



INDEX

A

aaa accounting dot1x command [1](#)
aaa authentication dot1x command [3](#)
aaa authorization network command [5](#)
AAA methods [3](#)
abort command [821](#)
access control entries
 See ACEs
access control lists
 See ACLs
access groups
 IP [163](#)
 MAC, displaying [570](#)
access list, IPv6 [230](#)
access map configuration mode [301](#)
access mode [761](#)
access ports [761](#)
ACEs [93, 370](#)
ACLs
 deny [91](#)
 displaying [427](#)
 for non-IP protocols [279](#)
 IP [163](#)
 matching [301](#)
 on Layer 2 interfaces [163](#)
 permit [368](#)
action command [6](#)
address aliasing [350](#)
aggregate-port learner [356](#)
allowed VLANs [781](#)
apply command [821](#)
archive copy-sw command [8](#)

archive download-sw command [11](#)
archive tar command [15](#)
archive upload-sw command [18](#)
arp access-list command [20](#)
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 [127](#)
autonegotiation of duplex mode [141](#)
auto qos voip command [22](#)

B

BackboneFast, for STP [684](#)
backup interfaces
 configuring [755](#)
 displaying [498](#)
boot (boot loader) command [2](#)
boot auto-copy-sw command [27](#)
boot auto-download-sw command [28](#)
boot config-file command [30](#)
boot enable-break command [31](#)
boot helper command [32](#)
boot helper-config file command [33](#)
booting
 Cisco IOS image [36](#)
 displaying environment variables [437](#)
 interrupting [28, 31](#)
 manually [34](#)

boot loader

accessing [1](#)

booting

Cisco IOS image [2](#)helper image [32](#)

directories

creating [15](#)displaying a list of [7](#)removing [19](#)

displaying

available commands [12](#)memory heap utilization [13](#)version [26](#)

environment variables

described [20](#)displaying settings [20](#)location of [21](#)setting [20](#)unsetting [24](#)

files

copying [5](#)deleting [6](#)displaying a list of [7](#)displaying the contents of [4, 16, 23](#)renaming [17](#)

file system

formatting [10](#)initializing flash [9](#)running a consistency check [11](#)prompt [1](#)resetting the system [18](#)boot manual command [34](#)boot private-config-file command [35](#)boot system command [36](#)BPDU filtering, for spanning tree [685, 720](#)BPDU guard, for spanning tree [687, 720](#)broadcast storm control [741](#)**C**

candidate switches

See clusters

cat (boot loader) command [4](#)Catalyst 3750G Integrated Wireless LAN Controller Switch [418](#)CDP, enabling protocol tunneling for [258](#)channel-group command [38](#)channel-protocol command [42](#)

Cisco SoftPhone

auto-QoS configuration [22](#)trusting packets sent from [341](#)class command [43](#)class-map command [45](#)

class maps

creating [45](#)defining the match criteria [303](#)displaying [442](#)

class of service

See CoS

clear dot1x command [47](#)clear eap sessions command [48](#)clear errdisable interface [49](#)clear ip arp inspection log command [50](#)clear ip arp inspection statistics command [51](#)clear ipc command [54](#)clear ip dhcp snooping database command [52](#)clear ipv6 dhcp conflict command [55](#)clear l2protocol-tunnel counters command [56](#)clear lacp command [57](#)clear mac address-table command [58, 60](#)clear pagp command [61](#)clear port-security command [62](#)clear spanning-tree counters command [64](#)clear spanning-tree detected-protocols command [65](#)clear vmmps statistics command [66](#)clear vtp counters command [67](#)cluster commander-address command [68](#)

- cluster discovery hop-count command 70
- cluster enable command 71
- cluster holdtime command 72
- cluster member command 73
- cluster outside-interface command 75
- cluster run command 76
- clusters
 - adding candidates 73
 - binding to HSRP group 77
 - building manually 73
 - communicating with
 - devices outside the cluster 75
 - members by using Telnet 397
 - debug messages, display 5
 - displaying
 - candidate switches 445
 - debug messages 5
 - member switches 447
 - status 443
 - hop-count limit for extended discovery 70
 - HSRP standby groups 77
 - redundancy 77
 - SNMP trap 672
- cluster standby-group command 77
- cluster timer command 79
- command modes defined 2
- commands changed in Cisco IOS Release 12.2(18)SE 6
- command switch
 - See clusters
- configuration files
 - password recovery disable considerations 1
 - specifying the name 30, 35
- configuring multiple interfaces 158
- config-vlan mode
 - commands 807
 - description 4
 - entering 806
 - summary 3
- controller, wireless 418

- copy (boot loader) command 5
- CoS
 - assigning default value to incoming packets 311
 - assigning to Layer 2 protocol packets 261
 - overriding the incoming value 311
- CoS-to-DSCP map 315
- CPU ASIC statistics, displaying 449
- crashinfo files 151

D

- debug auto qos command 2
- debug backup command 4
- debug cluster command 5
- debug dot1x command 7
- debug dtp command 9
- debug eap command 10
- debug etherchannel command 11
- debug ilpower command 13
- debug interface command 14
- debug ip dhcp snooping command 16
- debug ip igmp filter command 18
- debug ip igmp max-groups command 19
- debug ip igmp snooping command 20
- debug ip verify source packet command 17
- debug lacp command 21
- debug mac-notification command 22
- debug matm command 23
- debug matm move update command 24
- debug monitor command 25
- debug mvrdbg command 27
- debug nvram command 28
- debug pagp command 29
- debug platform acl command 30
- debug platform backup interface command 31
- debug platform cli-redirection main command 32
- debug platform configuration command 33, 41
- debug platform cpu-queues command 34
- debug platform device-manager command 36

- debug platform dot1x command [37](#)
- debug platform etherchannel command [38](#)
- debug platform fallback-bridging command [39](#)
- debug platform forw-tcam command [40](#)
- debug platform ip arp inspection command [43](#)
- debug platform ipc command [52](#)
- debug platform ip dhcp command [44](#)
- debug platform ip igmp snooping command [45](#)
- debug platform ip multicast command [47](#)
- debug platform ip unicast command [49](#)
- debug platform ip wccp command [51](#)
- debug platform led command [53](#)
- debug platform matm command [54](#)
- debug platform messaging application command [56](#)
- debug platform phy command [57](#)
- debug platform pm command [59](#)
- debug platform port-asic command [61](#)
- debug platform port-security command [62](#)
- debug platform qos-acl-tcam command [63](#)
- debug platform remote-commands command [64](#)
- debug platform resource-manager command [65](#)
- debug platform snmp command [66](#)
- debug platform span command [67](#)
- debug platform stack-manager command [68](#)
- debug platform supervisor-asic command [69](#)
- debug platform sw-bridge command [70](#)
- debug platform tcam command [71](#)
- debug platform udld command [74](#)
- debug platform vlan command [75](#)
- debug platform wireless-controller [101](#)
- debug pm command [76](#)
- debug port-security command [78](#)
- debug qos-manager command [79](#)
- debug spanning-tree backbonefast command [82](#)
- debug spanning-tree bpdu command [83](#)
- debug spanning-tree bpdu-opt command [84](#)
- debug spanning-tree command [80](#)
- debug spanning-tree mstp command [85](#)
- debug spanning-tree switch command [87](#)
- debug spanning-tree uplinkfast command [89](#)
- debug sw-vlan command [90](#)
- debug sw-vlan ifs command [92](#)
- debug sw-vlan notification command [94](#)
- debug sw-vlan vtp command [96](#)
- debug udld command [98](#)
- debug vqpc command [100](#)
- define interface-range command [81](#)
- delete (boot loader) command [6](#)
- delete command [83](#)
- deny (ARP access-list configuration) command [84](#)
- deny (IPv6) command [86](#)
- deny command [91](#)
- detect mechanism, causes [142](#)
- DHCP snooping
 - accepting untrusted packets from edge switch [191](#)
 - enabling
 - on a VLAN [198](#)
 - option 82 [189, 191](#)
 - trust on an interface [196](#)
 - error recovery timer [148](#)
 - rate limiting [195](#)
- DHCP snooping binding database
 - binding file, configuring [187](#)
 - bindings
 - adding [185](#)
 - deleting [185](#)
 - displaying [519](#)
 - clearing database agent statistics [52](#)
 - database agent, configuring [187](#)
 - displaying
 - binding entries [519](#)
 - database agent status [522, 524](#)
 - renewing [405](#)
- dir (boot loader) command [7](#)
- directories, deleting [83](#)
- domain name, VTP [832, 836](#)
- dot1x auth-fail max-attempts [103](#)
- dot1x auth-fail vlan [105](#)

- dot1x command [101](#)
- dot1x control-direction command [107](#)
- dot1x critical global configuration command [109](#)
- dot1x critical interface configuration command [111](#)
- dot1x default command [113](#)
- dot1x fallback command [114](#)
- dot1x guest-vlan command [115](#)
- dot1x host-mode command [118](#)
- dot1x initialize command [120](#)
- dot1x mac-auth-bypass command [121](#)
- dot1x max-reauth-req command [123](#)
- dot1x max-req command [124](#)
- dot1x multiple-hosts command [125](#)
- dot1x pae command [126](#)
- dot1x port-control command [127](#)
- dot1x re-authenticate command [129](#)
- dot1x re-authentication command [130](#)
- dot1x reauthentication command [131](#)
- dot1x test eapol-capable command [132](#)
- dot1x test timeout command [133](#)
- dot1x timeout command [134](#)
- dot1x violation-mode command [138](#)
- dropping packets, with ACL matches [6](#)
- drop threshold, Layer 2 protocol tunneling [258](#)
- DSCP-to-CoS map [315](#)
- DSCP-to-DSCP-mutation map [315](#)
- DTP [762](#)
- DTP flap
 - error detection for [142](#)
 - error recovery timer [148](#)
- DTP negotiation [766](#)
- duplex command [140](#)
- dynamic-access ports
 - configuring [751](#)
 - restrictions [752](#)
- dynamic ARP inspection
 - ARP ACLs
 - apply to a VLAN [171](#)
 - define [20](#)
 - deny packets [84](#)
 - display [431](#)
 - permit packets [360](#)
 - clear
 - log buffer [50](#)
 - statistics [51](#)
 - display
 - ARP ACLs [431](#)
 - configuration and operating state [514](#)
 - log buffer [514](#)
 - statistics [514](#)
 - trust state and rate limit [514](#)
 - enable per VLAN [181](#)
 - error detection for [142](#)
 - error recovery timer [148](#)
 - log buffer
 - clear [50](#)
 - configure [175](#)
 - display [514](#)
 - rate-limit incoming ARP packets [173](#)
 - statistics
 - clear [51](#)
 - display [514](#)
 - trusted interface state [177](#)
 - type of packet logged [182](#)
 - validation checks [179](#)
- dynamic auto VLAN membership mode [761](#)
- dynamic desirable VLAN membership mode [761](#)
- Dynamic Host Configuration Protocol (DHCP)
 - See DHCP snooping
- Dynamic Trunking Protocol
 - See DTP

E

EAP-request/identity frame

- maximum number to send [124](#)
- response time before retransmitting [134](#)

encapsulation methods [781](#)

environment variables, displaying [437](#)

errdisable detect cause command [142](#)

errdisable detect cause small-frame comand [145](#)

errdisable recovery cause small-frame [147](#)

errdisable recovery command [148](#)

error conditions, displaying [484](#)

error disable detection [142](#)

error-disabled interfaces, displaying [498](#)

EtherChannel

assigning Ethernet interface to channel group [38](#)

creating port-channel logical interface [156](#)

debug EtherChannel/PAgP, display [11](#)

debug platform-specific events, display [38](#)

displaying [488](#)

enabling Layer 2 protocol tunneling for

LACP [259](#)

PAgP [259](#)

UDLD [259](#)

interface information, displaying [498](#)

LACP

clearing channel-group information [57](#)

debug messages, display [21](#)

displaying [561](#)

modes [38](#)

port priority for hot-standby ports [262](#)

restricting a protocol [42](#)

system priority [264](#)

load-distribution methods [378](#)

PAgP

aggregate-port learner [356](#)

clearing channel-group information [61](#)

debug messages, display [29](#)

displaying [616](#)

error detection for [142](#)

error recovery timer [148](#)

learn method [356](#)

modes [38](#)

physical-port learner [356](#)

priority of interface for transmitted traffic [358](#)

Ethernet controller, internal register display [451](#)

Ethernet statistics, collecting [407](#)

exception crashinfo command [151](#)

exit command [821](#)

extended discovery of candidate switches [70](#)

extended-range VLANs

and allowed VLAN list [781](#)

and pruning-eligible list [781](#)

configuring [806](#)

extended system ID for STP [693](#)

F

fallback profile command [152](#)

fallback profiles, displaying [491](#)

fan information, displaying [479](#)

file name, VTP [832](#)

files, deleting [83](#)

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

Flex Links

configuring [755](#)

configuring preferred VLAN [758](#)

displaying [498](#)

flowcontrol command [154](#)

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

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

forwarding results, display [6](#)

frame forwarding information, displaying [6](#)

front-end controller, counter and status information [8](#)

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

G

global configuration mode [2, 4](#)

H

hardware ACL statistics [427](#)

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

hierarchical policy maps [376](#)

hop-count limit for clusters [70](#)

host connection, port configuration [760](#)

host ports, private VLANs [764](#)

Hot Standby Router Protocol

See HSRP

HSRP

binding HSRP group to cluster [77](#)

standby group [77](#)

I

IEEE 802.1Q trunk ports and native VLANs [823](#)

IEEE 802.1Q tunnel ports

configuring [761](#)

displaying [468](#)

limitations [762](#)

IEEE 802.1x

and switchport modes [762](#)

violation error recovery [148](#)

See also port-based authentication

IEEE 802.1X Port Based Authentication

enabling guest VLAN supplicant [104, 114, 153](#)

IGMP filters

applying [201](#)

debug messages, display [18](#)

IGMP groups, setting maximum [203](#)

IGMP maximum groups, debugging [19](#)

IGMP profiles

creating [205](#)

displaying [527](#)

IGMP snooping

adding ports as a static member of a group [222](#)

displaying [528, 533, 535](#)

enabling [207](#)

enabling the configurable-leave timer [209](#)

enabling the Immediate-Leave feature [218](#)

flooding query count [215](#)

interface topology change notification behavior [217](#)

multicast table [6, 531](#)

querier [211](#)

query solicitation [215](#)

report suppression [213](#)

switch topology change notification behavior [215](#)

images

See software images

Immediate-Leave feature, MVR [352](#)

immediate-leave processing [218](#)

Immediate-Leave processing, IPv6 [254](#)

interface configuration mode [2, 4](#)

interface port-channel command [156](#)

interface range command [158](#)

interface-range macros [81](#)

interfaces

assigning Ethernet interface to channel group [38](#)

configuring [140](#)

configuring multiple [158](#)

creating port-channel logical [156](#)

debug messages, display [14](#)

disabling [667](#)

displaying the MAC address table [582](#)

restarting [667](#)

interface speed, configuring [730](#)

interface vlan command [161](#)

internal registers, displaying [451, 461](#)

Internet Group Management Protocol

See IGMP

invalid GBIC

error detection for [142](#)

error recovery timer [148](#)

- ip access-group command [163](#)
- ip address command [166](#)
- IP addresses, setting [166](#)
- IP address matching [301](#)
- ip admission command [168](#)
- ip admission name proxy http command [169](#)
- ip arp inspection filter vlan command [171](#)
- ip arp inspection limit command [173](#)
- ip arp inspection log-buffer command [175](#)
- ip arp inspection trust command [177](#)
- ip arp inspection validate command [179](#)
- ip arp inspection vlan command [181](#)
- ip arp inspection vlan logging command [182](#)
- IP DHCP snooping
 - See DHCP snooping
- ip dhcp snooping binding command [185](#)
- ip dhcp snooping command [184](#)
- ip dhcp snooping database command [187](#)
- ip dhcp snooping information option allow-untrusted command [191](#)
- ip dhcp snooping information option command [189](#)
- ip dhcp snooping information option format remote-id command [193](#)
- ip dhcp snooping limit rate command [195](#)
- ip dhcp snooping trust command [196](#)
- ip dhcp snooping verify command [197](#)
- ip dhcp snooping vlan command [198](#)
- ip dhcp snooping vlan information option format-type circuit-id string command [199](#)
- ip igmp filter command [201](#)
- ip igmp max-groups command [203](#)
- ip igmp profile command [205](#)
- ip igmp snooping command [207](#)
- ip igmp snooping last-member-query-interval command [209](#)
- ip igmp snooping querier command [211](#)
- ip igmp snooping report-suppression command [213](#)
- ip igmp snooping tcn command [215](#)
- ip igmp snooping tcn flood command [217](#)
- ip igmp snooping vlan immediate-leave command [218](#)
- ip igmp snooping vlan mrouter command [220](#)
- ip igmp snooping vlan static command [222](#)
- IP multicast addresses [349](#)
- IP phones
 - auto-QoS configuration [22](#)
 - trusting packets sent from [341](#)
- IP-precedence-to-DSCP map [315](#)
- ip snap forwarding command [224](#)
- ip source binding command [225](#)
- IP source guard
 - disabling [229](#)
 - displaying
 - binding entries [537](#)
 - configuration [539](#)
 - dynamic binding entries only [519](#)
 - enabling [229](#)
 - static IP source bindings [225](#)
- ip ssh command [227](#)
- IPv6 access list, deny conditions [86](#)
- ipv6 access-list command [230](#)
- ipv6 address dhcp command [233](#)
- ipv6 dhcp client request vendor command [234](#)
- ipv6 dhcp ping packets command [235](#)
- ipv6 dhcp pool command [237](#)
- ipv6 dhcp server command [240](#)
- ipv6 mld snooping command [242](#)
- ipv6 mld snooping last-listener-query count command [244](#)
- ipv6 mld snooping last-listener-query-interval command [246](#)
- ipv6 mld snooping listener-message-suppression command [248](#)
- ipv6 mld snooping robustness-variable command [250](#)
- ipv6 mld snooping tcn command [252](#)
- ipv6 mld snooping vlan command [254](#)
- IPv6 SDM template [408](#)
- ipv6 traffic-filter command [256](#)
- ip verify source command [229](#)

J

jumbo frames

See MTU

L

l2protocol-tunnel command [258](#)

l2protocol-tunnel cos command [261](#)

LACP

See EtherChannel

lacp port-priority command [262](#)

lacp system-priority command [264](#)

Layer 2 mode, enabling [749](#)

Layer 2 protocol ports, displaying [558](#)

Layer 2 protocol-tunnel

error detection for [142](#)

error recovery timer [148](#)

Layer 2 protocol tunnel counters [56](#)

Layer 2 protocol tunneling error recovery [259](#)

Layer 2 traceroute

IP addresses [797](#)

MAC addresses [794](#)

Layer 3 mode, enabling [749](#)

line configuration mode [3, 5](#)

Link Aggregation Control Protocol

See EtherChannel

link flap

error detection for [142](#)

error recovery timer [148](#)

link state group command [270](#)

link state track command [272](#)

load-distribution methods for EtherChannel [378](#)

location (global configuration) command [266](#)

location (interface configuration) command [268](#)

logging event command [273](#)

logging event power-inline-status command [274](#)

logging file command [275](#)

logical interface [156](#)

loopback error

detection for [142](#)

recovery timer [148](#)

loop guard, for spanning tree [695, 699](#)

M

mac access-group command [277](#)

MAC access-groups, displaying [570](#)

MAC access list configuration mode [279](#)

mac access-list extended command [279](#)

MAC access lists [91](#)

MAC addresses

disabling MAC address learning per VLAN [282](#)

displaying

aging time [576](#)

all [574](#)

dynamic [580](#)

MAC address-table move updates [585](#)

notification settings [584, 587](#)

number of addresses in a VLAN [578](#)

per interface [582](#)

per VLAN [591](#)

static [589](#)

static and dynamic entries [572](#)

dynamic

aging time [281](#)

deleting [58](#)

displaying [580](#)

enabling MAC address notification [286](#)

enabling MAC address-table move update [284](#)

matching [301](#)

persistent stack [738](#)

static

adding and removing [288](#)

displaying [589](#)

dropping on an interface [289](#)

tables [574](#)

MAC address notification, debugging [22](#)

- mac address-table aging-time [277, 301](#)
- mac address-table aging-time command [281](#)
- mac address-table learning command [282](#)
- mac address-table move update command [284](#)
- mac address-table notification command [286](#)
- mac address-table static command [288](#)
- mac address-table static drop command [289](#)
- macro apply command [291](#)
- macro description command [294](#)
- macro global command [295](#)
- macro global description command [298](#)
- macro name command [299](#)
- macros
 - adding a description [294](#)
 - adding a global description [298](#)
 - applying [295](#)
 - creating [299](#)
 - displaying [618](#)
 - interface range [81, 158](#)
 - specifying parameter values [295](#)
 - tracing [295](#)
- maps
 - QoS
 - defining [315](#)
 - displaying [601](#)
 - VLAN
 - creating [818](#)
 - defining [301](#)
 - displaying [656](#)
- match (access-map configuration) command [301](#)
- match (class-map configuration) command [303](#)
- maximum transmission unit
 - See MTU
- mdix auto command [305](#)
- member switches
 - See clusters
- memory (boot loader) command [13](#)
- mkdir (boot loader) command [15](#)
- MLD snooping
 - configuring [248, 250](#)
 - configuring queries [244, 246](#)
 - configuring topology change notification [252](#)
 - displaying [548, 550, 552, 554](#)
 - enabling [242](#)
- MLD snooping on a VLAN, enabling [254](#)
- mls qos aggregate-policer command [309](#)
- mls qos command [307](#)
- mls qos cos command [311](#)
- mls qos dscp-mutation command [313](#)
- mls qos map command [315](#)
- mls qos queue-set output buffers command [319](#)
- mls qos queue-set output threshold command [321](#)
- mls qos rewrite ip dscp command [323](#)
- mls qos srr-queue input bandwidth command [325](#)
- mls qos srr-queue input buffers command [327](#)
- mls qos srr-queue input cos-map command [329](#)
- mls qos srr-queue input dscp-map command [331](#)
- mls qos srr-queue input priority-queue command [333](#)
- mls qos srr-queue input threshold command [335](#)
- mls qos srr-queue output cos-map command [337](#)
- mls qos srr-queue output dscp-map command [339](#)
- mls qos trust command [341](#)
- mls qos vlan-based command [343](#)
- mode, MVR [349](#)
- Mode button, and password recovery [412](#)
- modes, commands [2](#)
- monitor session command [344](#)
- more (boot loader) command [16](#)
- MSTP
 - displaying [634](#)
 - interoperability [65](#)
 - link type [697](#)
 - MST region
 - aborting changes [703](#)
 - applying changes [703](#)
 - configuration name [703](#)
 - configuration revision number [703](#)

- current or pending display [703](#)
- displaying [634](#)
- MST configuration mode [703](#)
- VLANs-to-instance mapping [703](#)
- path cost [705](#)
- protocol mode [701](#)
- restart protocol migration process [65](#)
- root port
 - loop guard [695](#)
 - preventing from becoming designated [695](#)
 - restricting which can be root [695](#)
 - root guard [695](#)
- root switch
 - affects of extended system ID [693](#)
 - hello-time [708, 716](#)
 - interval between BPDU messages [709](#)
 - interval between hello BPDU messages [708, 716](#)
 - max-age [709](#)
 - maximum hop count before discarding BPDU [710](#)
 - port priority for selection of [712](#)
 - primary or secondary [716](#)
 - switch priority [715](#)
- state changes
 - blocking to forwarding state [722](#)
 - enabling BPDU filtering [685, 720](#)
 - enabling BPDU guard [687, 720](#)
 - enabling Port Fast [720, 722](#)
 - forward-delay time [707](#)
 - length of listening and learning states [707](#)
 - rapid transition to forwarding [697](#)
 - shutting down Port Fast-enabled ports [720](#)
- state information display [633](#)
- MTU
 - configuring size [790](#)
 - displaying global setting [645](#)
- Multicast Listener Discovery
 - See MLD
- multicast group address, MVR [352](#)

- multicast groups, MVR [350](#)
- Multicast Listener Discovery
 - See MLD
- multicast router learning method [220](#)
- multicast router ports, configuring [220](#)
- multicast router ports, IPv6 [254](#)
- multicast storm control [741](#)
- multicast VLAN, MVR [349](#)
- multicast VLAN registration
 - See MVR
- Multiple Spanning Tree Protocol
 - See MSTP
- MVR
 - and address aliasing [350](#)
 - configuring [349](#)
 - configuring interfaces [352](#)
 - debug messages, display [27](#)
 - displaying [610](#)
 - displaying interface information [612](#)
 - members, displaying [614](#)
- mvr (global configuration) command [349](#)
- mvr (interface configuration) command [352](#)
- mvr vlan group command [353](#)

N

- native VLANs [781](#)
- native VLAN tagging [823](#)
- Network Admission Control Software Configuration Guide [168, 170](#)
- nonegotiate, speed [730](#)
- nonegotiating DTP messaging [766](#)
- non-IP protocols
 - denying [91](#)
 - forwarding [368](#)
- non-IP traffic access lists [279](#)
- non-IP traffic forwarding
 - denying [91](#)
 - permitting [368](#)

non-stop forwarding [355](#)
 normal-range VLANs [806, 812](#)
 no vlan command [806, 816](#)
 nsf command [355](#)

O

online diagnostics

displaying

configured boot-up coverage level [465](#)
 current scheduled tasks [465](#)
 event logs [465](#)
 supported test suites [465](#)
 test ID [465](#)
 test results [465](#)
 test statistics [465](#)

global configuration mode

clearing health monitoring diagnostic test
 schedule [50](#)
 clearing test-based testing schedule [97](#)
 setting health monitoring diagnostic testing [50](#)
 setting test-based testing [97](#)
 setting up health monitoring diagnostic test
 schedule [50](#)
 setting up test-based testing [97](#)

health monitoring diagnostic tests, configuring [94](#)

scheduled switchover

disabling [97](#)
 enabling [97](#)

scheduling

enabling [97](#)
 removing [97](#)

testing, starting [99](#)

test interval, setting [97](#)

pagp learn-method command [356](#)

pagp port-priority command [358](#)

password, VTP [832, 836](#)

password-recovery mechanism, enabling and
 disabling [412](#)

permit (ARP access-list configuration) command [360](#)

permit (IPv6) command [362](#)

permit (MAC access-list configuration) command [368](#)

per-VLAN spanning-tree plus

See STP

physical-port learner [356](#)

PID, displaying [513](#)

PIM-DVMRP, as multicast router learning method [220](#)

PoE

configuring the power budget [383](#)

configuring the power management mode [380](#)

displaying controller register values [459](#)

displaying power management information [626](#)

logging of status [274](#)

police aggregate command [373](#)

police command [371](#)

policed-DSCP map [315](#)

policy-map command [375](#)

policy maps

applying to an interface [414, 422](#)

creating [375](#)

displaying [621](#)

hierarchical [376](#)

policers

displaying [594](#)

for a single class [371](#)

for multiple classes [309, 373](#)

policed-DSCP map [315](#)

traffic classification

defining the class [43](#)

defining trust states [799](#)

setting DSCP or IP precedence values [420](#)

Port Aggregation Protocol

See EtherChannel

P

PAgP

See EtherChannel

- port-based authentication
 - AAA method list [3](#)
 - configuring violation modes [138](#)
 - debug messages, display [7](#)
 - enabling IEEE 802.1x
 - globally [101](#)
 - per interface [127](#)
 - guest VLAN [115](#)
 - host modes [118](#)
 - IEEE 802.1x AAA accounting methods [1](#)
 - initialize an interface [120, 133](#)
 - MAC authentication bypass [121](#)
 - manual control of authorization state [127](#)
 - PAE as authenticator [126](#)
 - periodic re-authentication
 - enabling [131](#)
 - time between attempts [134](#)
 - quiet period between failed authentication exchanges [134](#)
 - re-authenticating IEEE 802.1x-enabled ports [129](#)
 - resetting configurable IEEE 802.1x parameters [113](#)
 - switch-to-authentication server retransmission time [134](#)
 - switch-to-client frame-retransmission number [123 to 124](#)
 - switch-to-client retransmission time [134](#)
 - test for IEEE 802.1x readiness [132](#)
 - port-channel load-balance command [378](#)
 - Port Fast, for spanning tree [722](#)
 - port ranges, defining [81](#)
 - ports, debugging [76](#)
 - ports, protected [779](#)
 - port security
 - aging [773](#)
 - debug messages, display [78](#)
 - enabling [768](#)
 - violation error recovery [148](#)
 - port trust states for QoS [341](#)
 - port types, MVR [352](#)
 - power information, displaying [479](#)
 - power inline command [380](#)
 - power inline consumption command [383](#)
 - Power over Ethernet
 - See PoE
 - priority-queue command [385](#)
 - priority value, stack member [641, 744](#)
 - private-vlan command [387](#)
 - private-vlan mapping command [390](#)
 - private VLANs
 - association [777](#)
 - configuring [387](#)
 - configuring ports [764](#)
 - displaying [651](#)
 - host ports [764](#)
 - mapping
 - configuring [777](#)
 - displaying [498](#)
 - promiscuous ports [764](#)
 - privileged EXEC mode [2, 3](#)
 - product identification information, displaying [513](#)
 - promiscuous ports, private VLANs [764](#)
 - protected ports, displaying [504](#)
 - pruning
 - VLANs [781](#)
 - VTP
 - displaying interface information [498](#)
 - enabling [832, 836](#)
 - pruning-eligible VLAN list [783](#)
 - PVST+
 - See STP
-
- ## Q
- QoS
 - auto-QoS
 - configuring [22](#)
 - debug messages, display [6, 2](#)
 - displaying [432](#)
 - class maps

- creating 45
- defining the match criteria 303
- displaying 442
- defining the CoS value for an incoming packet 311
- displaying configuration information 432, 593
- DSCP transparency 323
- DSCP trusted ports
 - applying DSCP-to-DSCP-mutation map to 313
 - defining DSCP-to-DSCP-mutation map 315
- egress queues
 - allocating buffers 319
 - defining the CoS output queue threshold map 337
 - defining the DSCP output queue threshold map 339
 - displaying buffer allocations 597
 - displaying CoS output queue threshold map 601
 - displaying DSCP output queue threshold map 601
 - displaying queueing strategy 597
 - displaying queue-set settings 604
 - enabling bandwidth shaping and scheduling 734
 - enabling bandwidth sharing and scheduling 736
 - limiting the maximum output on a port 732
 - mapping a port to a queue-set 392
 - mapping CoS values to a queue and threshold 337
 - mapping DSCP values to a queue and threshold 339
 - setting maximum and reserved memory allocations 321
 - setting WTD thresholds 321
- enabling 307
- ingress queues
 - allocating buffers 327
 - assigning SRR scheduling weights 325
 - defining the CoS input queue threshold map 329
 - defining the DSCP input queue threshold map 331
 - displaying buffer allocations 597
 - displaying CoS input queue threshold map 601
 - displaying DSCP input queue threshold map 601
 - displaying queueing strategy 597
 - displaying settings for 595
 - enabling the priority queue 333
 - mapping CoS values to a queue and threshold 329
 - mapping DSCP values to a queue and threshold 331
 - setting WTD thresholds 335
- maps
 - defining 315, 329, 331, 337, 339
 - displaying 601
- policy maps
 - applying an aggregate policer 373
 - applying to an interface 414, 422
 - creating 375
 - defining policers 309, 371
 - displaying policers 594
 - displaying policy maps 621
 - hierarchical 376
 - policed-DSCP map 315
 - setting DSCP or IP precedence values 420
 - traffic classifications 43
 - trust states 799
- port trust states 341
- queues, enabling the expedite 385
- statistics
 - in-profile and out-of-profile packets 597
 - packets enqueued or dropped 597
 - sent and received CoS values 597
 - sent and received DSCP values 597
- trusted boundary for IP phones 341
- VLAN-based 343
- quality of service
 - See QoS
- querytime, MVR 349
- queue-set command 392

R

radius-server dead-criteria command [393](#)
radius-server host command [395](#)
rapid per-VLAN spanning-tree plus
 See STP
rapid PVST+
 See STP
rcommand command [397](#)
re-authenticating IEEE 802.1x-enabled ports [129](#)
re-authentication
 periodic [131](#)
 time between attempts [134](#)
receiver ports, MVR [352](#)
receiving flow-control packets [154](#)
recovery mechanism
 causes [148](#)
 display [49](#), [439](#), [482](#), [486](#)
 timer interval [149](#)
redundancy for cluster switches [77](#)
reload command [399](#)
remote command [401](#)
remote-span command [403](#)
Remote Switched Port Analyzer
 See RSPAN
rename (boot loader) command [17](#)
renew ip dhcp snooping database command [405](#)
reset (boot loader) command [18](#)
reset command [821](#)
resource templates, displaying [629](#)
restricted VLAN
 See dot1x auth-fail vlan
rmdir (boot loader) command [19](#)
rmon collection stats command [407](#)
root guard, for spanning tree [695](#)
routed ports
 IP addresses on [167](#)
 number supported [167](#)

RSPAN

configuring [344](#)
displaying [607](#)
filter RSPAN traffic [344](#)
remote-span command [403](#)
sessions
 displaying [607](#)

S

scheduled switchover
 disabling [97](#)
 enabling [97](#)
SDM mismatch mode [409](#), [642](#)
sdm prefer command [408](#)
SDM templates
 allowed resources [410](#)
 and stacking [409](#)
 displaying [629](#)
 dual IPv4 and IPv6 [408](#)
secure ports, limitations [770](#)
sending flow-control packets [154](#)
service password-recovery command [412](#)
service-policy command [414](#)
session command [418](#)
set (boot loader) command [20](#)
set command [420](#)
setup command [422](#)
setup express command [425](#)
show access-lists command [427](#)
show archive status command [430](#)
show arp access-list command [431](#)
show auto qos command [432](#)
show boot command [437](#)
show cable-diagnostics tdr command [439](#)
show changes command [821](#)
show class-map command [442](#)
show cluster candidates command [445](#)
show cluster command [443](#)

- show cluster members command 447
- show controllers cpu-interface command 449
- show controllers ethernet-controller command 451
- show controllers power inline command 459
- show controllers tcam command 461
- show controller utilization command 463
- show current command 821
- show dot1q-tunnel command 468
- show dot1x command 469
- show dtp 474
- show eap command 476
- show env command 479
- show errdisable detect command 482
- show errdisable flap-values command 484
- show errdisable recovery command 486
- show etherchannel command 488
- show facility-alarm status 491
- show fallback profile command 491
- show flowcontrol command 493
- show idprom command 495
- show interfaces command 498
- show interfaces counters command 510
- show inventory command 513
- show ip arp inspection command 514
- show ipc command 541
- show ip dhcp snooping binding command 519
- show ip dhcp snooping command 518
- show ip dhcp snooping database command 522, 524
- show ip igmp profile command 527
- show ip igmp snooping address command 550
- show ip igmp snooping command 528, 548
- show ip igmp snooping groups command 531
- show ip igmp snooping mrouter command 533, 552
- show ip igmp snooping querier command 535, 554
- show ip source binding command 537
- show ipv6 access-list command 545
- show ipv6 dhcp conflict command 547
- show ipv6 route updated 556
- show ip verify source command 539
- show l2protocol-tunnel command 558
- show lacp command 561
- show link state group command 568
- show location 565
- show mac access-group command 570
- show mac address-table address command 574
- show mac address-table aging time command 576
- show mac address-table command 572
- show mac address-table count command 578
- show mac address-table dynamic command 580
- show mac address-table interface command 582
- show mac address-table learning command 584
- show mac address-table move update command 585
- show mac address-table notification command 60, 587, 24
- show mac address-table static command 589
- show mac address-table vlan command 591
- show mls qos aggregate-policer command 594
- show mls qos command 593
- show mls qos input-queue command 595
- show mls qos interface command 597
- show mls qos maps command 601
- show mls qos queue-set command 604
- show mls qos vlan command 606
- show monitor command 607
- show mvr command 610
- show mvr interface command 612
- show mvr members command 614
- show pagp command 616
- show parser macro command 618
- show platform acl command 2
- show platform backup interface command 3
- show platform configuration command 4
- show platform etherchannel command 5
- show platform forward command 6
- show platform frontend-controller command 8
- show platform igmp snooping command 9
- show platform ipc trace command 17
- show platform ip multicast command 11
- show platform ip unicast command 12

- show platform ipv6 unicast command [18](#)
- show platform ip wccp command [16](#)
- show platform layer4op command [20](#)
- show platform mac-address-table command [21](#)
- show platform messaging command [22](#)
- show platform monitor command [23](#)
- show platform mvr table command [24](#)
- show platform pm command [25](#)
- show platform port-asic command [26](#)
- show platform port-security command [31](#)
- show platform qos command [32](#)
- show platform resource-manager command [33](#)
- show platform snmp counters command [35](#)
- show platform spanning-tree command [36](#)
- show platform stack-manager command [38](#)
- show platform stp-instance command [37](#)
- show platform tb command [40](#)
- show platform tcam command [42](#)
- show platform vlan command [45](#)
- show policy-map command [621](#)
- show port security command [623](#)
- show power inline command [626](#)
- show proposed command [821](#)
- show sdm prefer command [629](#)
- show setup express command [632](#)
- show spanning-tree command [633](#)
- show storm-control command [639](#)
- show switch command [641](#)
- show system mtu command [645](#)
- show trust command [799](#)
- show udd command [646](#)
- show version command [649](#)
- show vlan access-map command [656](#)
- show vlan command [651](#)
- show vlan command, fields [653](#)
- show vlan filter command [658](#)
- show vmps command [659](#)
- show vtp command [662](#)
- shutdown command [667](#)
- shutdown threshold, Layer 2 protocol tunneling [258](#)
- shutdown vlan command [669](#)
- small violation-rate command [670](#)
- Smartports macros
 - See macros
- SNMP host, specifying [677](#)
- SNMP informs, enabling the sending of [672](#)
- snmp-server enable traps command [672](#)
- snmp-server host command [677](#)
- snmp trap mac-notification command [682](#)
- SNMP traps
 - enabling MAC address notification trap [682](#)
 - enabling the MAC address notification feature [286](#)
 - enabling the sending of [672](#)
- SoftPhone
 - See Cisco SoftPhone
- software images
 - copying [8](#)
 - deleting [83](#)
 - downloading [11](#)
 - upgrading [8, 11](#)
 - uploading [18](#)
- software version, displaying [649](#)
- source ports, MVR [352](#)
- SPAN
 - configuring [344](#)
 - debug messages, display [25](#)
 - displaying [607](#)
 - filter SPAN traffic [344](#)
 - sessions
 - add interfaces to [344](#)
 - displaying [607](#)
 - start new [344](#)
- spanning-tree backbonefast command [684](#)
- spanning-tree bpduguard command [685](#)
- spanning-tree bpduguard command [687](#)
- spanning-tree cost command [689](#)
- spanning-tree etherchannel command [691](#)
- spanning-tree extend system-id command [693](#)

- spanning-tree guard command [695](#)
- spanning-tree link-type command [697](#)
- spanning-tree loopguard default command [699](#)
- spanning-tree mode command [701](#)
- spanning-tree mst configuration command [703](#)
- spanning-tree mst cost command [705](#)
- spanning-tree mst forward-time command [707](#)
- spanning-tree mst hello-time command [708](#)
- spanning-tree mst max-age command [709](#)
- spanning-tree mst max-hops command [710](#)
- spanning-tree mst port-priority command [712](#)
- spanning-tree mst pre-standard command [714](#)
- spanning-tree mst priority command [715](#)
- spanning-tree mst root command [716](#)
- spanning-tree portfast (global configuration) command [720](#)
- spanning-tree portfast (interface configuration) command [722](#)
- spanning-tree port-priority command [718](#)
- Spanning Tree Protocol
 - See STP
- spanning-tree transmit hold-count command [724](#)
- spanning-tree uplinkfast command [725](#)
- spanning-tree vlan command [727](#)
- speed command [730](#)
- srr-queue bandwidth limit command [732](#)
- srr-queue bandwidth share command [736](#)
- SSH, configuring version [227](#)
- stack-mac persistent timer command [738](#)
- stack member
 - access [418](#)
 - number [641, 747](#)
 - priority value [744](#)
 - provisioning [745](#)
 - reloading [399](#)
- stacks, switch
 - MAC address [738](#)
 - provisioning a new member [745](#)
 - reloading [399](#)
 - stack member access [418](#)
 - stack member number [641, 747](#)
 - stack member priority value [641, 744](#)
- static-access ports, configuring [751](#)
- statistics, Ethernet group [407](#)
- sticky learning, enabling [768](#)
- storm-control command [741](#)
- STP
 - BackboneFast [684](#)
 - counters, clearing [64](#)
 - debug messages, display
 - BackboneFast events [82](#)
 - MSTP [85](#)
 - optimized BPDUs handling [84](#)
 - spanning-tree activity [80](#)
 - switch shim [87](#)
 - transmitted and received BPDUs [83](#)
 - UplinkFast [89](#)
 - detection of indirect link failures [684](#)
 - enabling protocol tunneling for [258](#)
 - EtherChannel misconfiguration [691](#)
 - extended system ID [693](#)
 - path cost [689](#)
 - protocol modes [701](#)
 - root port
 - accelerating choice of new [725](#)
 - loop guard [695](#)
 - preventing from becoming designated [695](#)
 - restricting which can be root [695](#)
 - root guard [695](#)
 - UplinkFast [725](#)

- root switch
 - affects of extended system ID [693, 728](#)
 - hello-time [727](#)
 - interval between BPDU messages [727](#)
 - interval between hello BPDU messages [727](#)
 - max-age [727](#)
 - port priority for selection of [718](#)
 - primary or secondary [727](#)
 - switch priority [727](#)
- state changes
 - blocking to forwarding state [722](#)
 - enabling BPDU filtering [685, 720](#)
 - enabling BPDU guard [687, 720](#)
 - enabling Port Fast [720, 722](#)
 - enabling timer to recover from error state [148](#)
 - forward-delay time [727](#)
 - length of listening and learning states [727](#)
 - shutting down Port Fast-enabled ports [720](#)
- state information display [633](#)
- VLAN options [715, 727](#)
- SVIs, creating [161](#)
- SVI status calculation [753](#)
- Switched Port Analyzer
 - See SPAN
- switching characteristics
 - modifying [749](#)
 - returning to interfaces [749](#)
- switchport access command [751](#)
- switchport autostate exclude command [753](#)
- switchport backup interface command [755](#)
- switchport block command [759](#)
- switchport command [749](#)
- switchport host command [760](#)
- switchport mode command [761](#)
- switchport mode private-vlan command [764](#)
- switchport nonegotiate command [766](#)
- switchport port-security aging command [773](#)
- switchport port-security command [768](#)
- switchport priority extend command [775](#)

- switchport private-vlan command [777](#)
- switchport protected command [779](#)
- switchports, displaying [498](#)
- switchport trunk command [781](#)
- switchport voice vlan command [785, 786](#)
- switch priority command [744](#)
- switch provision command [745](#)
- switch renumber command [747](#)
- system env temperature threshold yellow command [788](#)
- system message logging [274](#)
- system message logging, save message to flash [275](#)
- system mtu command [790](#)
- system resource templates [408](#)

T

- tar files, creating, listing, and extracting [15](#)
- TDR, running [793](#)
- Telnet, using to communicate to cluster switches [397](#)
- temperature information, displaying [479](#)
- templates, system resources [408](#)
- test cable-diagnostics tdr command [793](#)
- test relay [794](#)
- traceroute mac command [794](#)
- traceroute mac ip command [797](#)
- trunking, VLAN mode [761](#)
- trunk mode [761](#)
- trunk ports [761](#)
- trunks, to non-DTP device [762](#)
- trusted boundary for QoS [341](#)
- trusted port states for QoS [341](#)
- tunnel ports, Layer 2 protocol, displaying [558](#)
- type (boot loader) command [23](#)

U

UDLD

- aggressive mode [801, 803](#)
- debug messages, display [98](#)
- enable globally [801](#)
- enable per interface [803](#)
- error recovery timer [148](#)
- message timer [801](#)
- normal mode [801, 803](#)
- reset a shutdown interface [805](#)
- status [646](#)

udld command [801](#)

udld port command [803](#)

udld reset command [805](#)

unicast storm control [741](#)

UniDirectional Link Detection

See UDLD

unknown multicast traffic, preventing [759](#)

unknown unicast traffic, preventing [759](#)

unset (boot loader) command [24](#)

upgrading

- software images
 - copying [8](#)
 - downloading [11](#)
 - monitoring status of [430](#)

UplinkFast, for STP [725](#)

user EXEC mode [2, 3](#)

V

version (boot loader) command [26](#)

version mismatch mode [642](#)

vlan (global configuration) command [806](#)

vlan (VLAN configuration) command [812](#)

vlan access-map command [818](#)

VLAN access map configuration mode [818](#)

VLAN access maps

- actions [6](#)
- displaying [656](#)

VLAN-based QoS [343](#)

VLAN configuration

- rules [809, 814](#)
- saving [806, 816](#)

VLAN configuration mode

- commands
 - VLAN [812](#)
 - VTP [836](#)

description [5](#)

entering [820](#)

summary [3](#)

vlan database command [820](#)

vlan dot1q tag native command [823](#)

vlan filter command [825](#)

VLAN filters, displaying [658](#)

VLAN ID range [806, 812](#)

VLAN maps

- applying [825](#)
- creating [818](#)
- defining [301](#)
- displaying [656](#)

VLAN Query Protocol

See VQP

VLANs

- adding [806](#)
- configuring [806, 812](#)
- debug messages, display
 - ISL [94](#)
 - VLAN IOS file system error tests [92](#)
 - VLAN manager activity [90](#)
 - VTP [96](#)
- displaying configurations [651](#)
- enabling guest VLAN supplicant [104, 114, 153](#)
- extended-range [806](#)

MAC addresses

displaying [591](#)number of [578](#)media types [809, 814](#)normal-range [806, 812](#)private [764](#)configuring [387](#)displaying [651](#)

See also private VLANs

restarting [669](#)saving the configuration [806](#)shutting down [669](#)SNMP traps for VTP [675, 679](#)suspending [669](#)variables [812](#)

VLAN Trunking Protocol

See VTP

VM mode [642](#)

VMPS

configuring servers [830](#)displaying [659](#)error recovery timer [149](#)reconfirming dynamic VLAN assignments [827](#)vmmps reconfirm (global configuration) command [828](#)vmmps reconfirm (privileged EXEC) command [827](#)vmmps retry command [829](#)vmmps server command [830](#)

voice VLAN

configuring [785, 786](#)setting port priority [775](#)

VQP

and dynamic-access ports [752](#)clearing client statistics [66](#)displaying information [659](#)per-server retry count [829](#)reconfirmation interval [828](#)reconfirming dynamic VLAN assignments [827](#)

VTP

changing characteristics [832](#)clearing pruning counters [67](#)

configuring

domain name [832, 836](#)file name [832](#)mode [832, 836](#)password [832, 836](#)counters display fields [663](#)displaying information [662](#)

enabling

pruning [832, 836](#)tunneling for [258](#)Version 2 [832, 836](#)mode [832, 836](#)pruning [832, 836](#)saving the configuration [806, 816](#)statistics [662](#)status [662](#)status display fields [665](#)vtp (global configuration) command [832](#)vtp (VLAN configuration) command [836](#)

Wwireless controller, accessing [418](#)wireless controller switch. [101](#)

XXENPAK module serial EEPROM information [455, 495](#)

