INDEX

Symbols

! in route patterns 9-90

+ dialing 9-13

+E.164 dial plans 9-66

<None> calling search space 23-8

@ in route patterns 9-90

Numerics

1040 Sensor 28-8

1700 Series Routers 17-7, 17-11

1A and 2A cabling 3-15

2111 Virtualization Experience Client 18-37

2112 Virtualization Experience Client 18-37

2211 Virtualization Experience Client 18-37

2212 Virtualization Experience Client 18-37

2800 Series Routers 17-7, 17-11, 17-19, 17-35

2900 Series Routers 17-35

3500 Series Video Gateways 13-27

3800 Series Routers 17-7, 17-11, 17-19, 17-35

3900 Series Routers 17-35

3900 Series SIP Phone 18-9

4000 Virtualization Experience Client 18-37

508 conformance 5-63

6215 Virtualization Experience Client 18-38

6901 IP Phone 18-9

6911 IP Phone 18-9

6921 IP Phone 18-10, 18-16

6941 IP Phone 18-12, 18-16

6945 IP Phone 18-12, 18-16

6961 IP Phone 18-10, 18-16

7902G IP Phone 18-9

7905_7912 dial rules 9-52, 9-84

7905G IP Phone 18-9

7906G IP Phone 18-9

7910G+SW IP Phone 18-10

7910G IP Phone 18-10

7911G IP Phone 18-10

7912G IP Phone 18-10

7914 Expansion Module 18-15

7915 Expansion Module 18-15

7916 Expansion Module 18-15

7921G Wireless IP Phone 12-46, 18-23

7925G-EX Wireless IP Phone 18-23

7925G Wireless IP Phone 12-46, 18-23

7926G Wireless IP Phone 18-23

7931G IP Phone 18-11

7936 IP Conference Station 18-29

7937G IP Conference Station 18-29

7940_7960_OTHER dial rules 9-52, 9-84

7940G IP Phone 18-11

7941G-GE IP Phone 18-11

7941G IP Phone 18-11

7942G IP Phone 18-12

7945G IP Phone 18-12

7960G IP Phone 18-12

7961G-GE IP Phone 18-13

7961G IP Phone 18-13

7962G IP Phone 18-13

7965G IP Phone 18-13

7970G IP Phone 18-14

7971G-GE IP Phone 18-14

7975G IP Phone 18-15

7985G IP Video Phone 18-33, 18-34, 18-50

802.1s 3-5

802.1w 3-5, 3-7
802.1X authentication 4-15
802.3af PoE 3-13
8900 Series IP Phone 18-13, 18-16, 18-33, 18-34
9.@ route pattern 9-90
911 25-106
911 calls 9-42, 10-1
9900 Series IP Phone 18-16, 18-33, 18-34
9951 IP Phone 18-15
9971 IP Phone 18-15

A

AA 21-24
AAR
  dial plan considerations 9-108
  for video calls 12-10, 13-32
  for Voice over PSTN 5-20, 5-21
  with Cisco Unity 21-9
  with globalized destination mask 9-23
  with hunt pilot 9-76
abbreviated dialing 9-7
AC 19-42
access codes 9-10, 9-109, 25-45
access control list (ACL) 4-22, 4-23, 18-48
Access Control Server (ACS) 18-27
accessibility of IP Telephony features 5-63
Access Layer 3-5
access lists for Mobile Connect calls 25-47
access numbers 25-55
access point (AP) 3-57, 3-58, 3-67, 18-23
ACF 9-133
ACL 4-22, 4-23, 18-48
ACS 18-27
Active Directory (AD) 16-10, 16-14, 16-16, 16-21
Active Directory Application Mode (ADAM) 16-11, 16-26
Active Directory Lightweight Directory Services (AD LDS) 16-18
AD 16-10, 16-14, 16-16, 16-21
ADAM 16-11, 16-26
Adaptive Security Appliance (ASA) 4-24, 4-35, 11-69
additional information xxxix, xli
addresses
  Admission Request (ARQ) 9-133
  flat 25-29
  MAC 4-8
  partitioned 25-27
  resolution 9-133, 9-134
  security 4-5, 4-6
Address Resolution Protocol (ARP) 3-67, 4-14
Add Traffic Stream (ADDTS) 18-28
ADDTS 18-28
ad-hoc conferences 12-18
AD LDS 16-18
Administrative XML Layer (AXL) 28-5
Admission Confirm (ACF) 9-133
Admission Reject (ARJ) 9-133
Admission Request (ARQ) 9-133
advanced formulas for bandwidth calculations 3-54
AFT 10-22
agents for call processing 5-27
Aggregation Services Router (ASR) 22-5
AHT 29-5
ALI 10-3, 10-5, 10-22
ALI Formatting Tool (AFT) 10-22
all trunks busy 10-14
alternate
  endpoints 14-54
  gatekeeper 8-38, 14-54
analog
  gateways 13-8, 13-25, 18-3
  interface modules 18-4, 18-5
Analog Telephone Adaptor (ATA) 18-8, 18-40
Analysis Manager 28-21
anchoring calls in the enterprise 25-59
Android 25-66, 25-74, 25-75, 25-79
ANI 10-3, 10-5, 10-7, 10-11, 13-18
Annex M1 14-54

annunciator 17-20
answer supervision 10-14
AnyConnect 25-80
AP 3-57, 3-58, 3-67, 18-23
Apple iPhone 25-88
application dialing rules 24-7, 25-55
Application ID for RSVP 11-28, 11-36, 11-48, 12-8
applications
  Attendant Console 19-42
  described 19-1
  Extension Mobility 19-7, 19-27
  for mobile users 25-1
  for phones 18-18
  for video telephony 12-41
  IP Manager Assistant 19-19
  IP Phone Services 19-2
  security 4-38
  third-party 1-2
  Unified Communications Manager Assistant 19-19
  WebDialer 19-32
applications and services layer 1-5, 20-1
application users 16-7
architecture
  applications and services layer 20-3
  call control layer 15-2
  call processing 8-3
  call routing layer 7-3
  Cisco IP Phone Messenger (IPPM) 24-29
  Cisco UC Integration for Microsoft Office Communicator 24-26
  Cisco Unified Client Services Framework 24-3
  Cisco Unified Communications Manager Assistant 19-19, 19-21
  Cisco Unified Contact Center 26-2
  Cisco Unified MeetingPlace 22-14
  Cisco Unified Mobile Communicator 25-90
  Cisco Unified Personal Communicator 24-10
  Cisco WebEx Connect 24-16
  conferencing 22-3
  deployment models 5-2
  directories 16-7
  dual-mode phones 25-66
  endpoints 18-3
  Enterprise Feature Access 25-56
  Extension Mobility 19-8
  IP Phone Services 19-2
  media resources 17-2
  Mobile Connect 25-48
  Mobile Voice Access 25-56
  networking layer 2-3
  operations and serviceability layer 27-3
  presence 23-9
  Service Advertisement Framework (SAF) 5-64
  trunks 14-2
  Unified Communications System 1-3
  videoconferencing 22-39
  voice and video over WLAN 3-57
  WebDialer 19-33, 19-37
  wireless LAN 3-57
area code 9-109
ARJ 9-133
ARP 3-67, 4-14
ARQ 9-133
ASA 4-24, 4-35, 11-69
ASR 22-5
assistance, obtaining xli
Assistant Console 19-31
asymmetric link between two RSVP-aware routers 11-30
asynchronous H.323 client 12-28, 12-33
Asynchronous Transfer Mode (ATM) 3-40, 5-13, 5-26
ATA 18-8, 18-40
ATM 3-40, 5-13, 5-26
Attendant Console (AC) 12-43, 19-42, 29-28
audio on computer 18-22, 24-5
audio-only calls 12-10
audio sources 17-45
authentication
  database 3-59

of phones 4-20, 18-24
of users 16-9, 16-19
open 18-25
shared key 18-25
auto-detection 8-44
automated alternate routing (AAR)
dial plan considerations 9-108
for video calls 12-10, 13-32
for Voice over PSTN 5-20, 5-21
with Cisco Unity 21-9
with globalized destination mask 9-23
with hunt pilot 9-76
automated attendant (AA) 21-24
Automatic Location Identification (ALI) 10-5, 10-22
Automatic Location Identifier (ALI) 10-3
Automatic Number Identification (ANI) 10-5, 10-7, 10-11, 13-18
automatic number identification (ANI) 10-3
AUTO negotiate 3-15
autonomous systems 3-78
average hold time (AHT) 29-5
AXL 28-5

B

BackboneFast 3-7
bandwidth
advanced formulas 3-54
best-effort 3-39
call control traffic 3-52, 3-53, 3-56
consumption 3-47, 3-49, 11-38
for Cisco Unity 21-34
for conferencing 22-10, 22-36
for contact center 26-12
for RSVP 11-34, 11-38
for shared line appearances 3-54
for Unified MeetingPlace 22-36
for virtual tie lines 3-56
for WebEx 22-10
general rule 5-46
guaranteed 3-38
management of 11-15
provisioning 3-20, 3-38, 3-47, 11-38
request for 14-54
requirements for call admission control 11-13
requirements for gatekeepers 11-15
voice class requirements 3-43
basic IP phones 18-8
B-Channel 13-34
beacons 3-68
Bearer Capabilities Information Element (bearer-caps) 13-37
bearer-caps command 13-37
bearer traffic 3-48, 11-34
best-effort bandwidth 3-39
best practices for
call admission control 11-126
centralized call processing 5-14
Cisco Unified Border Element 8-50
Cisco Unified Communications Manager Express (Unified CME) 8-46
Cisco Unity 21-34
Cisco Unity Connection 21-34
Cisco Unity Express (CUE) 21-45
distributed call processing 5-26
fax support 13-21
LDAP synchronization 16-16
line/device approach to building classes of service 9-62
modem support 13-24
music on hold 17-44
RSVP 11-33
single-site deployment 5-9
voice messaging 21-34
WAN design 3-37
BHCA 5-51, 9-78, 13-2, 29-4, 29-14, 29-21
BHCC 9-78, 29-4
bill-to number (BTN) 10-6
binding of channels 13-34

blade servers 5-59
BLF 23-7
blocking factor 29-4
blocking numbers 25-54
Bluetooth 3-66, 18-29
bootstrap server 5-35
border element 8-50, 14-58
BPDU 3-7
branch office router 17-50
bridge protocol data unit (BPDU) 3-7
B-Series Blade Server 5-59, 5-61
BTN 10-6
bugs, reporting xli
bump in the wire 4-26
bundled interfaces 11-32
bursting 3-46
bursty traffic 13-2, 29-5
Business Edition 8-3, 8-6, 8-24, 8-28, 8-29, 17-2, 25-63, 29-14
Business Edition 3000 5-13, 5-17, 5-20, 8-6, 9-146
Business Edition 5000 29-16
Business Edition 6000 5-57
business IP phones 18-10
busy hour 29-4
busy hour call attempts (BHCA) 5-51, 9-78, 13-2, 29-4, 29-14, 29-21
busy hour call completions (BHCC) 9-78, 29-4
busy lamp field (BLF) 23-7
busy-out channels 13-34

C

cabling
  Category 3 3-15
  IBM type 1A and 2A 3-15
CAC (*see* call admission control)
calendar integration for presence 23-32
call admission control
  bandwidth management 11-15
  bandwidth requirements 11-13
  best practices 11-126
  centralized call processing 11-71, 11-75, 11-80, 11-85
  components 11-12
  described 11-1
  design considerations 11-70
  distributed call processing 11-72, 11-77, 11-82
  elements 11-12
  for contact center 26-13
  for music on hold 17-47
  for Session Management Edition (SME) 11-110
  for TelePresence 11-95
  for video 11-95
  for wireless access points 18-28
  gatekeeper 8-37, 9-131, 11-15
  locations 11-97, 12-8
  migration from static locations to RSVP 11-45
  moving devices to a new location 10-15, 25-17
  MPLS 11-11
  regions 12-5
  RSVP-enabled locations 11-38
  RSVP for video calls 11-105
  RSVP ingress 11-29
  static locations 11-12
  topologies 11-70
  topology-aware 11-7
  topology-unaware 11-3
call anchoring 25-59
callback
  dial-via-office 25-93
  for emergency services 10-11, 10-16
  from the PSAP 10-11, 10-16
  reverse 25-93
call center 26-1
Call Control Discovery (CCD) 5-64, 9-24
call control layer 1-4, 15-1
call control traffic 3-52, 3-56
call detail record (CDR) 5-48, 28-10
caller ID 25-106
caller ID matching 25-55, 25-59

caller ID transformations 25-61
call flows
multicast music on hold 17-27, 17-30
music on hold 17-27, 17-30
unicast music on hold 17-29, 17-32
Call Forward Unregistered (CFUR) 9-23
call hand-in 25-73, 25-82
call handoff 25-73, 25-76, 25-81
call hand-out 25-73, 25-76, 25-81
calling line ID (CLID) 9-91, 13-18
calling party number
globalization 9-17
localization 9-20
calling party number (CPN) 10-6
calling party number normalization 14-26
calling privileges 9-101, 9-140
calling restrictions 9-101, 9-140
calling search spaces 9-61, 9-101, 9-102, 23-8, 25-58
call log 25-93
call management record (CMR) 5-48, 28-10
call processing
agents 5-27
architecture 8-3
capacity planning 8-25
centralized 5-10, 11-71, 11-75, 11-80, 11-85, 21-8, 21-11, 26-7, 28-25
design considerations 8-29
distributed 5-24, 11-72, 11-77, 11-82, 26-8, 28-26
guidelines 8-1
hardware platforms 8-4
high availability 8-15
mixed deployments 11-90
redundancy 8-17, 13-9
subscriber server 8-9, 8-10
with gatekeeper 8-37
call-related traffic 3-56
call routing
architectural layer 1-4, 7-1
for emergency calls 10-21
inbound 25-69
outbound 25-70
calls
911 10-1
audio-only 12-10
classification of 9-92
coverage of 9-75
emergency 9-42, 10-1
flow between clusters 12-12
forwarding 9-65, 9-104
H.323 14-53
history 23-8
hold 17-24
inbound 9-42, 9-49, 13-29, 13-35
load balancing 14-55
music on hold 17-21
outbound 9-42, 9-46, 13-31, 13-36, 14-55
per second (cps) 13-2
pickup at desk phone 25-41
pickup at remote destination phone 25-42
preservation of 13-15
privileges 9-101
restrictions 9-140
routing 9-87, 9-128, 9-131, 10-21, 13-29, 13-31, 25-105
scenarios 12-11
signaling 13-36, 13-37
simultaneous 13-2
types supported 12-4
within a cluster 9-42, 9-45
calls per second (cps) 29-4
CAM 4-8
CAMA 10-6
campus
access switch 3-3
deployment model 5-8
infrastructure requirements 3-1
cancellation of echo 13-23
CanMapAlias 14-54
capacity planning

applications and serviceability layer 20-5
Attendant Console 19-45, 29-28
Business Edition 8-28, 29-14
by product 29-13
call control layer 15-4
call processing 8-25
call routing layer 7-5
call traffic 29-21
Cisco IP Phone Messenger (IPPM) 24-32
Cisco Prime Unified Operations Manager (Unified OM) 29-47
Cisco Prime Unified Service Monitor (Unified SM) 29-47
Cisco UC Integration for Microsoft Office Communicator 24-28
Cisco Unified Client Services Framework 24-8
Cisco Unified Communications Manager Express (Unified CME) 29-14
Cisco Unified Mobile Communicator 25-100
Cisco Unified Personal Communicator 24-11
Cisco Unified Presence 29-45
Cisco WebEx Connect 24-21
clusters 29-18
codecs 29-35
conferencing 29-39
contact center 26-15
CTI applicaitons 29-23
CTI applications 8-34
definition of terms 29-4
deployment models 5-3
design and deployment considerations 29-1
dial plan 9-4, 29-22
direct connect mobile clients 25-113
dual-mode phones 25-85
emergency services 29-32
endpoints 18-54, 29-20
Express Media Server (EMS) 29-40
Extension Mobility 19-16, 29-25
factors to consider 29-2
gateways 29-32
IME-enabled ASA 4-33
instant messaging storage requirements 23-31
Intercompany Media Engine (IME) 5-42, 29-31
IP Phone Services 19-7
locations 29-19
media resources 17-34, 29-28
media server 29-41
megacluster 29-30
music on hold 17-36, 17-38
music on hold (MoH) 29-29
networking layer 2-4
operations and serviceability layer 27-4
performance overload 29-36
performance tuning 29-36
phones 18-54
presence 29-45
regions 29-19
servers 29-18
Session Management Edition (SME) 29-30
sizing tools 29-3
tools 8-26, 29-3
trunks 14-58
Unified CM 29-18
Unified CM Assistant 19-25, 29-27
Unified CM servers 8-26
Unified Communications Management Suite 29-46
Unified MeetingPlace 22-36, 29-43, 29-44
Unified Mobility 25-63
videoconferencing 22-44, 29-44
Virtualization Experience Clients (VXC) 24-34
voice activity detection (VAD) 29-35
voice messaging 29-38
WebDialer 19-40, 29-27
WebEx 22-9
wireless networks 3-63, 18-26
CAPWAP 3-58
CAR 5-48
cascading media resources 29-42
Category 3 cabling 3-15

CCA 3-68
CCD 5-64, 9-24, 11-67
CDP 4-6, 18-30
CDR 5-48, 28-10
CDR Analysis and Reporting (CAR) database 5-48
Centralized Automatic Message Accounting (CAMA) 10-6
centralized call processing
  call admission control 11-71, 11-75, 11-80, 11-85
  call coverage 9-76
  centralized messaging 21-8
  deployment model 5-10, 26-7, 28-25
  distributed messaging 21-11
  hunt lists 9-76
  Voice over the PSTN 5-20
centralized gatekeeper deployment 9-135
centralized messaging 21-6, 21-8, 21-15, 21-23
centralized TFTP services 3-33, 3-34
CFUR 9-23
Challenge Handshake Authentication Protocol (CHAP) 18-24
changes for this release xxxix
channels
  binding 13-34
  for video calls 13-34
  for wireless devices 3-65
  rollover 13-34
CHAP 18-24
CIF 18-36
CIR 3-46
Cisco 1040 Sensor 28-8
Cisco Business Edition 8-24, 17-2, 25-63
Cisco Centralized Key Management (Cisco CKM) 18-25, 18-27
Cisco Discovery Protocol (CDP) 4-6, 18-30
Cisco E20 Video Phone 18-34
Cisco Emergency Responder (ER) 10-7, 10-15, 12-42
Cisco EnergyWise Technology 3-13
Cisco IOS
  calling privileges 9-140
  call routing 9-128, 9-131
  classes of service 9-71
  digit manipulation 9-142
  gatekeeper 12-25
  minimum release required 18-5
  software MTP 17-19
Cisco IP Communicator 12-43, 18-44, 18-55
Cisco IP Conference Station 18-40
Cisco IP Phone Messenger (IPPM) 24-29
Cisco IP SoftPhone 10-16, 18-55
Cisco IP Voice Media Streaming Application 29-28
Cisco IP Voice Media Streaming Application 17-20
Cisco Jabber 25-74, 25-75, 25-78, 25-79
Cisco Jabber Android, Android 25-79
Cisco Jabber for Android 25-79
Cisco LEAP 18-24, 18-25
Cisco MediaSense 26-6
Cisco Mobile 25-74, 25-78, 25-79, 25-80
Cisco Mobile iPhone 25-78, 25-79
Cisco Multimedia Conference Manager (MCM) 12-36, 14-54
Cisco Multipoint Control Unit (MCU) 22-37, 22-43
Cisco Network Analysis Module (NAM) 28-11
Cisco Prime 28-1
Cisco Prime Unified Operations Manager (Unified OM) 28-4, 29-47
Cisco Prime Unified Provisioning Manager (Unified PM) 28-16
Cisco Prime Unified Service Monitor (Unified SM) 28-8, 29-47
Cisco Proprietary RTP 17-13
Cisco Security Agent 4-38
Cisco Technical Assistance Center (TAC) xli
Cisco UC Integration for Microsoft Office Communicator 24-1, 24-26
Cisco Unified Analysis Manager 28-21
Cisco Unified Border Element 4-36, 9-134, 11-66, 14-58
Cisco Unified Client Services Framework (CSF) 18-22, 24-3
Cisco Unified Communications Integration for Cisco WebEx Connect 24-19

Cisco Unified Communications Management Suite 28-1, 29-46
Cisco Unified Communications Manager Assistant (Unified CM Assistant) 12-42
Cisco Unified Communications Manager Express (Unified CME) 5-14, 5-27, 8-44, 18-19, 21-13, 29-14
Cisco Unified Communications Manager Real-Time Monitoring Tool (RTMT) 28-21
Cisco Unified Computing System (UCS) Platform 5-58
Cisco Unified Contact Center 12-43, 26-1
Cisco Unified Contact Center Enterprise (Unified CCE) 26-2
Cisco Unified Contact Center Express (Unified CCX) 26-4
Cisco Unified Contact Center Management Portal (Unified CCMP) 26-5
Cisco Unified Customer Voice Portal (Unified CVP) 26-3
Cisco Unified E-Mail Interaction Manager (Unified EIM) 26-5
Cisco Unified Expert Advisor 26-4
Cisco Unified Intelligence Center (Unified IC) 26-5
Cisco Unified IP Conference Station 18-29
Cisco Unified IP IVR 12-24, 12-43
Cisco Unified Media Capture Plartform 26-6
Cisco Unified MeetingPlace 12-44, 22-13, 25-98, 29-43, 29-44
Cisco Unified Messaging Gateway (UMG) 21-4
Cisco Unified Mobile Communicator 24-2, 25-87
Cisco Unified Mobility 25-1, 25-38, 25-79
Cisco Unified Personal Communicator 18-21, 18-44, 24-1, 24-10
Cisco Unified Presence 23-1, 23-9, 29-45
Cisco Unified Reporting 28-22
Cisco Unified Service Statistics Manager (Unified SSM) 28-14
Cisco Unified Video Advantage
  classification of traffic 18-48
  described 12-1, 18-30
  QoS recommendations 18-44
Cisco Unified Videoconferencing 22-37
Cisco Unified Web Interaction Manager (Unified WIM) 26-5
Cisco Unified Wireless IP Phone 7921G 12-46
Cisco Unified Wireless IP Phone 7925G 12-46
Cisco Unity 21-1, 21-8, 21-18, 21-22, 21-36, 25-97
Cisco Unity Connection 21-8, 21-19, 21-36, 25-97
Cisco Unity Express (CUE) 21-24
Cisco Unity Personal Assistant 21-6
Cisco Unity Telephony Integration Manager (UTIM) 21-41, 21-43
Cisco Voice Transmission Quality (CVTQ) 28-10
Cisco WebEx Connect 24-1, 24-16
CKM 18-25, 18-27
classes of service for users 9-54, 9-58, 9-71, 25-23
classification of
  calls 9-92
  traffic 3-4, 3-17, 3-70, 18-39, 18-48
class of restriction (COR) 9-71, 9-140
Class of Service (CoS) 3-4, 9-66, 9-70, 18-40
clear channel assessment (CCA) 3-68
CLEC 10-5
CLID 9-91, 13-18
Client Matter Code (CMC) 9-92
clients
  H.323 12-28
  zones 12-35
Client Services Framework 24-3
client transformation 24-8
clipping 5-14
clustering over the WAN
  Business Edition 6000 5-57
  Cisco Unity 21-15, 21-17
  CTI applications 8-33
  described 5-45
  failover with Cisco Unity 21-19
  for contact center 26-10, 28-27
  local failover 5-49
  music on hold 17-53
  presence 23-22
  remote failover 5-55
  troubleshooting 5-49
  WAN considerations 5-46

with Cisco Unity 21-22
clusters
co-located 11-86
design guidelines 8-8
Emergency Responder (ER) 10-9, 10-21
for presence servers 23-10
for Unified CM 8-8
guidelines for 8-14
maximum capacity 29-18
multiple, for Cisco Unity 21-38
redundancy 8-19
server nodes 8-9
services 8-8
clusterwide parameters 11-43
CMC 9-92
CMM 17-22, 18-6
CMR 5-48, 28-10
codecs
capacity planning 29-35
complexity modes 17-4, 17-5
flex mode 17-5
for music on hold 17-44
for video telephony 18-34
iLBC 14-56
lossy, Link Loss Type 14-56
low bit-rate (LBR) 17-41
packets per second (pps) 13-5
pass-through 11-42
selection of 14-56
supported by endpoint devices 12-6, 18-36
collaboration
Cisco Unified Client Services Framework 24-3
clients and applications 24-1
conferencing 22-1, 29-39
contact management 24-4
LDAP directory integration 24-4
solutions 12-44
third-party XMPP clients and applications 24-2
collaborative conferencing 22-1, 29-39
co-located
DHCP server 3-26
Unified CM clusters 11-86
COM 16-3
combined deployment models for messaging 21-14
Committed Information Rate (CIR) 3-46
Common Intermediate Format (CIF) 18-36
Communication Media Module (CMM) 17-22, 18-6
Communicator 18-21, 18-44, 18-55, 24-10
competitive local exchange carrier (CLEC) 10-5
complexity modes for codecs 17-4, 17-5
Component Object Model (COM) 16-3
components of
Device Mobility 25-18
IP Video Telephony 12-2
messaging system 21-3
presence 23-3
compressed Real-Time Transport Protocol (cRTP) 3-40, 3-43
Computer Telephony Integration (CTI) 8-11, 8-23, 8-31, 12-3, 12-42, 21-24, 29-23
conference bridges 17-18
Conference Station 18-29, 18-40
conferencing
ad-hoc 12-18
architecture 22-3
capacity planning 22-36
collaborative 22-1, 29-39
described 17-6, 22-1
hardware 8-45
hardware resources 17-7
Intelligent Bridge Selection 12-19, 12-20, 17-8
recording sessions 22-30
resources 12-16, 12-24, 17-6
rich media 1-1
scheduling interface 22-19
security 17-9
software resources 17-6
video 12-19, 12-20, 17-8

configuration examples for
ATA 188 and IP phones 18-40
endpoint gatekeeper 12-40
fax/modem support 13-26
gatekeeper 8-37
lobby phone security 4-39
QoS 18-39
software-based endpoints 18-44
Unified CME 8-44
VG224 gateways 18-39
VG248 gateways 18-39
Wireless IP Phones 18-46
zones 12-35
conformance with Section 508 5-63
connectivity options for the WAN 5-13, 5-26
console
for attendants 12-43, 19-42
for Unified CM Assistant assistant 19-31
contact center
described 26-1
gateway sizing 29-34
general 1-1
traffic patterns 13-3, 13-4, 29-34
video calls 12-43
content-addressable memory (CAM) 4-8
Content Engine (CE) 11-30
continuous-presence conference view 12-17, 17-8
Control and Provisioning of Wireless Access Points (CAPWAP) 3-58
Control Discovery (CCD) 11-67
control signaling 3-52, 3-56
conventions used in this document xlii
COR 9-71, 9-140
Core Layer 3-12
co-resident
DHCP 3-28
MoH 17-36
core switch 3-3
CoS 3-4, 9-66, 9-70, 18-40
coverage of calls 9-75
CPN 10-6
cps 13-2, 29-4
CPU usage 29-11
CPU utilization in gateways 13-5
cRTP 3-40, 3-43
cryptographic features xli
C-Series Rack-Mount Server 5-61, 5-62
CSF 18-22
CTI 8-11, 8-23, 8-31, 12-3, 12-42, 21-24, 29-23
CTI Manager 8-8, 8-23
CTIManager 8-11
CTI-QBE 21-24
CTI route points 17-18
CUE 21-24
customer contact 1-1
customer support xli
cutover 6-1
CVTQ 28-10

D

DAI 4-13, 4-14
database replication 8-11
database synchronization for Unified CM 16-27
data center 3-12, 4-33
data centers
redundant 4-43
single 4-42
data plan for Cisco Unified Mobile Communicator 25-88
delay
of packets 5-46, 5-48, 13-21, 13-24
variation (jitter) 13-21, 13-24
Delayed Offer 14-20
Delivery Traffic Indicator Message (DTIM) 3-66
Demilitarized Zone (DMZ) 4-40
deployment models
campus 5-8

clustering over the WAN 5-45, 17-53, 21-22, 23-22, 26-10, 28-27
combined for messaging 21-14
described 5-1
DHCP 3-27
federation 23-23
for Cisco Unified MeetingPlace 22-31
for Cisco Unity 21-5
for Cisco Unity Express 21-24
for contact center 26-6
for network management 28-23
for presence 23-18
for presence servers 23-14
for TelePresence 11-96
for Unified CME 8-46
for video 11-96
Intercompany Media Engine (IME) 5-34
media resources 17-41
messaging and call processing combinations 21-7
multi-cluster 23-21
multisite dial plan 9-35
multisite with centralized call processing 5-10, 9-76, 17-41, 17-49, 26-7, 28-25
multisite with distributed call processing 5-24, 9-37, 9-77, 17-42, 17-52, 26-8, 28-26
music on hold 17-49
Service Advertisement Framework (SAF) 5-64
Session Management Edition 5-28
single cluster 23-18
single site 5-8, 17-41, 17-49, 26-6, 28-23
site-based 5-3
Unified Computing System (UCS) 5-58
virtualized servers 5-58, 5-63
voice over the PSTN 5-20
designing for performance 29-5
desk phone call log 25-93
deskphone control mode (using deskphone for audio) 18-22, 24-5
deskphone for audio 24-5
desk phone integration 25-78, 25-79
desk phone pickup 25-41
desktop phones 18-8
desktop server 22-43
destination of a call 9-108
device mobility
dial plan 25-23, 25-25
feature components and operation 25-18
Group 25-18
Info 25-18
operation flowchart 25-22
operation of 25-22
parameter settings 25-19
Physical Location 25-18
settings 25-20
Device Mobility Group 25-20
devices
hunt list 9-78
line group 9-124
mobility 10-15, 25-17
pools 5-50, 5-56
route group 9-96
DFS 3-65
DHCP
binding information 4-13
deployment options 3-27
described 3-25
lease times 3-26
Option 150 3-25
servers 3-28
Snooping 4-11, 4-13
starvation attack 4-13
dialed pattern recognition 9-5, 9-52
dial-in conferences 12-24
dialing
habits 9-6
rules 25-55
dial peers 9-128, 9-140, 9-142
dial plan
+ dialing 9-13

911 calls 10-1
abbreviated dialing 9-7
access codes 9-10
application dialing rules 24-7
approaches to 9-38
architecture 9-3
Automated Alternate Routing (AAR) 9-23
Call Control Discovery (CCD) 9-24
Call Forward Unregistered (CFUR) 9-23
calling party settings 9-14
calling privileges 9-101, 9-140
calling search space 9-61
call routing 9-87
capacity planning 29-22
classes of service 9-54, 9-58, 9-71, 25-23
design considerations 9-11, 25-23
device mobility 25-23
dialing habits 9-6
dial peers 9-128, 9-140, 9-142
distribution of digits 9-9
E.164 9-26, 9-29
elements 9-78
emergency call string 10-12
Extension Mobility 9-57, 9-63, 9-114
for Cisco Unified Client Services Framework 24-7
for Device Mobility 25-23, 25-25
for distributed call processing 9-37
for mobility 25-106
for multisite deployments 9-35
for Unified CM Assistant 19-27
for Voice over PSTN 5-23
functions 9-1
globalized numbers 9-12, 9-20, 9-25
hunt lists 9-121, 9-122
Intercompany Media Engine (IME) 9-33
international calls 9-90
line groups 9-121, 9-122
localized call egress 9-20
localized call ingress 9-16
local route group 9-13
number of digits 9-8
on-net vs. off-net 9-6
overlapping extensions 9-7
partitions 9-61
planning considerations 9-5, 9-11
Service Advertisement Framework (SAF) 9-24
shared line appearance 10-16
site codes 9-10
string length 9-8
Tail End Hop Off (TEHO) 9-23
transformations 9-14
Unified Mobility 25-58
uniform on-net dialing 9-8, 9-40, 25-26
variable length on-net dialing 9-10, 9-43, 25-27, 25-29
voicemail 9-42, 9-49
dial rules 9-52, 9-81, 9-83, 9-84
dial-via-office 25-93, 25-107
DID 10-6, 13-18
differential threshold 18-27
Differentiated Service Code Point (DSCP) 3-70
Differentiated Services Code Point (DSCP) 3-4, 3-41, 11-98
different versions of Unified CM in the same cluster 3-34
digital gateways 13-8, 13-25
digital signal processor (*see* DSP resources)
digit manipulation 9-91, 9-107, 9-142, 13-30
direct connect mobile clients 25-102
Direct Inward Dial (DID) 10-6, 13-18
directories
access 16-3
architecture 16-7
authentication of users 16-9, 16-19
filtering 16-23
for Unified CM Assistant 19-31
high availability 16-27
integration with IP telephony system 16-1, 16-2
integration with Unified CM 16-5
LDAP 16-1
schema 16-1

search base 16-12
security 16-15
sn attribute 16-10
synchronization 16-9, 16-10, 16-23
UserID 16-10
directory
gatekeeper 8-41, 9-138
lookup rules 24-7
number (DN) 9-78
searches 24-5
distortion 3-66
distributed call processing 5-24, 9-77, 11-72, 11-77, 11-82, 26-8, 28-26
distributed gatekeeper deployment 9-137
distributed messaging 21-6, 21-11, 21-17
Distribution Layer 3-10
distribution of digits in a dial plan 9-9
DMVPN 3-39
DMZ 4-40
DN 9-78
DNS 3-23
documentation
feedback xli
obtaining xli
related xxxix, xli
Domain Name System (DNS) 3-23
DSCP 3-4, 3-41, 3-70, 11-98
DSP resources
described 17-4
in multisite deployment model 5-25
PVDM 17-34
PVDM3 17-35
DTIM 3-66
DTMF
conversion of 17-12
for SIP trunks 14-23
gateway capabilities 13-9
methods supported by endpoints 17-13
on H.323 gateways 17-18
on SIP gateways 17-16
Relay 13-10, 17-14, 17-17
DTPC 3-67
dual-attached Content Engine (CE) 11-30
dual-mode
clients 25-74, 25-75, 25-78, 25-79, 25-80
phones and clients 25-66
dual tone multifrequency (DTMF) 13-9, 13-10, 14-23, 17-12, 17-13
dynamic ANI interface 10-11
Dynamic ARP Inspection (DAI) 4-13, 4-14
Dynamic Frequency Selection (DFS) 3-65
Dynamic Host Configuration Protocol (DHCP) 3-25, 4-11, 4-13
Dynamic Multipoint VPN (DMVPN) 3-39
Dynamic Transmit Power Control (DTPC) 3-67

E

E.164 9-26, 9-29, 9-46, 9-47, 10-5, 10-6, 10-11, 14-26, 21-39
E20 Video Phone 18-34
E911 10-1, 10-4
EAP-FAST 18-24
EAP-TLS 18-24
Early Offer 14-20
echo cancellation 13-23
ECM 13-22
ECS 12-3
efficiency of links 3-43
elements of a dial plan 9-78
ELIN 10-10, 10-11
EMCC 11-59, 19-9, 19-17, 29-25
emergency calls 9-42
emergency call string 10-12
emergency location identification number (ELIN) 10-10, 10-11
Emergency Responder (ER) 9-42, 10-7, 10-15, 12-42
emergency response location (ERL) 10-10, 10-11, 10-15
emergency services 10-1, 14-57, 25-106, 29-32

EMP 12-16
Empty Capabilities Set (ECS) 12-3
EMS 22-15, 29-40
eMWI 21-39
encryption
  for phones 4-20
  for signaling 3-53, 3-54
  restrictions on use xli
endpoints
  alternate 14-54
  analog gateways 18-3
  architecture 18-3
  capacity planning 18-54, 29-20
  codecs supported 12-6
  design considerations 18-55
  directory access 16-3
  features 18-55
  for video calls 12-5
  gatekeeper 12-26, 12-28
  H.323 18-52
  H.323 clients 12-28
  high availability 18-54
  line group devices 9-124
  SIP 18-52
  software-based 18-21, 18-44
  Sony 18-35
  supplementary services 17-17
  Tandberg 18-35, 18-51
  time to live 12-39
  types of 18-1
  video 12-2, 18-30, 18-48
  wireless 3-60, 18-23
end users 16-7, 23-4
Energy conservation 3-13
EnergyWise Technology 3-13
Enhanced Media Processor (EMP) 12-16
Enhanced Message Waiting Indicator (eMWI) 21-39
Enhanced Survivable Remote Site Telephony (E-SRST) 5-19
Enterprise Feature Access 25-37, 25-43, 25-53, 25-54, 25-55
Enterprise MCM 8-37
equations for calculating
  bandwidth 3-52, 3-54
  Business Edition device capacities 29-14
  calling search spaces 9-61
  CPU usage 29-11
  CTI resource requirements 29-24
  memory usage 29-7
  music on hold server capacity 17-37
  partitions 9-61
ER 9-42, 10-15, 12-42
ERL 10-10, 10-11, 10-15
Erlang 29-5
Erlang blocking factor 29-12
Error Correction Mode (ECM) 13-22
error rate 5-49
E-SRST 5-19
ettercap virus 4-14
example configurations 12-35, 12-40
Exchange Web Services Calendar 23-35
executive IP phones 18-14
Expansion Module 7914 18-15
Expansion Module 7915 18-15
Expansion Module 7916 18-15
Expert Advisor 26-4
export regulations xli
Express Media Server (EMS) 29-40
Extensible Authentication Protocol (EAP) 18-24
Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST) 18-24
Extensible Authentication Protocol-Transport Layer Security (EAP-TLS) 18-24
extensible messaging 23-39
Extensible Messaging and Presence Protocol (XMPP) 25-109
Extension Mobility (EM)
  capacity planning 29-25
  described 19-7
  dial plan 9-57, 9-63, 9-114

interactions with Unified CM Assistant 19-27

Extension Mobility Cross Cluster (EMCC) 11-59, 19-9, 19-17, 29-25

extensions, overlapping 9-7

F

fabric extenders 5-60

FAC 9-92

factors that affect sizing 29-2

failover

- Cisco Unity 21-18, 21-19
- clustering over the WAN 5-49, 5-55
- scenarios 19-5
- to PSTN 9-46, 9-47

fallback 4-31

fallback mode 17-52

Fast Start 14-49, 17-17

fax

- Error Correction Mode 13-22
- gateway support for 13-9, 13-19
- interface modules 18-4
- pass-through mode 13-19
- protocols supported 13-25
- relay mode 13-19
- Super Group 3 (SG3) 13-22
- supported platforms and features 13-25
- V.34 13-22

FCoE 5-59, 5-60

features of endpoints 18-55

federated deployment 23-23

federation between domains 23-23

feedback on this document xli

Fibre Channel over Ethernet (FCoE) 5-59, 5-60

filtering for directory synchronization and authentication 16-23

filter strings for LDAP directories 16-26

firewalls

- access control lists 24-21
- around gateways 4-35
- bump in the road 4-26
- centralized deployment 4-40
- described 4-24
- routed mode 4-26
- stealth mode 4-26
- transparent mode 4-26
- with H.323 4-36

Firewall Services Module (FWSM) 4-24, 4-35

firmware upgrades for Cisco IP Phones 18-16

flash used for music on hold 17-50

flat addressing 9-38, 9-43, 25-29

flexible bandwidth interfaces 11-32

flex mode for codecs 17-5

flows for calls between clusters 12-12

Forced Account Codes (FAC) 9-92

Foreign Exchange Office (FXO) 10-7

forwarding calls 9-65, 9-104

Frame Relay 3-40, 5-13, 5-26

French national numbering plan 9-61

full-duplex 3-15

FWSM 4-24, 4-35

FXO 10-7

G

GARP 4-9, 4-14

gatekeeper

- alternate 8-38, 14-54
- call admission control 5-26, 11-15
- call routing 9-131
- centralized deployment 9-135
- clustering 8-38
- configuration examples 8-37
- described 12-25
- design considerations 8-37
- directory 8-41, 9-138
- distributed deployment 9-137
- for endpoints 12-26, 12-28

geographical resiliency 12-26
H.225 trunks 14-45, 14-53
incompatibilities 12-26
intercluster trunks 14-44
IOS 12-25
proxy 12-36, 12-37, 12-38
redundancy 8-38, 8-41
roles 12-26
scalability 12-26
summary 12-40
trunk redundancy 14-45
via-zone 9-134
zones 11-15, 12-35
gatekeeper-controlled
H.225 trunks 14-45, 14-53
H.323 client 12-28, 12-32
intercluster trunks 14-44
Gatekeeper Transaction Message Protocol (GKTMP) 14-54
Gatekeeper Update Protocol (GUP) 8-38, 14-45, 22-42
Gateway Load Balancing Protocol (GLBP) 3-10
gateways
911 services 10-13
additional documentation 13-6, 29-37
all trunks busy 10-14
analog 13-8, 13-25, 18-3, 18-7
automated alternative routing 13-32
blocking 10-14
capabilities 13-37
capacity planning 29-32
Cisco Unified Border Element 9-134, 14-58
Cisco Unified Videoconferencing 3500 Series Video Gateways 13-27
codecs 13-5
configuration examples for fax/modem support 13-26
configuration in Unified CM 13-36
contact center sizing 29-34
core feature requirements 13-9
CPU utilization 13-5
digital 13-8, 13-25
digit manipulation 13-30
fax support 13-19
features 18-55
firewalls 4-35
for contact centers 13-4
for local failover 5-55
for music on hold 17-22
for video telephony 13-27
H.320 12-34, 12-38
modem support 13-23
performance overload 13-5
performance tuning 13-5
placement 10-13
protocols 13-10
QoS configuration examples 18-39
redundancy 13-7, 13-15
security 4-34
selection of 13-9
service prefixes 13-31
SIP 13-11, 13-17
site-specific requirements 13-17
sizing for contact center traffic 13-4
sizing for traffic 13-2
TDM 13-7
V.34 modem support 13-25
V.90 modem support 13-25
VG202 18-7
VG204 18-7
VG224 18-7
VG248 18-7
voice applications 13-1, 18-3, 18-7
VoiceXML 25-50, 25-51
zone prefixes 12-38
general security 4-3
generic topologies 11-84
geographical diversity 5-7
geographical resiliency 12-26
geolocations 9-125

GKTMP 14-54
GLBP 3-10
globalization of calling party number 9-17
globalized dial plan 9-12, 9-20, 9-25
glossary 1-1
GoDaddy.com Enrollment Server 5-35
Gratuitous Address Resolution Protocol (GARP) 4-9, 4-14
groups for
  call routing 9-93
  Emergency Responder (ER) 10-17, 10-19
  gateways 29-33
  line numbers (hunting) 9-121
  media resources 17-1
  Unified CM redundancy 8-17, 14-36
guaranteed bandwidth 3-38
GUP 8-38, 14-45, 22-42

H

H.225 trunks 14-45, 14-53
H.245 Alphanumeric 17-13
H.245 Signal 17-13
H.320 12-34, 12-38
H.323
  Annex M1 14-54
  call hairpinning 8-44
  call preservation enhancements 13-15
  calls 14-53
  classes of service 9-71
  clients 12-28, 12-37
  dial peers for call routing 9-128
  Fast Start 14-49, 17-17
  fax and modem support 13-25
  firewalls 4-36
  gateways 13-10
  in Unified CM 14-51
  MCU resources 12-21
  supplementary services 17-17
  trunks 14-3, 14-36, 14-50
  video endpoints 12-3, 18-52
  zones prefixes 12-37
hairpinning 8-44, 25-51
half-duplex 3-15
hand-in of a call 25-73, 25-82
handoff of calls 25-73, 25-76, 25-81
hand-out of a call 25-73, 25-76, 25-81
hardware
  analog interface modules 18-5
  audio conferencing bridge 17-7
  gatekeepers 8-38
  media resource capacities 17-34
  media server 29-41
  MTP resources 17-19
  music on hold 17-36
  transcoder 17-11
  types of platforms 8-4
Hardware Media Server (HMS) 22-15
headers for voice packets 3-48
high availability
  applications and serviceability layer 20-4
  Attendant Console 19-45
  Business Edition 8-24
  call control layer 15-3
  call processing 8-15
  call routing layer 7-4
  Cisco IP Phone Messenger (IPPM) 24-31
  Cisco UC Integration for Microsoft Office Communicator 24-28
  Cisco Unified Client Services Framework 24-9
  Cisco Unified Mobile Communicator 25-99
  Cisco Unified Personal Communicator 24-13
  Cisco WebEx Connect 24-22
  contact center 26-11
  CTI 8-35
  deployment models 5-3
  dial plan 9-4
  direct connect mobile clients 25-112
  directories 16-27

dual-mode phones 25-84
endpoints 18-54
Enterprise Feature Access 25-57
Extension Mobility 19-14
gateways 13-7
hardware platforms 8-15
IME-enabled ASA 4-33
Intercompany Media Engine (IME) 5-42
IP Phone Services 19-5
media resources 17-39, 17-40
Mobile Connect 25-48
Mobile Voice Access 25-57
music on hold 17-40
network connectivity 8-15
networking layer 2-4
network services 3-4
operations and serviceability layer 27-4
phones 18-54
presence 23-13
requirements 5-5
servers 8-6
SIP trunks 14-18
Survivable Remote Site Telephony (SRST) 8-19
trunks 14-45
Unified CM 8-17
Unified CM Assistant 19-23
Unified Computing System (UCS) 8-23
Unified MeetingPLace 22-32
videoconferencing 22-42
Virtualization Experience Clients (VXC) 24-35
voice services 5-14
WebDialer 19-39
WebEx 22-9
wireless LAN 3-61
high-density analog interface modules 18-4
high-performance servers 8-6
history of
calls 23-8
revisions xl
this document xl
HMS 22-15
hold 17-21, 17-24
holdee 17-23
holder 17-23
hold time 13-2
hosted virtual desktop (HVD) 24-35
Hot Standby Router Protocol (HSRP) 3-10, 5-26, 8-37, 22-42
how to use this document 1-6
HSRP 3-10, 5-26, 8-37, 22-42
hub-and-spoke topology 3-3, 3-37, 9-131, 11-15, 11-70
hunt
groups 9-121
lists 9-78, 9-121, 9-122
pilot 9-78, 9-121, 9-122
HVD 24-35
hypervisor 5-61, 5-62

I

IBM Cabling System (ICS) 3-15
IBM Lotus Sametime 23-43
IButton 9-86
ICCS 5-47, 5-51, 8-11
ICMP 13-17
ICS 3-15
iDivert 9-120
IDS 4-35, 5-47
iLBC codec 14-56
IM 25-109
IME
architecture 5-36
basic (inline) deployment 4-30
bootstrap server 5-35
capcaity planning 29-31
components 5-34
described 5-34
dial plan considerations 9-33
offpath deployment 4-30

proxy 4-29
Immediate Divert (iDivert) 9-120
impairments without QoS 3-20
inbound calls 9-42, 9-49, 13-29, 13-35
incompatibilities 12-26
Informix Dynamic Server (IDS) 5-47
infrastructure (*see* network infrastructure)
infrastructure gatekeeper 12-26
ingress call admission control 11-29
inline deployment of IME-enabled ASA 4-30
inline power 3-13
instant messaging 23-17, 23-27, 23-29, 23-31, 24-21, 24-24, 25-109
Integrated Services (IntServ) model 11-25, 11-33
Integrated Services/Differentiated Services (IntServ/DiffServ) model 11-27, 11-33
Integrated Services Router (ISR) 17-35, 21-30
integrations with Cisco Unity 21-38
Intelligent Bridge Selection 12-19, 12-20, 17-8
Intelligent Session Control 25-60
interactive voice response (IVR) 5-10, 12-24, 12-43
intercluster trunks
gatekeeper controlled 14-44
non-gatekeeper controlled 14-38
Intercompany Media Engine (IME)
architecture 5-36
basic (inline) deployment 4-30
bootstrap server 5-35
capacity planning 29-31
components 5-34
described 5-34
dial plan considerations 9-33
offpath deployment 4-30
proxy 4-29
interface modules 18-4
interface types for 911 calls 10-5
interference to wireless communications 3-66
international calls 9-90
international dialing 9-69
Internet Control Message Protocol (ICMP) 13-17
interoperability 8-44, 8-48, 8-52, 11-61, 11-95, 12-44
Intra-Cluster Communication Signaling (ICCS) 5-47, 5-51, 8-11
introduction 1-1
Intrusion Detection System (IDS) 4-35
IntServ/DiffServ model 11-27, 11-33
IntServ model 11-25, 11-33
invia 9-134, 12-35
IOS
calling privileges 9-140
call routing 9-128, 9-131
classes of service 9-71
digit manipulation 9-142
Gatekeeper 12-25
minimum release required 18-5
software MTP 17-19
IP/H.323 feature set 8-37
IP/VC 3500 Series Video Gateways 13-27
IP addresses
security 4-5
IP Communicator 12-43, 18-21, 18-44, 18-55
IP Conference Station 18-29, 18-40
iPhone 25-66, 25-74, 25-78, 25-79, 25-88
IP IVR 12-43
iPlanet Directory Server 16-10, 16-15
IPMA 19-19
IP Manager Assistant (IPMA) 19-19
IP Phone Messenger (IPPM) 24-29
IP phones 18-8
IP Phone Services 19-2
IPPM 24-29
IP Precedence 3-4, 3-41
IPSec 5-13, 5-26
IP Security Protocol (IPSec) 5-13, 5-26
IP Telephony 1-1
IPv6
security 4-6

with Cisco Unified Provisioning Manager (Unified PM) 28-19

with Cisco Unity Connection 21-44

IP Video Telephony

components 12-2

described 1-1, 12-1

security 4-19

IP VOICE feature set 8-44

IP Voice Media Streaming Application 17-4, 17-6, 17-19, 17-20, 29-28

ISDN 5-14, 5-15, 13-34

ISR 17-35, 21-30

IVR 5-10, 12-24, 12-43

J

Jabber 25-66, 25-75, 25-78, 25-79

jitter 5-46, 13-21, 13-24

JTAPI 8-23, 12-3

K

Key Press Markup Language (KPML) 9-5, 9-81, 9-83, 17-13

KPML 9-5, 9-81, 9-83, 17-13

L

LAN infrastructure 3-4

Layer 2 3-4, 5-26

Layer 3 3-4

layers of security 4-4

LBR 17-41

LCF 8-41, 9-134

LCR 13-33

LDAP 8-11, 16-1, 24-4, 24-5, 25-92, 25-109

LDN 10-6

LEAP 18-24, 18-25

learned routes 5-36

leased lines 3-40, 5-13, 5-26

lease times for DHCP 3-26

least-cost routing (LCR) 13-33

LEC 10-3, 10-13

LFI 3-40, 3-43, 3-44

licenses 23-18

Lightweight Access Point Protocol (LWAPP) 3-58

Lightweight Directory Access Protocol (LDAP) 8-11, 16-1

Lightweight Directory Services 16-18

Limit Client Power setting on access points 3-67

line/device approach to classes of service 9-58, 25-23

line appearances 3-54

line group devices 9-124

line groups 9-78, 9-121, 9-122

line speed mismatch 3-45

link efficiency 3-43

link fragmentation and interleaving (LFI) 3-40, 3-43, 3-44

Link Loss Type 14-56

listed directory number (LDN) 10-6

Live Communications Server 2005 23-41

LLQ 3-40, 3-41

LMHOSTS file 3-23

load balancing 3-33, 8-22, 14-45, 14-55

lobby phone security 4-39

local dialing area 9-111

Local Eexchange Carrier (LEC) 10-3

local exchange carrier (LEC) 10-3, 10-13

local failover deployment model 5-49

localization of calling party number 9-20

localized call egress 9-20

localized call ingress 9-16

local route group 9-13

Location Confirm (LCF) 8-41, 9-134

Location Reject (LRJ) 9-134

Location Request (LRQ) 8-41, 9-134

locations

for video endpoints 11-97

maxiumum number 29-19

RSVP-enabled 11-38

settings 11-14

static 11-12, 12-8
topology-aware 12-8
logical partitioning 9-15, 9-125
loss of packets 13-21, 13-24
lossy, Link Loss Type 14-56
low bit-rate (LBR) codecs 17-41
low-density analog interface modules 18-4
low-latency queuing (LLQ) 3-40, 3-41
LRJ 9-134
LRQ 8-41, 9-134
LRQ blast 8-41
LWAPP 3-58

M

MAC address 4-8
Manager Assistant 12-42
manager IP phones 18-12
manipulation of digits 9-107, 9-142
Master Street Address Guide (MSAG) 10-3
maximum sessions per RSVP Agent 11-41
maximum simultaneous calls 29-4
MC 12-16
MCM 8-37, 12-25, 12-36, 14-54
MCP 26-6
MCU
capacity and sizing 12-23
configuration 12-33
for videoconferencing 22-37
for video telephony 12-2, 12-16
high availability 22-43
with H.323 or SIP 12-21
with Skinny Client Control Protocol (SCCP) 12-18
zone prefixes 12-37
zones 12-37
Mean Opinion Score (MOS) 28-8
Media Capture Platform (MCP) 26-6
media for Cisco Unified Client Services Framework 24-6
Media Gateway Control Protocol (MGCP) 12-3, 13-10, 13-25
media resource group (MRG) 11-40, 12-19, 17-39
media resource group list (MRGL) 11-40, 12-19, 17-39
Media Resource Manager (MRM) 17-2
media resources
architecture 17-2
capacity planning 17-34, 29-28
cascading 29-42
deployment models 17-41
described 17-1
design guidelines 17-39
for local failover 5-55
hardware and software capacities 17-34
hardware server 29-41
high availability 17-39, 17-40
PVDM 17-34
PVDM3 17-35
security 4-34
server 8-10
voice quality 17-43
MediaSense 26-6
media server 22-15
Media Streaming Application 17-4, 17-6, 17-19, 17-20, 29-28
media termination point (MTP)
conference bridges 17-18
described 17-12
in multisite deployment model 5-25
types 17-19
uses 14-57
with H.323 trunk 14-50
with SIP trunk 14-7, 14-21
MeetingPlace 12-44, 22-13, 25-98
MeetingPlace Express Media Server (EMS) 22-15
megacluster 5-2, 8-27, 29-30
memory usage 29-7
Message Waiting Indicator (MWI) 21-24
messaging
bandwidth management 21-34

centralized 21-6, 21-8, 21-15, 21-23
Cisco Unity 21-1
combined deployment models 21-14
deployment models 21-5
distributed 21-6, 21-11, 21-17
failover 21-18, 21-19
redundancy 21-18
system components 21-3
MGCP 12-3, 13-10, 13-25
Microsoft Active Directory (AD) 16-10, 16-14, 16-16, 16-21
Microsoft Active Directory Application Mode (ADAM) 16-11, 16-26
Microsoft Communications Server 23-41
Microsoft Exchange 25-99
Microsoft Office Communicator 23-41, 24-1, 24-26
Microsoft ViewMail for Outlook (VMO) 21-6
mid-call fallback 4-31
mid-call features 4-31, 25-43, 25-72
migration
from static locations to RSVP call admission control 11-45
to IP Telephony 6-1
MISTP 3-5
mixed call processing deployments 11-90
mixed-mode operation 3-34
MLP 3-40
MLPP 17-20
MLTS 10-2
Mobile Communicator 24-2, 25-87
Mobile Connect
architecture 25-48
described 25-36, 25-40
desk phone pickup 25-41
functionality 25-40
redundancy 25-48
remote destination phone pickup 25-42
voicemail 25-46
Mobile Voice Access
access numbers 25-55
architecture 25-56
described 25-37, 25-49
functionality 25-50
hairpinning 25-51
IVR VoiceXML gateway 25-50
number blocking 25-54
redundancy 25-57
Mobility
applications 25-1
described 25-1, 25-58
guidelines for deploying 25-62
integration with presence 23-36
Proxy 4-29
softkey method of call hand-out 25-76
modeling of computer systems 29-6
models for deployments (*see* deployment models)
models for PSTN connections 14-62
modem
features supported 13-25
gateway support for 13-9, 13-23
pass-through mode 13-23
platforms supported 13-25
protocols supported 13-25
relay mode 13-23
upspeed 13-23
V.34 13-25
V.90 13-25
MoH 5-55, 17-21, 29-29
MOS 28-8
moves, adds, and changes 10-7
MP 12-16, 12-17
MPLS 3-36, 3-40, 5-13, 5-26, 11-11, 11-78
MRG 11-40, 12-19, 17-39
MRGL 11-40, 12-19, 17-39
MRM 17-2
MSAG 10-3
MTP
conference bridges 17-18
described 17-12

hardware resources 17-19
in multisite deployment model 5-25
software resources 17-19
types 17-19
uses 14-57
with H.323 trunk 14-50
with SIP trunk 14-7, 14-21
multicast music on hold 17-22, 17-27, 17-30, 17-44, 17-46, 17-50
multicast traffic on WLAN 3-66
multichannel support 26-5
multi-cluster deployment 23-21
multi-forest LDAP synchronization 16-18
Multilevel Precedence Preemption (MLPP) 17-20
multi-line telephone system (MLTS) 10-2
Multilink Point-to-Point Protocol (MLP) 3-40
Multimedia Conference Manager (MCM) 8-37, 12-25, 14-54
multipath distortion 3-66
multiple clusters for Cisco Unity 21-38
Multiple Instance Spanning Tree Protocol (MISTP) 3-5
multiple Unified CM servers 21-23
multipoint conferencing 12-16
Multipoint Controller (MC) 12-16
Multipoint Control Unit (MCU)
capacity and sizing 12-23
configuration 12-33
for video telephony 12-2, 12-16
high availability 22-37, 22-43
with H.323 or SIP 12-21
with Skinny Client Control Protocol (SCCP) 12-18
Multipoint Processor (MP) 12-16, 12-17
Multiprotocol Label Switching (MPLS) 3-36, 3-40, 5-13, 5-26, 11-11, 11-78
multisite deployment model
with centralized call processing 5-10, 9-76, 17-41, 17-49, 26-7, 28-25
with distributed call processing 5-24, 9-77, 17-42, 17-52, 26-8, 28-26
multisite dial plan 9-35
music on hold (MoH) 5-55, 17-21, 29-29
MWI 21-24, 25-110

N

NAM 28-11
Named Service Event (NSE) 13-25
Named Telephony Event (NTE) 13-11, 17-13
National Emergency Number Association (NENA) 10-10, 10-22
native interoperability for video 11-95
native transcoding with Cisco Unity 21-35
NENA 10-10, 10-22
Netscape Directory Server 16-10, 16-15
Network Analysis Module (NAM) 28-11
network hold 17-24
network infrastructure
access layer 3-5
core layer 3-12
distribution layer 3-10
high availability 3-4
LAN 3-4
network management 28-3
requirements 3-1
roles 3-3
routed access layer 3-7
security 4-5
voice over wireless LAN (WLAN) 25-68
WAN 3-36
wireless LAN 25-68
WLAN 3-57
networking layer 1-3, 2-1
network management 26-16, 28-1
network services 3-23
Network Time Protocol (NTP) 3-35
network virtualization 4-41
new for this release xxxix
Nexus 1000V Switch 3-21
NIC teaming 8-16
NM-HD-1V/2V/2VE module 17-7, 17-11, 17-19
NM-HDV2 module 17-7, 17-11, 17-19
NM-HDV module 17-7, 17-11

Nokia Call Connect 25-80
non +E.164 directory numbers 9-68
non-fallback mode 17-50
non-gatekeeper controlled H.323 client 12-28, 12-29, 12-33
non-gatekeeper controlled intercluster trunks 14-38
normalization of calling party numbers 14-26
notational conventions xlii
NPA 9-109
NSE 13-25
NTE 13-11, 17-13
NTP 3-35
number blocking 25-54
Numbering Plan Area (NPA) 9-109
number of digits dialed 9-8
number transformations 9-14

O

Office Communications Server 2007 23-41
off-net dialing 9-6
offpath deployment of IME-enabled ASA 4-30
on-net dialing 9-6, 9-8, 9-10, 9-40, 9-43
open authentication 18-24, 18-25
Open Recording Architecture (ORA) 26-6
Open Shortest Path First (OSPF) 4-26
Open Virtualization Archives (OVA) 8-26, 8-31
operations and serviceability layer 1-5, 27-1
Option 150 3-25
ORA 26-6
OSPF 4-26
outbound calls 9-42, 9-46, 13-31, 13-36, 14-55
Outlook Web Access Calendar 23-33
outvia 9-134, 12-35
OVA templates 8-26, 8-31
overlap
  receiving 9-91
  sending 9-91
overlapping
  channels 3-65
  extensions 9-7
oversubscription of a link 3-46

P

PAC 18-24
packets
  delay 5-46, 5-48, 13-24
  headers 3-48
  jitter 5-46
  loss of 5-46, 13-21
packets per second (pps) 13-5
parallel cutover 6-2
parameters
  clusterwide 11-43
  for Device Mobility 25-19
partitioned addressing 9-38, 25-27
partitions 9-15, 9-61, 9-101, 9-125
passive-interface command 3-12
pass-through codec 11-42
pattern recognition in dialing 9-5, 9-52
PC
  Access to Voice VLAN 18-30
  port on IP phone 4-17, 18-30
PEAP 18-24
performance
  call rate 8-1
  designing for 29-5
  modeling 29-6
  of call processing servers 8-26
  of Extension Mobility 19-16
  of presence servers 23-17
  of Unified CM Assistant 19-25
  of WebDialer 19-40
  overload on gateways 13-5, 29-36
  quantitative analysis 29-6
  tuning of gateways 13-5, 29-36
Per-Port/Per-VLAN ACLs 18-51
persistent chat 23-31

Personal Communicator 18-21, 18-44, 24-1, 24-10
phased migration 6-2
Phone Proxy 4-28
phones
3900 Series 18-9
6901 18-9
6911 18-9
6921 18-10, 18-16
6941 18-12, 18-16
6945 18-12, 18-16
6961 18-10, 18-16
7902G 18-9
7905G 18-9
7906G 18-9
7910G 18-10
7910G+SW 18-10
7911G 18-10
7912G 18-10
7914 Expansion Module 18-15
7915 Expansion Module 18-15
7916 Expansion Module 18-15
7931G 18-11
7940G 18-11
7941G 18-11
7941G-GE 18-11
7942G 18-12
7945G 18-12
7960G 18-12
7961G 18-13
7961G-GE 18-13
7962G 18-13
7965G 18-13
7970G 18-14
7971G-GE 18-14
7975G 18-15
7985G IP Video Phone 18-33, 18-34, 18-50
8900 Series 18-13, 18-16, 18-33, 18-34
9900 Series 18-16, 18-33, 18-34
9951 18-15
9971 18-15
applications 18-18
Attendant Console 19-42
authentication and encryption 4-20
basic models 18-8
business models 18-10
call pickup at desk phone 25-41
capacity planning 18-54
Cisco E20 Video Phone 18-34
configuration 18-27
design considerations 18-55
desktop IP models 18-8
dialed pattern recognition 9-52
dual-mode 25-66, 25-84
energy conservation 3-13
executive models 18-14
Extension Mobility 19-7
features 18-55
firmware upgrades 18-16
high availability 18-54
IP Phone Services 19-2
manager models 18-12
mid-call features 25-43
PC port 4-17
Power Save mode 3-14
Power Save Plus mode 3-14
QoS 18-40
remote destination call pickup 25-42
roaming 3-64, 18-27
SCCP 9-80
security 4-17, 4-39
services 19-2
settings 4-19
SIP 9-81, 9-83, 18-38
software-based 18-21, 18-44
Type-A 9-81
Type-B 9-83
Unified Communications Manager Assistant 19-19
user input 9-80, 9-81, 9-83

video 18-34
video support 18-19, 18-23, 18-33
video telephony 18-48
web access 4-19
WebDialer 19-32
wireless 18-23, 18-46
wireless interface 18-17
Wireless IP Phone 7921G 18-23
Wireless IP Phone 7925G 18-23
Wireless IP Phone 7925G-EX 18-23
Wireless IP Phone 7926G 18-23
with Cisco Unified Video Advantage 12-2
with Cisco Unified Video Advantage 18-30
Phone Systems for Cisco Unity Connection 21-38
physical security 4-5
pilot number for hunt lists 9-78, 9-121, 9-122
ping utility 5-48
PIX 4-24, 4-35
PKI 18-24
plain old telephone service (POTS) 10-7
platforms 8-4, 8-38
PoE 3-13, 18-18, 24-33
policy
for network security 4-3
for presence 23-8
for RSVP 11-36, 11-43
polling model 23-39
PortFast 3-7
ports
access 4-10
enable/disable 18-30
for call signaling 13-36
for Cisco Unified Video Advantage 18-48
for integration of Cisco Unity with Unified CM 21-41, 21-43
on the IP phone 4-17
PC connection 18-30
security 4-8
POTS 10-7
Power over Ethernet (PoE) 3-13, 18-18, 24-33
Power Save mode 3-14
Power Save Plus mode 3-14
precedence settings for network traffic 3-4, 3-41
preconditions 11-50
preface xxxix
prefixes
for access code 9-109
gateway 12-35
MCU 12-34
service 12-22, 13-31
zones 12-37, 12-38
presence
calendar integration 23-32
call history 23-8
capacity planning 29-45
Cisco IP Phone Messenger (IPPM) 24-29
clustering over the WAN 23-22
clusters 23-10
components 23-3
deployment models 23-14, 23-18
described 23-1, 23-3
end user 23-4
Exchange Web Services Calendar integration 23-35
federation 23-23, 24-24
for direct connect mobile clients 25-109
groups 23-8
guidelines 23-9
IBM Lotus Sametime 23-43
instant messaging storage requirements 23-31
integration with third-party applications 23-41
interactions between components 23-18
licensing of users 23-18
message archiving and compliance 23-30
Microsoft Communications Server 23-41
migration 23-28
mobility integration 23-36
Outlook Web Access Calendar integration 23-33
policy 23-8

polling model 23-39
presentity 23-3
protocol interfaces 23-39
proxy feature 4-29
real-time eventing model 23-38
SCCP 23-7
server guidelines 23-40
server performance 23-17
server policy 23-28
server redundancy 23-13
servers 23-9
server synchronization 23-10
SIP 23-5
speed dial 23-7
SUBSCRIBE calling search space 23-8
synchronization of servers 23-10
Third-Party Open API 23-38
Unified CM 23-5
with Cisco Unified Mobile Communicator 25-97
presentity 23-3
preservation of calls 13-15
PRI 10-6
primary extension 23-4
Primary Rate Interface (PRI) 10-6
Prime compliance 28-1
prioritization of traffic 3-41
priority, urgent 9-91
Priority Queue 11-36
Private Internet Exchange (PIX) 4-24, 4-35
Private Switch ALI 10-3
privileges for making calls 9-101, 9-140
problems, reporting xli
product security xli
progress_ind alert enable 8 command 10-14
propagation of database 8-11
Protected Access Credential (PAC) 18-24
Protected Extensible Authentication Protocol (PEAP) 18-24
Protocol Auto Detect 14-53
protocols
ARP 3-67, 4-14
CAPWP 3-58
CDP 4-6, 18-30
CHAP 18-24
cRTP 3-40, 3-43
DHCP 3-25, 4-11, 4-13
EAP-TLS 18-24
features supported 12-4
for SIP trunks 14-24
GARP 4-9, 4-14
GKTMP 14-54
GLBP 3-10
GUP 8-38, 14-45, 22-42
H.225 14-45, 14-53
H.320 12-34, 12-38
H.323 4-36, 8-44, 9-71, 9-128, 12-3, 12-21, 12-28, 13-10, 13-25, 14-3, 14-36, 14-50, 18-52
HSRP 3-10, 5-26, 8-37, 22-42
IPSec 5-13, 5-26
JTAPI 12-3
LDAP 8-11, 16-1
LWAPP 3-58
MGCP 12-3, 13-10, 13-25
MISTP 3-5
MLP 3-40
MPLS 11-11
NTP 3-35
PEAP 18-24
RAS 9-131, 12-25
RCP 4-14
RIP 4-26
routing 3-12
RSTP 3-5, 3-7
RSVP 3-37, 11-7, 11-17, 11-105, 12-8
RTP 5-26, 12-3
SCCP 9-5, 9-80, 12-3, 12-18, 13-10, 13-25, 17-14, 17-27, 18-35, 23-7
SDP 14-20

SIMPLE 23-9
SIP 5-26, 8-48, 9-5, 9-52, 9-81, 9-83, 9-84, 12-3, 13-11, 13-17, 14-3, 14-6, 14-7, 17-20, 17-30, 18-38, 18-52, 23-5
SMTP 21-30
SNMP 10-7
SOAP 23-10
SRTP 3-48, 14-24
STP 3-7
TAPI 12-3
TFTP 3-25, 3-28, 8-8, 8-22
UDP 5-26, 14-45
VPIM 21-30
VRRP 3-10
provisioning
H.320 gateways 12-34
H.323 clients 12-28
MCUs 12-33
servers 8-26
proxy
Cisco Unified SIP Proxy 14-61
for gatekeeper 8-37, 12-36, 12-37, 12-38
line mode with Unified CM Assistant 19-19
Proxy feature for Cisco ASA 5500 Series appliances 4-27
PSAP 10-2, 10-11, 10-16
PSTN
911 calls 10-2
access to remote sites 5-13, 5-26
connection models 14-62
destination number 9-108
mid-call fallback 4-31
traffic patterns 13-3, 29-33
trunks 14-58
voice over the PSTN (VoPSTN) 5-20
public key infrastructure (PKI) 18-24
public safety answering point (PSAP) 10-2, 10-11, 10-16
Public Switched Telephone Network (PSTN) 5-13, 5-26, 9-108, 10-2, 13-3, 14-58
publisher server 5-47, 8-9
purpose-built appliance 8-6
PVDM 17-34
PVDM3 17-35

Q

QBE 8-32, 21-24
QBSS 3-68, 3-71, 18-27, 18-28
QBSS-Differential Threshold 18-27
QCIF 18-36
QoS
configuration examples 18-39
for Cisco Unified Computing System (UCS) 3-20
for contact center 26-12
for LAN 3-16
for music on hold 17-47
for security 4-21
for Unified CM Assistant 19-31
for video 11-95, 12-46
for WAN 3-36, 3-40
for wireless LAN 3-69
RSVP 11-24
QoS Basic Service Set (QBSS) 3-68, 3-71, 18-27, 18-28
QSIG 11-116, 14-54
Quality of Service (QoS)
configuration examples 18-39
for Cisco Unified Computing System (UCS) 3-20
for contact center 26-12
for LAN 3-16
for music on hold 17-47
for security 4-21
for Unified CM Assistant 19-31
for video 11-95, 12-46
for WAN 3-36, 3-40
for wireless LAN 3-69
RSVP 11-24
quality of voice transmissions 17-43
Quarter Common Intermediate Format (QCIF) 18-36
queue depth 3-55
queuing of voice traffic 3-19, 3-70

Quick Buffer Encoding (QBE) 8-32, 21-24
quiescent traffic 3-56

R

radio frequency (RF) 18-24
Rapid Spanning Tree Protocol (RSTP) 3-5, 3-7
RAS 9-131, 11-15, 12-25, 14-45
RASAggregator trunk 12-28, 12-32, 12-33
Rate Matching (RM) module 12-16, 12-18
rate of error 5-49
RBOC 10-3
RCF 12-39
RCP 4-14
RDNIS 21-9
real-time eventing model 23-38
Real Time Monitoring Tool (RTMT) 16-2
Real-Time Transport Protocol (RTP) 5-26, 12-3
recognition of dialed patterns 9-52
recording and silent monitoring 26-6
recording server 22-44
Redirected Dialed Number Information Service (RDNIS) 21-9
Redirector servlet 19-34
redundancy
  call processing 8-17
  cluster configurations 8-19
  Extension Mobility 19-14
  for messaging 21-18
  for Mobile Connect 25-48
  for Mobile Voice Access 25-57
  for presence servers 23-13
  for remote sites 5-14
  for trunks 14-45
  for Unified CM Assistant 19-23
  gatekeeper 8-38
  gateway support for 13-9, 13-15
  IP Phone Services 19-5
  load balancing 8-22
  TFTP services 3-33
  WebDialer 19-39
Regional Bell Operating Company (RBOC) 10-3
regions
  for video telephony 12-5, 12-7
  maximum number 29-19
  settings 11-14
Registration Admission Status (RAS) 9-131, 11-15, 12-25, 14-45
Registration Confirm (RCF) 12-39
registration of RSVP Agent 11-41
Registration Request (RRQ) 12-39
related documentation xxxix
Relative Signal Strength Indicator (RSSI) 18-27
releases of software xxxix
Remote Copy Protocol (RCP) 4-14
remote destination
  caller ID matching 25-55
  phone pickup 25-42, 25-54
  profile 25-58
remote failover deployment model 5-55
Remote Monitoring (RMON) 28-11
remote site survivability 5-14
re-packetization of a stream 17-12
replication of database 8-11
Representational State Transfer (REST) 23-38
request for bandwidth 14-54
rerouting calling search space 25-58
resilience 8-1, 14-45
resolution of addresses 9-133, 9-134
Resource Reservation Protocol (RSVP) 3-37, 11-7, 11-17, 11-105, 12-8
REST 23-38
restrictions for
  Extension Mobility 19-17
  IP Phone Services 19-7
  Unified CM Assistant 19-27
  WebDialer 19-41
Retry Video Call as Audio 12-10

reverse callback 25-93
revision history xl
RF 18-24
RFC 2833 13-11, 17-13
rich-media conferencing 1-1
RIP 4-26
RJ-45 3-15
RM 12-16, 12-18
RMON 28-11
roaming 3-64, 18-27
Roaming Sensitive Settings 25-19
rogue
  DHCP server 4-11
  network extensions 4-10
roles
  in the network infrastructure 3-3
  of a gatekeeper 12-26
rollover of channels 13-34
root guard 3-7
round-trip time (RTT) 5-48, 5-51
Route/Switch Processor (RSP) 13-23
Routed Access Layer 3-7
routed ASA firewall 4-26
routers
  access control list (ACL) 4-23
  branch office 17-50
  flash 17-50
  roles and features 3-3
  RSVP 11-24
  selective for E911 10-4
routes
  filters 9-90
  group devices 9-96
  groups 9-91, 9-93
  lists 9-93
  patterns 9-87, 9-89
  selection of 9-111
routing
  calling line ID 9-91
  calls 9-87, 9-128, 9-131, 25-69
  digit manipulation 9-91
  inbound calls 13-29
  least-cost 13-33
  outbound calls 13-31
  protocols 3-12
  time-of-day (ToD) 9-124
routing calls 25-105
Routing Information Protocol (RIP) 4-26
RRQ 12-39
RSP 13-23
RSSI 18-27
RSSI-Differential Threshold 18-27
RSTP 3-5, 3-7
RSVP 11-105
  Agent 11-120
  asymmetric link 11-30
  bundled interfaces 11-32
  call admission control 11-7, 11-29
  Cisco RSVP Agent 11-40, 11-41
  described 11-17
  dual-attached Content Engine (CE) 11-30
  end-to-end 11-63
  flexible bandwidth interfaces 11-32
  in Session Management Edition (SME) deployments 11-120
  locations enabled for RSVP 11-38, 12-8
  policy 11-43
  SIP Preconditions 11-63, 11-66
  SIP preconditions 11-50
  VPN Tunnel 11-32
  WAN infrastructure 3-37
RTMT 16-2, 28-21
RTP 5-26, 12-3
RTT 5-48, 5-51

S

SaaS 22-5

SAF
architecture 5-64
autonomous systems 3-78
call admission control 11-67
Client 3-75
described 3-72, 5-64
dial plan 9-24
Forwarder 3-73
security 4-36
split horizon 3-79
sampling time 13-5
SAN 5-61, 5-62
scalability of
gatekeepers 12-26
IP Phone Services 19-7
Unified CM 8-1
scavenger class traffic 3-43
SCCP
dialed pattern recognition 9-5
DTMF signaling 17-14
fax and modem support 13-25
gateway support for 13-10
MCU resources 12-18
music on hold (MoH) 17-27
phones 9-80
presence 23-7
user input on phones 9-80
video endpoints 12-3, 18-35
schema 16-1
SDK 16-3
SDP 14-20
search base for directories 16-12
Section 255 5-63
Section 508 5-63
Secure RTP (SRTP) 14-24
secure text messaging 25-99
security
access control list (ACL) 4-22, 4-23
Cisco Security Agent 4-38
Cisco Unified Border Element 4-36
conferences 17-9
configuration example 4-39
data center 4-33
DHCP Snooping 4-11
DHCP starvation attack 4-13
directories 16-15
Extension Mobility 19-13
firewalls 4-24, 4-40
for Cisco products xli
gateways 4-34
infrastructure 4-5
in general 4-1, 4-3
Intercompany Media Engine (IME) 5-45
intracluster communications 8-13
IPv6 addressing 4-6
layers 4-4
lobby phone example 4-39
MAC CAM flooding 4-8
media resources 4-34
PC port on the phone 4-17
phones 4-17
phone settings 4-19
physical access 4-5
policy 4-3
QoS 4-21
rogue network extensions 4-10
servers 4-38, 4-39
Service Advertisement Framework (SAF) 4-36
switch port 4-8
Video Capabilities 4-19
voice VLAN 4-18
VPN clients 4-21
web access 4-19
WebEx 24-20
Security Agent 4-38
Security Enhanced Linux (SELinux) 4-39
selecting the proper route 9-111
selective router 10-3, 10-4

SELinux 4-39
separate integrations for Cisco Unity 21-38
Sequenced Routing Update Protocol (SRTP) 3-48
sequential LRQs 8-41
servers
capacity planning 8-26, 29-18
clusters 8-8, 23-10
co-located 3-26
co-resident DHCP 3-28
co-resident MoH 17-36
CTI Manager 8-23
data center 3-12
farm 3-12
for DHCP 3-28
for media resources 17-1
for music on hold 17-36
for presence 23-9
for Unified CM 8-6
high availability 8-6
high-performance 8-6
multiple Unified CM servers 21-23
performance 8-26, 23-17
publisher 5-47, 8-9
redundancy 23-13
security 4-38, 4-39
standalone 3-28, 17-36
subscriber 8-9, 8-10
synchronization of 23-10
TFTP 8-10, 8-22
types 8-6
Service Advertisement Framework (SAF)
architecture 5-64
autonomous systems 3-78
call admission control 11-67
Client 3-75
described 3-72, 5-64
dial plan 9-24
Forwarder 3-73
security 4-36
split horizon 3-79
Service Inter-Working (SIW) 3-40, 5-13, 5-26
services
for IP phones 19-2
prefix 12-22, 12-34, 12-35, 13-31
supplementary 13-9
template 12-22
within a cluster 8-8
service set identifier (SSID) 3-64, 3-67
servlet for
Redirector 19-34
WebDialer 19-33
Session Description Protocol (SDP) 14-20
Session Initiation Protocol (SIP) 8-48
annunciator 17-20
delayed offer 14-20
dialed pattern recognition 9-5
dial rules 9-52, 9-84
early offer 14-20
for distributed call processing 5-26
gateways 13-17
gateway support for 13-11
music on hold (MoH) 17-30
phones 9-81, 9-83, 18-38
presence 23-5
trunks 14-3, 14-6, 14-7
Type-A phones 9-81
Type-B phones 9-83
video endpoints 12-3, 18-52
Session Management Edition (SME) 5-26, 5-28, 11-110, 29-30
settings for IP phones 4-19
SG3 13-22
shaping traffic 3-45
shared
key authentication 18-25
line appearances 3-54, 10-16
line mode with Unified CM Assistant 19-20
T.120 applications 12-44

shielded twisted-pair (STP) 3-15
signaling encryption 3-53, 3-54
silent monitoring and recording 26-6
SIMPLE 23-9
Simple Mail Transfer Protocol (SMTP) 21-30
Simple Network Management Protocol (SNMP) 10-7
Simple Object Access Protocol (SOAP) 23-10
simultaneous calls 13-2, 29-4
single-cluster deployment 23-18
single data center 4-42
Single Number Reach (*see* Mobile Connect)
single sign-on 4-38
single site
  deployment model 5-8, 17-41, 17-49, 26-6, 28-23
  messaging model 21-6
SIP 8-48
  annunciator 17-20
  calling party number normalization 14-26
  delayed offer 14-20
  design considerations 14-27
  dialed pattern recognition 9-5
  dial rules 9-52, 9-84
  DTMF Relay 17-14
  Early Offer 14-20
  for distributed call processing 5-26
  gateways 13-17
  gateway support for 13-11
  high availability of trunks 14-18
  MTP requirements 17-15
  music on hold (MoH) 17-30
  phones 9-81, 9-83, 18-38
  preconditions 11-50, 11-120
  presence 23-5
  proxy 11-69, 14-61
  route pattern 9-93
  routing requests 9-100
  transport protocols 14-24
  trunks 14-3, 14-6, 14-7
  Type-A phones 9-81
  Type-B phones 9-83
  video endpoints 12-3, 18-52
SIP for Instant Messaging and Presence Leveraging Extensions (SIMPLE) 23-9
site
  dialing codes 9-10, 9-50
  survey for wireless network 18-24
site-based design 5-3
SIW 3-40, 5-13, 5-26
sizing
  design and deployment considerations 29-1
  factors to consider 29-2
  MCUs 12-23
  tool 8-26, 29-3
  Unified CM servers 8-26
Skinny Client Control Protocol (SCCP)
  dialed pattern recognition 9-5
  DTMF signaling 17-14
  fax and modem support 13-25
  gateway support for 13-10
  MCU resources 12-18
  music on hold (MoH) 17-27
  phones 9-80
  presence 23-7
  user input on phones 9-80
  video endpoints 12-3, 18-35
SME 5-26, 5-28, 11-110, 29-30
SMTP 21-30
sn attribute 16-10
SNMP 10-7
snooping 4-11
SOAP 23-10
soft clients 10-16
SoftPhone 10-16, 18-55
softphone mode (audio on computer) 18-22, 24-5
software
  audio conferencing bridge 17-6
  endpoints 18-21
  media resource capacities 17-34

MTP resources 17-19
phones 18-55
versions 18-5, 18-6
software as a service (SaaS) 22-5
software-based endpoints 18-44
Software Development Kit (SDK) 16-3
software versions xxxix
Solution Reference Network Design (SRND) xxxix
Sony endpoints 18-35
Spanning Tree Protocol (STP) 3-7
speed dial presence 23-7
split data center 21-20
split horizon 3-79
SRND xxxix
SRST 5-13, 5-14, 5-17, 8-19, 9-77, 10-4, 17-50, 18-19, 21-13
SRSV 5-19, 21-9
SRTP 3-48
SSID 3-64, 3-67
standalone server 3-28, 17-36
star topology 11-70
static ANI interface 10-11
static locations 11-12
stealth firewall 4-26
storage area networking (SAN) 5-61, 5-62
STP 3-7, 3-15
string length 9-8
subnets 12-38
SUBSCRIBE calling search space 23-8
subscriber server 8-9, 8-10
summary of endpoint gatekeepers 12-40
Sun ONE Directory Server 16-10, 16-15
Super Group 3 (SG3) 13-22
supplementary services 8-47, 8-51
for H.323 endpoints 17-17
on gateways 13-9, 13-12
supported
call types 12-4
codecs 12-6, 18-36
protocols 12-3, 12-4
survey of wireless network 18-24
Survivable Remote Site Telephony (SRST) 5-13, 5-14, 5-17, 8-19, 9-77, 10-4, 17-50, 18-19, 21-13
Survivable Remote Site Voicemail (SRSV) 5-19, 21-9
switchback 11-41
switches
port security 4-8
roles and features 3-3
switchover 11-41
synchronization of
directories 16-9, 16-10
presence servers 23-10
Unified CM database 16-27
synchronous H.323 client 12-29

T

T.120 application sharing 12-44
TAC xli
Tail End Hop Off (TEHO) 9-23, 9-35
Tandberg endpoints
classification of traffic 18-51
described 12-2, 18-35
TAPI 8-23, 12-3
TCP/UDP ports 18-48
TCS 12-13
TDM gateways 13-7
technical assistance xli
Technical Assistance Center (TAC) xli
TEHO 9-23, 9-35
Telecommunications Act 5-63
telephone record and playback (TRaP) 21-6
telephone user interface (TUI) 21-6
TelePresence
deployment models 11-96
interoperability 11-95, 12-44
Quality of Service (QoS) 11-95, 12-46
RSVP 11-105
templates to define service settings 12-22

Terminal Capabilities Set (TCS) 12-13
termination of calls 17-4
test calls for 911 10-16
Tested Reference Configuration (TRC) 5-58
TFTP 3-25, 3-28, 8-8, 8-22
third-party
SIP phones 18-38
software applications 1-2
video endpoints 18-35
Third-Party Open API 23-38
third-party XMPP clients 24-23, 24-24
third-party XMPP clients and applications 24-2
threshold, differential 18-27
time-of-day (ToD) routing 9-124
timers for call signaling 13-37
time synchronization 3-35, 3-36
Time to Live (TTL) 12-39
TLS proxy 4-28
ToD 9-124
Token Ring 3-15
toll bypass 25-108
topology
for call admission control 11-70
generic 11-84
hub-and-spoke 9-131, 11-15, 11-70
MPLS-based 11-78
star 11-70
two-tier hub-and-spoke 11-74
topology-aware
call admission control 11-7
locations 12-8
topology-unaware call admission control 11-3
TPC 3-65
tracking domain 10-20, 10-21
traditional approach to classes of service 9-54, 25-23
traffic
bearer traffic 3-48, 11-34
bursty 13-2
call control 3-52, 3-56
call-related 3-56
classification 3-4, 3-17, 3-70, 18-39, 18-48
contact center traffic patterns 13-3, 13-4, 29-34
engineering 29-12
gateway sizing 13-2
normal business traffic 13-3, 29-34
planning for Unified MeetingPlace 22-36
planning for WebEx 22-10
prioritization 3-41
provisioning for 3-48
PSTN traffic patterns 13-3, 29-33
queuing 3-19, 3-70
quiescent 3-56
shaping 3-45
traffic patterns 13-2
video bearer traffic 3-51, 11-35
voice bearer traffic 3-48, 11-35, 29-12
Traffic Specification (TSPEC) 18-27, 18-28
transcoding
Cisco Unity 21-35
described 17-9
hardware resources 17-11
resources 17-11
transformations
caller ID 25-61
of calling and called numbers 9-14
translation of digits
patterns 9-107
voice translation profiles 9-142
Transmit Power Control (TPC) 3-65
transparent ASA firewall 4-26
TRaP 21-6
TRC 5-58
Trivial File Transfer Protocol (TFTP) 3-25, 3-28, 8-8, 8-22
troubleshooting for clustering over the WAN 5-49
TRP 3-19, 4-43, 17-19
trunks
architecture 14-2
capacity planning 14-58

comparing H.323 and SIP 14-3
described 14-1
emergency services 14-57
features supported 14-3
for video calls 12-15
H.225 14-45, 14-53
H.323 14-36, 14-50
intercluster, gatekeeper controlled 14-44
intercluster, non-gatekeeper controlled 14-38
load balancing 14-45
PSTN 14-58
RASAggregator 12-28, 12-32, 12-33
redundancy 14-45
SIP 14-6, 14-7, 17-20
to service provider network 14-58
transport protocols 14-24
utilization of 28-11
trust 18-39
Trusted Relay Point (TRP) 3-19, 4-43, 17-19
TSPEC 18-27, 18-28
TSpec 11-23
TTL 12-39
TUI 21-6
tuning gateway performance 13-5
Tunneled QSIG 14-54
two-stage dialing 25-53, 25-54, 25-55
two-tier hub-and-spoke topology 11-74
Type-A phones 9-81
Type-B phones 9-83

U

UAC 18-8
UAS 18-8
UC Integration for Microsoft Office Communicator 24-1
UCS
high availability 8-23
QoS 3-20
virtualized servers 5-58
UDC 3-15
UDLD 3-7
UDP 3-43, 5-26, 14-45
UMG 21-4, 21-30
UN 13-11
unicast call flow 17-29, 17-32
unicast music on hold 17-22, 17-27, 17-46
UniDirectional Link Detection (UDLD) 3-7
Unified Analysis Manager 28-21
Unified Border Element 4-36, 9-134, 11-66, 14-58
Unified CCE 26-2
Unified CCMP 26-5
Unified CCX 26-4
Unified Client Services Framework (CSF) 18-22, 24-3
Unified CM
capacity planning 29-18
co-located clusters 11-86
current release xxxix
database synchronization 16-27
different versions in the same cluster 3-34
groups 5-50, 5-56
H.323 14-51
mixed-mode operation 3-34
new for this release xxxix
presence 23-5
sizing tool 8-26
Unified CM Assistant 12-42, 19-19, 29-27
Unified CME 5-14, 5-17, 5-27, 8-6, 8-29, 8-44, 18-19, 21-13, 29-14
Unified CM Express (Unified CME) 5-14, 5-27, 8-44, 18-19, 21-13
Unified Communications Integration for Cisco WebEx Connect 24-19
Unified Communications Management Suite 28-1, 29-46
Unified Communications Manager Assistant (Unified CM Assistant) 12-42, 19-19
Unified Communications Manager Real-Time Monitoring Tool (RTMT) 28-21
Unified Communications Sizing Tool 8-26
Unified Communications System
applications and services layer 1-5, 20-1

architecture 1-3
call control layer 1-4, 15-1
call routing layer 1-4, 7-1
introduction 1-1
networking layer 1-3, 2-1
operations and serviceability layer 1-5, 27-1
Unified Computing System (UCS)
fault tolerance 8-16
high availability 8-23
QoS 3-20
virtualized servers 5-58
Unified Contact Center 26-1
Unified Contact Center Enterprise (Unified CCE) 26-2
Unified Contact Center Express (Unified CCX) 26-4
Unified Contact Center Management Portal (Unified CCMP) 26-5
Unified Customer Voice Portal (Unified CVP) 26-3
Unified CVP 26-3
Unified EIM 26-5
Unified E-Mail Interaction Manager (Unified EIM) 26-5
Unified Expert Advisor 26-4
Unified IC 26-5
Unified Intelligence Center (Unified IC) 26-5
Unified IP IVR 12-43
Unified Media Capture Platform 26-6
Unified MeetingPlace 22-13, 25-98, 29-43, 29-44
Unified MeetingPlace Express Media Server (EMS) 22-15
unified messaging (*see also* messaging) 21-1
Unified Messaging Gateway (UMG) 21-4, 21-30
Unified Mobile Communicator 24-2, 25-87
Unified Mobility 25-1, 25-38, 25-58, 25-79
Unified OM 28-4, 29-47
Unified Operations Manager (Unified OM) 28-4, 29-47
Unified Personal Communicator 18-44, 24-1
Unified PM 28-16
Unified Presence 23-1, 29-45
Unified Provisioning Manager (Unified PM) 28-16
Unified Reporting 28-22
Unified Service Monitor (Unified SM) 28-8, 29-47
Unified Service Statistics Manager (Unified SSM) 28-14
Unified SM 28-8, 29-47
Unified SSM 28-14
Unified Video Advantage
classification of traffic 18-48
described 12-1, 18-30
QoS recommendations 18-44
Unified Videoconferencing Manager 22-42
Unified Web Interaction Manager (Unified WIM) 26-5
Unified WIM 26-5
uniform on-net dial plan 9-8, 9-40, 25-26
uninterrupted power supplies (UPS) 3-13
Unity 21-1, 21-8, 21-18, 21-22
Unity Connection 21-8, 21-19, 25-97
Unity Express 21-24
Unity Telephony Integration Manager (UTIM) 21-38, 21-41, 21-43
universal data connector (UDC) 3-15
Unsolicited Notify 17-13
Unsolicited SIP Notify (UN) 13-11
UP 3-70
UplinkFast 3-7
UPS 3-13
upspeed 13-23
Urgent Priority 9-91
URLs for WebDialer 19-38
user agent client (UAC) 18-8
user agent server (UAS) 18-8
User Datagram Protocol (UDP) 3-43, 5-26, 14-45
user hold 17-24
UserID 16-10
user priority (UP) 3-70
users
application users 16-7
classes of service 9-54, 9-58, 9-71
directory search base 16-12
end users 16-7
input on phones 9-80, 9-81, 9-83
User-to-User Information Element (UUIE) 14-53

UTIM 21-38, 21-41, 21-43
UUIE 14-53

V

V.34 fax 13-22
V.34 modems 13-25
V.90 modems 13-25
V3PN 5-13, 5-26
VAD 8-13, 12-16, 13-4, 13-23, 29-35
VAF 3-44
variable length on-net dial plan 9-10, 9-43, 25-27, 25-29
VATS 3-46
VDI 24-34, 24-35
versions of software xxxix
VG202 Voice Gateway 18-7
VG204 Voice Gateway 18-7
VG224 Voice Gateway 18-7, 18-39
VG248 Analog Phone Gateway 18-7, 18-39
via-zone gatekeeper 9-134
VIC 18-4
video
  bearer traffic 3-51, 11-35
  call admission control 11-95
  capabilities 4-19
  conferences 12-19, 12-20, 17-8
  deployment models 11-96
  described 12-1
  enable/disable 18-30
  endpoints 12-2, 18-30, 18-48
  features 1-1
  gateways 13-27
  interoperability 11-95, 12-44
  Quality of Service (QoS) 11-95, 12-46
  support on phones 18-19, 18-23, 18-33
  traffic classification 3-18, 18-48
  VLAN 4-6
Video Capabilities 4-19
videoconferencing 22-37, 29-44
video telephony (*see* IP Video Telephony)
ViewMail for Outlook (VMO) 21-6
Virtual Desktop Infrastructure (VDI) 24-34, 24-35
virtualization
  Cisco Unity 21-33
  Cisco Unity Connection 21-33
Virtualization Experience Client (VXC) 18-37, 24-33
Virtualization Experience Client (VXC) Manager 24-33
Virtualization Experience Infrastructure (VXI) 18-37, 24-33
virtualized servers 5-58
virtual LAN (VLAN) 3-5, 3-64, 18-39
virtual network 4-41
Virtual Private Network (VPN) 4-41, 5-13, 5-26
Virtual Private Network Routing and Forwarding (VRF) 4-41
Virtual Router Redundancy Protocol (VRRP) 3-10
virtual software switches 3-20
virtual tie lines 3-56
VLAN
  access control list (ACL) 4-22
  number of devices per VLAN 3-5
  separate VLANs for voice and data 3-64
  video 4-6
  VLAN ID 18-39
  voice 4-6, 4-18
VMO 21-6
VMware 3-21, 5-58
voice
  bandwidth requirements 3-43
  bearer traffic 3-48, 11-35
  gateways 13-1, 18-3, 18-7
  port integration 21-41, 21-43
  termination 17-4
  translation profiles 9-142
  VLAN 4-6, 4-18
voice/WAN interface card (VWIC) 18-4
voice-activated conference view 12-16, 17-8
voice activity detection (VAD) 8-13, 12-16, 13-4, 13-23, 29-35

Voice-Adaptive Fragmentation (VAF) 3-44
Voice-Adaptive Traffic Shaping (VATS) 3-46
Voice and Video Enabled IPSec VPN (V3PN) 5-13, 5-26
voice interface card (VIC) 18-4
voicemail
  Cisco Unity 21-1
  Cisco Unity Express 21-24, 21-30
  dial plan 9-42, 9-49
  for local failover 5-55
  interoperability 21-31
  networking 21-30
  third-party systems 21-47
  unified messaging 21-1
  Unified Messaging Gateway (UMG) 21-30
  with Mobile Connect 25-46
voice messaging 21-1, 29-38
voice over IP (VoIP) 3-48
voice over the PSTN (VoPSTN) 5-20
Voice Profile for Internet Mail (VPIM) 21-30
voice quality 17-43
voice quality monitoring 28-8, 28-13
voice rtp send-recv command 10-14
voice traffic 29-12
VoiceXML (VXML) 25-50, 25-51
VoIP 3-48
VoPSTN 5-20
VPIM 21-30
VPN 4-21, 4-41, 5-13, 5-26
VPN Tunnel 11-32
VRF 4-41
VRRP 3-10
vSwitch 3-21
VWIC 18-4
VXC 18-37, 24-33
VXC Manager 24-33
VXI 18-37, 24-33
VXML 25-50, 25-51

W

Wait for Far-End to Send TCS 12-13
WAN
  aggregation router 3-3
  infrastructure 3-36
web access from IP phone 4-19
WebDialer 19-32, 29-27
WebEx 22-5, 22-20
WebEx Connect 24-1, 24-16
WebEx Node for MCS 22-16, 22-35
WebEx site 22-17
weighted fair queuing 3-41
WEP 18-24
what's new for this release
  call admission control 11-2
  call processing 8-2
  collaboration clients and applications 24-2
  conferencing 22-2
  deployment models 5-1
  dial plan 9-2
  endpoints 18-2
  gateways 10-2, 13-1
  LDAP directory integration 16-2
  media resources 17-2
  mobility applications 25-3
  network infrastructure 3-4
  network management 28-3
  Preface xxxix
  presence 23-2, 26-2
  security 4-2
  sizing considerations 29-2
  trunks 14-2
  Unified CM applications 19-2
  video telephony 12-2
  voice messaging 21-2
white list 24-21
Wi-Fi Multimedia (WMM) 3-70

Wi-Fi Multimedia Traffic Specification (WMM TSPEC) 3-71, 18-27, 18-28
Wi-Fi Protected Access (WPA) 18-25
Wi-Fi Protected Access 2 (WPA2) 18-25
Wi-Fi Protected Access 2 Pre-Shared Key (WPA2-PSK) 18-25
Wi-Fi Protected Access Pre-Shared Key (WPA-PSK) 18-25
wildcard route pattern 9-90
Windows Internet Naming Service (WINS) 3-28
WINS 3-28
Wired Equivalent Privacy (WEP) 18-24
wireless
  access points 3-58
  endpoints 3-60, 18-23
  interface on Cisco IP Phones 18-17
  IP Phone 7921G 12-46, 18-23
  IP Phone 7925G 12-46, 18-23
  IP Phone 7925G-EX 18-23
  IP Phone 7926G 18-23
  IP phones 18-23, 18-46
  LAN 3-57
  LAN controller (WLC) 3-59, 3-68
  networking solutions 12-46
wireless LAN (WLAN) 3-57
Wireless LAN Services Module (WLSM) 18-27
WLAN infrastructure 3-57
WLC 3-59, 3-68
WLSM 18-27
WMM 3-70
WMM TSPEC 3-71, 18-27, 18-28
WPA 18-25
WPA2 18-25
WPA2-PSK 18-25
WPA-PSK 18-25
WS-SVC-CMM-ACT module 17-7, 17-11
WS-X6624-FXS analog interface module 18-7

X

XML services 12-47
XMPP 25-109
XMPP clients 24-23, 24-24
XMPP clients and applications 24-2

Z

zones
  clients 12-35
  configuration on gatekeeper 12-35
  for gatekeepers 11-15
  H.320 gateways 12-38
  MCU 12-37
  prefixes 12-37, 12-38
  subnets 12-38