A

aaa accounting dot1x command 2-1
aaa authentication dot1x command 2-3
AAA methods 2-3
abort command 2-710
access control entries
  See ACEs
access control lists
  See ACLs
access groups
  IP 2-130
  MAC, displaying 2-474
access list, IPv6 2-188
access map configuration mode 2-239
access mode 2-653
access ports 2-653
ACEs 2-87, 2-307
ACLs
  deny 2-85
  displaying 2-357
  for non-IP protocols 2-219
  IP 2-130
  matching 2-239
  on Layer 2 interfaces 2-130
  permit 2-305
action command 2-5
address aliasing 2-288
aggregate-port learner 2-293
allowed VLANs 2-673
apply command 2-710
archive copy-sw command 2-7
archive download-sw command 2-10
archive tar command 2-15
archive upload-sw command 2-18
arp access-list command 2-20
audience xix
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 2-107
autonegotiation of duplex mode 2-115
auto qos voip command 2-22

B

BackboneFast, for STP 2-581
backup interfaces
  configuring 2-649
  displaying 2-417
boot (boot loader) command A-2
boot auto-copy-sw command 2-27
boot boothlpr command 2-28
boot config-file command 2-29
boot enable-break command 2-30
boot helper command 2-31
boot helper-config file command 2-32
booting
  Cisco IOS image 2-35
  displaying environment variables 2-366
  interrupting 2-30
  manually 2-33

boot loader
accessing A-1
booting
Cisco IOS image A-2
helper image 2-31
directories
creating A-16
displaying a list of A-7
removing A-20
displaying
available commands A-12
memory heap utilization A-14
version A-27
environment variables
described A-21
displaying settings A-21
location of A-22
setting A-21
unsetting A-25
files
copying A-5
deleting A-6
displaying a list of A-7
displaying the contents of A-4, A-17, A-24
renaming A-18
file system
formatting A-10
initializing flash A-9
running a consistency check A-11
loading helper images A-13
prompt A-1
resetting the system A-19
boot manual command 2-33
boot private-config-file command 2-34
boot system command 2-35
BPDU filtering, for spanning tree 2-582, 2-617
BPDU guard, for spanning tree 2-584, 2-617
broadcast storm control 2-637

C

candidate switches
See clusters
cat (boot loader) command A-4
caution, description xx
CDP, enabling protocol tunneling for 2-206
channel-group command 2-37
channel-protocol command 2-41
Cisco Network Assistant
See Network Assistant xx
Cisco SoftPhone
auto-QoS configuration 2-22
trusting packets sent from 2-279
class command 2-42
class-map command 2-44
class maps
creating 2-44
defining the match criteria 2-241
displaying 2-370
class of service
See CoS
clear ip arp inspection log command 2-46
clear ip arp inspection statistics command 2-47
clear ipc command 2-49
clear ip dhcp snooping database command 2-48
clear l2protocol-tunnel counters command 2-50
clear lacp command 2-51
clear mac address-table command 2-52, 2-54
clear pagp command 2-55
clear port-security command 2-56
clear spanning-tree counters command 2-58
clear spanning-tree detected-protocols command 2-59
clear vmps statistics command 2-60
clear vtp counters command 2-61
cluster commander-address command 2-62
cluster discovery hop-count command 2-64
cluster enable command 2-65
cluster holdtime command 2-67

cluster member command 2-68
cluster outside-interface command 2-70
cluster requirements xxi
cluster run command 2-71
clusters
  adding candidates 2-68
  binding to HSRP group 2-72
  building manually 2-68
  communicating with
    devices outside the cluster 2-70
    members by using Telnet 2-330
  debug messages, display B-5
  displaying
    candidate switches 2-373
    debug messages B-5
    member switches 2-375
    status 2-371
  hop-count limit for extended discovery 2-64
  HSRP standby groups 2-72
  redundancy 2-72
  SNMP trap 2-571
cluster standby-group command 2-72
cluster timer command 2-74
command modes defined 1-2
commands changed in Cisco IOS Release 12.2(18)SE 1-6
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 2-29, 2-34
configuring multiple interfaces 2-126
config-vlan mode
  commands 2-696
  description 1-4
  entering 2-695
  summary 1-2
conventions
  command xx
  for examples xx
  publication xx
  text xx
copy (boot loader) command A-5
CoS
  assigning default value to incoming packets 2-249
  assigning to Layer 2 protocol packets 2-209
  overriding the incoming value 2-249
CoS-to-DSCP map 2-253
CPU ASIC statistics, displaying 2-377
crashinfo files 2-121

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 etherchannel command B-10
debug ilpower command B-12
debug interface command B-15
debug ip dhcp snooping command B-13
debug ip igmp filter command B-17
debug ip igmp max-groups command B-18
debug ip igmp snooping command B-19
debug ip verify source packet command B-14
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 cli-redirection main command B-31
debug platform configuration command B-32, B-40
debug platform cpu-queues command B-33
debug platform device-manager command B-35
debug platform dot1x command B-36
debug platform etherchannel command B-37
debug platform fallback-bridging command B-38
debug platform forw-tcam command B-39
debug platform ip arp inspection command B-42
debug platform ipc command B-50
debug platform ip dhcp command B-43
debug platform ip igmp snooping command B-44
debug platform ip multicast command B-46
debug platform ip unicast command B-48
debug platform led command B-51
debug platform matm command B-52
debug platform messaging application command B-54
debug platform phy command B-56
debug platform pm command B-58
debug platform port-asic command B-60
debug platform port-security command B-61
debug platform qos-acl-tcam command B-62
debug platform remote-commands command B-63
debug platform resource-manager command B-64
debug platform snmp command B-65
debug platform span command B-66
debug platform stack-manager command B-67
debug platform supervisor-asic command B-68
debug platform sw-bridge command B-69
debug platform tcam command B-70
debug platform udld command B-73
debug platform vlan command B-74
debug pm command B-75
debug port-security command B-77
debug qos-manager command B-78
debug spanning-tree backbonefast command B-81
debug spanning-tree bpdu command B-82
debug spanning-tree bpdu-opt command B-83
debug spanning-tree command B-79
debug spanning-tree mstp command B-84
debug spanning-tree switch command B-86
debug spanning-tree uplinkfast command B-88
debug sw-vlan command B-89
debug sw-vlan ifs command B-91
debug sw-vlan notification command B-93
debug sw-vlan vtp command B-95
debug udld command B-97
debug vqpc command B-99
define interface-range command 2-75
delete (boot loader) command A-6
delete command 2-77
deny (ARP access-list configuration) command 2-78
deny (IPv6) command 2-80
deny command 2-85
detect mechanism, causes 2-116
device manager requirements xx
DHCP snooping
  accepting untrusted packets from edge switch 2-155
  enabling
    on a VLAN 2-160
    option 82 2-153, 2-155
    trust on an interface 2-158
  error recovery timer 2-118
  rate limiting 2-157
DHCP snooping binding database
  binding file, configuring 2-151
  bindings
    adding 2-149
    deleting 2-149
    displaying 2-435
  clearing database agent statistics 2-48
  database agent, configuring 2-151
  displaying
    binding entries 2-435
    database agent status 2-437
  renewing 2-337
dir (boot loader) command A-7
directories, deleting 2-77

documentation, related xx
document conventions xx
domain name, VTP 2-721, 2-725
dot1x auth-fail max-attempts 2-90
dot1x auth-fail vlan 2-92
dot1x command 2-88
dot1x control-direction command 2-94
dot1x critical command 2-96
dot1x default command 2-98
dot1x guest-vlan command 2-99
dot1x host-mode command 2-101
dot1x initialize command 2-103
dot1x max-req command 2-104, 2-105
dot1x multiple-hosts command 2-106
dot1x port-control command 2-107
dot1x re-authenticate command 2-109
dot1x re-authentication command 2-110
dot1x reauthentication command 2-111
dot1x timeout command 2-112
dropping packets, with ACL matches 2-5
drop threshold, Layer 2 protocol tunneling 2-206
DSCP-to-CoS map 2-253
DSCP-to-DSCP-mutation map 2-253
DTP 2-654
DTP flap
  error detection for 2-116
  error recovery timer 2-118
DTP negotiation 2-658
dual IPv4 and IPv6 templates 2-299
duplex command 2-114
dynamic-access ports
  configuring 2-647
  restrictions 2-648
dynamic ARP inspection
  ARP ACLs
    apply to a VLAN 2-135
    define 2-20
    deny packets 2-78
    display 2-361
    permit packets 2-297
  clear
    log buffer 2-46
    statistics 2-47
  display
    ARP ACLs 2-361
    configuration and operating state 2-431
    log buffer 2-431
    statistics 2-431
    trust state and rate limit 2-431
  enable per VLAN 2-145
  error detection for 2-116
  error recovery timer 2-118
  log buffer
    clear 2-46
    configure 2-139
    display 2-431
  rate-limit incoming ARP packets 2-137
  statistics
    clear 2-47
    display 2-431
  trusted interface state 2-141
  type of packet logged 2-146
  validation checks 2-143
dynamic auto VLAN membership mode 2-653
dynamic desirable VLAN membership mode 2-653
Dynamic Host Configuration Protocol (DHCP)
  See DHCP snooping
Dynamic Trunking Protocol
  See DTP

E

EAP-request/identity frame
  maximum number to send 2-105
  response time before retransmitting 2-112
encapsulation methods 2-673
environment variables, displaying 2-366
errdisable detect cause command 2-116
errdisable recovery command 2-118
error conditions, displaying 2-405
error disable detection 2-116
error-disabled interfaces, displaying 2-417
EtherChannel
  assigning Ethernet interface to channel group 2-37
  creating port-channel logical interface 2-124
  debug EtherChannel/PAgP, display B-10
  debug platform-specific events, display B-37
  displaying 2-409
  enabling Layer 2 protocol tunneling for
    LACP 2-207
    PAgP 2-207
    UDLD 2-207
  interface information, displaying 2-417
  LACP
    clearing channel-group information 2-51
    debug messages, display B-20
    displaying 2-470
    modes 2-37
    port priority for hot-standby ports 2-210
    restricting a protocol 2-41
    system priority 2-212
  load-distribution methods 2-315
EtherChannel (continued)
  PAgP
    aggregate-port learner 2-293
    clearing channel-group information 2-55
    debug messages, display B-28
    displaying 2-519
    error detection for 2-116
    error recovery timer 2-118
    learn method 2-293
    modes 2-37
    physical-port learner 2-293
    priority of interface for transmitted traffic 2-295
Ethernet controller, internal register display 2-379
Ethernet statistics, collecting 2-339
examples, conventions for xx
exception crashinfo command 2-121
exit command 2-710
extended discovery of candidate switches 2-64
extended-range VLANs
  and allowed VLAN list 2-673
  and pruning-eligible list 2-673
  configuring 2-695
extended system ID for STP 2-590

F

fan information, displaying 2-400
file name, VTP 2-721
files, deleting 2-77
flash_init (boot loader) command A-9
Flex Links
  configuring 2-649
  displaying 2-417
flowcontrol command 2-122
format (boot loader) command A-10
forwarding packets, with ACL matches 2-5
forwarding results, display C-6
frame forwarding information, displaying C-6

front-end controller
counter and status information C-8
fsck (boot loader) command A-11

G

global configuration mode 1-2, 1-4

H

hardware ACL statistics 2-357
help (boot loader) command A-12
hierarchical policy maps 2-313
hop-count limit for clusters 2-64
host connection, port configuration 2-652
host ports, private VLANs 2-656
Hot Standby Router Protocol
See HSRP
HSRP
binding HSRP group to cluster 2-72
standby group 2-72

I

IEEE 802.1Q trunk ports and native VLANs 2-712
IEEE 802.1Q tunnel ports
configuring 2-653
displaying 2-393
limitations 2-654
IEEE 802.1x
and switchport modes 2-654
violation error recovery 2-118
See also port-based authentication
IEEE 802.1X Port Based Authentication
enabling guest VLAN supplicant 2-91
IGMP filters
applying 2-161
debug messages, display B-17
IGMP groups, setting maximum 2-162
IGMP maximum groups, debugging B-18
IGMP profiles
creating 2-164
displaying 2-439
IGMP snooping
adding ports as a static member of a group 2-180
displaying 2-440, 2-445, 2-447
enabling 2-166
enabling the configurable-leave timer 2-168
enabling the Immediate-Leave feature 2-177
flooding query count 2-174
interface topology change notification behavior 2-176
multicast table 1-6, 2-443
querier 2-170
query solicitation 2-174
report suppression 2-172
switch topology change notification behavior 2-174
images
See software images
Immediate-Leave feature, MVR 2-290
Immediate-Leave processing
IPv6 2-202
immediate-leave processing 2-177
initial configuration
See getting started guide and hardware installation guide
interface configuration mode 1-2, 1-4
interface port-channel command 2-124
interface range command 2-126
interface-range macros 2-75
interfaces
assigning Ethernet interface to channel group 2-37
configuring 2-114
configuring multiple 2-126
creating port-channel logical 2-124
debug messages, display B-15
disabling 2-569
displaying the MAC address table 2-486
restarting 2-569

interface speed, configuring 2-627
interface vlan command 2-128
internal registers, displaying 2-379, 2-389
Internet Group Management Protocol
  See IGMP
invalid GBIC
  error detection for 2-116
  error recovery timer 2-118
ip access-group command 2-130
ip address command 2-133
IP addresses, setting 2-133
IP address matching 2-239
ip arp inspection filter vlan command 2-135
ip arp inspection limit command 2-137
ip arp inspection log-buffer command 2-139
ip arp inspection trust command 2-141
ip arp inspection validate command 2-143
ip arp inspection vlan command 2-145
ip arp inspection vlan logging command 2-146
IP DHCP snooping
  See DHCP snooping
ip dhcp snooping binding command 2-149
ip dhcp snooping command 2-148
ip dhcp snooping database command 2-151
ip dhcp snooping information option allow-untrusted command 2-155
ip dhcp snooping information option command 2-153
ip dhcp snooping limit rate command 2-157
ip dhcp snooping trust command 2-158
ip dhcp snooping verify command 2-159
ip dhcp snooping vlan command 2-160
ip igmp filter command 2-161
ip igmp max-groups command 2-162
ip igmp profile command 2-164
ip igmp snooping command 2-166
ip igmp snooping last-member-query-interval command 2-168
ip igmp snooping querier command 2-170
ip igmp snooping report-suppression command 2-172
ip igmp snooping tcn command 2-174
ip igmp snooping tcn flood command 2-176
ip igmp snooping vlan immediate-leave command 2-177
ip igmp snooping vlan mrouter command 2-178
ip igmp snooping vlan static command 2-180
IP multicast addresses 2-287
IP phones
  auto-QoS configuration 2-22
  trusting packets sent from 2-279
IP-precedence-to-DSCP map 2-253
ip snap forwarding command 2-182
ip source binding command 2-183
IP source guard
  disabling 2-187
  displaying
    binding entries 2-449
    configuration 2-451
    dynamic binding entries only 2-435
  enabling 2-187
  static IP source bindings 2-183
ip ssh command 2-185
IPv6 access list
  deny conditions 2-80
ipv6 access-list command 2-188
ipv6 mld snooping command 2-190
ipv6 mld snooping last-listener-query count command 2-192
ipv6 mld snooping last-listener-query-interval command 2-194
ipv6 mld snooping listener-message-suppression command 2-196
ipv6 mld snooping robustness-variable command 2-198
ipv6 mld snooping tcn command 2-200
ipv6 mld snooping vlan command 2-202
IPv6 SDM template 2-340
ipv6 traffic-filter command 2-204
ip verify source command 2-187

J

jumbo frames
See MTU

L

l2protocol-tunnel command 2-206
l2protocol-tunnel cos command 2-209
LACP
See EtherChannel
lacp port-priority command 2-210
lacp system-priority command 2-212
Layer 2 mode, enabling 2-645
Layer 2 protocol ports, displaying 2-467
Layer 2 protocol-tunnel
error detection for 2-116
error recovery timer 2-118
Layer 2 protocol tunnel counters 2-50
Layer 2 protocol tunneling error recovery 2-207
Layer 2 traceroute
IP addresses 2-686
MAC addresses 2-683
Layer 3 mode, enabling 2-645
line configuration mode 1-3, 1-5
Link Aggregation Control Protocol
See EtherChannel
link flap
error detection for 2-116
error recovery timer 2-118
load_helper (boot loader) command A-13
load-distribution methods for EtherChannel 2-315
logging event power-inline-status command 2-214
logging file command 2-215
logical interface 2-124
loopback error
detection for 2-116
recovery timer 2-118
loop guard, for spanning tree 2-592, 2-596

M

mac access-group command 2-217
MAC access-groups, displaying 2-474
MAC access list configuration mode 2-219
mac access-list extended command 2-219
MAC access lists 2-85
MAC addresses
displaying
aging time 2-480
all 2-478
dynamic 2-484
MAC address-table move updates 2-488
notification settings 2-490
number of addresses in a VLAN 2-482
per interface 2-486
per VLAN 2-494
static 2-492
static and dynamic entries 2-476
dynamic
aging time 2-221
deleting 2-52
displaying 2-484
enabling MAC address notification 2-224
enabling MAC address-table move update 2-222
matching 2-239
persistent stack 2-635
static
adding and removing 2-226
displaying 2-492
dropping on an interface 2-227
tables 2-478
MAC address notification, debugging B-21
mac address-table aging-time 2-217, 2-239
mac address-table aging-time command 2-221
mac address-table move update command 2-222
mac address-table notification command 2-224
mac address-table static command 2-226
mac address-table static drop command 2-227

macro apply command 2-229
macro description command 2-232
macro global command 2-233
macro global description command 2-236
macro name command 2-237
macros
  adding a description 2-232
  adding a global description 2-236
  applying 2-233
  creating 2-237
  displaying 2-521
  interface range 2-75, 2-126
  specifying parameter values 2-233
  tracing 2-233
manual
  audience xix
  purpose of xix
maps
  QoS
    defining 2-253
    displaying 2-504
  VLAN
    creating 2-707
    defining 2-239
    displaying 2-559
match (access-map configuration) command 2-239
match (class-map configuration) command 2-241
maximum transmission unit
  See MTU
mdix auto command 2-243
MDL snooping
  displaying 2-461
member switches
  See clusters
memory (boot loader) command A-14
mkdir (boot loader) command A-16
MLD snooping
  configuring 2-196, 2-198
  configuring queries 2-192, 2-194
  configuring topology change notification 2-200
  displaying 2-459, 2-463, 2-465
  enabling 2-190
MLD snooping on a VLAN
  enabling 2-202
mls qos aggregate-policer command 2-247
mls qos command 2-245
mls qos cos command 2-249
mls qos dscp-mutation command 2-251
mls qos map command 2-253
mls qos queue-set output buffers command 2-257
mls qos queue-set output threshold command 2-259
mls qos rewrite ip dscp command 2-261
mls qos srr-queue input bandwidth command 2-263
mls qos srr-queue input buffers command 2-265
mls qos-srr-queue input cos-map command 2-267
mls qos srr-queue input dscp-map command 2-269
mls qos srr-queue input priority-queue command 2-271
mls qos srr-queue input threshold command 2-273
mls qos-srr-queue output cos-map command 2-275
mls qos srr-queue output dscp-map command 2-277
mls qos trust command 2-279
mls qos vlan-based command 2-281
mode, MVR 2-287
Mode button, and password recovery 2-344
modes, commands 1-2
monitor session command 2-282
more (boot loader) command A-17
MSTP
  displaying 2-538
  interoperability 2-59
  link type 2-594

MSTP (continued)
MST region
aborting changes 2-600
applying changes 2-600
configuration name 2-600
configuration revision number 2-600
current or pending display 2-600
displaying 2-538
MST configuration mode 2-600
VLANs-to-instance mapping 2-600
path cost 2-602
protocol mode 2-598
restart protocol migration process 2-59
root port
loop guard 2-592
preventing from becoming designated 2-592
restricting which can be root 2-592
root guard 2-592
root switch
affects of extended system ID 2-590
hello-time 2-605, 2-613
interval between BDPU messages 2-606
interval between hello BPDU messages 2-605, 2-613
max-age 2-606
maximum hop count before discarding BPDU 2-607
port priority for selection of 2-609
primary or secondary 2-613
switch priority 2-612
state changes
blocking to forwarding state 2-619
enabling BPDU filtering 2-582, 2-617
enabling BPDU guard 2-584, 2-617
enabling Port Fast 2-617, 2-619
forward-delay time 2-604
length of listening and learning states 2-604
rapid transition to forwarding 2-594
shutting down Port Fast-enabled ports 2-617
state information display 2-537
MTU
configuring size 2-680
displaying global setting 2-548
Multicast Listener Discovery
See MLD
multicast group address, MVR 2-290
multicast groups, MVR 2-288
Multicast Listener Discovery
See MLD
multicast router learning method 2-178
multicast router ports
IPv6 2-202
multicast router ports, configuring 2-178
multicast storm control 2-637
multicast VLAN, MVR 2-287
multicast VLAN registration
See MVR
multiple hosts on authorized port 2-101
Multiple Spanning Tree Protocol
See MSTP
MVR
and address aliasing 2-288
configuring 2-287
configuring interfaces 2-290
debug messages, display B-26
displaying 2-513
displaying interface information 2-515
members, displaying 2-517
mvr (global configuration) command 2-287
mvr (interface configuration) command 2-290
mvr vlan group command 2-291

N

native VLANs 2-673
native VLAN tagging 2-712
Network Assistant requirements xx
nonegotiate
  DTP messaging 2-658
nonegotiate, speed 2-627
non-IP protocols
  denying 2-85
  forwarding 2-305
non-IP traffic access lists 2-219
non-IP traffic forwarding
  denying 2-85
  permitting 2-305
normal-range VLANs 2-695, 2-701
note, description xx
no vlan command 2-695, 2-705

P

PAgP
  See EtherChannel
pagp learn-method command 2-293
pagp port-priority command 2-295
password, VTP 2-721, 2-725
password-recovery mechanism, enabling and disabling 2-344
permit (ARP access-list configuration) command 2-297
permit (IPv6) command 2-299
permit (MAC access-list configuration) command 2-305
per-VLAN spanning-tree plus
  See STP
physical-port learner 2-293
PID, displaying 2-430
PIM-DVMRP, as multicast router learning method 2-178
PoE
  configuring the power budget 2-320
  configuring the power management mode 2-317
  displaying controller register values 2-387
  displaying power management information 2-529
  logging of status 2-214
police aggregate command 2-310
police command 2-308
policed-DSCP map 2-253
policy-map command 2-312
policy maps
  applying to an interface 2-346, 2-352
  creating 2-312
  displaying 2-524
  hierarchical 2-313
  policers
    displaying 2-497
    for a single class 2-308
    for multiple classes 2-247, 2-310
    policed-DSCP map 2-253
  traffic classification
    defining the class 2-42
    defining trust states 2-688
    setting DSCP or IP precedence values 2-350
Port Aggregation Protocol
  See EtherChannel
port-based authentication
  AAA method list 2-3
  debug messages, display B-7
  enabling IEEE 802.1x
    globally 2-88
    per interface 2-107
  guest VLAN 2-99
  host modes 2-101
  IEEE 802.1x AAA accounting methods 2-1
  initialize an interface 2-103
  manual control of authorization state 2-107

port-based authentication (continued)
multiple hosts on authorized port 2-101
periodic re-authentication
enabling 2-111
time between attempts 2-112
quiet period between failed authentication exchanges 2-112
re-authenticating IEEE 802.1x-enabled ports 2-109
resetting configurable IEEE 802.1x parameters 2-98
switch-to-authentication server retransmission time 2-112
switch-to-client frame-retransmission number 2-104 to 2-105
switch-to-client retransmission time 2-112
port-channel load-balance command 2-315
Port Fast, for spanning tree 2-619
port ranges, defining 2-75
ports, debugging B-75
ports, protected 2-671
port security
aging 2-665
debug messages, display B-77
enabling 2-660
violation error recovery 2-118
port trust states for QoS 2-279
port types, MVR 2-290
power information, displaying 2-400
power inline command 2-317
power inline consumption command 2-320
Power over Ethernet
See PoE
priority-queue command 2-322
priority value, stack member 2-545, 2-640
private-vlan command 2-324
private-vlan mapping command 2-327
private VLANs
association 2-669
configuring 2-324
configuring ports 2-656
displaying 2-554
host ports 2-656
mapping
configuring 2-669
displaying 2-417
promiscuous ports 2-656
privileged EXEC mode 1-2, 1-3
product identification information, displaying 2-430
promiscuous ports, private VLANs 2-656
protected ports, displaying 2-423
pruning
VLANs 2-673
VTP
displaying interface information 2-417
enabling 2-721, 2-725
pruning-eligible VLAN list 2-675
PVST+
See STP

Q

QoS
auto-QoS
configuring 2-22
debug messages, display 1-6, B-2
displaying 2-362
class maps
creating 2-44
defining the match criteria 2-241
displaying 2-370
defining the CoS value for an incoming packet 2-249
displaying configuration information 2-362, 2-496

QoS (continued)
DSCP transparency 2-261
DSCP trusted ports
applying DSCP-to-DSCP-mutation map to 2-251
defining DSCP-to-DSCP-mutation map 2-253
egress queues
allocating buffers 2-257
defining the CoS output queue threshold map 2-275
defining the DSCP output queue threshold map 2-277
displaying buffer allocations 2-500
displaying CoS output queue threshold map 2-504
displaying DSCP output queue threshold map 2-504
displaying queueing strategy 2-500
displaying queue-set settings 2-507
enabling bandwidth shaping and scheduling 2-631
enabling bandwidth sharing and scheduling 2-633
limiting the maximum output on a port 2-629
mapping a port to a queue-set 2-329
mapping CoS values to a queue and threshold 2-275
mapping DSCP values to a queue and threshold 2-277
setting maximum and reserved memory allocations 2-259
setting WTD thresholds 2-259
enabling 2-245
ingress queues
allocating buffers 2-265
assigning SRR scheduling weights 2-263
defining the CoS input queue threshold map 2-267
defining the DSCP input queue threshold map 2-269
displaying buffer allocations 2-500
displaying CoS input queue threshold map 2-504
displaying DSCP input queue threshold map 2-504
displaying queueing strategy 2-500
displaying settings for 2-498
enabling the priority queue 2-271
mapping CoS values to a queue and threshold 2-267
mapping DSCP values to a queue and threshold 2-269
setting WTD thresholds 2-273
QoS (continued)
maps
defining 2-253, 2-267, 2-269, 2-275, 2-277
displaying 2-504
policy maps
applying an aggregate policer 2-310
applying to an interface 2-346, 2-352
creating 2-312
defining policers 2-247, 2-308
displaying policers 2-497
displaying policy maps 2-524
hierarchical 2-313
policed-DSCP map 2-253
setting DSCP or IP precedence values 2-350
traffic classifications 2-42
trust states 2-688
port trust states 2-279
queues, enabling the expedite 2-322
statistics
in-profile and out-of-profile packets 2-500
packets enqueued or dropped 2-500
sent and received CoS values 2-500
sent and received DSCP values 2-500
trusted boundary for IP phones 2-279
VLAN-based 2-281
quality of service
See QoS
querytime, MVR 2-287
queue-set command 2-329

R

rapid per-VLAN spanning-tree plus
  See STP
rapid PVST+
  See STP
rcommand command 2-330
re-authenticating IEEE 802.1x-enabled ports 2-109
re-authentication
  periodic 2-111
  time between attempts 2-112
receiver ports, MVR 2-290
receiving flow-control packets 2-122
recovery mechanism
  causes 2-118
  display 2-368, 2-403, 2-407
  timer interval 2-119
redundancy for cluster switches 2-72
reload command 2-332
remote command 2-334
remote-span command 2-335
Remote Switched Port Analyzer
  See RSPAN
rename (boot loader) command A-18
renew ip dhcp snooping database command 2-337
requirements
  cluster xxi
  device manager xx
  Network Assistant xx
reset (boot loader) command A-19
reset command 2-710
resource templates, displaying 2-532
restricted VLAN
  See dot1x auth-fail vlan
rmdir (boot loader) command A-20
rmon collection stats command 2-339
root guard, for spanning tree 2-592
routed ports
  IP addresses on 2-134
  number supported 2-134
RSPAN
  configuring 2-282
  displaying 2-510
  filter RSPAN traffic 2-282
  remote-span command 2-335
  sessions
    add interfaces to 2-282
    displaying 2-510
    start new 2-282

S

SDM mismatch mode 2-341, 2-546
sdm prefer command 2-340
SDM templates
  allowed resources 2-341
  and stacking 2-341
  displaying 2-532
  dual IPv4 and IPv6 2-340
secure ports, limitations 2-662
sending flow-control packets 2-122
service password-recovery command 2-344
service-policy command 2-346
session command 2-349
set (boot loader) command A-21
set command 2-350
setup command 2-352
setup express command 2-355
show access-lists command 2-357
show archive status command 2-360
show arp access-list command 2-361
show auto qos command 2-362
show boot command 2-366
show cable-diagnostics tdr command 2-368
show changes command 2-710
show class-map command 2-370

show cluster candidates command 2-373
show cluster command 2-371
show cluster members command 2-375
show controllers cpu-interface command 2-377
show controllers ethernet-controller command 2-379
show controllers power inline command 2-387
show controllers tcam command 2-389
show controller utilization command 2-391
show current command 2-710
show dot1q-tunnel command 2-393
show dot1x command 2-394
show dtp 2-398
show env command 2-400
show errdisable detect command 2-403
show errdisable flap-values command 2-405
show errdisable recovery command 2-407
show etherchannel command 2-409
show flowcontrol command 2-412
show idprom command 2-414
show interfaces command 2-417
show interfaces counters command 2-427
show inventory command 2-430
show ip arp inspection command 2-431
show ipc command 2-453
show ip dhcp snooping binding command 2-435
show ip dhcp snooping command 2-434
show ip dhcp snooping database command 2-437
show ip igmp profile command 2-439
show ip igmp snooping address command 2-461
show ip igmp snooping command 2-440, 2-459
show ip igmp snooping groups command 2-443
show ip igmp snooping mrouter command 2-445, 2-463
show ip igmp snooping querier command 2-447, 2-465
show ip source binding command 2-449
show ipv6 access-list command 2-457
show ip verify source command 2-451
show l2protocol-tunnel command 2-467
show lacp command 2-470
show mac access-group command 2-474
show mac address-table address command 2-478
show mac address-table aging time command 2-480
show mac address-table command 2-476
show mac address-table count command 2-482
show mac address-table dynamic command 2-484
show mac address-table interface command 2-486
show mac address-table move update command 2-488
show mac address-table notification command 2-54, 2-490, B-23
show mac address-table static command 2-492
show mac address-table vlan command 2-494
show mls qos aggregate-policer command 2-497
show mls qos command 2-496
show mls qos input-queue command 2-498
show mls qos interface command 2-500
show mls qos maps command 2-504
show mls qos queue-set command 2-507
show mls qos vlan command 2-509
show monitor command 2-510
show mvr command 2-513
show mvr interface command 2-515
show mvr members command 2-517
show pagp command 2-519
show parser macro command 2-521
show platform acl command C-2
show platform backup interface command C-3
show platform configuration command C-4
show platform etherchannel command C-5
show platform forward command C-6
show platform frontend-controller command C-8
show platform igmp snooping command C-9
show platform ipc trace command C-16
show platform ip multicast command C-11
show platform ip unicast command C-12
show platform ipv6 unicast command C-17
show platform layer4op command C-19
show platform mac-address-table command C-20
show platform messaging command C-21
show platform monitor command C-22

show platform mvr table command C-23
show platform pm command C-24
show platform port-asic command C-25
show platform port-security command C-31
show platform qos command C-32
show platform resource-manager command C-33
show platform snmp counters command C-35
show platform spanning-tree command C-36
show platform stack-manager command C-38
show platform stp-instance command C-37
show platform tb command C-40
show platform tcam command C-42
show platform vlan command C-45
show policy-map command 2-524
show port security command 2-526
show power inline command 2-529
show proposed command 2-710
show sdm prefer command 2-532
show setup express command 2-536
show spanning-tree command 2-537
show storm-control command 2-543
show switch command 2-545
show system mtu command 2-548
show trust command 2-688
show udld command 2-549
show version command 2-552
show vlan access-map command 2-559
show vlan command 2-554
show vlan command, fields 2-556
show vlan filter command 2-560
show vmps command 2-561
show vtp command 2-564
shutdown command 2-569
shutdown threshold, Layer 2 protocol tunneling 2-206
shutdown vlan command 2-570
Smartports macros
  See macros
SNMP host, specifying 2-575
SNMP informs, enabling the sending of 2-571
snmp-server enable traps command 2-571
snmp-server host command 2-575
snmp trap mac-notification command 2-579
SNMP traps
  enabling MAC address notification trap 2-579
  enabling the MAC address notification feature 2-224
  enabling the sending of 2-571
SoftPhone
  See Cisco SoftPhone
software images
  copying 2-7
  deleting 2-77
  downloading 2-10
  upgrading 2-7, 2-10
  uploading 2-18
software version, displaying 2-552
source ports, MVR 2-290
SPAN
  configuring 2-282
  debug messages, display B-24
  displaying 2-510
  filter SPAN traffic 2-282
  sessions
    add interfaces to 2-282
    displaying 2-510
    start new 2-282
spanning 2-621
spanning-tree backbonefast command 2-581
spanning-tree bpdufilter command 2-582
spanning-tree bpduguard command 2-584
spanning-tree cost command 2-586
spanning-tree etherchannel command 2-588
spanning-tree extend system-id command 2-590
spanning-tree guard command 2-592
spanning-tree link-type command 2-594
spanning-tree loopguard default command 2-596
spanning-tree mode command 2-598
spanning-tree mst configuration command 2-600
spanning-tree mst cost command 2-602

spanning-tree mst forward-time command 2-604
spanning-tree mst hello-time command 2-605
spanning-tree mst max-age command 2-606
spanning-tree mst max-hops command 2-607
spanning-tree mst port-priority command 2-609
spanning-tree mst pre-standard command 2-611
spanning-tree mst priority command 2-612
spanning-tree mst root command 2-613
spanning-tree portfast (global configuration) command 2-617
spanning-tree portfast (interface configuration) command 2-619
spanning-tree port-priority command 2-615
Spanning Tree Protocol
  See STP
spanning-tree transmit hold-count command 2-621
spanning-tree uplinkfast command 2-622
spanning-tree vlan command 2-624
speed command 2-627
srr-queue bandwidth limit command 2-629
srr-queue bandwidth shape command 2-631
srr-queue bandwidth share command 2-633
SSH, configuring version 2-185
stack-mac persistent timer command 2-635
stack member
  access 2-349
  number 2-545, 2-643
  priority value 2-640
  provisioning 2-641
  reloading 2-332
stacks, switch
  MAC address 2-635
  provisioning a new member 2-641
  reloading 2-332
  stack member access 2-349
  stack member number 2-545, 2-643
  stack member priority value 2-545, 2-640
static-access ports, configuring 2-647
statistics, Ethernet group 2-339
sticky learning, enabling 2-660
storm-control command 2-637
STP
  BackboneFast 2-581
  counters, clearing 2-58
  debug messages, display
    BackboneFast events B-81
    MSTP B-84
    optimized BPDUs handling B-83
    spanning-tree activity B-79
    switch shim B-86
    transmitted and received BPDUs B-82
    UplinkFast B-88
  detection of indirect link failures 2-581
  enabling protocol tunneling for 2-206
  EtherChannel misconfiguration 2-588
  extended system ID 2-590
  path cost 2-586
  protocol modes 2-598
  root port
    accelerating choice of new 2-622
    loop guard 2-592
    preventing from becoming designated 2-592
    restricting which can be root 2-592
    root guard 2-592
    UplinkFast 2-622
  root switch
    affects of extended system ID 2-590, 2-625
    hello-time 2-624
    interval between BDPU messages 2-624
    interval between hello BPDU messages 2-624
    max-age 2-624
    port priority for selection of 2-615
    primary or secondary 2-624
    switch priority 2-624

STP (continued)
state changes
blocking to forwarding state 2-619
enabling BPDU filtering 2-582, 2-617
enabling BPDU guard 2-584, 2-617
enabling Port Fast 2-617, 2-619
enabling timer to recover from error state 2-118
forward-delay time 2-624
length of listening and learning states 2-624
shutting down Port Fast-enabled ports 2-617
state information display 2-537
VLAN options 2-612, 2-624
SVIs, creating 2-128
Switched Port Analyzer
See SPAN
switching characteristics
modifying 2-645
returning to interfaces 2-645
switchport access command 2-647
switchport backup interface command 2-649
switchport block command 2-651
switchport command 2-645
switchport host command 2-652
switchport mode command 2-653
switchport mode private-vlan command 2-656
switchport nonegotiate command 2-658
switchport port-security aging command 2-665
switchport port-security command 2-660
switchport priority extend command 2-667
switchport private-vlan command 2-669
switchport protected command 2-671
switchports, displaying 2-417
switchport trunk command 2-673
switchport voice vlan command 2-676
switch priority command 2-640
switch provision command 2-641
switch renumber command 2-643
system env temperature threshold yellow command 2-678
system message logging 2-214
system message logging, save message to flash 2-215
system mtu command 2-680
system resource templates 2-340

T

tar files, creating, listing, and extracting 2-15
TDR, running 2-682
Telnet, using to communicate to cluster switches 2-330
temperature information, displaying 2-400
templates, system resources 2-340
test cable-diagnostics tdr command 2-682
traceroute mac command 2-683
traceroute mac ip command 2-686
trunking, VLAN mode 2-653
trunk mode 2-653
trunk ports 2-653
trunks, to non-DTP device 2-654
trusted boundary for QoS 2-279
trusted port states for QoS 2-279
tunnel ports, Layer 2 protocol, displaying 2-467
type (boot loader) command A-24

U

UDLD
aggressive mode 2-690, 2-692
debug messages, display B-97
enable globally 2-690
enable per interface 2-692
error recovery timer 2-118
message timer 2-690
normal mode 2-690, 2-692
reset a shutdown interface 2-694
status 2-549
udld command 2-690
udld port command 2-692
udld reset command 2-694

unicast storm control 2-637
UniDirectional Link Detection
  See UDLD
unknown multicast traffic, preventing 2-651
unknown unicast traffic, preventing 2-651
unset (boot loader) command A-25
upgrading
  software images 2-7, 2-10
    monitoring status of 2-360
upgrading information
  See release notes
UplinkFast, for STP 2-622
user EXEC mode 1-2, 1-3

V

version (boot loader) command A-27
version mismatch mode 2-546
VLAN
  enabling guest VLAN supplicant 2-91
vlan (global configuration) command 2-695
vlan (VLAN configuration) command 2-701
vlan access-map command 2-707
VLAN access map configuration mode 2-707
VLAN access maps
  actions 2-5
  displaying 2-559
VLAN-based QoS 2-281
VLAN configuration
  rules 2-698, 2-703
  saving 2-695, 2-705
VLAN configuration mode
  commands
    VLAN 2-701
    VTP 2-725
  description 1-5
  entering 2-709
  summary 1-3
vlan database command 2-709
vlan dot1q tag native command 2-712
vlan filter command 2-714
VLAN filters, displaying 2-560
VLAN ID range 2-695, 2-701
VLAN maps
  applying 2-714
  creating 2-707
  defining 2-239
  displaying 2-559
VLAN Query Protocol
  See VQP
VLANs
  adding 2-695
  configuring 2-695, 2-701
  debug messages, display
    ISL B-93
    VLAN IOS file system error tests B-91
    VLAN manager activity B-89
    VTP B-95
  displaying configurations 2-554
  extended-range 2-695
  MAC addresses
    displaying 2-494
    number of 2-482
  media types 2-698, 2-703
  normal-range 2-695, 2-701
  private 2-656
    configuring 2-324
    displaying 2-554
    See also private VLANs
  restarting 2-570
  saving the configuration 2-695
  shutting down 2-570
  SNMP traps for VTP 2-573, 2-576
  suspending 2-570
  variables 2-701
VLAN Trunking Protocol
  See VTP
VM mode 2-546

VMPS
configuring servers 2-719
displaying 2-561
error recovery timer 2-119
reconfirming dynamic VLAN assignments 2-716
vmps reconfirm (global configuration) command 2-717
vmps reconfirm (privileged EXEC) command 2-716
vmps retry command 2-718
vmps server command 2-719
voice VLAN
configuring 2-676
setting port priority 2-667
VQP
and dynamic-access ports 2-648
clearing client statistics 2-60
displaying information 2-561
per-server retry count 2-718
reconfirmation interval 2-717
reconfirming dynamic VLAN assignments 2-716
VTP
changing characteristics 2-721
clearing pruning counters 2-61
configuring
domain name 2-721, 2-725
file name 2-721
mode 2-721, 2-725
password 2-721, 2-725
counters display fields 2-565
displaying information 2-564
enabling
pruning 2-721, 2-725
tunneling for 2-206
Version 2 2-721, 2-725
mode 2-721, 2-725
pruning 2-721, 2-725
saving the configuration 2-695, 2-705
statistics 2-564
status 2-564
status display fields 2-567
vtp (global configuration) command 2-721
vtp (VLAN configuration) command 2-725

X

XENPAK module serial EERPOM information 2-383, 2-414