-370](#)multicast groups, MVR [2-368](#)

Multicast Listener Discovery

See MLD

multicast router learning method [2-238](#)multicast router ports, configuring [2-238](#)multicast router ports, IPv6 [2-274](#)multicast storm control [2-759](#)multicast VLAN, MVR [2-367](#)

multicast VLAN registration

See MVR

multiple hosts on authorized port [2-135](#)

Multiple Spanning Tree Protocol

See MSTP

MVR

- configuring [2-367](#)
- configuring interfaces [2-370](#)
- debug messages, display [B-23](#)
- displaying [2-630](#)
- displaying interface information [2-632](#)
- members, displaying [2-634](#)
- mvr (global configuration) command [2-367](#)
- mvr (interface configuration) command [2-370](#)
- mvr vlan group command [2-371](#)

N
native VLANs [2-800](#)native VLAN tagging [2-840](#)network-policy (global configuration) command [2-373](#)network-policy command [2-372](#)

network-policy profile (network-policy configuration)
command [2-374](#)

nmsp attachment suppress command [2-377](#)

nmsp command [2-376](#)

nonegotiate

DTP messaging [2-785](#)

speed [2-749](#)

non-IP protocols

denying [2-108](#)

forwarding [2-391](#)

non-IP traffic access lists [2-297](#)

non-IP traffic forwarding

denying [2-108](#)

permitting [2-391](#)

non-stop forwarding [2-378](#)

normal-range VLANs [2-823, 2-829](#)

no vlan command [2-823, 2-833](#)

nsf command [2-378](#)

O

online diagnostics

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

displaying

configured boot-up coverage level [2-478](#)

current scheduled tasks [2-478](#)

event logs [2-478](#)

supported test suites [2-478](#)

test ID [2-478](#)

test results [2-478](#)

test statistics [2-478](#)

enabling

scheduling [2-113](#)

syslog messages [2-111](#)

online diagnostics (continued)

global configuration mode

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

clearing test-based testing schedule [2-113](#)

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

setting test-based testing [2-113](#)

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

setting up test-based testing [2-113](#)

removing scheduling [2-113](#)

scheduled switchover

disabling [2-113](#)

enabling [2-113](#)

setting test interval [2-113](#)

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

starting testing [2-115](#)

P

PAgP

See EtherChannel

pagp learn-method command [2-380](#)

pagp port-priority command [2-382](#)

password, VTP [2-849, 2-853](#)

password-recovery mechanism, enabling and
disabling [2-429](#)

permit (ARP access-list configuration) command [2-384](#)

permit (IPv6) command [2-386](#)

permit (MAC access-list configuration) command [2-391](#)

per-VLAN spanning-tree plus

See STP

physical-port learner [2-380](#)

PID, displaying [2-528](#)

PIM-DVMRP, as multicast router learning method [2-238](#)

police aggregate command [2-396](#)

police command [2-394](#)

policed-DSCP map [2-334](#)

policy-map command [2-398](#)

policy maps

- applying to an interface [2-431, 2-437](#)
- creating [2-398](#)
- displaying [2-646](#)
- hierarchical [2-399](#)
- policers
 - displaying [2-614](#)
 - for a single class [2-394](#)
 - for multiple classes [2-328, 2-396](#)
 - policed-DSCP map [2-334](#)
- traffic classification
 - defining the class [2-67](#)
 - defining trust states [2-816](#)
 - setting DSCP or IP precedence values [2-435](#)

Port Aggregation Protocol

See EtherChannel

port-based authentication

- AAA method list [2-3](#)
- configuring violation modes [2-148](#)
- debug messages, display [B-6](#)
- enabling guest VLAN supplicant [2-121, 2-132](#)
- enabling IEEE 802.1x
 - globally [2-118](#)
 - per interface [2-142](#)
- guest VLAN [2-133](#)
- host modes [2-135](#)
- IEEE 802.1x AAA accounting methods [2-1](#)
- initialize an interface [2-136](#)
- MAC authentication bypass [2-137](#)
- manual control of authorization state [2-142](#)
- multiple hosts on authorized port [2-135](#)
- PAE as authenticator [2-141](#)
- periodic re-authentication
 - enabling [2-145](#)
 - time between attempts [2-146](#)
- quiet period between failed authentication exchanges [2-146](#)
- re-authenticating IEEE 802.1x-enabled ports [2-144](#)
- resetting configurable IEEE 802.1x parameters [2-131](#)

port-based authentication (continued)

- switch-to-authentication server retransmission time [2-146](#)
- switch-to-client frame-retransmission number [2-139 to 2-140](#)
- switch-to-client retransmission time [2-146](#)
- port-channel load-balance command [2-401](#)
- Port Fast, for spanning tree [2-741](#)
- port ranges, defining [2-96, 2-98](#)
- ports, debugging [B-71](#)
- ports, protected [2-798](#)
- port security
 - aging [2-792](#)
 - debug messages, display [B-73](#)
 - enabling [2-787](#)
 - violation error recovery [2-166](#)
- port trust states for QoS [2-360](#)
- port types, MVR [2-370](#)
- power information, displaying [2-497](#)
- priority-queue command [2-403](#)
- priority value, stack member [2-664, 2-764](#)
- private-vlan command [2-405](#)
- private-vlan mapping command [2-408](#)
- private VLANs
 - association [2-796](#)
 - configuring [2-405](#)
 - configuring ports [2-783](#)
 - displaying [2-675](#)
 - host ports [2-783](#)
 - mapping
 - configuring [2-796](#)
 - displaying [2-513](#)
 - promiscuous ports [2-783](#)
- privileged EXEC mode [1-2, 1-3](#)
- product identification information, displaying [2-528](#)
- promiscuous ports, private VLANs [2-783](#)
- protected ports, displaying [2-519](#)

pruning

VLANs [2-800](#)

VTP

displaying interface information [2-513](#)enabling [2-849, 2-853](#)pruning-eligible VLAN list [2-802](#)

PVST+

See STP

Q

QoS

auto-QoS

configuring [2-45](#)debug messages, display [B-2](#)displaying [2-451](#)

class maps

creating [2-69](#)defining the match criteria [2-321](#)displaying [2-461](#)defining the CoS value for an incoming packet [2-330](#)displaying configuration information [2-451, 2-613](#)DSCP transparency [2-342](#)

DSCP trusted ports

applying DSCP-to-DSCP-mutation map to [2-332](#)defining DSCP-to-DSCP-mutation map [2-334](#)

egress queues

allocating buffers [2-338](#)defining the CoS output queue threshold map [2-356](#)defining the DSCP output queue threshold map [2-358](#)displaying buffer allocations [2-617](#)displaying CoS output queue threshold map [2-621](#)displaying DSCP output queue threshold map [2-621](#)displaying queueing strategy [2-617](#)displaying queue-set settings [2-624](#)

QoS (continued)

enabling bandwidth shaping and scheduling [2-753](#)enabling bandwidth sharing and scheduling [2-755](#)limiting the maximum output on a port [2-751](#)mapping a port to a queue-set [2-410](#)mapping CoS values to a queue and threshold [2-356](#)mapping DSCP values to a queue and threshold [2-358](#)setting maximum and reserved memory allocations [2-340](#)setting WTD thresholds [2-340](#)enabling [2-326](#)

ingress queues

allocating buffers [2-346](#)assigning SRR scheduling weights [2-344](#)defining the CoS input queue threshold map [2-348](#)defining the DSCP input queue threshold map [2-350](#)displaying buffer allocations [2-617](#)displaying CoS input queue threshold map [2-621](#)displaying DSCP input queue threshold map [2-621](#)displaying queueing strategy [2-617](#)displaying settings for [2-615](#)enabling the priority queue [2-352](#)mapping CoS values to a queue and threshold [2-348](#)mapping DSCP values to a queue and threshold [2-350](#)setting WTD thresholds [2-354](#)

maps

defining [2-334, 2-348, 2-350, 2-356, 2-358](#)displaying [2-621](#)

policy maps

applying an aggregate policer [2-396](#)applying to an interface [2-431, 2-437](#)creating [2-398](#)defining policers [2-328, 2-394](#)

QoS (continued)

- displaying policers [2-614](#)
- displaying policy maps [2-646](#)
- hierarchical [2-399](#)
- policed-DSCP map [2-334](#)
- setting DSCP or IP precedence values [2-435](#)
- traffic classifications [2-67](#)
- trust states [2-816](#)
- port trust states [2-360](#)
- queues, enabling the expedite [2-403](#)
- statistics
 - in-profile and out-of-profile packets [2-617](#)
 - packets enqueued or dropped [2-617](#)
 - sent and received CoS values [2-617](#)
 - sent and received DSCP values [2-617](#)
- trusted boundary for IP phones [2-360](#)
- VLAN-based [2-362](#)
- quality of service
 - See QoS
- querytime, MVR [2-367](#)
- queue-set command [2-410](#)

R

- radius-server dead-criteria command [2-411](#)
- radius-server host command [2-413](#)
- rapid per-VLAN spanning-tree plus
 - See STP
- rapid PVST+
 - See STP
- re-authenticating IEEE 802.1x-enabled ports [2-144](#)
- re-authentication
 - periodic [2-145](#)
 - time between attempts [2-146](#)
- receiver ports, MVR [2-370](#)
- receiving flow-control packets [2-173](#)

recovery mechanism

- causes [2-166](#)
- display [2-74](#), [2-458](#), [2-499](#), [2-502](#)
- timer interval [2-167](#)
- reload command [2-415](#)
- remote command [2-417](#)
- remote-span command [2-419](#)
- Remote Switched Port Analyzer
 - See RSPAN
- rename (boot loader) command [A-21](#)
- renew ip dhcp snooping database command [2-421](#)
- reset (boot loader) command [A-22](#)
- reset command [2-838](#)
- resource templates, displaying [2-651](#)
- restricted VLAN
 - See dot1x auth-fail vlan
- rmdir (boot loader) command [A-23](#)
- rmon collection stats command [2-425](#)
- root guard, for spanning tree [2-714](#)
- routed ports
 - IP addresses on [2-187](#)
 - number supported [2-187](#)
- routing frames
 - See MTU
- RSPAN
 - configuring [2-363](#)
 - displaying [2-627](#)
 - filter RSPAN traffic [2-363](#)
 - remote-span command [2-419](#)
 - sessions
 - add interfaces to [2-363](#)
 - displaying [2-627](#)
 - start new [2-363](#)

S

- scheduled switchover
 - disabling [2-113](#)
 - enabling [2-113](#)

- SDM mismatch mode [2-427, 2-665](#)
- sdm prefer command [2-426](#)
- SDM templates
 - allowed resources [2-427](#)
 - and stacking [2-426](#)
 - displaying [2-651](#)
 - dual IPv4 and IPv6 [2-426](#)
- secure ports, limitations [2-789](#)
- sending flow-control packets [2-173](#)
- service password-recovery command [2-429](#)
- service-policy command [2-431](#)
- session command [2-434](#)
- set (boot loader) command [A-24](#)
- set command [2-435](#)
- setup command [2-437](#)
- setup express command [2-440](#)
- show access-lists command [2-442](#)
- show archive status command [2-445](#)
- show arp access-list command [2-446](#)
- show authentication command [2-447](#)
- show auto qos command [2-451](#)
- show boot command [2-455](#)
- show cable-diagnostics tdr command [2-458](#)
- show changes command [2-838](#)
- show cisp command [2-460](#)
- show class-map command [2-461](#)
- show controllers cpu-interface command [2-462](#)
- show controllers ethernet-controller command [2-464](#)
- show controllers ethernet-controller fastethernet command [2-471](#)
- show controllers team command [2-474](#)
- show controller utilization command [2-476](#)
- show current command [2-838](#)
- show dot1q-tunnel command [2-483](#)
- show dot1x command [2-484](#)
- show dtp [2-488](#)
- show eap command [2-490](#)
- show energywise command [2-493](#)
- show env command [2-497](#)
- show errdisable detect command [2-499](#)
- show errdisable flap-values command [2-501](#)
- show errdisable recovery command [2-502](#)
- show etherchannel command [2-504](#)
- show fallback profile command [2-507](#)
- show flowcontrol command [2-509](#)
- show idprom command [2-511](#)
- show interfaces command [2-513](#)
- show interfaces counters command [2-525](#)
- show inventory command [2-528](#)
- show ip arp inspection command [2-530](#)
- show ipc command [2-556](#)
- show ip dhcp snooping binding command [2-535](#)
- show ip dhcp snooping command [2-534](#)
- show ip dhcp snooping database command [2-537, 2-539](#)
- show ip igmp profile command [2-542](#)
- show ip igmp snooping address command [2-565](#)
- show ip igmp snooping command [2-543, 2-563](#)
- show ip igmp snooping groups command [2-546](#)
- show ip igmp snooping mrouter command [2-548, 2-567](#)
- show ip igmp snooping querier command [2-550, 2-569](#)
- show ip source binding command [2-552](#)
- show ipv6 access-list command [2-560](#)
- show ipv6 dhcp conflict command [2-562](#)
- show ipv6 route updated [2-571](#)
- show ip verify source command [2-554](#)
- show l2protocol-tunnel command [2-573](#)
- show lacp command [2-576](#)
- show link state group command [2-580](#)
- show location [2-582](#)
- show location command [2-582](#)
- show logging command [2-585](#)
- show mac access-group command [2-590](#)
- show mac address-table address command [2-594](#)
- show mac address-table aging time command [2-596](#)
- show mac address-table command [2-592](#)
- show mac address-table count command [2-598](#)
- show mac address-table dynamic command [2-600](#)
- show mac address-table interface command [2-602](#)

- show mac address-table learning command [2-604](#)
- show mac address-table move update command [2-605](#)
- show mac address-table notification command [2-87, 2-607, B-21](#)
- show mac address-table static command [2-609](#)
- show mac address-table vlan command [2-611](#)
- show mls qos aggregate-policer command [2-614](#)
- show mls qos command [2-613](#)
- show mls qos input-queue command [2-615](#)
- show mls qos interface command [2-617](#)
- show mls qos maps command [2-621](#)
- show mls qos queue-set command [2-624](#)
- show mls qos vlan command [2-626](#)
- show monitor command [2-627](#)
- show mvr command [2-630](#)
- show mvr interface command [2-632](#)
- show mvr members command [2-634](#)
- show network-policy profile command [2-636](#)
- show nmsp command [2-638](#)
- show pagp command [2-641](#)
- show parser macro command [2-643](#)
- show platform acl command [C-2](#)
- show platform backup interface command [C-3](#)
- show platform configuration command [C-4](#)
- show platform dl command [C-5](#)
- show platform etherchannel command [C-6](#)
- show platform forward command [C-7](#)
- show platform frontend-controller command [C-9](#)
- show platform igmp snooping command [C-10](#)
- show platform ipc trace command [C-18](#)
- show platform ip multicast command [C-12](#)
- show platform ip unicast command [C-13](#)
- show platform ipv6 unicast command [C-19](#)
- show platform ip wccp command [C-17](#)
- show platform layer4op command [C-21](#)
- show platform mac-address-table command [C-22](#)
- show platform messaging command [C-23](#)
- show platform monitor command [C-24](#)
- show platform mvr table command [C-25](#)
- show platform pm command [C-26](#)
- show platform port-asic command [C-27](#)
- show platform port-security command [C-32](#)
- show platform qos command [C-33](#)
- show platform resource-manager command [C-34](#)
- show platform snmp counters command [C-36](#)
- show platform spanning-tree command [C-37](#)
- show platform stack-manager command [C-39](#)
- show platform stp-instance command [C-38](#)
- show platform tb command [C-43](#)
- show platform team command [C-45](#)
- show platform vlan command [C-48](#)
- show policy-map command [2-646](#)
- show port security command [2-648](#)
- show proposed command [2-838](#)
- show sdm prefer command [2-651](#)
- show setup express command [2-655](#)
- show spanning-tree command [2-656](#)
- show storm-control command [2-662](#)
- show switch command [2-664](#)
- show system mtu command [2-669](#)
- show trust command [2-816](#)
- show uddl command [2-670](#)
- show version command [2-673](#)
- show vlan access-map command [2-680](#)
- show vlan command [2-675](#)
- show vlan command, fields [2-677](#)
- show vlan filter command [2-681](#)
- show vmps command [2-682](#)
- show vtp command [2-684](#)
- shutdown command [2-689](#)
- shutdown threshold, Layer 2 protocol tunneling [2-278](#)
- shutdown vlan command [2-690](#)
- small violation-rate command [2-691](#)
- Smartports macros
 - See macros
- SNMP host, specifying [2-697](#)
- SNMP informs, enabling the sending of [2-693](#)
- snmp-server enable traps command [2-693](#)

- snmp-server host command [2-697](#)
- snmp trap mac-notification command [2-701](#)
- SNMP traps
 - enabling MAC address notification trap [2-701](#)
 - enabling the MAC address notification feature [2-304](#)
 - enabling the sending of [2-693](#)
- SoftPhone
 - See Cisco SoftPhone
- software images
 - copying [2-8](#)
 - deleting [2-100](#)
 - downloading [2-11](#)
 - upgrading [2-8, 2-11](#)
 - uploading [2-18](#)
- software version, displaying [2-673](#)
- source ports, MVR [2-370](#)
- SPAN
 - configuring [2-363](#)
 - debug messages, display [B-22](#)
 - displaying [2-627](#)
 - filter SPAN traffic [2-363](#)
 - sessions
 - add interfaces to [2-363](#)
 - displaying [2-627](#)
 - start new [2-363](#)
- spanning-tree backbonefast command [2-703](#)
- spanning-tree bpduguard command [2-704](#)
- spanning-tree bpduguard command [2-706](#)
- spanning-tree cost command [2-708](#)
- spanning-tree etherchannel command [2-710](#)
- spanning-tree extend system-id command [2-712](#)
- spanning-tree guard command [2-714](#)
- spanning-tree link-type command [2-716](#)
- spanning-tree loopguard default command [2-718](#)
- spanning-tree mode command [2-720](#)
- spanning-tree mst configuration command [2-722](#)
- spanning-tree mst cost command [2-724](#)
- spanning-tree mst forward-time command [2-726](#)
- spanning-tree mst hello-time command [2-727](#)
- spanning-tree mst max-age command [2-728](#)
- spanning-tree mst max-hops command [2-729](#)
- spanning-tree mst port-priority command [2-730](#)
- spanning-tree mst pre-standard command [2-732](#)
- spanning-tree mst priority command [2-733](#)
- spanning-tree mst root command [2-734](#)
- spanning-tree portfast (global configuration) command [2-738](#)
- spanning-tree portfast (interface configuration) command [2-741](#)
- spanning-tree port-priority command [2-736](#)
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command [2-743](#)
- spanning-tree uplinkfast command [2-744](#)
- spanning-tree vlan command [2-746](#)
- speed command [2-749](#)
- srr-queue bandwidth limit command [2-751](#)
- srr-queue bandwidth shape command [2-753](#)
- srr-queue bandwidth share command [2-755](#)
- SSH, configuring version [2-245](#)
- stack-mac persistent timer command [2-757](#)
- stack member
 - access [2-434](#)
 - number [2-664, 2-767](#)
 - priority value [2-764](#)
 - provisioning [2-765](#)
 - reloading [2-415](#)
- stacks, switch
 - disabling a member [2-762](#)
 - enabling a member [2-762](#)
 - MAC address [2-757](#)
 - provisioning a new member [2-765](#)
 - reloading [2-415](#)
 - stack member access [2-434](#)
 - stack member number [2-664, 2-767](#)
 - stack member priority value [2-664, 2-764](#)
- static-access ports, configuring [2-771](#)
- statistics, Ethernet group [2-425](#)

sticky learning, enabling [2-787](#)

storm-control command [2-759](#)

STP

BackboneFast [2-703](#)

counters, clearing [2-92](#)

debug messages, display

BackboneFast events [B-77](#)

MSTP [B-80](#)

optimized BPDUs handling [B-79](#)

spanning-tree activity [B-75](#)

switch shim [B-82](#)

transmitted and received BPDUs [B-78](#)

UplinkFast [B-84](#)

detection of indirect link failures [2-703](#)

enabling protocol tunneling for [2-278](#)

EtherChannel misconfiguration [2-710](#)

extended system ID [2-712](#)

path cost [2-708](#)

protocol modes [2-720](#)

root port

accelerating choice of new [2-744](#)

loop guard [2-714](#)

preventing from becoming designated [2-714](#)

restricting which can be root [2-714](#)

root guard [2-714](#)

UplinkFast [2-744](#)

root switch

affects of extended system ID [2-712, 2-747](#)

hello-time [2-746](#)

interval between BDPUs messages [2-746](#)

interval between hello BDPUs messages [2-746](#)

max-age [2-746](#)

port priority for selection of [2-736](#)

primary or secondary [2-746](#)

switch priority [2-746](#)

STP (continued)

state changes

blocking to forwarding state [2-741](#)

enabling BPDU filtering [2-704, 2-738](#)

enabling BPDU guard [2-706, 2-738](#)

enabling Port Fast [2-738, 2-741](#)

enabling timer to recover from error state [2-166](#)

forward-delay time [2-746](#)

length of listening and learning states [2-746](#)

shutting down Port Fast-enabled ports [2-738](#)

state information display [2-656](#)

VLAN options [2-733, 2-746](#)

SVIs, creating [2-181](#)

SVI status calculation [2-773](#)

Switched Port Analyzer

See SPAN

switching characteristics

modifying [2-769](#)

returning to interfaces [2-769](#)

switchport access command [2-771](#)

switchport autostate exclude command [2-773](#)

switchport backup interface command [2-775](#)

switchport block command [2-778](#)

switchport command [2-769](#)

switchport host command [2-779](#)

switchport mode command [2-780](#)

switchport mode private-vlan command [2-783](#)

switchport nonegotiate command [2-785](#)

switchport port-security aging command [2-792](#)

switchport port-security command [2-787](#)

switchport priority extend command [2-794](#)

switchport private-vlan command [2-796](#)

switchport protected command [2-798](#)

switchports, displaying [2-513](#)

switchport trunk command [2-800](#)

switchport voice detect [2-803](#)

switchport voice vlan command [2-804](#)

switch priority command [2-762, 2-764](#)

switch provision command [2-765](#)

switch renumber command [2-767](#)
 system env temperature threshold yellow command [2-806](#)
 system message logging, save message to flash [2-293](#)
 system mtu command [2-808](#)
 system resource templates [2-426](#)

T

tar files, creating, listing, and extracting [2-15](#)
 TDR, running [2-810](#)
 temperature information, displaying [2-497](#)
 templates, system resources [2-426](#)
 test cable-diagnostics tdr command [2-810](#)
 traceroute mac command [2-811](#)
 traceroute mac ip command [2-814](#)
 trunking, VLAN mode [2-780](#)
 trunk mode [2-780](#)
 trunk ports [2-780](#)
 trunks, to non-DTP device [2-781](#)
 trusted boundary for QoS [2-360](#)
 trusted port states for QoS [2-360](#)
 tunnel ports, Layer 2 protocol, displaying [2-573](#)
 type (boot loader) command [A-27](#)

U

UDLD

aggressive mode [2-818, 2-820](#)
 debug messages, display [B-92](#)
 enable globally [2-818](#)
 enable per interface [2-820](#)
 error recovery timer [2-166](#)
 message timer [2-818](#)
 normal mode [2-818, 2-820](#)
 reset a shutdown interface [2-822](#)
 status [2-670](#)
 udd command [2-818](#)
 udd port command [2-820](#)

udd reset command [2-822](#)
 unicast storm control [2-759](#)
 UniDirectional Link Detection
 See UDLD
 unknown multicast traffic, preventing [2-778](#)
 unknown unicast traffic, preventing [2-778](#)
 unset (boot loader) command [A-28](#)
 upgrading
 copying software images [2-8](#)
 downloading software images [2-11](#)
 software images, monitoring status of [2-445](#)
 UplinkFast, for STP [2-744](#)
 user EXEC mode [1-2, 1-3](#)

V

version (boot loader) command [A-30](#)
 version mismatch mode [2-665, C-40](#)
 vlan (global configuration) command [2-823](#)
 vlan (VLAN configuration) command [2-829](#)
 vlan access-map command [2-835](#)
 VLAN access map configuration mode [2-835](#)
 VLAN access maps
 actions [2-6](#)
 displaying [2-680](#)
 VLAN-based QoS [2-362](#)
 VLAN configuration
 rules [2-826, 2-831](#)
 saving [2-823, 2-833](#)
 VLAN configuration mode
 commands
 VLAN [2-829](#)
 VTP [2-853](#)
 description [1-5](#)
 entering [2-837](#)
 summary [1-3](#)
 vlan database command [2-837](#)
 vlan dot1q tag native command [2-840](#)
 vlan filter command [2-842](#)

- VLAN filters, displaying [2-681](#)
- VLAN ID range [2-823, 2-829](#)
- VLAN maps
 - applying [2-842](#)
 - creating [2-835](#)
 - defining [2-319](#)
 - displaying [2-680](#)
- VLAN Query Protocol
 - See VQP
- VLANs
 - adding [2-823](#)
 - configuring [2-823, 2-829](#)
 - debug messages, display
 - ISL [B-88](#)
 - VLAN IOS file system error tests [B-87](#)
 - VLAN manager activity [B-85](#)
 - VTP [B-90](#)
 - displaying configurations [2-675](#)
 - extended-range [2-823](#)
 - MAC addresses
 - displaying [2-611](#)
 - number of [2-598](#)
 - media types [2-826, 2-831](#)
 - normal-range [2-823, 2-829](#)
 - private [2-783](#)
 - configuring [2-405](#)
 - displaying [2-675](#)
 - See also private VLANs
 - restarting [2-690](#)
 - saving the configuration [2-823](#)
 - shutting down [2-690](#)
 - SNMP traps for VTP [2-695, 2-698](#)
 - suspending [2-690](#)
 - variables [2-829](#)
- VLAN Trunking Protocol
 - See VTP
- VM mode [2-665, C-40](#)
- VMPS
 - configuring servers [2-847](#)
 - displaying [2-682](#)
 - error recovery timer [2-167](#)
 - reconfirming dynamic VLAN assignments [2-844](#)
 - vmmps reconfirm (global configuration) command [2-845](#)
 - vmmps reconfirm (privileged EXEC) command [2-844](#)
 - vmmps retry command [2-846](#)
 - vmmps server command [2-847](#)
 - voice VLAN
 - configuring [2-803, 2-804](#)
 - setting port priority [2-794](#)
- VQP
 - and dynamic-access ports [2-772](#)
 - clearing client statistics [2-94](#)
 - displaying information [2-682](#)
 - per-server retry count [2-846](#)
 - reconfirmation interval [2-845](#)
 - reconfirming dynamic VLAN assignments [2-844](#)
- VTP
 - changing characteristics [2-849](#)
 - clearing pruning counters [2-95](#)
 - configuring
 - domain name [2-849, 2-853](#)
 - file name [2-849](#)
 - mode [2-849, 2-853](#)
 - password [2-849, 2-853](#)
 - counters display fields [2-685](#)
 - displaying information [2-684](#)
 - enabling
 - pruning [2-849, 2-853](#)
 - tunneling for [2-778](#)
 - Version 2 [2-849, 2-853](#)
 - mode [2-849, 2-853](#)
 - pruning [2-849, 2-853](#)
 - saving the configuration [2-823, 2-833](#)
 - statistics [2-684](#)
 - status [2-684](#)
 - status display fields [2-686](#)

vtp (global configuration) command [2-849](#)

vtp (VLAN configuration) command [2-853](#)