A

aaa accounting dot1x command 2-1
aaa authentication dot1x command 2-3
AAA methods 2-3
abort command 2-652
access control entries
  See ACEs
access control lists
  See ACLs
access groups
  IP 2-118
  MAC, displaying 2-420
access map configuration mode 2-201
access mode 2-595
access ports 2-595
ACEs 2-81, 2-263
ACLs
  deny 2-79
  displaying 2-310
  for non-IP protocols 2-183
  IP 2-118
  matching 2-201
  on Layer 2 interfaces 2-118
  permit 2-261
action command 2-5
address aliasing 2-250
aggregate-port learner 2-255
allowed VLANs 2-615
apply command 2-652
archive copy-sw command 2-7
archive download-sw command 2-10
archive tar command 2-14
archive upload-sw command 2-17
arp access-list command 2-19
audience xvii
authorization state of controlled port 2-95
autonegotiation of duplex mode 2-103
auto qos voip command 2-21

B

BackboneFast, for STP 2-523
backup interfaces
  configuring 2-591
  displaying 2-372
boot (boot loader) command A-2
boot auto-copy-sw command 2-26
boot boothlpr command 2-27
boot config-file command 2-28
boot enable-break command 2-29
boot helper command 2-30
boot helper-config file command 2-31
booting
  Cisco IOS image 2-34
  displaying environment variables 2-320
  interrupting 2-29
  manually 2-32
boot loader
  accessing A-1
  booting
    Cisco IOS image A-2
    helper image 2-30

boot loader (continued)
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 2-32
boot private-config-file command 2-33
boot system command 2-34
BPDU filtering, for spanning tree 2-524, 2-559
BPDU guard, for spanning tree 2-526, 2-559
broadcast storm control 2-579

C

candidate switches
See clusters
cat (boot loader) command A-4
caution, description xviii
CDP, enabling protocol tunneling for 2-170
channel-group command 2-36
channel-protocol command 2-40
Cisco Network Assistant
See Network Assistant xviii
Cisco SoftPhone
auto-QoS configuration 2-21
trusting packets sent from 2-241
class command 2-41
class-map command 2-43
class maps
creating 2-43
defining the match criteria 2-203
displaying 2-325
class of service
See CoS
clear ip arp inspection log command 2-45
clear ip arp inspection statistics command 2-46
clear ipc command 2-48
clear ip dhcp snooping database command 2-47
clear l2protocol-tunnel counters command 2-49
clear lacp command 2-50
clear mac address-table command 2-51
clear pagp command 2-53
clear port-security command 2-54
clear spanning-tree counters command 2-56
clear spanning-tree detected-protocols command 2-57
clear vmps statistics command 2-58
clear vtp counters command 2-59
cluster commander-address command 2-60
cluster discovery hop-count command 2-62
cluster enable command 2-63
cluster holdtime command 2-65
cluster member command 2-66
cluster outside-interface command 2-68
cluster requirements xviii
cluster run command 2-69

clusters
adding candidates 2-66
binding to HSRP group 2-70
building manually 2-66
communicating with
devices outside the cluster 2-68
members by using Telnet 2-284
debug messages, display B-4
displaying
candidate switches 2-328
debug messages B-4
member switches 2-330
status 2-326
hop-count limit for extended discovery 2-62
HSRP standby groups 2-70
redundancy 2-70
SNMP trap 2-513
cluster standby-group command 2-70
cluster timer command 2-72
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 2-28, 2-33
configuring multiple interfaces 2-113
config-vlan mode
commands 2-638
description 1-4
entering 2-637
summary 1-2
conventions
command xviii
for examples xviii
publication xviii
text xviii
copy (boot loader) command A-5
CoS
assigning default value to incoming packets 2-211
assigning to Layer 2 protocol packets 2-173
overriding the incoming value 2-211
CoS-to-DSCP map 2-215
CPU ASIC statistics, displaying 2-332

D

debug auto qos command B-2
debug cluster command B-4
debug dot1x command B-6
debug dtp command B-8
debug etherchannel command B-9
debug ilpower command B-11
debug interface command B-14
debug ip dhcp snooping command B-12
debug ip igmp filter command B-16
debug ip igmp max-groups command B-17
debug ip igmp snooping command B-18
debug ip verify source packet command B-13
debug lacp command B-19
debug mac-notification command B-20
debug matm command B-21
debug monitor command B-22
debug mvrdbg command B-24
debug nvram command B-25
debug pagp command B-26
debug platform acl command B-27
debug platform cli-redirection main command B-28
debug platform configuration command B-29, B-37
debug platform cpu-queues command B-30
debug platform device-manager command B-32
debug platform dot1x command B-33
debug platform etherchannel command B-34
debug platform fallback-bridging command B-35
debug platform forw-tcam command B-36
debug platform ip arp inspection command B-39

debug platform ipc command B-47
debug platform ip dhcp command B-40
debug platform ip igmp snooping command B-41
debug platform ip multicast command B-43
debug platform ip unicast command B-45
debug platform led command B-48
debug platform matm command B-49
debug platform messaging application command B-51
debug platform phy command B-53
debug platform pm command B-55
debug platform port-asic command B-57
debug platform port-security command B-58
debug platform qos-acl-tcam command B-59
debug platform remote-commands command B-60
debug platform resource-manager command B-61
debug platform snmp command B-62
debug platform span command B-63
debug platform stack-manager command B-64
debug platform supervisor-asic command B-65
debug platform sw-bridge command B-66
debug platform tcam command B-67
debug platform udld command B-70
debug platform vlan command B-71
debug pm command B-72
debug port-security command B-74
debug qos-manager command B-75
debug spanning-tree backbonefast command B-78
debug spanning-tree bpdu command B-79
debug spanning-tree bpdu-opt command B-80
debug spanning-tree command B-76
debug spanning-tree mstp command B-81
debug spanning-tree switch command B-83
debug spanning-tree uplinkfast command B-85
debug sw-vlan command B-86
debug sw-vlan ifs command B-88
debug sw-vlan notification command B-90
debug sw-vlan vtp command B-92
debug udld command B-94
debug vqpc command B-96
define interface-range command 2-73
delete (boot loader) command A-6
delete command 2-75
deny (ARP access-list configuration) command 2-77
deny command 2-79
detect mechanism, causes 2-104
device manager requirements xviii
DHCP snooping
  accepting untrusted packets from edge switch 2-143
  enabling
    on a VLAN 2-148
    option 82 2-141, 2-143
    trust on an interface 2-146
  error recovery timer 2-106
  rate limiting 2-145
DHCP snooping binding database
  binding file, configuring 2-139
  bindings
    adding 2-137
    deleting 2-137
    displaying 2-390
  clearing database agent statistics 2-47
  database agent, configuring 2-139
  displaying
    binding entries 2-390
    database agent status 2-393
  renewing 2-291
dir (boot loader) command A-7
directories, deleting 2-75
documentation, related xviii
document conventions xviii
domain name, VTP 2-662, 2-666
dot1x command 2-82
dot1x control-direction command 2-84
dot1x default command 2-86
dot1x guest-vlan command 2-87
dot1x host-mode command 2-89
dot1x initialize command 2-91
dot1x max-req command 2-92, 2-93

dot1x multiple-hosts command 2-94
dot1x port-control command 2-95
dot1x re-authenticate command 2-97
dot1x re-authentication command 2-98
dot1x reauthentication command 2-99
dot1x timeout command 2-100
dropping packets, with ACL matches 2-5
drop threshold, Layer 2 protocol tunneling 2-170
DSCP-to-CoS map 2-215
DSCP-to-DSCP-mutation map 2-215
DTP 2-596
DTP flap
  error detection for 2-104
  error recovery timer 2-106
DTP negotiation 2-600
duplex command 2-102
dynamic-access ports
  configuring 2-589
  restrictions 2-590
dynamic ARP inspection
  ARP ACLs
    apply to a VLAN 2-123
    define 2-19
    deny packets 2-77
    display 2-315
    permit packets 2-259
  clear
    log buffer 2-45
    statistics 2-46
  display
    ARP ACLs 2-315
    configuration and operating state 2-385
    log buffer 2-385
    statistics 2-385
    trust state and rate limit 2-385
  enable per VLAN 2-133
  error detection for 2-104
  error recovery timer 2-106
dynamic ARP inspection (continued)
  log buffer
    clear 2-45
    configure 2-127
    display 2-385
  rate-limit incoming ARP packets 2-125
  statistics
    clear 2-46
    display 2-385
  trusted interface state 2-129
  type of packet logged 2-134
  validation checks 2-131
dynamic auto VLAN membership mode 2-595
dynamic desirable VLAN membership mode 2-595
Dynamic Host Configuration Protocol (DHCP)
  See DHCP snooping
Dynamic Trunking Protocol
  See DTP

E

EAP-request/identity frame
  maximum number to send 2-93
  response time before retransmitting 2-100
encapsulation methods 2-615
environment variables, displaying 2-320
errdisable detect cause command 2-104
errdisable recovery command 2-106
error conditions, displaying 2-361
error disable detection 2-104
error-disabled interfaces, displaying 2-372
EtherChannel
  assigning Ethernet interface to channel group 2-36
  creating port-channel logical interface 2-111
  debug EtherChannel/PAgP, display B-9
  debug platform-specific events, display B-34
  displaying 2-365

EtherChannel (continued)
enabling Layer 2 protocol tunneling for
LACP 2-171
PAgP 2-171
UDLD 2-171
interface information, displaying 2-372
LACP
clearing channel-group information 2-50
debug messages, display B-19
displaying 2-416
modes 2-36
port priority for hot-standby ports 2-174
restricting a protocol 2-40
system priority 2-176
load-distribution methods 2-271
PAgP
aggregate-port learner 2-255
clearing channel-group information 2-53
debug messages, display B-26
displaying 2-463
error detection for 2-104
error recovery timer 2-106
learn method 2-255
modes 2-36
physical-port learner 2-255
priority of interface for transmitted traffic 2-257
Ethernet controller, internal register display 2-334
Ethernet statistics, collecting 2-293
examples, conventions for xviii
exit command 2-652
extended discovery of candidate switches 2-62
extended-range VLANs
and allowed VLAN list 2-615
and pruning-eligible list 2-615
configuring 2-637
extended system ID for STP 2-532

F

fan information, displaying 2-356
file name, VTP 2-662
files, deleting 2-75
flash_init (boot loader) command A-9
Flex Links
configuring 2-591
displaying 2-372
flowcontrol command 2-109
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 2-310
help (boot loader) command A-12
hierarchical policy maps 2-269
hop-count limit for clusters 2-62
host connection, port configuration 2-594
host ports, private VLANs 2-598
Hot Standby Router Protocol
See HSRP
HSRP
binding HSRP group to cluster 2-70
standby group 2-70

IEEE 802.1Q trunk ports and native VLANs 2-654
IEEE 802.1Q tunnel ports
  configuring 2-595
  displaying 2-349
  limitations 2-596
IEEE 802.1x
  and switchport modes 2-596
  violation error recovery 2-106
  See also port-based authentication
IGMP filters
  applying 2-149
  debug messages, display B-16
IGMP groups, setting maximum 2-150
IGMP maximum groups, debugging B-17
IGMP profiles
  creating 2-152
  displaying 2-395
IGMP snooping
  displaying 2-396, 2-399, 2-403
  enabling 2-154
  enabling the configurable-leave timer 2-157
  multicast table 1-6, 2-401
  querier 2-159
  report suppression 2-161
images
  See software images
Immediate-Leave feature, MVR 2-252
Immediate-Leave processing 2-154
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 2-73
interfaces
  assigning Ethernet interface to channel group 2-36
  configuring 2-102
  configuring multiple 2-113
  creating port-channel logical 2-111
  debug messages, display B-14
  disabling 2-511
  displaying the MAC address table 2-432
  restarting 2-511
interface speed, configuring 2-569
interface vlan command 2-116
internal registers, displaying 2-334, 2-345
Internet Group Management Protocol
  See IGMP
invalid GBIC
  error detection for 2-104
  error recovery timer 2-106
ip access-group command 2-118
ip address command 2-121
IP addresses, setting 2-121
IP address matching 2-201
ip arp inspection filter vlan command 2-123
ip arp inspection limit command 2-125
ip arp inspection log-buffer command 2-127
ip arp inspection trust command 2-129
ip arp inspection validate command 2-131
ip arp inspection vlan command 2-133
ip arp inspection vlan logging command 2-134
IP DHCP snooping
  See DHCP snooping
ip dhcp snooping binding command 2-137
ip dhcp snooping command 2-136
ip dhcp snooping database command 2-139
ip dhcp snooping information option allow-untrusted command 2-143
ip dhcp snooping information option command 2-141
ip dhcp snooping limit rate command 2-145
ip dhcp snooping trust command 2-146
ip dhcp snooping verify command 2-147

ip dhcp snooping vlan command 2-148
ip igmp filter command 2-149
ip igmp max-groups command 2-150
ip igmp profile command 2-152
ip igmp snooping command 2-154
ip igmp snooping querier command 2-159
ip igmp snooping report-suppression command 2-161
ip igmp snooping vlan last-member-query-interval command 2-157
IP multicast addresses 2-249
IP phones
  auto-QoS configuration 2-21
  trusting packets sent from 2-241
IP-precedence-to-DSCP map 2-215
ip snap forwarding command 2-163
ip source binding command 2-164
IP source guard
  disabling 2-168
  displaying
    binding entries 2-405
    configuration 2-407
    dynamic binding entries only 2-390
  enabling 2-168
  static IP source bindings 2-164
ip ssh command 2-166
IPv6 SDM template 2-294
ip verify source command 2-168

J

jumbo frames
  See MTU

L

l2protocol-tunnel command 2-170
l2protocol-tunnel cos command 2-173
LACP
  See EtherChannel
lacp port-priority command 2-174
lacp system-priority command 2-176
Layer 2 mode, enabling 2-587
Layer 2 protocol ports, displaying 2-413
Layer 2 protocol-tunnel
  error detection for 2-104
  error recovery timer 2-106
Layer 2 protocol tunnel counters 2-49
Layer 2 protocol tunneling error recovery 2-171
Layer 2 traceroute
  IP addresses 2-628
  MAC addresses 2-625
Layer 3 mode, enabling 2-587
line configuration mode 1-3, 1-5
Link Aggregation Control Protocol
  See EtherChannel
link flap
  error detection for 2-104
  error recovery timer 2-106
load_helper (boot loader) command A-13
load-distribution methods for EtherChannel 2-271
logging event power-inline-status command 2-178
logging file command 2-179
logical interface 2-111
loopback error
  detection for 2-104
  recovery timer 2-106
loop guard, for spanning tree 2-534, 2-538

M

mac access-group command 2-181
MAC access-groups, displaying 2-420
MAC access list configuration mode 2-183
mac access-list extended command 2-183
MAC access lists 2-79

MAC addresses
displaying
aging time 2-426
all 2-424
dynamic 2-430
notification settings 2-434
number of addresses in a VLAN 2-428
per interface 2-432
per VLAN 2-438
static 2-436
static and dynamic entries 2-422
dynamic
aging time 2-185
deleting 2-51
displaying 2-430
enabling MAC address notification 2-186
matching 2-201
persistent stack 2-577
static
adding and removing 2-188
displaying 2-436
dropping on an interface 2-189
tables 2-424
MAC address notification, debugging B-20
mac address-table aging-time 2-181, 2-201
mac address-table aging-time command 2-185
mac address-table notification command 2-186
mac address-table static command 2-188
mac address-table static drop command 2-189
macro apply command 2-191
macro description command 2-194
macro global command 2-195
macro global description command 2-198
macro name command 2-199
macros
adding a description 2-194
adding a global description 2-198
applying 2-195
creating 2-199
macros (continued)
displaying 2-465
interface range 2-73, 2-113
specifying parameter values 2-195
tracing 2-195
manual
audience xvii
purpose of xvii
maps
QoS
defining 2-215
displaying 2-448
VLAN
creating 2-649
defining 2-201
displaying 2-502
match (access-map configuration) command 2-201
match (class-map configuration) command 2-203
maximum transmission unit
See MTU
mdix auto command 2-205
member switches
See clusters
memory (boot loader) command A-14
mkdir (boot loader) command A-16
mls qos aggregate-policer command 2-209
mls qos command 2-207
mls qos cos command 2-211
mls qos dscp-mutation command 2-213
mls qos map command 2-215
mls qos queue-set output buffers command 2-219
mls qos queue-set output threshold command 2-221
mls qos rewrite ip dscp command 2-223
mls qos srr-queue input bandwidth command 2-225
mls qos srr-queue input buffers command 2-227
mls qos-srr-queue input cos-map command 2-229
mls qos srr-queue input dscp-map command 2-231
mls qos srr-queue input priority-queue command 2-233
mls qos srr-queue input threshold command 2-235

mls qos-srr-queue output cos-map command 2-237
mls qos srr-queue output dscp-map command 2-239
mls qos trust command 2-241
mls qos vlan-based command 2-243
mode, MVR 2-249
Mode button, and password recovery 2-298
modes, commands 1-2
monitor session command 2-244
more (boot loader) command A-17
MSTP
  displaying 2-481
  interoperability 2-57
  link type 2-536
  MST region
    aborting changes 2-542
    applying changes 2-542
    configuration name 2-542
    configuration revision number 2-542
    current or pending display 2-542
    displaying 2-481
    MST configuration mode 2-542
    VLANs-to-instance mapping 2-542
  path cost 2-544
  protocol mode 2-540
  restart protocol migration process 2-57
  root port
    loop guard 2-534
    preventing from becoming designated 2-534
    restricting which can be root 2-534
    root guard 2-534
  root switch
    affects of extended system ID 2-532
    hello-time 2-547, 2-555
    interval between BDPU messages 2-548
    interval between hello BPDU messages 2-547, 2-555
    max-age 2-548
    maximum hop count before discarding BPDU 2-549
    port priority for selection of 2-551
MSTP (continued)
  root switch (continued)
    primary or secondary 2-555
    switch priority 2-554
  state changes
    blocking to forwarding state 2-561
    enabling BPDU filtering 2-524, 2-559
    enabling BPDU guard 2-526, 2-559
    enabling Port Fast 2-559, 2-561
    forward-delay time 2-546
    length of listening and learning states 2-546
    rapid transition to forwarding 2-536
    shutting down Port Fast-enabled ports 2-559
  state information display 2-480
MTU
  configuring size 2-622
  displaying global setting 2-491
multicast group address, MVR 2-252
multicast groups, MVR 2-250
multicast router learning method 2-154
multicast router ports, configuring 2-154
multicast storm control 2-579
multicast VLAN, MVR 2-249
multicast VLAN registration
  See MVR
multiple hosts on authorized port 2-89
Multiple Spanning Tree Protocol
  See MSTP
MVR
  and address aliasing 2-250
  configuring 2-249
  configuring interfaces 2-252
  debug messages, display B-24
  displaying 2-457
  displaying interface information 2-459
  members, displaying 2-461
mvr (global configuration) command 2-249
mvr (interface configuration) command 2-252
mvr vlan group command 2-253

N

native VLANs 2-615
native VLAN tagging 2-654
Network Assistant requirements xviii
nonegotiate
  DTP messaging 2-600
  speed 2-569
nonegotiate, speed 2-569
non-IP protocols
  denying 2-79
  forwarding 2-261
non-IP traffic access lists 2-183
non-IP traffic forwarding
  denying 2-79
  permitting 2-261
normal-range VLANs 2-637, 2-643
note, description xviii
no vlan command 2-637, 2-647

P

PAgP
  See EtherChannel
pagp learn-method command 2-255
pagp port-priority command 2-257
password, VTP 2-662, 2-666
password-recovery mechanism, enabling and disabling 2-298
permit (ARP access-list configuration) command 2-259
permit (MAC access-list configuration) command 2-261
per-VLAN spanning-tree plus
  See STP
physical-port learner 2-255
PID, displaying 2-384
PIM-DVMRP, as multicast router learning method 2-154
PoE
  configuring the power management mode 2-273
  displaying controller register values 2-342
  displaying power management information 2-473
  logging of status 2-178
police aggregate command 2-266
police command 2-264
policed-DSCP map 2-215
policy-map command 2-268
policy maps
  applying to an interface 2-300, 2-305
  creating 2-268
  displaying 2-468
  hierarchical 2-269
  policers
    displaying 2-441
    for a single class 2-264
    for multiple classes 2-209, 2-266
    policed-DSCP map 2-215
  traffic classification
    defining the class 2-41
    defining trust states 2-630
    setting DSCP or IP precedence values 2-303
Port Aggregation Protocol
  See EtherChannel
port-based authentication
  AAA method list 2-3
  debug messages, display B-6
  enabling IEEE 802.1x
    globally 2-82
    per interface 2-95
  guest VLAN 2-87
  host modes 2-89
  IEEE 802.1x AAA accounting methods 2-1
  initialize an interface 2-91
  manual control of authorization state 2-95
  multiple hosts on authorized port 2-89

port-based authentication (continued)
periodic re-authentication
enabling 2-99
time between attempts 2-100
quiet period between failed authentication exchanges 2-100
re-authenticating IEEE 802.1x-enabled ports 2-97
resetting configurable IEEE 802.1x parameters 2-86
switch-to-authentication server retransmission time 2-100
switch-to-client frame-retransmission number 2-92 to 2-93
switch-to-client retransmission time 2-100
port-channel load-balance command 2-271
Port Fast, for spanning tree 2-561
port ranges, defining 2-73
ports, debugging B-72
ports, protected 2-613
port security
aging 2-607
debug messages, display B-74
enabling 2-602
violation error recovery 2-106
port trust states for QoS 2-241
port types, MVR 2-252
power information, displaying 2-356
power inline command 2-273
Power over Ethernet
See PoE
priority-queue command 2-276
priority value, stack member 2-488, 2-582
private-vlan command 2-278
private-vlan mapping command 2-281
private VLANs
association 2-611
configuring 2-278
configuring ports 2-598
displaying 2-497
host ports 2-598
private VLANs (continued)
mapping
configuring 2-611
displaying 2-372
promiscuous ports 2-598
privileged EXEC mode 1-2, 1-3
product identification information, displaying 2-384
promiscuous ports, private VLANs 2-598
protected ports, displaying 2-378
pruning
VLANs 2-615
VTP
displaying interface information 2-372
enabling 2-662, 2-666
pruning-eligible VLAN list 2-617
PVST+
See STP

Q

QoS
auto-QoS
configuring 2-21
debug messages, display 1-6, B-2
displaying 2-316
class maps
creating 2-43
defining the match criteria 2-203
displaying 2-325
defining the CoS value for an incoming packet 2-211
displaying configuration information 2-316, 2-440
DSCP transparency 2-223
DSCP trusted ports
applying DSCP-to-DSCP-mutation map to 2-213
defining DSCP-to-DSCP-mutation map 2-215

QoS (continued)
egress queues
allocating buffers 2-219
defining the CoS output queue threshold map 2-237
defining the DSCP output queue threshold map 2-239
displaying buffer allocations 2-444
displaying CoS output queue threshold map 2-448
displaying DSCP output queue threshold map 2-448
displaying queueing strategy 2-444
displaying queue-set settings 2-451
enabling bandwidth shaping and scheduling 2-573
enabling bandwidth sharing and scheduling 2-575
limiting the maximum output on a port 2-571
mapping a port to a queue-set 2-283
mapping CoS values to a queue and threshold 2-237
mapping DSCP values to a queue and threshold 2-239
setting maximum and reserved memory allocations 2-221
setting WTD thresholds 2-221
enabling 2-207
ingress queues
allocating buffers 2-227
assigning SRR scheduling weights 2-225
defining the CoS input queue threshold map 2-229
defining the DSCP input queue threshold map 2-231
displaying buffer allocations 2-444
displaying CoS input queue threshold map 2-448
displaying DSCP input queue threshold map 2-448
displaying queueing strategy 2-444
displaying settings for 2-442
enabling the priority queue 2-233
mapping CoS values to a queue and threshold 2-229
mapping DSCP values to a queue and threshold 2-231
setting WTD thresholds 2-235
maps
defining 2-215, 2-229, 2-231, 2-237, 2-239
displaying 2-448
QoS (continued)
policy maps
applying an aggregate policer 2-266
applying to an interface 2-300, 2-305
creating 2-268
defining policers 2-209, 2-264
displaying policers 2-441
displaying policy maps 2-468
hierarchical 2-269
policed-DSCP map 2-215
setting DSCP or IP precedence values 2-303
traffic classifications 2-41
trust states 2-630
port trust states 2-241
queues, enabling the expedite 2-276
statistics
in-profile and out-of-profile packets 2-444
packets enqueued or dropped 2-444
sent and received CoS values 2-444
sent and received DSCP values 2-444
trusted boundary for IP phones 2-241
VLAN-based 2-243
quality of service
See QoS
querytime, MVR 2-249
queue-set command 2-283

R

rapid per-VLAN spanning-tree plus
See STP
rapid PVST+
See STP
rcommand command 2-284
re-authenticating IEEE 802.1x-enabled ports 2-97
re-authentication
periodic 2-99
time between attempts 2-100
receiver ports, MVR 2-252

receiving flow-control packets 2-109
recovery mechanism
causes 2-106
display 2-322, 2-359, 2-363
timer interval 2-107
redundancy for cluster switches 2-70
reload command 2-286
remote command 2-288
remote-span command 2-289
Remote Switched Port Analyzer
See RSPAN
rename (boot loader) command A-18
renew ip dhcp snooping database command 2-291
requirements
cluster xviii
device manager xviii
Network Assistant xviii
reset (boot loader) command A-19
reset command 2-652
resource templates, displaying 2-476
rmdir (boot loader) command A-20
rmon collection stats command 2-293
root guard, for spanning tree 2-534
routed ports
IP addresses on 2-122
number supported 2-122
RSPAN
configuring 2-244
displaying 2-454
filter RSPAN traffic 2-244
remote-span command 2-289
sessions
add interfaces to 2-244
displaying 2-454
start new 2-244

S

SDM mismatch mode 2-295, 2-489
sdm prefer command 2-294
SDM templates
allowed resources 2-295
and stacking 2-295
displaying 2-476
dual IPv4 and IPv6 2-294
secure ports, limitations 2-604
sending flow-control packets 2-109
service password-recovery command 2-298
service-policy command 2-300
session command 2-302
set (boot loader) command A-21
set command 2-303
setup command 2-305
setup express command 2-308
show access-lists command 2-310
show archive status command 2-313
show arp access-list command 2-315
show auto qos command 2-316
show boot command 2-320
show cable-diagnostics tdr command 2-322
show changes command 2-652
show class-map command 2-325
show cluster candidates command 2-328
show cluster command 2-326
show cluster members command 2-330
show controllers cpu-interface command 2-332
show controllers ethernet-controller command 2-334
show controllers power inline command 2-342
show controllers tcam command 2-345
show controller utilization command 2-347
show current command 2-652
show dot1q-tunnel command 2-349
show dot1x command 2-351
show dtp 2-354
show env command 2-356
show errdisable detect command 2-359
show errdisable flap-values command 2-361
show errdisable recovery command 2-363

show etherchannel command 2-365
show flowcontrol command 2-368
show idprom command 2-370
show interfaces command 2-372
show interfaces counters command 2-381
show inventory command 2-384
show ip arp inspection command 2-385
show ipc command 2-409
show ip dhcp snooping binding command 2-390
show ip dhcp snooping command 2-389
show ip dhcp snooping database command 2-393
show ip igmp profile command 2-395
show ip igmp snooping command 2-396
show ip igmp snooping groups command 2-401
show ip igmp snooping mrouter command 2-403
show ip igmp snooping querier detail command 2-399
show ip source binding command 2-405
show ip verify source command 2-407
show l2protocol-tunnel command 2-413
show lacp command 2-416
show mac access-group command 2-420
show mac address-table address command 2-424
show mac address-table aging time command 2-426
show mac address-table command 2-422
show mac address-table count command 2-428
show mac address-table dynamic command 2-430
show mac address-table interface command 2-432
show mac address-table notification command 2-434
show mac address-table static command 2-436
show mac address-table vlan command 2-438
show mls qos aggregate-policer command 2-441
show mls qos command 2-440
show mls qos input-queue command 2-442
show mls qos interface command 2-444
show mls qos maps command 2-448
show mls qos queue-set command 2-451
show mls qos vlan command 2-453
show monitor command 2-454
show mvr command 2-457
show mvr interface command 2-459
show mvr members command 2-461
show pagp command 2-463
show parser macro command 2-465
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-30
show platform qos command C-31
show platform resource-manager command C-32
show platform snmp counters command C-34
show platform spanning-tree command C-35
show platform stack-manager command C-37
show platform stp-instance command C-36
show platform tb command C-39
show platform tcam command C-41
show platform vlan command C-44
show policy-map command 2-468
show port security command 2-470
show power inline command 2-473
show proposed command 2-652
show sdm prefer command 2-476
show setup express command 2-479
show spanning-tree command 2-480

show storm-control command 2-486
show switch command 2-488
show system mtu command 2-491
show trust command 2-630
show udld command 2-492
show version command 2-495
show vlan access-map command 2-502
show vlan command 2-497
show vlan command, fields 2-499
show vlan filter command 2-503
show vmps command 2-504
show vtp command 2-507
shutdown command 2-511
shutdown threshold, Layer 2 protocol tunneling 2-170
shutdown vlan command 2-512
Smartports macros
  See macros
SNMP host, specifying 2-517
SNMP informs, enabling the sending of 2-513
snmp-server enable traps command 2-513
snmp-server host command 2-517
snmp trap mac-notification command 2-521
SNMP traps
  enabling MAC address notification trap 2-521
  enabling the MAC address notification feature 2-186
  enabling the sending of 2-513
SoftPhone
  See Cisco SoftPhone
software images
  copying 2-7
  deleting 2-75
  downloading 2-10
  upgrading 2-7, 2-10
  uploading 2-17
software version, displaying 2-495
source ports, MVR 2-252
SPAN
  configuring 2-244
  debug messages, display B-22
  displaying 2-454
  filter SPAN traffic 2-244
  sessions
    add interfaces to 2-244
    displaying 2-454
    start new 2-244
spanning 2-563
spanning-tree backbonefast command 2-523
spanning-tree bpdufilter command 2-524
spanning-tree bpduguard command 2-526
spanning-tree cost command 2-528
spanning-tree etherchannel command 2-530
spanning-tree extend system-id command 2-532
spanning-tree guard command 2-534
spanning-tree link-type command 2-536
spanning-tree loopguard default command 2-538
spanning-tree mode command 2-540
spanning-tree mst configuration command 2-542
spanning-tree mst cost command 2-544
spanning-tree mst forward-time command 2-546
spanning-tree mst hello-time command 2-547
spanning-tree mst max-age command 2-548
spanning-tree mst max-hops command 2-549
spanning-tree mst port-priority command 2-551
spanning-tree mst pre-standard command 2-553
spanning-tree mst priority command 2-554
spanning-tree mst root command 2-555
spanning-tree portfast (global configuration) command 2-559
spanning-tree portfast (interface configuration) command 2-561
spanning-tree port-priority command 2-557
Spanning Tree Protocol
  See STP
spanning-tree transmit hold-count command 2-563
spanning-tree uplinkfast command 2-564

spanning-tree vlan command 2-566
speed command 2-569
srr-queue bandwidth limit command 2-571
srr-queue bandwidth shape command 2-573
srr-queue bandwidth share command 2-575
SSH, configuring version 2-166
stack-mac persistent timer command 2-577
stack member
  access 2-302
  number 2-488, 2-585
  priority value 2-582
  provisioning 2-583
  reloading 2-286
stacks, switch
  MAC address 2-577
  provisioning a new member 2-583
  reloading 2-286
  stack member access 2-302
  stack member number 2-488, 2-585
  stack member priority value 2-488, 2-582
static-access ports, configuring 2-589
statistics, Ethernet group 2-293
sticky learning, enabling 2-602
storm-control command 2-579
STP
  BackboneFast 2-523
  counters, clearing 2-56
  debug messages, display
    BackboneFast events B-78
    MSTP B-81
    optimized BPDUs handling B-80
    spanning-tree activity B-76
    switch shim B-83
    transmitted and received BPDUs B-79
    UplinkFast B-85
  detection of indirect link failures 2-523
  enabling protocol tunneling for 2-170
  EtherChannel misconfiguration 2-530
  extended system ID 2-532
STP (continued)
  path cost 2-528
  protocol modes 2-540
  root port
    accelerating choice of new 2-564
    loop guard 2-534
    preventing from becoming designated 2-534
    restricting which can be root 2-534
    root guard 2-534
    UplinkFast 2-564
  root switch
    affects of extended system ID 2-532, 2-567
    hello-time 2-566
    interval between BDPU messages 2-566
    interval between hello BPDU messages 2-566
    max-age 2-566
    port priority for selection of 2-557
    primary or secondary 2-566
    switch priority 2-566
  state changes
    blocking to forwarding state 2-561
    enabling BPDU filtering 2-524, 2-559
    enabling BPDU guard 2-526, 2-559
    enabling Port Fast 2-559, 2-561
    enabling timer to recover from error state 2-106
    forward-delay time 2-566
    length of listening and learning states 2-566
    shutting down Port Fast-enabled ports 2-559
  state information display 2-480
  VLAN options 2-554, 2-566
SVIs, creating 2-116
Switched Port Analyzer
  See SPAN
switching characteristics
  modifying 2-587
  returning to interfaces 2-587
switchport access command 2-589
switchport backup interface command 2-591
switchport block command 2-593

switchport command 2-587
switchport host command 2-594
switchport mode command 2-595
switchport mode private-vlan command 2-598
switchport nonegotiate command 2-600
switchport port-security aging command 2-607
switchport port-security command 2-602
switchport priority extend command 2-609
switchport private-vlan command 2-611
switchport protected command 2-613
switchports, displaying 2-372
switchport trunk command 2-615
switchport voice vlan command 2-618
switch priority command 2-582
switch provision command 2-583
switch renumber command 2-585
system env temperature threshold yellow command 2-620
system message logging 2-178
system message logging, save message to flash 2-179
system mtu command 2-622
system resource templates 2-294

T

tar files, creating, listing, and extracting 2-14
TDR, running 2-624
Telnet, using to communicate to cluster switches 2-284
temperature information, displaying 2-356
templates, system resources 2-294
test cable-diagnostics tdr command 2-624
traceroute mac command 2-625
traceroute mac ip command 2-628
trunking, VLAN mode 2-595
trunk mode 2-595
trunk ports 2-595
trunks, to non-DTP device 2-596
trusted boundary for QoS 2-241
trusted port states for QoS 2-241
tunnel ports, Layer 2 protocol, displaying 2-413
type (boot loader) command A-24

U

UDLD
  aggressive mode 2-632, 2-634
  debug messages, display B-94
  enable globally 2-632
  enable per interface 2-634
  error recovery timer 2-106
  message timer 2-632
  normal mode 2-632, 2-634
  reset a shutdown interface 2-636
  status 2-492
udld command 2-632
udld port command 2-634
udld reset command 2-636
unicast storm control 2-579
UniDirectional Link Detection
  See UDLD
unknown multicast traffic, preventing 2-593
unknown unicast traffic, preventing 2-593
unset (boot loader) command A-25
upgrading
  software images 2-7, 2-10
    monitoring status of 2-313
upgrading information
  See release notes
UplinkFast, for STP 2-564
user EXEC mode 1-2, 1-3

V

version (boot loader) command A-27
version mismatch mode 2-489
vlan (global configuration) command 2-637
vlan (VLAN configuration) command 2-643
vlan access-map command 2-649

VLAN access map configuration mode 2-649
VLAN access maps
  actions 2-5
  displaying 2-502
VLAN-based QoS 2-243
VLAN configuration
  rules 2-640, 2-645
  saving 2-637, 2-647
VLAN configuration mode
  commands
    VLAN 2-643
    VTP 2-666
  description 1-5
  entering 2-651
  summary 1-3
vlan database command 2-651
vlan dot1q tag native command 2-654
vlan filter command 2-655
VLAN filters, displaying 2-503
VLAN ID range 2-637, 2-643
VLAN maps
  applying 2-655
  creating 2-649
  defining 2-201
  displaying 2-502
VLAN Query Protocol
  See VQP
VLANs
  adding 2-637
  configuring 2-637, 2-643
  debug messages, display
    ISL B-90
    VLAN IOS file system error tests B-88
    VLAN manager activity B-86
    VTP B-92
  displaying configurations 2-497
  extended-range 2-637
VLANs (continued)
  MAC addresses
    displaying 2-438
    number of 2-428
  media types 2-640, 2-645
  normal-range 2-637, 2-643
  private 2-598
    configuring 2-278
    displaying 2-497
    See also private VLANs
  restarting 2-512
  saving the configuration 2-637
  shutting down 2-512
  SNMP traps for VTP 2-515, 2-518
  suspending 2-512
  variables 2-643
VLAN Trunking Protocol
  See VTP
VM mode 2-489
VMPS
  configuring servers 2-660
  displaying 2-504
  error recovery timer 2-107
  reconfirming dynamic VLAN assignments 2-657
vmps reconfirm (global configuration) command 2-658
vmps reconfirm (privileged EXEC) command 2-657
vmps retry command 2-659
vmps server command 2-660
voice VLAN
  configuring 2-618
  setting port priority 2-609
VQP
  and dynamic-access ports 2-590
  clearing client statistics 2-58
  displaying information 2-504
  per-server retry count 2-659
  reconfirmation interval 2-658
  reconfirming dynamic VLAN assignments 2-657

VTP
changing characteristics 2-662
clearing pruning counters 2-59
configuring
domain name 2-662, 2-666
file name 2-662
mode 2-662, 2-666
password 2-662, 2-666
counters display fields 2-508
displaying information 2-507
enabling
pruning 2-662, 2-666
tunneling for 2-170
Version 2 2-662, 2-666
mode 2-662, 2-666
pruning 2-662, 2-666
saving the configuration 2-637, 2-647
statistics 2-507
status 2-507
status display fields 2-509
vtp (global configuration) command 2-662
vtp (VLAN configuration) command 2-666

X

XENPAK module serial EERPOM information 2-338, 2-370