



INDEX

A

aaa accounting dot1x command [2-1](#)
aaa authentication dot1x command [2-3](#)
aaa authorization network command [2-5](#)
AAA methods [2-3](#)
abort command [2-755](#)
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP [2-118](#)
 MAC, displaying [2-493](#)
access mode [2-706](#)
access ports [2-706](#)
ACEs [2-69](#), [2-259](#)
ACLs
 deny [2-67](#)
 displaying [2-398](#)
 for non-IP protocols [2-180](#)
 IP [2-118](#)
 on Layer 2 interfaces [2-118](#)
 permit [2-257](#)
address aliasing [2-248](#)
aggregate-port learner [2-253](#)
allowed VLANs [2-722](#)
apply command [2-755](#)
archive download-sw command [2-6](#)
archive tar command [2-8](#)
archive upload-sw command [2-11](#)
audience [xiii](#)

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 [2-93](#)
autonegotiation of duplex mode [2-101](#)
auto qos voip command [2-13](#)

B

BackboneFast, for STP [2-641](#)
backup interfaces
 configuring [2-700](#)
 displaying [2-453](#)
boot (boot loader) command [A-2](#)
boot bootlpr command [2-18](#)
boot config-file command [2-19](#)
boot enable-break command [2-20](#)
boot helper command [2-21](#)
boot helper-config file command [2-22](#)
booting
 Cisco IOS image [2-25](#)
 displaying environment variables [2-406](#)
 interrupting [2-20](#)
 manually [2-23](#)

boot loader

accessing [A-1](#)

booting

Cisco IOS image [A-2](#)helper image [2-21](#)

directories

creating [A-14](#)displaying a list of [A-7](#)removing [A-18](#)

displaying

available commands [A-12](#)memory heap utilization [A-13](#)version [A-25](#)

environment variables

described [A-19](#)displaying settings [A-19](#)location of [A-20](#)setting [A-19](#)unsetting [A-23](#)

files

copying [A-5](#)deleting [A-6](#)displaying a list of [A-7](#)displaying the contents of [A-4, A-15, A-22](#)renaming [A-16](#)

file system

formatting [A-10](#)initializing flash [A-9](#)running a consistency check [A-11](#)prompt [A-1](#)resetting the system [A-17](#)boot manual command [2-23](#)boot private-config-file command [2-24](#)boot system command [2-25](#)BPDU filtering, for spanning tree [2-642, 2-677](#)BPDU guard, for spanning tree [2-644, 2-677](#)broadcast storm control [2-695](#)**C**

candidate switches

See clusters

cat (boot loader) command [A-4](#)caution, description [xiv](#)channel-group command [2-26](#)channel-protocol command [2-29](#)

Cisco Network Assistant

See Network Assistant [xiv](#)

Cisco SoftPhone

auto-QoS configuration [2-13](#)trusting packets sent from [2-240](#)class command [2-31](#)class-map command [2-33](#)

class maps

creating [2-33](#)defining the match criteria [2-200](#)displaying [2-410](#)

class of service

See CoS

clear dot1x command [2-35](#)clear eap sessions command [2-36](#)clear errdisable interface [2-37](#)clear ip dhcp snooping database command [2-38](#)clear lacp command [2-40](#)clear mac address-table command [2-41, 2-43](#)clear pagp command [2-44](#)clear port-security command [2-45](#)clear spanning-tree counters command [2-47](#)clear spanning-tree detected-protocols command [2-48](#)clear vmps statistics command [2-49](#)clear vtp counters command [2-50](#)cluster commander-address command [2-51](#)cluster discovery hop-count command [2-53](#)cluster enable command [2-54](#)cluster holdtime command [2-55](#)cluster member command [2-56](#)cluster outside-interface command [2-58](#)

- cluster requirements [xiv](#)
- cluster run command [2-59](#)
- clusters
 - adding candidates [2-56](#)
 - binding to HSRP group [2-60](#)
 - building manually [2-56](#)
 - communicating with
 - devices outside the cluster [2-58](#)
 - members by using Telnet [2-275](#)
 - debug messages, display [B-5](#)
 - displaying
 - candidate switches [2-413](#)
 - debug messages [B-5](#)
 - member switches [2-415](#)
 - status [2-411](#)
 - hop-count limit for extended discovery [2-53](#)
 - HSRP standby groups [2-60](#)
 - redundancy [2-60](#)
 - SNMP trap [2-631](#)
- cluster standby-group command [2-60](#)
- cluster timer command [2-62](#)
- command modes defined [1-1](#)
- 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 [2-19, 2-24](#)
- configuring multiple interfaces [2-113](#)
- config-vlan mode
 - commands [2-743](#)
 - description [1-4](#)
 - entering [2-742](#)
 - summary [1-2](#)

conventions

- command [xiii](#)
- for examples [xiv](#)
- publication [xiii](#)
- text [xiii](#)

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

CoS

- assigning default value to incoming packets [2-210](#)
- overriding the incoming value [2-210](#)

CoS-to-DSCP map [2-214](#)

CPU ASIC statistics, displaying [2-417](#)

crashinfo files [2-106](#)

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 interface command [B-14](#)

debug ip dhcp snooping command [B-16](#)

debug ip igmp filter command [B-17](#)

debug ip igmp max-groups command [B-18](#)

debug ip igmp snooping command [B-19](#)

debug lacp command [B-20](#)

debug mac-notification command [B-21](#)

debug matm command [B-22](#)

debug matm move update command [B-23](#)

debug monitor command [B-24](#)

debug mvrdbg command [B-26](#)

debug nvram command [B-27](#)

debug pagp command [B-28](#)

debug platform acl command [B-29](#)

debug platform backup interface command [B-30](#)

debug platform cpu-queues command [B-31](#)

debug platform dot1x command [B-33](#)

debug platform etherchannel command [B-34](#)

debug platform forw-tcam command [B-35](#)

debug platform ip dhcp command [B-36](#)

debug platform ip igmp snooping command [B-37](#)

debug platform led command [B-39](#)

debug platform matm command [B-40](#)

debug platform messaging application command [B-42](#)

debug platform phy command [B-43](#)

debug platform pm command [B-45](#)

debug platform port-asic command [B-47](#)

debug platform port-security command [B-48](#)

debug platform qos-acl-tcam command [B-49](#)

debug platform resource-manager command [B-50](#)

debug platform snmp command [B-51](#)

debug platform span command [B-52](#)

debug platform supervisor-asic command [B-53](#)

debug platform sw-bridge command [B-54](#)

debug platform tcam command [B-55](#)

debug platform udd command [B-57](#)

debug platform vlan command [B-58](#)

debug pm command [B-59](#)

debug port-security command [B-61](#)

debug qos-manager command [B-62](#)

debug spanning-tree backbonefast command [B-65](#)

debug spanning-tree bpdu command [B-66](#)

debug spanning-tree bpdu-opt command [B-67](#)

debug spanning-tree command [B-63](#)

debug spanning-tree mstp command [B-68](#)

debug spanning-tree switch command [B-70](#)

debug spanning-tree uplinkfast command [B-72](#)

debug sw-vlan command [B-73](#)

debug sw-vlan ifs command [B-75](#)

debug sw-vlan notification command [B-77](#)

debug sw-vlan vtp command [B-79](#)

debug udd command [B-81](#)

debug vqpc command [B-83](#)

define interface-range command [2-64](#)

delete (boot loader) command [A-6](#)

delete command [2-66](#)

- deny command [2-67](#)
 - detect mechanism, causes [2-102](#)
 - device manager requirements [xiv](#)
 - DHCP snooping
 - accepting untrusted packets from edge switch [2-133](#)
 - enabling
 - on a VLAN [2-138](#)
 - option 82 [2-131, 2-133](#)
 - trust on an interface [2-136](#)
 - error recovery timer [2-104](#)
 - rate limiting [2-135](#)
 - DHCP snooping binding database
 - binding file, configuring [2-129](#)
 - bindings
 - adding [2-127](#)
 - deleting [2-127](#)
 - displaying [2-467](#)
 - clearing database agent statistics [2-38](#)
 - database agent, configuring [2-129](#)
 - displaying
 - binding entries [2-467](#)
 - database agent status [2-469, 2-471](#)
 - renewing [2-279](#)
 - dir (boot loader) command [A-7](#)
 - directories, deleting [2-66](#)
 - documentation, related [xiv](#)
 - document conventions [xiii](#)
 - domain name, VTP [2-762, 2-766](#)
 - dot1x auth-fail max-attempts [2-72](#)
 - dot1x auth-fail vlan [2-74](#)
 - dot1x command [2-70](#)
 - dot1x control-direction command [2-76](#)
 - dot1x critical global configuration command [2-78](#)
 - dot1x critical interface configuration command [2-80](#)
 - dot1x default command [2-82](#)
 - dot1x fallback command [2-83](#)
 - dot1x guest-vlan command [2-84](#)
 - dot1x host-mode command [2-86](#)
 - dot1x initialize command [2-87](#)
 - dot1x mac-auth-bypass command [2-88](#)
 - dot1x max-reauth-req command [2-90](#)
 - dot1x max-req command [2-91](#)
 - dot1x pae command [2-92](#)
 - dot1x port-control command [2-93](#)
 - dot1x re-authenticate command [2-95](#)
 - dot1x reauthentication command [2-96](#)
 - dot1x timeout command [2-97](#)
 - DSCP-to-CoS map [2-214](#)
 - DSCP-to-DSCP-mutation map [2-214](#)
 - DTP [2-707](#)
 - DTP flap
 - error detection for [2-102](#)
 - error recovery timer [2-104](#)
 - DTP negotiation [2-709](#)
 - dual-purpose uplink ports
 - displaying configurable options [2-456](#)
 - displaying the active media [2-460](#)
 - selecting the type [2-204](#)
 - duplex command [2-100](#)
 - dynamic-access ports
 - configuring [2-698](#)
 - restrictions [2-699](#)
 - dynamic auto VLAN membership mode [2-706](#)
 - dynamic desirable VLAN membership mode [2-706](#)
 - Dynamic Host Configuration Protocol (DHCP)
 - See DHCP snooping
 - Dynamic Trunking Protocol
 - See DTP
-
- ## E
- EAP-request/identity frame
 - maximum number to send [2-91](#)
 - response time before retransmitting [2-97](#)
 - environment variables, displaying [2-406](#)
 - errdisable detect cause command [2-102](#)
 - errdisable recovery command [2-104](#)
 - error conditions, displaying [2-442](#)

error disable detection [2-102](#)

error-disabled interfaces, displaying [2-453](#)

EtherChannel

- assigning Ethernet interface to channel group [2-26](#)
- creating port-channel logical interface [2-111](#)
- debug EtherChannel/PAGP, display [B-12](#)
- debug platform-specific events, display [B-34](#)
- displaying [2-446](#)
- interface information, displaying [2-453](#)

LACP

- clearing channel-group information [2-40](#)
- debug messages, display [B-20](#)
- displaying [2-484](#)
- modes [2-26](#)
- port priority for hot-standby ports [2-164](#)
- restricting a protocol [2-29](#)
- system priority [2-166](#)

load-distribution methods [2-266](#)

PAGP

- aggregate-port learner [2-253](#)
- clearing channel-group information [2-44](#)
- debug messages, display [B-28](#)
- displaying [2-537](#)
- error detection for [2-102](#)
- error recovery timer [2-104](#)
- learn method [2-253](#)
- modes [2-26](#)
- physical-port learner [2-253](#)
- priority of interface for transmitted traffic [2-255](#)

Ethernet controller, internal register display [2-419](#)

Ethernet statistics, collecting [2-383](#)

examples, conventions for [xiv](#)

exception crashinfo command [2-106](#)

exit command [2-755](#)

extended discovery of candidate switches [2-53](#)

extended-range VLANs

- and allowed VLAN list [2-722](#)
- and pruning-eligible list [2-722](#)
- configuring [2-742](#)

extended system ID for STP [2-650](#)

F

fallback profile command [2-107](#)

fallback profiles, displaying [2-449](#)

fan information, displaying [2-439](#)

file name, VTP [2-762](#)

files, deleting [2-66](#)

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

Flex Links

- configuring [2-700](#)
- configuring preferred VLAN [2-702](#)
- displaying [2-453](#)

flowcontrol command [2-109](#)

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

forwarding results, display [C-5](#)

frame forwarding information, displaying [C-5](#)

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

G

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

H

hardware ACL statistics [2-398](#)

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

hierarchical policy maps [2-264](#)

hop-count limit for clusters [2-53](#)

host connection, port configuration [2-705](#)

Hot Standby Router Protocol

- See HSRP

HSRP

- binding HSRP group to cluster [2-60](#)
- standby group [2-60](#)

- IEEE 802.1x
 - and switchport modes [2-707](#)
 - violation error recovery [2-104](#)
 - See also port-based authentication
- IEEE 802.1X Port Based Authentication
 - enabling guest VLAN supplicant [2-73, 2-83, 2-108](#)
- IGMP filters
 - applying [2-139](#)
 - debug messages, display [B-17](#)
- IGMP groups, setting maximum [2-141](#)
- IGMP maximum groups, debugging [B-18](#)
- IGMP profiles
 - creating [2-143](#)
 - displaying [2-474](#)
- IGMP snooping
 - adding ports as a static member of a group [2-160](#)
 - displaying [2-475, 2-480, 2-482](#)
 - enabling [2-145](#)
 - enabling the configurable-leave timer [2-147](#)
 - enabling the Immediate-Leave feature [2-156](#)
 - flooding query count [2-153](#)
 - interface topology change notification behavior [2-155](#)
 - multicast table [2-478](#)
 - querier [2-149](#)
 - query solicitation [2-153](#)
 - report suppression [2-151](#)
 - switch topology change notification behavior [2-153](#)
- images
 - See software images
- Immediate-Leave feature, MVR [2-250](#)
- immediate-leave processing [2-156](#)
- initial configuration
 - See getting started guide and hardware installation guide
- interface configuration mode [1-2, 1-4](#)
- interface port-channel command [2-111](#)
- interface range command [2-113](#)
- interface-range macros [2-64](#)
- interfaces
 - assigning Ethernet interface to channel group [2-26](#)
 - configuring [2-100](#)
 - configuring multiple [2-113](#)
 - creating port-channel logical [2-111](#)
 - debug messages, display [B-14](#)
 - disabling [2-629](#)
 - displaying the MAC address table [2-505](#)
 - restarting [2-629](#)
- interface speed, configuring [2-687](#)
- interface vlan command [2-116](#)
- internal registers, displaying [2-419, 2-426](#)
- Internet Group Management Protocol
 - See IGMP
- invalid GBIC
 - error detection for [2-102](#)
 - error recovery timer [2-104](#)
- ip access-group command [2-118](#)
- ip address command [2-121](#)
- IP addresses, setting [2-121](#)
- ip admission command [2-123](#)
- ip admission name proxy http command [2-124](#)
- IP DHCP snooping
 - See DHCP snooping
- ip dhcp snooping binding command [2-127](#)
- ip dhcp snooping command [2-126](#)
- ip dhcp snooping database command [2-129](#)
- ip dhcp snooping information option allow-untrusted command [2-133](#)
- ip dhcp snooping information option command [2-131](#)
- ip dhcp snooping limit rate command [2-135](#)
- ip dhcp snooping trust command [2-136](#)
- ip dhcp snooping verify command [2-137](#)
- ip dhcp snooping vlan command [2-138](#)
- ip igmp filter command [2-139](#)
- ip igmp max-groups command [2-141](#)
- ip igmp profile command [2-143](#)
- ip igmp snooping command [2-145](#)

ip igmp snooping last-member-query-interval command [2-147](#)
 ip igmp snooping querier command [2-149](#)
 ip igmp snooping report-suppression command [2-151](#)
 ip igmp snooping tcn command [2-153](#)
 ip igmp snooping tcn flood command [2-155](#)
 ip igmp snooping vlan immediate-leave command [2-156](#)
 ip igmp snooping vlan mrouter command [2-158](#)
 ip igmp snooping vlan static command [2-160](#)
 IP multicast addresses [2-247](#)
 IP phones
 auto-QoS configuration [2-13](#)
 trusting packets sent from [2-240](#)
 IP-precedence-to-DSCP map [2-214](#)
 IP source guard
 displaying
 dynamic binding entries only [2-467](#)
 ip ssh command [2-162](#)

J

jumbo frames
 See MTU

L

LACP
 See EtherChannel
 lacp port-priority command [2-164](#)
 lacp system-priority command [2-166](#)
 Layer 2 traceroute
 IP addresses [2-733](#)
 MAC addresses [2-730](#)
 line configuration mode [1-2, 1-5](#)
 Link Aggregation Control Protocol
 See EtherChannel
 link flap
 error detection for [2-102](#)
 error recovery timer [2-104](#)

link state group command [2-172](#)
 link state track command [2-174](#)
 load-distribution methods for EtherChannel [2-266](#)
 location (global configuration) command [2-168](#)
 location (interface configuration) command [2-170](#)
 logging event command [2-175](#)
 logging file command [2-176](#)
 logical interface [2-111](#)
 loopback error
 detection for [2-102](#)
 recovery timer [2-104](#)
 loop guard, for spanning tree [2-652, 2-656](#)

M

mac access-group command [2-178](#)
 MAC access-groups, displaying [2-493](#)
 MAC access list configuration mode [2-180](#)
 mac access-list extended command [2-180](#)
 MAC access lists [2-67](#)
 MAC addresses
 displaying
 aging time [2-499](#)
 all [2-497](#)
 dynamic [2-503](#)
 MAC address-table move updates [2-507](#)
 notification settings [2-509](#)
 number of addresses in a VLAN [2-501](#)
 per interface [2-505](#)
 per VLAN [2-513](#)
 static [2-511](#)
 static and dynamic entries [2-495](#)
 dynamic
 aging time [2-182](#)
 deleting [2-41](#)
 displaying [2-503](#)
 enabling MAC address notification [2-185](#)
 enabling MAC address-table move update [2-183](#)

MAC addresses (continued)

static

adding and removing [2-187](#)

displaying [2-511](#)

dropping on an interface [2-188](#)

tables [2-497](#)

MAC address notification, debugging [B-21](#)

mac address-table aging-time [2-178](#)

mac address-table aging-time command [2-182](#)

mac address-table move update command [2-183](#)

mac address-table notification command [2-185](#)

mac address-table static command [2-187](#)

mac address-table static drop command [2-188](#)

macro apply command [2-190](#)

macro description command [2-193](#)

macro global command [2-194](#)

macro global description command [2-197](#)

macro name command [2-198](#)

macros

adding a description [2-193](#)

adding a global description [2-197](#)

applying [2-194](#)

creating [2-198](#)

displaying [2-539](#)

interface range [2-64, 2-113](#)

specifying parameter values [2-194](#)

tracing [2-194](#)

manual

audience [xiii](#)

purpose of [xiii](#)

maps

QoS

defining [2-214](#)

displaying [2-523](#)

match (class-map configuration) command [2-200](#)

maximum transmission unit

See MTU

mdix auto command [2-202](#)

media-type command [2-204](#)

member switches

See clusters

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

mkdir (boot loader) command [A-14](#)

mls qos aggregate-policer command [2-208](#)

mls qos command [2-206](#)

mls qos cos command [2-210](#)

mls qos dscp-mutation command [2-212](#)

mls qos map command [2-214](#)

mls qos queue-set output buffers command [2-218](#)

mls qos queue-set output threshold command [2-220](#)

mls qos rewrite ip dscp command [2-222](#)

mls qos srr-queue input bandwidth command [2-224](#)

mls qos srr-queue input buffers command [2-226](#)

mls qos-srr-queue input cos-map command [2-228](#)

mls qos srr-queue input dscp-map command [2-230](#)

mls qos srr-queue input priority-queue command [2-232](#)

mls qos srr-queue input threshold command [2-234](#)

mls qos-srr-queue output cos-map command [2-236](#)

mls qos srr-queue output dscp-map command [2-238](#)

mls qos trust command [2-240](#)

mode, MVR [2-247](#)

Mode button, and password recovery [2-387](#)

modes, commands [1-1](#)

monitor session command [2-242](#)

more (boot loader) command [A-15](#)

MSTP

displaying [2-551](#)

interoperability [2-48](#)

link type [2-654](#)

MST region

aborting changes [2-660](#)

applying changes [2-660](#)

configuration name [2-660](#)

configuration revision number [2-660](#)

current or pending display [2-660](#)

displaying [2-551](#)

MST configuration mode [2-660](#)

VLANs-to-instance mapping [2-660](#)

MSTP (continued)

- path cost [2-662](#)
- protocol mode [2-658](#)
- restart protocol migration process [2-48](#)
- root port
 - loop guard [2-652](#)
 - preventing from becoming designated [2-652](#)
 - restricting which can be root [2-652](#)
 - root guard [2-652](#)
- root switch
 - affects of extended system ID [2-650](#)
 - hello-time [2-665, 2-673](#)
 - interval between BPDU messages [2-666](#)
 - interval between hello BPDU messages [2-665, 2-673](#)
 - max-age [2-666](#)
 - maximum hop count before discarding BPDU [2-667](#)
 - port priority for selection of [2-669](#)
 - primary or secondary [2-673](#)
 - switch priority [2-672](#)
- state changes
 - blocking to forwarding state [2-679](#)
 - enabling BPDU filtering [2-642, 2-677](#)
 - enabling BPDU guard [2-644, 2-677](#)
 - enabling Port Fast [2-677, 2-679](#)
 - forward-delay time [2-664](#)
 - length of listening and learning states [2-664](#)
 - rapid transition to forwarding [2-654](#)
 - shutting down Port Fast-enabled ports [2-677](#)
- state information display [2-550](#)

MTU

- configuring size [2-727](#)
- displaying global setting [2-558](#)
- multicast group address, MVR [2-250](#)
- multicast groups, MVR [2-248](#)
- multicast router learning method [2-158](#)
- multicast router ports, configuring [2-158](#)
- multicast storm control [2-695](#)

multicast VLAN, MVR [2-247](#)

multicast VLAN registration

See MVR

Multiple Spanning Tree Protocol

See MSTP

MVR

- and address aliasing [2-248](#)
- configuring [2-247](#)
- configuring interfaces [2-250](#)
- debug messages, display [B-26](#)
- displaying [2-531](#)
- displaying interface information [2-533](#)
- members, displaying [2-535](#)
- mvr (global configuration) command [2-247](#)
- mvr (interface configuration) command [2-250](#)
- mvr vlan group command [2-251](#)

N

native VLANs [2-722](#)

Network Admission Control Software Configuration Guide [2-123, 2-125](#)

Network Assistant requirements [xiv](#)

nonegotiate, speed [2-687](#)

nonegotiating DTP messaging [2-709](#)

non-IP protocols

denying [2-67](#)

forwarding [2-257](#)

non-IP traffic access lists [2-180](#)

non-IP traffic forwarding

denying [2-67](#)

permitting [2-257](#)

normal-range VLANs [2-742, 2-748](#)

note, description [xiv](#)

no vlan command [2-742, 2-752](#)

P

PAgP

See EtherChannel

pagp learn-method command [2-253](#)

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

password, VTP [2-762, 2-766](#)

password-recovery mechanism, enabling and disabling [2-387](#)

permit (MAC access-list configuration) command [2-257](#)

per-VLAN spanning-tree plus

See STP

physical-port learner [2-253](#)

PID, displaying [2-465](#)

PIM-DVMRP, as multicast router learning method [2-158](#)

police aggregate command [2-262](#)

police command [2-260](#)

policed-DSCP map [2-214](#)

policy-map command [2-264](#)

policy maps

applying to an interface [2-389, 2-393](#)

creating [2-264](#)

displaying [2-542](#)

hierarchical [2-264](#)

policers

displaying [2-516](#)

for a single class [2-260](#)

for multiple classes [2-208, 2-262](#)

policed-DSCP map [2-214](#)

traffic classification

defining the class [2-31](#)

defining trust states [2-735](#)

setting DSCP or IP precedence values [2-391](#)

Port Aggregation Protocol

See EtherChannel

port-based authentication

AAA method list [2-3](#)

debug messages, display [B-7](#)

enabling IEEE 802.1x

globally [2-70](#)

per interface [2-93](#)

guest VLAN [2-84](#)

host modes [2-86](#)

IEEE 802.1x AAA accounting methods [2-1](#)

initialize an interface [2-87](#)

MAC authentication bypass [2-88](#)

manual control of authorization state [2-93](#)

PAE as authenticator [2-92](#)

periodic re-authentication

enabling [2-96](#)

time between attempts [2-97](#)

quiet period between failed authentication exchanges [2-97](#)

re-authenticating IEEE 802.1x-enabled ports [2-95](#)

resetting configurable IEEE 802.1x parameters [2-82](#)

switch-to-authentication server retransmission time [2-97](#)

switch-to-client frame-retransmission number [2-90 to 2-91](#)

switch-to-client retransmission time [2-97](#)

port-channel load-balance command [2-266](#)

Port Fast, for spanning tree [2-679](#)

port ranges, defining [2-64](#)

ports, debugging [B-59](#)

ports, protected [2-720](#)

port security

aging [2-716](#)

debug messages, display [B-61](#)

enabling [2-711](#)

violation error recovery [2-104](#)

port trust states for QoS [2-240](#)

port types, MVR [2-250](#)

power information, displaying [2-439](#)

priority-queue command [2-268](#)

privileged EXEC mode [1-2, 1-3](#)

product identification information, displaying [2-465](#)

protected ports, displaying [2-458](#)

pruning

VLANs [2-722](#)

VTP

displaying interface information [2-453](#)

enabling [2-762, 2-766](#)

pruning-eligible VLAN list [2-723](#)

PVST+

See STP

Q

QoS

auto-QoS

configuring [2-13](#)

debug messages, display [B-2](#)

displaying [2-402](#)

class maps

creating [2-33](#)

defining the match criteria [2-200](#)

displaying [2-410](#)

defining the CoS value for an incoming packet [2-210](#)

displaying configuration information [2-402, 2-515](#)

DSCP transparency [2-222](#)

DSCP trusted ports

applying DSCP-to-DSCP-mutation map to [2-212](#)

defining DSCP-to-DSCP-mutation map [2-214](#)

egress queues

allocating buffers [2-218](#)

defining the CoS output queue threshold map [2-236](#)

defining the DSCP output queue threshold map [2-238](#)

displaying buffer allocations [2-519](#)

displaying CoS output queue threshold map [2-523](#)

displaying DSCP output queue threshold map [2-523](#)

displaying queueing strategy [2-519](#)

QoS (continued)

egress queues

displaying queue-set settings [2-526](#)

enabling bandwidth shaping and scheduling [2-691](#)

enabling bandwidth sharing and scheduling [2-693](#)

limiting the maximum output on a port [2-689](#)

mapping a port to a queue-set [2-270](#)

mapping CoS values to a queue and threshold [2-236](#)

mapping DSCP values to a queue and threshold [2-238](#)

setting maximum and reserved memory allocations [2-220](#)

setting WTD thresholds [2-220](#)

enabling [2-206](#)

ingress queues

allocating buffers [2-226](#)

assigning SRR scheduling weights [2-224](#)

defining the CoS input queue threshold map [2-228](#)

defining the DSCP input queue threshold map [2-230](#)

displaying buffer allocations [2-519](#)

displaying CoS input queue threshold map [2-523](#)

displaying DSCP input queue threshold map [2-523](#)

displaying queueing strategy [2-519](#)

displaying settings for [2-517](#)

enabling the priority queue [2-232](#)

mapping CoS values to a queue and threshold [2-228](#)

mapping DSCP values to a queue and threshold [2-230](#)

setting WTD thresholds [2-234](#)

maps

defining [2-214, 2-228, 2-230, 2-236, 2-238](#)

displaying [2-523](#)

QoS (continued)

- policy maps
 - applying an aggregate policer [2-262](#)
 - applying to an interface [2-389, 2-393](#)
 - creating [2-264](#)
 - defining policers [2-208, 2-260](#)
 - displaying policers [2-516](#)
 - displaying policy maps [2-542](#)
 - hierarchical [2-264](#)
 - policed-DSCP map [2-214](#)
 - setting DSCP or IP precedence values [2-391](#)
 - traffic classifications [2-31](#)
 - trust states [2-735](#)
- port trust states [2-240](#)
- queues, enabling the expedite [2-268](#)
- statistics
 - in-profile and out-of-profile packets [2-519](#)
 - packets enqueued or dropped [2-519](#)
 - sent and received CoS values [2-519](#)
 - sent and received DSCP values [2-519](#)
- trusted boundary for IP phones [2-240](#)
- quality of service
 - See QoS
- querytime, MVR [2-247](#)
- queue-set command [2-270](#)

R

- radius-server dead-criteria command [2-271](#)
- radius-server host command [2-273](#)
- rapid per-VLAN spanning-tree plus
 - See STP
- rapid PVST+
 - See STP
- rcommand command [2-275](#)
- re-authenticating IEEE 802.1x-enabled ports [2-95](#)
- re-authentication
 - periodic [2-96](#)
 - time between attempts [2-97](#)

- receiver ports, MVR [2-250](#)
- receiving flow-control packets [2-109](#)
- recovery mechanism
 - causes [2-104](#)
 - display [2-37, 2-408, 2-440, 2-444](#)
 - timer interval [2-104](#)
- redundancy for cluster switches [2-60](#)
- remote-span command [2-277](#)
- Remote Switched Port Analyzer
 - See RSPAN
- rename (boot loader) command [A-16](#)
- renew ip dhcp snooping database command [2-279](#)
- requirements
 - cluster [xiv](#)
 - device manager [xiv](#)
 - Network Assistant [xiv](#)
- reset (boot loader) command [A-17](#)
- reset command [2-755](#)
- resource templates, displaying [2-547](#)
- restricted VLAN
 - See dot1x auth-fail vlan
- rmdir (boot loader) command [A-18](#)
- rmon collection stats command [2-383](#)
- root guard, for spanning tree [2-652](#)
- RSPAN
 - configuring [2-242](#)
 - displaying [2-529](#)
 - filter RSPAN traffic [2-242](#)
 - remote-span command [2-277](#)
 - sessions
 - add interfaces to [2-242](#)
 - displaying [2-529](#)
 - start new [2-242](#)

S

- sdm prefer command [2-385](#)
- SDM templates
 - displaying [2-547](#)
- secure ports, limitations [2-713](#)
- sending flow-control packets [2-109](#)
- service password-recovery command [2-387](#)
- service-policy command [2-389](#)
- set (boot loader) command [A-19](#)
- set command [2-391](#)
- setup command [2-393](#)
- setup express command [2-396](#)
- show access-lists command [2-398](#)
- show archive status command [2-401](#)
- show auto qos command [2-402](#)
- show boot command [2-406](#)
- show cable-diagnostics tdr command [2-408](#)
- show changes command [2-755](#)
- show class-map command [2-410](#)
- show cluster candidates command [2-413](#)
- show cluster command [2-411](#)
- show cluster members command [2-415](#)
- show controllers cpu-interface command [2-417](#)
- show controllers ethernet-controller command [2-419](#)
- show controllers team command [2-426](#)
- show controller utilization command [2-428](#)
- show current command [2-755](#)
- show dot1x command [2-430](#)
- show dtp [2-434](#)
- show eap command [2-436](#)
- show env command [2-439](#)
- show errdisable detect command [2-440](#)
- show errdisable flap-values command [2-442](#)
- show errdisable recovery command [2-444](#)
- show etherchannel command [2-446](#)
- show fallback profile command [2-449](#)
- show flowcontrol command [2-451](#)
- show interfaces command [2-453](#)
- show interfaces counters command [2-462](#)
- show inventory command [2-465](#)
- show ip dhcp snooping binding command [2-467](#)
- show ip dhcp snooping command [2-466](#)
- show ip dhcp snooping database command [2-469, 2-471](#)
- show ip igmp profile command [2-474](#)
- show ip igmp snooping command [2-475](#)
- show ip igmp snooping groups command [2-478](#)
- show ip igmp snooping mrouter command [2-480](#)
- show ip igmp snooping querier command [2-482](#)
- show lacp command [2-484](#)
- show link state group command [2-491](#)
- show location [2-488](#)
- show mac access-group command [2-493](#)
- show mac address-table address command [2-497](#)
- show mac address-table aging time command [2-499](#)
- show mac address-table command [2-495](#)
- show mac address-table count command [2-501](#)
- show mac address-table dynamic command [2-503](#)
- show mac address-table interface command [2-505](#)
- show mac address-table move update command [2-507](#)
- show mac address-table notification command [2-43, 2-509, B-23](#)
- show mac address-table static command [2-511](#)
- show mac address-table vlan command [2-513](#)
- show mls qos aggregate-policer command [2-516](#)
- show mls qos command [2-515](#)
- show mls qos input-queue command [2-517](#)
- show mls qos interface command [2-519](#)
- show mls qos maps command [2-523](#)
- show mls qos queue-set command [2-526](#)
- show mls qos vlan command [2-528](#)
- show monitor command [2-529](#)
- show mvr command [2-531](#)
- show mvr interface command [2-533](#)
- show mvr members command [2-535](#)
- show pagp command [2-537](#)
- show parser macro command [2-539](#)
- show platform acl command [C-2](#)

- show platform backup interface command [C-3](#)
- show platform etherchannel command [C-4](#)
- show platform forward command [C-5](#)
- show platform igmp snooping command [C-7](#)
- show platform layer4op command [C-9](#)
- show platform mac-address-table command [C-10](#)
- show platform messaging command [C-11](#)
- show platform monitor command [C-12](#)
- show platform mvr table command [C-13](#)
- show platform pm command [C-14](#)
- show platform port-asic command [C-15](#)
- show platform port-security command [C-20](#)
- show platform qos command [C-21](#)
- show platform resource-manager command [C-22](#)
- show platform snmp counters command [C-24](#)
- show platform spanning-tree command [C-25](#)
- show platform stp-instance command [C-26](#)
- show platform tcam command [C-27](#)
- show platform vlan command [C-29](#)
- show policy-map command [2-542](#)
- show port security command [2-544](#)
- show proposed command [2-755](#)
- show sdm prefer command [2-547](#)
- show setup express command [2-549](#)
- show spanning-tree command [2-550](#)
- show storm-control command [2-556](#)
- show system mtu command [2-558](#)
- show trust command [2-735](#)
- show udd command [2-560](#)
- show version command [2-563](#)
- show vlan command [2-565](#)
- show vlan command, fields [2-567](#)
- show vmps command [2-569](#)
- show vtp command [2-572](#)
- shutdown command [2-629](#)
- shutdown vlan command [2-630](#)
- Smartports macros
 - See macros
- SNMP host, specifying [2-635](#)
- SNMP informs, enabling the sending of [2-631](#)
- snmp-server enable traps command [2-631](#)
- snmp-server host command [2-635](#)
- snmp trap mac-notification command [2-639](#)
- SNMP traps
 - enabling MAC address notification trap [2-639](#)
 - enabling the MAC address notification feature [2-185](#)
 - enabling the sending of [2-631](#)
- SoftPhone
 - See Cisco SoftPhone
- software images
 - deleting [2-66](#)
 - downloading [2-6](#)
 - upgrading [2-6](#)
 - uploading [2-11](#)
- software version, displaying [2-563](#)
- source ports, MVR [2-250](#)
- SPAN
 - configuring [2-242](#)
 - debug messages, display [B-24](#)
 - displaying [2-529](#)
 - filter SPAN traffic [2-242](#)
 - sessions
 - add interfaces to [2-242](#)
 - displaying [2-529](#)
 - start new [2-242](#)
- spanning-tree backbonefast command [2-641](#)
- spanning-tree bpdupfilter command [2-642](#)
- spanning-tree bpduguard command [2-644](#)
- spanning-tree cost command [2-646](#)
- spanning-tree etherchannel command [2-648](#)
- spanning-tree extend system-id command [2-650](#)
- spanning-tree guard command [2-652](#)
- spanning-tree link-type command [2-654](#)
- spanning-tree loopguard default command [2-656](#)
- spanning-tree mode command [2-658](#)
- spanning-tree mst configuration command [2-660](#)
- spanning-tree mst cost command [2-662](#)
- spanning-tree mst forward-time command [2-664](#)

spanning-tree mst hello-time command [2-665](#)
 spanning-tree mst max-age command [2-666](#)
 spanning-tree mst max-hops command [2-667](#)
 spanning-tree mst port-priority command [2-669](#)
 spanning-tree mst pre-standard command [2-671](#)
 spanning-tree mst priority command [2-672](#)
 spanning-tree mst root command [2-673](#)
 spanning-tree portfast (global configuration) command [2-677](#)
 spanning-tree portfast (interface configuration) command [2-679](#)
 spanning-tree port-priority command [2-675](#)
 Spanning Tree Protocol
 See STP
 spanning-tree transmit hold-count command [2-681](#)
 spanning-tree uplinkfast command [2-682](#)
 spanning-tree vlan command [2-684](#)
 speed command [2-687](#)
 srr-queue bandwidth limit command [2-689](#)
 srr-queue bandwidth share command [2-693](#)
 SSH, configuring version [2-162](#)
 static-access ports, configuring [2-698](#)
 statistics, Ethernet group [2-383](#)
 sticky learning, enabling [2-711](#)
 storm-control command [2-695](#)

STP

BackboneFast [2-641](#)
 counters, clearing [2-47](#)
 debug messages, display
 BackboneFast events [B-65](#)
 MSTP [B-68](#)
 optimized BPDUs handling [B-67](#)
 spanning-tree activity [B-63](#)
 switch shim [B-70](#)
 transmitted and received BPDUs [B-66](#)
 UplinkFast [B-72](#)
 detection of indirect link failures [2-641](#)
 EtherChannel misconfiguration [2-648](#)
 extended system ID [2-650](#)

STP (continued)

path cost [2-646](#)
 protocol modes [2-658](#)
 root port
 accelerating choice of new [2-682](#)
 loop guard [2-652](#)
 preventing from becoming designated [2-652](#)
 restricting which can be root [2-652](#)
 root guard [2-652](#)
 UplinkFast [2-682](#)
 root switch
 affects of extended system ID [2-650, 2-685](#)
 hello-time [2-684](#)
 interval between BDPU messages [2-684](#)
 interval between hello BPDU messages [2-684](#)
 max-age [2-684](#)
 port priority for selection of [2-675](#)
 primary or secondary [2-684](#)
 switch priority [2-684](#)
 state changes
 blocking to forwarding state [2-679](#)
 enabling BPDU filtering [2-642, 2-677](#)
 enabling BPDU guard [2-644, 2-677](#)
 enabling Port Fast [2-677, 2-679](#)
 enabling timer to recover from error state [2-104](#)
 forward-delay time [2-684](#)
 length of listening and learning states [2-684](#)
 shutting down Port Fast-enabled ports [2-677](#)
 state information display [2-550](#)
 VLAN options [2-672, 2-684](#)
 Switched Port Analyzer
 See SPAN
 switchport access command [2-698](#)
 switchport backup interface command [2-700](#)
 switchport block command [2-704](#)
 switchport host command [2-705](#)
 switchport mode command [2-706](#)
 switchport nonegotiate command [2-709](#)
 switchport port-security aging command [2-716](#)

switchport port-security command [2-711](#)
 switchport priority extend command [2-718](#)
 switchport protected command [2-720](#)
 switchports, displaying [2-453](#)
 switchport trunk command [2-722](#)
 switchport voice vlan command [2-725](#)
 system message logging, save message to flash [2-176](#)
 system mtu command [2-727](#)
 system resource templates [2-385](#)

T

tar files, creating, listing, and extracting [2-8](#)
 TDR, running [2-729](#)
 Telnet, using to communicate to cluster switches [2-275](#)
 temperature information, displaying [2-439](#)
 templates, SDM [2-385](#)
 templates, system resources [2-385](#)
 test cable-diagnostics tdr command [2-729](#)
 traceroute mac command [2-730](#)
 traceroute mac ip command [2-733](#)
 trunking, VLAN mode [2-706](#)
 trunk mode [2-706](#)
 trunk ports [2-706](#)
 trunks, to non-DTP device [2-707](#)
 trusted boundary for QoS [2-240](#)
 trusted port states for QoS [2-240](#)
 type (boot loader) command [A-22](#)

U

UDLD

aggressive mode [2-737, 2-739](#)
 debug messages, display [B-81](#)
 enable globally [2-737](#)
 enable per interface [2-739](#)
 error recovery timer [2-104](#)
 message timer [2-737](#)

UDLD (continued)

normal mode [2-737, 2-739](#)
 reset a shutdown interface [2-741](#)
 status [2-560](#)
 uddl command [2-737](#)
 uddl port command [2-739](#)
 uddl reset command [2-741](#)
 unicast storm control [2-695](#)
 UniDirectional Link Detection
 See UDLD
 unknown multicast traffic, preventing [2-704](#)
 unknown unicast traffic, preventing [2-704](#)
 unset (boot loader) command [A-23](#)
 upgrading
 software images
 downloading [2-6](#)
 monitoring status of [2-401](#)
 upgrading information
 See release notes
 UplinkFast, for STP [2-682](#)
 user EXEC mode [1-2, 1-3](#)

V

version (boot loader) command [A-25](#)
 vlan (global configuration) command [2-742](#)
 vlan (VLAN configuration) command [2-748](#)
 VLAN configuration
 rules [2-745, 2-750](#)
 saving [2-742, 2-752](#)
 VLAN configuration mode
 commands
 VLAN [2-748](#)
 VTP [2-766](#)
 description [1-5](#)
 entering [2-754](#)
 summary [1-2](#)
 vlan database command [2-754](#)
 VLAN ID range [2-742, 2-748](#)

VLAN Query Protocol

See VQP

VLANs

adding [2-742](#)

configuring [2-742, 2-748](#)

debug messages, display

ISL [B-77](#)

VLAN IOS file system error tests [B-75](#)

VLAN manager activity [B-73](#)

VTP [B-79](#)

displaying configurations [2-565](#)

enabling guest VLAN supplicant [2-73, 2-83, 2-108](#)

extended-range [2-742](#)

MAC addresses

displaying [2-513](#)

number of [2-501](#)

media types [2-744, 2-750](#)

normal-range [2-742, 2-748](#)

restarting [2-630](#)

saving the configuration [2-742](#)

shutting down [2-630](#)

SNMP traps for VTP [2-633, 2-636](#)

suspending [2-630](#)

variables [2-748](#)

VLAN Trunking Protocol

See VTP

VMPS

configuring servers [2-760](#)

displaying [2-569](#)

error recovery timer [2-104](#)

reconfirming dynamic VLAN assignments [2-757](#)

vmmps reconfirm (global configuration) command [2-758](#)

vmmps reconfirm (privileged EXEC) command [2-757](#)

vmmps retry command [2-759](#)

vmmps server command [2-760](#)

voice VLAN

configuring [2-725](#)

setting port priority [2-718](#)

VQP

and dynamic-access ports [2-699](#)

clearing client statistics [2-49](#)

displaying information [2-569](#)

per-server retry count [2-759](#)

reconfirmation interval [2-758](#)

reconfirming dynamic VLAN assignments [2-757](#)

VTP

changing characteristics [2-762](#)

clearing pruning counters [2-50](#)

configuring

domain name [2-762, 2-766](#)

file name [2-762](#)

mode [2-762, 2-766](#)

password [2-762, 2-766](#)

counters display fields [2-573](#)

displaying information [2-572](#)

enabling

pruning [2-762, 2-766](#)

Version 2 [2-762, 2-766](#)

mode [2-762, 2-766](#)

pruning [2-762, 2-766](#)

saving the configuration [2-742, 2-752](#)

statistics [2-572](#)

status [2-572](#)

status display fields [2-575](#)

vtp (global configuration) command [2-762](#)

vtp (VLAN configuration) command [2-766](#)