



# **Avaya CallPilot® Network Planning Guide**

5.0  
NN44200-201, 01.06  
December 2010

## Notice

While reasonable efforts have been made to ensure that the information in this document is complete and accurate at the time of printing, Avaya assumes no liability for any errors. Avaya reserves the right to make changes and corrections to the information in this document without the obligation to notify any person or organization of such changes.

## Documentation disclaimer

"Documentation" means information published by Avaya in varying mediums which may include product information, operating instructions and performance specifications that Avaya generally makes available to users of its products. Documentation does not include marketing materials. Avaya shall not be responsible for any modifications, additions, or deletions to the original published version of documentation unless such modifications, additions, or deletions were performed by Avaya. End User agrees to indemnify and hold harmless Avaya, Avaya's agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation, to the extent made by End User.

## Link disclaimer

Avaya is not responsible for the contents or reliability of any linked Web sites referenced within this site or documentation provided by Avaya. Avaya is not responsible for the accuracy of any information, statement or content provided on these sites and does not necessarily endorse the products, services, or information described or offered within them. Avaya does not guarantee that these links will work all the time and has no control over the availability of the linked pages.

## Warranty

Avaya provides a limited warranty on its Hardware and Software ("Product(s)"). Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language, as well as information regarding support for this Product while under warranty is available to Avaya customers and other parties through the Avaya Support Web site: <http://support.avaya.com>. Please note that if you acquired the Product(s) from an authorized Avaya reseller outside of the United States and Canada, the warranty is provided to you by said Avaya reseller and not by Avaya.

## Licenses

THE SOFTWARE LICENSE TERMS AVAILABLE ON THE AVAYA WEBSITE, [HTTP://SUPPORT.AVAYA.COM/LICENSEINFO/](http://support.avaya.com/licenseinfo/) ARE APPLICABLE TO ANYONE WHO DOWNLOADS, USES AND/OR INSTALLS AVAYA SOFTWARE, PURCHASED FROM AVAYA INC., ANY AVAYA AFFILIATE, OR AN AUTHORIZED AVAYA RESELLER (AS APPLICABLE) UNDER A COMMERCIAL AGREEMENT WITH AVAYA OR AN AUTHORIZED AVAYA RESELLER. UNLESS OTHERWISE AGREED TO BY AVAYA IN WRITING, AVAYA DOES NOT EXTEND THIS LICENSE IF THE SOFTWARE WAS OBTAINED FROM ANYONE OTHER THAN AVAYA, AN AVAYA AFFILIATE OR AN AVAYA AUTHORIZED RESELLER; AVAYA RESERVES THE RIGHT TO TAKE LEGAL ACTION AGAINST YOU AND ANYONE ELSE USING OR SELLING THE SOFTWARE WITHOUT A LICENSE. BY INSTALLING, DOWNLOADING OR USING THE SOFTWARE, OR AUTHORIZING OTHERS TO DO SO, YOU, ON BEHALF OF YOURSELF AND THE ENTITY FOR WHOM YOU ARE INSTALLING, DOWNLOADING OR USING THE SOFTWARE (HEREINAFTER REFERRED TO INTERCHANGEABLY AS "YOU" AND "END USER"), AGREE TO THESE TERMS AND CONDITIONS AND CREATE A BINDING CONTRACT BETWEEN YOU AND AVAYA INC. OR THE APPLICABLE AVAYA AFFILIATE ("AVAYA").

## Copyright

Except where expressly stated otherwise, no use should be made of materials on this site, the Documentation, Software, or Hardware provided by Avaya. All content on this site, the documentation and the Product provided by Avaya including the selection, arrangement and design of the content is owned either by Avaya or its licensors and is protected by copyright and other intellectual property laws including the sui generis rights relating to the protection of databases. You may not modify, copy, reproduce, republish, upload, post, transmit or distribute in any way any content, in whole or in part, including any code and software unless expressly authorized by Avaya. Unauthorized reproduction, transmission, dissemination, storage, and or use without the express written consent of Avaya can be a criminal, as well as a civil offense under the applicable law.

## Third-party components

Certain software programs or portions thereof included in the Product may contain software distributed under third party agreements ("Third Party Components"), which may contain terms that expand or limit rights to use certain portions of the Product ("Third Party Terms"). Information regarding distributed Linux OS source code (for those Products that have distributed the Linux OS source code), and identifying the copyright holders of the Third Party Components and the Third Party Terms that apply to them is available on the Avaya Support Web site: <http://support.avaya.com/Copyright>.

## Trademarks

The trademarks, logos and service marks ("Marks") displayed in this site, the Documentation and Product(s) provided by Avaya are the registered or unregistered Marks of Avaya, its affiliates, or other third parties. Users are not permitted to use such Marks without prior written consent from Avaya or such third party which may own the Mark. Nothing contained in this site, the Documentation and Product(s) should be construed as granting, by implication, estoppel, or otherwise, any license or right in and to the Marks without the express written permission of Avaya or the applicable third party.

Avaya is a registered trademark of Avaya Inc.

All non-Avaya trademarks are the property of their respective owners, and "Linux" is a registered trademark of Linus Torvalds.

## Downloading Documentation

For the most current versions of Documentation, see the Avaya Support Web site: <http://support.avaya.com>.

## Contact Avaya Support

Avaya provides a telephone number for you to use to report problems or to ask questions about your Product. The support telephone number is 1-800-242-2121 in the United States. For additional support telephone numbers, see the Avaya Web site: <http://support.avaya.com>.

# Contents

<b>Chapter 1: Customer service</b> .....	<b>21</b>
Getting technical documentation.....	21
Getting product training.....	21
Getting help from a distributor or reseller.....	21
Getting technical support from the Avaya Web site.....	22
<b>Chapter 2: About this Guide</b> .....	<b>23</b>
In this chapter:.....	23
Overview.....	23
How this guide is organized.....	23
Contents.....	24
Related information sources.....	25
Product guides.....	25
Fundamentals.....	26
Planning and Engineering.....	26
Installation and Configuration.....	26
Administration.....	26
Maintenance.....	26
End User information.....	27
Customer Documentation Map.....	27
Online resources.....	30
CallPilot administration online Help.....	30
CallPilot end-user online Help.....	30
Contacting technical support.....	30
Logging on to the CallPilot server with CallPilot Manager.....	31
Multi-administrator access.....	32
Administrator privileges.....	32
Simultaneous access.....	32
Refreshing screens.....	33
<b>Chapter 3: Getting started</b> .....	<b>35</b>
In this chapter.....	35
Section A: About networking and networking protocols.....	35
In this section.....	35
Overview.....	35
Definition: Network.....	35
Definition: Switch network.....	36
Public switched network.....	36
Private switch network.....	37
Definition: Data network.....	37
Public data network.....	37
Private data network.....	37
Definition: Messaging network.....	37
Network setup.....	38
Possible setups.....	38
Mesh network.....	38
Non-mesh network.....	38
Messaging Protocols.....	39

Types of messaging protocols.....	39
Industry-standard messaging protocols.....	40
Proprietary messaging protocols.....	40
Analog and digital messaging protocols.....	40
Analog messaging protocols.....	40
Digital messaging protocols.....	40
Voice Profile for Internet Mail.....	41
Analog and digital messaging protocols compared.....	42
Section B: Messaging networks.....	42
In this section.....	42
Networks and messaging.....	42
Messaging network.....	42
Sites and connections.....	43
Definition: Site.....	43
NMS site.....	44
Implementation is incremental.....	45
Network database.....	45
Contents.....	45
Local site information.....	45
Remote site information.....	46
Network database and the implementation process.....	46
Integrated and open sites.....	46
Integrated site.....	46
Open site.....	46
Protocols and open sites.....	47
Integrated and open messaging networks.....	47
Exchanging messages in open messaging networks.....	47
Combining open and private sites.....	47

**Chapter 4: Understanding Avaya CallPilot® networking solutions.....49**

In this chapter.....	49
Section C: About Avaya CallPilot networking solutions.....	49
In this section.....	49
Overview.....	50
CallPilot networking solutions.....	50
AMIS Networking.....	51
Integrated AMIS Networking.....	52
Open AMIS networking.....	52
Enterprise Networking.....	53
Advantages.....	53
VPIM Networking.....	54
Open VPIM networking.....	55
Network Message Service.....	55
NMS networks and NMS sites.....	56
Combining networking solutions.....	56
Example.....	57
Connections.....	57
Third-party systems.....	58
Networking software options.....	58
Section D: Messaging networks and users.....	59
In this section.....	59

In this section.....	60
Overview.....	60
Terminology note.....	60
Ease of use.....	60
Message types supported.....	60
Comparison.....	60
Message type and non-delivery notifications.....	61
Sending voice messages to external users.....	61
Message lengths.....	61
Comparison.....	62
Message length and non-delivery notifications.....	62
Approximate equivalents.....	63
Telephone users and desktop users.....	63
Telephone users.....	64
Desktop users.....	64
Terminology note.....	64
Teaching users how to use networking.....	64
Addressing open sites.....	65
Non-delivery notifications.....	66
Non-delivery notifications and the Event Monitor.....	66
Exception.....	66
See also.....	66
Section E: Features.....	67
In this section.....	67
Overview.....	67
Feature comparisons.....	67
Enhancements to Meridian Mail capabilities.....	68
Migration from Meridian Mail.....	69
Section F: Networking and other features.....	69
In this section.....	69
Overview.....	70
Shared Distribution Lists.....	70
Example.....	70
Personal Distribution Lists (PDL).....	71
Names Across the Network and Enhanced Names Across the Network.....	71
System trigger mailboxes.....	74
See also.....	74
Section G: Networking solution considerations.....	75
In this section.....	75
In this section.....	75
Overview.....	75
General messaging network considerations.....	75
AMIS Networking features.....	76
Mailbox length.....	78
Message handling.....	78
Other considerations.....	78
Enterprise Networking features.....	79
Message body length.....	81
Message handling.....	81
Other considerations.....	81
VPIM Networking features.....	81

Planning and engineering considerations.....	83
LAN load.....	84
Message handling.....	84
Other considerations.....	84
Network Message Service (NMS) features.....	84
Name of recipient (Text).....	85
Signaling.....	85
ISDN Network Call Redirection.....	86
Dialing plans.....	86
NMS dialing restriction scenarios.....	87
Dialing restrictions for calls within an NMS network.....	87
Dialing restrictions for calls within a private messaging network.....	87
Dialing restrictions for calls beyond the private messaging network.....	87
Implications.....	88
Section H: Transmission times and traffic calculations.....	89
In this section.....	89
Overview.....	90
Factors affecting transmission times.....	90
Transmission time concerns.....	90
Message transmission times for analog protocols.....	90
Assumptions.....	91
AMIS Networking messages.....	91
NMS messages.....	91
Transmission time comparisons.....	91
See also.....	92
Transmission times for messages containing text information.....	92
Control of text information transmission.....	93
Text information transmission times.....	93
Transmission times comparison.....	93
Transmission times for messages with Names Across the Network.....	93
When Names Across the Network information is sent.....	94
Traffic considerations for VPIM Networking messages.....	94
Traffic calculations.....	94
Section I: Remote users.....	95
In this section.....	95
Overview.....	95
Definition: Remote user.....	95
Benefits.....	96
Status of remote users.....	96
Temporary remote users.....	97
Temporary remote user capacity.....	97
Time stamps and nightly audits.....	97
Protecting a temporary remote user from deletion.....	98
Permanent remote users.....	98
How remote users are added.....	98
Names Across the Network.....	99
Enhanced Names Across the Network (Enhanced NAN).....	99
User Administration.....	99
How remote users are deleted.....	100
User Administration.....	100
Nightly audits.....	100

Enhanced Names Across the Network.....	100
Considerations when using NAN with Enterprise Networking.....	101
Considerations - NAN and Enhanced NAN.....	102
Outgoing networking sessions (NAN with Enterprise Networking only).....	103
Time stamps updated.....	103
See also.....	103
Synchronizing user information across networked servers for Enhanced NAN.....	104
Geographic Redundancy.....	104

## **Chapter 5: Dialing plans and networking.....107**

In this chapter.....	107
Section J: About dialing plans and networking solutions.....	107
In this section.....	107
Overview.....	108
Definition: Dialing plan.....	108
System perspective.....	108
User perspective.....	108
Dialing plan setup.....	109
Dialing plans.....	109
Location code.....	109
Uniform dialing plans.....	110
Definition: Uniform dialing plan.....	110
Example: Uniform dialing plan.....	110
Non-uniform dialing plans.....	111
Examples: Nonuniform dialing plan.....	112
Different addresses.....	112
Different CDP steering codes.....	112
ESN dialing plan.....	113
Definition: ESN.....	113
ESN prefix.....	113
Access code.....	114
Location code.....	114
Available directory numbers.....	114
Calling with an ESN dialing plan.....	114
Local recipient.....	115
Remote recipient.....	115
Addressing a message with an ESN dialing plan.....	115
Local recipient.....	115
Remote recipient.....	115
Example.....	115
Dialing plans and mailbox addresses.....	116
CDP.....	116
Definition: CDP.....	116
CDP codes.....	117
Example.....	117
Definition: Steering code.....	117
Unique steering codes.....	117
Creating steering codes.....	118
How a CDP call is placed.....	119
Extension length.....	119
Dialing plans and mailbox addresses.....	119

Hybrid dialing plan (ESN and CDP combined).....	120
Dialing plans and mailbox addresses.....	120
Another dialing plan.....	121
Dialing plans and addressing plans.....	121
Dialing plan.....	121
Addressing plan.....	121
Relationship.....	121
Modifying dialing plan information.....	122
Switch changes.....	122
Messaging network changes.....	122
Modifying CDP steering codes.....	122
Impact of modifications.....	123
Impact on switch settings.....	123
Impact on user administration records.....	123
Scenario.....	123
Section K: Dialing plan information.....	124
In this section.....	124
Gathering dialing plan information.....	124
Create a messaging network representation.....	125
Benefits.....	125
Examples of messaging network diagrams.....	126
Typical ESN network diagram.....	126
ESN network with an NMS site.....	126
Typical CDP messaging network diagram.....	127
Hybrid messaging network diagram.....	128
Messaging network with another dialing plan.....	130
Example 1.....	131
Example 2.....	132

**Chapter 6: Network and location-specific broadcast messages.....133**

In this chapter.....	133
Types of network broadcasts.....	133
Broadcast requirements.....	134
Location broadcast.....	134
Broadcast sent to a specific remote site.....	134
Broadcast sent to an NMS location at the local site.....	135
Broadcast sent to an NMS location at a remote site.....	135
Network broadcast.....	137
Broadcast message addresses.....	138
Broadcast address rules.....	138
Network broadcast prefix.....	138
Location prefix.....	138
User capabilities for broadcast messages.....	139
Mailbox capabilities.....	139
Distribution lists.....	140
Shared distribution lists.....	140
Personal distribution lists.....	140
Mailbox class validation for phoneset users.....	140
Mailbox class validation for desktop and Web messaging users.....	141
SMTP authentication.....	141
CallPilot server capabilities for broadcast messages.....	141

Levels of control.....	142
When to disable broadcast messages between sites.....	143
See also.....	143
Broadcast messages in a mixed messaging network.....	144
Broadcast support between systems.....	144
Multimedia support between systems.....	145
Example 1: VPIM Networking.....	145
Example 2: Enterprise Networking.....	145
Example 3: AMIS Networking.....	145
Broadcast message content policy.....	145
Viewing or printing all broadcast addresses.....	146
Viewing the broadcast addresses used by each switch location.....	146
Deleting unread broadcast messages.....	146

**Chapter 7: About VPIM Networking.....147**

In this chapter.....	147
Overview.....	147
Data networks.....	147
VPIM address.....	148
VPIM address restrictions.....	148
Left-hand side.....	148
Right-hand side.....	149
VPIM message.....	149
Encoding parts.....	149
Message header.....	149
Desktop and telephone users.....	150
Sending VPIM Networking messages to other sites.....	150
Open sites.....	150
Telephone users.....	150
Desktop users.....	151
Integrated sites.....	151
Distinction between open and network shortcuts.....	152
Creating the From: header.....	152
Receiving VPIM Networking messages.....	152
If a message is received successfully.....	152
If the message is not received successfully.....	153
Relationship of the server FQDN to VPIM shortcuts.....	153
Message from an integrated site.....	153
Message from an implicit open site.....	154
Message from an unknown open site.....	154
Non-delivery notifications.....	154
Multimedia messages and non-delivery notifications.....	155
Message delivery notification.....	155
OM reports.....	155
TCP/IP.....	156
TCP/IP routing.....	156
Fully qualified domain names.....	157
Domain name.....	157
Host name.....	157
Domain name system.....	157
Need for DNS server.....	158

DNS lookup tables.....	158
DNS servers and MX records.....	158
MX records and mail servers.....	159
MX records and user accounts.....	159
DNS server setup.....	159
Setting DNS.....	159
TCP/IP protocols.....	160
SMTP/ESMTP.....	160
MIME.....	160
VPIM.....	161
Implementation overview.....	161
Before you begin.....	161
Data network is set up.....	162
DNS server.....	162
Work with the ISP.....	163
Firewall.....	163
E-mail gateway server.....	163
Internet Mail Access Protocol (IMAP).....	164
Windows configuration.....	164
VPIM-compliant messaging systems requirements.....	164
Number of recipients and message length.....	164
Voice encoding.....	165
VPIM Version 2 conformance.....	165
VPIM Version 2 conformance table.....	165
Conformance table description.....	165

**Chapter 8: Avaya CallPilot® networking implementation concepts.....173**

In this chapter.....	173
Section L: About implementing networking.....	173
In This section.....	173
Overview.....	173
AMIS Networking.....	174
Enterprise Networking.....	174
VPIM Networking.....	175
About implementation.....	175
Implementation scenarios.....	176
Network administrators.....	177
Designing the messaging network.....	177
Basic design tasks for network administrators.....	177
Network database.....	178
When to add remote sites to the network database.....	178
Open and integrated sites.....	180
Protocols used to communicate with open sites.....	180
Installation and implementation concepts.....	180
Differences between installation and implementation.....	180
Installation.....	181
Implementation.....	181
Network implementation prerequisites.....	181
Recommended order of implementation.....	181
Network Message Service implementation.....	182
Open AMIS Networking.....	182

Integrated AMIS Networking.....	182
Implementation checklists.....	183
Section M: Key concepts.....	183
In this section.....	183
Network views.....	183
Performing local and remote administration.....	184
Site security.....	184
Logging on to a local or remote server.....	184
Message Delivery Configuration.....	184
Message Network Configuration.....	185
Network Diagnostics (Enterprise networking only).....	185
Relationship of the CallPilot Manager Web server to the CallPilot server.....	185
Logging on.....	185
Multi-administrator environments.....	186
Section N: CallPilot Manager networking configuration pages.....	186
In this section.....	186
Message Delivery Configuration description.....	186
To open the Message Delivery Configuration page.....	187
To navigate to subsequent pages.....	187
To cancel changes on a CallPilot Manager page.....	187
To save configuration changes.....	188
Message Network Configuration description.....	188
To open the Message Network Configuration page.....	188
How sites and switch locations are represented.....	188
Local messaging server and prime switch location.....	189
Remote messaging servers and prime switch locations.....	189
Satellite switch locations.....	189
Network tree and maximum number of sites.....	190
Network tree organization.....	190
Local site.....	190
Remote sites.....	191
Working with the Message Network Configuration page.....	191
To open a messaging server or switch location page.....	191
To navigate to subsequent pages.....	192
To cancel changes on a CallPilot Manager page.....	192
To save configuration changes.....	192
Validation.....	192
Levels of validation.....	193
Examples.....	193
Ensuring information is unique.....	193
Context.....	194
Uniqueness and validation.....	194
Unique numbers.....	194
Example.....	195
Specifying time periods.....	195
24-hour clock.....	195
Guidelines.....	195
Section O: Coordination among sites.....	196
In this section.....	196
Coordinating network information.....	196
Ensuring information is consistent across the network.....	196

Information that must be coordinated.....	196
Configuration worksheets.....	197
Networking requirements and considerations.....	198
Interaction of networking with other CallPilot features.....	198
Dialing plans.....	198
Channel requirements.....	199
NMS and channels.....	200
Types of channels required.....	200
VPIM considerations.....	200
Network security.....	200
Engineering considerations.....	201
Other considerations.....	201

**Chapter 9: Gathering information.....203**

In this chapter.....	203
Overview.....	203
Required information.....	204
Why gather information?.....	204
Information about open sites.....	204
If the implementation is an upgrade.....	204
If the implementation is a new network.....	205
Recommendation.....	205
Data network information.....	205
Data network.....	205
Remote data network information.....	206
Switch information.....	206
Gathering dialing plan information.....	206
Gathering information directly from the switch.....	206
Confirming settings.....	207
How dialing plans are used by VPIM Networking.....	207
Example.....	207
Information required from switch.....	207
Gather information about used features only.....	208
Local prime switch location information checklist.....	208
Remote switch location information checklist.....	209
Evaluating the switch information.....	210
Mandatory requirement.....	210
Configuring dialing plan information.....	211
Information from other sites.....	211

**Chapter 10: About Network Message Service.....213**

In this chapter.....	213
Overview.....	213
Prime switch location and satellite-switch locations.....	214
Prime switch location and Meridian Application Server.....	214
Switches and NMS.....	215
Confirming the Network Class of Service.....	215
NCOS and NMS.....	215
NMS access mechanisms.....	215
Desktop user logon.....	215
Direct access.....	216
Indirect access.....	216

Offnet access.....	216
NMS considerations.....	217
Message center directory number.....	217
Local messaging server broadcast.....	217
Feature interaction.....	217
Call Forward (Unconditional Call Forward, Call Forward No Answer, Call Forward Busy).....	218
Network Call Transfer.....	218
Network Hunting.....	218
Call Forward by Call Type Allowed to a Network DN.....	218
Attendant Extended Call.....	219
Call from CO Loop Start.....	219
Conference Call.....	219
Barge-in Attendant.....	220
Dialing plans and NMS.....	220
Dialing plans and NMS user locations.....	220
ESN dialing plan.....	220
CDP dialing plan.....	221
Define one switch location as one user location.....	221
Define two or more switch locations as one user location.....	221
How two or more switch locations are combined into one user location.....	221
Hybrid dialing plan requirements.....	222
Implementing NMS.....	222
Configuring the local CallPilot server.....	223
SDN Table.....	223
Services not in the SDN Table.....	223
Configuring the prime switch location.....	224
Determine the CDNs and the phantom DNs on the prime switch.....	224
Phantom DNs.....	224
Configuring the satellite-switch locations.....	224
Upgrading an existing satellite-switch.....	225
Satellite switch location SDNs.....	225
Satellite switch location phantom DNs.....	225
Dummy ACD-DNs on satellite-switch locations.....	226
Number of dummy ACD-DNs required.....	226
Switch overlays.....	227
Responses to overlay prompts.....	227
Define the dummy ACD-DNs.....	227
Setting the dummy ACD-DNs to night call forward.....	228
NMS time zone conversions.....	228
Network Message Service description.....	228
Network Message Service operation in multiple time zones.....	229
CallPilot time zone conversion.....	229
How time zone conversion affects mailbox owners and administrators.....	229
Phoneset users.....	229
Desktop messaging users.....	230
Web messaging users.....	230
CallPilot administrators.....	230
How time zone conversion affects networking recipients.....	231
VPIM Networking recipients.....	231
AMIS Networking recipients.....	231
Enterprise Networking recipients.....	231

<b>Chapter 11: Implementing and configuring Avaya CallPilot® networking.....</b>	<b>233</b>
In this chapter.....	233
Overview.....	233
See also.....	234
AMIS networking.....	234
Enterprise networking.....	235
VPIM networking.....	235
NMS.....	235
Complex network.....	236
Configuring the switch using phantom DNS.....	236
Example.....	237
Example.....	237
See also.....	238
Configuring CallPilot.....	238
SDN Table and message networking.....	238
Example: SDN Table.....	239
Creating an SDN.....	239
SDN numbers.....	241
Example.....	241
Media type.....	241
Minimum and maximum channels.....	241
Example: Channel allocation.....	242
Example of unique SDN used with Enterprise networking.....	242
See also.....	243
Implementing message networking.....	243
Message Delivery Configuration parameters.....	244
Parameter default values.....	244
Defaults.....	244
AMIS message delivery configuration.....	245
Outgoing and incoming AMIS.....	245
Number of Messages to Collect Before Sending (Batch threshold).....	246
Holding time.....	246
Standard message holding time.....	246
Urgent message holding time.....	246
Example 1.....	247
Example 2.....	247
Example 3.....	247
Open AMIS compose prefix.....	247
Example.....	247
Define Open AMIS delivery times.....	248
Example.....	248
Local AMIS System Access Number.....	248
Example.....	249
Economy Delivery (Eastern Time).....	249
Example.....	250
Example.....	250
Stale Times.....	251
Economy Open AMIS.....	251
Economy Integrated AMIS.....	251
Example.....	251
Standard.....	252

Urgent.....	252
Remote Contact: AMIS.....	252
Enterprise message delivery configuration.....	252
Outgoing and incoming Enterprise networking.....	253
Number of Messages to Collect Before Sending (Batch threshold).....	253
Economy Delivery (Eastern Time).....	253
Stale Times.....	253
Remote Contact: Enterprise.....	254
VPIM message delivery configuration.....	254
SMTP/VPIM section.....	254
Incoming SMTP/VPIM.....	254
Outgoing SMTP/VPIM.....	254
Outgoing SMTP Mail/Proxy Server.....	255
Fixed message delivery parameters.....	255
Security and Encryption Modes for SMTP Sessions.....	255
Security Modes for SMTP Sessions section.....	255
Encryption Options section.....	256
Enable SSL for Incoming SMTP Sessions.....	256
Requires SSL for Incoming SMTP Sessions.....	256
Connect to server with SSL for Outgoing SMTP Sessions.....	256
Authentication Options section.....	257
Unauthenticated.....	257
User ID/Password Authentication.....	257
SMTP/VPIM Password for Initiating Authenticated Connections to Remote Servers.....	257
Authentication Failure Attempts section.....	258
Maximum failed authentication attempts from a remote server.....	258
Action to perform when the maximum is reached.....	258
Maximum failed authentication attempts from a user.....	258
Action to perform when the maximum is reached.....	259
Unauthenticated Access Restrictions.....	259
Unauthenticated Desktop User Restrictions section.....	260
Delivery to Telephone or Fax.....	260
Enable Open AMIS.....	260
Enable Integrated Networking.....	260
Enable SDL Addressing.....	260
Enable Broadcast Addressing.....	261
Restrict Recipients.....	261
Maximum Recipients.....	261
Unauthenticated Server Restrictions section.....	261
Enable SDL Addressing.....	261
Enable Broadcast Addressing.....	262
Restrict Recipients.....	262
Maximum Recipients.....	262
VPIM Compose Prefix.....	262
VPIM Shortcuts section.....	263
Shortcut and Domain.....	263

**Chapter 12: Configuring local and remote networking sites.....265**

In this chapter.....	265
In this chapter.....	265
Overview.....	265

Before you begin.....	266
Configuring the local messaging server.....	266
General section.....	266
Name.....	266
Server type.....	267
Description.....	267
Site ID.....	267
Send Messages to all other Servers.....	267
Send User Info to Remote Servers.....	268
Receive User Info from remote servers.....	268
Send Network Broadcast and Receive Network Broadcast.....	269
Enterprise Networking section.....	269
Receive Message Text Info.....	269
SMTP/VPIM section.....	269
Server FQDN.....	269
Configuring the local prime switch location.....	270
General section.....	272
Name.....	272
Description.....	272
Location ID.....	272
Spoken Name Recorded.....	272
Dialing and Addressing section.....	273
Mailbox Addressing Follows Dialing Plan.....	273
Mailbox Prefixes.....	273
ESN section.....	274
Access Codes.....	274
ESN Access Code Used by this Location.....	274
Location Codes.....	274
Overlap.....	274
CDP section.....	275
Location Codes - CDP or Hybrid Dialing Plan.....	275
Steering Code.....	275
Overlap.....	275
VPIM section.....	276
VPIM Network Shortcuts.....	276
Prefix.....	276
Overlap.....	276
Time Zone Settings section.....	277
Time zone.....	277
Adding and configuring a remote site.....	277
Correcting information about remote sites already added to the network database.....	278
Configuring a remote messaging server.....	278
General section.....	280
Name.....	280
Server Type.....	280
Description.....	280
Site ID.....	281
Send Messages to this Server.....	281
Send Network Broadcast to this server and Receive Network Broadcast from this server.....	282
Send User Info to this server (for Names Across the Network).....	282
Example.....	283

Send Message Text Info to this Server.....	283
SMTP/VPIM section.....	284
Server FQDN.....	284
Connections section.....	284
Network protocol.....	284
Connections section: Connection DNs.....	284
Connections section: Enterprise.....	285
Initiating Password and Responding Password.....	285
Connections section: VPIM Security.....	285
SSL port number.....	286
Server password.....	286
Failed attempts from this server.....	286
System Maximum.....	286
Receive messages from this server.....	286
Configuring a remote prime switch location.....	287
General section.....	287
Name.....	287
Description.....	287
Location ID.....	287
Spoken Name Recorded.....	288
Dialing and addressing section.....	288
Mailbox addressing follows dialing plan.....	288
Mailbox prefixes.....	289
Dialing prefix.....	289
ESN information.....	289
CDP information.....	290
VPIM section.....	290
VPIM Network Shortcuts.....	290
Prefix.....	290
Overlap.....	290
Time Zone Settings section.....	291
Time zone.....	291
Configuring a remote satellite-switch location.....	291
Capacity.....	291
Organization.....	291
Where to configure a satellite-switch location.....	292
ESN.....	292
CDP.....	292
Spoken Name Recorded.....	292
Dialing plan interaction.....	293

**Chapter 13: Security and encryption.....295**

In this chapter.....	295
Section P: Networking and security.....	295
In this section.....	295
Overview.....	295
Open AMIS Networking and security.....	296
Long-distance toll charge features.....	296
Assigning user access and Restriction/Permission Lists.....	296
Mailbox class settings.....	297
Example.....	297

See also.....	297
VPIM Networking and security.....	298
Firewalls.....	298
Definition: Firewall.....	299
Packet filter.....	299
Proxy server and application gateway.....	299
Definition: Proxy server.....	299
Definition: Application gateway.....	300
Encryption.....	300
VPIM Networking and Windows.....	300
Malicious attacks.....	301
Service attacks.....	301
Ping attacks.....	301
Security against ping attacks.....	301
Switch security and networking.....	302
Switch security features.....	302
Section Q: SMTP security.....	303
In this section.....	303
Overview.....	303
Simple Mail Transport Protocol (SMTP) authentication.....	304
Modes of authentication.....	304
Monitoring suspicious SMTP activity.....	305
Encryption.....	305
Unauthenticated mode.....	305
How to enable unauthenticated mode.....	306
When to use the unauthenticated mode.....	306
Preventing denial-of-service attacks and junk e-mail in unauthenticated mode.....	306
Preventing toll fraud.....	307
Authenticated mode.....	307
How to enable the authenticated mode.....	308
When to use the authenticated mode.....	308
Denial-of-service attacks, junk e-mail, and toll fraud.....	309
Mixed authentication mode.....	309
How to enable mixed authentication.....	309
When to use mixed authentication.....	309
How mixed authentication affects users.....	310
When you should not use mixed authentication.....	310
SMTP authentication methods.....	310
User ID and Password authentication process.....	311
Authentication failures.....	312
When authentication can fail.....	312
What happens when authentication fails.....	313
Incoming messages from desktop messaging or My CallPilot users.....	313
Incoming messages from remote servers.....	314
Outgoing messages to remote messaging servers.....	314
What happens when there are too many failed authentication attempts?.....	315
Enabling CallPilot SMTP authentication.....	315
Configuring unauthenticated access restrictions.....	316
Monitoring suspicious SMTP activity.....	316
Automatic monitoring.....	316
How it works.....	317

Manual monitoring.....	318
Using wildcards.....	318
Section R: Encryption.....	319
In this section.....	319
CallPilot encryption description.....	319
Privacy guarantee.....	319
When to use encryption.....	320
Considerations for implementing encryption.....	320
How CallPilot encryption works.....	320
SSL port monitoring.....	321
SSL with User ID and Password authentication.....	321
CallPilot encryption and VPIM-compliant systems.....	322
Encryption, authentication, mail relays, and firewalls.....	322
CallPilot encryption and certificates.....	322
Implementing encryption on CallPilot.....	323

**Chapter 14: Implementation and planning tools.....325**

Overview.....	325
Implementation checklists.....	325
Implementation process.....	326
Configuration worksheets.....	326
Section A: Implementation checklists.....	327
In this section.....	327
Open AMIS Networking Implementation Checklist: NWP-035.....	328
Integrated AMIS Networking Implementation Checklist: NWP-032.....	330
Enterprise Networking Implementation Checklist: NWP-031.....	332
VPIM Networking Implementation Checklist: NWP-029.....	335
Open VPIM Implementation Checklist: NWP-036.....	337
Section B: Configuration worksheets.....	338
In this section.....	338
CallPilot Networking: CDP Steering Codes: NWP-027.....	339
CDP steering codes.....	339
CallPilot Networking: ESN Location Codes: NWP-037.....	340
ESN location codes.....	340
CallPilot Networking: Local Server Maintenance: NWP-024.....	342
Network broadcast addresses.....	342
SMTP and VPIM Networking.....	343
CallPilot Networking: Remote Server Maintenance: NWP-025.....	343
SMTP and VPIM Networking.....	345
Remote system access number (complete one only).....	345
CallPilot Networking: Switch Location Maintenance: NWP-026.....	346
ESN dialing plan information.....	346
CDP dialing plan information.....	347
VPIM network shortcuts.....	347
Time zone.....	348
CallPilot Networking: Message Delivery Configuration: NWP-028.....	348
CallPilot Networking: Open VPIM Shortcuts: NWP-038.....	352
Open VPIM shortcuts.....	352

**Chapter 15: How AMIS and Enterprise Networking handle messages.....355**

Networking messages.....	355
Message header.....	355

Message body.....	356
Message priorities.....	356
MTA and ANA.....	356
MTA responsibilities.....	357
MTA Monitor.....	357
ANA responsibilities.....	357
Main steps of message transfer.....	358
What the MTA does.....	358
How MTA and ANA handle messages.....	358
What the ANA does.....	360
How the ANA sets up calls.....	360
Message transfer process.....	361
Example of message handling with AMIS Networking.....	362
How CallPilot handles the message.....	363
How a remote user replies to an AMIS message.....	363
How the remote system handles the message reply.....	363
Example.....	364
Relationship of a system access number to a connection DN.....	364

**Index.....365**

# Chapter 1: Customer service

Visit the Avaya Web site to access the complete range of services and support that Avaya provides. Go to [www.avaya.com](http://www.avaya.com) or go to one of the pages listed in the following sections.

## Navigation

- [Getting technical documentation](#) on page 21
- [Getting product training](#) on page 21
- [Getting help from a distributor or reseller](#) on page 21
- [Getting technical support from the Avaya Web site](#) on page 22

---

## Getting technical documentation

To download and print selected technical publications and release notes directly from the Internet, go to [www.avaya.com/support](http://www.avaya.com/support).

---

## Getting product training

Ongoing product training is available. For more information or to register, you can access the Web site at [www.avaya.com/support](http://www.avaya.com/support). From this Web site, you can locate the Training contacts link on the left-hand navigation pane.

---

## Getting help from a distributor or reseller

If you purchased a service contract for your Avaya product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance.

---

## Getting technical support from the Avaya Web site

The easiest and most effective way to get technical support for Avaya products is from the Avaya Technical Support Web site at [www.avaya.com/support](http://www.avaya.com/support).

# Chapter 2: About this Guide

---

## In this chapter:

[Overview](#) on page 23

[How this guide is organized](#) on page 23

[Related information sources](#) on page 25

[Logging on to the CallPilot server with CallPilot Manager](#) on page 31

[Multi-administrator access](#) on page 32

---

## Overview

The Networking Planning Guide is your key to Avaya CallPilot® networking. Read the guide before implementing any networking solution. The guide provides an overview of key concepts and terminology necessary to implement a messaging network. It introduces all of the networking solutions offered with Avaya CallPilot and describes specific feature interactions. It also explains the process that you follow to implement one or more networking solutions.

For actual procedural instructions to perform a specific task, you must refer to the CallPilot Manager online Help files. Topics are indexed, and the system also contains extensive context-sensitive Help information.

---

## How this guide is organized

The Networking Planning Guide provides an overview of key CallPilot concepts and terminology. This guide is designed to help you to understand and implement a messaging network.

---

## Contents

The Networking Planning Guide is organized into the following chapters:

Chapter title	Description
<a href="#">About this Guide</a> on page 23	This chapter describes this guide and how to log on to the CallPilot Manager.
<a href="#">Getting started</a> on page 35	This chapter introduces networking and networking protocols. It also describes the key concepts necessary to understand messaging networks.
<a href="#">Understanding Avaya CallPilot® networking solutions</a> on page 49	This chapter describes each the networking solutions, their features, and how they work.
<a href="#">Dialing plans and networking</a> on page 107	This chapter describes each dialing plan supported by CallPilot. It also describes how to create a network representation using the dialing plan information.
<a href="#">Network and location-specific broadcast messages</a> on page 133	This chapter provides an overview of the CallPilot network broadcast feature and the types of network broadcasts available.
<a href="#">About Network Message Service</a> on page 213	This chapter provides an overview of the CallPilot Network Message Service (NMS) feature that enables messaging services to users in a network of compliant switches.
<a href="#">About VPIM Networking</a> on page 147	This chapter provides an overview of the CallPilot VPIM Networking capabilities.
<a href="#">Avaya CallPilot® networking implementation concepts</a> on page 173	This chapter provides an overview of how networking solutions are implemented. It stresses the importance of organizing all sites in the messaging network and coordinating information.
<a href="#">Gathering information</a> on page 203	This chapter describes how to gather the information required to implement message networking. It provides a checklist for all information that is needed about the switch configuration.

Chapter title	Description
<a href="#">Implementing and configuring Avaya CallPilot® networking</a> on page 233	This chapter provides implementation and configuration information required for CallPilot networking solutions.
<a href="#">Configuring local and remote networking sites</a> on page 265	This chapter describes how to configure the local messaging server and prime switch location. It also explains how to add and configure remote messaging servers and switch locations.
<a href="#">Security and encryption</a> on page 295	This chapter provides an overview of security and encryption as they apply to CallPilot networking.
<a href="#">Implementation and planning tools</a> on page 325	This appendix provides checklists and worksheets that you can use while setting up your messaging network.
<a href="#">How AMIS and Enterprise Networking handle messages</a> on page 355	This appendix describes the roles of the Message Transfer Agent (MTA) and Analog Networking Agent (ANA) in the handling of messages through AMIS and Enterprise networking.

---

## Related information sources

The CallPilot technical documents are stored on the CD-ROM that you receive with your system. The documents are also available from the following sources:

- CallPilot Manager application
- My CallPilot application
- the Avaya Support Web site at: <http://www.avaya.com/support>

---

## Product guides

The CallPilot documentation suite is organized into six categories to provide specific information for the various personnel involved in implementing and using CallPilot. The categories are as follows:

---

## Fundamentals

The Fundamentals category contains the CallPilot Fundamentals Guide, which is the primary initial reference for the CallPilot product.

---

## Planning and Engineering

Use the Planning and Engineering guides to help plan your system and networks before you install CallPilot, or to plan a migration of data from Meridian Mail\* to CallPilot.

---

## Installation and Configuration

The Installation and Configuration guides describe how to install the following:

- CallPilot server hardware and software
- Desktop Messaging and My CallPilot software

---

## Administration

The Administration guides provide specialized information to help you configure administer and maintain CallPilot, and use its features. Guides for ancillary applications (Reporter and Application Builder) are also included.

---

## Maintenance

The Maintenance category provides maintenance and diagnostics guides for the specific supported server types. Also included is the CallPilot Troubleshooting Guide (NN44200-700), which describes symptoms that can appear on all CallPilot server platforms, and describes ways to resolve them.

---

## End User information

The End User Information category contains documents required by CallPilot users, such as telephone set users and Desktop Messaging users. Specific guides are included for various desktop applications, as well as a host of printable quick reference cards.

---

## Customer Documentation Map

The following diagram shows the overall organization and content of the CallPilot documentation suite.

**Table 1: CallPilot Customer Documentation Map**

Fundamentals
Avaya CallPilot® Fundamentals Guide (NN44200-100)
Avaya CallPilot® Library Listing (NN44200-117)
Planning and Engineering
Avaya CallPilot® Planning and Engineering Guide (NN44200-200)
Avaya CallPilot® Network Planning Guide (NN44200-201)
Avaya Communication Server 1000 Converging the Data Network with VoIP Fundamentals (NN43001-260)
Solution Integration Guide for Avaya Communication Server 1000/CallPilot®/NES Contact Center/Telephony Manager (NN49000-300)
Installation and Configuration
Avaya CallPilot® Upgrade and Platform Migration Guide (NN44200-400)
Avaya CallPilot® High Availability: Installation and Configuration (NN44200-311)
Avaya CallPilot® Geographic Redundancy Application Guide (NN44200-322)
Avaya CallPilot® Installation and Configuration Task List Guide (NN44200-306)
Avaya CallPilot® Quickstart Guide (NN44200-313)
Avaya CallPilot® Installer Roadmap (NN44200-314)
Server Installation Guides
Avaya CallPilot® 201i Server Hardware Installation Guide (NN44200-301)
Avaya CallPilot® 202i Server Hardware Installation Guide (NN44200-317)

Avaya CallPilot® 202i Installer Roadmap (NN44200-319)  
Avaya CallPilot® 703t Server Hardware Installation Guide (NN44200-304)  
Avaya CallPilot® 1002rp Server Hardware Installation Guide (NN44200-300)  
Avaya CallPilot® 1002rp System Evaluation (NN44200-318)  
Avaya CallPilot® 1005r Server Hardware Installation Guide (NN44200-308)  
Avaya CallPilot® 1005r System Evaluation (NN44200-316)  
Avaya CallPilot® 1006r Server Hardware Installation Guide (NN44200-320)  
Avaya CallPilot® 600r Server Hardware Installation Guide (NN44200-307)  
Avaya CallPilot® 600r System Evaluation (NN44200-315)

#### Configuration and Testing Guides

Avaya Meridian 1 and Avaya CallPilot® Server Configuration Guide (NN44200-302)  
Avaya T1/SMDI and Avaya CallPilot® Server Configuration Guide (NN44200-303)  
Avaya Communication Server 1000 System and Avaya CallPilot® Server Configuration Guide (NN44200-312)

#### Unified Messaging Software Installation

Avaya CallPilot® Desktop Messaging and My CallPilot Installation and Administration Guide (NN44200-305)

#### Administration

Avaya CallPilot® Administrator Guide (NN44200-601)  
Avaya CallPilot® Software Administration and Maintenance Guide (NN44200-600)  
Avaya Meridian Mail to Avaya CallPilot® Migration Utility Guide (NN44200-502)  
Avaya CallPilot® Application Builder Guide (NN44200-102)  
Avaya CallPilot® Reporter Guide (NN44200-603)

#### Maintenance

Avaya CallPilot® Troubleshooting Reference Guide (NN44200-700)  
Avaya CallPilot® Preventative Maintenance Guide (NN44200-505)

#### Server Maintenance and Diagnostics

Avaya CallPilot® 201i Server Maintenance and Diagnostics Guide (NN44200-705)  
Avaya CallPilot® 202i Server Maintenance and Diagnostics Guide (NN44200-708)

Avaya CallPilot® 703t Server Maintenance and Diagnostics Guide  
(NN44200-702)

Avaya CallPilot® 1002rp Server Maintenance and Diagnostics Guide  
(NN44200-701)

Avaya CallPilot® 1005r Server Maintenance and Diagnostics Guide  
(NN44200-704)

Avaya CallPilot® 1006r Server Maintenance and Diagnostics Guide  
(NN44200-709)

Avaya CallPilot® 600r Server Maintenance and Diagnostics Guide  
(NN44200-703)

Avaya NES Contact Center Manager Communication Server 1000/  
Meridian 1 & Voice Processing Guide (297-2183-931)

## End User Information

### End User Cards

Avaya CallPilot® Unified Messaging Quick Reference Card  
(NN44200-111)

Avaya CallPilot® Unified Messaging Wallet Card (NN44200-112)

Avaya CallPilot® A-Style Command Comparison Card (NN44200-113)

Avaya CallPilot® S-Style Command Comparison Card (NN44200-114)

Avaya CallPilot® Menu Interface Quick Reference Card (NN44200-115)

Avaya CallPilot® Alternate Command Interface Quick Reference Card  
(NN44200-116)

Avaya CallPilot® Multimedia Messaging User Guide (NN44200-106)

Avaya CallPilot® Speech Activated Messaging User Guide  
(NN44200-107)

Avaya CallPilot® Desktop Messaging User Guide for Microsoft Outlook  
(NN44200-103)

Avaya CallPilot® Desktop Messaging User Guide for Lotus Notes  
(NN44200-104)

Avaya CallPilot® Desktop Messaging User Guide for Novell Groupwise  
(NN44200-105)

Avaya CallPilot® Desktop Messaging User Guide for Internet Clients  
(NN44200-108)

Avaya CallPilot® Desktop Messaging User Guide for My CallPilot  
(NN44200-109)

Avaya CallPilot® Voice Forms Transcriber User Guide (NN44200-110)

The Map was created to facilitate navigation through the suite by showing the main task groups and the documents contained in each category. It appears near the beginning of each guide, showing that guide's location within the suite.

---

## Online resources

---

### CallPilot administration online Help

The CallPilot Manager and CallPilot Reporter software contain administration and procedural online Help areas that provide access to:

- technical documentation in Acrobat PDF format
- online Help topics in HTML format

To access online information, use either of the following methods:

- Click the orange Help button at the top of any page to access the Administration Help area.
- Click the grey Help button on any page to display a topic that relates to the contents of the page.

---

### CallPilot end-user online Help

The My CallPilot software contains a Useful Information area that provides access to the end-user guides in PDF format.

To access online Help for the currently selected My CallPilot tab, click the Help button on the upper-right corner of the My CallPilot page.

Desktop messaging provides product-specific Windows Help for groupware clients (Microsoft Outlook, Novell GroupWise, and Lotus Notes). The stand-alone version of CallPilot Player also provides addressing and troubleshooting information for Internet mail clients.

---

### Contacting technical support

Contact your Avaya distributor's technical support organization to get help with troubleshooting your system.

---

## Logging on to the CallPilot server with CallPilot Manager

You must use a Web browser to log on to and administer the CallPilot server.

### Important:

CallPilot Manager can be installed on the CallPilot server or on a stand-alone server. If CallPilot Manager is installed on a stand-alone server, you must know the CallPilot Manager server host name or IP address, as well as the CallPilot server host name or IP.

### To log on to CallPilot Manager

1. Launch the Web browser on a PC or on the CallPilot server.
2. Type the CallPilot Manager Web server URL in the Address or Location box of the Web browser, and then press Enter.

Example: `http://sunbird/cpmgr/`

Result: When the connection is established, the CallPilot Manager Logon screen appears.

### Note:

The URL automatically appears as `http://<Web server host name or IP address>/cpmgr/login.asp`.

3. Type the administration mailbox number and password.  
The supplied administrator mailbox number is 000000. The default password is 124578.
4. Do one of the following:
  - If connection information is pre-configured, you can select a server or location from the Preset server list box.
  - Type the CallPilot server host name or IP address in the Server box.
  - If the CallPilot server you are connecting to has Network Message Service (NMS) installed, type the CallPilot server's host name or IP address in the Server box, and then type the name of the switch location on which the administration mailbox resides in the Location box.
  - If you are using Microsoft Internet Explorer, you can reuse information you entered during a prior session on the same PC. Do the following:
    - a. Clear the contents in the box.
    - b. Click once inside the box.
    - c. Choose the item you need from the list that appears.
5. Click Login.

Result: The main CallPilot Manager screen appears.

6. Work on the site as if you are working locally.

---

## Multi-administrator access

Multiple administration is a standard database management feature that enables many administrators to work on a database at the same time. There is no limit to the number of administrators who can work on the network database at the same time.

Multiple administration offers several advantages, including:

- shared knowledge of network database maintenance
- faster and more efficient implementation

Multiple accounts enable administration responsibilities to be distributed among a number of people. Therefore, certain administrators can specialize in certain tasks, such as maintaining users, performing backups, analyzing reports, or creating multimedia services.

---

## Administrator privileges

For security reasons, administrators can be given access only to those parts of the system that relate to their role. An individual can be assigned full, partial or no administrative privileges.

Refer to the CallPilot Administrator's Guide (NN44200-601), for detailed information on assigning administrative privileges.

---

## Simultaneous access

Multiple administrators can log on to CallPilot at the same time without overwriting other work.

If you are the first to log in to a particular resource, such as a specific mailbox class or user profile, and another administrator tries to access the same resource, a dialog box appears to inform you of the other administrator. Select one of the following choices:

- Continue editing.
- Save your changes, and release the resource to the other administrator.
- Cancel your changes, and release the resource to the other administrator.

If you do not select any of the choices within two minutes—because you are away from the terminal, for example—the system releases the resource so that others can access it. If this happens, all your unsaved changes are lost.

An administrator who accesses a resource that is currently being edited sees a read-only view of the property sheet in which all boxes are dimmed, indicating that the resource is currently locked. The administrator is not notified when the resource is released, but must try to access the property sheet again to see whether its status has changed. If a user tries to log on to a mailbox while an administrator is changing the profile, the user is unable to log on and receives a message that says the mailbox is in use.

---

## Refreshing screens

The Message Network Configuration tree display does not automatically refresh the views for all messaging network administrators. For this reason, if you are working in a multiple administration environment, click the Web browser Refresh or Reload button frequently. This ensures that you see the most current tree display.

For example, if you are viewing a list of users when another administrator deletes a user, the only way to see the change is to refresh the screen.

Refreshing the view is especially important if you are deleting a remote site with satellite-switch locations. A remote site cannot be deleted unless all satellite-switch locations, in addition to the remote messaging server, are selected.



# Chapter 3: Getting started

---

## In this chapter

[Section A: About networking and networking protocols](#) on page 35

[Section B: Messaging networks](#) on page 42

---

## Section A: About networking and networking protocols

---

### In this section

[Overview](#) on page 35

[Network setup](#) on page 38

[Messaging Protocols](#) on page 39

[Analog and digital messaging protocols](#) on page 40

---

### Overview

Basic networking concepts and terms is a useful background for understanding Avaya CallPilot® messaging networks.

---

### Definition: Network

At its simplest, a network is a communication system that connects two or more sites. With a network, users at all sites can exchange information and share specified resources.

Data networks and switch networks are two of the most common types of networks. Both types can be either public or private.

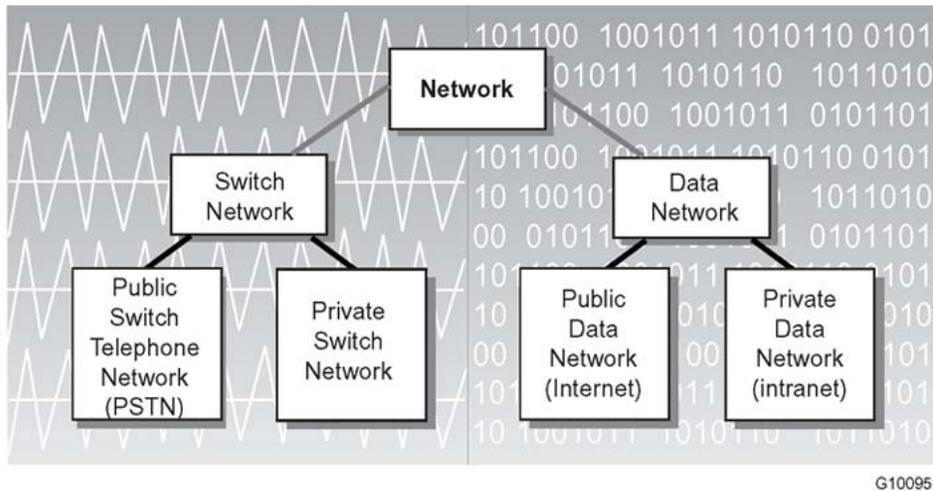


Figure 1: Network types

---

## Definition: Switch network

Traditionally, telephone systems are organized into switch networks.

The three basic parts to a switched network are:

- terminals (such as telephones or computers)
- transmission links (such as lines or trunks)
- one or more switches

In a switch network, a physical line is used to carry signals between the sender and the receiver. The sender uses a terminal and connects to a series of private and public telephony switches that terminate at the terminal of the receiver. The path of connection is maintained for the duration of the call and is destroyed when the call is completed. The signals are delivered in their original order.

---

## Public switched network

If the switched network is maintained by a telecommunications service provider and is used by more than one customer, it is considered the public switched network. The public switched telephone network (PSTN) is the public telephone network used around the world.

---

## Private switch network

If the switched network is privately owned and operated, and its use is restricted, it is considered a private switched network.

---

## Definition: Data network

A data network is a communication system that enables two or more computers to communicate with each other and share resources.

In a data network, a stream of communication, such as a spoken message, is broken down into a series of packets. These packets contain information that identifies their origin, their intended recipient, and their correct order. The packets are routed through a network and are reconstructed, in their proper order, at their destinations.

There are many types of data networks, including local area networks (LANs), wide area networks (WANs), metropolitan area networks (MANs), and global area networks (GANs).

---

## Public data network

A data network can make use of the publicly available infrastructure to transmit information. The Internet is an example of a public data network.

---

## Private data network

A data network can be privately controlled. An intranet is an example of a private data network.

---

## Definition: Messaging network

A network that exists for the purpose of exchanging messages is called a messaging network. When you implement any of the Avaya CallPilot networking solutions, you are creating a messaging network. In this context, a CallPilot networking solution is the Avaya implementation of a specific messaging protocol.

Messaging networks are built on an existing switched or data network infrastructure. A message network uses the voice or data network to transport messages between message servers. The existing structure is often called the backbone. A messaging network is usually private, although it is possible to exchange messages with sites that are not within the private messaging network.

---

## Network setup

All networks have a physical setup that determines how the network operates.

The setup of a messaging network is an important factor in determining how you implement networking solutions and how users are able to exchange messages. The network setup consists of the sites and the connections between them. This setup is often called a network topology.

---

## Possible setups

CallPilot supports different network setups to ensure that your messaging network is designed for the specific needs of your organization.

Two common types of network setup are the mesh network and the non-mesh network.

---

## Mesh network

One of the most common network setups is the mesh network, also known as a point-to-point network. In a mesh network, every site is connected to every other site in the messaging network.

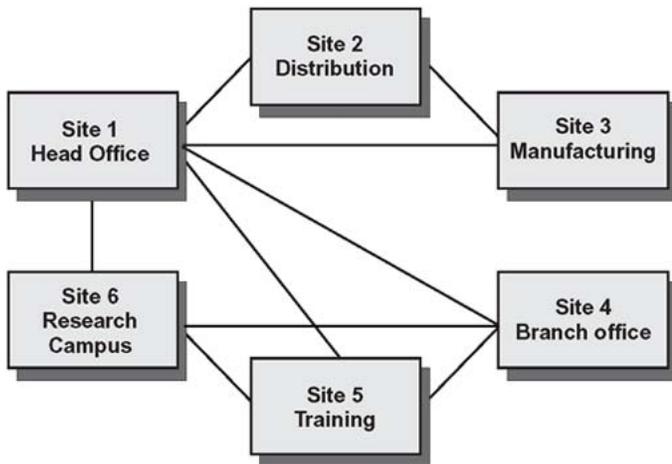
For small messaging networks, a mesh network setup is common. Every site can exchange messages with every other site in the network.

---

## Non-mesh network

For larger messaging networks, a mesh network can be impractical or unnecessary. In fact, in most messaging networks, a site is connected only to those remote sites with which it commonly exchanges messages, such as in the hub-and-spoke network configuration. NMS Networking is an example of this.

The following diagram illustrates a non-mesh network. In this example, only the head office is connected to every other site. All other sites are connected only to those sites with which messages are exchanged. The manufacturing center, for example, is connected only with the distribution center and the head office



G101147.eps

**Figure 2: Non-mesh network.**

This type of network setup also greatly simplifies the implementation and administration of the messaging network. Site 1 is the most complicated site to administer, because records for all other sites must be maintained. Site 3, however, is much simpler to administer because records for only the two sites with which messages are exchanged must be maintained.

---

## Messaging Protocols

Communication among sites in a messaging network is achieved by messaging protocols. A messaging protocol is a set of rules that defines how sites exchange information.

A messaging protocol must be used to exchange information between transmitting and receiving sites.

---

## Types of messaging protocols

CallPilot uses two types of messaging protocols for exchanging messages: analog and digital.

Analog protocols run over voice networks. Digital protocols are used over data networks.

These two main categories include both industry-standard and proprietary messaging protocols.

---

## Industry-standard messaging protocols

Industry-standard messaging protocols are based on industry-recognized rules and conventions.

---

## Proprietary messaging protocols

Proprietary messaging protocols are based on specifications defined by a closed group or organization for its own use within its own products.

---

## Analog and digital messaging protocols

A network can use analog messaging protocols and digital messaging protocols.

---

## Analog messaging protocols

Analog messaging protocols send voice signals that are similar to the original signal.

CallPilot supports two analog messaging protocols:

- Audio Messaging Interchange Specification-Analog (AMIS-A)

Issued in 1990, AMIS-A is an industry standard that allows the voice messaging systems produced by different vendors to exchange voice messages.

- Enterprise Networking

Avaya proprietary protocol for analog transmission of voice messages. Enterprise Networking is an extension of AMIS-A and adds many important improvements, including longer voice message length and the ability to address a single message to multiple recipients.

---

## Digital messaging protocols

Digital messaging protocols convert analog signals into binary format before transmission.

---

## Voice Profile for Internet Mail

Voice Profile for Internet Mail (VPIM) is a unified messaging protocol (voice, text, and fax) that specifies the use of SMTP as the message transfer protocol and the use of MIME to format messages. CallPilot uses the SMTP and MIME protocols in compliance with industry-standard specifications.

- Simple Message Transfer Protocol (SMTP)

A protocol for sending electronic mail (e-mail).

- Multipurpose Internet Mail Extensions (MIME)

A means of representing the format of multimedia messages, including graphics, audio, and text files, over the Internet.

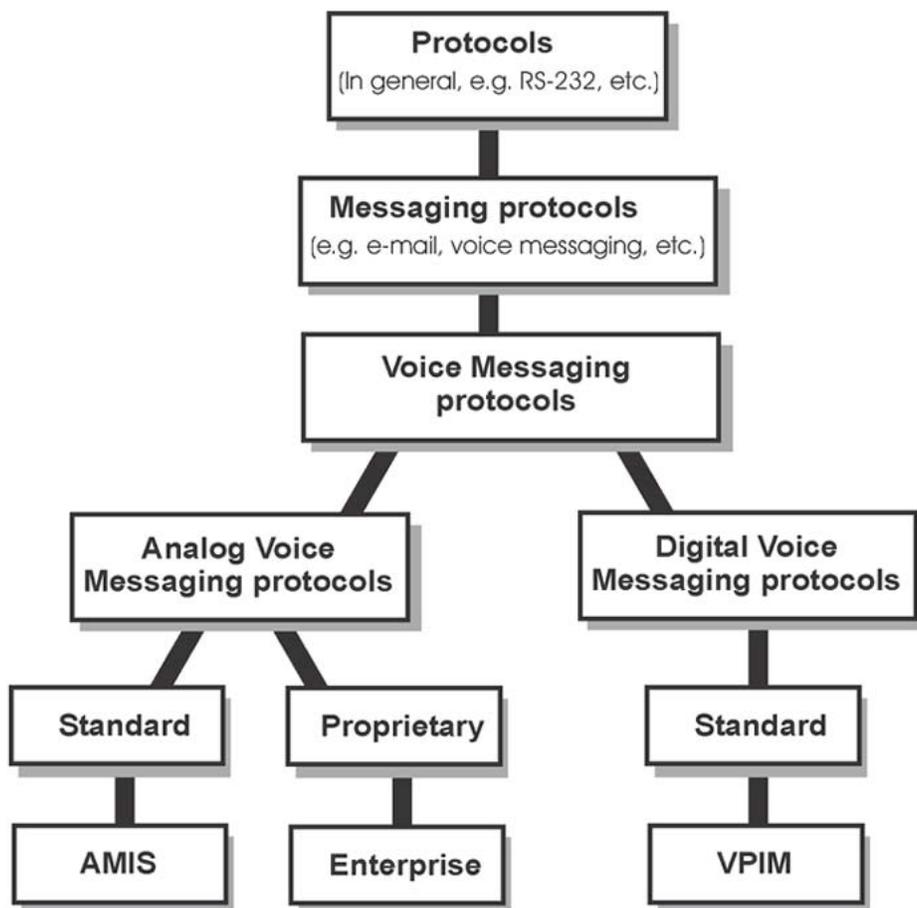


Figure 3: Messaging protocol hierarchy

---

## Analog and digital messaging protocols compared

In an analog transmission, the signal can pick up stray or random noise. Messages sent with analog protocols can become degraded when they are forwarded, because of rerecording.

In a digital transmission, the signal does not pick up stray noise and can be cleaner than an analog signal.

Because computers use digital information, digital protocols allow telephone messaging to use the latest technologies available, including greater integration with electronic messaging, such as fax and e-mail, and desktop applications. Messages consist of digital parts that contain different media, including voice, fax, and text.

Digital messages are generally less expensive than analog messages because no long-distance toll charges are currently associated with the Internet.

---

## Section B: Messaging networks

---

### In this section

[Networks and messaging](#) on page 42

[Network database](#) on page 45

[Integrated and open sites](#) on page 46

---

## Networks and messaging

---

### Messaging network

Messaging is the exchange of information, a common function of a network. CallPilot enables networks to function as messaging networks. A messaging network is a private network, whether data or switch, where users at one site can send messages to and receive messages from users at other sites.

CallPilot handles voice, fax, and text messages. Digital messaging protocols must be used for this because analog messaging protocols handle only voice messages. Messages are sent and received through the telephone, the computer desktop, or a combination of both.

Message networking transports messages from one messaging server to another. Note that Network Message Service (NMS) networking uses the Avaya Communication Server 1000 MCDN network to deliver calls from remote switches to a central CallPilot server.

## Sites and connections

A messaging network consists of sites and connections. Connections are the agreed-upon protocols used between two sites

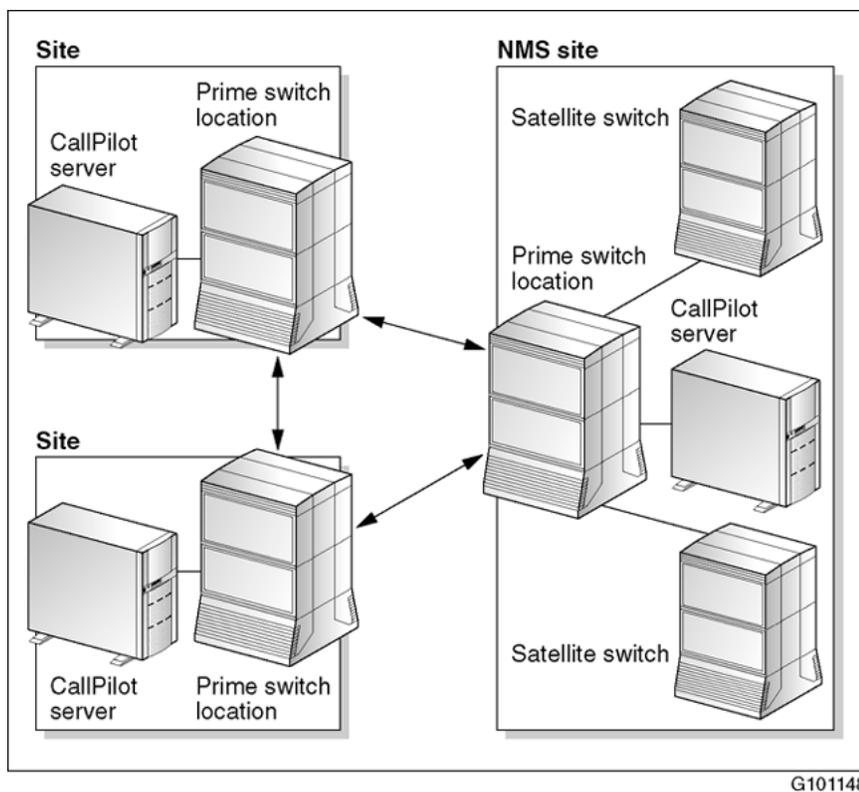


Figure 4: Network sites and connections.

## Definition: Site

In a messaging network, a site consists of a messaging server and a prime switch location.

The messaging server is the computer that is running CallPilot. The network database resides on the messaging server.

The prime switch location is the switch that is directly connected to the messaging server.

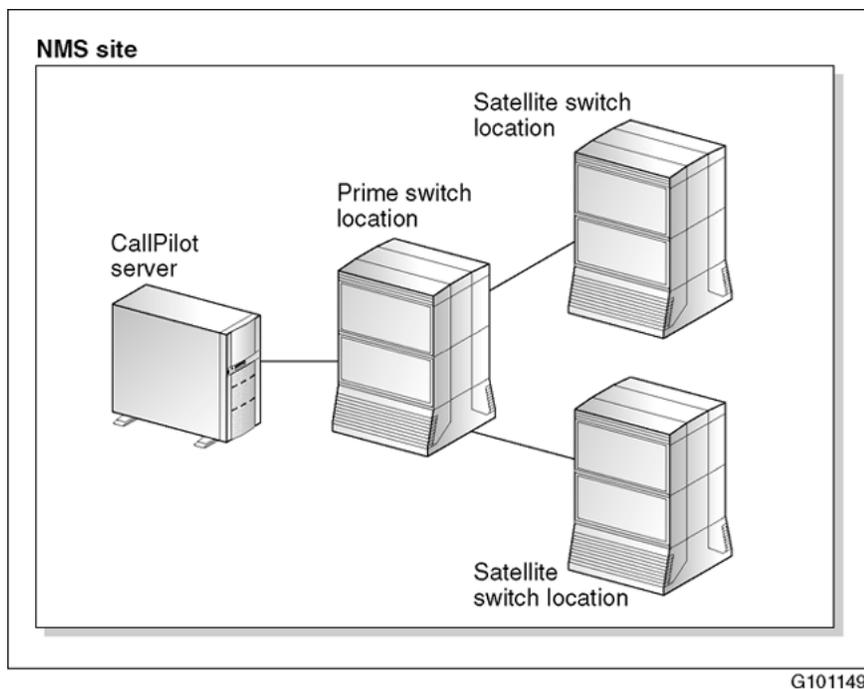
---

## NMS site

If a site has NMS implemented, it is called an NMS site. An NMS site consists of a messaging server, a prime switch location, and up to 999 satellite-switch locations.

**\* Note:**

Networking with pre-5.0 servers does not fully support 999 satellite locations because these older servers do not recognize location IDs greater than 59. For this reason, messages sent from a CallPilot server that has a location ID greater than 59 to a pre-5.0 server are sent correctly, but the mailbox information identifies the sending location as a deleted site. Additionally, users on the pre-5.0 servers are not able to send to locations with IDs higher than 59.



**Figure 5: NMS site.**

---

## Implementation is incremental

A messaging network is constructed on top of existing switch and data networks. It defines a portion of the network that CallPilot uses for messaging.

To implement a messaging network database is created that contains information about the sites included in the messaging network and how they communicate with one another.

---

## Network database

The network database is the foundation of a CallPilot messaging network.

Every site in a CallPilot messaging network has its own network database. The network database resides on the messaging server. It can hold information for up to 500 networking sites.

---

## Contents

The network database for a site contains information about the local site and all the remote sites with which the local site exchanges messages.

---

## Local site information

A network database contains the following types of configuration information for the local site:

- local messaging network configuration
- local messaging server
- local prime switch location
- local satellite-switch locations, if an NMS site

---

## Remote site information

A network database also contains the following types of configuration information for each remote site with which the local site exchanges messages:

- remote messaging server
- remote prime switch location
- remote satellite-switch locations, if an NMS site

When this information about a remote site is added to a local network database, it becomes an integrated site.

---

## Network database and the implementation process

When you implement a CallPilot networking solution, you add information to the network database.

---

## Integrated and open sites

Messaging networks exchange messages with two types of remote sites: integrated sites and open sites. Whether a remote site is integrated or open depends on how the local network database is configured.

---

### Integrated site

A remote site is integrated if information about it is added to the local network database.

---

### Open site

A remote site is open if information about it is not added to the local network database. In most instances, an open site is a site that is not part of the private messaging network.

---

## Protocols and open sites

The exchange of messages with open sites is possible through the use of industry-standard protocols. By using industry-standard protocols, systems can exchange messages regardless of the hardware platforms. Communication is possible if both systems use the same protocol.

Two CallPilot protocol implementations exchange messages with open sites:

- AMIS Networking—over a switch network
- VPIM Networking—over a data network

---

## Integrated and open messaging networks

A private messaging network consisting of integrated sites is self-contained but is built on the infrastructure of switch and data networks, both public and private. The ability to exchange messages with open sites means that users can go beyond the integrated network, into switch and data networks, both public and private.

---

## Exchanging messages in open messaging networks

The concept of open sites does not imply that a user in a private messaging network can automatically exchange messages with other systems that use the same industry-standard protocol.

Instead, an open site indicates that there is potential for users at the sites to exchange messages if they agree to do so and set up their networks to accept the communication.

When networking solutions that can exchange messages with open sites are implemented, access to open sites can be restricted.

---

## Combining open and private sites

Many large messaging networks consist of integrated sites but can also exchange messages with open sites. Within an organization, it may be important to have messaging capabilities with external sites as well as internal sites.



# Chapter 4: Understanding Avaya CallPilot® networking solutions

---

## In this chapter

[Section C: About Avaya CallPilot networking solutions](#) on page 49

[Section D: Messaging networks and users](#) on page 59

[Section E: Features](#) on page 67

[Section F: Networking and other features](#) on page 69

[Section G: Networking solution considerations](#) on page 75

[Section H: Transmission times and traffic calculations](#) on page 89

[Section I: Remote users](#) on page 95

---

## Section C: About Avaya CallPilot networking solutions

---

### In this section

[Overview](#) on page 50

[AMIS Networking](#) on page 51

[Enterprise Networking](#) on page 53

[VPIM Networking](#) on page 54

[Network Message Service](#) on page 55

[Combining networking solutions](#) on page 56

[Connections](#) on page 57

[Networking software options](#) on page 58

---

## Overview

CallPilot offers a range of coordinated messaging networking solutions that provide great flexibility and service. In this context, a networking solution is the Avaya implementation of a messaging protocol.

This guide provides overviews of each networking solution. The overviews explain how the networking solutions work. The online Help system provides detailed procedural information about the implementation process for each solution.

To fully implement a networking solution, you also need access to the relevant messaging server and switch documentation.

---

## CallPilot networking solutions

CallPilot message networking can be implemented with three different protocols:

- AMIS
- Enterprise
- VPIM

CallPilot also supports switches that are networked using Network Message Service (NMS).

These message networking protocols require the CallPilot Networking software option. NMS requires a separate CallPilot software option.

It is also important to note that Message Networking networks two or more messaging systems, while NMS networks two or more voice switches to a common CallPilot.

The following diagram shows a hypothetical network that makes use of all the available CallPilot networking solutions. Different solutions are implemented between different sites, depending on the corporate requirements.

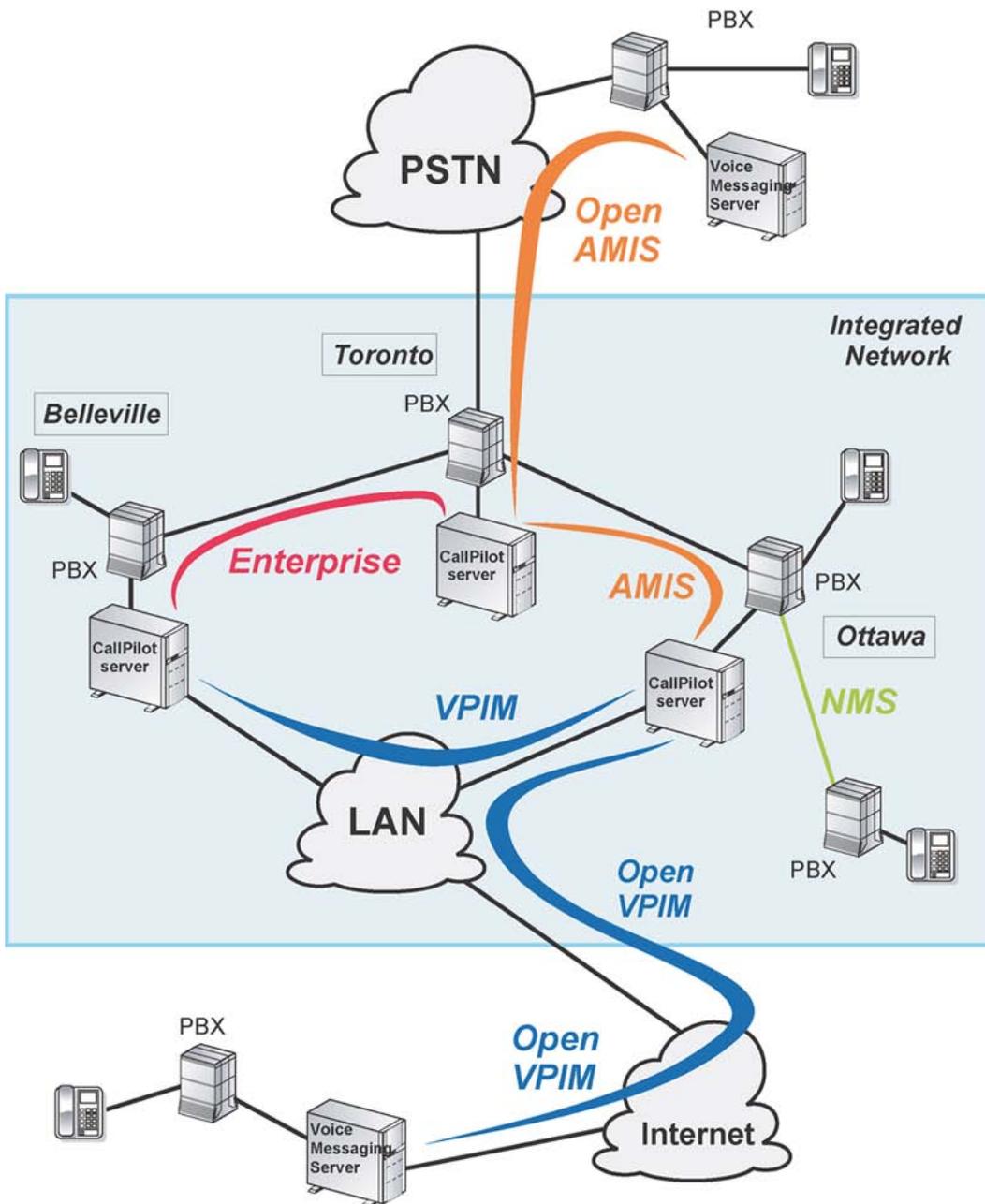


Figure 6: Multinet EPS diagram

## AMIS Networking

AMIS Networking uses the industry-standard analog Audio Messaging Interchange Specification - Analog (AMIS-A) protocol. With AMIS networking, users can send messages

to any other AMIS-compliant messaging system either on the local network or (subject to the Restriction/Permission List) on the PSTN.

AMIS Networking uses dual-tone multi-frequency (DTMF) tones to send information and supports voice messages, but it does not support fax and text messages.

There are two types of AMIS networking: integrated and open.

---

## Integrated AMIS Networking

Integrated AMIS Networking is used to exchange messages with integrated sites. When a remote site that uses the AMIS protocol is defined within the local network database, it is called an integrated site. Users sending messages to other users at integrated sites can use the private network number addresses. This means they simply address a remote user using that user's DN. Additionally, AMIS messages sent and received from an integrated site can have increased functionality, such as Call Sender.

---

## Open AMIS networking

Open AMIS networking is usually used to exchange messages with sites that are not part of the private messaging network.

To compose a message to an open AMIS address, the user must enter the open AMIS prefix, the system access number (SAN) and the mailbox number.

Features, such as Call Sender are not supported on open AMIS.

Remote sites can use any voice messaging system that supports the AMIS protocol

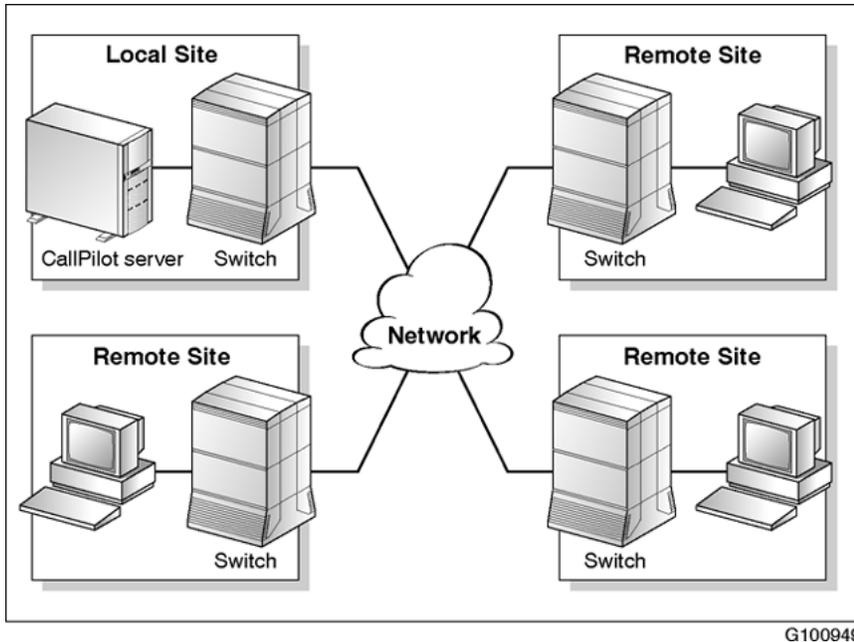


Figure 7: AMIS networking.

**\* Note:**

The functionality of open AMIS Networking is contained within Integrated AMIS Networking. This means that if you implement Integrated AMIS Networking, users can also, if allowed, exchange messages with open sites.

## Enterprise Networking

Enterprise Networking uses the Enterprise Networking protocol, an Avaya proprietary analog networking protocol supported only on Meridian Mail and CallPilot systems. The Enterprise Networking protocol is based on proprietary extensions to the AMIS protocol, and as such, offers many advantages over AMIS Networking.

Enterprise Networking uses dual-tone multi-frequency (DTMF) tones to send information. Enterprise Networking supports voice messages but does not support fax and text messages.

## Advantages

The Enterprise Networking protocol offers several advantages over the AMIS protocol.

Feature	AMIS protocol	Enterprise Networking protocol
Multiple recipients	Sends one message to each recipient; requires greater system resources and long-distance toll charges	Sends a single message to multiple recipients; requires less system resources and lowers long-distance toll charges
Message length	8-minute maximum	120-minute maximum of all parts, where any individual part can be up to 99 minutes in length
Security	Uses no special security features	Uses initiating and responding passwords between the sending and receiving sites before exchanging messages
Increased features	Limited feature availability	Supports additional features such as message privacy, message read acknowledgments, sending Username and Subject information, and Names Across the Network.

When networking CallPilot to a Meridian Mail, use Enterprise Networking. When networking a CallPilot to a non-Avaya messaging system, use Integrated AMIS.

---

## VPIM Networking

VPIM Networking provides CallPilot with the capability to exchange multimedia messages using an IP intranet or the Internet. VPIM Networking can exchange messages with any other system that uses the same data communications protocol, regardless of vendor. VPIM Networking formats and sends messages using industry-standard application protocols. Messages are sent across either a private data network, such as an intranet, or a public data network, the Internet, for delivery. With VPIM Networking, users can exchange messages with both open and integrated sites. For VPIM Networking to work within a private network, the destination must support VPIM and must be in the local network database.

In addition because VPIM Networking transmits messages over data networks, the messages do not incur long-distance toll charges.

VPIM supports both Names Across the Network and Enhanced Names Across the Network.

---

## Open VPIM networking

Open VPIM is used to exchange messages with sites that are not part of the private messaging network.

To compose a message to an open VPIM address, the user must enter the open VPIM prefix, the VPIM shortcut, and the mailbox number.

Features such as "Call Sender" are not supported.

The following diagram shows the block interconnection between a CallPilot system and other voice mail systems.

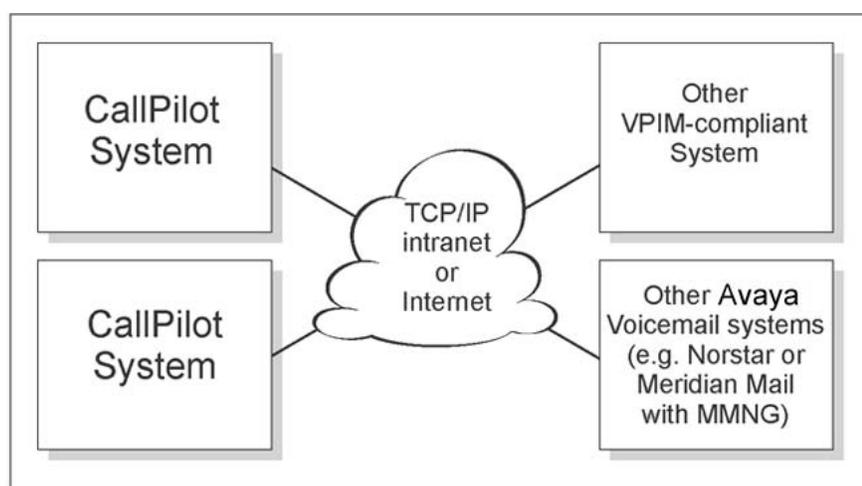


Figure 8: VPIM networking

---

## Network Message Service

Network Message Service (NMS) permits one CallPilot messaging server to provide messaging services to users on more than one switch. The CallPilot messaging server is directly connected to a prime switch location. Up to 999 satellite-switch locations can be attached to the prime switch location. The CallPilot messaging server provides messaging services to all switch locations.

NMS is transparent to users. A user whose telephone or desktop is attached to a satellite-switch location can receive the same services as a user attached to the prime switch location. All users dial the same way to reach the same services.

---

## NMS networks and NMS sites

The collection of switch locations, connections, and the messaging server is known as an NMS network. If an NMS network is a site in a private messaging network, it is called an NMS site.

**\* Note:**

Networking with pre-5.0 servers does not fully support 999 satellite locations because these older servers do not recognize location IDs greater than 59. For this reason, messages sent from a CallPilot server that has a location ID greater than 59 to a pre-5.0 server are sent correctly, but the mailbox information identifies the sending location as a deleted site. Additionally, users on the pre-5.0 servers are not able to send to locations with IDs higher than 59.

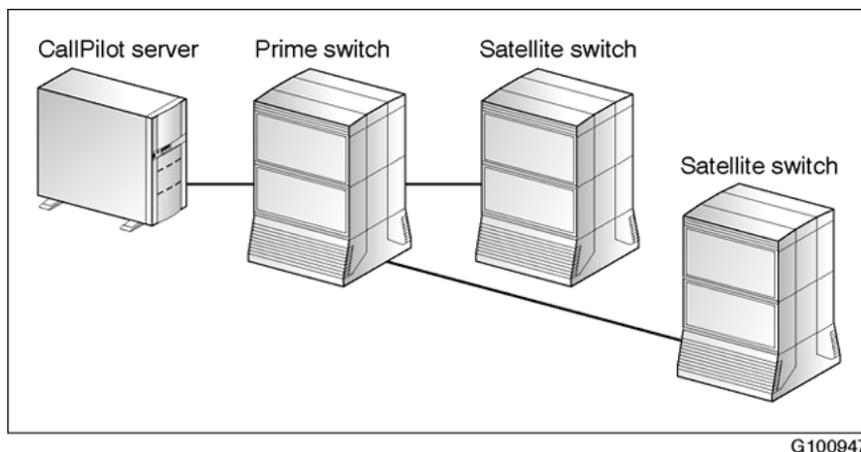


Figure 9: NMS networks and NMS sites

---

## Combining networking solutions

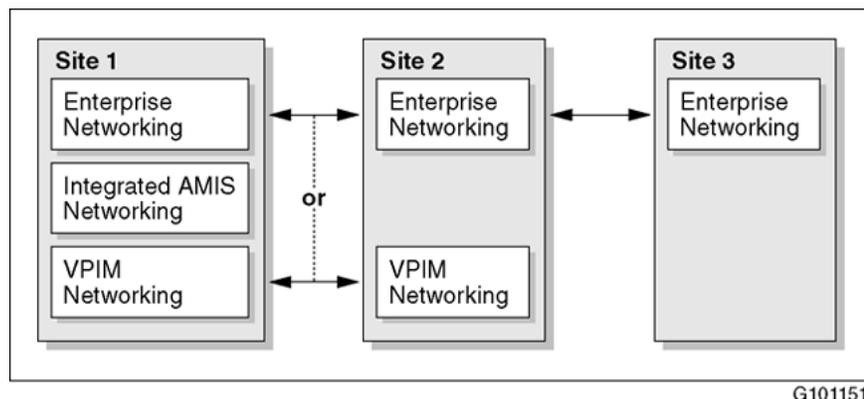
A messaging network can combine several networking solutions. Many messaging networks are combinations of several solutions at various sites. In addition, one or more of the sites in a messaging network can be NMS sites. With this ability to combine networking solutions, you can optimize your messaging network and create a customized solution for different business requirements.

However, to exchange messages between any two sites in a messaging network, both sites must have a common networking solution implemented and must agree to use it.

## Example

The following diagram shows three sites that are part of a larger messaging network.

- Site 1 has Enterprise Networking, Integrated AMIS Networking, and VPIM Networking implemented.
- Site 2 has Enterprise Networking and VPIM Networking implemented.
- Site 3 has Enterprise Networking implemented.



**Figure 10: Three sites in messaging network**

Sites 1 and 2 can exchange messages using either Enterprise Networking or VPIM Networking. The sending site is configured as to which protocol to use to connect to the remote site. Sites 2 and 3 can exchange messages using only Enterprise Networking.

## Connections

A CallPilot system can connect to different systems, depending on the protocols installed.

CallPilot can be connected to the following systems using the following networking solutions:

System	Networking solution
CallPilot	<ul style="list-style-type: none"> <li>• Enterprise Networking</li> <li>• VPIM Networking</li> <li>• AMIS/Integrated AMIS Networking</li> </ul>
CallPilot 100/150	VPIM Networking

System	Networking solution
Avaya Business Communications Manager Messaging	VPIM Networking
Avaya Norstar* Voice Mail (Release 3 and later)	<ul style="list-style-type: none"> <li>• VPIM Networking</li> <li>• AMIS Networking</li> </ul>
Meridian Mail (Release 11 and later)	<ul style="list-style-type: none"> <li>• Enterprise Networking</li> <li>• AMIS Networking</li> </ul>
Meridian Mail (Release 11 and later) with Meridian Mail Net Gateway (Release 1 and later)	VPIM Networking
Third-party system (must be compliant)	<ul style="list-style-type: none"> <li>• VPIM Networking</li> <li>• AMIS/Integrated AMIS Networking</li> </ul>

---

## Third-party systems

If you are connecting a CallPilot system to a third-party system, check the documentation for that system to ensure that the system is compliant. You may need to adjust the configuration of a third-party system.

---

## Networking software options

The five networking solutions are available as optional additions to CallPilot software. Software options are required to make the networking solutions available.

The following software options are used to enable networking solutions:

Option	Action
Networking	<p>Enables the following networking solutions:</p> <ul style="list-style-type: none"> <li>• AMIS Networking</li> <li>• Enterprise Networking</li> <li>• VPIM Networking</li> </ul> <p>Enables a maximum of 500 integrated sites.</p>

Option	Action
NMS	<p> <b>Note:</b> Enables remote NMS sites to be added to the network database. Does not allow the local site to be added as an NMS site.</p> <p>Enables use of NMS on the local site.</p>
	<p> <b>Note:</b> Enables a maximum of 1000 switch locations, including prime switch location.</p>

 **Note:**  
When you purchase the networking software option, all networking solutions, except for NMS, are installed on your site.

---

## Section D: Messaging networks and users

---

### In this section

[Overview](#) on page 60

[Message types supported](#) on page 60

[Message lengths](#) on page 61

[Telephone users and desktop users](#) on page 63

[Teaching users how to use networking](#) on page 64

[Non-delivery notifications](#) on page 66

## In this section

---

### Overview

The networking solutions offered by CallPilot are designed to make it easier for users to exchange messages.

---

### Terminology note

Although users have mailboxes on the CallPilot Server, their telephones are attached to the switch. Their desktops are on the local area network (LAN). For convenience, users are said to be on a switch.

---

### Ease of use

When you implement a networking solution, you provide information that the system uses to make it easy for local users to use networking. While the implementation process can seem complicated, the end result is a system that is easy to use. Whenever possible, CallPilot networking is designed so that users can address a message to a remote site in the same way they dial that remote site. That is, there are no additional numbers to memorize.

---

### Message types supported

CallPilot networking supports the exchange of different types of messages and message attachments.

---

### Comparison

The following are the message types supported by each networking solution.

Networking solution	Voice	Fax	Text
AMIS Networking	Yes	No	No
Enterprise Networking	Yes	No	No
VPIM Networking	Yes	Yes	Yes
NMS	Yes	Yes	Yes

---

## Message type and non-delivery notifications

When users send a message type that is not supported, they receive non-delivery notifications.

---

## Sending voice messages to external users

When composing a voice message to:

- An Open VPIM address, the voice message is transcoded to G.726 and delivered to the remote voice mailbox
- An e-mail address using CallPilot desktop or My CallPilot messaging, the voice message is transcoded to WAV format and delivered to recipients' e-mail accounts

---

## Message lengths

Each networking solution supports different system message lengths.

A message consists of the message header, the message body, and all attachments. A message can contain a mixture of message types, because each message can be one of different media types: voice, fax, or text.

 **Note:**

The Class of Service granted to a mailbox determines the message length limits that can be sent and received by a user. The length can be shorter than the system maximum.

## Comparison

The following table compares the message lengths supported by each networking solution.

Networking solution	Approximate byte limit	Approximate maximum voice length time limit	Notes
AMIS Networking	1.2 Mbytes	8 minutes	Only voice supported
Enterprise Networking	17.3 Mbytes	120 minutes	<ul style="list-style-type: none"> <li>• Limit of each part is 99 minutes</li> <li>• Only voice supported</li> </ul>
VPIM Networking	17.3 Mbytes	120 minutes	<ul style="list-style-type: none"> <li>• Voice, fax, and text supported</li> <li>• A single part can be 120 minutes long</li> <li>• Affected by voice encoding format used and other factors</li> </ul>
NMS	17.3 Mbytes	120 minutes	Same as limit for local messages

## Message length and non-delivery notifications

All messages are sent in their entirety. A message that exceeds the length limit is not broken into smaller units and sent as a series of messages.

If a message exceeds the length limit or is rejected by the receiving system due to length, the message is not delivered and a non-delivery notification is sent to the sender.

### Length checking

The length of a message is not checked before it is sent, because a message can be addressed to multiple recipients using different networking solutions that allow for different maximum message length.

This means that a sender does not know that the limit is exceeded until a non-delivery notification is received.

## Enterprise Networking

A non-delivery notification is sent if an Enterprise Networking message

- exceeds the total limit of 120 minutes, or
- any part of the message exceeds the 99-minute limit

---

## Approximate equivalents

A message can contain a mixture of media. This means that only an approximate equivalent can be determined from the total bytes of storage needed for a message.

To determine the approximate length of voice, fax, and text messages, the following conversion guideline factors are used:

### Voice

144 kbytes = approximately one minute

### Fax

41 kbytes = one fax page (normal resolution, standard page size)

### Text

- 1 byte = 1 ASCII character
- 2 bytes = 1 Unicode character

---

## Telephone users and desktop users

CallPilot networking solutions support computer telephony.

Computer telephony brings together two communications systems—the telephone system and the computer system. Merging these systems offers a rich information channel and a way to improve the capabilities of two communication systems. However, computer telephony has special requirements in terms of implementing CallPilot networking.

When you implement a networking solution, much of the configuration is designed to make networking as transparent as possible for users. That is, you configure the system so that users address a message to another site in almost the same way they dial to that site.

## Telephone users

Telephone users can use networking features as allowed by the system administrator.

---

## Desktop users

The desktop is another way for users to access messages. It offers the same capabilities as the telephone, but can also be used to view fax and text messages.

If your site has desktop users, there is an impact only on the implementation of VPIM Networking. For all other networking solutions, the implementation is the same whether the local site supports telephone users, desktop users, or both.

---

## Terminology note

Throughout the networking documentation, a distinction is made between telephone users and desktop users, where necessary. All CallPilot users have telephone access and use the telephone interface. However, only some (or perhaps all) users can have desktop access. These users can use the desktop interface.

However, if there is no difference between the actions of the two types of users or no differences between the functionality they can expect, the term user applies to both groups.

It is important to remember the distinction between the two types of users while implementing a networking solution. Some information that you must provide during implementing applies specifically to telephone users or desktop users.

---

## Teaching users how to use networking

After you implement CallPilot networking, you must let local users know how to use it.

During implementation, you specify various access codes and other information for each remote site that can exchange messages with the local site. Some of this information must be made available to your local users. It supplements the information in their user's guides.

## Example

You configure the system with a VPIM Networking access code, 15. This access code must be entered before a VPIM shortcut to an open site is entered. You must announce what the code is and when to use it.

---

## Addressing open sites

To exchange messages with open sites, users must know that an open site uses a compliant protocol and must know how to address users at that open site.

### Example

The following business card provides an open AMIS address and a open VPIM address, as well as a telephone number

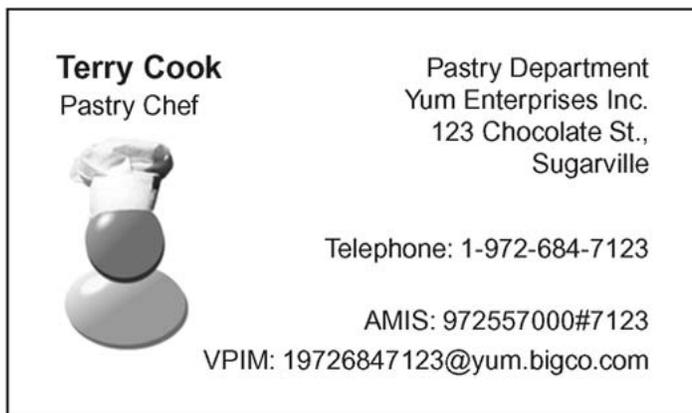


Figure 11: Business card.

### Open AMIS Networking

To exchange messages with a remote open site using the AMIS protocol, users must know the system access number of that remote site.

### Open VPIM Networking

To exchange messages with a remote open site using the VPIM protocol, users must know the VPIM address of that remote site.

A VPIM address resembles a standard e-mail address, as follows.

- e-mail address: username@institution.com
- VPIM address: 14165975555@institution.com

The composition of a VPIM address creates some problems. Because the address contains alphabetic, as well as numeric, characters, only desktop users can enter an Open VPIM address. If local telephone users want to exchange messages with open sites using VPIM networking, you must create an Open VPIM shortcut for them.

An Open VPIM shortcut translates an alphanumeric VPIM address into a numeric address. This enables telephone users to enter VPIM addresses.

**See also**

For a detailed discussion on addressing VPIM Networking messages and how VPIM shortcuts work, see [About VPIM Networking](#) on page 147 in this guide.

---

## Non-delivery notifications

If users attempt to use CallPilot in ways that are not supported, they receive non-delivery notifications. A non-delivery notification provides a brief description of the reason a message can not be delivered. Usually, a non-delivery notification contains enough information for a user to identify and correct a problem without assistance from the network administrator.

---

## Non-delivery notifications and the Event Monitor

Most networking activities that generate non-delivery notifications also trigger an event listed in the Event Monitor. In this way, the network administrator can monitor how users are attempting to use the messaging network.

Too many events indicates that users need additional training on how to use networking features.

---

## Exception

One activity generates a non-delivery notification for a user but does not trigger an event.

If a user sends a message to a non-existent mailbox on a remote site, a non-delivery notification is generated. An event is not triggered even if several attempts are made to reach this non-existent mailbox.

Users can contact their local network administrator to help resolve the problem.

---

## See also

For detailed information about the Event Monitor, consult the Maintenance and Diagnostics Guide for your server.

---

## Section E: Features

---

### In this section

[Overview](#) on page 67

[Enhancements to Meridian Mail capabilities](#) on page 68

[Migration from Meridian Mail](#) on page 69

---

### Overview

Each CallPilot networking solution supports different features.

---

### Feature comparisons

The following table lists the CallPilot features that are supported by each of the networking solutions. Details of these features are available in the sections that follow.

In the following table, Yes can be qualified. Check the detailed descriptions for more information.

Feature	AMIS	Enterprise	VPIM	NMS
Call Sender	Yes *	Yes	Yes *	Yes
Names Across the Network	No	Yes	Yes	n/a
Enhanced Names Across the Network	No	No	Yes	n/a
Name Addressing	Yes *	Yes	Yes *	Yes
Personal Distribution Lists	Yes	Yes	Yes	Yes
Shared Distribution Lists	Yes *	Yes	Yes *	Yes
Multiple Recipients	No	Yes	Yes	Yes
Reply To	Yes	Yes	Yes	Yes

Feature	AMIS	Enterprise	VPIM	NMS
Reply All	No	Yes	Yes	Yes
User-Recorded Personal Verification	No	Yes	Yes	Yes
Administrator-Recorded Personal Verification	Yes *	Yes	Yes *	Yes
Remote Site Spoken Names	Yes *	Yes	Yes *	Yes
Privacy Tag	No	Yes	Yes	Yes
Acknowledgment Tag	Yes	Yes	Yes	Yes
Urgent Tag	Yes	Yes	Yes	Yes
Received Time Announced	Yes	Yes	Yes	Yes
Sent Time Announced	No	Yes	Yes	Yes
120-Minute Messages	No	Yes	Yes	Yes
Sender's Name (Text)	No	Yes	Yes	Yes
Recipient's Name (Text)	No	Yes	Yes	Yes
Message Subject (Text)	No	Yes	Yes	Yes
Timed Delivery	Yes	Yes	Yes	Yes
Time Zone support	No	Yes**	Yes	Yes

\* Not for open addresses.

\*\* Must be supported at both ends.

---

## Enhancements to Meridian Mail capabilities

If you are familiar with Meridian Mail, you notice that CallPilot expands and enhances the networking capabilities offered by Meridian Mail.

CallPilot offers networking enhancements in the following areas:

- site capacity
- steering code capacity
- VPIM Networking

### Site capacity

A CallPilot messaging network can contain 500 integrated sites. A Meridian Mail messaging network can contain 150 integrated sites.

### Steering code capacity

CallPilot increases the number of CDP steering codes supported from 50 to 500.

### VPIM Networking

VPIM Networking is a new networking solution. Meridian Mail does not include a digital networking solution. Meridian Mail sites that want to use digital networking must attach Meridian Mail Net Gateway to their existing Meridian Mail system.

 **Note:**

The Bulk Provisioning feature in Meridian Mail is called AutoAdd in CallPilot.

For more detailed information, consult the Meridian Mail to CallPilot Migration Guide (NN44200-502).

---

## Migration from Meridian Mail

If your implementation of a CallPilot networking solution is an upgrade of an existing Meridian Mail networking solution, you can use the Migration utility to capture most of the legacy information. The migration utility saves you time and ensures that information is upgraded accurately and completely.

Note that because CallPilot provides many enhancements to Meridian Mail, the migration is not a straightforward transfer of information. Some information must be modified after migration. Additional information must be provided.

For detailed information on migrating networking information, consult the Meridian Mail to CallPilot Migration Guide.

---

## Section F: Networking and other features

---

### In this section

[Overview](#) on page 70

[Shared Distribution Lists](#) on page 70

[Personal Distribution Lists \(PDL\)](#) on page 71

[Names Across the Network and Enhanced Names Across the Network](#) on page 71

[System trigger mailboxes](#) on page 74

---

## Overview

CallPilot networking solutions have special interactions with the following features:

- Shared Distribution Lists
- Personal Distribution Lists
- Names Across the Network
- Enhanced Names Across the Network
- System trigger mailbox

---

## Shared Distribution Lists

Shared Distribution Lists (SDL) can be used in a messaging network. An SDL is a list created by a system administrator. It can include both local and remote users. To be included in an SDL, a remote user must be defined on the local site.

If a message is sent by a local user to an SDL, all local and remote users on the list receive the message. In addition, a user at one site can send a message to an SDL that is defined on another site.

If a message is sent by a remote user to an SDL on the local system, only local users in the list receive the message. The administrator can configure the system so that remote users in the list also receive a copy of the message.

---

## Example

The following example describes how SDLs are used.

### Using SDLs

Sam Hicks in New York wants to send a message to everyone on an SDL that includes local users and remote users in Boston.

New York SDL = 2201

Sam composes a message and enters 2201. Users at both sites receive Sam's message.

For more information about nested, static, and dynamic shared distribution lists, see the CallPilot Manager online Help.

---

## Personal Distribution Lists (PDL)

Personal Distribution Lists (PDL) can be used in a messaging network.

As its name implies, a PDL is created and maintained by a user, not an administrator. A PDL contains the addresses that are used frequently by a user. The list saves time, because a user does not have to enter each recipient's address each time a message is sent.

Network addresses can be included in a PDL. A list can include local users, remote users, Open AMIS users, Open VPIM users, broadcast addresses, SDLs (but not other PDLs), and NMS users. Network addresses are validated. If a network address from a PDL is found to be invalid after a message addressed with a PDL is sent, the user receives a non-delivery notification.

Possible causes of invalid network addresses include the following:

- Changes are made to the network configuration. PDLs are not automatically updated when changes are made.
- The user's permissions, such as the ability to use AMIS Networking, are revoked.

---

## Names Across the Network and Enhanced Names Across the Network

With CallPilot, users can call or address a message by entering a person's name. There are two features that make the management of names and addresses easier for sites using name dialing and name addressing on networked servers: Names Across the Network (NAN), and Enhanced Names Across the Network (Enhanced NAN). Because Enhanced NAN is an extension of NAN, you must read the sections on NAN in this guide to fully understand how Enhanced NAN works.

- Names Across the Network (NAN)

The Names Across the Network feature is only available with Enterprise and VPIM Networking. NAN is not needed with NMS because users on remote switches are on the same server as local users. Local user messaging to users on remote switches is completely transparent.

With Names Across the Network, you can reproduce the spoken names of senders of messages at recipient sites. If a user sends a message to a user on a remote server and the sender does not exist at the recipient site as a remote user, the NAN feature adds a temporary remote user to the site. The information added includes the sender's text name and spoken name.

Names Across the Network eliminates the need for a system administrator to manually add a permanent remote user and record a spoken name on the user's behalf.

System administrators can configure the system to handle NAN according to their needs. System administrators can:

- define whether the local site accepts and stores remote user information received using Names Across the Network
- define whether the local site sends user information with Enterprise Networking messages to a particular remote site (VPIM Networking automatically sends the user information.)
- define which remote sites accept user information from another site

For Enterprise Networking, the ability to configure these definitions is useful if the local site places calls to remote sites that incur long-distance toll charges. The administrator can choose to send remote user information to toll-free sites, but not to sites that incur toll charges. For VPIM Networking, because messages are transmitted over data networks, the messages do not incur long-distance toll charges.

For a general description of remote users and how Names Across the Network works, see [Section I: Remote users](#) on page 95.

- Enhanced Names Across the Network (Enhanced NAN)

Enhanced Names Across the Network is an enhanced version of the VPIM networking Names Across the Network feature. Enhanced NAN is supported only for VPIM networking on CallPilot 5.0 or later servers. Enhanced NAN offers an automated means of propagating user information throughout the network. When Enhanced NAN is enabled on a server, the system automatically sends user information to each supported remote server. As a result, each local user becomes a temporary remote user (TRU) in the database of the remote server. User information is available on the remote servers for the name dialing and name addressing feature. When a local user's name, mailbox, or personal verification (PV) is changed, the change is automatically sent to remote VPIM servers. Also, if a local user is deleted, the corresponding remote user is deleted from the remote VPIM servers.

In summary, Enhanced NAN overcomes two limitations of NAN. Enhanced NAN:

- adds and updates user information automatically on a remote server
- a user deleted locally is automatically deleted from the remote server

 **Note:**

Both NAN and Enhanced NAN propagate only local user information on the remote server. They do not propagate SDL, Directory Entry, or Non-User information.

The following table outlines the differences between NAN and Enhanced NAN based on selected variables.

Variable	Names Across the Network (NAN)	Enhanced Names Across the Network (Enhanced NAN)
How users are added to a remote server	A user is only added as a remote user on a remote server if users compose a network message to the remote site. One way to overcome this is by requesting users to send a message to each remote site when they first join the company.	Users are added automatically.
How updates (additions, modifications, and deletions) are made to remote user profiles	While NAN adds and updates remote users, it does not support deletions. Therefore, the administrator must delete the remote users after a user leaves the company.	<p>Adds, updates, and deletes remote users when users are added, updated, or deleted on the remote servers. Whenever a local user's name, mailbox, or PV is changed, the change is automatically sent to remote VPIM servers.</p> <p> <b>Note:</b> An administrator can add, modify, and delete TRUs. However, if the Enhanced NAN feature is on, all changes are overwritten during a synchronization.</p>
	NAN propagates more information than the Enhanced NAN feature. NAN ensures that each local user is maintained as a Temporary Remote User (TRU) on all supported remote servers. TRUs only contain a small subset of the local user information. Specifically, a TRU requires the following information: First Name, Initials, Last Name, Mailbox, NMS location, and personal verification (PV), TRU Extension DN 1, and Callback DN.	Enhanced NAN ensures that each local user is maintained as a Temporary Remote User (TRU) on all supported remote servers. TRUs only contain a small subset of the local user information. Specifically, a TRU requires the following information: First Name, Initials, Last Name, Mailbox, NMS location, and personal verification (PV). The TRU Extension DN 1 and Callback DN are actually created dynamically at the remote server using the dial plan defined on the remote site.

Variable	Names Across the Network (NAN)	Enhanced Names Across the Network (Enhanced NAN)
CallPilot version support	Remote servers must be running CallPilot 2.0 or higher.	Remote servers must be running CallPilot 5.0 or higher.
Synchronization of user information	With NAN, user information is not automatically synchronized. A user is only added as a TRU on a remote server if he or she composes a message to that site. Also, a user deleted locally is not automatically deleted from the remote server.	User information is automatically synchronized when Enhanced NAN is enabled.

---

## System trigger mailboxes

A system trigger mailbox is a mailbox defined by the system administrator for a specific purpose.

Two types of system mailboxes are used by networking:

- Alarm mailbox : An alarm mailbox receives messages generated by errors. You specify the type of error messages that are placed in the alarm mailbox.
- Broadcast mailbox : A mailbox that is assigned the rights to send network broadcasts

In an NMS network, system mailboxes exist on the prime switch, not on a satellite-switch.

---

## See also

For more information about system mailboxes, see [Network and location-specific broadcast messages](#) on page 133 and the CallPilot Manager online Help.

---

## Section G: Networking solution considerations

---

### In this section

[Overview](#) on page 75

[General messaging network considerations](#) on page 75

[AMIS Networking features](#) on page 76

[Enterprise Networking features](#) on page 79

[VPIM Networking features](#) on page 81

[Network Message Service \(NMS\) features](#) on page 84

[NMS dialing restriction scenarios](#) on page 87

---

### In this section

---

## Overview

You must keep some important considerations in mind when implementing CallPilot networking solutions. Understanding these considerations before implementation helps you recognize what functionality to expect from each networking solution.

The two main types of considerations are as follows:

- general—apply to all networking solutions
- specific—apply to a particular networking solution

---

## General messaging network considerations

General considerations that apply to all messaging solutions must be considered when planning a network.

### Number of sites

CallPilot supports a maximum of 500 integrated sites.

### Channels supported

AMIS and Enterprise networking protocols use voice channels. VPIM protocol does not generate traffic on voice channels because it uses the IP network.

### Delivery sessions

The maximum number of simultaneous delivery sessions to a single remote site depends on the networking solution.

This networking solution	supports
AMIS Networking	up to five sessions.
Enterprise Networking	up to five sessions.
VPIM Networking	up to 10 sessions outgoing. up to 10 sessions incoming.

### Other considerations

In addition to these general considerations, each networking solution has specific considerations that must be kept in mind. These are described in the following sections.

## AMIS Networking features

The following table lists the CallPilot features that are or are not supported by AMIS Networking.

CallPilot feature	Supported	Notes
Call Sender	Integrated only	<p>Call Sender can be used for both call answering and composed messages from Integrated AMIS Networking users if</p> <ul style="list-style-type: none"> <li>the mailbox numbering plan follows the dialing plan, or</li> <li>a remote user is added for the network user</li> </ul> <p> <b>Note:</b> Call Sender is not supported in a mixed ESN, CDP, or MP dialing plan.</p>
Names Across the Network	No	

CallPilot feature	Supported	Notes
Enhanced Names Across the Network	No	
Name Addressing	Integrated only	This feature is available if users at the remote site are defined as remote users at the local site.
Name Dialing	Integrated only	This features is available if users at the remote site are defined as remote users at the local site.
Personal Distribution Lists	Yes	Integrated AMIS Networking addresses can be included in a PDL.
Shared Distribution Lists	Integrated only	A remote user is required. A network address cannot be entered into the shared distribution list unless the address corresponds to a remote user.
Multiple Recipients	No	
Reply To	Yes	
Reply All	No	A message has only one recipient.
Users Actual Personal Verification	No	The user's actual personal verification is not carried across sites.
Administrator-Recorded Personal Verification	Integrated only	The administrator can record a personal verification for remote users who are defined at the local site.
Remote Site Spoken Names	Integrated only	A spoken name can be recorded for each remote switch location when configuring the remote site maintenance screen.
Private Tag	No	AMIS does not support private message tags. For this reason, messages tagged as private are returned to the sender with a non-delivery notification.
Acknowledgment Tag	Yes	Acknowledgment tags indicate that the message was delivered to the remote system, not that it was listened to.
Urgent Tag	Yes	Users can tag a message as urgent, and the system treats it as urgent for the prioritizing of delivery. However, the recipient of an urgent message does not know it was tagged as urgent.
Economy Tag	Yes	Users can tag a message as economy, and the system treats it as economy for the prioritizing of delivery. However, the recipient of an urgent message does not know it was tagged as economy.

CallPilot feature	Supported	Notes
Received Time Announced	Yes	The time when the message was deposited into the mailbox is announced to the recipient.
Sent Time Announced	No	
120-Minute Messages	No	Message body length is limited to eight minutes. Messages longer than eight minutes are not sent, and a non-delivery notification is sent to the originator.
Sender's Name (Text)	No	
Recipient's Name (Text)	No	If the recipients are defined as remote users, their names are provided.
Message Subject (Text)	No	
Sender's Department	No	
Timed Delivery	Yes	
Time Zone Support	No	

---

## Mailbox length

For AMIS Networking, mailboxes cannot exceed 16 digits.

---

## Message handling

AMIS Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

---

## Other considerations

The considerations described in [General messaging network considerations](#) on page 75 also apply to AMIS Networking.

---

## Enterprise Networking features

The following table lists the CallPilot features that are or are not supported by Enterprise Networking.

CallPilot feature	Supported	Notes
Call Sender	Yes	Can be used for both call answering and composed messages from network users if <ul style="list-style-type: none"> <li>• the calling line identification (CLID) is present in the message, or</li> <li>• the mailbox numbering plan follows the dialing plan, or</li> <li>• a remote user entry is added for the network user</li> </ul>
Names Across the Network	Yes	
Enhanced Names Across the Network	No	
Name Addressing	Yes	Name addressing is available if users at the remote site are defined as remote users at the local site. This can be done automatically with Names Across the Network or manually by the administrator.
Personal Distribution Lists	Yes	This feature is available if users at the remote site are defined as remote users at the local site, which can be done by Names Across the Network.
Shared Distribution Lists	Yes	A remote user is required. A network address cannot be entered into the shared distribution list unless the address corresponds to a remote user.
Multiple Recipients	Yes	The Enterprise Networking message contains all the recipients of the message who are at integrated sites. Recipients at open sites are not included.
Reply To	Yes	This feature can be used with all network messages. It can also be used with call answering messages left by network users if the calling line identification (CLID) is present on the message and all other conditions listed for Call Sender are met.

---

CallPilot feature	Supported	Notes
Reply All	Yes	This feature works with all recipients at integrated sites. It does not include recipients at open sites.
User's Actual Personal Verification	Yes	The user's personal verification is played to callers in voice messaging scenarios if recipients are defined as remote users at the local site. AutoAdd or Names Across the Network can be used to create the user's personal verification.
Administrator-Recorded Personal Verification	Yes	The administrator can record a personal verification for remote users who are defined at the local site.
Remote Site Spoken Names	Yes	A spoken name can be recorded for each remote site when configuring a remote site.
Private Tag	Yes	Messages tagged as private are announced to the recipient and may not be forwarded by the recipient to anyone else.
Acknowledgment Tag	Yes	Acknowledgment tags result in a message to the sender indicating that the message was actually listened to.
Urgent Tag	Yes	Messages tagged as urgent trigger urgent-related features, such as Remote Notification or Message Waiting Indication. Urgent messages are treated with priority for transmission as determined by the scheduling parameters.
Economy Tag	Yes	
Received Time Announced	Yes	The time when the message was deposited into the mailbox is announced to the recipient. The time reflects the time zone of the recipient.
Sent Time Announced	Yes	The sent time announced to the recipient reflects the time zone of the sender, not the recipient.
120-Minute Messages	Yes	Enterprise Networking supports messages containing up to 120 minutes of voice, including any attachments.
Sender's Name (Text)	Yes	Only supported if American English character set (ASCII 32-126) used.
Recipient's Name (Text)	Yes	If the recipients are defined as remote users, their names are provided.

CallPilot feature	Supported	Notes
		Only supported if American English character set (ASCII 32-126) used.
Message Subject (Text)	Yes	Only supported if American English character set (ASCII 32-126) used.
Sender's Department	No	
Timed Delivery	Yes	Any message can be tagged for future delivery.

---

## Message body length

The maximum length of an Enterprise Networking message, including the voice recording and all attachments, is 120 minutes. Any single part of the message can be up to 99 minutes in length.

The length of an Enterprise Networking message is not restricted by the number of recipients.

---

## Message handling

Enterprise Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

---

## Other considerations

The considerations described in [General messaging network considerations](#) on page 75 also apply to Enterprise Networking.

---

## VPIM Networking features

The following table lists the CallPilot features that are or are not supported by VPIM Networking.

CallPilot feature	Supported	Notes
Call Sender	Yes	Supported for messages to integrated sites only. Can be used for both call answering and composed messages from network users if <ul style="list-style-type: none"> <li>• the calling line identification (CLID) is present in the message, or</li> <li>• mailbox addressing follows dialing plan for the remote site, or</li> <li>• a remote user entry is added for the network user</li> </ul>
Names Across the Network	Yes	
Enhanced Names Across the Network	Yes	
Name Addressing	Yes	A remote user must be defined.
Personal Distribution Lists	Yes	A remote user must be defined.
Shared Distribution Lists	Yes	A remote user must be defined.
Multiple Recipients	Yes	Recipients to non-VPIM sites are not included in the VPIM message.
Reply To	Yes	
Reply All	Yes	Replies are sent to the VPIM recipients of the message only.
User's Actual Personal Verification	Yes	
Administrator-Recorded Personal Verification	Yes	A remote user must be defined.
Remote Site Spoken Names	Yes	To integrated VPIM sites only.
Private Tag	Yes	Messages tagged as private are announced as such to the recipient. Private messages can be forwarded.

CallPilot feature	Supported	Notes
Acknowledgment Tag	Yes	Acknowledgment tags result in a message to the sender indicating that the message was actually listened to.
Urgent Tag	Yes	Messages tagged as urgent trigger urgent-related features, such as Remote Notification or Message Waiting Indication. Messages tagged as urgent are announced as such to the recipient.
Economy Tag	Yes	
Received Time Announced	Yes	
Sent Time Announced	Yes	Sent time is converted to the recipient's local time zone and is expressed in local time.
120-Minute Messages	Yes	Length is restricted only by memory available on the mail server and other factors.
Sender's Name (Text)	Yes	Only supported if American English character set (ASCII 32-126) used.
Recipient's Name (Text)	Yes	Only supported if American English character set (ASCII 32-126) used.
Message Subject (Text)	Yes	Only supported if American English character set (ASCII 32-126) used.
Sender's Department	No	
Timed Delivery	Yes	

---

## Planning and engineering considerations

The following issues must be considered for VPIM Networking implementation:

- impact of VPIM on the local area network (LAN)
- message handling capabilities (throughput)
- message queuing capacities
- message delivery times

---

## LAN load

The VPIM Networking protocol requires an average of 180 kbytes of data per second of voice to transport a voice message over the IP network. The peak load on the IP network is equal to the "pump rate" of the SMTP delivery process. The pump rate is independent of the aggregate number of SMTP connections on allocated IP ports (specified as five inbound and five outbound). Rather, the pump rate is dependent more on of contention of the SMTP service with other services for CPU and disk resources.

When VPIM is compared to four active Enterprise Networking channels, the equivalent data rate imposed on the IP Network by VPIM is 21 kbytes per second (less than 1 percent of 10BaseT bandwidth).

---

## Message handling

VPIM Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

---

## Other considerations

The considerations described in [General messaging network considerations](#) on page 75 also apply to VPIM Networking.

---

## Network Message Service (NMS) features

The following table lists the CallPilot features that are or are not supported by NMS.

CallPilot feature	Supported
Call Sender	Yes
Names Across the Network	n/a
Enhanced Names Across the Network	n/a
Name Addressing	Yes

---

CallPilot feature	Supported
Name Dialing	Yes
Personal Distribution Lists	Yes
System Distribution Lists	Yes
Multiple Recipients	Yes
Reply To	Yes
Reply All	Yes
User's Actual Personal Verification	Yes
Administrator-Recorded Personal Verification	Yes
Remote Site Spoken Names	Yes
Private Tag	Yes
Acknowledgment Tag	Yes
Urgent Tag	Yes
Received Time Announced	Yes
Sent Time announced	Yes
120-Minute Messages	Yes
Sender's Name	Yes
Recipient's Name (Text)	Yes
Message Subject (Text)	Yes
Sender's Department	Yes
Deferred Delivery	Yes

---

## Name of recipient (Text)

This feature is available for use if it is implemented on the local system. This feature is not available if the recipient is a user at a remote site and is not defined as a remote user.

---

## Signaling

NMS has the following signaling considerations:

### **ISDN signaling**

NMS uses the signaling capabilities of the ISDN primary rate access (ISDN PRA) and ISDN signaling link (ISL) to provide messaging servers. Therefore, NMS is subject to the assumptions and considerations of the ISDN Network Numbering Plan Enhancement feature.

If a non-PRA or -ISL trunk is involved in an NMS call, NMS is not supported, because the original called number and calling party number are not sent.

### **Virtual signaling**

Virtual signaling is used between the prime switch and the satellite-switches to:

- turn the Message Waiting Indicator (MWI) on and off at a user's telephone
- transport necessary call information for a networked voice messaging feature, such as Call Sender

These capabilities are supported by using ISDN non-call associated transaction messages.

### **End-to-end signaling**

End-to-end in-band signaling (EES) is required to access CallPilot features from a satellite-switch.

---

## **ISDN Network Call Redirection**

NMS is based on the Network Call Redirection (NCRD) features of the switch. Therefore, NMS is subject to the assumptions and considerations of the NCRD features.

---

## **Dialing plans**

NMS supports the following dialing plans:

- Electronic Switched Network (ESN)
- Coordinated Dialing Plan (CDP)
- hybrid dialing plan, which combines ESN and CDP

NMS does not support another dialing plan, such as the public switched telephone network (PSTN).

---

## NMS dialing restriction scenarios

A uniform dialing plan is required for an NMS network. This requirement has important implications for implementing an NMS network and can require the reconfiguration of an existing dialing plan.

The uniform dialing plan requirement applies in the following scenarios:

- calls to other users in the NMS environment
- calls to other users in the private messaging network but not part of the local NMS network
- calls to public switched telephone network (PSTN) users beyond the private messaging network

---

## Dialing restrictions for calls within an NMS network

Dialing among all users on all switches in an NMS network must be done uniformly, but the ESN access code may be different.

---

## Dialing restrictions for calls within a private messaging network

A uniform dialing plan is also necessary when an NMS network is a site in a larger private messaging network and the local users dial remote switch locations in the messaging network.

Dialing from all users on all switches in an NMS network to a remote site in the private network must be done uniformly, but the ESN code may be different.

---

## Dialing restrictions for calls beyond the private messaging network

A uniform dialing plan is also necessary when local NMS network users call PSTN destinations.

The PSTN access code must be the same on all NMS locations.

## Implications

Dialing plan restrictions for calls beyond the private messaging network have important implications for implementing an NMS network.

For all switches in an NMS network to dial PSTN destinations in the same way, the following must occur:

- All switches in the NMS network must be in the same area code.
- All switches must be located close to one another.
- All switches must use the same prefixes to reach the PSTN.

If these requirements are not met, when a user in the NMS network dials a PSTN destination using features such as Thru-Dial, Call Sender, and Remote Notification, the system operation may not be as expected.

### **All switches must be in the same country and area/city code**

For example, switch A is in the 416 area/city code, and switch B is in the 905 area code. To dial from switch A to (416)597-1234, a user dials 95971234. However, a user on switch B must dial 614165971234. NMS is not supported in this environment.

### **All switches must be close to one another**

For example, to reach the PSTN number (905)555-1234, a user on switch C can dial 619055551234. A user on switch D, however, can only dial 95551234. Because the switches have different local and long-distance dialing areas and use different dialing formats to reach the same PSTN number, the dialing plan is not uniform. NMS is not supported in this environment.

### **All switches must use the same prefixes to reach the PSTN**

All switches in the NMS network must use the same local, long-distance, and international dialing prefixes. If for example, users at switch E dial 61 for long distance and users at switch F dial 71, the dialing plan is not uniform and NMS is not supported.

### **Interaction of DAPC with CLID**

Display of Access Prefix (DAPC) on CLID (Calling Line Identification) enhances the content of the set display, which can be used by applications to call back some stored numbers which are either calling or called numbers. The application stores these numbers directly from the individual set's display.

The Access Prefix is added to the normal CLID display. The Prefix is obtained from a table maintaining values for all the allowed NPI (Numbering Plan Identification Ex: E164, PRIV, NATL, etc.) and TON (Type of Number Ex: UNKN, INTL, NATL, etc.) combinations.

The CLID is shifted right by number of digits in DAPC and the DAPC prefix is inserted at the beginning of CLID. If DAPC is activated, the prefix is appended in the display when the caller tries to contact the external party. But for accessing voicemail and to initiate Call sender, this prefix is not added in USM Active calls for CallPilot calls.

### **Interaction with the Auto logon feature associated with an external caller**

The Auto logon feature for an external caller must be set appropriately to allow the CallPilot server to recognize the calling number. To provide the Auto logon feature to an external calling number, the mailbox must be configured with the following Extension DN: Callpilot Long Distance Prefix + the CSE1000 DAPC + CLID.

For example:

The external DN (CLID) is a PSTN phone number (0)247493323.

When this phone calls into the Succession switch, the CLID number received is as follows:  
247493323

NPI (Numbering Plan Identification): E164

TON (Type of Number): NATL

The DAPC Table configured in the Succession for NPI E164 / TON NATL is 90. (9 being the AC1 configured in the ESN).

The CallPilot Dialing information for the Long Distance Prefix is also set to 90.

In order to let CallPilot recognize the calling number as associated to the mailbox, the following configuration must be set for the CallPilot mailbox:

9090247493323 (90 DAPC for NPI E164 / TON NATL + 90 CallPilot Long Distance Prefix + 247493323 CLID).

---

## **Section H: Transmission times and traffic calculations**

---

### **In this section**

[Overview](#) on page 90

[Message transmission times for analog protocols](#) on page 90

[Transmission times for messages containing text information](#) on page 92

[Transmission times for messages with Names Across the Network](#) on page 93

[Traffic considerations for VPIM Networking messages](#) on page 94

## Overview

Transmission time is the length of time it takes to transmit a message. Transmission times are an important consideration in networking, especially if long-distance toll charges are incurred when messages are sent to remote sites.

---

## Factors affecting transmission times

Transmission times depend on several factors, including the following:

- the protocol used
- the number of recipients
- whether recipients are at the same site or different sites
- the length of the message body
- whether the message contains remote user information for the Names Across the Network feature

### Digital networking

The transmission times of digital messages depend on the amount of traffic on the network and the network connection bandwidth.

---

## Transmission time concerns

The two types of transmission time concerns are as follows:

- general issues that affect all CallPilot networking solutions
- issues that are specific to the nature of the message being sent

---

## Message transmission times for analog protocols

The amount of time that a voice channel is used to transmit a networking message depends on the networking solution being used.

---

## Assumptions

The following discussion of message transmission times in a messaging network is based on these assumptions:

- A network consists of three sites.
- Five percent of recipients of composed messages are remote.
- The average message contains 40 seconds of voice.
- Communication patterns among sites are symmetrical.

---

## AMIS Networking messages

AMIS Networking messages are transmitted separately for each recipient (for example, a message to ten recipients is transmitted ten times).

---

## NMS messages

Within an NMS network, messages are not transmitted. All users on the switches that make up the NMS network are added as mailbox users on the CallPilot server. The CallPilot server functions as the message center for the NMS network. When a message is sent to one or more users within an NMS network, the message is deposited into each recipient's mailbox.

---

## Transmission time comparisons

The following tables compare the transmission times when:

- All recipients are at the same site.
- There is one recipient at each site in the network.

**Table 2: All recipients at the same site**

Number of recipients at receiving site	AMIS Networking	Enterprise Networking
1 recipient	54.4 seconds	76 seconds

Number of recipients at receiving site	AMIS Networking	Enterprise Networking
10 recipients	544 seconds	111 seconds
50 recipients	2720 seconds	262 seconds

**Table 3: One recipient at each site**

Number of sites	AMIS Networking	Enterprise Networking
1 site	54.4 seconds	76 seconds
10 sites	544 seconds	760 seconds
66 sites	2176 seconds	3040 seconds

---

## See also

For more detailed information on traffic calculations, consult the Planning and Engineering Guide (NN44200-200).

---

## Transmission times for messages containing text information

VPIM Networking and Enterprise Networking can transmit the following text information with a message:

- sender name
- all recipient names
- message subject

CallPilot displays this information on the recipient's desktop.

### VPIM Networking

Transmitting this information over a digital network with VPIM Networking has no real impact on transmission times.

---

## Control of text information transmission

With Enterprise Networking, text information can take much longer than VPIM Networking to deliver.

You can define the sites to which text information can be sent. This is useful when the local site is exchanging messages with sites that incur long-distance toll charges. You can choose to send text to toll-free sites, but not to sites that incur long-distance toll charges.

---

## Text information transmission times

The sender's and the recipient's names can be included as text in a message. Each name can consist of up to 19 characters. Each character requires two DTMF tones. Based on five DTMF tones per second, it can take as long as 7.8 seconds to transmit a single name.

---

## Transmission times comparison

The following table compares the transmission times of a standard message and a message that includes text.

Number of recipients at receiving site	Standard message (in seconds)	Enterprise Networking message with text	VPIM Networking message with text
1	76	89.6 seconds	Not applicable
10	111	132.8 seconds	Not applicable
50	262	324.8 seconds	Not applicable

---

## Transmission times for messages with Names Across the Network

The Names Across the Network feature is available with Enterprise Networking and VPIM. This feature provides the ability to have the spoken name of a message sender reproduced at

the recipient site. The user at the remote site is added to the local network database and becomes a remote user.

The Names Across the Network feature adds the sender's spoken name to the message body.

---

## When Names Across the Network information is sent

When an Enterprise Networking or VPIM message is sent, the sending and receiving sites negotiate whether spoken names are to be sent.

If the system administrator of the receiving site configured the site to receive Names Across the Network, the sending site includes the spoken name with the message. If the system administrator of the receiving site configured the site not to receive Names Across the Network, the sending site does not send the spoken name. This results in a shorter transmission time.

For detailed information on Names Across the Network and remote users, consult [Configuring local and remote networking sites](#) on page 265 in this guide.

---

## Traffic considerations for VPIM Networking messages

---

### Traffic calculations

It is difficult to provide precise measurements for VPIM Networking traffic. Performance depends on the total CallPilot server load at any given moment. However, some indication of capacity can be provided.

#### Assumptions

These measurements are based on the following assumptions:

- The maximum number of messages created each minute is 96 for the entire CallPilot system.
- Networking traffic does not exceed 10 percent of total data network traffic. Therefore, VPIM Networking is designed to handle approximately ten messages every minute.
- The average message length is 30 seconds.

#### Traffic calculations

The preceding assumptions lead to the following average traffic load on the IP network:

$$10 * 30 * 4 \text{ kbyte}/60 \text{ s} = 40 \text{ kbyte/s}$$

The practical bandwidth of a typical LAN is approximately 1 Mbyte/s. This is sufficient to support a network data rate of 40 kbyte/s.

 **Note:**

Peak traffic loads from VPIM can significantly exceed the average, as a message is sent to a large distribution list with recipients on many different messaging systems.

---

## Section I: Remote users

---

### In this section

[Overview](#) on page 95

[Temporary remote users](#) on page 97

[Permanent remote users](#) on page 98

[How remote users are added](#) on page 98

[How remote users are deleted](#) on page 100

[Considerations when using NAN with Enterprise Networking](#) on page 101

[Synchronizing user information across networked servers for Enhanced NAN](#) on page 104

---

## Overview

---

### Definition: Remote user

A remote user is a messaging user whose mailbox resides on a remote messaging system, is networked to the local site, and who is added to the directory of the local site. The presence of remote user information in the local system enables local users to message with the remote user transparently, as if they were also a local user on the same system.

It is important to distinguish between a remote user and a user at a remote site. A remote user is added to your database. A user at a remote site is not added to your database.

## Benefits

There are many benefits to adding users from remote sites as remote users to the local site, including the following:

- When a user at the local site addresses a message to a remote voice user, the remote voice user's personal verification (spoken name) is played.
- Local users can use the Name Dialing and Name Addressing features to call and compose messages to remote voice users.
- While listening to a voice message left by a remote voice user, a local user can use Call Sender to call back the originator of the message immediately.
- External callers can name-dial remote voice users if this feature is enabled.
- Remote voice users can be added to system and personal distribution lists.

### Example

Patricio Simpson is a local user at your office in Buenos Aires. Maria Andres is a user at the Berlin office. Maria is added to the local site as a remote user.

Patricio can use name addressing when composing a voice message to Maria. During message addressing, he hears Maria's spoken name as a verification of the mailbox number he entered.

When Patricio listens to a voice message from Maria, he presses 9, Call Sender, to call Maria back.

---

## Status of remote users

You can grant a remote user temporary status or permanent status, and the status can be changed as required.

The status that you grant to a remote user determines not only how the remote user works with the system. The status also determines, in part, how you administer the remote user.

### Temporary remote user status

Temporary remote users are created by the NAN and Enhanced NAN features, and are managed by the system. When system resources for remote users become limited, CallPilot automatically deletes the temporary remote users who are inactive for a long time. This ensures that system resources are available to active users.

### Permanent remote user status

Permanent remote users remain on your local system until you decide to manually delete them. Permanent remote users require more administration than temporary remote users.

---

## Temporary remote users

A temporary remote user is a remote user who can be removed from the network database automatically.

When a remote user is granted temporary status, the remote user's position in the network database is determined by that user's activity and the needs of the system. If the system must delete some temporary remote users, it selects those users who are inactive for the longest time. The temporary status simplifies the administration of remote users, because they can be added and deleted automatically by the system.

---

## Temporary remote user capacity

With CallPilot 5.0, the number of temporary remote users that can be added to the system is limited to a maximum of 35 000 remote users for the 201i, and 70 000 remote users for the 600r, 703t, 1002rp, 1005r, and 1006r. The system accepts more than the maximum of 70 000 users during the day, however, temporary remote users in excess of 70 000 are automatically removed during the nightly audit.

### Example

Your system currently has 69 990 temporary remote users. During the day, the system receives 40 additional temporary remote users. These are accepted by the system, and 70 030 remote users are able to use the system during that day. However, during the nightly audit, the system removes 30 temporary remote users, based on their time stamp records.

---

## Time stamps and nightly audits

Every remote user has a time stamp, which is a record of the user's activity. An initial time stamp is created when a remote user is originally added to your local database. The time stamp is updated automatically when:

- the user is modified through User Administration
- a networking message is received from the remote user
- a remote voice user's personal verification, or mailbox number, is played

The nightly audit removes temporary remote users when the total number exceeds the system capacity of remote users. Remote users with the oldest time stamps are deleted.

---

## Protecting a temporary remote user from deletion

To ensure that a specific temporary remote user is not deleted from the database during the automatic nightly audits, you must change that user's status from temporary to permanent.

---

## Permanent remote users

A permanent remote user is created by an administrator on the local system and remains there until manually deleted. Therefore, permanent remote users require more administration than temporary remote users. They must be manually maintained. The nightly audit, which automates much of the routine administration of temporary remote users, does not affect permanent remote users.

Because they take up system resources, permanent remote users should be active users. If a permanent remote user is not active, change the user's status to temporary and let the system automatically maintain the user's status.

There are two ways to verify when a remote user was last active:

- Check the last Access Time box in the View/Modify Remote Voice User dialog box.
- Use the Find function, and list all permanent remote voice users. Remote users can be selected and modified from the List dialog box.

---

## How remote users are added

There are three ways to add remote users to your local database:

- Names Across the Network (NAN)
- Enhanced Names Across the Network (Enhanced NAN)
- User Administration

You can use either NAN or Enhanced NAN, along with user administration to add and administer remote users, depending on your particular needs.

---

## Names Across the Network

Names Across the Network is a feature that automatically adds and maintains temporary remote users to a local database.

Temporary remote users are automatically added to the local system after they send messages to the local site if both the remote system and the local system are configured for Names Across the Network. Names Across the Network adds a temporary remote user to the local site after a user at a remote site sends a network message to a user at the local site. The remote user information is taken from the header of the message that is received.

The setting to add remote users with Names Across the Network is on the Messaging Network Configuration dialog box for your local messaging server. This setting controls your local server. You must coordinate with the system administrator of each remote site with which you want to enable Names Across the Network.

---

## Enhanced Names Across the Network (Enhanced NAN)

After you enable Enhanced NAN on a server, it automatically sends user information to each supported remote server. As a result, each local user becomes a temporary remote user (TRU) in the database of each remote server. This makes user information available on the remote servers for the name dialing and name addressing features, as well as for spoken name verification. When there are changes to a local user's name, mailbox number, or personal verification, or if the user is deleted, these changes are automatically updated on remote servers.

In summary, Enhanced NAN overcomes two limitations of NAN. Enhanced NAN:

- adds and updates user information automatically on a remote server
- a user deleted locally is automatically deleted from the remote server

---

## User Administration

User Administration is used to add both temporary and permanent remote users. It is an entirely manual process that must be repeated for each individual user that you want to add or delete. It is the most appropriate method to use when you want to perform basic administration and maintenance on just a few users, but it is not practical when you are initially setting up your system and adding many remote users.

## How remote users are deleted

There are three ways to delete a remote user from the local system:

- User Administration
- Nightly audits
- Enhanced Names Across the Network

 **Note:**

With Enhanced NAN, the system also deletes a remote user if a sender of a message receives a Non Delivery Notice (NDN) showing that the remote user no longer exists.

---

## User Administration

You can remove either permanent or remote users manually, one at a time, through User Administration. Permanent remote users remain on the local system until they are deleted in this way.

Use a flat file to create or delete large numbers of remote users in a batch. Refer to the Administrators Guide (NN44200-601).

---

## Nightly audits

Nightly audits are performed to ensure the temporary remote voice user database does not exceed its limit. When the number of temporary remote users exceeds the capacity of the system, the oldest temporary remote users, indicated by their time stamps, are removed automatically.

---

## Enhanced Names Across the Network

If Enhanced NAN is enabled, after a user is deleted locally, the corresponding user is automatically deleted from each remote server.

---

## Considerations when using NAN with Enterprise Networking

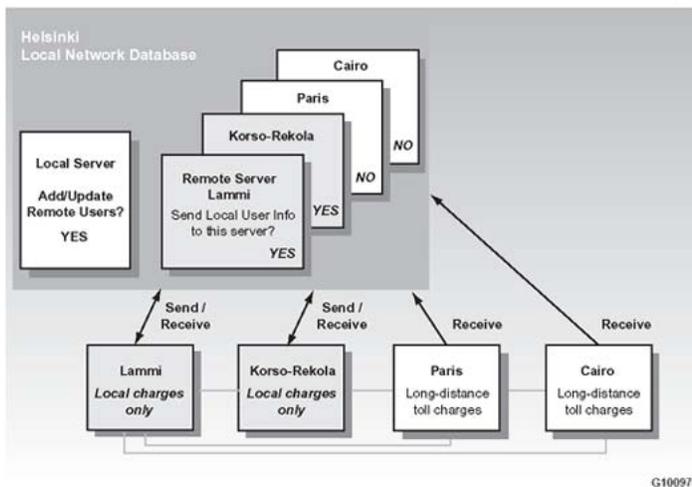
When you use NAN with Enterprise Networking, you can control incoming and outgoing messages separately. A temporary remote user can be added after:

- a local user addresses a message to a user at a remote site
- a user at a remote site addresses a message to a local user

When you select Names Across the Network for incoming messages, you add temporary remote users from all sites in the messaging network. However, because outgoing messages must carry additional information with them, resulting in longer transmission times, you can select Names Across the Network for outgoing messages for individual sites. For example, you can select the feature for outgoing messages to a site that does not incur long-distance toll charges, but disable the feature for a site that incurs these charges.

### Example 1

The following example shows a messaging network consisting of five sites:



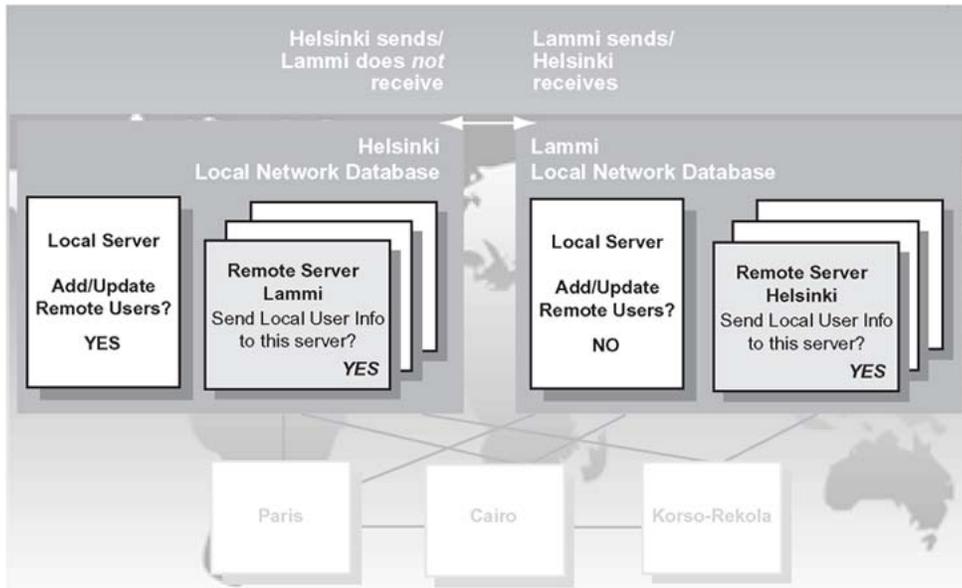
**Figure 12: Five site message network.**

As the local administrator of the Helsinki site, you set your system to receive Names Across the Network. You receive messages from all other sites. However, when configuring information about the remote servers in your local database, you clear the Send User Info to this server option for the sites to which you do not want to send remote user information. In this case, you do not want to incur the extra long-distance toll charges associated with Names Across the Network. Therefore, you clear the Send User Info to this server option for Cairo and Paris.

However, Names Across the Network is also affected by the way the network administrator at a remote site configures the system.

**Example 2**

In the following example, the network administrator in Lammi decides to disable the Send User Info to this server option when configuring the Helsinki remote server in the local messaging database. This means that even though you are willing to receive Names Across the Network information from Lammi, it is not sent to your site in Helsinki.



G100971

**Figure 13: Helsinki to Lammi remote settings**

In this case, when a user from Helsinki sends a message to a user in Lammi, the Helsinki user is not added to the Lammi database as a remote user.

---

## Considerations - NAN and Enhanced NAN

NAN and Enhanced NAN have the following considerations:

- For NAN, users at remote sites are added to your system as temporary remote users only after messages are received from them. Users at remote sites who do not send network messages are not added, even if messages are sent to them.
- For both NAN and Enhanced NAN the following applies:
  - Operational measurements are not collected for remote users.

- If the sender's site does not have mailbox numbers that match the dialing plan, the Call Sender and Name Dialing features are not available.
- For NAN with Enterprise Networking, only 17 characters of the remote voice user's text name are sent.

IF	THEN
the first and last names are 17 characters or less	the first and last names of the user are sent.
the initials and last name are 17 characters or less	the initials and last name of the user are sent.

## Outgoing networking sessions (NAN with Enterprise Networking only)

When the local site initiates a networking session to a remote site, the two sites negotiate whether spoken names are sent. This negotiation occurs as follows:

IF	THEN
the local site chooses to send spoken names and the remote site selected the Receive User Info from the remote servers option	the local site includes the sender's text and spoken name with each message. The remote site adds or updates the sender's remote user information.
the local site chooses not to send spoken names and/or the remote site did not selected the Receive User Info from the remote servers option	the local site does not include the spoken names for the senders. The remote site does not add or update the sender's remote user information.

## Time stamps updated

After a message is received from a user who exists in the local database as a temporary remote user, the time stamp of the remote user is updated with the current date and time.

## See also

For detailed information about user templates and how to add users, see CallPilot online Help.

---

## Synchronizing user information across networked servers for Enhanced NAN

CallPilot automatically synchronizes user information between all sites. Automatic synchronization occurs whenever the following happens:

- the Enhanced NAN feature is enabled for the first time
- the server is restarted
- a new remote server is added, or is changed to VPIM networking
- you select the Send User Info to this server check box for a remote server in your network tree
- during the nightly audit (one server is synchronized per night in a rotating cycle)

If the Enhanced Names Across the Network (NAN) feature for networked servers is enabled, you can also manually synchronize information for temporary remote users (TRUs) between the local server and remote servers. Avaya recommends manual synchronization when the data is corrupted or needs to be rebuilt. Manual synchronization requires a lot of data to be transferred but because Enhanced NAN synchronization is given a lower priority than VPIM traffic, there is no impact to users.

To check the last time a remote server was synchronized, or to synchronize user information across networked servers, see Call Manager online Help.

---

## Geographic Redundancy

Geographic Redundancy allows two CallPilot servers separated by large distances to operate as an active-active geo-redundant pair. Users can log into the GR CallPilot, access their messages, and even compose and send messages, as if they were on their home CallPilot.

This feature is based on two existing CallPilot features, ENAN and MFR.

Enhanced Names Across the Network (ENAN) automatically propagates user details between CallPilots using VPIM messages. User details sent to remote CallPilots are currently saved on those systems as Temporary Remote Users. ENAN also introduced the capability of deleting Temporary Remote Users, which is accomplished by sending an NDN (Non-Delivery Notification) of type Address Error. Manual resynchronization of Temporary Remote Users was also introduced.

ENAN is extended to send additional user details, including PDLs and Greetings, and password details so that the user can log into either CallPilot in a GR pair. Instead of creating

Temporary Remote Users, GR CallPilots create "GR users" which have mailboxes similar to local users.

Message Forwarding Rules (MFR) allows a user to forward all his mailbox messages to a remote destination (via VPIM). It also allows messages to be tagged as read or even deleted upon return of a Read Receipt from the destination. MFR is extended to automatically forward a user's messages to his GR user mailbox, and vice versa. It also allows additional message tags (eg. unsent, urgent, etc.) to be modified from either CallPilot in a GR pair, as well as performing message deletion propagation from either end. Mailbox synchronization verification and resynchronization is also introduced.



# Chapter 5: Dialing plans and networking

---

## In this chapter

[Section J: About dialing plans and networking solutions](#) on page 107

[Section K: Dialing plan information](#) on page 124

---

## Section J: About dialing plans and networking solutions

---

### In this section

[Overview](#) on page 108

[Uniform dialing plans](#) on page 110

[Non-uniform dialing plans](#) on page 111

[ESN dialing plan](#) on page 113

[CDP](#) on page 116

[Hybrid dialing plan \(ESN and CDP combined\)](#) on page 120

[Another dialing plan](#) on page 121

[Dialing plans and addressing plans](#) on page 121

[Modifying dialing plan information](#) on page 122

[Modifying CDP steering codes](#) on page 122

## Overview

When you implement a networking solution, you provide detailed information about the dialing plan used by the local site. It is important to understand dialing plans and their component pieces when implementing an Avaya CallPilot® networking solution to:

- gather the required information
- analyze the dialing plan information
- implement a networking solution

---

## Definition: Dialing plan

A dialing plan is the set of rules used by a switch to route a call or message through a network to its destinations. Before Avaya CallPilot can deliver a message to a remote site, it must first determine where that site is and how to connect to it.

---

## System perspective

From a system perspective, the dialing plan determines how to route a message to its proper destination.

---

## User perspective

From a user perspective, the dialing plan determines how users address a message to another user in a private messaging network.

There are two main options. You can give every user in the network a unique mailbox number. Callers use only this number to call another user in the network. However, in very large networks, this may not be feasible. Therefore, you can assign different switches in the messaging network a unique number. A user on a switch can have the same mailbox number as a user on another switch because the switch number and the mailbox number combined create a unique identifier.

---

## Dialing plan setup

When you begin to implement a networking solution, the dialing plan used by your local site is already configured on the switch. Therefore, during implementation, you are reflecting the existing plan in your network database.

Even though the dialing plan is already set up, you must understand how to gather the dialing plan information from the switch. You must also understand the implications of the dialing plan for your messaging network.

---

## Dialing plans

CallPilot networking works with four dialing plans:

- Electronic Switched Network (ESN)
- Coordinated Dialing Plan (CDP)
- hybrid dialing plan—ESN and CDP combined
- another dialing plan, such as PSTN

---

## Location code

The basis of an ESN, CDP, or hybrid dialing plan is the location code. A location code is a unique identifier that indicates a particular location within a network. All dialing plans use a location code. However, location code is a generic term and specific dialing plans refer to it using different terms, as shown in the following table.

For this dialing plan	the location code is called
ESN	ESN prefix consists of ESN access code and ESN location code
CDP	CDP steering code

---

## Uniform dialing plans

Regardless of which dialing plan is used, Avaya recommends that you use a uniform, or standardized, dialing plan for your network.

---

### Definition: Uniform dialing plan

A dialing plan is uniform when all users, regardless of which switch they are on, dial the same way to reach the same recipient. The only exception is that ESN access codes can be different.

A uniform dialing plan offers the following benefits:

- The network is easier to configure and maintain.
- Future growth of the network is allowed.
- Users find it easier to use the network when visiting other sites.

If you are upgrading an existing system, analyze the current dialing plans. If necessary, modify them across the network to ensure a uniform dialing plan.

---

### Example: Uniform dialing plan

The following diagram shows a uniform dialing plan. The messaging network uses an ESN dialing plan. Each site uses the same ESN prefix to reach the other sites in the network

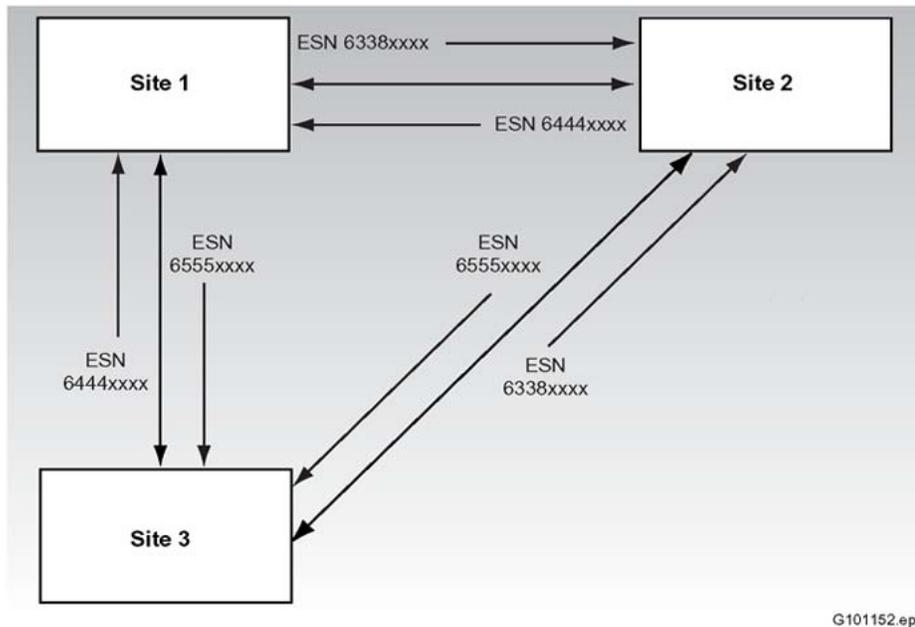


Figure 14: Uniform dialing plan.

## Non-uniform dialing plans

In some instances, creating a uniform dialing plan is not possible.

For example, suppose you are implementing CallPilot on an existing messaging network. If an established dialing plan is in place, it can be preferable to leave the nonuniform dialing plan alone. This ensures that users do not have to learn new ways to dial and exchange messages with one another.

However, a nonuniform dialing plan is not recommended and should be avoided whenever possible.

If it is not possible to design a uniform dialing plan, you can at least understand the impact of a nonuniform dialing plan on your messaging network configuration.

One of the biggest obstacles occurs as a messaging network with a nonuniform dialing plan grows. The network becomes increasingly difficult to administer and maintain. Users who visit different sites in the messaging network can have difficulties, because the dialing plan is unfamiliar.

---

## Examples: Nonuniform dialing plan

The following diagrams show examples of networks that have nonuniform dialing plans.

---

### Different addresses

In this example, the dialing plan is nonuniform because users address sites in different ways

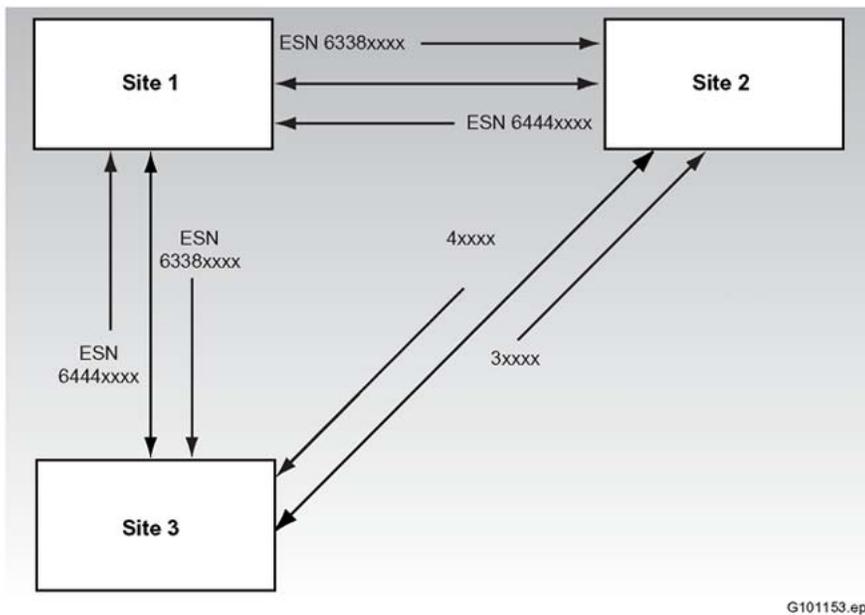


Figure 15: Non-uniform dialing plan - different addresses.

---

### Different CDP steering codes

A dialing plan is considered nonuniform if different sites in the network address other sites in different ways, including using CDP steering codes.

In this example, CDP is used throughout the network, but users at Site 1 send messages to Site 2 by entering 3xxxx, while users at Site 3 enter 4xxxx.

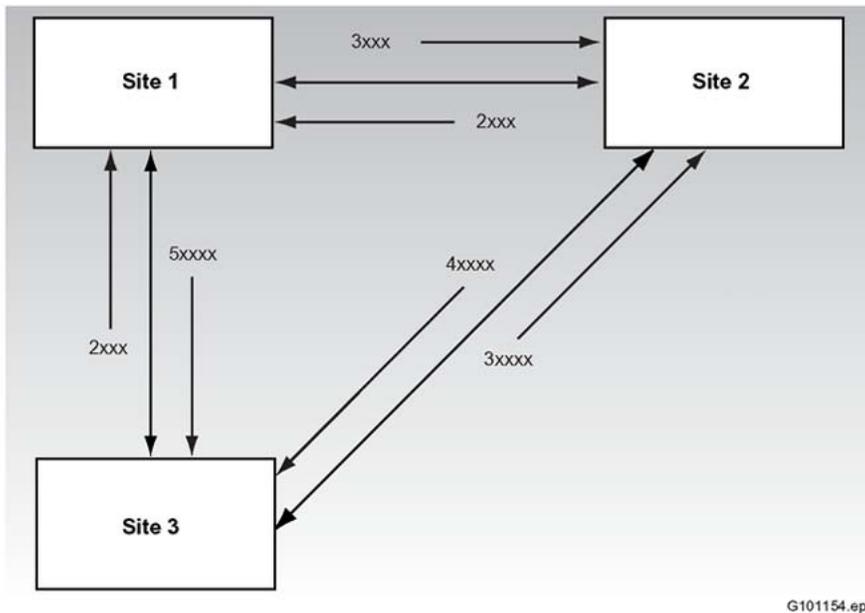


Figure 16: Different CDP steering codes

---

## ESN dialing plan

---

### Definition: ESN

An Electronic Switched Network (ESN) is a dialing plan used by organizations in a private messaging network.

---

### ESN prefix

In an ESN dialing plan, every switch in the messaging network is assigned an ESN prefix. The ESN prefix can be up to seven digits long. The ESN prefix consists of:

- an access code
- a unique location code

## Access code

An access code is used to access ESN routing in the same way an access code (often 9) is needed to dial out from a private network to a public network. An access code is usually one or two digits in length.

Typically, all switches in an ESN network use the same ESN access code, although this is not required. Different ESN access codes do not make the dialing plan nonuniform. ESN access codes are similar to trunk access codes and are set independently for each switch.

---

## Location code

The location code is a routing prefix that identifies a location within the network. It is usually three digits in length but can be up to seven digits in length.

Example:

- ESN access code = 6
  - ESN location code = 444
  - ESN prefix = 6444
- 

## Available directory numbers

To expand the range of available directory numbers, you can overlap the leading digits of the local extension with the trailing digits of the ESN prefix.

For example, the directory number 6644000 consists of the local extension, 4000, and the ESN prefix, 6644. The digit 4 is overlapped. It is both the first number of the extension and the last number of the ESN prefix. This overlap enables the use of local extensions in the 4000 to 4999 range.

---

## Calling with an ESN dialing plan

The way a user calls another user depends on whether the recipient is at the local site or a remote site.

---

## Local recipient

To make a telephone call to a user at the same site, the sender enters the extension number only.

---

## Remote recipient

When a user makes a telephone call to a recipient at another site in the network, the ESN dialing plan is not transparent. The user enters additional numbers, the access and location codes, in addition to the recipient's mailbox number, to call a user at another site.

---

## Addressing a message with an ESN dialing plan

An ESN message is addressed in the same way that an ESN call is placed.

---

## Local recipient

When a user addresses a message to a recipient at the same site, only the recipient's mailbox number is entered.

---

## Remote recipient

When a user addresses a message to a recipient on another switch in the network, the user enters the access and location codes, as well as the recipient's mailbox number, to direct the message.

---

## Example

To send a message to Tam, Bertha enters 5678. To address a message to Tina, Bertha enters the ESN prefix, 3777, and 9876.

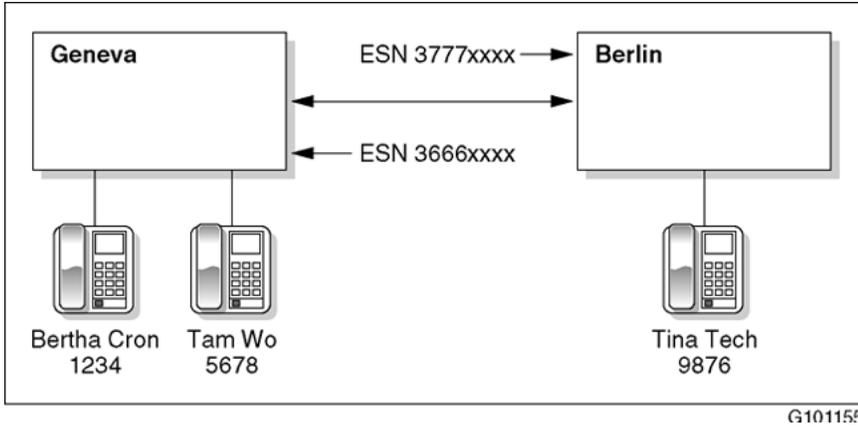


Figure 17: Remote recipient

## Dialing plans and mailbox addresses

CallPilot uses the dialing plans as mailbox addresses if users have the same number for both their extension and their mailbox.

For	the mailbox consists of	Example
ESN	<ul style="list-style-type: none"> <li>• access and location codes.</li> <li>• user's extension.</li> </ul>	<ul style="list-style-type: none"> <li>• access code = 6</li> <li>• location code = 338</li> <li>• mailbox number = 7460</li> <li>• mailbox address = 63387460</li> </ul>

## CDP

A Coordinated Dialing Plan (CDP) is used by organizations in a private messaging network.

### Definition: CDP

CDP is a switch feature used to coordinate the dialing plans of users on various switches in your messaging network.

CDP enables a user at one site to dial a user at another site by entering a unique number without access codes and associated pauses for dial tones. CDP is transparent to users.

To send a message to a recipient at the same site, a user enters the extension number.

When a user sends a message to a recipient on another switch in the network, the extension directory number is dialed. No additional numbers are needed because the extension number itself contains a steering code that directs the call to the appropriate switch.

---

## CDP codes

The number that a user enters to address a message consists of two parts:

- a CDP steering code (one to four digits in length)
- the recipient's extension number (one to seven digits in length)

---

## Example

Patricia McKenna sends a message to Thomas Brish, who is located on the same switch. Patricia dials Thomas's full DN, 41112. When the system encounters the 4, it determines that the call is intended for a local user, strips off the 4, and sends the message to Thomas.

To send a message to Ana Trujillo, Patricia dials Ana's full address, 51234. When the system encounters the 5, it determines that the call is intended for a user at a remote site, and sends the message to Ana.

---

## Definition: Steering code

CDP uses steering codes. A steering code is a unique number that is entered by a user before the recipient's extension number. The steering code determines where the message is supposed to go. Each switch is assigned at least one steering code; each switch can have as many as 250 steering codes.

---

## Unique steering codes

The steering codes on a switch must be different from any other assigned DN code on that switch.

The steering codes on a switch must also be different from the steering codes assigned on any other switch.

The following diagram shows an example of steering code availability for two switches. For Site 1, the digits 2-6 are available. Site 1 uses 2 and 3 for the steering code. Site 2 now has the digits 4-6 available. Site 2 uses 4 and 5 for the steering code. The digit 6 remains available.

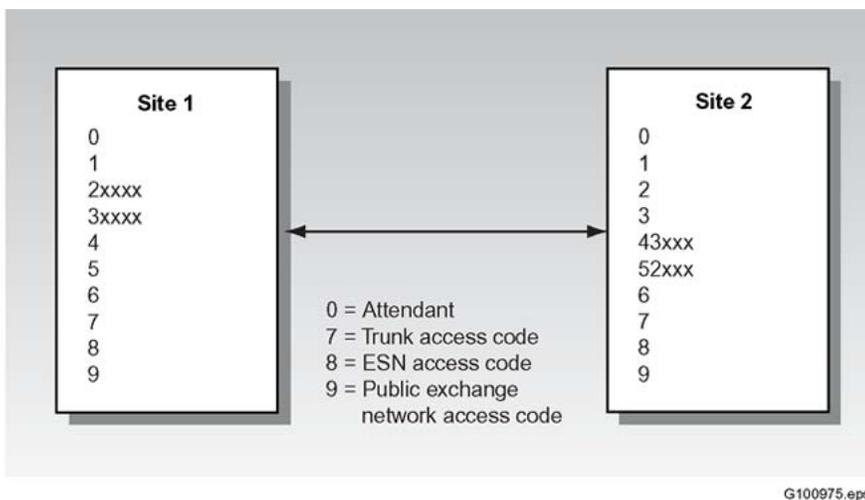


Figure 18: Unique steering codes

## Creating steering codes

There are two ways to create a unique number from the CDP steering code and the extension number:

- Combine both parts.
- Keep both parts distinct.

A steering code and an extension number can overlap. For example,

- The extension number is 7121.
- The steering code is 7.
- The 7 is a single-digit overlap.
- A user enters 7121 to reach the recipient, not 77121.

This CDP setup is common. It is convenient for users because dialing any additional numbers is unnecessary, and only the recipient's extension number is required.

However, this CDP setup requires that every extension within the messaging network is unique. A user on one site cannot have the same extension as a user on another site.

The steering code and an extension are not required to overlap. For example, if the extension number is 8976 and the steering code is 44, there is no overlap. A user dials 448976 to reach the recipient.

---

## How a CDP call is placed

To place a call to a recipient, the user dials the steering code followed by the recipient's extension number.

IF the call is being placed	THEN
to a user at the same site	the steering code is deleted, and the call is terminated locally.
to a user at another site	the steering code identifies the recipient's site, and the call is terminated at the remote site.

---



---

## Extension length

If the CDP steering code is two digits long and the mailbox directory numbers are three digits long, the total extension length is five digits.

If the length of the steering code and the mailbox directory numbers vary across the network, the total extension length must be the same.

For example, at Location 1 the steering code is one digit long and the mailbox directory numbers are four digits long. At Location 2 the steering code is two digits long and the mailbox directory numbers are three digits long. At both locations the total extension length is five digits.

---

## Dialing plans and mailbox addresses

CallPilot uses the dialing plans as mailbox addresses if users have the same number for both their extension and their mailbox.

For	the mailbox consists of	Example
CDP	steering code and user's extension	<ul style="list-style-type: none"> <li>steering code = 22</li> <li>mailbox number = 7460</li> <li>mailbox address = 227460</li> </ul>
	steering code and user's extension that overlap	<ul style="list-style-type: none"> <li>steering code = 7</li> <li>overlap = 1</li> </ul>

---

For	the mailbox consists of	Example
		<ul style="list-style-type: none"> <li>• mailbox number = 7123</li> <li>• mailbox address = 7123, not 77123</li> </ul>

## Hybrid dialing plan (ESN and CDP combined)

A messaging network can use both ESN and CDP dialing plans. When both plans are used, the messaging network is said to use a hybrid plan.

## Dialing plans and mailbox addresses

CallPilot uses the dialing plans as mailbox addresses if users have the same number for both their extension and their mailbox number.

For	the mailbox consists of	Example
ESN	<ul style="list-style-type: none"> <li>• the access and location codes.</li> <li>• the user's extension.</li> </ul>	<ul style="list-style-type: none"> <li>• access code = 6</li> <li>• location code = 338</li> <li>• mailbox number = 7460</li> <li>• mailbox address = 63387460</li> </ul>
CDP	steering code and user's extension.	<ul style="list-style-type: none"> <li>• steering code = 22</li> <li>• mailbox number = 7460</li> <li>• mailbox address = 227460</li> </ul>
	steering code and user's extension that overlap.	<ul style="list-style-type: none"> <li>• steering code = 7</li> <li>• mailbox number = 7123</li> <li>• mailbox address = 7123, not 77123</li> </ul>

---

## Another dialing plan

If ESN, CDP, or a hybrid dialing plan is not implemented, then the messaging network must use another dialing plan, such as PSTN. When another dialing plan is used, there are no private dialing codes. Therefore, a user must enter the following to send messages:

- trunk access code (such as 9)
- country and city/area code for long-distance
- exchange code
- mailbox number, typically the extension number

---

## Dialing plans and addressing plans

When you implement a networking solution, you specify whether the dialing plan is the same as an addressing plan. If these plans are not the same, you must provide additional information.

**Important:**

Avaya strongly recommends that the dialing plan and the addressing plan be the same.

---

## Dialing plan

A dialing plan specifies how a user makes a telephone call to another user.

---

## Addressing plan

An addressing plan specifies how a user sends a message to another user.

---

## Relationship

The following table shows the relationship between the dialing plan and the addressing plan.

Dialing plan	Addressing plan
ESN (for example, 6338xxxx)	Same as dialing plan strongly recommended
CDP (for example, 55xxx)	Same as dialing plan strongly recommended
Hybrid (for example, 6338xxxx, 55xxx)	Same as dialing plan strongly recommended
Another (for example, PSTN dialing prefix and mailbox, 61213777xxxx)	Choose either <ul style="list-style-type: none"><li>• format same as dialing plan, or</li><li>• a shortcut (for example, 77xxxx)</li></ul>

---

## Modifying dialing plan information

After a dialing plan is established, it is rarely modified. Modifications to a dialing plan affect users and can require considerable retraining on the system.

However, in some cases, modifications are necessary. In most cases, these modifications are guided by changes made by the switch technician. These changes can be local or remote.

---

## Switch changes

If any changes to the dialing plan are made on a switch, the changes must be reflected in the network databases of all sites in the messaging network.

If changes are made locally, ensure that they are announced to all remote sites.

---

## Messaging network changes

Modifications to the dialing plan are rarely guided by the network administrator. In most cases, the switch technician maintains changes to the dialing plan.

---

## Modifying CDP steering codes

There can be instances when you must make modifications to the CDP steering codes.

For example, when a user in a messaging network moves from one site to another, the user can continue to use the CDP steering code of the original site. This makes it more convenient for other users who are attempting to reach the moved user.

However, this convenience for users requires considerable work by the switch administrators, system administrators, and network administrators.

 **Important:**

It is strongly recommended that you weigh the benefits of modifying CDP steering codes for individual users before making the modifications.

---

## Impact of modifications

Modifying CDP steering codes does not affect just the administration of the messaging network. The switches and the user administration records must also be modified.

---

## Impact on switch settings

The switch changes should be made before you make changes to the CDP steering codes in the network database. Your changes must reflect the settings on the switch and cannot be done before the switch changes are made.

---

## Impact on user administration records

Modifications to the CDP steering codes can also require changes to the basic system and User Administration. For example, if you are modifying the CDP steering codes because a user moved from one site to another site, the following User Administration changes are required:

- The shared distribution lists (SDLs) at both sites must be modified.
- The user must be removed from the system and added to the other system.

---

## Scenario

Tabitha Smithoc, a user in Cairo, moves to the Bahrain site. As Chief Financial Officer, it is important for her to keep her DN to make it easy for other users in the messaging network to reach her.

The Cairo site, which has exactly 1000 users, uses the extension DNs 7000 to 7999. The CDP steering code is 7, and the overlap is 1. Tabitha's extension DN is 7123.

The Bahrain site, which has exactly 1000 users, uses the extension DNs 8000 to 8999. The CDP steering code is 8, and the overlap is 1.

When Tabitha moves to Bahrain, the 7123 extension DN must be added to the Bahrain CDP steering codes as 7123, with an overlap of 4.

However, there is now a conflict between the steering codes in Cairo and Bahrain. Therefore, the CDP steering codes for Cairo must first be changed so that there is no possible conflict with the 7123 steering code used in Bahrain.

The CDP steering codes for Cairo must be changed to the following:

- 70, 72, 73, 74, 75, 76, 77, 78, 79 (not 71)
- 710, 711, 713, 714, 715, 716, 717, 718, 719 (not 712)
- 7220, 7121, 7124, 7125, 7126, 7127, 7128, 7129 (not 7123)

The network databases of all sites in the messaging network must be updated to reflect these changes.

In Bahrain, the CDP steering codes for the Cairo remote switch and the Bahrain local switch must be updated. In Cairo, the CDP steering codes for the Bahrain remote switch and the Cairo local switch must be updated. In Nairobi, the CDP steering codes for both the Cairo and the Bahrain remote switches must be updated.

---

## Section K: Dialing plan information

---

### In this section

[Gathering dialing plan information](#) on page 124

[Create a messaging network representation](#) on page 125

[Examples of messaging network diagrams](#) on page 126

---

## Gathering dialing plan information

Gathering the required information is the first step in implementing every networking solution. Much of the required information is taken from the switch. The dialing plans that are configured

on the switch for making telephone calls between sites are also used to exchange messages between sites.

Gather the dialing plan information and analyze it to make sure it is suitable for the networking solution you are implementing. Information from the switch must also be verified to ensure that it supports networking. Some of this information, such as dialing plan information, is used to configure CallPilot.

See [Gathering information](#) on page 203 for a detailed description of the information gathering process.

---

## Create a messaging network representation

The second major step in implementing any networking solution is to create a messaging network representation. A messaging network diagram is a graphical representation of your network. It shows all sites in the network, the protocols implemented at each site, how sites are connected, the protocol used between sites, location codes and names, and dialing plan information. If sufficiently detailed, a representation is the primary source of information used when implementing a networking solution.

For most messaging networks, a diagram is the most suitable form of representation. For very large messaging networks, however, a spreadsheet can be more appropriate.

Much of the information for your network representation must be provided by the administrators of other sites. For example, you need to know the site name and other information for every site. Although each site administrator creates a representation, ideally one site administrator can create a final version to distribute to all sites. This ensures that the representation is comprehensive and that each site uses the same information for implementation.

Remember also that your messaging network representation contains sensitive information. You can properly store and protect it as part of normal security procedures.

---

## Benefits

There are many benefits to creating a representation of your messaging network. A representation:

- offers a clear view of how your network is connected
- gathers all the information required to implement a networking solution in one source
- provides useful information when planning future modifications
- helps during the analysis of traffic issues
- reveals areas where you can improve the messaging network

---

## Examples of messaging network diagrams

The following examples of network diagrams show how each type of dialing plan is treated.

---

### Typical ESN network diagram

A diagram of a typical ESN network provides information about the dialing plan and indicates how users send messages to each other.

In this diagram, users at one site dial the ESN access code, 6, the ESN location code 338, and the recipient's mailbox number to send messages to remote sites

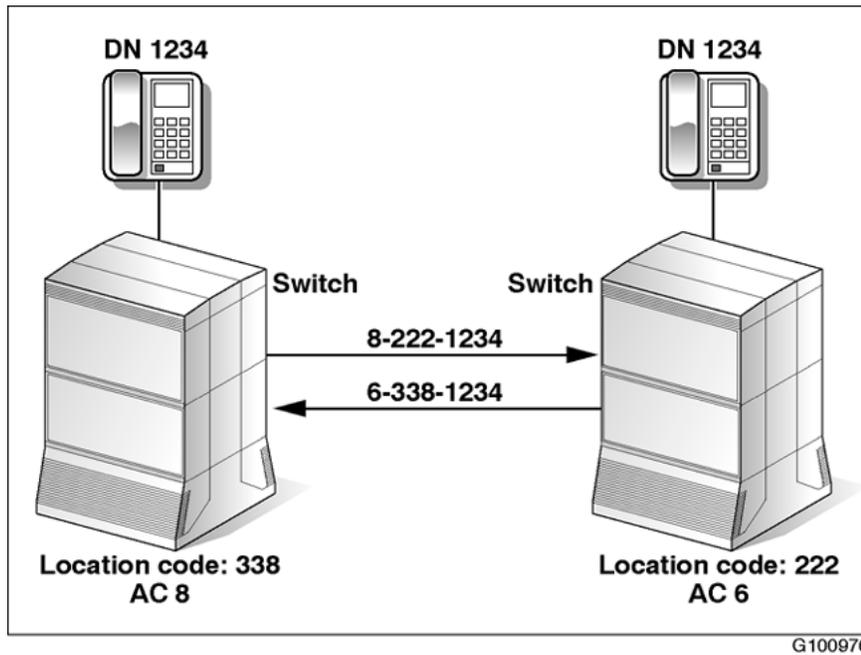


Figure 19: Typical ESN network.

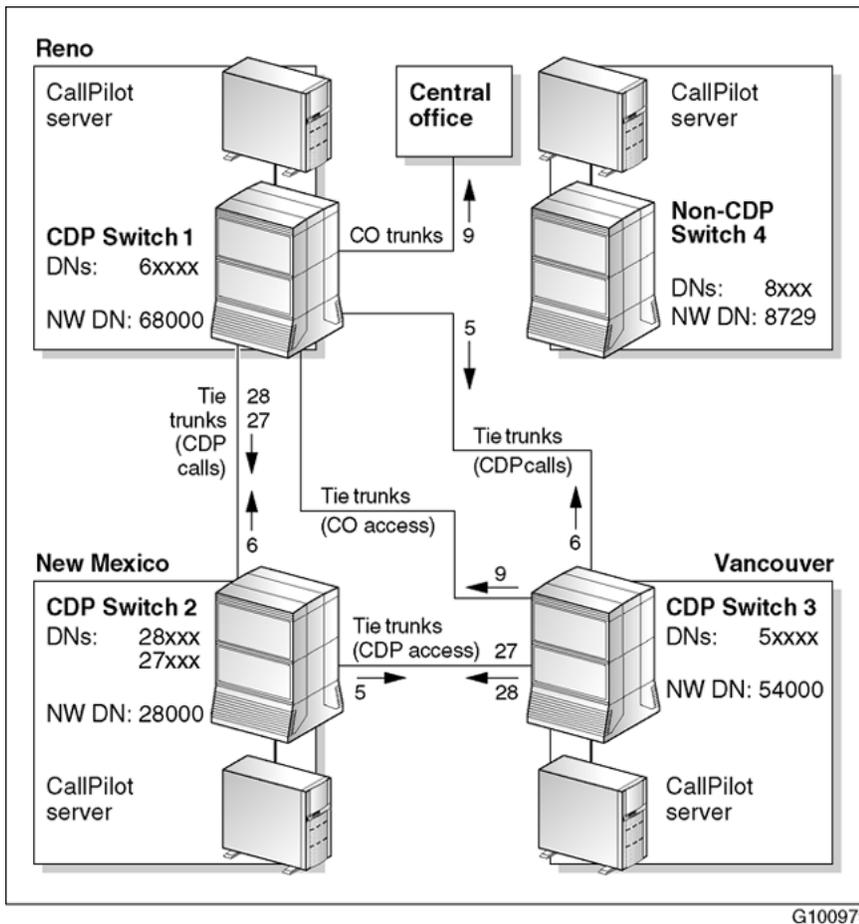
---

### ESN network with an NMS site

When a messaging network includes an NMS site, it is important to include this information in the diagram. Information about all switches in an NMS network are entered when implementing a networking solution.

## Typical CDP messaging network diagram

A diagram of a typical CDP messaging network provides information about the dialing plan and indicates how users send messages to one another.



G100979

Figure 20: Typical CDP messaging network

In this example:

- The extensions in Reno are numbered 60000 to 69999, and the steering code is 6.
- The extensions in New Mexico are numbered 27000 to 28999, and the steering codes are 27 and 28.
- The extensions in Vancouver are numbered 50000 to 59999, and the steering code is 5.

A user, regardless of site, uses the same extension to reach a particular user. For example, a user in Reno dials 27341 to send a message to a user in New Mexico. A remote prefix is not

required because the first two digits of the extension, in this case 27, make up the steering code that identifies the site within the messaging network.

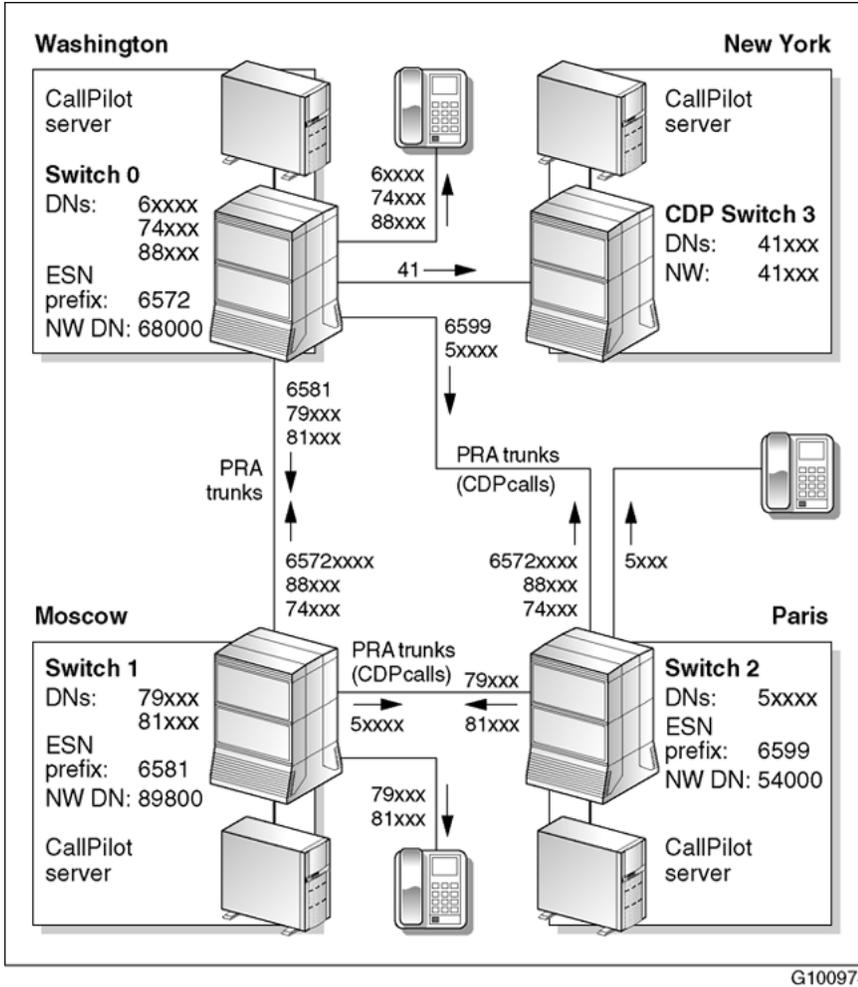
This diagram also shows that Reno provides centralized access to the public telephone network.

---

## Hybrid messaging network diagram

A hybrid messaging network, which combines both ESN and CDP dialing plans, is often complicated. However, a messaging network diagram is an easy way to visualize how the sites exchange messages. By adding all dialing plan information to the diagram, you can see how the messaging network works.

In this diagram, Washington, DC, Moscow, and Paris support both ESN and CDP. New York supports CDP only.



G100978

Figure 21: Hybrid messaging network

How users send messages to other sites is described in the following table:

This site	dials
Washington, DC	Moscow with <ul style="list-style-type: none"> <li>• 6581xxxxx using ESN.</li> <li>• 79xxx and 81xxx using CDP.</li> </ul> Paris with <ul style="list-style-type: none"> <li>• 6599xxxxx using ESN.</li> <li>• 5xxxx using CDP.</li> </ul>
Moscow	Washington, DC with <ul style="list-style-type: none"> <li>• 6572xxxxx using ESN.</li> <li>• 74xxx and 88xxx using CDP.</li> </ul>

This site	dials
	Paris with <ul style="list-style-type: none"> <li>• 6599xxxxx using ESN.</li> <li>• 5xxxx using CDP.</li> </ul> New York with <ul style="list-style-type: none"> <li>41xxx using CDP.</li> </ul>
Paris	Washington, DC with <ul style="list-style-type: none"> <li>• 6572xxxxx with ESN.</li> <li>• 74xxx and 88xxx using CDP.</li> </ul> Moscow with <ul style="list-style-type: none"> <li>• 6581xxxxx using ESN.</li> <li>• 79xxx and 81xxx using CDP.</li> </ul> New York with <ul style="list-style-type: none"> <li>41xxx using CDP.</li> </ul>
New York	Washington, DC with <ul style="list-style-type: none"> <li>74xxx and 88xxx using CDP.</li> </ul> Moscow with <ul style="list-style-type: none"> <li>79xxx and 81xxx using CDP.</li> </ul> Paris with <ul style="list-style-type: none"> <li>5xxxx using CDP.</li> </ul>

## Messaging network with another dialing plan

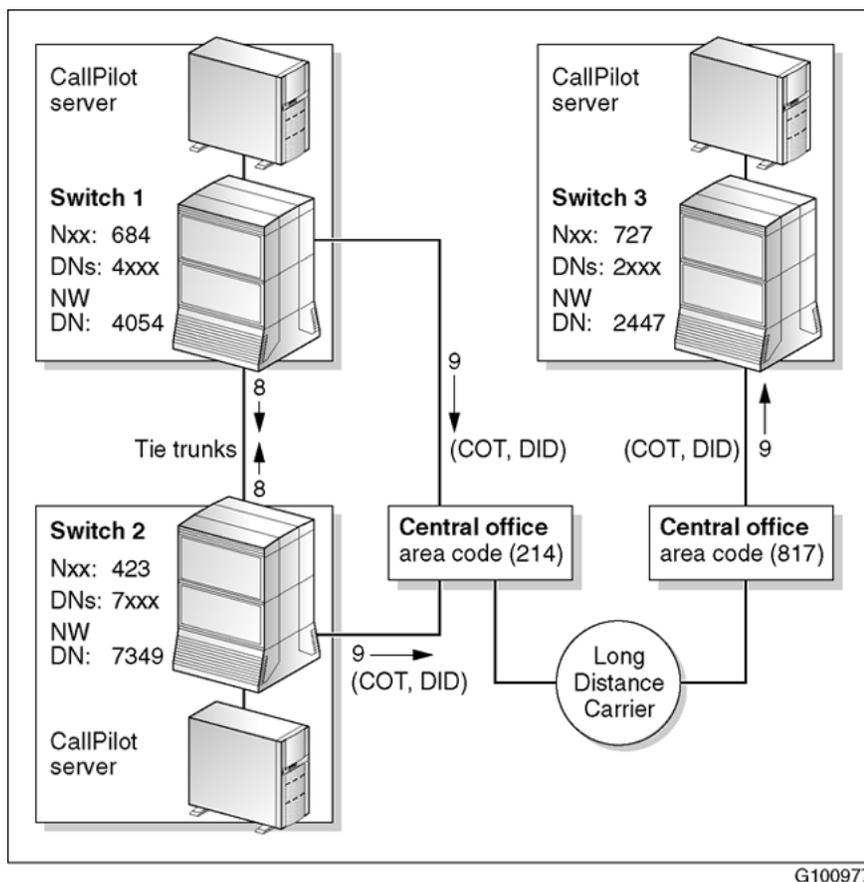
If your messaging network is not using ESN, CDP, or a hybrid dialing plan, you are using another dialing plan.

If you are using another dialing plan, you must use an alternate means of addressing messages. You can do this by designating a mailbox prefix for the site.

Users have some means of dialing the users at the site. For example, they can use an access code and a public switch number. The call can travel through a switchboard if the users are not directly dialable. You can set the mailbox prefixes to something related to the dialing plan if you want to make it easier for users to remember what to enter. For example, for a system in the 416 area code, use the prefix 8416.

## Example 1

The following diagram illustrates a messaging network that uses another dialing plan, in this example, tie lines.



G100977

**Figure 22: Messaging network with another dialing plan**

When a messaging network uses another dialing plan, sites can be configured to use different dialing prefixes to reach a specific remote site. However, CallPilot is unable to represent the dialing plan. A tie line between sites is an example of a network without a representable dialing plan. In this case, a mailbox prefix can be entered to allow users to compose to mailboxes at the remote site, because the mailbox numbering plan is independent of the dialing plan. When there is no specified dialing plan, CallPilot uses the trunk access code and the following:

For	the access code is followed by
long-distance calls	NPA + Nxx + xxxx
local calls	Nxx + xxxx

For	the access code is followed by
tie-line calls	xxxx

When entering network connection DNs for remote sites, you must provide for this format.

## Example 2

The following diagram shows another network with another dialing plan. In this network, each site uses the same extension directory numbers. The exchange code makes each site in the network unique.

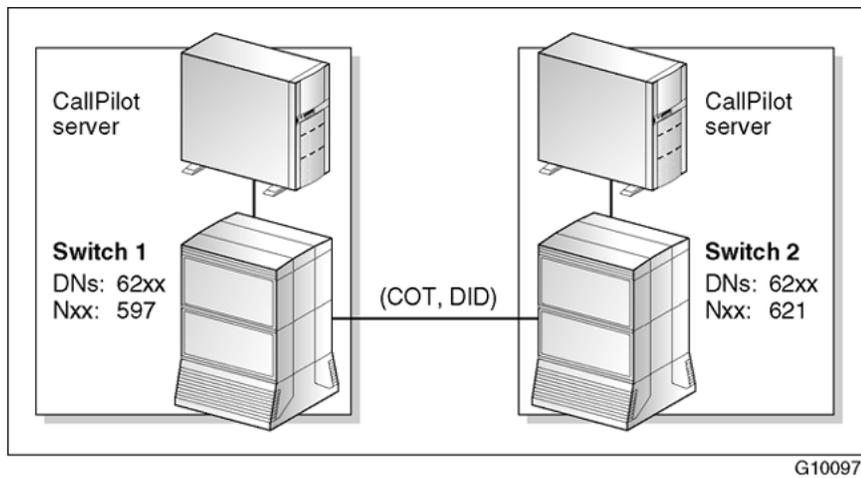


Figure 23: Another dialing plan using same extension directory numbers

# Chapter 6: Network and location-specific broadcast messages

---

## In this chapter

[Types of network broadcasts](#) on page 133

[Broadcast message addresses](#) on page 138

[User capabilities for broadcast messages](#) on page 139

[CallPilot server capabilities for broadcast messages](#) on page 141

[Broadcast messages in a mixed messaging network](#) on page 144

[Viewing or printing all broadcast addresses](#) on page 146

[Deleting unread broadcast messages](#) on page 146

---

## Types of network broadcasts

The Avaya CallPilot® network broadcast feature enables a phoneset, or desktop or Web messaging user to send a broadcast message to:

- all users at a specific network location (location broadcast)
- all users in the network (network broadcast)

With this feature, in addition to the existing broadcast feature, local users can send a broadcast message to all local users (including NMS users) on the Avaya CallPilot server (local broadcast).

 **Note:**

In order for a user to be able to send a local or network broadcast, the user must have that privilege enabled in the mailbox profile. Typically, only a few users are given the right to send broadcast messages.

---

## Broadcast requirements

To send a broadcast message, the following criteria must be met:

- The message must be addressed to the appropriate broadcast address.

If the local user wants to send a broadcast message to all NMS locations associated with a remote site, the user must address the message to each location. To simplify this task, the user can create a personal distribution list containing the location-specific broadcast address for each location.

 **Note:**

Broadcast addresses cannot be added to shared distribution lists (SDLs).

- The user must have sufficient capabilities as determined by his or her mailbox class.
- Broadcast messages must be enabled between the local CallPilot server and remote voice messaging systems.
- Broadcast messages must be supported on both the local CallPilot server and remote voice messaging system. For more information about broadcast messages, see [Broadcast messages in a mixed messaging network](#) on page 144.

---

## Location broadcast

When a user sends a location broadcast, the message is delivered only to the users at the specified location. In this context, the location can be a remote site, or it can be a Network Message Service location associated with either a local or remote site.

---

## Broadcast sent to a specific remote site

When a user sends a location broadcast to a remote site, the network broadcast prefix, and the location prefix defined in the network database for the prime switch location at the remote site must be used. For this and the following examples, 12345 is the network broadcast prefix and 6338 is the prime switch location prefix.

## Broadcast sent to an NMS location at the local site

In the following illustration, the CallPilot system provides messaging services to four Meridian 1\* switches at the local site. All users who are connected to these switches have mailboxes on the CallPilot system. 12345 is the network broadcast prefix and 6338 is the location prefix defined in the network database for the prime switch location. The location-specific broadcast is targeted to only the users whose phonesets reside at the switch location identified by the 6338 location prefix.

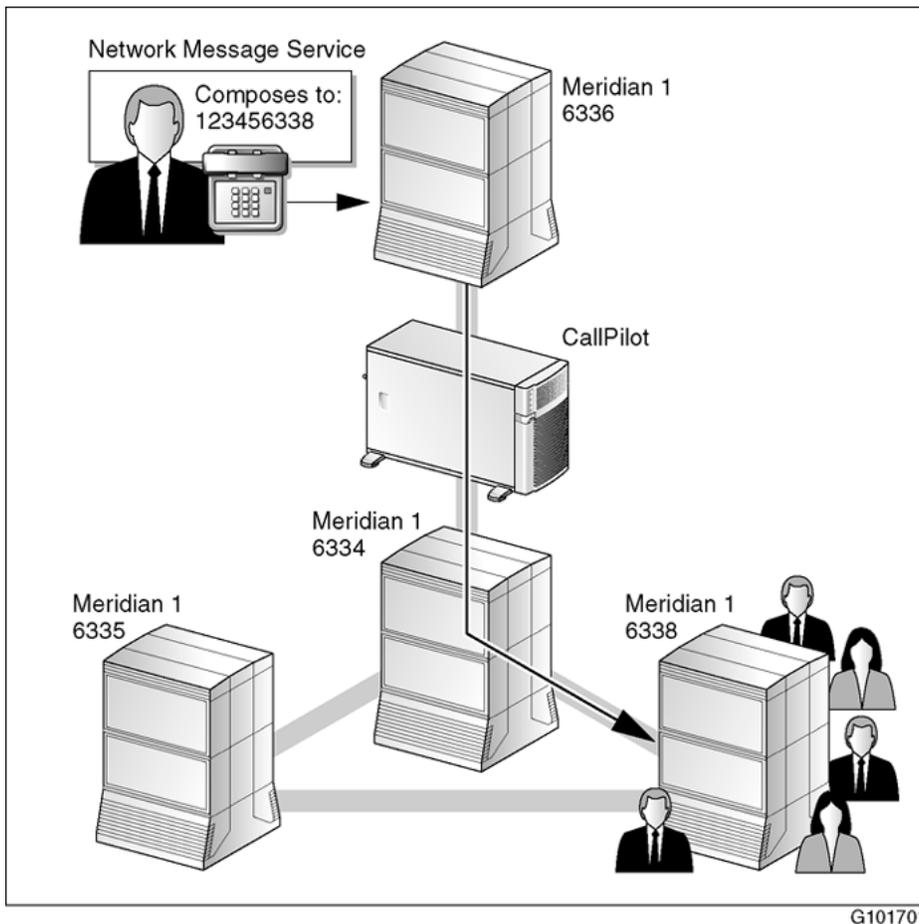


Figure 24: Broadcast sent to NMS location at local site

## Broadcast sent to an NMS location at a remote site

In the following illustration, the CallPilot system at remote site 2 provides messaging services to users on three Meridian 1 switches. The location-specific broadcast is addressed by a user on

the local CallPilot system to only the users whose phonesets reside at the switch location identified by the 6338 location prefix.

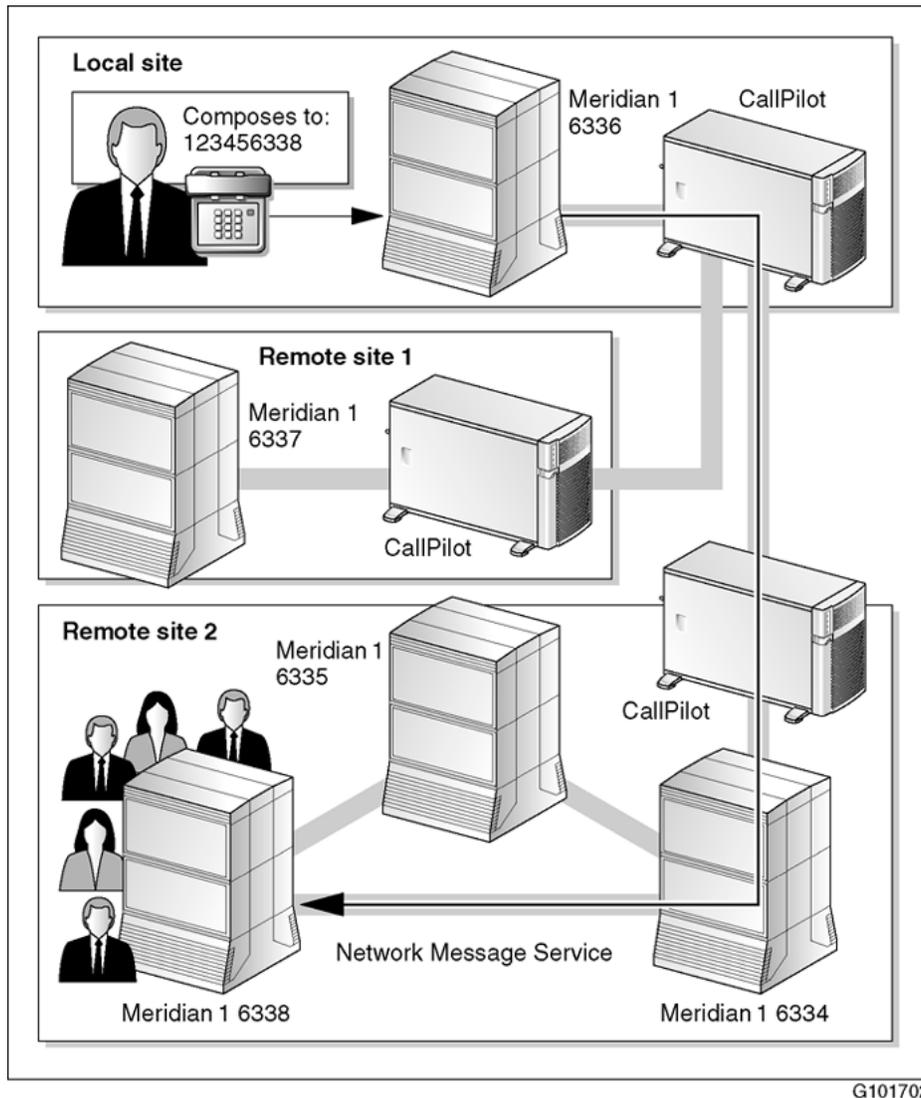


Figure 25: Broadcast sent to NMS location at remote site

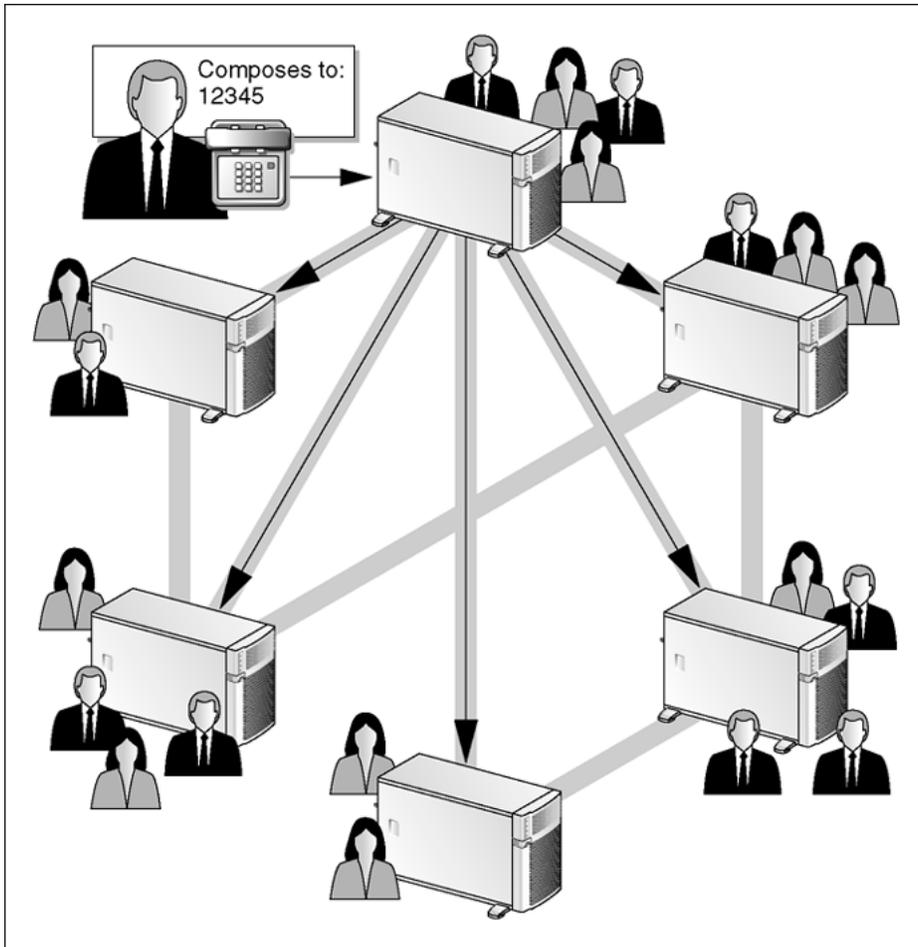
**\* Note:**

If the local user wants to send a broadcast message to all NMS locations associated with a remote site, the user must address the message to each location. To simplify this task, the user can create a personal distribution list containing the location-specific broadcast address for each location.

## Network broadcast

When a user sends a network-wide broadcast, the message is delivered to all users at both local and remote sites. This is accomplished by addressing the message to the network broadcast prefix.

In the following diagram, 12345 is the network broadcast prefix:



G101699

Figure 26: Network broadcast

---

## Broadcast message addresses

The following table shows the types of broadcasts, including local broadcasts, and how they are addressed.

Broadcast type	Address	Example
Local broadcast	Broadcast mailbox	5555
Network-wide broadcast	Network broadcast prefix	12345
Location-specific broadcast	Network broadcast prefix + Location prefix	12345+6338

---

## Broadcast address rules

---

### Network broadcast prefix

The network broadcast prefix must be between 5 and 18 digits long. The minimum length helps prevent users from accidentally composing network-wide broadcast messages.

The network broadcast prefix cannot conflict with any other prefix defined on the system. This includes, but is not limited to, the following:

- Open AMIS Compose Prefix
- Open VPIM Compose Prefix
- Delivery to Telephone (DTT) and Delivery to Fax (DTF) prefixes
- Name Dialing and Name Addressing prefixes
- network prefixes (ESN, CDP, and mailbox prefixes)

---

### Location prefix

The location prefix is the portion of the telephone number that the user must dial to reach a user at a specific location. For example, if your dialing plan is ESN, the location prefix consists

of the ESN access code used to make outgoing calls from your location (for example, 6), and the location code for the remote location (for example, 338).

For more information about dialing plans, see your switch documentation.

---

## User capabilities for broadcast messages

To send a broadcast message, the user must have the appropriate mailbox capability. If CallPilot is configured to use authentication, and the user is a desktop or Web messaging user, SMTP authentication must be successful before the broadcast message is sent to the remote destinations.

---

## Mailbox capabilities

Each user must have one of the following capabilities in the mailbox class:

Broadcast capability	Description
Local broadcast only	The user can send broadcast messages to users at: <ul style="list-style-type: none"> <li>• the local site</li> <li>• a specific NMS location associated with the local site (if Network Message Service is installed)</li> </ul>
Local and network broadcasts	The user can send broadcast messages to users at: <ul style="list-style-type: none"> <li>• the local site (local broadcast)</li> <li>• a specific remote site (location-specific broadcast)</li> <li>• a specific NMS location associated with either the local or a remote site (if Network Message Service is installed; location-specific broadcast)</li> <li>• all sites in the network (network-wide broadcast)</li> </ul>
Disabled	The user cannot send any type of broadcast message.

 **Note:**

If Networking is not installed, the only options available for broadcast capability are enabled and disabled. When broadcast capability is enabled on a site that does not have networking installed, local broadcast capability is provided.

---

## Distribution lists

---

### Shared distribution lists

Broadcast addresses cannot be added to shared distribution lists (SDLs).

---

### Personal distribution lists

Users can include broadcast addresses in their personal distribution lists (PDLs) according to their mailbox capability. If a user without broadcast capability attempts to add a broadcast address to his or her PDL, CallPilot informs the user that the address does not exist.

If a user wants to send a broadcast message to two or more NMS locations that are associated with a remote site, the user must address the message to each location, because each location has its own location prefix in the dialing plan. To simplify this task, the user can create a personal distribution list containing the location-specific broadcast address for each location.

---

### Mailbox class validation for phoneset users

For phoneset users, the mailbox class includes an option to "send messages through DTT if mailbox not found." This option determines the type of system prompt that a user without broadcast capability hears when attempting to address a broadcast message. The user can hear one of the following prompts:

- "Phone number <string entered by user>."
- "There is no mailbox at <string entered by user>."

For security reasons, the prompt does not state that the address is a broadcast address or that the user does not have permission to send the broadcast message. Indication that the address is a broadcast address is valuable information for a hacker.

---

## Mailbox class validation for desktop and Web messaging users

The desktop or Web messaging client cannot validate a user's mailbox class while sending a message. The message must be sent from the user's desktop to the CallPilot server before mailbox class validation can occur. If CallPilot determines that the user is not allowed to send the broadcast message, the user receives a non-delivery notification (NDN).

For security reasons, the NDN states that the address was not found. It does not state that the user did not have permission to send the broadcast message or suggest that the address is a broadcast address. Indication that the address is a broadcast address is valuable information for a hacker.

---

## SMTP authentication

To send a location-specific or network-wide broadcast message, a desktop or Web messaging user must have the appropriate mailbox capability and be successfully SMTP-authenticated. If SMTP authentication fails while sending the message, the user receives an error message.

 **Note:**

For more information about SMTP authentication, see [Security and encryption](#) on page 295

---

## CallPilot server capabilities for broadcast messages

If Networking is installed on your CallPilot server, then users can send and receive both network-wide and location-specific broadcast messages, if broadcast capabilities are granted at both the user mailbox and CallPilot server level.

If only Network Message Service is installed on your CallPilot server, then users can send only local and location-specific broadcast messages, if broadcast capabilities are granted at the user mailbox level. Location-specific broadcast messages can be sent to any prime or satellite-switch location in the local NMS network.

## Levels of control

By default, broadcast capabilities at the CallPilot server level are enabled for VPIM and Enterprise Networking. If the networking protocol between the local and remote site is AMIS Networking, broadcast capability is not available because network-wide broadcast and location-specific broadcast are not supported by the AMIS protocol.

You can disable the exchange of broadcast messages between the local CallPilot server and remote voice messaging systems. When you disable the exchange of broadcast messages on the local server, you can quickly and temporarily turn off broadcasts without modifying other CallPilot settings.

You can control the exchange of broadcast messages in the local CallPilot networking database under Messaging, and then Message Network Configuration, as follows:

Where	How
<p>On the local CallPilot server</p>	<p>Enable the following options, as required:</p> <ul style="list-style-type: none"> <li>• Send network broadcasts</li> <li>• Receive network broadcasts</li> </ul> <p>Both settings apply to the following broadcasts:</p> <ul style="list-style-type: none"> <li>• network-wide broadcasts</li> <li>• location-specific broadcasts to and from all locations associated with remote sites</li> </ul> <p> <b>Note:</b> Location-specific broadcasts to local locations are exempt because these types of broadcast messages are not actually sent over the network.</p>
<p>For each remote server that is defined in the network database</p>	<p>Enable the following options, as required:</p> <ul style="list-style-type: none"> <li>• Send network broadcasts to this server</li> <li>• Receive network broadcasts from this server</li> </ul> <p>Both settings apply to the following broadcasts:</p> <ul style="list-style-type: none"> <li>• network-wide broadcasts</li> <li>• location-specific broadcasts to and from this remote site</li> <li>• location-specific broadcasts to and from locations associated with this remote site</li> </ul>

---

## When to disable broadcast messages between sites

Use the following guidelines to determine when to disable broadcast messages between the local and one or more remote servers:

Disable broadcast messages	when
to the local server	<ul style="list-style-type: none"> <li>• you observe a security breach, such as a hacker attempting to send messages to the local server.</li> <li>• you do not want to receive broadcast messages from remote servers.</li> </ul>
from the local server	<p>all users are not allowed to send broadcast messages to other sites.</p> <p>For example, a small sales office may not be permitted to send network broadcast messages, whereas the corporate head office site can do so.</p>
to a remote server	<ul style="list-style-type: none"> <li>• the remote server does not support network-wide and location-specific broadcasts.</li> </ul> <p>For more details, see <a href="#">Broadcast messages in a mixed messaging network</a> on page 144.</p> <ul style="list-style-type: none"> <li>• the remote server does not want to receive broadcast messages from the local server.</li> </ul>
from a remote server	<ul style="list-style-type: none"> <li>• you observe a security breach, such as a hacker attempting to send messages to the local server while pretending to be at the remote server.</li> <li>• you do not want to receive broadcast messages from the remote server.</li> </ul>

 **Note:**

Another reason to disable broadcast messages is that you can prevent high usage of network and CallPilot resources (network traffic, channel usage, and CPU resource usage).

---

## See also

SMTP authentication can also restrict network broadcast messages from remote servers that are not required to authenticate before transmitting messages to the local CallPilot server. For more details, see [Unauthenticated mode](#) on page 305.

---

## Broadcast messages in a mixed messaging network

If your messaging network contains a mixture of voice messaging systems, this can affect the ability for users to send network-wide and location-specific broadcast messages to other locations.

The type of content that a broadcast message can contain (voice, fax, or text) is affected by:

- the networking protocol used between two servers
- the networking solutions installed on your server
- whether the receiving server supports the content

---

## Broadcast support between systems

The following table identifies whether network-wide and location-specific broadcast is supported on a specific type and release of voice messaging system:

Messaging system type	Network-wide broadcast	Location-specific broadcast
CallPilot 2.0 or later	yes	yes
CallPilot 1.0x	no	no
Meridian Mail 12 Meridian Mail 13	yes	yes
Meridian Mail 11	yes	no
Meridian Mail 11 and later with Meridian Mail Net Gateway	yes	no
Meridian Mail 10 and earlier	no	no
Avaya Norstar VoiceMail	no	no
Avaya Business Communications Manager 2.5	no	no
Voice messaging systems from other vendors	no	no

The type of network broadcast supported between two specific servers is the lowest common denominator of what both servers support. For example, only network-wide broadcast is supported between CallPilot 2.0 and Meridian Mail 11.

---

## Multimedia support between systems

All types of broadcast messages can contain voice, fax, or text. However, to successfully arrive at their destinations, the following requirements apply:

- The networking protocol used to send the broadcast message must support the transmission of the content.
- The remote server must support the receipt of the content.

---

### Example 1: VPIM Networking

VPIM Networking supports the transmission of voice, fax, and text messages. Therefore, broadcast messages can contain voice, fax, or text. However, if the receiving server does not support the content, a non-delivery notification can be returned to the sender.

---

### Example 2: Enterprise Networking

Enterprise Networking supports the transmission of voice content only. Therefore, if a user composes a broadcast message containing fax or text, and the message is to be transmitted using the Enterprise Networking protocol, the message is rejected and the sender receives a non-delivery notification.

---

### Example 3: AMIS Networking

AMIS Networking does not support network broadcast messages.

---

## Broadcast message content policy

You must establish a policy for the type of content that users can include in a network broadcast message, and communicate this policy to your users. You can partially enforce the policy by granting desktop messaging and fax capability in each user's mailbox class.

---

## Viewing or printing all broadcast addresses

To compose broadcast messages and ensure they arrive at the correct destination, users must know the broadcast addresses. It is relatively simple to remember the local broadcast mailbox and network broadcast prefix because there are only two numbers to memorize.

However, it becomes more complex for location-specific broadcast messages, because each site or NMS location in the network database has its own location prefix.

---

## Viewing the broadcast addresses used by each switch location

Location-specific addresses can vary depending on the location from which the broadcast message is composed. The Print Broadcast Addresses page in CallPilot Manager contains a list box that lists all local switch locations. By default, the list is shown from the local prime location's point of view. To view the broadcast addresses from a particular local satellite location's point of view, you choose the satellite location from the list box.

 **Note:**

The Print Broadcast Addresses page also shows, for your reference, the local broadcast mailbox and network broadcast prefix used by the local server.

---

## Deleting unread broadcast messages

Broadcast messages usually contain information that is valuable for a short period of time. You should consider enabling delete unread broadcast messages if your organization uses a large number of broadcast messages. This will reduce the number of messages stored in the mailbox.

See Administrator Guide NN44200-601 for instructions on how to configure delete unread broadcast messages.

# Chapter 7: About VPIM Networking

---

## In this chapter

[Overview](#) on page 147

[Sending VPIM Networking messages to other sites](#) on page 150

[Receiving VPIM Networking messages](#) on page 152

[TCP/IP](#) on page 156

[TCP/IP protocols](#) on page 160

[Implementation overview](#) on page 161

[VPIM-compliant messaging systems requirements](#) on page 164

[VPIM Version 2 conformance table](#) on page 165

---

## Overview

VPIM Networking offers the ability to exchange voice, fax, and text messages with other users over a Transport Control Protocol/Internet Protocol (TCP/IP) data network. Messages can be exchanged with users at integrated sites, which are part of your private messaging network, as well as with users who are at open, VPIM-compliant sites. VPIM Networking uses Simple Message Transfer Protocol (SMTP) and Multipurpose Internet Mail Extensions (MIME) in compliance with the Voice Profile for Internet Mail (VPIM) standard.

VPIM is an integral part of successfully configuring Geographic Redundancy. If you want to configure Geographic Redundancy or simply gain further understanding of this feature, see the *Geographic Redundancy Application Guide* (NN44200-322).

---

## Data networks

VPIM Networking uses existing data networks, not switch networks, to transport messages. The data network must support the TCP/IP protocol.

---

## VPIM address

A VPIM address is similar in form to an e-mail address. To send an e-mail message to a user over the Internet, you enter a two-part address. The left-hand side of the address contains a unique identifier for the user, often the user's name. The right-hand side of the address is the domain name of the user, the system on the data network that handles messages.

### **Example**

#### **Example:**

username@company.com

VPIM addresses also have two parts. However, the left-hand side usually contains the user's public switched telephone network (PSTN) number. The right-hand side is the domain name. For example:

14165977070@company.com

---

## VPIM address restrictions

Some restrictions apply to VPIM addresses.

---

## Left-hand side

- can contain numeric characters only
- maximum length of 128 characters

---

## Right-hand side

maximum length of 255 characters

---

## VPIM message

A VPIM message consists of two parts:

- a message header
- a message body that consists of voice, fax, and text parts

all message parts are MIME-encoded

---

## Encoding parts

VPIM voice messaging parts are encoded using the ITU's G.726 32 kbps ADPCM standard. VPIM text parts are not encoded. VPIM fax messaging parts are encoded based on the tagged image file format-Class F (TIFF-F) specification.

 **Note:**

A fax must be in TIFF-F. When saving faxes, be aware of subtypes (there are many besides Class F). Not all subtypes are fax-compatible. All TIFF files, no matter what the subtype is, have a .tif extension.

---

## Message header

VPIM Networking messages are addressed with the following format: left-hand\_side@right-hand\_side. This format is used by Avaya CallPilot® for both the To: and From: entries of a message header.

For example, the To: and From: entries in a typical VPIM Networking message header can be

- To: 12046679000@anothercompany.com
- From: 15739921000@thiscompany.com

This header information is critical to VPIM Networking because the header is used to route a message to its destination and to identify the sender. Avaya CallPilot creates the complete To:

and From: entries for users. This is convenient for telephone users, who do not have to enter the complete, long VPIM address. It is also a way of ensuring the accuracy of the address information.

---

## Desktop and telephone users

VPIM Networking is available to both desktop users and telephone users. Using a keyboard, a desktop user can easily enter the alphanumeric VPIM addresses, including the alphanumeric right-hand side for open VPIM sites. A telephone user uses VPIM prefixes and shortcuts.

---

## Sending VPIM Networking messages to other sites

---

### Open sites

An open site is not part of the private messaging network. It can be any VPIM-compliant system. Telephone users and desktop users have different ways of addressing messages to recipients at open sites.

---

### Telephone users

If a telephone user wants to send a message to an open site, the open site must be defined in the local network database through an open VPIM shortcut. An open VPIM shortcut identifies the PSTN number of the open site to the domain name of the open site. An open VPIM shortcut is used to form outgoing VPIM addresses only. For example, Gwendolyn wants to compose and send a message to a user at an open site. She knows the recipient's VPIM address: 12044541000@bigcompany.com

To send a message to this open site using a telephone, the list of open VPIM shortcuts can include an entry such as the following:

1204454 = bigcompany.com

Gwendolyn gets the PSTN telephone number and the open shortcut from the network administrator. When Gwendolyn sends a message to this open site, she must enter 15 1204454 1000, where

- 15 is the VPIM compose prefix
- 1204454 is the VPIM open shortcut
  - 1 is the country code
  - 204 is the area code
  - 454 is the exchange code
- 1000 is the mailbox number

CallPilot uses this information to identify that the message is being sent with VPIM Networking. It finds the shortcut in the network database and maps it to a domain name. CallPilot creates the following To: header from this information:

To: 12044541000@bigcompany.com

---

## Desktop users

To send a message to an open site, a desktop user does not require a VPIM open shortcut to be defined in the network database. A desktop user can address a message to any open site user without restriction and can use either a VPIM open shortcut or a VPIM address.

---

## Integrated sites

Integrated sites are part of your private messaging network. Information about all integrated sites that exchange messages with your local site is defined in your local network database. This information includes VPIM networking shortcuts. These shortcuts are the various ways that local users can address users at the remote site.

---

## Distinction between open and network shortcuts

VPIM open shortcuts and SMTP/VPIM network shortcuts have very different roles. The open shortcuts provide the alphanumeric domain name required on the right-hand side of a VPIM address.

The network shortcuts provide alternative ways for local users to address messages to users at remote sites. Instead of always entering the left-hand side of the VPIM address, users can enter the same numbers that they use to dial that site. The right-hand side is supplied by the fully qualified domain name (FQDN) for the site in the network database.

---

## Creating the From: header

When a local user sends a VPIM Networking message to an open or integrated site, the message header contains a From: entry. The From: entry enables the recipient to reply to the sender. The From: entry consists of the PSTN address and the CallPilot FQDN. For example:

14165979999@branch.thiscompany.com

The left-hand side of the address is created from the PSTN address for the local site. The right-hand side is the fully qualified domain name of CallPilot. This FQDN is defined in the local network database and is added to the outbound address automatically.

---

## Receiving VPIM Networking messages

The way your local system receives inbound VPIM Networking messages depends on how your data network is set up. CallPilot continuously monitors TCP port 25 (and port 465 if SSL is configured) for incoming SMTP information.

---

## If a message is received successfully

If a message is received successfully, the message and addresses are converted to their native format and the message is delivered to the local mailboxes.

---

## If the message is not received successfully

If there is a problem during the message transfer session, the local system logs an event. The event log indicates the address of the sending system.

If the session is successful but the message is not delivered to a local mailbox, a non-delivery notification (NDN) is generated and sent to the message sender. There are several reasons why a message can be successfully received but undeliverable to a local mailbox. For example, the mailbox does not exist.

---

## Relationship of the server FQDN to VPIM shortcuts

There are two possible origins of an inbound message:

- The message originated from an integrated site that is part of your messaging network.
- The message originated from an implicit open site, which is not part of your messaging network but is known and is listed in the open VPIM shortcuts, or an unknown open site, which is not part of your messaging network and is not included in the open VPIM shortcuts. To CallPilot, these are indistinguishable.

---

## Message from an integrated site

The following examples are based on this message:

- From: 16135558877@chilly.org
- To: 14165551234@realcool.org

If the sender of the message is located at an integrated site in your messaging network, the sender is presented as an integrated site to the recipient. This assumes that when VPIM Networking was implemented at the receiving site (realcool), the following were configured for the remote site (chilly):

- server location: Chilly Branch Office
- server FQDN: chilly.org
- VPIM shortcut: 1613555 (overlap: 0)

The left-hand side of the incoming message is matched against the VPIM shortcut. This identifies the message sender as a user at Chilly Branch Office. The address is converted to an internal format designating the remote site and the sender's mailbox number (8877). For

example, using a telephone to retrieve the message, the recipient hears an announcement similar to the following: "Message 1 from Mailbox 8877 at Chilly Branch Office."

Similarly, a user at realcool can compose to a chilly recipient by using the dialing plan format as configured in the messaging network configuration. For example, a user enters 63318877, where 633 is the ESN prefix for the chilly site. The message is sent to 16135558877@chilly.org using the network configuration information for the site to make up the address.

---

## Message from an implicit open site

An implicit open site is one that is known and is included in the list of open VPIM shortcuts.

In this example, the open VPIM shortcut list includes the following entry:

- VPIM shortcut: 1613555
- FQDN: chilly.org

The address is converted to an internal format. For example, when using a telephone to retrieve the message, the recipient hears an announcement similar to the following: "Message 1, from 16135558877 at open network location chilly.org." The address is spelled out in full ("c-h-i-l-l-y dot o-r-g").

---

## Message from an unknown open site

When an incoming message is from an unknown open site, nothing in your site configuration identifies the source.

---

## Non-delivery notifications

A non-delivery notification (NDN) is generated if an error occurs during an attempt to deliver a message. There are three types of non-delivery notifications:

- local: generated by the local sending system
- network: generated by the remote receiving system
- intermediate: generated by systems involved in routing message

 **Note:**

If VPIM Networking messages are sent over the Internet, there is no guarantee of when users receive non-delivery notifications. Internet servers can take up to several days before sending a non-delivery notification.

---

## Multimedia messages and non-delivery notifications

If a multimedia message is sent to a user who does not have the mailbox capabilities to accept one or more parts of the message, the entire message is rejected. For example, if a voice message with a text attachment is sent to a user with a voice mailbox only, the entire message is rejected and the sender receives a non-delivery notification.

---

## Message delivery notification

A message delivery notification (MDN) is generated if a user requests one before sending a message. This request is made by tagging the message for acknowledgment. With VPIM Networking, a message delivery notification indicates that the recipient opened at least one part of a message.

The following must also be considered:

- The receiving system can be configured to not send message delivery notifications. If so, local users cannot tell if their messages were never delivered or never read by recipients on the receiving system.
- Meridian Mail Net Gateway does not support message delivery notifications. Local users cannot tell if a recipient at a Net Gateway site read the message.

Although CallPilot supports message delivery notification, even messages exchanged between two CallPilot systems may not be entirely supported. For example, if a message is routed through any system that does not support message delivery notifications, the message delivery notifications are lost.

---

## OM reports

Operational Measurement (OM) reports for cumulative network activity to a particular site are available for VPIM Networking. OM reports for individual messages are not generated for VPIM Networking. Because VPIM messages do not incur long-distance toll charges, it is not necessary to track each message for the purposes of bill-back.

---

## TCP/IP

VPIM Networking uses the Transport Control Protocol/Internet Protocol (TCP/IP). Only TCP/IP data networks are supported. The CallPilot server, on which VPIM Networking resides, is connected directly to your existing TCP/IP data network. TCP/IP is the most commonly used transport for data networks. TCP/IP is a driver that enables computers to communicate with one another regardless of their platforms. The connections that form the basis of the Internet are based on TCP/IP.

Transport Control Protocol (TCP) is the transport layer of TCP/IP. It ensures that the information transmission is both reliable and verifiable. TCP breaks the information into smaller portions. Each portion receives a header that is used to route the packet to its proper destination. A portion of data and its header are known as a packet or a datagram. TCP passes the packet, with its header, to the IP protocol, which routes the packet to the correct destination.

Internet Protocol (IP) is the network layer of TCP/IP. It ensures that the information is transmitted from its source to its destination. To transmit the packets created by TCP, IP routes them. When IP receives packets from TCP, IP adds another header to the packets.

---

## TCP/IP routing

Routing in a TCP/IP data network relies on IP addresses. Each computer on a TCP/IP network is identified by its address. The source and destination addresses used by IP have a specific format. An IP address is a 32-bit number represented by a four-part decimal number (n.n.n.n). Each part, known as an octet, contains 8 bits of the address. Each octet has an assigned number between 1 and 254. For example, 45.211.100.58.

For many organizations, one physical network is impractical, so they have two or more physical networks. Instead of getting additional IP addresses for each physical network, the networks are assigned subdivided portions of the original IP address. This is called subnetting an IP address. Subnetting provides many advantages. One of the most important is that, to the outside world, the organization has a single IP address. This means there is one direct connection to the Internet. All subnetted physical networks gain access to the Internet through this connection.

---

## Fully qualified domain names

An IP address is difficult to remember and enter. While the computers on the TCP/IP network use IP addresses, end users use fully qualified domain names (FQDNs). A fully qualified domain name is made up of two parts:

- domain name
- host name

---

## Domain name

A domain name is interpreted from right to left. For example, in the domain name acme.com, .com is the top-level domain for commercial sites, and acme is a domain within the .com domain.

---

## Host name

A domain contains many computers. Each computer in a domain is a host with a name.

A fully qualified domain name (FQDN) combines the name of a host, a dot, and the domain name. For example, test.example.com.

---

## Domain name system

The domain name system (DNS) is a naming protocol used with the TCP/IP protocol. It enables the use of names, instead of IP addresses, to route messages. The DNS provides a domain name to IP address mapping, or translation. This mapping takes place on a name server, frequently called the domain name system (DNS) server. A network of DNS servers works cooperatively. If one DNS server does not know how to translate a particular domain name, it passes the name on to another DNS server.

---

## Need for DNS server

To communicate over the Internet, every physical network requires a DNS server. Many organizations own and maintain their own DNS server. Other organizations, especially smaller ones, can rely on an Internet service provider (ISP) for a DNS server. If you do not exchange messages over the Internet, but only over an intranet, your network may or may not include a DNS server.

---

## DNS lookup tables

A DNS server contains a lookup table that translates FQDNs into IP addresses. This table is defined and maintained by the data network administrator. The table is also automatically propagated by the DNS server. A DNS lookup table can store different types of records, including:

- mail exchange records (MX records)
- address records (A records)

---

## DNS servers and MX records

The DNS server contains many types of records, including mail exchange (MX) records. MX records point to the mail servers that are configured to receive mail sent to the domain name. They describe where SMTP mail for the domain can be sent. MX records are useful because they enable you to redirect mail for any host or domain to any other host or domain. This means that, while your organization can use many mail servers, all mail can be sent to the same domain name.

For example, all mail is sent to `user@company.com`, even though there is no host called `company.com`. The MX records redirect the mail to a system that accepts mail. This separation of mail delivery and physical hosts is an efficient way of ensuring that the addresses of all users in your organization are common and easy to remember.

Many data networks have more than one mail server. You can specify the order of preference. Mail is deposited at the first server in the list. If the mail is not intended for that server, it is passed to the next server. Every host that receives mail has an MX record. The MX record contains a preference value that is the order that a mail server can follow when attempting to deliver messages. The preference value provides some fault tolerance in your mail setup.

---

## MX records and mail servers

If you want to use mail exchange servers within your domain, create specific MX records for each of the mail servers in your domain. If you use MX records, assign VPIM Networking the last, or least preferred, MX resource record in the list.

Your domain can have multiple MX records, such as the following:

- acme.com mail.acme.com MX 0 mail.acme.com
- acme.com mail2.acme.com MX 10 mail2.acme.com
- acme.com mail.is.net MX 100 mail3.acme.com

In this case, mail delivery is attempted to mail.acme.com first, because it has the lowest preference value. If delivery fails, mail delivery is attempted to mail2.acme.com.

---

## MX records and user accounts

MX records provide routing for destination systems. They do not provide routing for individual user accounts. End-user routing can be provided by a mail server, for example.

---

## DNS server setup

You must set the DNS server up and fill the database before you implement VPIM Networking. However, you must add one or more records to the database. One record is for the server, which is entered as part of the CallPilot installation and is not specific to VPIM Networking. As an option, you can add MX records if they are being used.

---

## Setting DNS

The Primary DNS suffix must be configured for the CallPilot Address Book to function properly.

### To set the primary DNS suffix

1. Right-click My Computer and Click properties.

Result: The System Properties screen appears.

2. Select the Computer Name tab
3. Click the Change button
4. Click the More button
5. Enter the Primary DNS Suffix for the CP Server.

---

## TCP/IP protocols

VPIM Networking uses the TCP/IP protocol to exchange messages over data networks. TCP/IP is actually a family of protocols that are often called application protocols. These application protocols are based on TCP/IP, but are specialized for particular purposes. VPIM Networking uses the following TCP/IP industry-standard application protocols:

- Simple Message Transfer Protocol (SMTP)
- Extended Simple Mail Transfer Protocol (ESMTP)
- Multipurpose Internet Mail Extensions (MIME)

---

## SMTP/ESMTP

SMTP is a way to move e-mail from server to server on a TCP/IP network. Most e-mail systems that send mail over the Internet use SMTP to send messages. The messages are retrieved with an e-mail client using either Post Office Protocol (POP) or Internet Mail Access Protocol, version 4 (IMAP4\*). In general, SMTP is also used to send messages from a mail client to a mail server. For this reason, when you configure an e-mail application, both the POP or IMAP server and the SMTP server must be specified. ESMTP has extended features such as machine-readable non-delivery notifications.

---

## MIME

Although TCP/IP is capable of 8-bit binary data transfer, SMTP allows for only 7-bit data transfer. This means that, to be exchanged over a data network, voice, fax, and simple text messages must be encoded into a 7-bit representation and encapsulated into a format that can be broken into packets consisting of message headers and data. The Multipurpose Internet Mail Extension (MIME) is a specification for formatting non-ASCII messages so that they can be transmitted over the Internet. MIME enables multimedia e-mail messages containing graphics, audio, video, and text to be sent. MIME also supports messages written in other character sets besides ASCII.

---

## VPIM

VPIM is a standard that provides detailed conformance rules for the use of Internet mail for voice mail messaging systems. With the development of voice messaging, a class of special-purpose computers evolved to provide voice messaging services. These computers generally interface to a telephone switch and provide call answering and voice messaging services.

---

## Implementation overview

The implementation depends on the connections established among the CallPilot system, other sites in the messaging network, and other sites to which you want to send messages. Whether or not your site uses mail relays, proxy servers, and firewalls, as well as how they are configured, affects the implementation of VPIM Networking. There is no one standard procedure for implementing VPIM.

---

## Before you begin

Implementing VPIM Networking is an incremental activity. The following assumptions are made:

- A private, server-based data network, including all necessary security devices, is already in place. This network must support the TCP/IP protocol.
- CallPilot is installed and tested (except for VPIM Networking), and mailboxes are configured.
- The switch is installed and configured.
- If implemented on the local site, Network Message Service (NMS) is fully implemented.
- If local desktop users use Internet Mail Access Protocol (IMAP) clients, IMAP is fully configured and tested.
- Contact is made with the network administrators of the remote sites.

---

## Data network is set up

VPIM Networking uses your private data network. Your Simple Message Transport Protocol (SMTP) message network is configured for your unique needs and can vary in complexity from other networks. VPIM Networking interacts with one or more of the following systems:

- Domain Name System (DNS) server
- SMTP e-mail proxy server (or gateway, or relay)

Configuration and management of these systems is at your discretion. The following overview is intended as a basic guideline only.

---

## DNS server

The names of VPIM Networking remote sites are entered into the network database during VPIM Networking implementation. These names must be resolvable to IP addresses by VPIM Networking's SMTP delivery agent using the Windows system network sockets facilities on the CallPilot server.

The CallPilot server can be configured to use a local host name table or, more likely, to use an external DNS. This server must be able to resolve, in cooperation with other DNS servers, all of the network site names entered in the database.

In the event that an intervening firewall or e-mail gateway separates CallPilot from the Internet or intranet, CallPilot must resolve only the IP address of the relay server, which is also entered during implementation. However, a DNS server must, in turn, be available to the relay server to resolve the final destination address of the site's name in outbound VPIM Networking messages.

If VPIM Networking sends messages over the Internet, your site requires a domain name system (DNS) server. Your local site can maintain its own DNS server or use an Internet service provider (ISP). In both instances, however, additional configuration must be done to the DNS server to make it work with VPIM Networking.

Many smaller corporations have an external supplier, known as an Internet service provider (ISP), supply DNS services. If your data network uses an ISP, most of the setup is complete. The ISP fulfills the following requirements:

- registers a domain name on your behalf
- gives the numeric IP addresses of the primary and secondary DNS servers

These addresses are used to configure the TCP/IP stacks of the CallPilot Server.

---

## Work with the ISP

Even if an ISP is supplying your DNS services, you must ensure that the configuration of the DNS server is complete. You must

- Tell the ISP which DNS records you want to publish. These published records allow outside users to send SMTP messages to your network.
- Add another mail exchange (MX) record for the computer that accepts e-mail connections for your domain into the DNS database of the ISP. With this record, you can receive VPIM Networking messages over the Internet.
- the ISP add an A record, corresponding to the MX record, to the DNS database of the ISP.

 **Important:**

An ISP is not behind a firewall. Check with your ISP to resolve security issues before deciding to use an ISP for mail services.

---

## Firewall

If the Internet is being used to transport VPIM Networking messages, a firewall must be in place and must support transmission of SMTP/MIME.

---

## E-mail gateway server

VPIM Networking can be configured to forward all outbound SMTP message traffic to a machine that serves as an SMTP relay.

If a proxy is to be used for this site, the proxy software must be configured to recognize and handle messages for any other site. For example, the proxy with a domain name of example.com must have an entry that maps, for example, 14165551234 at example.com to 14165551234 at test.example.com.

Incoming VPIM Networking messages are always received as SMTP proxies on port 25. How the message was routed to the site is irrelevant to CallPilot. For example, CallPilot does not care if the incoming messages were routed through mail relays.

For outgoing messages, however, CallPilot is interested in the routing path of the message. The outgoing message can be routed directly to the destination system, or it can be routed through a mail server or a proxy server. When you configure VPIM Networking, you specify

the server that is used for outgoing messages. If you use any other port but port 25 for outgoing messages, you also specify the port number.

---

## Internet Mail Access Protocol (IMAP)

If local users use desktop clients that support IMAP, configure the Internet Mail Client on CallPilot before implementing VPIM Networking. Because IMAP also uses SMTP, some of the configuration of IMAP is completed on the same dialog boxes where VPIM Networking is configured.

---

## Windows configuration

Configure Windows for VPIM Networking. Configure the following:

- TCP/IP setup
- server FQDN
- DNS

---

## VPIM-compliant messaging systems requirements

A messaging system must meet certain requirements for VPIM compliance.

---

## Number of recipients and message length

The VPIM standard does not restrict the number of recipients in a single message. It also does not limit the maximum message length. The limitations of disk storage affect the accepted message length. However, CallPilot does have restrictions. CallPilot cannot deliver a message body that is longer than 120 minutes. This length is also affected by the limits of disk storage. Mail relays can also impose restrictions on message length.

---

## Voice encoding

To exchange messages between CallPilot and a VPIM-compatible system, G.726 voice encoding is used.

---

## VPIM Version 2 conformance

To claim conformance and be recognized as VPIM-compliant, a messaging system must implement all mandatory features in the areas of content and transport. In addition, systems that conform to this profile must not send messages with features beyond this profile unless explicit per-destination configuration of these enhanced features is provided.

---

## VPIM Version 2 conformance table

VPIM Networking conforms to the VPIM Version 2 specifications established by the Internet Engineering Task Force (IETF). The conformance table that follows indicates what functionality a messaging system must support to be considered VPIM-compliant. This table also indicates CallPilot support for these requirements.

---

## Conformance table description

The conformance table has the following columns:

- Feature: Name of the protocol feature.
- Area: Conformance area to which each feature applies.
  - C = content
  - T = transport
  - N = notification
- Status: Whether the feature is mandatory, optional, or prohibited. Five degrees of status are used in this table:
  - Must = mandatory
  - Should = encouraged optional

- May = optional
- Should not = discouraged optional
- Must not = prohibited

- Avaya: CallPilot VPIM Networking compliance with the feature is marked with an X. Features ignored when messages are received are marked with an I.

**Table 4: Conformance table**

Feature	Area	Must	Should	May r	Should not	Must not	Avaya
Message addressing formats							
Use DNS host names	C	X					X
Use only numbers in mailbox IDs	C		X				X
Use alphanumeric mailbox IDs	C			X			
Support of postmaster@domain	C	X					X
Support of non-mail-user@domain	C		X				X
Support of distribution lists	C		X				
Message header fields: Encoding outbound messages							
From	C	X					X
From: addition of text name	C		X				X
To	C	X					X
CC	C		X				X
Date	C	X					X
Sender	C			X			
Return-path	C			X			
Message ID	C	X					X
Reply to	C			X			
Received	C	X					X
MIME Version 1.0 (Voice 2.0)	C		X				X
Content-type	C	X					X

Feature	Area	Must	Should	Mayt r	Should not	Must not	Avaya
Content-transfer encoding	C	X					X
Sensitivity	C			X			X
Importance	C			X			X
Subject	C		X				X
Disposition-notification-to	N			X			
Other headers	C			X			X
Message header fields: Detection and decoding inbound messages							
From	C	X					X
From: utilize text personal name	C			X			X
To	C	X					X
CC	C			X			I
Date	C	X					X
Date: conversion of date to local time	C		X				
Sender	C			X			I
Return-path	C			X			I
Message ID	C	X					X
Reply to	C	X					X
Received	C			X			I
MIME Version 1.0 (Voice 2.0)	C			X			I
Content type	C	X					X
Content-transfer encoding	C	X					X
Sensitivity	C	X					X
Importance	C			X			X
Subject	C			X			X
Disposition-notification-to	N			X			
Other headers	C	X					I
Message content encoding: Encoding outbound audio/fax contents							

Feature	Area	Must	Should	Mayt r	Should not	Must not	Avaya
7bit MIME	C					X	
8bit MIME	C					X	
Quoted printable	C					X	
Base64	C	X					X
Binary	C		X				
Message content encoding: Detection and decoding inbound messages							
7bit MIME	C	X					X
8bit MIME	C	X					X
Quoted printable	C	X					X
Base64	C	X					X
Binary	C	X					X
Message content types: Inclusion in inbound messages							
Multipart/voice message	C	X					X
Message/RFC822	C			X			X
Application/directory	C		X				X
Application/directory: include TEL, EMAIL	C	X					X
Application/directory: include N, ROLE, SOUND, REV	C		X				X
Application/directory: only one per level	C	X					X
Audio/32KADPCM	C	X					X
Audio/32KADPCM: content-description	C			X			X
Audio/32KADPCM: content-disposition	C	X					X
Audio/32KADPCM: content-duration	C			X			X
Audio/32KADPCM: content-language	C			X			
Audio/* (other encodings)	C			X			X
Image/TIFF	C			X			
Multipart/mixed	C			X			X

Feature	Area	Must	Should	Mayt r	Should not	Must not	Avaya
Text/plain	C				X		X
Multipart/report	N	X					X
Multipart/report: human-readable part is voice	N	X					
Message/delivery status	N	X					X
Message/disposition-notification	N		X				
Other contents	C				X		X
Message content types: Detection and decoding in inbound messages							
Multipart/voice message	C	X					X
Message/RFC822	C	X					X
Application/directory	C		X				X
Application/directory: recognize TEL, EMAIL	C	X					X
Application/directory: recognize N, ROLE, SOUND, REV	C		X				X
Audio/32KADPCM	C	X					X
Audio/32KADPCM: content description	C			X			I
Audio/32KADPCM: content disposition	C		X				X
Audio/32KADPCM: content duration	C			X			X
Audio/32KADPCM: content language	C			X			I
Image/TIFF	C		X				X
Image/TIFF: send NDN if unable to render	C	X					X
Audio/* (other encodings)	C			X			X
Multipart/mixed	C	X					X
Text/plain	C	X					X
Text/plain: send NDN if unable to render	C	X					X
Multipart/report	N	X					X

Feature	Area	Must	Should	Mayt r	Should not	Must not	Avaya
Multipart/report: human-readable part is voice	N	X					X
Message/delivery status	N	X					X
Message/disposition-notification	N		X				
Other contents	C				X		X
Other contents: send NDN if unable to render	N		X				X
Forwarded messages: use message/RFC822 construct	C		X				X
Forwarded messages: simulate headers if none available	C		X				X
Reply messages: send to reply-to, else From address	C	X					X
Reply messages: always send error on non-delivery	C	X					X
Notifications: use multipart/report format	N	X					
Notifications: always send error on non-delivery	C		X				
Message transport protocol: ESMTP commands							
HELO	T	X					X
MAIL FROM	T	X					X
MAIL FROM: support null address	T	X					X
RCP To	T	X					X
DATA	T	X					X
TURN	T					X	X
QUIT	T	X					X
RSET	T	X					X
VERFY	T						

Feature	Area	Must	Should	Mayt r	Should not	Must not	Avaya
EHLO				X			X
BDAT (5)	T		X				
Message transport protocol: ESMTP keywords and parameters							
PIPELINING	T		X				
SIZE	T	X					X
CHUNKING	T		X				
BINARYMIME	T		X				X
NOTIFY	N	X					X
ENHANCED STATUSCODES	N		X				
RET	N		X				X
ENVID	N			X			X
Message transport protocol: ESMTP-SMTP downgrading							
Send delivery report upon downgrade							
Directory address resolution							
Provide facility to resolve addresses	C		X				X
Use Vcards to populate local directory	C	X					X
Use headers to populate local directory	C				X		X
Management protocols							
Network management	T		X				



# Chapter 8: Avaya CallPilot® networking implementation concepts

---

## In this chapter

[Section L: About implementing networking](#) on page 173

[Section M: Key concepts](#) on page 183

[Section N: CallPilot Manager networking configuration pages](#) on page 186

[Section O: Coordination among sites](#) on page 196

---

## Section L: About implementing networking

---

### In This section

[Overview](#) on page 173

[Designing the messaging network](#) on page 177

[Installation and implementation concepts](#) on page 180

---

## Overview

This chapter provides an overview of the concepts required to implement Avaya CallPilot networking solutions. For more detailed information, see [Implementing and configuring Avaya CallPilot® networking](#) on page 233 of this guide, which deals with the specifics of implementing and configuring the networking solutions.

The CallPilot networking solutions allow you to create a multimedia messaging network of up to 500 sites so that mailbox owners at one site can exchange messages with mailbox owners at

other sites. Voice, fax, and text messages can be sent and received through the telephone or desktop PC.

Messages are transmitted from the local site to a remote site using one of the following protocols:

- AMIS Networking
- Enterprise Networking
- VPIM Networking

CallPilot can also exchange messages with users at sites that are not defined in your messaging network. Sites that are not defined in your messaging network are referred to as open sites. You can exchange messages with open sites using one of the following protocols:

- AMIS Networking (also referred to as Open AMIS Networking)
- VPIM Networking (also referred to as Open VPIM Networking)

In addition to these networking protocols, you can use Network Message Service (NMS). With NMS, you can have two or more switches that are connected by ISDN and share the same messaging system. The users at each switch location have complete CallPilot functionality, and are all maintained on one CallPilot server. The collection of switch locations, connections, and the messaging server is known as an NMS network.

---

## AMIS Networking

AMIS Networking uses the Audio Messaging Interchange Specification-Analog (AMIS-A) protocol, an industry standard for the transmission of voice messages between messaging systems. You can use AMIS Networking to exchange voice messages with any remote sites that support the AMIS protocol. These remote sites can be within a private switch network (integrated sites), or within the public switch network (open AMIS sites).

 **Note:**

Remote sites that are configured to use the AMIS protocol in your network database are referred to as Integrated AMIS Networking sites.

---

## Enterprise Networking

Enterprise Networking is a networking solution that transmits voice messages between mailbox owners at different sites in a private messaging network. Enterprise Networking uses a proprietary analog protocol that is based on extensions to the AMIS protocol.

If the Names Across the Network feature is enabled, Enterprise Networking also:

- allows the local mailbox owner to hear a remote user's spoken name while composing and sending messages
- supports the display of text names on the phoneset
- supports name dialing for remote addresses

---

## VPIM Networking

With VPIM Networking, mailbox owners can exchange voice, fax, and text messages with other mailbox owners over a TCP/IP data network. You can use VPIM Networking to exchange messages with any remote site that supports the VPIM protocol. These remote sites can be part of your private network (integrated sites), or they can be in a public network (open VPIM sites). VPIM Networking uses Simple Message Transfer Protocol (SMTP) and Multipurpose Internet Mail Extensions (MIME) in compliance with the Voice Profile for Internet Mail (VPIM) standard.

If either the Names Across the Network, or Enhanced Names Across the Network feature is enabled, VPIM Networking also:

- allows the local mailbox owner to hear a remote user's spoken name while composing and sending messages
- supports the display of text names on the phoneset
- supports name dialing for remote addresses

---

## About implementation

Implementation of CallPilot networking requires planning and coordination between the network administrators of the various sites. The time you spend planning the network saves you time during implementation. It also reduces the time it takes to troubleshoot network problems after implementation.

To properly plan for implementation, you must understand the process and all the information that you are expected to provide. You must also look at the implementation on paper. Analyze it to determine if there are any conflicts or missing information.

---

## Implementation scenarios

There are several possible scenarios for implementing your CallPilot system:

- Your site is part of a new messaging network of CallPilot systems.

If you are designing a completely new messaging network in which each site uses CallPilot, you can design a simple and elegant messaging network.

Preliminary planning must be done before you can install any networking solution. This planning results in a messaging network that is perfectly designed for CallPilot networking.

- Your site is being added to an existing, compatible messaging network.
- Your site is part of an existing messaging network that is being converted to CallPilot.

If your site is part of an existing network that is being converted to CallPilot, the implementation process is somewhat different. For example, a dialing plan exists. CallPilot networking is easiest to implement and maintain when the messaging network uses a uniform dialing plan. However, it is unlikely that you can change the entire dialing plan to suit your preferences. Therefore, you may have to implement the networking solution or solutions using a dialing plan that is more complicated to implement and maintain. For more information about implementing a uniform dialing plan, see your switch documentation.

If your site is being converted to CallPilot from Meridian Mail, you can migrate most of the existing information from Meridian Mail into the CallPilot network database. The Meridian Mail to CallPilot Migration Utility automates the movement of data. For more information about converting to CallPilot from Meridian Mail, see the Meridian Mail to CallPilot Migration Utility Guide (NTP NN44200-502).

- Your site is part of an existing messaging network and is being converted to CallPilot, while other sites are not being converted.

The process that you follow is determined somewhat by your particular situation. To simplify the process, follow the guidelines described in this guide, as well as in the online Help.

---

## Network administrators

A network administrator maintains the messaging network at one or more sites. You can designate

- one network administrator for all sites
- one network administrator for each site
- several network administrators, with each administrator being responsible for a small number of sites in the network

Your first step in planning is to determine who maintains a particular site. Avaya recommends that one network administrator be responsible for coordinating the implementation and administration of the entire messaging network. Communication among site administrators is required to maintain the messaging network. A coordinator can simplify this process.

---

## Designing the messaging network

When you receive your CallPilot server, the basic design of your messaging network is already complete. The planning engineers who determined how CallPilot can be used in your messaging network also decided:

- how many sites the messaging network contains
- which networking protocols are used

---

## Basic design tasks for network administrators

You must complete the basic design of the messaging network. This includes the following tasks:

- Assign unique, useful names to every site in the messaging network.
- Identify the Network Message Service (NMS) sites in the messaging network.
- Determine the dialing plan that is used among sites.
- Determine the networking solution that is used between a pair of sites.

## Network database

Each site in the messaging network has its own network database that contains all information entered during the implementation and configuration of networking at that site. You must understand the network database structure because it is integral to understanding how to implement a networking solution.

The network database contains three main types of information:

- information about each of the networking solutions installed at the site
- information about the local site
- information about every remote site in the messaging network with which the local site communicates

The local site and each remote site that is configured in the network database consist of:

- a messaging server—the computer on which CallPilot (or for remote sites, some other messaging system) resides
- a prime switch location—the switch that is directly attached to the messaging server

When the site uses NMS, the site configuration consists of:

- a messaging server
- a prime switch location
- one or more satellite-switch locations

If a remote site is configured in the network database, it is considered to be an integrated site. If a remote site is not configured in the network database, it is considered to be an open site. For more details, see [Networking requirements and considerations](#) on page 198.

The information you enter into your network database for each remote site must be provided by the remote site's network administrator. Most of the information that you enter for a remote site is the same information that is entered for the remote site in its network database. Network databases must be identical across the messaging network. Otherwise, networking does not work correctly.

---

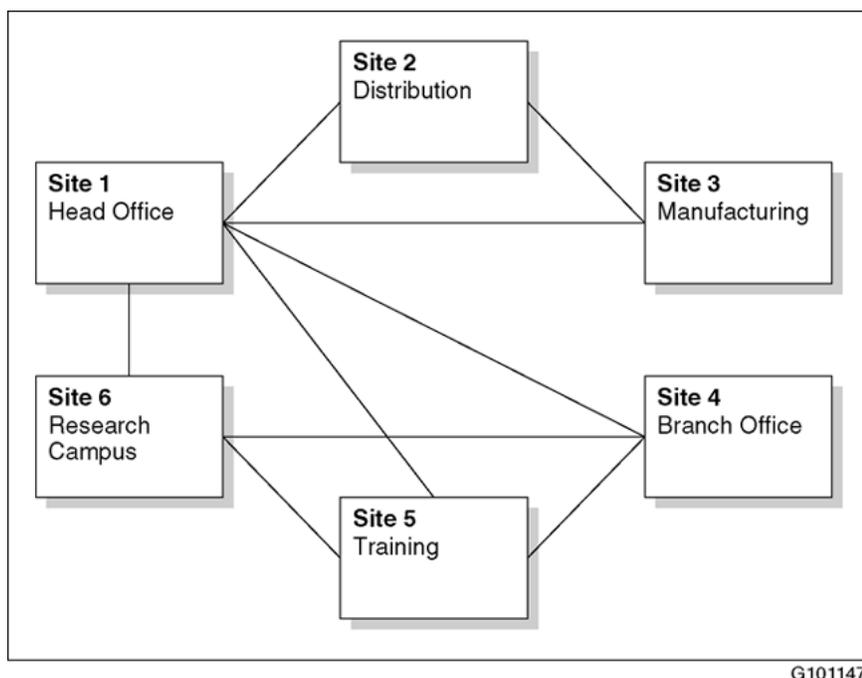
## When to add remote sites to the network database

The local network database contains information about the remote sites with which the local site exchanges messages. These sites appear in the messaging network tree in CallPilot Manager.

If the messaging network is a true mesh network, your network database contains information about each site in the network. Each site can exchange messages with all sites in the network.

For larger messaging networks, a mesh network can be impractical or unnecessary. In fact, in most messaging networks, a site connects only to those remote sites with which it commonly exchanges messages. In this case, the database does not contain the sites with which the local site does not exchange messages.

The following diagram illustrates a non-mesh network. In this example, only Head Office (site 1) connects to all sites. The other sites connect only to those sites with which messages are exchanged. The Manufacturing site, for example, connects only with the Distribution and Head Office sites.



G101147

**Figure 27: Non-mesh network**

The mesh or non-mesh network concepts are important because some values must be unique both in the network database and throughout the messaging network. When you configure CallPilot, CallPilot Manager can identify information that is not unique in the local network database. You must manually ensure that information is unique across the messaging network.

For more information about how CallPilot Manager validates information that you enter, see the following sections:

- [Validation](#) on page 192
- [Ensuring information is unique](#) on page 193

## Open and integrated sites

A messaging network is made up of integrated sites. A site is considered integrated when it is included in the network databases of the other sites in the messaging network.

However, a site can exchange messages with sites that are not part of the messaging network. These other sites are known as open sites. A typical open site can be a major customer or supplier to your company.

---

## Protocols used to communicate with open sites

The ability to exchange messages with open sites is achieved by using industry-standard protocols, such as AMIS or VPIM. As long as the messaging system at an open site complies with either protocol, sites in the messaging network can communicate with the open site.

---

## Installation and implementation concepts

In CallPilot, a distinction is made between a networking solution that is installed and one that is implemented. This concepts detailed in this guide, used in conjunction with the procedures in the online Help, describe the implementation process for each of the networking solutions.

This guide provides:

- a general description of the implementation process and introduces some of the key concepts necessary to understand the process
- implementation checklists and configuration worksheets to help you plan and implement networking on your CallPilot server

The online Help provides the actual procedures for implementing the various networking solutions.

---

## Differences between installation and implementation

The difference between networking installation and implementation is important.

---

## Installation

When you purchase the networking keycode, all networking solutions except NMS are installed and enabled on your CallPilot server.

---

## Implementation

To be available on your server, the networking solution must be implemented. Implementation means that the networking solution is properly configured and the network database is set up.

---

## Network implementation prerequisites

Implementation of a networking solution is an incremental activity. Before you begin to implement a networking solution, you must ensure that the following tasks are already completed:

- The CallPilot server is set up and configured for local use.

If it is not, see the following documents for instructions:

- CallPilot Installation and Configuration guide for your server
- CallPilot Administrator's Guide (NN44200-601)

- The switch is set up and configured for local use.

**Note:**

Switch security features can be configured with networking in mind.

- The appropriate number of switch trunks are available.
- The appropriate number of CallPilot channels are available.

---

## Recommended order of implementation

Information that you provide when implementing one networking solution is also required when you implement the next networking solution.

For example, suppose you have Integrated AMIS Networking and Enterprise Networking installed on your system. Several configuration boxes that you must complete during the

implementation of Integrated AMIS Networking are enabled because Enterprise Networking is also installed. In some instances, you must enter temporary information (which is called a placeholder) into those boxes before you can save the information in the network database.

The implementation process is easier if you follow this recommended order:

1. Network Message Service (NMS)
2. Desktop or Web messaging. For information about IMAP implementation, see the Desktop Messaging and My CallPilot Installation and Administration Guide (NN44200-305).
3. AMIS Networking, Enterprise Networking or VPIM Networking

---

## Network Message Service implementation

Avaya recommends that you implement and test all NMS sites in the messaging network before you implement any other networking solution.

Avaya also recommends that you verify the accuracy of information for your site before you release it to remote network administrators.

---

## Open AMIS Networking

If your site uses the AMIS protocol to exchange messages with open sites only, implement open AMIS Networking. Follow the procedures in the online Help.

---

## Integrated AMIS Networking

If your local site uses the AMIS protocol to exchange messages with only integrated sites, or with both integrated and open sites, implement Integrated AMIS Networking. Follow the procedures in the online Help.

---

## Implementation checklists

To help you track your progress while implementing one or more networking solutions, you can use the implementation checklists that are provided in [Implementation and planning tools](#) on page 325:

- [Open AMIS Networking Implementation Checklist: NWP-035](#) on page 328
- [Integrated AMIS Networking Implementation Checklist: NWP-032](#) on page 330
- [Enterprise Networking Implementation Checklist: NWP-031](#) on page 332
- [VPIM Networking Implementation Checklist: NWP-029](#) on page 335
- [Open VPIM Implementation Checklist: NWP-036](#) on page 337

---

## Section M: Key concepts

---

### In this section

[Network views](#) on page 183

[Performing local and remote administration](#) on page 184

[Multi-administrator environments](#) on page 186

---

### Network views

Your view of your messaging network depends on which site you are on. From your perspective, only one site is local. All other sites are remote. However, the administrator of another site sees that site as local and all others as remote.

In most cases, the site where you are physically located is the local site. However, if the necessary permissions are set up on the system, you can administer a remote site. Even though the site is physically remote, from your perspective, it is the local site. For example, while dialing in to Site 2 and performing network administration from another site, Site 2 is considered the local site and all other sites are remote.

---

## Performing local and remote administration

You can implement and administer a CallPilot networking site either locally or remotely.

In most networks, each site has a local on-site messaging network administrator who maintains the system. However, with CallPilot's remote administration capability, you can implement and administer sites remotely. If you are implementing and administering sites remotely, follow the procedures in the online Help for each site.

It is important to note, however, that whenever you are administering a site remotely, you are acting as the local administrator of that site.

---

## Site security

CallPilot protects site configuration from unauthorized users. To implement and administer sites remotely, you must have the proper authorization and password for each site.

---

## Logging on to a local or remote server

CallPilot Manager is a Web-enabled administration tool that is used to configure and maintain your CallPilot server from any PC that has IP connectivity to your CallPilot server.

CallPilot Manager provides three pages for implementing and maintaining the CallPilot networking solutions:

- Message Delivery Configuration
- Message Network Configuration
- Network Diagnostics (Enterprise Networking only)

---

## Message Delivery Configuration

The Message Delivery Configuration page is where message transmissions for each networking protocol are enabled, and settings such as the batch thresholds, delivery schedules, SMTP security, and encryption are defined.

---

## Message Network Configuration

The Message Network Configuration page is where the local site, switch locations, and remote sites are defined.

---

## Network Diagnostics (Enterprise networking only)

Use the Network Diagnostics test to check the Enterprise networking configuration. With Network Diagnostics, you can determine which sites are enabled or disabled and check the status of all of your AMIS and Enterprise sites.

---

## Relationship of the CallPilot Manager Web server to the CallPilot server

The CallPilot Manager Web server software can be installed on the CallPilot server, or on a stand-alone server. If the CallPilot Manager Web server software is installed on a stand-alone server, you must know the CallPilot Manager server's host name or IP address as well as the CallPilot server's host name or IP address.

---

## Logging on

You must use a Web browser to log on to and administer the CallPilot server. The process for logging on to a remote CallPilot server is the same as for logging on to the local server. The logon process is detailed in [Logging on to the CallPilot server with CallPilot Manager](#) on page 31.

 **Note:**

You can use CallPilot Manager to log on to and administer any CallPilot 2.0 or later server in your network. You cannot use CallPilot Manager to administer CallPilot servers that are running CallPilot 1.07 or earlier.

---

## Multi-administrator environments

Multiple administration is a standard database management feature that allows many administrators to work on a database at the same time. For more information about multi-administrator environments, see [Multi-administrator access](#) on page 32.

---

## Section N: CallPilot Manager networking configuration pages

---

### In this section

[Message Delivery Configuration description](#) on page 186

[Message Network Configuration description](#) on page 188

[Working with the Message Network Configuration page](#) on page 191

[Validation](#) on page 192

[Ensuring information is unique](#) on page 193

[Specifying time periods](#) on page 195

---

## Message Delivery Configuration description

The Message Delivery Configuration page contains message delivery options information for each of the networking solutions. It is accessible in CallPilot Manager as follows:

- for all networking solutions if you purchased the networking feature
- for Enterprise Networking only, if you did not purchase the networking feature Networking solutions

You must complete the Message Delivery Configuration page to implement the following networking solutions:

- AMIS Networking
- Enterprise Networking
- VPIM Networking

You do not use the Message Delivery Configuration page to implement NMS.

---

## To open the Message Delivery Configuration page

In CallPilot Manager, click Messaging - Message Delivery Configuration.

### Example

Result: The Message Delivery Configuration page appears:



### Note:

If you want to print the Message Delivery Configuration parameters, follow the procedure detailed in the CallPilot Manager online Help.

---

## To navigate to subsequent pages

Some Message Delivery Configuration options are accessible on separate pages. To access the subsequent pages, click the underlined text on the main Message Delivery Configuration page, or the action button in the area you are configuring. When you click an underlined link or the action button, a new page appears.

---

## To cancel changes on a CallPilot Manager page

Each page has a Cancel button. You must understand how Cancel works to ensure that you do not inadvertently lose configuration information that you entered.

When you enter configuration information on a page, the information is saved to the network database only when you click Save.

This means that when you click Cancel, the following occurs:

- All of the changes that you enter on the page are deleted.
- You are returned to the previous page.

Click Cancel only if you want to undo all of your changes on the page.



**Note:**

To delete specific information from a field, use the standard Windows methods, such as the Backspace or Delete keys.

---

## To save configuration changes

You do not have to complete the configuration of your entire messaging network at one time. You must save any changes that you do make in a session. If you do not save your changes, the network database is not updated when you go to another CallPilot Manager page.

To save your changes, click Save on the page on which you are working.

---

## Message Network Configuration description

The Message Network Configuration page contains a graphical representation of your messaging network. It uses a tree to show the local site and all remote sites in the messaging network. Use the tree to add, remove, and modify the configuration of messaging servers and switch locations in your messaging network.

---

## To open the Message Network Configuration page

In CallPilot Manager, click Messaging, and then Message Network Configuration.

The Message Network Configuration page appears, showing the network tree.

---

## How sites and switch locations are represented

A site consists of a messaging server and a prime switch location. If the site is using NMS, the site also includes one or more satellite-switch locations. In the tree view, a site is represented by

the messaging server icon. To see the switch locations associated with a site, click the plus sign (+) next to the messaging server.

 **Note:**

To reduce the amount of time required to display the network tree, you can expand the tree for only one site at a time. This means that if the switch locations for a particular site are visible when you click another messaging server, the page refreshes to show only the switch locations for the messaging server that you chose.

---

## Local messaging server and prime switch location

The local messaging server and local prime switch location are automatically added to the Message Network Configuration tree when CallPilot is installed on your system. They cannot be deleted.

---

## Remote messaging servers and prime switch locations

Each messaging server is associated with a prime switch location. For this reason, when you add a remote messaging server to your messaging network, a prime switch location is automatically created for that remote messaging server. By default, the prime switch location is given the same name as the messaging server. The prime switch location for a remote messaging server cannot be deleted.

---

## Satellite switch locations

The messaging network tree shows which sites in the network are NMS sites. NMS sites have one or more satellite-switch locations in addition to the prime switch location.

You can distinguish a prime switch location from a satellite-switch location by its icon as follows:

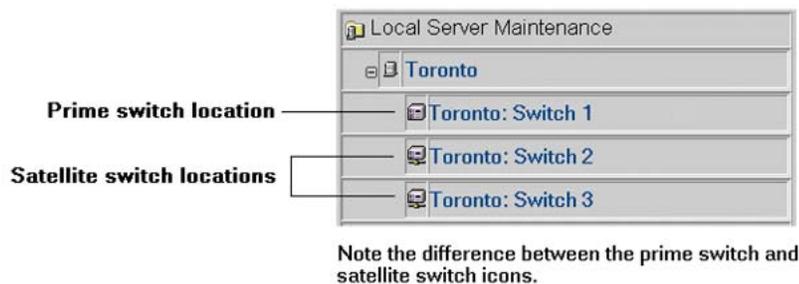


Figure 28: Satellite switch locations

---

## Network tree and maximum number of sites

The Message Network Configuration tree can contain up to 500 sites. An NMS site can have up to 999 satellite-switch locations. It is very important to be organized when implementing large messaging networks.

If the size of the network tree exceeds the size of the browser window, a scroll bar appears on the right side of the browser window.

---

## Network tree organization

When you are implementing and maintaining large networks, it can be difficult to keep track of sites, messaging servers, and switch locations. For this reason, CallPilot automates some of the organization for you.

---

## Local site

The local site is always shown at the top of the network tree, under the Local Server Maintenance branch.

If the local site is an NMS site, the prime switch location is always listed directly following the messaging server. The satellite-switch locations are listed in alphabetical order following the prime switch location.

---

## Remote sites

Remote sites are shown following the Remote Server Maintenance branch. Remote sites are listed in alphabetical order.

All the satellite locations, including the prime switch location, are listed in alphabetical order. Note that the prime location icon differs from the remote location icons.

---

## Working with the Message Network Configuration page

Each messaging server and switch location in the Message Network Configuration tree has a page that contains the configuration settings for that messaging server or switch location.

---

## To open a messaging server or switch location page

You can open the page for any messaging server or switch location in the messaging network from the Message Network Configuration tree.

1. In CallPilot Manager, click Messaging, and then Message Network Configuration.
2. Do one of the following tasks:

To	Click
add a new remote server	New Server. Result: A blank page for the new messaging server appears.
add a new switch location	the name of the messaging server in which you are interested, and then click New Location. Result: A blank page for the switch location appears.
modify the configuration for an existing server or switch location	the name of the messaging server or switch location in which you are interested, and then click Show Details. Result: The page for the messaging server or switch location appears.

3. Configure the settings on the page as required.

For instructions, see the CallPilot Manager online Help.

4. Click Save.

## To navigate to subsequent pages

Some Message Network Configuration options are accessible on separate pages. To access these pages, click the underlined text on the main Message Network Configuration page, or the action button in the area you are configuring. When you click an underlined link or the action button, a new page appears.

---

## To cancel changes on a CallPilot Manager page

Each page has a Cancel button. You must understand how Cancel works to ensure that you do not inadvertently lose configuration information that you entered. When you enter configuration information on a page, the information is saved to the network database only when you click Save. This means that when you click Cancel, the following occurs:

- All of the changes that you enter on the page are deleted.
- You are returned to the previous page.

Click Cancel only if you want to undo all of your changes on the page.

 **Note:**

To delete specific information from a field, use the standard Windows methods, such as the Backspace or Delete keys.

---

## To save configuration changes

You do not have to complete the configuration of your entire messaging network at one time. You must save changes that you do make in a session. If you do not save your changes, the network database is not updated when you go to another CallPilot Manager page.

To save your changes, click Save on the page on which you are working.

---

## Validation

Validation is the process of checking the information entered during configuration before saving it to the database. Validation identifies any problems with the information that you entered

before it is added to the network database. This minimizes configuration problems and helps to ensure that the information that you entered is correct.

---

## Levels of validation

There are two levels of validation:

- field
- record

Field validation ensures that you can enter only valid characters into a box on a page. For example, if a box accepts only numbers, you are not allowed to enter letters. If you are unable to enter characters into a box and do not know why they are being rejected, click the Help button on the page. The online Help appears explaining what the page does, as well as identifying its default values and restrictions, if any.

Record validation ensures that the information you entered while completing a page is complete and consistent, and does not conflict with any other records in the network database. Record validation occurs when you click Save.

---

## Examples

Many boxes must be unique within the site. If a site uses the Coordinated Dialing Plan (CDP), up to 250 steering codes can be defined. Every steering code must be unique for the site.

Other boxes must be unique across the messaging network. For example, every messaging server must have a unique name.

For more information about validation, see [Ensuring information is unique](#) on page 193.

---

## Ensuring information is unique

As you configure the messaging network, you must provide information that is unique. When determining if information is unique, you must consider two factors:

- the context in which an item is unique
- the comparison against which an item is unique

## Context

There are different contexts in which an item must be unique:

- Some items must be unique for the local site.

Example: CDP steering codes

- Other items must be unique in the local network database (which contains the local site and all remote sites with which the local site exchanges messages).

Example: Site ID

- An item can be absolutely unique in the context of certain other items.

Example: Network shortcuts and prefixes (For more details, see [Unique numbers](#) on page 194.)

---

## Uniqueness and validation

It is important to keep the uniqueness requirements in mind when implementing a messaging network, because not all boxes are automatically validated for uniqueness.

When a box must be unique against local information or information in the local network database, it is automatically validated. If a box is not unique as required, an error is generated and you must correct the information before it is accepted.

 **Note:**

Several boxes (such as the site ID and connection DNs) must be synchronized across the entire messaging network. The information in various network databases cannot be checked automatically. For these types of boxes, the network administrators of all sites must coordinate their efforts and determine if the information entered in each network database is correct. This must be done before implementation begins, ideally as part of the information-gathering phase of the implementation process.

---

## Unique numbers

Most of the information that must be unique is numerical. In a messaging network, unique numbers have a particular definition.

A unique number is one that does not conflict with another number. Conflict occurs when there is an exact or a partial match when compared from left to right. A number is unique when it does not repeat any consecutive digits when read from left to right.

---

## Example

- 6338 conflicts with 6338, 633, 63, and 6.
- If you use 6338 and require a unique number, you must use one that is unique from left to right; for example, 7338 is unique

---

## Specifying time periods

When you implement CallPilot networking solutions, several parameters are expressed as periods of time.

---

## 24-hour clock

CallPilot uses a 24-hour clock. Therefore, 3:00 p.m. is expressed as 15:00.

---

## Guidelines

Use the following guidelines to specify time periods:

- The last minute of any hour is expressed as x:59 (where x represents the hour).

For example, 8:00–8:00 is actually configured as 8:00–7:59.

- Overlapping time periods are affected accordingly.
  - There is no overlap between 8:00–10:00 (configured as 8:00–9:59) and 10:00–17:00 (configured as 10:00–16:59).
  - There is a 1-minute overlap between 8:00–10:00 (configured as 8:00–9:59) and 9:59–17:00 (configured as 9:59–16:59).

---

## Section O: Coordination among sites

---

### In this section

[Coordinating network information](#) on page 196

[Networking requirements and considerations](#) on page 198

---

### Coordinating network information

If a network administrator makes changes to the configuration of one site, often these changes must be communicated to the network administrators of all other sites. The network databases of all other sites must reflect these changes.

---

### Ensuring information is consistent across the network

One of the most important implications of the CallPilot network database system is the interdependence of the databases. Although each site has its own network database, the information in one must be consistent with the information in another. If you change one network database, you must ensure that all other network databases are also changed.

Therefore, network administrators must coordinate their efforts before implementing a networking solution or making changes. If changes are made to one network database but not to the other network databases, the messages exchanged with the site that changed its network database can result in non-delivery notifications, depending on what was changed.

---

### Information that must be coordinated

As part of the coordination effort, you must gather information for the whole network and analyze it to ensure that there are no conflicts or oversights. You must also coordinate the

following information with the other network administrators before any site in the messaging network can be implemented:

- local messaging server name
- site ID
- protocol used between a pair of sites
- dialing plan used for connecting to each site
- connection information:
  - ESN location codes
  - CDP steering codes
  - connection DNs (Enterprise Networking) or system access numbers (AMIS Networking)
- SMTP/VPIM network shortcuts (VPIM Networking)

---

## Configuration worksheets

You can use the configuration worksheets, which are provided in [Implementation and planning tools](#) on page 325 to record the information that you gather. You can then transfer this information to a messaging network diagram to help you visualize the network. Check the information carefully to ensure that each element is unique.

After all information is configured in CallPilot, you can:

- retain the completed configuration worksheets as a hard copy backup record of your network
- send the completed worksheets to other messaging network administrators to help them configure the network databases at their sites

The following table identifies the configuration worksheets:

Information type	Worksheet name
CDP steering codes	<a href="#">CallPilot Networking: CDP Steering Codes: NWP-027</a> on page 339
ESN location codes	<a href="#">CallPilot Networking: ESN Location Codes: NWP-037</a> on page 340
your local site	<a href="#">CallPilot Networking: Local Server Maintenance: NWP-024</a> on page 342
each remote site	<a href="#">CallPilot Networking: Remote Server Maintenance: NWP-025</a> on page 343

Information type	Worksheet name
each switch location	<a href="#">CallPilot Networking: Switch Location Maintenance: NWP-026</a> on page 346
your local server's message delivery configuration settings	<a href="#">CallPilot Networking: Message Delivery Configuration: NWP-028</a> on page 348
open VPIM shortcuts	<a href="#">CallPilot Networking: Open VPIM Shortcuts: NWP-038</a> on page 352

---

## Networking requirements and considerations

When implementing a particular networking solution, consider the items discussed in this section.

---

## Interaction of networking with other CallPilot features

Each CallPilot networking solution supports different features. You must also be aware of how a particular networking solution interacts with other CallPilot features.

---

## Dialing plans

When you begin to implement a networking solution, the dialing plan used by your local site is already configured on the switch. The decision about which dialing plan to use for each site in your network is already determined when you begin to implement a networking solution. Therefore, during implementation, you are simply reflecting the existing plan in your network database.

Even though the dialing plan is already set up, you must understand how to gather the dialing plan information from the switch. You must also understand the implications of the dialing plan for your messaging network.

see [Dialing plans and networking](#) on page 107 for detailed information on dialing plans.

---

## Channel requirements

To process a call, AMIS and Enterprise Networking require access to a channel. A channel provides a connection between the switch and the Digital Signal Processor (DSP) cards on the CallPilot server.

CallPilot supports three channel types, each corresponding to different media:

- voice
- fax
- speech recognition

Although a networking solution can work with all three types of channels, voice ports are usually used.

The channel requirements for a networking solution are expressed as a minimum and maximum range.

Coordinate with the system administrator to determine how the channel requirements are set. The system administrator must know about the networking solutions that are implemented and the anticipated traffic before setting up the channels. This ensures that when a networking solution is implemented, the necessary channel resources are available.

If channels are dedicated to networking, the number of channels required for networking must be identified. However, the number required also depends on the traffic requirements of other CallPilot features.

For significant amounts of analog networking traffic and for NMS, additional voice channels can be required.

The following table shows how many networking calls are processed each hour for a specific number of channels. The table is based on the following assumptions:

- Five percent of the recipients of composed messages are at remote sites.
- The message length is 40 seconds.
- The network consists of three sites.

Number of channels	Networking channels	Number of networking calls
72	2	102
96	3	153

---

## NMS and channels

NMS does not require channels to transmit messages. Calls between switches in an NMS network are routed to the CallPilot server over ISDN PRI links.

However, a calculation of the system size must consider all users, even if they are attached to NMS users on satellite-switches.

---

## Types of channels required

Networking requires full-service voice channels. Networking does not work on basic-service voice channels.

If full-service multimedia channels are configured, they are used by networking only if all full-service voice channels are busy or out of service

---

## VPIM considerations

When VPIM Networking is installed, the CallPilot server must be attached to the Avaya server subnet. Usually, this connection is already in place. VPIM Networking is transmitted over the TCP/IP network. Therefore, VPIM Networking does not require or use voice channels.

---

## Network security

To maintain the integrity and security of your CallPilot system, each site in your messaging network must follow the recommended security precautions discussed in [Security and encryption](#) on page 295.

Consider the following security measures:

- phoneset user, desktop user, and server access restrictions to prevent toll fraud
- switch features, such as the following:
  - Trunk Group Access Restrictions (TGARs)
  - Class of Service (COS)
  - Network Class of Service (NCOS)

- firewalls and packet filters (if you are using VPIM Networking)
- encryption (if you are using VPIM Networking)

---

## Engineering considerations

You must consider the following engineering issues for each networking solution:

- the impact of VPIM Networking on the local area network (LAN)
- message handling capabilities of the networking solution (throughput)
- message queuing capacities
- message transmission times

---

## Other considerations

Other considerations that you must be aware of are:

- The number of sites the messaging network can contain. CallPilot supports a maximum of 500 integrated sites.
- The number of delivery sessions than can be active at one time
- The maximum number of simultaneous delivery sessions to a single remote site depends on the networking solution.
- The length to which mailbox numbers are limited. For AMIS Networking, mailboxes cannot exceed 16 digits.
- The way messages are handled.

All networking solutions deliver all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.



# Chapter 9: Gathering information

---

## In this chapter

[Overview](#) on page 203

[Switch information](#) on page 206

[Data network information](#) on page 205

[Information required from switch](#) on page 207

[Evaluating the switch information](#) on page 210

[Information from other sites](#) on page 211

---

## Overview

This chapter describes how to gather the information required to implement message networking. It also provides a checklist for all information that is needed about the switch configuration.

For VPIM networking, information is required about the data network, the dialing plan configured on the local switch location, and the other sites in the messaging network.

Before you can begin to implement networking, gather the information you require. You speed up the implementation process if you have this information available before you begin. When you analyze the information and look for inconsistencies and incompleteness, you ensure that potential problems are resolved.

---

## Required information

You must gather several types of information:

- local site information, especially about the switch configuration information and dialing plan
- messaging network information that is provided by all remote sites
- local data network information (VPIM)

---

## Why gather information?

The gathered information is used to:

- identify the sites in the messaging network
- identify the networking protocols used among sites
- identify how the sites relate to each other
- identify the dialing plan used by each switch in the network
- determine if the dialing plan on one or more switches in the network must be modified to support the networking solutions of Avaya CallPilot®
- create a messaging network representation (see [Create a messaging network representation](#) on page 125 for more information)
- prepare for Avaya CallPilot configuration

---

## Information about open sites

If local users exchange messages with open sites, gather the system access numbers of these open sites. You need the system access number of at least one open site that you can use when you test your implementation. Coordinate with the administrator of a remote open site before you begin to test the implementation.

---

## If the implementation is an upgrade

If CallPilot NMS is an upgrade from an existing NMS setup or is being added to an existing site, information must be gathered about the existing site. Whenever possible, the information

is reused so that the implementation of CallPilot NMS is transparent to users, and they can continue to use the system as they always have.

---

## If the implementation is a new network

If NMS is a new implementation, this information must be created. Information about the administrative setup must be gathered first so that there are no conflicts. For example, prefixes used to dial an exterior number, a long-distance number, or an international call can be gathered.

Much of the required information depends on the dialing plan that is used. If CallPilot NMS is replacing a current system, usually the existing dialing plan is re-created. If CallPilot is a new implementation, the choice of dialing plan depends on how the system is used.

---

## Recommendation

Avaya recommends an ESN dialing plan over a CDP dialing plan. An ESN dialing plan has several advantages, including the following:

- easier to maintain
- easier to add new sites
- minimal conflicts with numbering plans

---

## Data network information

VPIM Networking is implemented on top of the existing data network. To configure VPIM Networking, you must be familiar with your local data network and the remote data networks.

---

## Data network

The following items were required when CallPilot was installed in your data network:

- FQDN of the outgoing SMTP mail server
- IP address of the DNS

- host name of the local CallPilot system
- subnet mask used by the local CallPilot system

To implement VPIM Networking on CallPilot, you need to know the FQDN of the local server.

You must also know the FQDN of each remote server that is expected to exchange VPIM messages with the local CallPilot server.

---

## Remote data network information

For each remote site with which the local site exchanges VPIM Networking information, you must have the FQDN of the SMTP server. When configuring VPIM Networking, you can provide the outgoing SMTP or the mail proxy server FQDN, depending on your physical network setup.

---

## Switch information

When you begin to implement networking, the switch is already correctly installed and configured, and is operational for CallPilot. This means that the switch is set up for dialing among the sites in the messaging network. The dialing plans that are configured on the switch for making telephone calls between sites are also used to exchange messages among sites.

If messages are exchanged with open sites only, dialing plan information is not required.

---

## Gathering dialing plan information

You need the dialing plan information that is configured on the switch. You must know the dialing plan used in the messaging network and how all sites dial one another. The easiest way to gather this information is to ask the switch technician or system administrator.

---

## Gathering information directly from the switch

Gathering information directly from the switch is not recommended. The information that you require is found on several switch configuration files called overlays. Finding the information can be difficult and time-consuming.

If you must gather the information from the switch, consult your switch documentation for the proper procedures and detailed descriptions of the information in each overlay.

---

## Confirming settings

Usually, when the switch is configured, the switch technician addresses the impact of messaging on the switch. However, to ensure that there are no problems, you must confirm that the configuration suits the needs of your networking solution and can handle your anticipated volume of traffic. If you discover that changes are necessary, you must complete these changes before you proceed with the implementation of your messaging network.

---

## How dialing plans are used by VPIM Networking

Even though VPIM Networking transmits messages over the data network, not a switch network, dialing plan information is still required if messages are exchanged with integrated sites.

The dialing plan that is configured on the switch is used by VPIM Networking. VPIM Networking is designed to be virtually transparent. Users can address a VPIM Networking message to an integrated site by using the same numbers that they use to call that integrated site.

---

## Example

To call the site in Dallas, Samantha Singh dials an ESN prefix, 7888, and the extension number of the individual she is calling, 1234.

To send a message to the same user, she enters 75 to begin composing a message, and enters the ESN prefix and the extension number as an address. VPIM Networking translates this information into a complete VPIM address that forms the To: entry:

12145551234@company.com

The 1214555 is a VPIM Network shortcut for the Dallas site configured in the local database. The Dallas site must have corresponding information configured for its local site.

---

## Information required from switch

You must gather information about the switch. You must verify that the switch supports networking. You use some of the information, such as dialing plan information, to configure CallPilot.

Gather information from:

- the local prime switch location
- the remote switch locations (prime and satellite)

 **Note:**

If the local site is an NMS site, you must also gather information from each satellite-switch location.

---

## Gather information about used features only

Most of the information that you gather from the switch is related to the dialing plan. Gather information about a dialing plan only if a dialing plan is being used. Do not gather the information if the dialing plan is installed on the switch but is not currently being used.

Example: Your switch has both ESN and CDP installed. However, only ESN is used. Do not gather CDP information.

---

## Local prime switch location information checklist

You need the following information from the switch configuration:

- name or physical location of switch (useful to name the switch location on CallPilot)
- dialing plan used:
  - Electronic Switched Network (ESN)
  - Coordinated Dialing Plan (CDP)
  - hybrid dialing plan, combining ESN and CDP
  - another dialing plan, such as public switched telephone network (PSTN)
- if ESN or hybrid dialing plan is used:
  - ESN access code
  - ESN location codes:
    - local switch location
    - remote switch locations
  - overlap of location codes with extension numbers

- if CDP or hybrid dialing plan is used:
  - CDP steering codes
    - local switch location
    - remote switch location
  - overlap of steering codes with extension numbers
- if another dialing plan, such as PSTN, is used:
  - dialing prefix information
- confirmation that sufficient trunks are available for anticipated networking traffic
- confirmation that restrictions are suitable for the planned messaging network (for example, Trunk Group Access Restrictions [TGAR]) and not too restrictive
- range of extension numbers used at the local site (for example, 7000-7999)
- information about existing CDNs and phantom DNs that are defined on the switch

---

## Remote switch location information checklist

For each remote site in the messaging network, you need the following information about each switch location (prime and satellite):

- name or physical location of switch
- dialing plan used:
  - Electronic Switched Network (ESN)
  - Coordinated Dialing Plan (CDP)
  - hybrid dialing plan, combining ESN and CDP
  - another dialing plan, such as public switched telephone network (PSTN)
- if ESN or hybrid dialing plan is used:
  - ESN prefix and ESN access code
  - verify the ESN location codes
    - local switch location
    - remote switch locations
  - overlap of location codes with extension numbers

- if CDP or hybrid dialing plan is used:
  - CDP steering codes
    - local switch location
    - remote switch location
  - overlap of steering codes with extension numbers
- if another dialing plan, such as PSTN, is used:
  - dialing prefix information
- range of extension numbers used at the local site (for example, 7000-7999)
- confirmation that all extension numbers at this switch location can be dialed directly from the local switch
- confirmation that all extension numbers at this switch location can be dialed in the same way
- information about existing phantom DNs and dummy ACD queues defined on the switch

---

## Evaluating the switch information

When you have the dialing plan information from all switches in the messaging network, review the information to ensure that you do not have to make any changes to switch configurations.

---

## Mandatory requirement

The dialing plans of all switches in the network must have a uniform, or standardized, dialing plan. A uniform dialing plan means that users on all switches dial the same way to reach the same recipient. There is only one exception to this rule: ESN access codes can be different. You need a uniform dialing plan to dial users on other switches within the messaging network and at public sites.

A uniform dialing plan offers the following benefits:

- The network is easier to configure and maintain.
- Future growth of the network is allowed.

---

## Configuring dialing plan information

You need extensive switch programming experience to configure dialing plan information on a switch.

 **Important:**

If you determine that changes to the dialing plan configuration are necessary, ask a switch technician to confirm your conclusion and make the necessary changes.

---

## Information from other sites

Implementation of a networking solution is a coordinated effort. Many decisions must be made before implementation begins. Gather the following information before you begin to implement a messaging network:

- site names
- Enterprise site IDs, if Enterprise Networking is implemented in the messaging network
- passwords—each site must decide on the initiating password and the responding password that is used with every other site (Enterprise Networking)
- fully qualified domain names (FQDNs) of servers
- the protocol used between the local site and all remote sites
- the dialing plan used between the local site and all remote sites
- connection DNs for each site that uses the AMIS protocol to exchange messages with the local site

If any remote sites are NMS sites, also gather the following information for each satellite-switch location:

switch location name, switch type, location ID



# Chapter 10: About Network Message Service

---

## In this chapter

- [Overview](#) on page 213
- [Dialing plans and NMS](#) on page 220
- [Implementing NMS](#) on page 222
- [NMS time zone conversions](#) on page 228

---

## Overview

Network Message Service (NMS) is an Avaya CallPilot® feature that enables one Meridian Application Server to provide messaging services to users in a network of compliant switches. The collection of switch locations, connections, and the messaging server is collectively known as an NMS network. An NMS network consists of the Meridian Application Server, a prime switch location, and two satellite-switch locations. Only the prime switch location is directly attached to the server.

An NMS network is often a site within a more complex messaging network. When an NMS network is part of a messaging network, it is called an NMS site. A messaging network can have many NMS sites.

An NMS network is a type of private messaging network that is set up and maintained by an organization for private use. In a typical private messaging network, every switch is connected to a messaging server. Users connected to a switch have mailboxes and can exchange messages with other users connected to the same switch. Users can also send messages to users on other switches in the network.

The following terms are used in discussions of NMS:

Term	Definition
NMS network	The interconnected switches and the Meridian Application Server
NMS site	An NMS network when it is part of a larger messaging network in which each site has its own server

Term	Definition
Prime switch location	The switch location directly attached to the Meridian Application Server
Satellite switch location	A switch location that is directly connected to the prime switch
Tandem switch location	A switch location that is connected between the prime switch location and a satellite-switch location
User location	A logical grouping of mailboxes; can be the mailboxes on one switch or the mailboxes on two or more switches

---

## Prime switch location and satellite-switch locations

The switches are connected by Integrated Service Digital Network (ISDN) primary rate access (PRA), and ISDN signaling link (ISL) trunks. The prime switch communicates with the satellite-switches with the D channel of Primary Rate Interface (PRI) (64 kbit/s).

The prime switch location and the satellite-switch locations communicate through virtual signaling to turn the Message Waiting Indicator (MWI) on a user's telephone on and off. Virtual signaling is also used to transport necessary call information for a networking voice message feature, such as Call Sender. These calls are supported by using ISDN noncall-associated transaction signaling messages.

---

## Prime switch location and Meridian Application Server

The Meridian Application Server is connected to the prime switch with two connections, one for voice and one for data. The Meridian Application Server communicates with the prime switch using the Application Module Link (AML) protocol. If the AML link fails, NMS calls are routed to the default ACD DN configured for the CDN (DFDN).

 **Note:**

AML was previously known as Command and Status Link (CSL) and Integrated Services Digital Network/Applications Protocol link (ISDN/AP)

---

## Switches and NMS

Switches provide the call handling required by Avaya CallPilot. All switches that are used by NMS are already configured and tested when you begin to implement NMS. However, you must check this configuration to determine if it is suitable for NMS. You must also do additional configuration to enable functionality that is required by NMS.

---

## Confirming the Network Class of Service

On each switch location in the NMS network, confirm that the Network Class of Service (NCOS) level is adequate for NMS. If an NCOS level is inadequate, NMS may not work. A Network Class of Service level is a switch setting that controls access to trunks and call queuing. It also provides users with extensive route warning tones.

---

## NCOS and NMS

NMS requires that the system can dial within the NMS network. Therefore, ensure that the NCOS level is sufficient to support a CallPilot system with all features. The NCOS level must allow the system to dial out of a switch location for Call Sender and Thru-Dial, but not create possible security breaches.

---

## NMS access mechanisms

---

### Desktop user logon

NMS is designed to be transparent to users. Users on one switch use the messaging system in the same way as users on all other switches and have access to the same features. The only time NMS is not transparent is when a desktop user logs on to the system. When desktop users at non-NMS sites log on to CallPilot, they enter only their mailbox number and their password. However, the first time desktop users at NMS sites log on to the system, they must also select their location name from a drop-down list. The location name is the name assigned to their switch location. After the first logon, the selected location name becomes the default.

## Direct access

Direct access is initiated by a user dialing an NMS directory number, either by switch or network, or by pressing the Message Waiting key. Auto-logon on NMS is supported if the call is initiated from the user's station. For a direct access call, the call is presented to CallPilot at the prime switch through direct switches. This is a basic ISDN call that requires noncall-associated ISDN Q.931 messages.

However, to support NMS features that require transaction signaling to transport the noncall-associated information, such as Message Waiting Indicator notification and the Call Sender feature, the configuration between the originating switch and the prime switch must support the NMS transaction signaling transport. If the path used to transport the noncall-associated messages is relayed through a switch that does not support NMS transaction signaling, NMS is not supported.

---

## Indirect access

Indirect access is initiated when a call is presented to NMS through call redirection. For any call redirected to NMS, the original called number from the ISDN Q.931 SETUP message is extracted when the call is forwarded to the prime switch. It is then passed to the Meridian Application Server. CallPilot can distinguish the address of the original called party.

For a redirected network call, NMS uses the Network Call Redirection (NCRD) feature to provide the original called number. The following Network Call Redirection types are supported:

- network call forward all calls (NCFAC)
- network call forward no answer (NCFNA)
- network call forward busy (NCFB)
- network hunting (NHUNT)

Indirect access requires the same NMS transaction signaling message.

---

## Offnet access

A user can directly dial in to the prime switch, or a user can dial in to the user's own switch to access a remote switch. For this type of offnet access, the user's switch may need to support direct inward system access (DISA). The user can dial another network location after dialing in to the user's own switch.

---

## NMS considerations

All CallPilot features are available to users in an NMS network. The prime switch must be an Avaya Communication Server 1000 (Release 3.0 or later) switch. Satellite switches must be either Avaya CS 1000 switches or other compliant switches. A CallPilot server can support one prime switch and a maximum of 999 satellite-switches.

---

## Message center directory number

Only one message center directory number can be defined on each user telephone.

---

## Local messaging server broadcast

NMS interprets a local messaging server message broadcast to include users on all switch locations in the NMS network. This feature is especially useful if, for example, you want to inform users of a server shutdown. To avoid excessive resource usage, non-delivery notifications are not generated for broadcast messages. You can also send a broadcast message to a single switch location within the NMS network.

---

## Feature interaction

Many switch features interact with NMS. The following features interact with ISDN Network Call Redirection (NCRD):

- Call Forward (Unconditional, No Answer, and Busy)
- Network Call Transfer
- Network Hunting
- Call Forward by Call Type Allowed to a Network DN
- Attendant Extended Call
- Call from CO Loop Start
- Conference Call
- Barge-in Attendant

---

## Call Forward (Unconditional Call Forward, Call Forward No Answer, Call Forward Busy)

All three types of Call Forward are supported by the ISDN Network Call Redirection features. These are the basis for NMS indirect access. In the case of an indirect NMS access call, the original called number and the redirecting reason are extracted from the original called number information element in the PRA SETUP message. The original called number and the redirected reason are put into the AML PCI message when presenting a call to the Meridian Application Server. If the original called number information element is not present, the redirecting information element is used instead. Similarly, the redirecting number and reason are extracted and transported to the server through a PCI message.

---

## Network Call Transfer

Network Call Transfer is supported by the ISDN Network Call Redirection feature. If an NMS location is involved in a Network Call Transfer scenario, the connected party number is extracted from the PRA NOTIFY message and put into the AML DNP message when the transfer is complete. The DN update message informs CallPilot that a call transfer occurred.

---

## Network Hunting

Network Hunting is supported by the ISDN Network Call Redirection feature. Indirect NMS access can be presented to CallPilot through Network Hunting. The messaging is the same as for Call Forward Busy. Therefore, the original called number information element in the PRA SETUP message is used to construct the ISDN/AP PCI message.

---

## Call Forward by Call Type Allowed to a Network DN

The definition of the Call Forward by Call Type Allowed class of service is changed by the ISDN Network Call Redirection feature. This means that private network calls are treated as internal calls and are forwarded, using the Call Forward No Answer feature or the Network Hunting feature, to the Flexible Directory Number or Hunt DN rather than to the External Flexible Number or External Hunt DN. The Call Forward feature is implemented through the ISDN Network Call Redirection feature. With this feature, the switch can provide different messaging treatments for different types of calls, such as offnet calls instead of on-net calls.

A location can be configured so that all off-net calls are handled by a centralized attendant, while internal calls are handled by CallPilot. However, there is a limit of one message center DN for each location. This means that a user can be served by two message centers, one that handles internal calls and one that handles external calls, but only one center can control the Message Waiting Indicator (MWI) activation.

---

## Attendant Extended Call

Attendant Extended Call has an impact that is similar to Network Call Transfer. There is one important difference, however. The DN update message is sent to CallPilot when the attendant releases the call. Therefore, the connected party number is updated only when the attendant is released.

---

## Call from CO Loop Start

Calls that come in to the switch from the CO Loop Start trunk cannot be redirected to another trunk through attendant extension or call redirection. These calls must be blocked when redirection is activated.

The ISDN Network Call Redirection feature does not redirect calls from CO Loop Start. Therefore, NMS does not support these calls.

---

## Conference Call

When another party has a conference call with a CallPilot system, a DN update message is sent indicating a conference call type. The connected party DN is the same as the station initiating the conference call, which is always the same as the DN in the PCI message. If additional parties are added to the conference, no additional DNP messages must be sent. When a conference call drops back to a simple call, a DNP message is sent indicating a simple call as call type and showing the remaining party as the connected DN. When the conference is established and is dropped at a satellite-switch, a FACILITY message with TCAP protocol is transported to notify the prime switch of the conference call activities. The DNP message is then triggered and sent to the Meridian Application Server.

## Barge-in Attendant

The attendant can barge in on an NMS call on the prime switch location. During barge-in, users cannot use the features that require switch effort, such as Call Sender.

---

## Dialing plans and NMS

The dialing plan that connects the switch locations in a NMS network can affect the way your NMS network is implemented. As well, if the dialing plan is set up incorrectly, NMS cannot work. The dialing plan can also affect the configuration of the switch locations. NMS supports the following dialing plans:

- Electronic Switched Network (ESN)
- Coordinated Dialing Plan (CDP)
- hybrid, which is a combination of ESN and CDP

 **Note:**

NMS does not support another dialing plan, such as PSTN.

---

## Dialing plans and NMS user locations

The dialing plan that is used can affect the flexibility of configuring the user locations in an NMS network. A user location is a logical grouping of mailboxes. A user location can be the mailboxes on one switch or the mailboxes on two or more switches.

---

## ESN dialing plan

If the ESN dialing plan is used, there must be a one-to-one correspondence of switch locations to user locations.

---

## CDP dialing plan

If the CDP dialing plan is used, there are two ways to define the correspondence of switch locations to user locations:

- a one-to-one correspondence
- an all-to-one correspondence

---

### Define one switch location as one user location

Typically, each switch location is represented by a user location. If this is done, ensure that there are no conflicts. For example, the same extension cannot exist on two different switch locations. Configuration of satellite-switch locations, and the configuration of phantom DN's for services at all locations are simplified. However, defining one user location means that the spoken name for each individual location is lost.

---

### Define two or more switch locations as one user location

By defining two or more switch locations as one user location, you do not have to check for conflicts. With this option, you can maximize the number of users supported. You can combine all switch locations into one user location, or you can combine some switch locations into one user location.

---

### How two or more switch locations are combined into one user location

When implementing NMS, if each switch location is a user location, on CallPilot you add and configure each satellite-switch. However, each switch is configured individually. To combine two or more switch locations into a single user location, you add and configure only one satellite-switch location. The CDP steering codes for the switch locations are added to a single list. Note, however, that a switch location can have a maximum of 500 CDP steering codes. If, by defining a single user location, you require more than 500 CDP steering codes, you cannot use this option. If a CDP dialing plan is used, the CDP code must overlap the mailbox number sufficiently.

---

## Hybrid dialing plan requirements

If a hybrid dialing plan is implemented in the NMS network, the following requirements must be met:

- All switches must support ESN and have ESN prefixes.
- The prime switch must support both ESN and CDP.
- CDP can exist on any satellite-switches.
- The general restrictions that apply to CDP also apply to CDP when used in a hybrid dialing plan.

If all CDP switches share the same ESN prefix, configure the prime switch to represent all of the switches that are part of CDP. If each CDP switch has its own ESN prefix, or prefixes, create a location for each ESN switch in the network. That is, group the switches by ESN prefixes.

---

## Implementing NMS

This guide assumes that the following preliminary requirements are met:

- The prime switch is installed and configured.
- The satellite-switches are installed and configured.
- CallPilot is installed and configured, except for NMS.
- Sufficient trunks connecting the prime switch to a public switch are available.
- If the implementation is an upgrade from Meridian Mail, all legacy information is available.

The main steps in the implementation process are:

1. Configure the local CallPilot server.
2. Configure the prime switch locationCallPilot.
3. Configure the satellite the switch locations.

NMS configuration consists of adding information about the Meridian Application Server, the prime switch location, and all satellite-switch locations to the database. NMS provides the same CallPilot services to users on satellite-switches that are available to users on the prime switch. NMS provides these services transparently. That is, users receive the same services without having to enter any additional numbers, regardless of which switch they are on. To provide these services, the switches and the server in the NMS network must be carefully configured.

---

## Configuring the local CallPilot server

When you configure the local CallPilot server for NMS, you add inbound SDN information to the SDN Table for all services provided by all switch locations.

---

### SDN Table

Although the Service Directory Number (SDN) Table on the Meridian Application Server is already set up and configured, you must make additions to the table for NMS after configuring the phantom DNs and ACD queues on the satellite-switch locations.

To enter a satellite-switch SDN, you must know the phantom DNs and ACD-DNs that are set on the satellite-switch, and the location codes of the switch in the dialing plan. Usually (for example, if an ESN dialing plan is used) the phantom DNs on the satellite-switches are numbered the same as those on the prime switch.

The SDN Table on the CallPilot server contains the SDNs that correspond to the phantom DNs, CDNs, and dummy ACD queues of both the satellite-switch locations and the prime switch location.

---

### Services not in the SDN Table

All directly dialed services, such as Express Messaging, must have a corresponding entry in the SDN Table. However, Call Answering services do not have an entry and are treated as a special case. These services do not have an entry because the number dialed (for example, a user's telephone number) is not in the SDN Table. Because the dialed number is not found, the CDN used to route the call to CallPilot is used to determine the appropriate type of call answering service to start.

The CDNs are the prime switch CDNs, even for call answering calls from satellite locations. Typically, two CDNs are used. One CDN is for call answering with the Multimedia Messaging service configured against it, with the media type set to Voice. The second CDN is for voice and fax call answering with the Multimedia Messaging service configured against it, with the media type set to Fax. A result of this configuration is that even if fax call answering is used only on satellites, a corresponding CDN queue and SDN entry for Multimedia (fax media) must be configured.



**Note:**

For detailed information on SDNs and SDN Tables, consult the relevant sections in this guide and in the CallPilot Manage online Help.

---

## Configuring the prime switch location

The prime switch provides the call handling services required by NMS. All requests for services from the satellite-switch locations are forwarded to the prime switch location.

---

## Determine the CDNs and the phantom DNs on the prime switch

When you configure the prime switch location for NMS, you complete the required information on the Messaging Network Configuration—Prime Location Properties page. Configuration consists of providing general information about the switch location, such as name and server type, as well as detailed information about the dialing plan used.

---

## Phantom DNs

While some services are accessed by directly dialing a CDN, many services are accessed by dialing a phantom DN. A phantom DN forwards incoming calls to a controlled directory number (CDN) for further call handling. A phantom DN is created for each service offered by the switch. This ensures that each CallPilot service has a unique number that users dial. For example, a user dials 8000 to access Express Messaging and 7040 to access Fax Item Maintenance. Phantom DNs must exist for both services.

---

## Configuring the satellite-switch locations

When you configure a satellite-switch location, you complete the required information on the Messaging Network Configuration—Server Properties page. Configuration consists of providing general information about the switch location, such as name and server type, as well as detailed information about the dialing plan used.

You must configure the phantom DNs and ACD queues on the satellite-switch locations. After adding a phantom DN for a satellite-switch, you must add an entry to the SDN Table on the CallPilot server.

The administrators of the satellite-switches must know the phantom DNs used on the prime switch. Ensure that every administrator has a complete and accurate list of the phantom DNs and the services they provide.

---

## Upgrading an existing satellite-switch

The configuration of satellite-switches for NMS in CallPilot is different from the configuration for Meridian Mail. Meridian Mail uses dummy ACD-DNs, instead of phantom DNs, to forward a call to another ACD-DN on a satellite-switch. These ACD-DNs forward to ACD-DNs for Meridian Mail on the prime switch. If you are upgrading an existing system, you must decide how to configure the satellite-switches. You can either reuse the existing legacy configuration or reconfigure the system.

To continue to use the dummy ACD-DNs instead of phantom DNs with CallPilot, make sure that the ACD-DN that is forwarded to is, in turn, configured to night call forward to the CDN on the prime switch, specified in network format.

You can also upgrade the existing dummy ACD-DNs and replace them with phantom DNs. Remove the unused dummy ACD-DNs.

---

## Satellite switch location SDNs

The dialing plan prefix distinguishes the SDNs for satellite-switch locations from the SDNs for the prime switch location. If an ESN dialing plan is used, the satellite-switch location SDN entries do not include the ESN access code. Only the location code is required. For example, if the ESN access code is 6, the location code is 339, and the DN is 8000, enter 3398000 for the service in the SDN Table.

---

## Satellite switch location phantom DNs

The phantom DNs of the satellite-switch location are separately defined on the satellite-switch. With phantom DNs, users on the satellite-switch can dial a local number rather than using the prime switch phantom DNs with a prefix. For example, a user enters 63388000 for Express Messaging.

Although the satellite-switch locations are installed and set up before you implement NMS, some additional configuration is required, because Satellite switches must forward to the prime switch .

Phantom directory numbers (DNs) are set up on the prime switch. These phantom DNs are used by the switch to route calls to services. Phantom DN forward incoming calls to the appropriate CDN queues on the prime switch for further call handling. By creating a phantom DN for CallPilot services, every service has a unique number that users dial. Some services, such as Integrated Voice and Fax, can be configured to use the CDN numbers directly.

To make the services that are available to users on the prime switch available to users on the satellite-switches, the phantom DN on the satellite-switches must be configured to forward to the ACD queues on the satellite-switch. In turn, the ACD queues on the satellite-switch forward to the CDN queues on the prime switch. Ask the switch technician responsible for configuring the prime switch location for this information.

Add phantom DN for services that you want available at that satellite-switch location.

 **Note:**

You can add additional phantom DN to account for additional services that you plan to implement in the future.

For detailed instructions on how to add a phantom DN to a satellite-switch location, consult the documentation for the switch. The procedures for entering phantom DN on the prime switch are the same as the procedures for entering phantom DN on a satellite-switch.

---

## Dummy ACD-DNs on satellite-switch locations

Every phantom DN that is added to a satellite-switch location must be call-forwarded to the dummy ACD-DN on a satellite-switch. CDNs exist on the prime switch only. Satellite switch locations have dummy ACD-DNs. A dummy ACD-DN forwards a request for a service by a user on the satellite-switch location to a CDN on the prime switch. To provide the service, a dummy ACD-DN forwards the request through a night call forward (NCFW) DN. The NCFW DN determines the CDN to which calls are routed.

---

## Number of dummy ACD-DNs required

The number of dummy ACD-DNs on a satellite-switch location must be the same as the number of CDNs on the prime switch. For example, if there are two CDNs on the prime switch, one for voice and one for fax, there must be two dummy ACD-DNs on each satellite-switch location, one for voice and one for fax.

---

## Switch overlays

 **Note:**

For actual procedures and more information about NMS and switch overlays, see the CallPilot Manager online Help.

Satellite switch locations for NMS are configured on the following overlays:

Task	Overlay
Define a dummy ACD-DN.	23
Configure a phantom DN.	10

---

## Responses to overlay prompts

To program an overlay, you respond to a series of prompts. You must respond to these prompts in a certain way. Any prompt that is not mentioned can be programmed in any way. To accept the default value for other prompts, press Enter. You must know the CDNs and phantom DNs that are used on the prime switch location to configure the phantom DNs and dummy ACD-DNs on the satellite-switch locations.

---

## Define the dummy ACD-DNs

Define a dummy ACD-DN for each media type used. Usually, for each type of CDN on the prime switch, there is a corresponding dummy ACD-DN on the satellite-switch.

If this is on the prime switch	Then this is on a satellite-switch
CDN Media type: Voice	Dummy ACD-DN Media type: Voice
CDN Media type: Fax	Dummy ACD-DN Media type: Fax
CDN Media type: Speech recognition	Dummy ACD-DN Media type: Speech recognition

If a satellite-switch does not provide any of the services provided by a type of CDN queue, it is not necessary to define a dummy ACD-DN. For example, if a satellite-switch does not provide any speech recognition services, a speech recognition dummy ACD-DN is not required.

---

## Setting the dummy ACD-DNs to night call forward

Every dummy ACD-DN must be configured to night call forward to the corresponding CDN on the prime switch location. The forwarding address must be in network format. For example, to night call forward to 63387000,

- ESN access code = 6
- Location code of prime switch = 338
- Voice CDN on prime switch = 7000

By configuring night call forwarding in this way, users on the satellite-switch location can access the CallPilot service by entering the local satellite-switch ACD queue number, 7000. They do not have to explicitly dial the CDN on the prime switch location.

---

## NMS time zone conversions

If Network Message Service is installed on your CallPilot server, and you have switch locations that are in different time zones from the CallPilot server, you can define, for each switch location, the time zone in which the switch is located. This results in time and date stamps on messages and voice prompts to be indicated in the mailbox owner's time zone, instead of in the time zone of the CallPilot server.

---

## Network Message Service description

The Network Message Service (NMS) feature in CallPilot enables your CallPilot system to provide voice messaging services to mailbox owners who reside at different switches. All user mailboxes are located on the CallPilot server. This setup is more cost-effective than installing and running a CallPilot system at each switch location.

Each switch is defined in the CallPilot network database as a switch location that is associated with the CallPilot site. The switch that is directly connected to CallPilot is defined as the prime switch location. All other switches are defined as satellite-switch locations.

---

## Network Message Service operation in multiple time zones

Network Message Service supports mailbox owners residing on switches in different time zones. Prior to CallPilot 2.0, time and date stamps on messages and voice prompts were indicated in the CallPilot server's time zone, without the time zone name. This leads to a situation where, for mailbox owners in time zones to the west of the CallPilot server, time and date stamps are in the future.

---

## CallPilot time zone conversion

When Network Message Service is used in CallPilot, all time and date stamps can be presented to the mailbox owner in his or her switch location's time zone. This is accomplished by specifying the time zone for each local satellite-switch location in the network database. The time zone setting can be set to one of the following:

- CallPilot server's time zone
- switch location's time zone (that is, the satellite-switch location's time zone is different from the CallPilot server's time zone)

 **Note:**

The local prime location automatically acquires its time zone setting from the CallPilot server. On the CallPilot server, the time zone setting is defined in the Control Panel (which is defined when the Configuration Wizard is run).

---

## How time zone conversion affects mailbox owners and administrators

---

### Phonaset users

Phonaset users benefit the most from the time zone conversion feature. All time and date stamps are converted to the time in the phonaset user's time zone.

## Desktop messaging users

There is little impact to desktop messaging users because most desktop messaging clients already convert time and date stamps to the time zone configured on the PC used to access CallPilot messages. The PC must be configured with the correct time zone setting in the Date/Time component of the Windows Control Panel.

Exception: Non-delivery notifications and acknowledgments received by desktop messaging users contain a CallPilot server-generated time and date stamp in the CallPilot server's time zone, with the time zone name.

---

## Web messaging users

For Web messaging users, time and date stamps are presented in the time zone configured on the CallPilot server for the switch location at which the users reside.

---

## CallPilot administrators

Many configuration and administration pages in CallPilot Manager contain a time field that applies to the item being configured or viewed. When Network Message Service is installed, these pages also contain a read-only time zone name field.

In some situations, an administrator can define whether the time is presented to administrators in the server's time zone, or in the mailbox owner's time zone. The options are available only when Network Message Service is installed, and applies to the following:

- User Properties and User Creation:
  - Remote Notification
  - Security
  - Status (for Temporary Absence Greeting expiry)
- Message Network Configuration for the local satellite-switch location

---

## How time zone conversion affects networking recipients

---

### VPIM Networking recipients

VPIM Networking recipients are not affected because time zone information is included during transmission of VPIM Networking messages. Time and date stamps on VPIM Networking messages include the time zone name.

---

### AMIS Networking recipients

The AMIS Networking protocol does not support the inclusion of time information in messages during transmission. The sent and received time and date stamps are always set to the time when the message is received, which is, therefore, presented in the mailbox owner's time zone.

---

### Enterprise Networking recipients

How Enterprise Networking recipients are affected depends on whether the sending and receiving CallPilot systems are Release 2.0 or later.

Enterprise Networking cannot send or receive time zone information if the messaging server is running a release prior to CallPilot 2.0. Therefore, the time zone feature affects only the messages that are transmitted between systems that are running CallPilot Release 2.0 or later.



# Chapter 11: Implementing and configuring Avaya CallPilot® networking

---

## In this chapter

[Overview](#) on page 233

[Configuring the switch using phantom DNS](#) on page 236

[Configuring CallPilot](#) on page 238

[SDN Table and message networking](#) on page 238

[Implementing message networking](#) on page 243

[Message Delivery Configuration parameters](#) on page 244

[AMIS message delivery configuration](#) on page 245

[Enterprise message delivery configuration](#) on page 252

[VPIM message delivery configuration](#) on page 254

---

## Overview

AMIS, Enterprise, and VPIM Networking are the networking solutions offered by Avaya CallPilot.

AMIS Networking uses the industry-standard Audio Messaging Interchange Specification - Analog (AMIS-A) analog protocol to exchange messages with AMIS-compliant systems that are configured in the local network database.

 **Note:**

There are both analog and digital versions of the AMIS protocol, but CallPilot uses only the analog version. Therefore, AMIS refers to AMIS-Analog throughout this guide.

Enterprise Networking uses a proprietary analog protocol that is based on extensions to the AMIS protocol.

VPIM Networking offers the ability to exchange voice, fax, and text messages with other users over an IP data network. Messages can be exchanged with users at integrated sites, which are part of your private messaging network, as well as with users who are at open, VPIM-compliant sites.

The implementation of AMIS, Enterprise, and VPIM Networking requires additional configuration of CallPilot. This configuration determines how your networking solution exchanges messages with other sites in the messaging network.

To implement network messaging you need to:

1. Gather information for the network.
2. Configure the switch for networking. See [Configuring the switch using phantom DNSs](#) on page 236.
3. Configure CallPilot for networking. See [Configuring CallPilot](#) on page 238
4. Add and configure the remote sites. See [Configuring local and remote networking sites](#) on page 265
5. Test the network and back up the system. See the CallPilot Manager online Help.

 **Note:**

The CallPilot Manager online Help provides the actual configuration procedures.

As you plan and implement networking, keep detailed records about your site. These records:

- provide a source of information for support personnel
- share information about the site with other network administrators

---

## See also

If you need conceptual information about the general implementation process, consult [Avaya CallPilot® networking implementation concepts](#) on page 173 in this guide.

---

## AMIS networking

To be universal, AMIS Networking gives up some advanced messaging functionality. Therefore, AMIS Networking does not support some of the advanced features of CallPilot. CallPilot compensates for some of the shortcomings of the AMIS protocol. For example, the AMIS protocol allows only one recipient for a message. Users can send a message to more than one AMIS recipient by sending the message to each recipient in turn.

AMIS Networking can be used to exchange messages with sites that are part of the private messaging network. When a site is included in the private messaging network, it is called an

integrated site. AMIS can also be used to send messages to an open site that is not included in the private messaging network.

When you implement AMIS Networking on a site, you must add information about every integrated remote site that you want to exchange messages with using the AMIS protocol.

---

## Enterprise networking

Enterprise Networking uses a proprietary analog protocol that is based on extensions to the Audio Messaging Interchange Specification (AMIS) protocol. Like the AMIS protocol, the Enterprise Networking protocol uses dual-tone multifrequency (DTMF) tones. Because DTMF is a global standard, Enterprise Networking can be used globally.

The Enterprise protocol typically requires less resource consumption and costs less to operate. For example, when a single message is sent to multiple recipients at the same remote site using AMIS Networking, you make one call for each recipient. With Enterprise Networking, you make only one call.

The Enterprise protocol supports a longer voice message length than AMIS, and Enterprise Networking extensions support additional CallPilot features that are not supported by AMIS Networking.

---

## VPIM networking

VPIM Networking uses Simple Message Transfer Protocol (SMTP) and Multipurpose Internet Mail Extensions (MIME) in compliance with the Voice Profile for Internet Mail (VPIM) standard. VPIM Networking uses existing data networks, not switch networks, to transport messages. The data network must support the TCP/IP protocol. If you have VPIM Networking implemented on your local site, local users can exchange messages not only with other sites within the private messaging network, but also with users at open sites.

---

## NMS

With the Network Message Service (NMS) feature, the CallPilot Server can provide messaging services to users in a network of compliant switches.



for the switch. A phantom directory number (DN) is required. Review the switch information that you gathered. Confirm the settings to ensure that they are correct.

SDNs on the server have a direct correspondence to phantom directory numbers (DNs) on the switch. If you create a new SDN, you need a phantom DN. If you share an existing SDN with an existing service, networking also shares the phantom DN of that service.

There are two ways to create a phantom DN:

- Use a unique phantom DN. Most switch technicians create additional phantom DNs for use by services like AMIS Networking.
- Share an existing phantom DN.

To access a CallPilot service, a user enters a unique dialable number. The dialable number is known as a directory number (DN). There are different types of DNs, including extension numbers and telephone numbers. The switch uses the DN to route the call to the requested service.

All DNs that you use to access a service correspond to a setting on the switch. To handle calls in sequence of arrival, the system places calls in a queue, called controlled directory number (CDN) queues. Each CDN queue is associated with a dialable number known as the CDN. A user can dial the service directly by entering the CDN. For example, the CDN of Voice Messaging is 7400. A user can dial 7400 to reach Voice Messaging. The call is placed into the queue.

To offer multiple services, the switch uses phantom DNs. A phantom DN is a unique dialable number that is routed to one of the CDN queues. A phantom DN is not a randomly selected number. There is a direct correspondence between the local system access number (SAN) and the phantom DN.

---

## Example

If the local system access number for AMIS Networking is 567-7575, the phantom DN is 7575. If AMIS Networking shares an existing phantom DN, check that the phantom DN is configured to forward messages to the correct CDN queue. For AMIS Networking, the phantom DN forwards messages to the Voice Messaging CDN queue.

---

## Example

The phantom DN for Express Messaging is 7401. A user dials 7401 and expects to reach the requested service. The switch routes the phantom DN to the appropriate CDN queue (in this case, Voice Messaging) before the service is provided.

## See also

For detailed information about the configuring the switch, consult your switch documentation.

---

## Configuring CallPilot

The network database contains information about your messaging network. When you configure CallPilot, you add information to the network database. To configure CallPilot for message networking, you must:

- add information to the Service Directory Number (SDN) Table
- define networking information in the Message Delivery Configuration pages
- add detailed information in the Message Network Configuration pages about the local site: information about how the server handles messages and how the switch handles messages
- add detailed information in the Message Network Configuration pages about each integrated remote site that communicates with the local site

---

## SDN Table and message networking

On the server, you must set up inbound and outbound service directory numbers (SDNs). With a service directory number (SDN), a user can access a CallPilot service. Each SDN must be unique (except for one exception where SDNs can share a CDN) so that CallPilot can identify the requested service and play the appropriate prompts.

The system automatically creates the Service Directory Number Table during the initial installation of CallPilot. The SDN Table lists all SDNs and provides details about their settings. CallPilot uses the SDN Table to map directory numbers (DNs) to services. The SDN Table lists both inbound and outbound SDNs. You must manually add an inbound SDN. An outbound SDN is created automatically if networking is installed.

For most services, an inbound SDN is a number that a user enters to access a service. However, the message networking inbound SDN is not a directly dialable number. A remote system dials this SDN when it delivers a networking message.

CallPilot uses an outbound SDN to make the requested service available. An outbound SDN consists of the word OUTBOUND and a number.

## Example: SDN Table

The following image shows an SDN Table that lists both inbound and outbound SDNs.

#	Service DN	App Name	Media Type	Min Channels	Max Channels	Comments
1	540	Voice Messaging	Voice	0	Default Max.	
2	541	Express Fax Messaging	Fax	0	Default Max.	
3	OUTBOUND10	AMIS Networking	Voice	0	Default Max.	
4	OUTBOUND11	Remote Notification	Voice	0	Default Max.	
5	OUTBOUND15	Multi-delivery to Fax	Fax	0	Default Max.	
6	OUTBOUND18	Desktop Telephony Agent	Voice	0	Default Max.	
7	OUTBOUND23	SCCS VPE	Voice	0	Default Max.	
8	OUTBOUND25	Conferencing Outcalling	Voice	0	Default Max.	
9	OUTBOUND55	Enterprise Diagnostics	Voice	0	Default Max.	
10	OUTBOUND6	Admin Agent	Voice	0	Default Max.	
11	OUTBOUND7	Delivery To Telephone	Voice	0	Default Max.	
12	OUTBOUND8	Delivery To Fax	Fax	0	Default Max.	
13	OUTBOUND88	SCCS IVR	Voice	0	Default Max.	
14	OUTBOUND9	Enterprise Networking	Voice	0	Default Max.	
15	OUTBOUNDMAS1	MWI Application	Voice	0	Default Max.	VTG MWI Application
16	OUTBOUNDMAS26	MASCPD	Voice	0	Default Max.	SDN reserved for CPTD tools
17	OUTBOUNDMAS99	MWI Application	Voice	0	Default Max.	Matra MWI indications

Figure 30: SDN Table

## Creating an SDN

The following image shows the System, Service Directory Number, SDN Details page where you can create an SDN.

# Implementing and configuring Avaya CallPilot® networking

**Home** **User** **System** **Maintenance** **Messaging** **Tools** **Help**

Location: System > Service Directory Number > SDN Details

**SDN Details: 3669**

Save Cancel Print Help

**General**

Service DN: 3669

Application Name: Voice Form Transcription Service

Media Type: Voice

Minimum Channels: 0

Maximum Channels:  Use Default

Remote Activation Password: \*\*\*\*\*

Password Confirmation: \*\*\*\*\*

Comments:

Ring-back type: USA

**Session Profile**

Session Time Limit: 10 minutes

Maximum Invalid Password Entries: 10

Act on AMIS/Enterprise Networking Tone:

Voice Form: Application form

Mailbox Number:

Language: English(American)

SDN Overrides Mailbox Class:

**Fax Settings**

Fax Selections:

Maximum Number: 5

Page Limit for Fax Items: 40

Sender Fax Number:

Sponsor Fax Item:   Browse...

Billing DN:

Page Transmission Error Handling: Continue

Fax Delivery Options: Callback

**Cover Sheet**

Automatic Cover Sheet:

Name and Address to Display:

Cover Page Background:   Browse...

**Callback Handling**

Callback Extension Prompt:

Treat Callback Number As: National

Callback Dialing RPL: On Switch

Save Cancel Print Help

Figure 31: SDN Details page

---

## SDN numbers

An SDN must be unique, but it is not randomly selected. CallPilot uses SDNs to map numbers to services. There are also important relationships between the SDN and other numbers used by the system.

The CallPilot SDN setup echoes the DN settings on the switch. An important relationship exists between the inbound SDN and the local system access number (SAN), and the phantom DN on the switch.

---

## Example

- The inbound AMIS Networking SDN = 7400.
- The phantom DN for AMIS Networking = 7400.
- The AMIS Networking local SAN = 1-416-597-7400.

The AMIS inbound SDN on CallPilot must correspond to the AMIS phantom DN on the switch. Before you create an SDN, confirm the phantom DN on the switch. To view the phantom DN setting, consult the gathered switch information.

---

## Media type

To process a call, networking needs access to a channel. A channel provides a connection between the switch and the Digital Signal Processor (DSP) cards on the CallPilot server. CallPilot supports three channel types. Each type corresponds to different media:

- voice
- fax
- speech recognition

Networking can use all three channel types. By default, CallPilot automatically assigns a voice port to networking.

---

## Minimum and maximum channels

You must determine the channel resources for both inbound and outbound networking SDNs. Every service, including networking, requires channel resources to process calls. Channel

resources are the number of channels that networking has available. Channel resources are set as minimum and maximum values. The minimum value is the number of channels that is always reserved for the exclusive use of the service. This setting is important because, if you incorrectly allocate channel resources, users can experience delays in reaching requested services.

---

## **Example: Channel allocation**

Your system has 96 available channels. You decide to dedicate a minimum of 5 channels and a maximum of 30 channels to networking. If the system handles only 5 networking calls each day, a more appropriate allocation is a minimum of 1 channel and maximum of 3 channels.

---

## **Example of unique SDN used with Enterprise networking**

Joy wants to send a message to Howard in Philadelphia. She enters 7070, which is directed to the SDN for Integrated Voice/Fax. The request is directed to CallPilot, which routes it to the outbound Enterprise Networking SDN. The system in Chicago calls the remote SAN of the system in Philadelphia, 63386080, and the two systems complete the required handshaking before the message is transferred. The inbound Enterprise Networking SDN receives the message and directs it to Howard's mailbox.

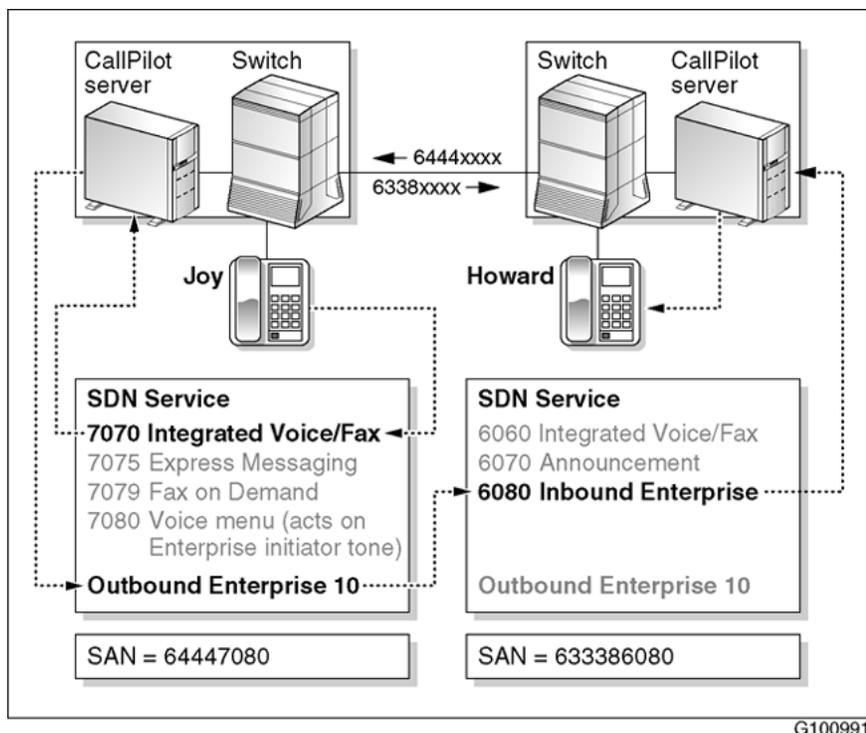


Figure 32: Unique SDN used with Enterprise networking

**\* Note:**

Each SDN must be unique (except for one exception where SDNs can share a CDN). For example, AMIS/Enterprise can be shared with a Voice Messaging SDN because a special tone identifies the switching service.

## See also

For detailed information on SDNs and SDN Tables, consult the CallPilot Manager online Help.

## Implementing message networking

The following assumptions are made:

- The switch is installed and configured.
- Sufficient trunks that connect the switch to a public switch are available.
- CallPilot is installed and configured, except for networking.

- If it is part of the local site, Network Message Service (NMS) is fully implemented.
- If implementation is an upgrade from Meridian Mail, all legacy information is available or is migrated.
- Contact is made with the network administrators of the remote sites.
- Information is collected from at least one remote system that communicates with the local system. This information is used to test the system.

The implementation of each networking solution builds upon earlier implementations. Information is often configured only once, and all subsequent networking solutions that are implemented use this configuration.

The recommended order for implementation is

- Network Message Service (NMS)—if the local site is an NMS site
- AMIS Networking
- Enterprise Networking
- VPIM Networking

---

## Message Delivery Configuration parameters

You set networking parameters during the implementation process. These parameters work with internal CallPilot settings to control how networking works.

The actual procedures for configuring message networking are detailed in the CallPilot Manager online Help. The following is an overview of the required information.

---

## Parameter default values

CallPilot provides default settings for all scheduling parameters. The default values are based on typical requirements. To ensure a quick implementation process, use these default values. After your system is operational, monitor usage to determine if the default settings are serving the needs of your users. You can modify the scheduling parameters whenever users' needs change.

---

## Defaults

CallPilot provides default settings for the message delivery configuration. The default values are based on typical requirements.

To simplify the process of implementing networking, use the default values. After your system is operational, monitor usage and performance to determine if the default settings are sufficient. You can modify the settings whenever users' needs change.

Parameter	Current default
Batch threshold	4 messages
Stale time for standard messages	2 hours
Holding time for standard messages	40 minutes (calculated internally, based on stale time settings)
Stale time for urgent messages	60 minutes
Holding time for urgent messages	6 minutes (calculated internally, based on stale time settings)
Stale time for economy messages	24 hours
Delivery start time for economy messages	6:00 p.m.
Delivery stop time for economy messages	8:00 a.m.

---

## AMIS message delivery configuration

The following message delivery parameters are available for AMIS networking.

As you configure the AMIS Networking message delivery information, you see several boxes for configuring Open AMIS. If users at the local site exchange messages with open sites, you must configure the Open AMIS boxes.

You must complete all Open AMIS fields when you configure AMIS Networking.

---

## Outgoing and incoming AMIS

If AMIS Networking is installed on your system, the following options are enabled by default:

- Outgoing AMIS Networking
- Incoming AMIS Networking

These boxes restrict the use of AMIS Networking.

If you do not want local users to send outbound AMIS Networking messages, clear the Outgoing AMIS Networking option. If you do not want local users to receive inbound AMIS Networking messages, clear the Incoming AMIS Networking option. To completely disable AMIS Networking, clear both options.

---

## Number of Messages to Collect Before Sending (Batch threshold)

The batch threshold is the number of standard and urgent messages that are held in queue waiting for delivery to a single remote site. When you send messages in batches, you make more efficient use of system resources. However, to ensure that messages awaiting delivery are not held too long in the queue, the holding time overrides the batch threshold. A message is held in a batch until either the batch threshold is exceeded or the holding time for standard or urgent messages is reached.

---

## Holding time

Holding time is the period of time that a message is held in queue before CallPilot attempts delivery. CallPilot holds a message in queue while it awaits the arrival of more messages for the same destination. This bulk sending makes more efficient use of the system.

To ensure that messages are always delivered in a timely fashion and do not wait too long for the arrival of additional messages, they are held only for a set period of time. This is the holding time. CallPilot computes the holding time internally, based on the stale time.

---

## Standard message holding time

The holding time for standard messages is one-third of the stale time for standard messages.

---

## Urgent message holding time

The holding time for urgent messages is one-tenth of the stale time for urgent messages.

---

## Example 1

Milo sends a standard message. The message is held in the queue awaiting the arrival of three more messages. However, when the message has waited in queue for 40 minutes (the holding time for standard messages), the message is sent.

---

## Example 2

Ronnie and Philippe are users at the same site. Ronnie sends three standard messages for users at the remote site in Newmarket. Her messages are held in the queue. Philippe sends a message to a user at the same remote site. The batch threshold is reached, and all four messages are sent.

---

## Example 3

Barney sends an urgent message. It is held in queue. No other messages for the same remote site arrive within six minutes (the holding time for urgent messages). Barney's urgent message is sent.

---

## Open AMIS compose prefix

If users are exchanging messages with open sites, provide the Open AMIS compose prefix. This number alerts the system that the number about to be entered is an Open AMIS address. The Open AMIS compose prefix must not conflict with any other prefixes used in the system, such as the name dialing prefix or the VPIM prefix.

---

## Example

A local user logs in to CallPilot and enters 75 to compose a message. The user enters the AMIS compose prefix (in this example, 13). The system is alerted that this is an AMIS address. To complete the address, the user enters the system access number and the mailbox number, followed by #.

## Define Open AMIS delivery times

If local users send AMIS Networking messages to sites that are not part of the messaging network, you must define the Open AMIS delivery times. Open AMIS delivery times determine how AMIS Networking messages are handled during business and nonbusiness days. In some countries, these settings have legal ramifications.

Open AMIS Networking messages are considered computer-generated calls. Because they are sent to recipients who are not part of the private messaging network, there is a risk of disturbing the wrong recipient. For this reason, many countries legally allow computer-generated calls only during set times of the business day.

If your country has these regulations in place, configure the Open AMIS delivery times. If your country does not have these regulations, or if your local site does not send AMIS Networking messages to sites that are not part of the messaging network, do not configure the Open AMIS delivery times.

The legal AMIS delivery times must not conflict with the economy delivery start and stop times. The economy delivery start and stop times must always fit within the legal delivery times.

Parameter	Default
Business days	Monday, Tuesday, Wednesday, Thursday, Friday
Nonbusiness days	Saturday, Sunday
Business day hours	9:00 a.m.-5:00 p.m.
Nonbusiness hours	5:00 p.m.-9:00 a.m.

## Example

If it is legal to send computer-generated messages only between 9:00 p.m. and 1:00 a.m., the economy delivery times cannot be set to 6:00 p.m. and 6:00 a.m. In this example, the economy delivery time must be set within the legal hours (for example, 9:30 p.m. and 12:30 a.m.).

## Local AMIS System Access Number

The destination system uses the local system access number (SAN) to identify the source system of the message. The system access number is included in the header of all outgoing messages. When a recipient of an AMIS Networking message uses the Reply feature or its

equivalent to contact the originator of the message, the caller uses the system access number to send a reply to the originating system.

You can use two types of local system access number:

- **Public network access number** You need this type of local system access number if you use AMIS Networking to send messages to remote sites outside of your private messaging network.
- **Private Network access number** You need this type of local system access number if you use AMIS Networking only to send messages within your private network.

The public network access number consists of the following:

- the country code of the local site (up to four digits long)
- the area/city code of the local system (up to eight digits long)
- the directory number of the voice service (the exchange code and the directory number) that accepts AMIS Networking calls

---

## Example

The country code is 1, the area/city code is 416, and the number to send an outbound AMIS Networking message is 5553653. The system access number sent with the message consists of 14165553653.

 **Note:**

The actual system access number in the header is 1#416#5553653. The system inserts the pound (#) symbols.

The private network access number is made up of the dialing plan prefix and the SDN for AMIS Networking (for example, the ESN prefix 6338, and the SDN 7707). The private system access number must be dialable from all sites in the messaging network. The use of a private network access number is uncommon.

---

## Economy Delivery (Eastern Time)

An economy message is a message that a user tags for economy delivery. Economy messages are treated differently from standard and urgent messages. Economy messages are collected through the day and sent only during designated times, rather than held in queues. The delivery start and stop times determine when the system sends economy messages to their destinations. Economy messages often have a start time set to the beginning of lower-rate telephone services, and a stop time set to the resumption of regular rates. For example, if the

telephone rate is lower between 11:00 p.m. and 6:00 a.m., set the start time at 11:00 p.m. and the stop time at 5:59 a.m

Set delivery times for economy messages in the following boxes:

- Open AMIS Start Time
- Open AMIS Stop Time
- Integrated AMIS Start Time
- Integrated AMIS Stop Time

---

## Example

At 8:00 a.m., Marge sends an economy message to a remote site. The message is held in queue until the economy delivery start time. The message is held in queue for a total of 16 hours. The economy message stale time is large enough to take this into account.



**Note:**

You can adjust the economy delivery start and stop times if you also configure the Open AMIS delivery times.

The AMIS economy delivery start and stop times must have some overlap with Open AMIS delivery times for both business and nonbusiness days. If there is no overlap, delivery is not attempted. Allow at least one hour of overlap to allow for retries.

---

## Example

It is legal to send computer-generated messages only between 8:00 p.m. and 1:00 a.m. on business days, and between 10:00 a.m. and 8:00 p.m. on nonbusiness days. The economy delivery times are set to between 6:00 p.m. and 6:00 a.m. The economy messages are delivered only between 6:00 p.m. and 1:00 a.m. on business days, and between 6:00 p.m. and 8:00 p.m. on nonbusiness days.



**Note:**

The stale times for economy messages, if altered from the default values, allow for the maximum noneligible time period. For this example, therefore, on nonbusiness days allow for 8:00 p.m. to 6:00 p.m. the following day, plus one hour for retries (that is, 23 hours).

---

## Stale Times

Stale time is the period of time that CallPilot holds an undelivered message before it considers the message undeliverable and returns it to the sender with a non-delivery notification (NDN). In the period before a message is considered stale, CallPilot makes repeated attempts at delivery. You set stale times independently for economy, standard, and urgent messages. Typically, the stale time for a standard message is longer than the stale time for an urgent message, because it can be critical for a user to know that an urgent message was not delivered. Stale time is expressed as a time period, such as 10 minutes or 5 hours.

---

## Economy Open AMIS

Set a stale time for economy Open AMIS messages if local users send AMIS Networking messages to open sites.

---

## Economy Integrated AMIS

The economy delivery stale time is usually longer than the standard and urgent stale times. It is expressed as a time period, such as 23 hours. To calculate an appropriate stale time, you must consider other scheduling parameters. The economy stale time that you set must allow for the length of time a message can be held due to the settings for the economy delivery start and stop times.

The default economy delivery stale time is 23:59 (hh:mm).

**Important:**

Avaya strongly recommends that you use the default.

---

## Example

If an economy message can only be delivered starting at 6:00 p.m., and an economy message is sent at 8:00 a.m., the stale time must be at least 10 hours. If an hour is allowed for retries, then the minimum stale time is 11 hours.

Stale times affect how long messages are held by CallPilot while waiting for other messages to the same remote site. CallPilot uses stale time settings to calculate holding times.

---

## Standard

For standard messages, the holding time is one-third of the stale time. For example, if you set the standard stale time to 6 hours, the standard message holding time is automatically set to 2 hours.

---

## Urgent

For urgent messages, the holding time is one-tenth of the stale time. For example, if you set the urgent stale time to 30 minutes, the urgent message holding time is automatically set to 3 minutes.

---

## Remote Contact: AMIS

Set time values for the following parameters:

- Wait Before Sending C DTMF Tone
- Delay for each Pause Character in DN
- Delay for each Non-Pause Character in DN

The Delay Character is a default value.

---

## Enterprise message delivery configuration

You must configure various message delivery settings when you implement Enterprise Networking. Determine these settings in cooperation with the network administrators of all sites. The settings must be decided on before any site is implemented.

---

## Outgoing and incoming Enterprise networking

If Enterprise Networking is installed on your system, the following options are enabled by default:

- Outgoing Enterprise Networking
- Incoming Enterprise Networking

These boxes restrict the use of Enterprise Networking.

If you do not want local users to send outbound Enterprise Networking messages, clear the Outgoing Enterprise Networking option. If you do not want local users to receive inbound Enterprise Networking messages, clear the Incoming Enterprise Networking option. To completely disable Enterprise Networking, clear both options.

---

## Number of Messages to Collect Before Sending (Batch threshold)

This message delivery parameter is the same for AMIS and Enterprise. see [Number of Messages to Collect Before Sending \(Batch threshold\)](#) on page 246 for detailed information.

---

## Economy Delivery (Eastern Time)

This message delivery parameter is the same for AMIS and Enterprise. see [Economy Delivery \(Eastern Time\)](#) on page 249 for detailed information.

---

## Stale Times

This message delivery parameter is the same for AMIS and Enterprise. see [Stale Times](#) on page 251 for detailed information.

## Remote Contact: Enterprise

Set time values for the following parameters:

- Wait Before Sending C DTMF Tone
- Delay for each Pause Character in DN
- Delay for each Non-Pause Character in DN

The Delay Character is a default value.

---

## VPIM message delivery configuration

You must configure various message delivery settings when you implement VPIM Networking. Determine these settings in cooperation with the network administrators of all sites. The Message Delivery Configuration page is shown on page [Message Delivery Configuration parameters](#) on page 244.

---

## SMTP/VPIM section

---

### Incoming SMTP/VPIM

Check this option to allow CallPilot to receive messages from other systems using VPIM Networking. To prevent the server from receiving messages from any remote systems, clear this option. This option is checked by default, and must be enabled if you want to allow users to send messages with desktop messaging. The Outgoing SMTP/VPIM option applies to VPIM Networking only and does not affect desktop messaging.

---

### Outgoing SMTP/VPIM

Check this option to allow CallPilot to send messages to integrated and open remote systems using VPIM Networking. To prevent the server from sending messages to any remote systems, clear this option. This option is checked by default.

---

## Outgoing SMTP Mail/Proxy Server

Type the fully qualified domain name (FQDN) for the server to route outgoing messages through an e-mail or proxy server. The maximum length is 255 alphanumeric characters and the default port number is 25. To change the port number, type a colon after the FQDN, followed by the port number.

---

## Fixed message delivery parameters

- Stale Times is set to 48 hours.
- Number of Messages to Collect Before Sending (Batch threshold) is set to 1.
- Economy Delivery is set to 24 hours (all day).

---

## Security and Encryption Modes for SMTP Sessions

The following section deals with the security and encryption options you can set for VPIM SMTP sessions.

For additional information on CallPilot security and encryption techniques and options, see [Security and encryption](#) on page 295.

---

## Security Modes for SMTP Sessions section

Click Security Modes for SMTP Sessions to display the following page.

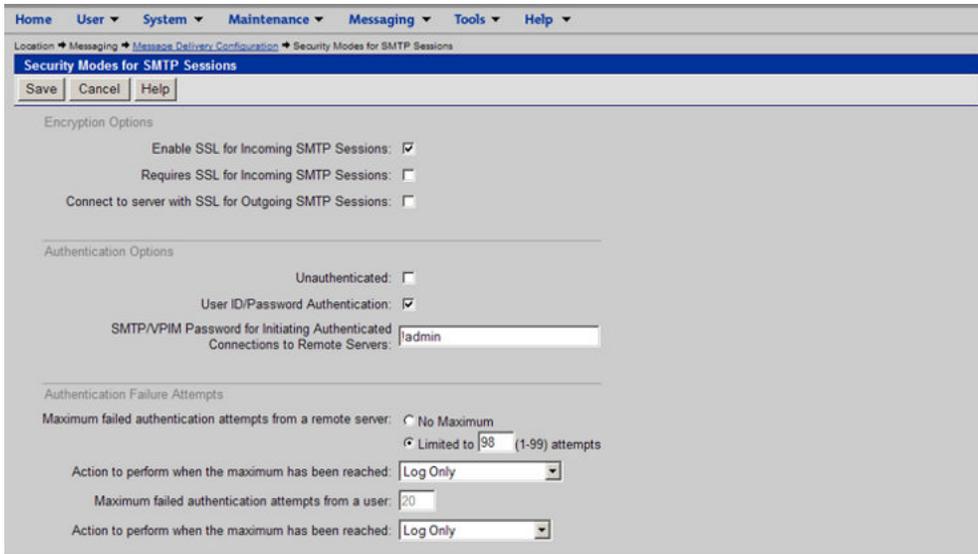


Figure 33: Click Security Modes for SMTP Sessions

---

## Encryption Options section

---

### Enable SSL for Incoming SMTP Sessions

Choose this option if you want to establish secure connections with incoming connecting SMTP hosts. When enabled, the CallPilot SMTP server listens on port 465 for encrypted connection requests. This option is cleared by default.

---

### Requires SSL for Incoming SMTP Sessions

Choose this option if you want the CallPilot server to force all clients to use the SSL connection when connecting using a specific protocol. All incoming SMTP connections must use SSL or the system rejects the connection.

---

### Connect to server with SSL for Outgoing SMTP Sessions

Choose this option if you want to encrypt outgoing VPIM Networking message transmission sessions. When enabled, the CallPilot SMTP server attempts to initiate secure connections

with the SSL port on remote SMTP hosts. This option is cleared by default. If the Enable SSL for incoming SMTP Sessions check box is cleared, this option is not available.

---

## Authentication Options section

---

### Unauthenticated

Choose this option if you want to accept messages from desktop messaging and My CallPilot clients and remote servers in your messaging network without SMTP authentication. This option is checked by default. When checked, CallPilot accepts messages from unauthenticated desktop messaging and My CallPilot users and remote servers. If unauthenticated mode is used, Avaya recommends that you also enable unauthenticated access restrictions for servers and desktop messaging users.

---

### User ID/Password Authentication

Choose this option if you want CallPilot to request SMTP authentication using the User ID and Password algorithm. This option is cleared by default. Avaya recommends that you also enable encryption to prevent password transmission in the clear.

---

### SMTP/VPIM Password for Initiating Authenticated Connections to Remote Servers

If authentication is used, type the password that CallPilot sends when initiating outgoing message transmissions to remote servers. A blank password means that CallPilot does not attempt to perform SMTP authentication when connecting to remote servers. The password must:

- contain a minimum of 6 characters
- be mixed uppercase and lowercase
- contain both letters and digits or special characters
- have a maximum length of 30 alphanumeric characters

---

## Authentication Failure Attempts section

---

### Maximum failed authentication attempts from a remote server

Type a number to identify how many times a remote server can fail SMTP authentication before an event is logged. Default: 4

---

### Action to perform when the maximum is reached

Choose one of the following options:

- Log only: To report an event in the event log only.
- Log and Disable Server: To report an event in the event log and disable incoming message receipts from the server that failed SMTP authentication. This option is enabled by default. When the remote server is disabled, CallPilot rejects all incoming VPIM messages from that server (both authenticated and unauthenticated). This prevents hackers from trying all the possible password combinations, and eventually obtaining the correct password. If unsuccessful authentication attempts continue, CallPilot reports an event for each time the maximum number of failed attempts is exceeded.

---

### Maximum failed authentication attempts from a user

This option identifies how many times a desktop messaging or My CallPilot client can fail SMTP authentication before an event is logged. The default is 9 (it can be changed on the Security page).

---

## Action to perform when the maximum is reached

Choose one of the following options:

- Log only: To report an event in the event log only.
- Log and Disable User: To report an event in the event log and disable the mailbox belonging to the desktop messaging or My CallPilot user that failed SMTP authentication. This option is enabled by default. When the user's mailbox is disabled, CallPilot rejects the following from the user:
  - all attempts to log on to the mailbox (including logon attempts from a phoneset)
  - all incoming VPIM messages from a desktop messaging or My CallPilot client that is configured as belonging to the user.

This prevents hackers from trying all the possible password combinations, and eventually obtaining the correct password. If unsuccessful authentication attempts continue, CallPilot reports an event for each time the maximum number of failed attempts is exceeded.

---

## Unauthenticated Access Restrictions

Click Unauthenticated Access Restrictions to display the following page. UARs are used to restrict the capabilities of desktops or servers who use an unauthenticated SMTP login to send messages to CallPilot.

Home User System Maintenance Messaging Tools Help

Location > Messaging > Message Delivery Configuration > Unauthenticated Access Restrictions

### Unauthenticated Access Restrictions

Save Cancel Help

Unauthenticated Desktop User Restrictions

Delivery to Telephone or Fax:

Enable Open AMIS:

Enable Integrated Networking:

Enable SDL Addressing:

Enable Broadcast Addressing:

Restrict Recipients:

Maximum Recipients:

Unauthenticated Server Restrictions

Enable SDL Addressing:

Enable Broadcast Addressing:

Restrict Recipients:

Maximum Recipients:

Save Cancel Help

Figure 34: Unauthenticated Access Restrictions

---

## Unauthenticated Desktop User Restrictions section

---

### Delivery to Telephone or Fax

Choose this option if you want to allow desktop messaging and My CallPilot users to send Delivery to Telephone (DTT) or Delivery to Fax (DTF) messages. When checked, users are still constrained by the desktop restriction/permission list and their own mailbox class restrictions. This option is cleared by default.

---

### Enable Open AMIS

Choose this option if you want to allow desktop messaging and My CallPilot users to address messages to open AMIS sites. When checked, users are still constrained by the desktop restriction/permission list and their own mailbox class restrictions. This option is cleared by default. If AMIS Networking is not enabled on CallPilot, this option is not available.

---

### Enable Integrated Networking

Choose this option if you want to allow desktop messaging and My CallPilot users to address messages to users at integrated sites. When checked, users are still constrained by the desktop restriction/permission list and their own mailbox class restrictions. This option is enabled by default.

---

### Enable SDL Addressing

Choose this option if you want to allow desktop messaging and My CallPilot users to address messages to shared distribution lists. When checked, users are still constrained by their own mailbox class restrictions. This option is cleared by default.

---

## Enable Broadcast Addressing

Choose this option if you want to allow desktop messaging and My CallPilot users to address messages to location broadcast or network broadcast addresses. When checked, users are still constrained by their own mailbox class restrictions. This option is cleared by default.

---

## Restrict Recipients

Choose this option if you want to limit the number of recipients that a message from a desktop messaging or My CallPilot user can contain. This prevents hackers from copying the contents of a large address book into the recipient list. The limit applies to all recipients within the message, including recipients in nested messages. This option is cleared by default. When cleared, you can have messages that contain any number of recipients.

---

## Maximum Recipients

Type a number to identify how many recipients the message can contain in each of the TO, CC, and Blind CC recipient lists. CallPilot enforces the limit separately for each address list. For example, if the limit is defined as 100, the user can enter 100 addresses in each of the TO, CC, and Blind CC recipient lists. If any recipient list exceeds this limit, CallPilot rejects the entire message and sends a non-delivery notification (NDN) to the user. Range: 0 (no restrictions on the number of recipients) to 999 (maximum of 999 recipients). The default is 10.

---

## Unauthenticated Server Restrictions section

---

## Enable SDL Addressing

Choose this option if you want CallPilot to accept messages from remote servers that are addressed to shared distribution lists. This option is cleared by default. When cleared, CallPilot rejects messages addressed to shared distribution lists and sends non-delivery notifications (NDNs) to the senders.

---

## Enable Broadcast Addressing

Choose this option if you want CallPilot to accept messages from remote servers that are addressed to location broadcast or network broadcast addresses. This option is cleared by default. When cleared, CallPilot rejects messages addressed to broadcast addresses and sends non-delivery notifications (NDNs) to the senders. You can also block incoming network broadcasts from a specific network site or all sites in the network database. This capability is in addition to the SMTP authentication feature. See Network and location broadcasts.

---

## Restrict Recipients

Choose this option if you want to limit the number of recipients that a message from a remote server can contain. This prevents hackers from copying the contents of a large address book into the recipient list. The limit applies to all recipients within the message, including recipients in nested messages. This option is cleared by default. When cleared, you can have messages that contain any number of recipients.

---

## Maximum Recipients

Type a number to identify how many recipients the message can contain in each of the TO, CC, and Blind CC recipient lists. CallPilot enforces the limit separately for each address list. For example, if the limit is defined as 100, the sender can enter 100 addresses in each of the TO, CC, and Blind CC recipient lists. If any recipient list exceeds this limit, CallPilot rejects the entire message and sends a non-delivery notification (NDN) to the sender. The Range is 0 (no restrictions on the number of recipients) to 999 (maximum of 999 recipients). The Default is 10.

---

## VPIM Compose Prefix

The open VPIM compose prefix is a number that identifies a message that is to be delivered to an open site using the VPIM protocol. When users address a message to an open VPIM site, they enter the compose prefix before entering the address. Define the open VPIM compose prefix if any local users want to exchange VPIM messages with open sites. The open VPIM compose prefix must not conflict with any other prefixes, shared distribution lists (SDLs), broadcast mailboxes, or a dialing plan access code.

If you are verifying settings for desktop messaging, you do not need to define the open VPIM compose prefix. The open VPIM compose prefix does not affect desktop messaging. Type the prefix in the VPIM Compose Prefix box. The maximum length is 5 digits (0-9).

---

## VPIM Shortcuts section

If users want to send messages to VPIM-compliant sites that are not defined in your network database, you must create open VPIM shortcuts because alphabetic characters cannot be entered from the telephone. The open VPIM shortcut can be any number. Avaya strongly recommends using the open site's Public Switched Telephone Network (PSTN) number because it is familiar to your users, so it is easy to remember, and it is a unique number that is unlikely to conflict with neighboring voice mail systems when users send and receive open VPIM messages.

When defining the shortcut, use a long number to ensure that the mapping is correct and no conflict occurs. A short number can conflict with the left side of another SMTP address. To address a message to the open VPIM site, users must enter the VPIM compose prefix (which tells CallPilot that the message is destined for an open VPIM site), the open VPIM shortcut, and destination mailbox number. For example: 1905225 is created as a shortcut for an open VPIM site at another\_company.com. If a phoneset user wants to address a VPIM message to mailbox 1234 at that open site, he or she must first enter the VPIM compose prefix, and then enter 19052251234 as the address. When CallPilot sends the message, the message header's To: address is generated as 19052251234@other\_server.another\_company.com.

---

## Shortcut and Domain

Type the numeric shortcut for the open VPIM site in the Prefix box. The maximum length is 20 digits (0-9). Type the open VPIM site's FQDN name in the Domain box. The maximum length is 255 alphanumeric characters. The maximum number of open VPIM shortcuts is 500.



# Chapter 12: Configuring local and remote networking sites

---

## In this chapter

[Overview](#) on page 265

[Configuring the local messaging server](#) on page 266

[Configuring the local prime switch location](#) on page 270

[Adding and configuring a remote site](#) on page 277

[Configuring a remote messaging server](#) on page 278

[Configuring a remote prime switch location](#) on page 287

[Configuring a remote satellite-switch location](#) on page 291

---

## In this chapter

---

### Overview

This chapter describes how to configure the local messaging server and prime switch location. It also explains how to add and configure remote messaging servers and switch locations. An Avaya CallPilot® messaging network consists of a local site and one or more remote sites.

All sites in your private messaging network with which your local site exchanges messages must appear in the Messaging Network Configuration tree view. If a remote site is part of the messaging network, but the local site does not exchange messages with that remote site, you do not add it to the tree view.

When Avaya CallPilot is initially installed on your system, a local messaging server and local switch location are automatically added to the Messaging Network Configuration tree view. To

implement networking, configure the local site and add and configure all remote sites that transfer messages with the local site.



**Important:**

Avaya strongly recommends that you complete each step in the configuration process in the order presented.

---

## Before you begin

First, you must configure the Message Delivery Configuration options.

If your local site is an NMS site, NMS must be configured and tested. If NMS is installed, the NMS satellite-switch locations for the local site appear in the Messaging Network Configuration tree view in alphabetical order.

Your messaging network representation must be complete and available. This representation provides a blueprint for the implementation process.

---

## Configuring the local messaging server

You must configure the local messaging server to implement message networking.

The local messaging server is configured from the Message Network Configuration page that shows the local messaging server on the Network Tree. Double-click the local server to display the Server Properties.

---

## General section

---

### Name

By default, both the local messaging server and the prime switch location are assigned the name "Untitled." Assign new names during configuration. The messaging server is usually given a name that corresponds to its geographic location. The name given to the local messaging server becomes the name of the local site.

---

## Server type

The local messaging server is always CallPilot.

 **Note:**

If you are configuring an Avaya CallPilot® Mini system, Avaya Business Communications Manager, or Avaya Norstar, select Other Avaya. If you are configuring a 3rd party VPIM compliant system, select Other.

---

## Description

Provide a brief description of the messaging server, or implementation notes, such as when the server was configured or who completed the configuration, in the Description box.

---

## Site ID

To implement networking, you must assign a site ID to your local messaging server. The site ID, combined with the location ID, identifies the local site to remote sites in the messaging network.

The site ID is one of the pieces of information included in a message header. When networking is implemented on any site in a messaging network, every site that exchanges networking messages with it must have a site ID.

If the Site ID box is enabled, the Local Messaging Server Properties information cannot be saved to the network database unless the Site ID box contains some information. If you do not know the Site ID, enter a valid placeholder and then enter the correct ID when you implement networking.

---

## Send Messages to all other Servers

The Send Messages to all other Servers check box determines if the local site can send messages to integrated remote sites in the messaging network. This check box is selected by default and is cleared only under exceptional circumstances. When cleared, the local messaging server does not send messages to any integrated remote site using any protocol. Messages can still be sent to open remote sites.

This option lets you quickly disable messaging from your local site. Clear this check box in emergency situations.

To prohibit the local messaging server from sending messages to a particular remote site, clear the Send Messages to this Server check box in the Remote Messaging Server Properties page. For example, your messaging network has six sites. You do not want to send messages to one of these sites. You select the Send Messages to all other Servers option while you configure the local messaging server. You clear the Send Messages to this Server box while you configure the remote server to which you do not want to send messages.

 **Note:**

When the Send Messages to all other Servers box is cleared, users can still send messages to open sites using the VPIM and AMIS protocols.

---

## Send User Info to Remote Servers

After you select the Send User Info to Remote Servers check box, the system enables the Enhanced Names Across the Network feature on the local server. By default, the Enhanced NAN feature is off.

When you select the Send User Info to Remote Servers check box, the system propagates user information to all remote CallPilot 5.0 VPIM servers. However, as with the regular NAN feature, you can control which sites receive the messages when you configure the remote servers for Enhanced NAN. In order for the settings that you make on the local server to take effect, each of the remote servers with which you want to exchange user information, must have Enhanced NAN enabled too.

For a detailed discussion of remote users and Names Across the Network, and Enhanced NAN, see [Understanding Avaya CallPilot® networking solutions](#) on page 49 in this guide. For more information about configuring and enabling Enhanced NAN, see CallPilot Manager online Help.

---

## Receive User Info from remote servers

The Receive User Info from remote servers check box enables the Names Across the Network feature. This option is checked by default.

This box controls your local server. You must coordinate with the network administrator of each remote site with which you want to enable Names Across the Network. You can use Names Across the Network only with remote sites that use Enterprise or VPIM Networking, and have the Send User Info to this server feature enabled.

The Names Across the Network feature is not the only way to add remote users to your local network database. You can also add remote users using Enhanced NAN, and manually, with User Administration. For a detailed discussion of remote users and Names Across the Network, and Enhanced NAN, see [Understanding Avaya CallPilot® networking solutions](#) on page 49 in this guide. For more information about configuring and enabling Enhanced NAN, see CallPilot Manager online Help.

---

## Send Network Broadcast and Receive Network Broadcast

Both check boxes apply to network-wide broadcasts, and location-specific broadcasts to and from all locations associated with remote sites.

---

## Enterprise Networking section

---

### Receive Message Text Info

The Receive Message Text Info check box is enabled only if Enterprise Networking is installed on your local messaging server. Configure this box when you implement Enterprise Networking.

The local messaging server can receive message subject headers in the messages sent by all remote sites that are enabled to send message subject headers. The message subject header is available to desktop users. In most environments, the Receive Message Text Info check box is selected. However, if voice ports become tied up for too long, you can clear this option because these messages take longer to send.

---

## SMTP/VPIM section

---

### Server FQDN

The Server FQDN box is enabled only if VPIM Networking is installed on your system. It is configured during the implementation of VPIM Networking. However, the message delivery information cannot be saved to the network database unless the Server FQDN box contains

the correct information. Enter the computer name and domain for CallPilot. If you do not know what the FQDN is, to find it use the 'ipconfig/all' command from a DOS window, or get the information from the appropriate 'properties' window.

 **Note:**

Do not continue configuring the system if you do not have the proper FQDN.

---

## Configuring the local prime switch location

You must configure the local prime switch location to implement networking. The final step in configuring the local site is to configure the local prime switch location. The local prime switch is configured from the Message Network Configuration page that shows the local prime switch on the Network Tree. Doubleclick the local prime switch to display the Server Properties. The following image shows the Prime Location Properties page.

Home User System Maintenance Messaging Tools Help

Location: Messaging Message Network Configuration Prime Location Properties

Server: Untitled Prime Location Properties: Untitled

Save Cancel Print Help

General

Name: Untitled

Description: [Text Field]

Location ID: 0

Spoken Name Recorded: No

Record... Import...

Dialing and Addressing

ESN Dialing Plan for this Location:

CDP Dialing Plan for this Location:

Mailbox Addressing Follows Dialing Plan:

Mailbox Prefixes: [Text Field]

ESN

Access Codes

ESN Access Code Used by this Location: [Text Field]

Location Codes

Add... Delete Selected

# Location Code + Overlap

Add... Delete Selected

CDP

Location Codes - CDP or Hybrid Dialing Plan

Add... Delete Selected

# Overlap Code + Overlap

Add... Delete Selected

VPIM

VPIM Network Shortcuts

Add... Delete Selected

# Prefix + Overlap

Add... Delete Selected

Time zone settings

Time zone: (GMT-05:00) Eastern Time

Save Cancel Print Help

Figure 35: Prime Location Properties page

**\* Note:**

If another networking solution was implemented on the local site, the local prime switch location is already configured. Check the current configuration information. Make any necessary modifications. Also, if NMS is installed on the local site, the local prime switch location is already configured. All satellite-switch locations attached to the local prime switch location are also already configured. Check the current configuration information. Make any necessary modifications. If no other networking solution is implemented on the local site, complete the Prime location Properties page.

---

## General section

Complete the General section no matter what dialing plan is used on your local site. The following outlines the names and descriptions of the fields in the General section.

---

### Name

Every switch location needs a name that is unique within the messaging network. Usually, this name is the same as the name of the messaging server. This ensures that the identity of the switch location within the network is immediately apparent. A geographic name is common. For example, if a messaging server is named "Moscow," the prime switch location is usually also named "Moscow." By default, the local prime switch location is given the name "Untitled." This name must be changed.

---

### Description

The Description box is useful for short notes, reminders, or comments about the switch location. You can specify your switch model, the date of the switch configuration, or contact information for the switch technician.

---

### Location ID

The Location ID box is not enabled for the prime switch location. The location ID for the prime switch location is always 0 and cannot be changed.

---

### Spoken Name Recorded

If a spoken name is recorded, voice mail users hear the name followed by the local mailbox directory number.

If a spoken name is not recorded, local users hear a full mailbox address that does not identify the sender's site by name. For example, for an ESN switch location, users hear the ESN location prefix followed by the local mailbox directory number, "Mailbox 6444 2346".

You can decide that you do not want local users to hear a spoken name for a particular site. For example, if CDP is used for messaging with a site and the mailbox numbers follow the dialing plan, you can decide that a recorded spoken name is unnecessary. In this case, do not record or import a spoken name.

There are two ways to add a spoken name recording: record a spoken name directly by clicking the Record button, or import a prerecorded message.

---

## Dialing and Addressing section

You need detailed information about the dialing plan used by the local site when you configure the local prime switch location.

You must specify which of the following dialing plans is used to dial to the local switch location:

- ESN Dialing Plan for this Location
- CDP Dialing Plan for this Location
- (hybrid, which combines ESN and CDP)

 **Note:**

If you use ESN anywhere in the messaging network, you must select ESN because you need an ESN access code.

---

## Mailbox Addressing Follows Dialing Plan

If NMS is implemented, this check box is already properly configured .

---

## Mailbox Prefixes

A mailbox prefix is a leading string of digits that uniquely identifies a mailbox number as belonging to a particular site. If the local site does not have NMS installed, the mailbox prefixes are never required for the local prime switch location. If the local site does have NMS installed, the mailbox prefix, or prefixes, are properly configured.

---

## ESN section

---

### Access Codes

If the local prime switch location uses either an ESN dialing plan or a hybrid dialing plan, you must complete the ESN section. You must provide the ESN access codes and ESN location codes. These are combined to create the ESN prefix.

---

### ESN Access Code Used by this Location

The ESN access code is used to access ESN routing in the same way that an access code, such as 9, is used to dial out to the public network from a private network. Typically, all switches in a messaging network use the same ESN access code.

---

### Location Codes

An ESN location code is a routing prefix that identifies a location within a network. It is usually three digits long, but can be up to ten digits long. You must also indicate the number of digits in the ESN location code that overlap the mailbox number.

The ESN Location Codes list contains all ESN location codes currently assigned and indicates the overlap between the ESN location code and the mailbox directory numbers. ESN location codes can be added, modified, or deleted at any time. The ESN location codes must always match the dialing plan configuration on the switch. The maximum number of ESN location codes for a switch location is 30.

---

### Overlap

When you are entering the dialing plan information for the local site, you must calculate the number of digits in the ESN prefix that overlap the digits in the local extension. If there is overlap between the rightmost digit or digits of the location code and the leftmost digit or digits of the extension number, enter the amount of overlap.

The following table provides examples of ESN location code overlap.

Access code	Location code	Extension number	Number dialed by users at other sites	Overlap
6	338	8300	63388300	0
6	338	8300	6338300	1
6	300	8300-8999	63008300-63008999	0
6	302	25000-26999	63025000-63026999	1

---

## CDP section

---

### Location Codes - CDP or Hybrid Dialing Plan

If the local switch location uses either a CDP dialing plan or a hybrid dialing plan, complete the CDP section. You must provide the CDP steering codes.

---

### Steering Code

A CDP steering code is a site prefix that identifies the local site within the network. Therefore, a CDP prefix must be unique for all switches in the messaging network. CDP steering codes are determined by the switch technician.

The CDP steering codes defined on the switch are entered on CallPilot because the system must be able to identify the steering code in the mailbox number to determine the site. The CDP Steering Codes list box contains all CDP steering codes currently assigned to the switch location. The list box also indicates the overlap between the CDP steering codes and the mailbox directory numbers. CDP steering codes can be added, modified, or deleted. The maximum number of CDP steering codes for a switch location is 500.

---

### Overlap

When entering the dialing plan information, you must calculate the number of digits in the CDP steering code that overlap the digits of the local extension. If there is overlap between the last digit or digits of the steering code and the first digit or digits of the extension number, enter the

amount of overlap. Normally, the steering code overlaps with the first few digits of a local extension number.

The following table provides three examples of CDP steering code overlap.

Steering code	Extension number	Number dialed by users at other sites	Amount of overlap
22	22345	2222345	0
22	22345	222345	1
22	22345	22345	2

---

## VPIM section

---

### VPIM Network Shortcuts

The VPIM network shortcut identifies the switch location to desktop messaging clients. In the VPIM section, click Add. The VPIM Network Shortcut Detail page appears.

---

### Prefix

Type the shortcut in the Prefix box. The maximum length is 30 digits (0-9). The recommended format is the same as the PSTN number (country code + area code + exchange portions).

---

### Overlap

In the Overlap box, specify the number of digits that overlap with the mailbox number.

---

## Time Zone Settings section

---

### Time zone

The time zone for the local prime switch location is automatically the same as the time zone for the CallPilot server. It is configured in the CallPilot Configuration Wizard.

---

### Adding and configuring a remote site

When you implement a protocol, you add to the Messaging Network Configuration tree view all the remote sites that use that protocol to receive messages from the local site. Every remote site added to the tree view must be configured.

The information that you enter when configuring a remote site often reflects the information that is configured for that site in its own local network database. The name for the site can be different however the site IDs must match. You can get this information from the remote network administrator.

But configuring a remote site is not simply copying the information provided by the remote site. You also enter information that reflects how your local site communicates with the remote site. For example, for each remote site you decide whether your local site sends messages to this particular remote server.

There are three main steps to adding a remote site to your local network database. For each remote site, you must add and configure:

- the remote messaging server
- the remote prime switch location
- the remote satellite-switch locations, if the remote site is an NMS site

 **Note:**

Much of the information that you must provide while configuring a remote messaging server is in the network diagram.

---

## Correcting information about remote sites already added to the network database

If you are implementing a network solution, and another messaging network solution is already implemented on your local site, check the information for the remote messaging servers that you added to your local network database during that configuration.

For example, if you added remote sites to your network database during the installation of Integrated AMIS Networking, you added the remote sites that use the AMIS protocol to send messages to and receive messages from your local site. When configuring these remote sites, the validation process forced you to enter an Enterprise site ID for the remote site to save the configuration to your network database.

You must check the Enterprise site IDs that you entered for these sites to ensure that they are valid and correct. If you entered a random number as a placeholder, change them to actual site ID numbers.

---

## Configuring a remote messaging server

When you initially install CallPilot on your system, your local site, which consists of a local messaging server and a local prime switch location, is automatically added into the Messaging Network Configuration tree view.

However, you must manually add each remote site that exchanges messages with the local site into the Messaging Network Configuration tree view. Both the remote messaging server and the remote prime switch location must be configured.

You must complete the following sections for each remote messaging server:

- Remote Messaging Server Properties—General information
- Remote Messaging Server Properties—Connection information

A remote server is configured from the Message Network Configuration page. Click New Server or double-click an existing server on the network Tree. The following image shows the Server Properties page for a remote server.

The screenshot shows the 'Server Properties' configuration page. At the top, there is a navigation menu with 'Home', 'User', 'System', 'Maintenance', 'Messaging', 'Tools', and 'Help'. Below this is a breadcrumb trail: 'Location > Messaging > Message Network Configuration > Server Properties'. The main title is 'Server Properties:' with a toolbar containing 'Save', 'Save & Test', 'Cancel', 'Print', and 'Help'.

**General**

Name: [text field]  
Server Type: CallPilot [dropdown]  
Description: [text field]  
Site ID: 1 [dropdown]  
Send Messages to this server:   
Send User Info to this Server:   
Receive User Info from this Server:   
Send Network Broadcast to this server:   
Receive Network Broadcast from this server:

**Enterprise Networking**

Send message text info to this server:

**SMTP/VPIM**

Server FQDN: [text field]

**Connections**

Network Protocol: VPIM [dropdown]

**Connection DNs**

DN1: [text field] [Define...]  
DN2: [text field] [Define...]  
DN3: [text field] [Define...]

**Enterprise**

Initiating Password: [text field]  
Responding Password: [text field]

**VPIM Security**

SSL port number: 465 [text field]  
Server password: [text field]  
Failed attempts from this server: 0 [text field] [Reset Count]  
System Maximum: 98 [text field]  
Receive messages from this server: enabled [dropdown]  
Last time user information was synced: Never

At the bottom, there is another toolbar with 'Save', 'Save & Test', 'Cancel', 'Print', and 'Help'.

Figure 36: Server Properties page for a remote server

---

## General section

---

### Name

Avaya recommends that you assign the remote messaging server the same name that was assigned to it by its local network administrator. This correspondence in naming sites makes the network easier to administer and maintain because all network administrators use the same names for the same sites.

For example, if a remote site calls itself Connecticut, name it Connecticut when you add it to the Messaging Network Configuration tree view.

---

### Server Type

The remote messaging server can be any of the following types:

- CallPilot
- CallPilot GR Partner
- (Meridian Mail Net Gateway) MMNG
- Meridian Mail
- Other Avaya
- Other

 **Note:**

If you are configuring an Avaya CallPilot Mini system, BCM, or Norstar, select Other Avaya. If you are configuring a 3rd party VPIM compliant system, select Other.

---

### Description

Provide a brief description of the remote messaging server or useful notes, such as when the messaging server was configured or who completed the configuration.

---

## Site ID

Every remote site in your network database requires a Site ID. All site IDs must be unique. You need to coordinate with remote network administrators to ensure that this rule is observed before any site is implemented. Site ID is mandatory regardless of the protocol.

If your implementation of Enterprise Networking is an upgrade of an existing voice messaging system that used Enterprise Networking, maintain the Site ID numbers of the previous system.

---

## Send Messages to this Server

The Send Messages to this Server check box interacts with the Send Messages to all other Servers check box on the Local Messaging Server Properties—General section.

When you configure the local messaging server, you decide if you want the local messaging server to be able to send messages to other servers. This option is selected by default and is only cleared under exceptional circumstances.

With the Send Messages to this Server check box, you can block the delivery of messages from your local messaging server to a particular remote site.

Example: In the following diagram, Helsinki is configured to deliver messages to all other sites. However, the network database records for Paris and Cairo specify that messages are not sent to these remote sites. Messages are sent to Lammi and Korso-Rekola. Therefore, while the potential exists for sending messages to both remote sites, only two sites in the messaging network receive messages from Helsinki.

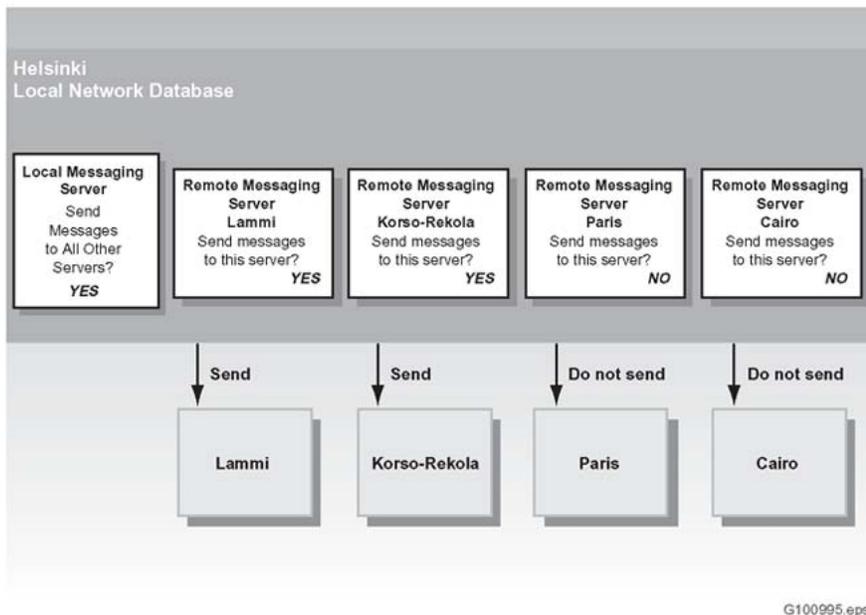


Figure 37: Helsinki Local Network Database

---

## Send Network Broadcast to this server and Receive Network Broadcast from this server

Both check boxes apply to network-wide broadcasts, and location-specific broadcasts from all locations associated with the remote site. This is particularly useful when sites that do not belong to your company or organization are included in the network tree.

---

## Send User Info to this server (for Names Across the Network)

The Send User Info to this server check box determines if the Names Across the Network feature sends user information from the local server to the remote server.

Names Across the Network is an Enterprise and VPIIM Networking feature that automatically adds temporary remote users to the local database and maintains them. You enable Names Across the Network for incoming and outgoing messages separately. A temporary remote user can be added when A user at a remote site addresses a message to a local user. The remote user information is taken from the header of the message that is received.

The setting to add remote users with Names Across the Network is on the Messaging Network Configuration page for your local server. This setting controls your local server. You must coordinate with the system administrator of each remote site with which you want to enable Names Across the Network. You can use Names Across the Network only with remote sites that have Enterprise or VPIM Networking installed.

When you select Names Across the Network for incoming messages, you add temporary remote users from all sites in the messaging network. However, because outgoing messages must carry additional information with them, which results in longer transmission time, you can select Names Across the Network for outgoing messages for individual sites. For example, you can select the feature for outgoing messages to a site that does not incur long-distance toll charges, but clear the feature for a site that incurs these charges.

**Note:**

If configuring a CallPilot GR Partner, do not select Send User Info to this server or Receive User Info from this server.

---

## Example

As the local administrator of the Helsinki site, after you select Receive User Info from remote servers, temporary remote users are created if both ends support Names Across the Network. You receive messages from all other sites that are configured to send the information. However, when you configure information about the remote servers in your local database, you clear the Send User Info to this server option for the sites to which you do not want to send remote user information. Names Across the Network is also affected by the way the network administrator at a remote site configures the system.

When the local site initiates an Enterprise Networking session to a remote site, the two sites negotiate whether spoken names are sent. This negotiation occurs as follows:

---

## Send Message Text Info to this Server

With the Send Message Text Info to this Server feature, you can send the subject portion of a message to a remote site. Because a subject cannot be added from the telephone, it is only useful if there are desktop users.

---

## SMTP/VPIM section

---

### Server FQDN

If VPIM Networking is installed on your local site, the VPIM Networking Server FQDN box is enabled.

 **Note:**

VPIM cannot be installed separately from other protocols. When networking is installed, all protocols become available (but not NMS; it is packaged separately).

---

## Connections section

---

### Network protocol

To use a particular protocol, both sites must have the same networking solution installed and implemented.

If a remote site is not configured to use the same protocol as the local site, the following occurs when the local site attempts to send a message:

- The message is not delivered.
- An error message is generated.
- The remote site is put into error status on the local system.

---

## Connections section: Connection DNs

When CallPilot initiates a call to a remote site, it uses the networking connection DN that is specified for the remote site in your network database. You can define up to three DNs. DN1 is mandatory. DN2 and DN3 are optional.

At least one connection DN must be the networking system access number for the remote site, as defined on the Message Delivery Configuration page for the remote site. You can include the system access number of the remote site on the network representation.

The first Enterprise Networking connection DN is the Enterprise Networking SDN for the remote site, as defined in the SDN table of the remote site. If Enterprise Networking is sharing an SDN with another service, such as AMIS Networking, then the networking connection DN is the DN that accepts such network calls.

You must contact the administrator of the remote site for the connection DN. The connection DNs are entered in a format that is dialable from the local site.

The system always uses DN1 to call the remote site unless it encounters problems. If the system does encounter a problem, it attempts to contact the remote site using DN2, and then DN3. In general, the DNs are ordered from least expensive to most expensive connections. For example, DN1 can be a private number and DN3 can be a public telephone number.

---

## Connections section: Enterprise

Unique passwords are used between each pair of sites in an Enterprise messaging network. They are used to secure the messaging network and the integrity of the messages. Two passwords are used to verify that any two sites can communicate with each other:

- Initiating Password
- Responding Password

The passwords on your site must match the site you are calling or from which you are receiving messages.

---

## Initiating Password and Responding Password

Enterprise Networking uses passwords to send messages securely. When a message is sent from one site to another, the two sites trade two passwords, an initiating password and a responding password. Both passwords must match before a message is sent. You establish passwords between pairs of sites. For this reason, you must contact the network administrator of each remote site in the messaging network and agree on the passwords that are used.

---

## Connections section: VPIM Security

Ensure that VPIM is selected in the Network Protocol box.

## SSL port number

If encryption is used, type the port number designated as the Secure Socket Layer port on the remote messaging server. The standard port setting is 465. When the SSL port is specified, and if the Connect to server with SSL for Outgoing SMTP Sessions option is enabled in Message Delivery Configuration, CallPilot attempts to establish an encrypted connection with this port when connecting to this remote server.

---

## Server password

Type the SMTP authentication password that the remote server must send when the local CallPilot server requests SMTP authentication. The maximum length is 30 alphanumeric characters.

---

## Failed attempts from this server

This box displays the number of failed SMTP authentication attempts that occurred to date. If this value reaches the maximum number of failures defined on the local server (specified in the System Maximum box described in the following paragraph), CallPilot disables incoming VPIIM message transmissions from this remote server, if configured. After you resolve the cause of SMTP authentication failures from the remote server, click Reset Count to set the counter back to 0.

---

## System Maximum

This box displays the maximum number of SMTP authentication failures that the local server tolerates from any server.

---

## Receive messages from this server

Choose Enabled from the list box to allow the local server to receive messages from this remote server.

---

---

## Configuring a remote prime switch location

When you add a remote messaging server to the Message Network Configuration tree view, a corresponding prime switch location is added. A remote prime switch location must be configured. This process is almost identical to configuring the local prime switch location.

---

### General section

Complete the General section no matter what dialing plan is used on your local site.

---

### Name

Assign a unique name to each switch location. Avaya recommends that the name correspond to the switch location to make the location easy to identify. The remote switch location is automatically given the name of the remote server that was added to the Messaging Network Configuration tree view. This name can be changed.

---

### Description

Enter short notes or comments about the remote switch location in this box.

---

### Location ID

The Location ID box is enabled only if Enterprise Networking is implemented on the local site. A location ID is required for all remote sites if Enterprise Networking is installed locally, even if another protocol is used to exchange messages with this site. The location ID of the prime switch location is set to 0 by default and cannot be changed.

## Spoken Name Recorded

When local users compose a message to this remote site or use the playback feature to determine the sender of a message, they hear a message that identifies the sender. The content of the message depends on whether a spoken name for that remote site is recorded. If a spoken name is recorded, voice mail users hear the location name followed by the local mailbox directory number, "Dallas, Mailbox 2346".

If a spoken name is not recorded, local users hear a full mailbox address that does not identify the sender's site by name. For example, for an ESN switch location, users hear the ESN location prefix followed by the local mailbox directory number, "Mailbox 6444 2346".

You can decide that you do not want local users to hear a spoken name for a particular remote site. For example, if CDP is used for messaging with this remote site and the mailbox numbers follow the dialing plan, you can decide that a recorded spoken name is unnecessary. In this case, do not record or import a spoken name.

There are two ways to add a spoken name recording: record a spoken name directly by clicking the Record button, or import a prerecorded message.

---

## Dialing and addressing section

You must specify which dialing plan is used to dial this remote switch location from the local switch location. The dialing plans are:

- ESN
- CDP
- (hybrid, which combines ESN and CDP)

---

## Mailbox addressing follows dialing plan

When a mailbox follows the dialing plan:

- A user's mailbox number and extension number are the same.
- The addressing plan and the dialing plan are the same.

If either situation is true, select the Mailbox Addressing Follows Dialing Plan check box.

---

## Mailbox prefixes

Mailbox prefixes are used by local users to address users at a remote site if mailboxes at the remote site do not follow the dialing plan. A mailbox prefix must be provided if the mailbox does not follow the dialing plan or if another dialing plan, such as PSTN, is used. A mailbox prefix cannot overlap with local mailbox numbers. Two mailbox prefixes can be entered. Either prefix can be used to address any mailbox at the local site. Normally, however, only one prefix is required. A mailbox prefix can be any number as long as it does not conflict with other network data. A mailbox prefix can also be the entire telephone number of the site, including country code, city/area code, and exchange.

Example: If the mailbox prefix is 22 and the mailbox number of a local user is 6565, users at other switches address the local user by dialing 226565.

---

## Dialing prefix

A dialing prefix is needed if the local site uses another dialing plan, such as PSTN, and users at your local site use dialing prefix to reach users at this remote site. Usually, if the Dialing prefix box is enabled, you enter the prefix. In a few cases, a dialing prefix is not needed. For example, if the mailbox number, without the mailbox prefix, can be dialed directly, a dialing prefix is not needed. This situation is rare because most systems use at least some sort of access code.

---

## ESN information

If the remote prime switch location uses an ESN or hybrid dialing plan, complete the ESN section. The procedure for configuring the ESN information for a remote prime switch is identical to the procedure used for the local prime switch location.

 **Note:**

You must provide the ESN access code used at the remote site. Do not enter the access code used locally.

For a review of the ESN access codes, ESN location codes, and overlap, consult the [ESN section](#) on page 274.

## CDP information

If a CDP dialing plan or a hybrid dialing plan is used to connect the local site to the remote site, complete the CDP section. Configuring the CDP information for a remote prime switch location is identical to configuring the local prime switch location. For a review of the CDP steering codes and overlap, consult the [CDP section](#) on page 275.

---

## VPIM section

If you are using desktop messaging and My CallPilot, VPIM Networking, or both, define the VPIM network shortcuts for this switch location. The VPIM network shortcut identifies the switch location to desktop messaging clients. It also facilitates the delivery of VPIM messages that are addressed to recipients at sites that do not use the VPIM protocol.

---

## VPIM Network Shortcuts

The VPIM network shortcut identifies the switch location to desktop messaging clients. In the VPIM section, click Add. The VPIM Network Shortcut Detail page appears.

---

## Prefix

Type the shortcut in the Prefix box. The maximum length is 30 digits (0-9). The recommended format is the same as the PSTN number (country code + area code + exchange portions).

---

## Overlap

In the Overlap box, specify the number of digits that overlap with the mailbox number. Typically, a shortcut overlaps with the first digit of the mailbox number. The Range is 0 to the length of this shortcut. For more information about VPIM shortcuts, see [About VPIM Networking](#) on page 147

---

---

## Time Zone Settings section

---

### Time zone

The time zone for the prime switch location is automatically the same as the time zone for the CallPilot server. It is configured in the Date/Time component of the Windows Control Panel.

---

### Configuring a remote satellite-switch location

Configuring a satellite-switch location for a remote site is identical to configuring a remote prime switch location for a remote site.

If a remote site is an NMS site, you must add and configure each of its satellite-switch locations. This information is saved to the local network database. Although a prime switch location is added automatically when a remote site is added to the Messaging Network Configuration tree view, you must manually add each satellite-switch location of a remote NMS site.

---

### Capacity

An NMS site can have up to 999 satellite-switch locations.

---

### Organization

When you add a satellite-switch location, this location appears in the Messaging Network Configuration tree view. Satellite switch locations are listed alphabetically.

---

## Where to configure a satellite-switch location

To configure a satellite-switch location, complete the General section of the Server Properties page. You must also complete the sections that correspond to the dialing plan used by the local site.

---

### ESN

Complete the ESN section if you use an ESN or hybrid dialing plan.

---

### CDP

Complete the CDP section if you use a CDP or hybrid dialing plan.

---

## Spoken Name Recorded

When local users compose a message to a remote satellite-switch location or use the playback feature to hear who sent a message, the name of the switch location is played. If a spoken name is not recorded, local users hear the full DN, such as "Mailbox 64441234." If a recording of the spoken name is available, local users hear the switch location name followed by the mailbox number, such as "Milan 1234." You can either record a message using the telephone or import a prerecorded WAV file.

When a recording of the spoken name is available, Yes appears in the Spoken Name Recorded box.

If you do not want your local users to hear the name of this satellite-switch location when composing messages or using playback, do not record a message. For example, if you are using CDP to transfer messages to the site and mailbox numbers follow the dialing plan, you may feel that a spoken name is unnecessary.

---

## Dialing plan interaction

The dialing plan boxes are dynamically enabled or disabled depending on the choices made. Complete all enabled fields.



# Chapter 13: Security and encryption

---

## In this chapter

[Section P: Networking and security](#) on page 295

[Section Q: SMTP security](#) on page 303

[Section R: Encryption](#) on page 319

---

## Section P: Networking and security

---

### In this section

[Overview](#) on page 295

[Open AMIS Networking and security](#) on page 296

[VPIM Networking and security](#) on page 298

[Switch security and networking](#) on page 302

---

## Overview

It is important to maintain the integrity and security of your Avaya CallPilot® system.

Every site in your messaging network must follow the recommended security precautions. In addition to these general security precautions, there are some precautions specific to a messaging network. These specific precautions are described in this section.

 **Important:**

This description is intended only as an overview. For more detailed information about switch security features and how they must be set, consult your switch documentation and/or a security specialist.

---

## Open AMIS Networking and security

With AMIS Networking, local users can dial out to the public network. This means that the messaging network is susceptible to toll fraud. You must take precautions to ensure that the network is not exploited at your company's expense.

All AMIS Networking messages sent to sites that are not part of your private messaging network appear on the telephone bill for your site.

---

## Long-distance toll charge features

Several features minimize the likelihood of long-distance toll fraud from an AMIS Networking site:

- Avaya CallPilot feature
  - Restriction/Permission Lists (RPLs)
- switch features, such as:
  - Trunk Group Access Restrictions (TGARs)
  - Class of Service (COS)
  - Network Class of Service (NCOS)

---

## Assigning user access and Restriction/Permission Lists

If you allow local users to send messages to open sites, you must establish user access because long-distance toll charges can be incurred when messages are sent to open sites.

There are two basic levels of control:

- When you define message delivery parameters, you define general system-wide controls over networking messages.
- When you define different classes of users, you define the access level individual users have to networking.

---

## Mailbox class settings

You control a user's access to networking, in part, by the mailbox class to which the user is assigned. The following options for each mailbox class are available:

- default message priority—standard or economy
- permission for exchange of messages with open sites
- Restriction/Permission List for open messages, if you allow users to send messages to open sites

You must set the options for each mailbox class.

If you allow local users to exchange messages with open sites, create any necessary Restriction/Permission Lists (RPL). An RPL defines any restrictions to access and lists any exceptions to these restrictions. An RPL provides additional security and prevents unauthorized long-distance toll charges.

---

## Example

Local users can send messages to open sites. However, you want to ensure that different classes of users can send messages only to specific sites. Users with a manager-level mailbox class can send messages to any site. Users with a summer student mailbox class can send messages to any open site that does not incur long-distance toll charges.

Usually, you assign a pre-existing Restriction/Permission List. However, if no pre-existing list satisfies your requirements, you can create a new list.

---

## See also

For further information consult the CallPilot Manager online Help.

---

## VPIM Networking and security

There are special security considerations if VPIM Networking is used to send messages over the Internet.

 **Important:**

The following information is intended as an overview only. For detailed information on how to secure your system, consult your data network administrator or a security specialist.

When a private data network is connected to the Internet, the Internet becomes almost an extension of the private network. This poses several security concerns, especially keeping unauthorized users from accessing your network and ensuring that messages are not tampered with during transport. VPIM Networking connects sites with links created over the Internet. Basically, network connections are created over the public Internet rather than over private leased lines or public packet-switched networks.

VPIM Networking makes use of the existing security features of your data network. If it is connected to the Internet, your network probably uses some or all of the following:

- firewall
- packet filters
- proxy servers and application gateways

These are standard security features for a TCP/IP network.

---

## Firewalls

If your messaging network sends messages over the Internet, Avaya recommends that your data network be protected by a firewall.

This guide assumes that if your local data network is connected to the Internet, a firewall is already in place.

The following discussion is an overview of how a firewall works with CallPilot. For information on how to configure the firewall to secure your network, consult your data network administrator.

---

## Definition: Firewall

A firewall is a mechanism—consisting of hardware, software, or both—that protects your network from other users on the Internet. Many firewalls are independent devices, while others reside on existing machines.

A firewall controls who can access information behind it and how they can access it. The firewall determines the relationship between users within the firewall and those outside of it. All traffic into a private data network must go through the firewall. All traffic from the private data network into the public data network must also go through the firewall. Each message is examined, and those that do not meet specified security criteria are blocked.

It is not possible to give specific recommendations for setting up a firewall, because many configurations are possible. Note however, that it is strongly recommended that you use a router to create a subnet for the CallPilot system to separate it from the larger data network.

---

## Packet filter

A packet filter, also known as a screening router, limits TCP packet traffic to and from hosts on your network. Packet filters usually consist of both hardware and software components. You set the limits that a packet filter uses. In most instances, a packet filter is a stand-alone router. All messages traveling to and from hosts on your network go through the router. Software that contains the limits you establish restricts traffic flow.

A packet filter uses the information in the TCP packet header. The packet filter checks the source and destination addresses and compares them to your limits. You can limit all traffic to only packets that you want. For example, if you want your network to exchange messages only with your branch office, you can set your packet filter to accept only these messages.

---

## Proxy server and application gateway

Proxy servers and application gateways provide another level of security for your network.

---

## Definition: Proxy server

The proxy server performs duties for other computers on the network.

A proxy server separates an intranet behind a firewall. A proxy server often sits on the firewall. At its simplest, with the proxy server, users can access the Internet from a secured LAN.

A proxy server intercepts all messages entering and leaving a network.

A proxy server also effectively hides true network addresses. Remote users send messages to the proxy server, which then passes the messages to their intended recipients.

---

## Definition: Application gateway

An application gateway is the host computer that runs the proxy server. Application gateways offer the following services:

- authenticating and logging usage
- hiding the internal system names—only the name of the application gateway is visible to the outside world
- simplifying the programming of the packet filter—less complicated filtering rules are required, and only traffic destined for the application gateway is filtered and all other traffic is rejected

---

## Encryption

With encryption, you can protect the integrity of messages sent over the Internet. It provides a way to send encoded messages from one site to another in a form that only the two sites can understand.

If you must transmit messages that contain information important to your business, encryption can be required. Information that may need to be secure includes:

- financial data
- proprietary information, such as product development information
- confidential personnel information

---

## VPIM Networking and Windows

Windows includes its own encryption features. If you want to use the Windows encryption feature with VPIM Networking, you must thoroughly test how this feature works.

---

## Malicious attacks

Hackers use several types of attacks against sites that are connected to the Internet.

Some of the most common malicious attacks include:

- service attacks
- e-mail flooding
- spamming

---

## Service attacks

Service attacks are intended to bring down a data network. A service attack is designed to keep a data network continuously occupied so that it cannot perform its usual tasks.

---

## Ping attacks

One of the most common types of service attacks is the continuous use of the Packet Internet Groper (ping) utility.

The ping program is an echo utility that tests continuity and path delay. Pinging is used to determine if a remote site is reachable and is an invaluable tool for testing your system.

However, the process of pinging uses system resources. If continually pinged, the system is unable to provide other services. Although it is illegal to do so in many countries, hackers create programs that ping a server continually until the system is brought down.

---

## Security against ping attacks

Ping attacks can be deflected by using packet filters. A packet filter examines the TCP/IP header of each incoming message and rejects all those that are specified as not allowed or restricted. The list of rejected headers is maintained in a filter table. The ping protocol, which usually uses port 7, is usually allowed but restricted.

Setting up filter tables is complicated. The syntax and format used by each vendor's router is different.

Work with your data network administrator to set up the necessary defenses against service attacks.

---

## Switch security and networking

The switch location is already set up and configured when you begin to implement a networking solution. Several switch security features are set. These must be considered when implementing a networking solution. Switch security must be tight enough that restricted activity is not allowed, but not so tight that networking messages that should be allowed are restricted.

---

## Switch security features

The following switch security features can affect the exchange of networking messages:

- Restriction Permission Lists (RPLs)
- ACD agent restrictions
  - Trunk Group Access Restrictions (TGARs)
  - Class of Service (COS)
  - Network Class of Service (NCOS)

These features offer multiple layers of defense against fraud and other system abuses. However, if these features are set without considering the needs of networking, they can also block legitimate messages from reaching their destinations.



**Important:**

Avaya strongly recommends that you review the switch security settings with the switch technician before you begin to implement a networking solution. Compare the networking needs with the current security settings, and ensure that necessary changes are made.

---

## Section Q: SMTP security

---

### In this section

[Overview](#) on page 303

[Unauthenticated mode](#) on page 305

[Authenticated mode](#) on page 307

[Mixed authentication mode](#) on page 309

[SMTP authentication methods](#) on page 310

[Authentication failures](#) on page 312

[Enabling CallPilot SMTP authentication](#) on page 315

[Configuring unauthenticated access restrictions](#) on page 316

[Monitoring suspicious SMTP activity](#) on page 316

---

### Overview

CallPilot uses Simple Mail Transport Protocol (SMTP) to send:

- VPIM Networking messages between the local CallPilot server and remote CallPilot servers
- VPIM Networking messages between the local CallPilot server and remote messaging servers that are VPIM compliant
- messages from desktop messaging and My CallPilot users to the CallPilot server

In CallPilot, the component that implements SMTP is known as the Internet Mail Agent.

---

## Simple Mail Transport Protocol (SMTP) authentication

CallPilot supports Simple Mail Transport Protocol (SMTP) authentication, which is a hacker and toll fraud prevention method. CallPilot authenticates message transmission sessions from the following:

- desktop messaging and My CallPilot users
- voice messaging servers that are defined as remote sites in the CallPilot network database

Only one method of authentication is supported: User ID and Password authentication.

For more information about authentication, see [SMTP authentication methods](#) on page 310.

This guide focuses on SMTP authentication and messaging activity between remote messaging servers and CallPilot. For more information about SMTP, desktop messaging, and My CallPilot activity, see CallPilot online Help.

---

## Modes of authentication

You can configure SMTP authentication in one of the following modes on CallPilot:

- unauthenticated mode

CallPilot does not request authentication from a sender. Therefore, message senders are never authenticated.

 **Note:**

CallPilot, however, can limit the addressing capabilities of the sender by enforcing the unauthenticated access restrictions for users and servers, if they are configured.

- authenticated mode

CallPilot always requests authentication. Successful authentication must occur before the message can be transmitted.

You enable authentication by choosing the User ID and Password authentication method.

- mixed authentication mode

Authentication is optional. It is performed only if it is supported at both ends of the connection. If authentication is not being performed, CallPilot can limit the addressing capabilities of the sender by enforcing the unauthenticated access restrictions for users and servers, if they are configured.

If authentication is being used, and it fails, the session is disconnected.

You enable mixed authentication by choosing both the unauthenticated mode, and the User ID and Password authentication method.

 **Important:**

When defining the authentication settings, remember that the settings also affect the addressing capabilities of desktop messaging and My CallPilot users who want to compose messages.

---

## Monitoring suspicious SMTP activity

You can use one of the following methods to monitor suspicious SMTP and VPIM Networking activity:

- Automatic monitoring: review SMTP-related events in the Windows event log
- Manual monitoring: enable monitoring of activity from specific origins on the Security Administration page in CallPilot Manager

---

## Encryption

Optionally, you can use encryption to secure all message traffic. Encryption prevents:

- password transmission in the clear
- eavesdroppers from gaining access to the contents of the message (thereby guaranteeing user privacy)

CallPilot networking, desktop messaging, and My CallPilot use encryption. Encryption is enabled and configured independently from SMTP authentication configuration.

For more information about encryption, see [Section R: Encryption](#) on page 319

---

## Unauthenticated mode

In unauthenticated mode, CallPilot does not request authentication from a sender. The Internet Mail Agent (SMTP) transports message without authentication:

- from a remote voice messaging server to the CallPilot server
- from a desktop messaging or My CallPilot user to the CallPilot server

---

## How to enable unauthenticated mode

The unauthenticated mode is enabled by default when you install or upgrade your CallPilot server.

---

## When to use the unauthenticated mode

Use the unauthenticated mode if:

- you are not experiencing problems with inappropriate access
- you do not want to use SMTP authentication in your network
- the desktop messaging or My CallPilot clients used in your organization do not support SMTP authentication
- your messaging network contains:
  - messaging servers that do not support SMTP authentication
  - VPIM-compliant sites that are not defined in CallPilot's network database (open VPIM sites)



**Note:**

Open VPIM sites can use only the unauthenticated mode when connecting to CallPilot.

---

## Preventing denial-of-service attacks and junk e-mail in unauthenticated mode

To prevent denial-of-service attacks and junk e-mail proliferation, Avaya recommends that you restrict the following from remote messaging servers that are not authenticated:

- incoming messages that are addressed to shared distribution lists (SDLs)
- incoming location and network broadcast messages

 **Note:**

You can block incoming network broadcasts from a specific network site or all sites in the network database. This capability is in addition to the SMTP authentication feature, and is discussed in [CallPilot server capabilities for broadcast messages](#) on page 141.

- the number of recipients on incoming messages

This prevents hackers from copying the contents of a large address book into the recipient list. The limit applies to all recipients within the message, including recipients in nested messages.

CallPilot enforces the limit separately on each of the TO, CC, and Blind CC lists. For example, if the limit is defined as 100, the sender can enter 100 addresses in each of these recipient lists.

If any recipient list exceeds the recipient limit, CallPilot rejects the entire message.

If CallPilot rejects a message as a result of any of these restrictions, the sender receives a non-delivery notification (NDN).

---

## Preventing toll fraud

 **Important:**

To prevent toll fraud by desktop messaging and My CallPilot users who are not authenticated, Avaya recommends that you restrict user addressing capabilities and the number of recipients on outgoing messages. These restrictions are enforced by:

- unauthenticated desktop user restrictions on the Unauthenticated Access Restrictions page in CallPilot Manager
- the desktop restriction/permission list (RPL)
- mailbox class

For more information about preventing toll fraud, see CallPilot online Help.

---

## Authenticated mode

Authentication verifies the authenticity of the sender, which can be a desktop messaging user, My CallPilot user, or a remote messaging server.

In authenticated mode, CallPilot always requests authentication from the sender. Successful authentication must occur before the message is transmitted and received by the CallPilot server.

SMTP authentication can also be performed on outgoing sessions to remote servers. The receiving system advertises the methods it supports, and CallPilot responds accordingly. If

authentication fails, the CallPilot SMTP server attempts to send the message without authentication. If the receiving system rejects any SMTP commands, the connection is dropped, and a non-delivery notification is generated.

---

## How to enable the authenticated mode

To enable authenticated mode, you choose the User ID and Password authentication method in CallPilot Manager:

For more information about the authentication methods, see [SMTP authentication methods](#) on page 310.

---

## When to use the authenticated mode

SMTP authentication provides maximum security in which spoofing is virtually impossible. You can only use the authenticated mode when all messaging servers in the network, desktop messaging clients, and My CallPilot clients support authentication.

SMTP authentication is only supported in closed networks. SMTP authentication cannot be performed between CallPilot and open VPIM sites (that is remote messaging servers that are not defined in the CallPilot network database). If the message transmission session cannot be authenticated, the messages themselves cannot be transmitted.

 **Note:**

You must use the mixed authentication mode if:

- your voice messaging network contains messaging systems, desktop messaging clients, and My CallPilot clients that do not support SMTP authentication
- your users want to receive messages from open VPIM sites

For more details, see [Mixed authentication mode](#) on page 309.

---

## Denial-of-service attacks, junk e-mail, and toll fraud

The authenticated mode prevents denial-of-service attacks, junk e-mail, and toll fraud. Therefore, it is not necessary to enforce the restrictions that are described in:

- [Preventing denial-of-service attacks and junk e-mail in unauthenticated mode](#) on page 306
- [Preventing toll fraud](#) on page 307

---

## Mixed authentication mode

In mixed authentication mode, SMTP authentication is optional. CallPilot requests authentication, but does not require it for a successful connection.

Authentication is performed only if it is supported at both ends of the connection. If authentication is not supported, CallPilot accepts the message without authentication, but limits the addressing capabilities of the sender.

---

## How to enable mixed authentication

To enable mixed authentication, you choose both of the following in CallPilot Manager:

- unauthenticated mode
- the User ID and Password authentication method

By default, unauthenticated mode is enabled.

---

## When to use mixed authentication

Use mixed authentication if your messaging network contains any of the following:

- VPIM-compliant sites that are not defined in CallPilot's network database
- messaging servers that support SMTP authentication
- messaging servers that do not support SMTP authentication

- desktop messaging or My CallPilot clients that support authentication
- desktop messaging or My CallPilot clients that do not support authentication

CallPilot accepts messages from both authenticated and unauthenticated senders, but restricts the capabilities of senders that are not authenticated.

---

## How mixed authentication affects users

In mixed authentication mode, message receipts and hence, user addressing capabilities are affected as follows:

When the server or user is	incoming messages
unauthenticated	<ul style="list-style-type: none"><li>• from remote servers can be blocked as described in <a href="#">Preventing denial-of-service attacks and junk e-mail in unauthenticated mode</a> on page 306</li><li>• from desktop messaging or My CallPilot users can be restricted as described in <a href="#">Preventing toll fraud</a> on page 307</li></ul>
authenticated	do not have to be blocked. The restrictions for users and remote servers are not enforced.

 **Note:**  
Users are still restricted to the capabilities allowed in their mailbox classes.

---

## When you should not use mixed authentication

If you are concerned about security, Avaya recommends that you use only the authenticated mode.

---

## SMTP authentication methods

CallPilot supports the User ID and Password SMTP authentication method.

The method used to perform SMTP authentication on a remote server, desktop messaging client, or My CallPilot client depends on what is supported by both the sending and receiving systems. If the User ID and Password authentication method is supported, the sending system chooses the authentication method.

**!** Important:

Avaya recommends that, if you want to use the User ID and Password authentication method, you also use Secure Socket Layer (SSL) to encrypt the connection. SSL encryption prevents password transmission in the clear and ensures content privacy while the message is in transit.

For more information about encryption, see [Section R: Encryption](#) on page 319

**\*** Note:

Authentication of remote servers can occur only if the remote server is defined in the CallPilot network database. Open VPIM sites cannot be authenticated.

---

## User ID and Password authentication process

The following steps describe the User ID and Password authentication process for an incoming message session:

1. The sending system (remote server, desktop messaging user, or My CallPilot user) connects to the CallPilot Internet Mail Agent (SMTP server) through either the SMTP port or the SSL port.

Notes:

- Port 465 is defined as the SSL port that listens for encrypted sessions. Port 25 listens for unencrypted sessions. These port settings are mandatory.
  - The CallPilot SMTP server does not require SSL on incoming transmissions, but does support it. On outgoing sessions, SSL must be enabled if User ID and Password authentication is being used.
2. CallPilot advertises that it supports user ID and password authentication.
  3. One of the following occurs:

IF the sending system	THEN
supports User ID and Password authentication	the sending system requests authentication.
does not support User ID and Password authentication	authentication fails and the message transmission is handled as described in <a href="#">Authentication failures</a> on page 312.

4. CallPilot requests the user ID.
5. The sending system responds with the user ID:
  - For a desktop messaging or My CallPilot user, the user ID is the user's PSTN number (SMTP/VPIM shortcut and mailbox number).

- For a remote messaging server, the user ID is the remote server's FQDN.
6. CallPilot requests the password.
  7. The sending system responds with the password.
  8. CallPilot verifies the user ID and password:
    - For a desktop messaging or My CallPilot user, the mailbox and user password are obtained from the user database.
    - For a remote messaging server, the remote server's FQDN and SMTP/VPIM password are obtained from the network database.

IF the user ID and password	THEN
match	the sending system is authenticated and message transmission continues.
do not match	message transmission is handled as described in <a href="#">Authentication failures</a> on page 312.

---

## Authentication failures

This section describes:

- situations in which SMTP authentications can fail
- what happens when SMTP authentication failures occur

You can specify the maximum number of authentication failures that can occur from remote messaging servers, desktop messaging users, or My CallPilot users.

You can also specify what CallPilot does when the number of failed authentication attempts exceeds the maximum limit that you specify.

---

## When authentication can fail

SMTP authentication can fail in the following situations:

- Passwords are not configured correctly in CallPilot Manager for the local CallPilot server and the remote messaging server.
- The user's user ID, password, or both are not configured correctly in the desktop messaging or My CallPilot client.
- The requested authentication method is not supported at both ends of the connection.

This can occur when:

- a desktop messaging or My CallPilot user is using a desktop client or Web browser that does not support SMTP authentication at all
- the desktop messaging or My CallPilot user is using a client or Web browser that does not support the SMTP authentication method requested by CallPilot
- the remote messaging server does not support SMTP authentication
- the remote messaging server does not support the SMTP authentication method requested by CallPilot

---

## What happens when authentication fails

CallPilot cannot receive messages when authenticated mode only is used and authentication fails. If mixed authentication is being used on CallPilot, a message transmission can still occur without authentication.

---

## Incoming messages from desktop messaging or My CallPilot users

For incoming messages from desktop messaging or My CallPilot users, the message must leave the user's outbox and be received by the CallPilot server before CallPilot can deliver the message to the destination.

IF CallPilot is configured to use	THEN
authenticated mode only, and authentication fails for an incoming message from a desktop messaging or My CallPilot user	the message remains in the user's outbox in the desktop messaging client or Web browser. An NDN is not sent to the user because the user can immediately determine that the message was not sent.
mixed authentication, and authentication fails for an incoming session from a desktop messaging or My CallPilot user	the message remains in the user's outbox in the desktop messaging client or Web browser. An NDN is not sent to the user because the user can immediately determine that the message was not sent.
mixed authentication, and authentication is not attempted for an incoming message from a desktop messaging or My CallPilot user	CallPilot accepts the message without authentication. The unauthenticated desktop user restrictions are enforced. See <a href="#">Preventing toll fraud</a> on page 307.

## Incoming messages from remote servers

IF CallPilot is configured to use	THEN
authenticated mode only, and authentication fails for an incoming VPIM Networking message transmission	CallPilot drops the connection. The sender can receive an NDN if the remote server supports NDNs.
mixed authentication, and authentication fails for an incoming VPIM Networking session	CallPilot drops the connection. The sender can receive an NDN if the remote server supports NDNs.
mixed authentication, and authentication is not attempted for an incoming VPIM Networking message transmission	CallPilot accepts the message without authentication. The unauthenticated server restrictions are enforced. See <a href="#">Preventing denial-of-service attacks and junk e-mail in unauthenticated mode</a> on page 306.

## Outgoing messages to remote messaging servers

When an initiating SMTP password is defined on your CallPilot server, SMTP authentication is performed on outgoing sessions to remote servers. If authentication is attempted and fails, CallPilot still attempts to send the message. If the advertised authentication method is not supported, CallPilot attempts to send the message without authentication.

If the outgoing message was initiated by a desktop messaging or My CallPilot user, the unauthenticated desktop user restrictions are enforced. See [Preventing toll fraud](#) on page 307.

If the remote server rejects any SMTP commands, and the message cannot be sent after several attempts, CallPilot sends an NDN to the sender and logs an event.

---

## What happens when there are too many failed authentication attempts?

You can specify the maximum number of failed authentication attempts that can occur from remote messaging servers, desktop messaging users, or My CallPilot users, and what action to perform when the limit is exceeded. You can choose to:

- report the event in the event log and generate an alarm
- disable the remote messaging server in your network database and report the event

When the remote server is disabled, the following results occur:

- CallPilot rejects all incoming VPIM messages from that server (both authenticated and unauthenticated). This prevents hackers from trying all the possible password combinations and eventually obtaining the correct password.
  - If unsuccessful authentication attempts continue, CallPilot reports an event for each time the maximum number of failed attempts is exceeded.
- disable the user's mailbox and report the event

When the user's mailbox is disabled, CallPilot rejects the following from the user:

- all mailbox logon attempts (including logon attempts from a phoneset)
- all incoming VPIM messages from a desktop messaging or My CallPilot client that is configured as belonging to the user

This prevents hackers from trying all the possible password combinations and eventually obtaining the correct password.

CallPilot also reports an event for each time the maximum number of failed attempts is exceeded.

To allow CallPilot to receive incoming messages again, you must re-enable the remote server in your network database or the user's mailbox in user administration.

---

## Enabling CallPilot SMTP authentication

To enable SMTP authentication between CallPilot and remote messaging servers, you must configure specific options on both the local server and on each remote server in the CallPilot network database that is using VPIM Networking. The procedures for the tasks that you must complete are provided in the CallPilot Manager online Help.

To enable SMTP authentication between CallPilot, desktop messaging users, and My CallPilot users, you must also configure the desktop messaging and My CallPilot clients. For instructions

about configuring the desktop messaging and My CallPilot clients, see Desktop Messaging and My CallPilot Installation and Administration Guide (NN44200-302).

---

## Configuring unauthenticated access restrictions

If unauthenticated mode is used, Avaya recommends that you also enable unauthenticated access restrictions for servers and desktop users.

You can perform the following additional tasks, as required:

- Configure the desktop restriction/permission lists (RPLs).
- Assign RPLs to a mailbox class.
- Assign message delivery options to mailbox class members.

For instructions, see CallPilot Manager online Help.

---

## Monitoring suspicious SMTP activity

You can use one of the following methods to monitor suspicious SMTP and VPIM Networking activity:

- review SMTP-related events in the Windows event log (automatic monitoring)

If you choose to use the Windows event log as your monitoring method, no action is required from you to initiate SMTP/VPIM monitoring.

- enable monitoring of activity from specific origins on the Security Administration page in CallPilot Manager (manual monitoring)

---

## Automatic monitoring

Automatic monitoring alerts you to suspicious SMTP activity, blocks access to the system, and provides sufficient information for further investigation. No configuration is required for automatic SMTP/VPIM monitoring.

---

## How it works

If CallPilot detects repeated unsuccessful authentication attempts (for example, an incorrect password is presented), the following events occur:

- for a local user: after the specified number of unsuccessful attempts, an event is logged in the Windows event log and, if configured, the user's mailbox is disabled.

If the mailbox is disabled, the user cannot log on either from a phoneset or by using a desktop messaging or My CallPilot client. Messages are no longer accepted through SMTP from that user, regardless of whether the user is authenticated or not.

- for a remote server: after the specified number of unsuccessful attempts, an event is logged in the Windows event log and, if configured, message reception from the remote server is disabled.

If the remote server is disabled, messages from the remote server are no longer accepted.

 **Note:**

If the sender presents itself as a local mailbox or a remote server that does not actually exist, the system treats it the same way as when the mailbox or remote server does exist. This prevents the hacker from learning that the mailbox or server are not defined on the local system.

When the mailbox or server becomes disabled, an event is logged in the Windows event log. The event includes the following information:

- the User ID used in the authentication attempt

The user ID can be either a user's public switch telephone (PSTN) number (SMTP/VPIM shortcut and mailbox number) or a remote server's authenticating FQDN.

- the hostname and IP address from which the last authentication failure occurred

You can use this information to investigate the source of the suspicious activity, or enable manual hacker monitoring.

---

## Manual monitoring

You can manually monitor activity based on the following information:

- the authenticating user ID
- the IP address of the remote messaging server, desktop messaging client, or My CallPilot client that is attempting to connect to the CallPilot server
- the FQDN of the remote messaging server, desktop messaging client, or My CallPilot client that is attempting to connect to the CallPilot server

You can define up to 100 activities to monitor. When you enable monitoring, the system provides you with a detailed list of activities received from the user ID, IP address, or FQDN. Activities that appear in the list include:

- all connections with successful authentication attempts
- all connections with unsuccessful authentication attempts
- all unauthenticated connections (that is, where authentication was not attempted)

In addition to the activities list, an alarm message is deposited in the alarm mailbox, if the alarm mailbox is configured and these events are not throttled. For more information about manual monitoring, see the following in the CallPilot Administrator's Guide (NN44200-601):

- "Configuring messaging service defaults"
- "Throttling and customizing events"

When you accumulate enough data about the hacker attack, you can disable monitoring of the offending source to avoid excessive logging. You can disable monitoring by using one of the following methods:

- Click Delete to remove the monitoring activity from the list.
- Click Disable to disable the monitoring activity.



**Note:**

This retains the activity in the list so that you can enable it again, if required.

---

## Using wildcards

Wildcards are not supported when creating activity specifications.

---

## Section R: Encryption

---

### In this section

[CallPilot encryption description](#) on page 319

[How CallPilot encryption works](#) on page 320

[Implementing encryption on CallPilot](#) on page 323

---

### CallPilot encryption description

CallPilot supports Secure Socket Layer (SSL) encryption to encrypt message transmissions between CallPilot and:

- desktop and Web messaging clients
- another messaging server

---

### Privacy guarantee

When you use SSL to encrypt message traffic between messaging servers, users are provided with privacy over the network.

Total privacy is obtained only when:

- the message originates from a phoneset, or SSL is used between the desktop or Web messaging client and the CallPilot server
- SSL is used end-to-end between messaging servers
- the SSL transaction is successful

---

## When to use encryption

Encryption is optional. However, Avaya strongly recommends that you establish a secure (encrypted) session if you use the User ID and Password authentication method. User ID and password transmission in the clear is strongly discouraged.

Encryption prevents:

- password transmission in the clear
- eavesdroppers from gaining access to the contents of the message (thereby guaranteeing user privacy)

---

## Considerations for implementing encryption

To determine whether you need to implement encryption in your CallPilot network, consider the following questions:

- Is encryption needed for secure desktop or Web messaging logon?
- Is encryption required between messaging servers?
- Does your network infrastructure support secure message transmission from end to end?

If messages cross a firewall or pass through an intermediate mail relay, encryption may not be provided end-to-end.

- Do you need to upgrade any systems?

TCP/IP traffic encryption for SSL requires significant CPU resources. The impact of using SSL depends on:

- total network traffic (desktop and VPIM)
- percentage of traffic that is using SSL

Secure transmission of a message to a remote CallPilot system is pointless if the message is also addressed to another system that does not support SSL. To do so wastes CPU bandwidth.

---

## How CallPilot encryption works

The CallPilot SMTP server monitors port 25 for non-encrypted SMTP sessions. The CallPilot SMTP server also monitors (and connects to) port 465 for encrypted sessions. Encryption is

provided by enabling Secure Socket Layer (SSL), which is also known as Transport Layer Security (TLS).

SSL sessions can be established only when SSL is supported at both ends of the connection.

---

## SSL port monitoring

When SSL is enabled, the CallPilot server listens on port 465 for SSL handshake protocol commands. If the remote host sends a request for a connection to this port but does not provide the SSL handshake commands, the session cannot be established.

Similarly, if SSL is required, the CallPilot SMTP server attempts to connect to the SSL port on a remote messaging server. The standard SSL port setting is 465.

---

## SSL with User ID and Password authentication

The following table describes how SSL and the User ID and Password authentication method work together to guarantee user privacy over the network:

IF	THEN
SSL is enabled on the local server	<p>message transmission sessions are encrypted.</p> <ul style="list-style-type: none"> <li>• For outgoing sessions, the CallPilot SMTP server attempts to connect to the SSL port on the remote messaging server. If the connection is successful, the session is encrypted to prevent password transmission in the clear.</li> <li>• For incoming sessions, the CallPilot SMTP server listens for non-encrypted connections on port 25 and encrypted connections on port 465 from remote SMTP hosts. If the connection on port 465 is successful, the session is encrypted to prevent password transmission in the clear.</li> </ul>
SSL is not enabled on the local server	<p>message transmission sessions are not encrypted.</p> <p>For outgoing sessions, the CallPilot SMTP server establishes the connection with the remote messaging server, but does not try to authenticate. The session continues without authentication to prevent password transmission in the clear. If the remote server requires authentication, message transmission does not occur.</p>
SSL is not enabled on the local server (continued)	<p>For incoming sessions, the CallPilot SMTP server listens for connections from remote SMTP hosts only on port 25.</p>

IF	THEN
the SSL connection cannot be established on an incoming connection (encryption fails)	the CallPilot SMTP server drops the connection. Message transmission does not occur.
the SSL connection cannot be established on an outgoing connection (encryption fails)	the CallPilot SMTP server drops the connection. CallPilot sends a non-delivery notification (NDN) to the message originator.

---

## CallPilot encryption and VPIM-compliant systems

The SMTP connection is encrypted if:

- SSL is enabled at both ends
- encryption certificates are accepted by each system

Intermediate mail relays and application proxy servers must participate in the establishment of secure sessions.

---

## Encryption, authentication, mail relays, and firewalls

SSL encryption (and authentication) works best when messages are transferred point-to-point (for example, within a firewall).

When messages are not transmitted point-to-point, SSL sessions can still be initiated and authentication can still be performed if the firewalls are configured appropriately. It can also be possible to initiate SSL sessions between intermediary mail relays and proxies if those systems support SSL and are configured appropriately. However, end-to-end authentication may not be possible.

---

## CallPilot encryption and certificates

SSL implementation requires a certificate on the CallPilot server. The CallPilot SMTP server uses the certificate that is provided for Internet Message Access Protocol (IMAP) and Lightweight Directory Access Protocol (LDAP). No specific manual interventions are required by you to create a certificate for SMTP.

**Notes:**

- Some third-party VPIM-compliant messaging systems may or may not accept the CallPilot certificate. Therefore, it may be necessary to use third-party certificates. The availability of compatible encryption algorithms can limit the use of SSL between some systems.
- You may need to use a certificate import feature to import certificates created from known certificate authorities, such as Verisign.

The CallPilot SMTP server accepts all certificates when establishing an SSL session. That is, CallPilot does not verify the digital signature. Therefore, establishing the secure session does not guarantee that CallPilot is actually sending the message to a specific destination.

For example, a tampered router in the network can redirect messages to a server that is spoofing a known site. CallPilot cannot verify that the certificate presented by the remote site is legitimate, and sends the encrypted message to the rogue server, which can decrypt the message with its master keys.

---

## Implementing encryption on CallPilot

Encryption is enabled and configured independently from SMTP authentication configuration. (For information about SMTP authentication, see [Enabling CallPilot SMTP authentication](#) on page 315).

### To configure SSL

1. On the local server:
  - Enable SSL for incoming sessions from desktop or Web messaging clients and remote messaging systems.
  - Enable SSL for outgoing message transmission sessions to remote messaging systems.
2. For each remote server defined in the CallPilot network database, specify the port that the CallPilot server connects to establish an SSL session.

For specific instructions on how to configure the encryption options on the CallPilot server for both the local server and each remote server that is defined in the CallPilot network database, see CallPilot online Help.

For instructions on how to configure the encryption options in desktop or Web messaging clients, see the Desktop Messaging and My CallPilot Installation and Administration Guide (NN44200-305).

 **Important:**

Ensure that SSL is available on all systems, including intermediate systems such as gateways, mail relays, and so on. For information about implementing encryption on network devices, see the device manufacturer's documentation.



# Chapter 14: Implementation and planning tools

---

## Overview

This chapter provides checklists and worksheets that you can use while setting up your messaging network.

---

## Implementation checklists

To help you track your progress while implementing one or more networking solutions, you can use the following implementation checklists:

Checklist	For an example, see
Open AMIS Networking Implementation Checklist (NWP-035)	page <a href="#">Open AMIS Networking Implementation Checklist: NWP-035</a> on page 328.
Integrated AMIS Networking Implementation Checklist (NWP-032)	page <a href="#">Integrated AMIS Networking Implementation Checklist: NWP-032</a> on page 330.
Enterprise Networking Implementation Checklist (NWP-031)	page <a href="#">Enterprise Networking Implementation Checklist: NWP-031</a> on page 332.
VPIM Networking Implementation Checklist (NWP-029)	page <a href="#">VPIM Networking Implementation Checklist: NWP-029</a> on page 335.
Open VPIM Implementation Checklist (NWP-036)	page <a href="#">Open VPIM Implementation Checklist: NWP-036</a> on page 337.

For instructions on completing the tasks on these checklists, see the following:

- this guide
- CallPilot Manager online Help
- CallPilot Administrator's Guide (NN44200-601)

---

## Implementation process

The implementation process is easier if you follow this recommended order:

### To implement messaging network

1. Network Message Service (NMS)
2. Desktop or Web messaging

For information about IMAP implementation, see the Desktop Messaging and My CallPilot Installation and Administration Guide (NN44200-305).

3. AMIS Networking, Enterprise Networking or VPIM Networking

Notes:

- Avaya recommends that you implement and test all NMS sites in the messaging network before you implement any other networking solution.
- Avaya also recommends that you verify the accuracy of information for your site before you release it to remote network administrators.

---

## Configuration worksheets

To help you plan the configuration of your messaging network, you can use the following configuration worksheets:

Worksheet	For an example, see
Messaging Network Configuration worksheets	
CallPilot Networking—CDP Steering Codes (NWP-027)	page <a href="#">CallPilot Networking: CDP Steering Codes: NWP-027</a> on page 339.
CallPilot Networking—ESN Location Codes (NWP-037)	page <a href="#">CallPilot Networking: ESN Location Codes: NWP-037</a> on page 340.

Worksheet	For an example, see
CallPilot Network Information—Local Server Maintenance (NWP-024)	page <a href="#">CallPilot Networking: Local Server Maintenance: NWP-024</a> on page 342.
CallPilot Network Information—Remote Server Maintenance (NWP-025)	page <a href="#">CallPilot Networking: Remote Server Maintenance: NWP-025</a> on page 343.
CallPilot Network Information—Switch Location Maintenance (NWP-026)	page <a href="#">CallPilot Networking: Switch Location Maintenance: NWP-026</a> on page 346.
<hr/> Messaging Delivery Configuration worksheets <hr/>	
CallPilot Networking—Message Delivery Configuration (NWP-028)	page <a href="#">CallPilot Networking: Message Delivery Configuration: NWP-028</a> on page 348.
CallPilot Networking—Open VPIM Shortcuts (NWP-038)	page <a href="#">CallPilot Networking: Open VPIM Shortcuts: NWP-038</a> on page 352.

The configuration worksheets:

- provide a hard copy record of your network
- help you capture all the information for entry into CallPilot Manager

You can send the completed worksheets to other messaging network administrators to help them configure the network databases at their sites.

---

## Section A: Implementation checklists

---

### In this section

[Open AMIS Networking Implementation Checklist: NWP-035](#) on page 328

[Integrated AMIS Networking Implementation Checklist: NWP-032](#) on page 330

[Enterprise Networking Implementation Checklist: NWP-031](#) on page 332

[VPIM Networking Implementation Checklist: NWP-029](#) on page 335

[Open VPIM Implementation Checklist: NWP-036](#) on page 337

## Open AMIS Networking Implementation Checklist: NWP-035

Step	Description	Done
Gather information for the network		
1	Obtain the system access number for each open AMIS site with which Avaya CallPilot® exchanges messages.	—
Configure the switch		
 <b>Note:</b> For the switch requirements, see <a href="#">Implementing and configuring Avaya CallPilot® networking</a> on page 233 in this guide. For instructions on configuring the switch, see the documentation for your switch.		
2	Define the ACD queues.	—
3	Dedicate ACD agents to networking, if required.	—
4	Verify TGAR and NCOS on ACD agents.	—
5	Define trunks (if additional trunks are required).	—
6	Verify access to trunks (TGAR).	—
Configure the network database in Avaya CallPilot		
 <b>Note:</b> For instructions, see CallPilot Manager online Help.		
7	Configure the local server. Use the information recorded on the "CallPilot Networking—Local Server Maintenance" worksheet (NWP-024).	—
8	Configure the prime location for the local server. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
9	Configure the Network Message Service (NMS) satellite locations for the local server, if required. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
Configure the AMIS Networking message delivery options in CallPilot		
 <b>Note:</b> For instructions, see CallPilot Manager online Help.		

Step	Description	Done
10	Enable AMIS Networking message transmissions to and from open AMIS sites.	—
11	Define the open AMIS compose prefix.	—
12	Configure the AMIS Networking batch delivery threshold.	—
13	Define the allowed open AMIS delivery times.	—
14	Configure the local server's system access number.	—
Configure the System and Messaging options in CallPilot		
 <b>Note:</b> For instructions, see CallPilot Manager online Help.		
15	Define the AMIS Networking DN in the Service Directory Number (SDN) table and, if required, dedicate channels.	—
 <b>Note:</b> For guidelines on channel allocation, see CallPilot Manager online Help.		
16	Define Dialing Information and Dialing Translations.	—
Test the network for correct operation		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
17	Test call routing access by testing each ACD agent.	—
18	Compose and send a message from a mailbox on the local server to a mailbox on the local server.	—
19	Send a message from a mailbox on the local server to a user at an open AMIS site, if possible.	—
Create a backup of the network		
20	Back up CallPilot.	—
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
21	Print CallPilot network information.	—
 <b>Note:</b> For instructions, see "Printing networking information" in the CallPilot Manager online Help.		
22	Back up the switch.	—
 <b>Note:</b> For instructions, see your switch documentation.		

Step	Description	Done
23	Print switch network information.	—
	 <b>Note:</b> For instructions, see your switch documentation.	

## Integrated AMIS Networking Implementation Checklist: NWP-032

Step	Description	Done
	Gather information for the network	
	 <b>Note:</b> For instructions, see <a href="#">Implementing and configuring Avaya CallPilot® networking</a> on page 233 in this guide. If necessary, consult with a switch technician.	
1	Gather ESN information from the switch.	—
2	Gather CDP information from the switch.	—
3	Draw a diagram of the existing network.	—
4	Assign a unique site ID to each site in the network.	—
5	Analyze the information and determine if changes are required to the dialing plan configuration on the switch.	—
	Configure the switch	
	 <b>Note:</b> For the switch requirements, see <a href="#">Implementing and configuring Avaya CallPilot® networking</a> on page 233 in this guide. For instructions on configuring the switch, see your switch documentation.	
6	Define the ACD queues.	—
7	Dedicate ACD agents to networking, if required.	—
8	Verify TGAR and NCOS on ACD agents.	—
9	Define trunks (if additional trunks are required).	—
10	Verify access to trunks (TGAR).	—
11	Modify the dialing plan configuration on the switch if required.	—
	Configure the network sites and locations in CallPilot	

Step	Description	Done
 <b>Note:</b>	For instructions, see the CallPilot Manager online Help.	
12	Configure the local server. Use the information recorded on the "CallPilot Networking—Local Server Maintenance" worksheet (NWP-024).	—
13	Configure each remote server. Use the information recorded on the "CallPilot Networking—Remote Server Maintenance" worksheet (NWP-025).	—
14	Configure the prime location for each of the local and remote servers. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
15	Configure the Network Message Service (NMS) satellite locations for each of the local and remote servers, if required. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
16	Convert existing sites to AMIS Networking if necessary.	—
Configure the AMIS Networking message delivery options in CallPilot		
 <b>Note:</b>	For instructions, see the CallPilot Manager online Help.	
17	Enable AMIS Networking message transmissions to and from AMIS sites.	—
18	Configure the AMIS Networking batch delivery threshold.	—
19	Define the open AMIS compose prefix (if your network also contains open AMIS sites).	—
20	Configure the local server's system access number.	—
21	Define the open AMIS delivery times (if your network also contains open AMIS sites).	—
22	Define the AMIS Networking economy delivery times.	—
23	Define the AMIS Networking stale times.	—
Configure the System and Messaging options in CallPilot		
 <b>Note:</b>	For instructions, see the CallPilot Manager online Help.	
24	Define the AMIS Networking DN in the SDN table and, if required, dedicate channels.	—
25	Define Dialing Information and Dialing Translations.	—
Test the network for correct operation		

Step	Description	Done
	<p> <b>Note:</b> For instructions, see the CallPilot Manager online Help.</p>	
26	Test call routing access by testing each ACD agent.	—
27	Compose and send a message from a mailbox on the local server to a mailbox on the local server.	—
28	Send a message from a mailbox on the local server to a user at an integrated AMIS (remote) site.	—
Create a backup of the network		
29	Back up CallPilot.	—
	<p> <b>Note:</b> For instructions, see the CallPilot Manager online Help.</p>	
30	Print CallPilot network information.	—
	<p> <b>Note:</b> For instructions, see "Printing networking information" in the CallPilot Manager online Help.</p>	
31	Back up the switch.	—
	<p> <b>Note:</b> For instructions, see your switch documentation.</p>	
32	Print switch network information.	—
	<p> <b>Note:</b> For instructions, see your switch documentation.</p>	

## Enterprise Networking Implementation Checklist: NWP-031

Step	Description	Done
Gather information for the network		
	<p> <b>Note:</b> For instructions, see <a href="#">Implementing and configuring Avaya CallPilot® networking</a> on page 233 in this guide. If necessary, consult with a switch technician.</p>	
1	Gather ESN information from the switch.	—
2	Gather CDP information from the switch.	—

Step	Description	Done
3	Draw a diagram of the existing network.	—
4	Assign a unique site ID to each site in the network.	—
5	Analyze the information and determine if changes are required to the dialing plan configuration on the switch.	—

---

#### Configure the switch

**Note:**

For the switch requirements, see [Implementing and configuring Avaya CallPilot® networking](#) on page 233 in this guide. For instructions on configuring the switch, see your switch documentation.

6	Define the ACD queues.	—
7	Dedicate ACD agents to networking (if required). This step is optional.	—
8	Verify TGAR and NCOS on ACD agents.	—
9	Define trunks (if additional trunks are required).	—
10	Verify access to trunks (TGAR).	—
11	Modify the dialing plan configuration on the switch if required.	—

---

#### Configure the network sites and locations in CallPilot

**Note:**

For instructions, see the CallPilot Manager online Help.

12	Configure the local server. Use the information recorded on the "CallPilot Networking—Local Server Maintenance" worksheet (NWP-024).	—
13	Configure each remote server. Use the information recorded on the "CallPilot Networking—Remote Server Maintenance" worksheet (NWP-025).	—
14	Configure the prime location for each of the local and remote servers. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
15	Configure the Network Message Service (NMS) satellite locations for each of the local and remote servers (if required). Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
16	Convert existing sites to Enterprise Networking if necessary.	—

---

#### Configure the Enterprise Networking message delivery options in CallPilot

**Note:**

For instructions, see the CallPilot Manager online Help.

Step	Description	Done
17	Enable Enterprise Networking message transmissions to and from Enterprise Networking sites.	—
18	Configure the Enterprise Networking batch delivery threshold.	—
19	Define the Enterprise Networking economy delivery times.	—
20	Define the Enterprise Networking stale times.	—
Configure the System options in CallPilot		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
21	Define the Enterprise Networking DN in the Service Directory Number (SDN) table and, if required, dedicate channels.	—
Test the network for correct operation		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
22	Test call routing access by testing each ACD agent.	—
23	Compose and send a message from a mailbox on the local server to a mailbox on the local server.	—
24	Send a message from a mailbox on the local server to a mailbox user at a remote Enterprise Networking site.	—
Create a backup of the network		
25	Back up CallPilot.	—
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
26	Print CallPilot network information.	—
 <b>Note:</b> For instructions, see "Printing networking information" in the CallPilot Manager online Help.		
27	Back up the switch.	—
 <b>Note:</b> For instructions, see your switch documentation.		
28	Print switch network information.	—
 <b>Note:</b> For instructions, see your switch documentation.		

## VPIM Networking Implementation Checklist: NWP-029

Step	Description	Done
Gather information for the network		
1	Obtain the following information for each remote server: <ul style="list-style-type: none"> <li>• fully qualified domain name (FQDN)</li> <li>• VPIM prefix for each switch location at the remote site</li> <li>• SMTP password (if SMTP authentication is being used)</li> </ul>	—
2	Obtain the fully qualified domain name of the outgoing SMTP mail/proxy server.	—
3	Draw a diagram of the existing network.	—
4	Assign a unique site ID to each site in the network.	—
5	Create a VPIM network shortcut for each switch location in the network (for both the local and remote servers).	—
Configure the network sites and locations in CallPilot		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
6	Configure the local server. Use the information recorded on the "CallPilot Networking—Local Server Maintenance" worksheet (NWP-024).	—
7	Configure each remote server. Use the information recorded on the "CallPilot Networking—Remote Server Maintenance" worksheet (NWP-025).	—
8	Configure the prime location for each of the local and remote servers. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
9	Configure the Network Message Service (NMS) satellite locations for each of the local and remote servers (if required). Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
10	Convert existing sites to VPIM Networking if necessary.	—
Configure the VPIM Networking message delivery options in CallPilot		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		

Step	Description	Done
11	Enable incoming SMTP/VPIM message transmissions from desktop or Web messaging users and open VPIM sites.	–
12	Enable outgoing VPIM Networking message transmissions to open VPIM sites.	–
13	Configure the Outgoing SMTP mail/proxy server's FQDN.	–
14	Define the open VPIM compose prefix (if required).	–
15	Create an open VPIM shortcut for each open VPIM-compliant site with which CallPilot exchanges messages (if required).	–
16	Configure the encryption settings (if required).	–
17	Configure the SMTP authentication settings (if required).	–
18	Configure the unauthenticated access restrictions for users and remote servers, if users or servers in your network are not SMTP authenticated.	–
Test the network for correct operation		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
19	Perform a connectivity test by pinging the outgoing SMTP mail/proxy server or by establishing a telnet connection to the server.	–
20	Compose and send a message from a mailbox on the local server to a mailbox on the local server.	–
21	Send a message from a mailbox on the local server to a mailbox user at a remote VPIM Networking site.	–
Create a backup of the network		
22	Back up CallPilot.	–
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
23	Print CallPilot network information.	–
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		

## Open VPIM Implementation Checklist: NWP-036

Step	Description	Done
Gather information for the network		
1	Obtain the following for each open VPIM-compliant site with which CallPilot exchanges messages: <ul style="list-style-type: none"> <li>• fully qualified domain name</li> <li>• VPIM prefix</li> </ul>	—
2	Obtain the fully qualified domain name of the outgoing SMTP mail/proxy server.	—
3	Draw a diagram of the existing network.	—
4	Create an open VPIM shortcut for each open VPIM site.	—
Configure the network database in CallPilot		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
5	Configure the local server. Use the information recorded on the "CallPilot Networking—Local Server Maintenance" worksheet (NWP-024).	—
6	Configure the prime location for the local server. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
7	Configure the Network Message Service (NMS) satellite locations for the local server, if required. Use the information recorded on the "CallPilot Networking—Switch Location Maintenance" worksheet (NWP-026).	—
Configure the VPIM Networking message delivery options in CallPilot		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
8	Enable incoming SMTP/VPIM message transmissions from desktop or Web messaging users and open VPIM sites.	—
9	Enable outgoing VPIM Networking message transmissions to open VPIM sites.	—
10	Configure the Outgoing SMTP mail/proxy server's FQDN.	—
11	Define the open VPIM compose prefix.	—

Step	Description	Done
12	Create an open VPIM shortcut for each open VPIM-compliant site with which CallPilot exchanges messages, if required.	—
13	Configure the encryption settings, if required.	—
14	Configure the SMTP authentication settings, if required.	—
15	Define unauthenticated access restrictions for users and remote servers, if users or servers in your network are not SMTP authenticated.	—
Test the network for correct operation		
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
16	Perform a connectivity test by pinging the outgoing SMTP mail/proxy server or by establishing a telnet connection to the server.	—
17	Compose and send a message from a mailbox on the local server to a mailbox on the local server.	—
18	Send a message from a mailbox on the local server to a mailbox user at an open VPIM site, if possible.	—
Create a backup of the network		
19	Back up CallPilot.	—
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		
20	Print CallPilot network information.	—
 <b>Note:</b> For instructions, see the CallPilot Manager online Help.		

---

## Section B: Configuration worksheets

---

### In this section

[CallPilot Networking: CDP Steering Codes: NWP-027](#) on page 339

[CallPilot Networking: ESN Location Codes: NWP-037](#) on page 340

[CallPilot Networking: Local Server Maintenance: NWP-024](#) on page 342







---

## CallPilot Networking: Local Server Maintenance: NWP-024



**Note:**

Complete and attach CallPilot Networking—Switch Location Maintenance (NWP-026) for the prime switch location.

**Table 9: Local server information**

Site name:	Site ID:
Does site use Network Message Service? -- Yes -- No	
Send messages to all other servers: -- Yes -- No	Activate Names Across the Network (add or update remote users on this server): -- Yes -- No Activate Enhanced Names Across the Network (automatically add and update remote users on selected servers): -- Yes -- No

**Table 10: Network broadcast ability**

Send network broadcast messages to remote sites: -- Yes -- No	Receive network broadcast messages from remote sites: -- Yes -- No
---------------------------------------------------------------------	--------------------------------------------------------------------------

---

## Network broadcast addresses

**Table 11: Enterprise Networking options**

Receive message text information: _ Yes _ No
----------------------------------------------------

**Table 12: VPIM Networking options**

Send user information to this server: _ Yes _ No	Send message text information to this server: _ Yes _ No
Receive user information from this server: _ Yes _ No	Receive message text information from this server: _ Yes _ No
Send User Info to Remote Servers: _ Yes _ No	
Receive User Info from Remote Servers: _ Yes _ No	

---

## SMTP and VPIM Networking

**Table 13: Completed by**

Administrator:	Date:
----------------	-------

---

## CallPilot Networking: Remote Server Maintenance: NWP-025

 **Note:**

Complete and attach CallPilot Networking—Switch Location Maintenance (NWP-026) for the prime switch location.

**Table 14: Remote server information**

Site name:		Does site use Network Message Service? _ Yes _ No
Server type:    _ CallPilot    _ MMNG	_ Meridian Mail	_ Other Avaya    _ Other

<p> <b>Note:</b>                  If you are configuring an Avaya CallPilot® Mini system, Avaya Business Communications Manager, or Avaya Norstar, select Other Avaya. If you are configuring a 3rd party VPIM compliant system, select Other.</p>		
Site ID:		Send messages to this server: <input type="checkbox"/> Yes <input type="checkbox"/> No

**Table 15: Network broadcast ability**

Send network broadcast messages to this server: <input type="checkbox"/> Yes <input type="checkbox"/> No	Receive network broadcast messages from this server: <input type="checkbox"/> Yes <input type="checkbox"/> No
----------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------

**Table 16: Enterprise Networking options**

Send user information to this server: <input type="checkbox"/> Yes <input type="checkbox"/> No	Send message text information to this server: <input type="checkbox"/> Yes <input type="checkbox"/> No
------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------

**Table 17: VPIM Networking options**

Send user information to this server: <input type="checkbox"/> Yes <input type="checkbox"/> No	Send message text information to this server: <input type="checkbox"/> Yes <input type="checkbox"/> No
Receive user information from this server: <input type="checkbox"/> Yes <input type="checkbox"/> No	Receive message text information from this server: <input type="checkbox"/> Yes <input type="checkbox"/> No
Send User Info to Remote Servers: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Receive User Info from Remote Servers: <input type="checkbox"/> Yes <input type="checkbox"/> No	

---

## SMTP and VPIM Networking

**Table 18: Connection information**

Message transfer protocol: _ AMIS _ Enterprise _ VPIM	Connection DNs (Enterprise Networking only)   <b>Note:</b> If the remote server is uses the AMIS protocol, complete the "Remote system access number" section in the following paragraph. DN 1: _____ DN 2: _____ DN 3: _____
----------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

---

## Remote system access number (complete one only)

Complete this section only if the remote server uses the AMIS protocol.

Public network number:  Country code: _____ Area/city code: _____ Number: _____	Private network number:  _____
---------------------------------------------------------------------------------------------	--------------------------------------

**Table 19: Enterprise Networking passwords**

Initiating password: _____ Responding password: _____
----------------------------------------------------------

**Table 20: VPIM Networking security**

SSL port number (for encryption): Server password:
Receive messages from this server:      _ Yes                                      _ No

**Table 21: Completed by**

Administrator:	Date:
----------------	-------

## CallPilot Networking: Switch Location Maintenance: NWP-026

Complete this form for each switch location and attach it to NWP-024 or NWP-025.

**Table 22: Location Information**

This location belongs to Site name:	Site ID:	This location is a <input type="checkbox"/> Prime switch location <input type="checkbox"/> Satellite switch location
Location name:	Do you want to record a spoken name for the location? <input type="checkbox"/> Yes (Click Record or import.) <input type="checkbox"/> No	
Location ID:		

**Table 23: Dialing plans**

<input type="checkbox"/> ESN (Complete the ESN dialing plan information section in the following section.)	<input type="checkbox"/> CDP (Complete the CDP dialing plan information section on the next page.)
Mailbox addressing follows the dialing plan: <input type="checkbox"/> Yes <input type="checkbox"/> No (Complete the Mailbox prefixes field.)	
Mailbox prefixes: _____	Dialing prefix (for remote locations only): _____
_____	_____

## ESN dialing plan information

(Complete this section if you select the ESN dialing plan.)

ESN access code:
------------------

ESN location codes and overlap: Complete and attach "ESN Location Codes" (NWP-037).

## CDP dialing plan information

(Complete this section if you select the CDP dialing plan.)

CDP steering codes and overlap: Complete and attach "CDP Steering Codes" (NWP-027).

## VPIM network shortcuts

(Complete this section to allow phoneset users to send VPIM Networking messages. You can create up to 30 VPIM network shortcuts for this location.)

VPIM prefix:	Overlap between VPIM prefix and local extensions:	VPIM prefix:	Overlap between VPIM prefix and local extensions:
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	

**Table 24: VPIM network shortcuts (continued)**

VPIM prefix:	Overlap between VPIM prefix and local extensions:	VPIM prefix:	Overlap between VPIM prefix and local extensions:
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	

_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	
_____	_____	_____	_____
-		-	

---

## Time zone

(Complete this section for local satellite-switch locations only.)

Use server time zone: <input type="checkbox"/> Yes <input type="checkbox"/> No (Specify the time zone to be used.)	Time zone (if server time zone is not used):
--------------------------------------------------------------------------------------------------------------------------	----------------------------------------------

### Table 25: Completed by

Administrator:	Date:
----------------	-------

---

## CallPilot Networking: Message Delivery Configuration: NWP-028

### Table 26: AMIS Networking options

Enable outgoing AMIS Networking messages	Enable incoming AMIS Networking messages
------------------------------------------	------------------------------------------

_ Yes _ No	_ Yes _ No
Number of messages to collect before sending (batch threshold):	Open AMIS compose prefix:

**Table 27: Open AMIS networking delivery times**

Days active:			
_ Monday	_ Tuesday:	_ Wednesday	_ Thursday
_ Friday	_ Saturday	_ Sunday	
Outgoing messages allowed on business days (hh:mm)	From: _____	To: _____	
Outgoing messages allowed on non-business days (hh:mm)	From: _____	To: _____	

**Table 28: Local system access number (complete one only)**

Public network number:	Private network number:
Country code: _____	_____
Area/city code: _____	_____
Number: _____	_____

**Table 29: Economy delivery times (hh:mm)**

Open AMIS	Integrated AMIS
Start time: _____	Start time: _____
Stop time: _____	Stop time: _____

**Table 30: Stale times (hh:mm)**

Economy Open AMIS: _____	Standard _____
Economy Integrated AMIS: _____	Urgent: _____

**Table 31: Enterprise Networking options**

Enable outgoing Enterprise Networking messages _ Yes _ No	Enable incoming Enterprise Networking messages _ Yes _ No
Number of messages to collect before sending (batch threshold):	

**Table 32: Economy delivery times (hh:mm)**

Start time:	Stop time:
-------------	------------

**Table 33: Stale times (hh:mm)**

Economy:	Standard:
Urgent:	

**Table 34: SMTP and VPIM Networking options**

Enable incoming VPIM Networking messages: _ Yes _ No	Enable outgoing VPIM Networking messages: _ Yes _ No
Outgoing SMTP Mail/Proxy server:	
Open VPIM compose prefix:	
Open VPIM shortcuts: Complete and attach "Open VPIM Shortcuts" (NWP-038).	

Security modes for SMTP sessions

 **Note:**

These settings apply for VPIM Networking, desktop messaging, and Web messaging.

Encryption options		
Enable SSL for incoming SMTP sessions:	_ Yes	_ No
Connect to server with SSL for Outgoing SMTP sessions:	_ Yes	_ No
Authentication options		
 <b>Note:</b>		
If you choose Yes for Unauthenticated as well as User ID and Password authentication, this is referred to as mixed authentication.		

Unauthenticated:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
User ID and Password authentication:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
SMTP/VPIM password for initiating authenticated connections to remote servers:	_____	
Authentication failure attempts		
Maximum failed authentication attempts from a remote server:	_____	
Action to perform when the maximum is reached:	<input type="checkbox"/> Log only	<input type="checkbox"/> Log and disable server
Maximum failed authentication attempts from a user:	_____	
Action to perform when the maximum is reached:	<input type="checkbox"/> Log only	<input type="checkbox"/> Log and disable user

**Table 35: Unauthenticated access restrictions**

Enable unauthenticated desktop user restrictions	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Delivery to telephone or fax	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Enable Open AMIS	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Enable Integrated Networking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Enable SDL addressing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Enable broadcast addressing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Restrict the number of recipients		
Maximum recipients	_____	
Enable unauthenticated server restrictions:		
Enable SDL addressing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Enable broadcast addressing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Restrict the number of recipients	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Maximum recipients	_____	

**Table 36: Remote contact options (AMIS and Enterprise Networking)**

Wait before sending C DTMF tone (milliseconds):
Delay for each non-pause character in DN (milliseconds):

**Table 37: Completed by**

Administrator:	Date:
----------------	-------



_____	_____	_____	_____
-	-	-	-
_____	_____	_____	_____
-	-	-	-
_____	_____	_____	_____
-	-	-	-

**Table 38: Completed by**

Administrator:	Date:
----------------	-------



# Chapter 15: How AMIS and Enterprise Networking handle messages

[Networking messages](#) on page 355

[What the MTA does](#) on page 358

[What the ANA does](#) on page 360

[Example of message handling with AMIS Networking](#) on page 362

---

## Networking messages

Every networking message contains two main parts:

- a message header
- the message body

---

## Message header

The message header transmits to the receiving site with DTMF signals. The header contains the following information:

- the sender's address, which can include the site or location ID, mailbox number, and text name, depending on how the features are enabled (for Enterprise, the sender's spoken name is recorded)
- each recipient's address (site or location ID, mailbox number)
- the system access number
- the type of message (regular, acknowledgment, or non-delivery notification [NDN])
- the time and date when the message was sent
- for Enterprise only, the priority applied to the message (private, urgent, or acknowledgment)

## Message body

The recorded message is played over the voice port of the sending site and is recorded by the receiving site. The recorded message contains the following information:

- the voice portion of the message
- any attachments

---

## Message priorities

The sender can assign a message priority to an Enterprise networking message. There are three priorities:

- economy
- standard
- urgent

Standard is usually the default. Users must assign another message priority manually. In general, you send economy messages during lower long-distance toll charge periods. You send urgent messages quickly, with the emphasis on speed rather than cost.

---

## MTA and ANA

The scheduling parameters that you configure during the implementation of a networking solution work with internal Avaya CallPilot® networking settings. These internal settings are controlled by the:

- Message Transfer Agent (MTA)
- Analog Networking Agent (ANA)

This brief overview provides a general understanding of how networking handles messages to help you interpret Alarm and Event reports.

---

## MTA responsibilities

The MTA provides many of the basic maintenance functions required by Avaya CallPilot networking. The MTA maintains the following services:

- queue outgoing network messages
- determine when to begin sending messages to a remote system
- receive incoming messages for delivery to local users
- collect networking traffic Operational Measurements (OM) reports

To ensure the timely handling of messages, the MTA wakes up every minute. When it wakes up, the MTA does the following:

- initiates calls to remote sites
- checks for stale messages
- checks if any sites are in error status

---

## MTA Monitor

When enabled, the MTA Monitor continuously watches the performance of the MTA. The MTA Monitor provides detailed information and is useful for regular maintenance and troubleshooting.

---

## ANA responsibilities

The ANA sends messages to and receives messages from remote systems configured with either AMIS or Enterprise networking. There is one instance of the ANA for every active analog networking session. An ANA instance terminates when the session is over.

## Main steps of message transfer

There are three main steps in the message transfer process:

- The MTA determines if a message destined for an AMIS or Enterprise site is ready for transfer and if so, passes it to the ANA.
- The ANA completes a communication process, known as handshaking, with the receiving site.
- The message, which consists of the message header and the message body, is transferred.

---

## What the MTA does

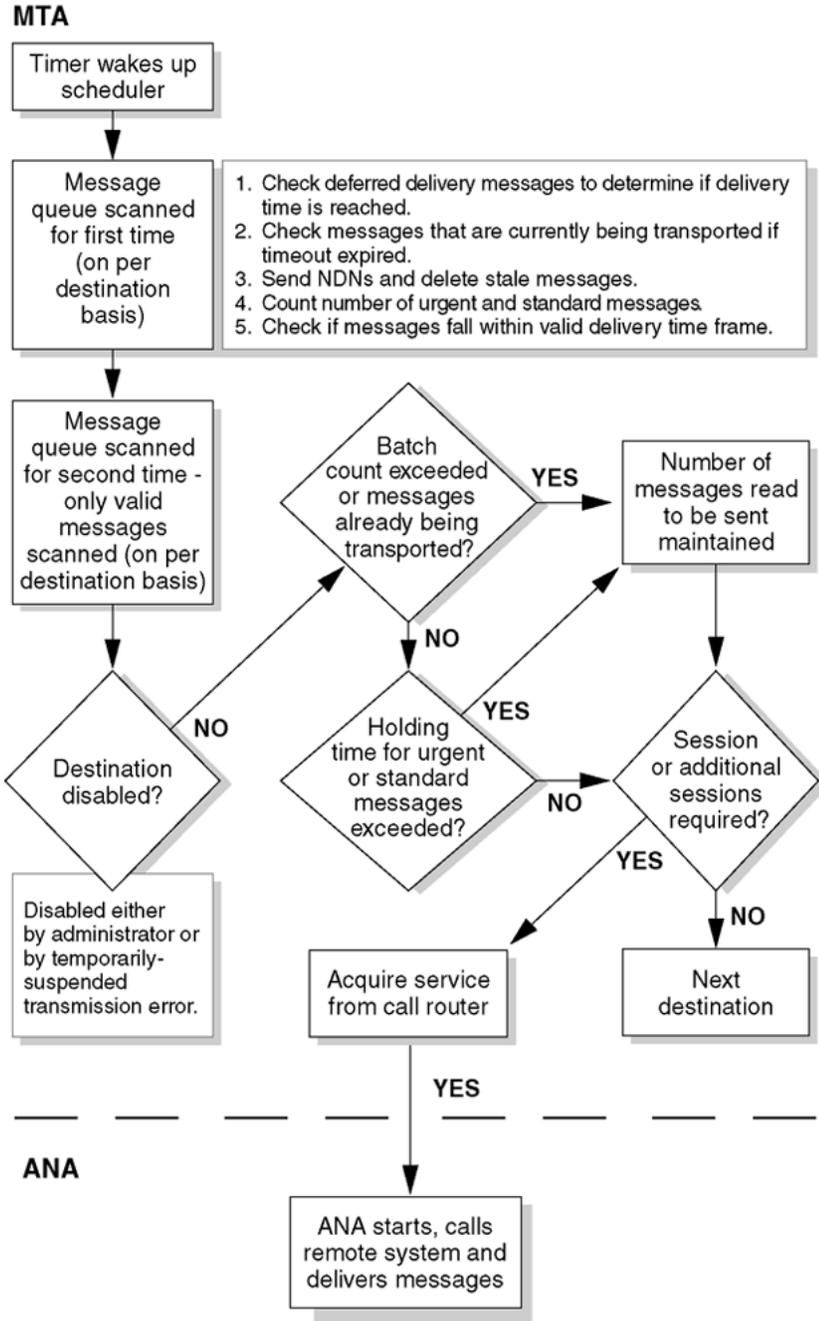
The MTA handles most aspects of message transmission for CallPilot.

---

## How MTA and ANA handle messages

The following diagram is a graphical representation of how CallPilot handles Integrated AMIS Networking messages.

The diagram shows the activity of both the MTA and the ANA in message handling.



G100969

**Figure 38: MTA and ANA message handling**

As the preceding diagram indicates, the MTA handles most of the message processing. Every minute, a scheduler wakes the MTA. The MTA scans the message queue for each destination, and checks the status of messages awaiting delivery. This scan determines if there are valid messages, according to the system parameter configuration. The MTA determines if the valid messages are ready for delivery, according to the set system parameters. When the MTA

determines that a transmission session is needed, it seeks a method of delivery from the call router. The ANA assumes responsibility for delivering the message.

---

## What the ANA does

The ANA does the actual message delivery or reception. It works with the MTA to handle messages.

---

## How the ANA sets up calls

The ANA calls a remote site and delivers messages. CallPilot originates a network call to the receiving site using the connection directory number (DN) defined for that site. The switch places the call according to switch call-processing parameters. If the call is successful, the call terminates on the networking connection DN at the receiving site.

If the call fails due to a busy or no-answer condition, CallPilot waits until the next wake-up interval before it attempts the call again. If three consecutive attempts fail, CallPilot places the receiving site into error status and an alarm is generated, depending on the nature of the problem. CallPilot waits for half an hour before it repeats the three-call attempt cycle.

When connection between the sending and receiving sites is established, ANA initiates a communication process known as handshaking. Handshaking consists of the following steps:

1. The sending site identifies itself to the receiving site.
2. For the Enterprise solution, the receiving site verifies that the sending site is defined in the network database of the receiving site, and that the site ID and the message transfer protocol agree. If the information does not agree, the receiving site informs the sending site of the error and drops the call.
3. The sending site sends the initiating password and the receiving site ID to the receiving site.
4. The sending site also indicates that it sends a remote user text information if the necessary options are enabled on the site configuration for the receiving site.
5. The receiving site checks the site ID and password:  
  
If the information is invalid, the receiving site informs the sending site that either the site ID or the password is incorrect, and drops the call.  
  
If the information is valid, the receiving site proceeds to the following step.
6. The receiving site determines whether remote user or message text information is received during this session.

7. The receiving site sends the responding password and indicates whether Names Across the Network information and a text subject header is sent during this session.

8. The sending site checks the password:

If the password is invalid, the sending site sends an end-of-session message and drops the call.

If the password is valid, the sending site starts the message transfer to the receiving site.

## Message transfer process

The following table describes how messages are transferred for Integrated AMIS networking:

The sending site	The receiving site
uses DTMF tones to send the message header to the integrated site. The message header contains:	receives the DTMF tones, interprets the tones, and creates the message.
<ul style="list-style-type: none"> <li>• the sender's mailbox number without location prefixes</li> <li>• the sender's system access number</li> <li>• the recipient's mailbox without location prefixes</li> </ul>	records the message body and adds it to the message.
plays the voice portion of the message across a voice port.	repeats these steps for each message.
repeats these steps for each message the sending site must send.	repeats these steps for each message.
<p> <b>Note:</b> The maximum number of messages in a transfer session is five.</p>	
terminates the message transfer session.	hangs up.

The following table describes how messages are transferred for Enterprise networking:

The sending site	The receiving site
sends the message information. The message contains the following:	receives and intercepts the message information and creates the message.
<ul style="list-style-type: none"> <li>• time and date stamp</li> <li>• subject</li> <li>• message priority (private, urgent, or acknowledgment)</li> </ul>	

The sending site	The receiving site
sends the information about the sender. The information includes the following: <ul style="list-style-type: none"><li>mailbox number, including site ID (and location ID if the remote site is using NMS)</li></ul>	receives and adds the sender to the message.
if the Remote User Receive User Info from remote servers option is selected, plays the spoken name.	<ul style="list-style-type: none"><li>records the spoken name.</li><li>adds or updates the remote user.</li></ul>
sends recipient information. The information includes the following: <ul style="list-style-type: none"><li>mailbox number (including site and location ID).</li><li>recipient's address as text, if the Receive Text Information option is selected.</li></ul>	receives and adds each recipient to the message.
plays the message body.	records the message body and adds it to the message.
plays any attachments.	records each attachment and adds it to the message.
indicates the end of the message.	sends to the local MTA to deposit the message in each local recipient's mailbox.
repeats all of the above for each message.	repeats all of the above for each message.

---

## Example of message handling with AMIS Networking

The following example shows how the message delivery configuration and the internal settings work together. The example offers a high-level overview of how users use AMIS Networking and how the system handles AMIS Networking messages.

### How a user sends a message to an open AMIS user

1. The user logs on to CallPilot.
2. The user enters 75 to compose a message.
3. The user enters the AMIS compose prefix.

Example:13

The prefix alerts the system that the message is intended for an AMIS Networking user.

4. The user enters the number as it normally is dialed from the system, followed by #.

Example:914165553333#

The # symbol indicates the end of the system access number.

5. The user enters the mailbox number of the intended remote recipient, followed by #.

Example:8123#

The system responds with the following message: Open network user <mailbox number> at <system access number>.

6. The user enters # and 5 to record the message, records the message, and enters # to stop the recording.
7. The user enters 79 to send the message.
8. The user logs out of CallPilot and hangs up.

---

## How CallPilot handles the message

Here is a simplified overview of the process that transfers an AMIS message to a remote user. The MTA periodically checks for new outgoing messages. When the MTA detects a ready message with an AMIS recipient, it starts a queue for the recipient site. Successful delivery results in an acknowledgment if the message was so tagged. An acknowledgment to an AMIS message is sent when the message is transmitted, not when it is listened to.

---

## How a remote user replies to an AMIS message

A remote user at a CallPilot site can easily reply to an AMIS message.

1. While within the received message, the remote user enters 71 to reply to the message.
2. The user enters 5 to record the message, records the message, and then enters # to stop the recording.
3. The user enters 79 to send the message.

---

## How the remote system handles the message reply

The remote system uses the system access number in the header of the original message to return the call. However, when using the public switch telephone network, the original system

access number does not include a network dialing prefix. The missing prefix indicates to the system that the reply is an external call. The remote system must add the network dialing prefix to the system access number.

---

## Example

- The system access number of the original message = 14167779898.
- The remote system adds a dialing prefix (for example, 9) to allow dialing out from the switch.

---

## Relationship of a system access number to a connection DN

A system access number becomes a connection DN in the network database record of a remote messaging server. The system access number uniquely identifies a site. When you send a message to an integrated site, the local site looks up the connection DN for that remote site and initiates the network call. The local site identifies itself to the remote site by including its own system access number in the message header. The receiving site takes that system access number and searches its own network database for a connection DN that matches the system access number.

The receiving site identifies the sending site if it finds a connection DN that matches the system access number it received. When the recipient listens to the message, the sending site is identified.

If the receiving site does not find a connection DN that matches the system access number it received, it treats the message as an Open AMIS message sent from a remote site that is not part of the private messaging network. When the recipient listens to the message, the sending site is identified only as an open site.

## Index

### A

access code and ESN prefix .....	113	compared with Enterprise Networking protocol ....	
access code, ESN .....	274	53	
access mechanism		AMIS-A protocol. See AMIS protocol .....	40
direct access .....	216	AML. See Application Module Link .....	214
indirect access .....	216	ANA (Analog Networking Agent)	
offnet access .....	216	description .....	357
ACD-DNs, on existing satellite-switches .....	225	analog protocol	
addressing a message		AMIS protocol .....	40
to a local user with ESN .....	115	compared to digital .....	42
to a remote user with ESN .....	115	Enterprise Networking protocol .....	40
to an open site .....	65	another dialing plan	
addressing plan		example .....	130
distinguished from dialing plan .....	121	recommended relationship between dialing and	
administration guides .....	26	addressing plans .....	121
administration, network		application gateway	
about implementation .....	175	definition .....	300
administrator responsibilities .....	177	overview .....	299
implementation scenarios .....	176	Application Module Link	
administrators		previously known as .....	215
time zone conversions (Network Message Service)		Attendant Extended Call feature, interaction with NMS	
.....	230	.....	219
alarm mailbox .....	74	Audio Messaging Interchange Specification protocol.	
AMIS compose prefix		See AMIS protocol .....	40
selecting .....	247	authentication activity, monitoring .....	305, 316, 318
AMIS delivery times		automatic monitoring .....	316
default values .....	248	manual monitoring .....	318
described .....	249, 253	authentication failures, description .....	315
AMIS Networking		authentication modes	
broadcast messages .....	142, 145	description .....	304
description .....	174	enabling .....	308
disabling .....	245	when to use .....	308
enabling .....	245	authentication, mixed	
implementation checklists .....	325	enabling .....	309
in complex network .....	236	user impact .....	310
message length supported .....	62	when to use .....	309, 310
message transmission time .....	91	authentication, SMTP	
message types supported .....	60	broadcast messages .....	141
minimizing risk of long-distance toll fraud .....	296	description .....	304
preliminary requirements for configuration .....	266	desktop or Web messaging users .....	304
recipients, time zone conversions (Network		disabling .....	306
Message Service) .....	231	enabling .....	308
sending message to remote user scenario .....	362	encryption .....	305, 322
when to implement .....	182	location broadcasts .....	143
AMIS protocol .....	40, 53	network broadcasts .....	143
		user ID and password .....	311
		when to disable .....	306
		when to use .....	308

---

**B**

Barge-in Attendant feature, interaction with NMS	220
batch threshold	
default value	244
description	246, 253
benefits of remote users	96
broadcast mailbox	74
broadcast message	217
broadcast, network	
addresses, viewing	146
addressing rules	138
description	137
desktop messaging users, mailbox class validation	
	141
distribution lists	140
location broadcast, description	134
multimedia support	145, 146
Network Message Service (NMS)	141
networking protocols	142
phoneset users, mailbox class validation	140
remote server capabilities	144
requirements	134
server capabilities	142
SMTP authentication	141, 143
user capabilities	139
when to disable	143
Business Communications Manager	
location broadcasts	144
network broadcasts	144

---

**C**

calculating message length	63
Call Forward by Call Type Allowed feature, interaction with NMS	218
Call Forward feature	
interaction with NMS	218
types supported	218
calling	
local users with CDP	119
remote users with	119
CallPilot	
features supported by networking solutions	67
messaging network	37, 42
networking solutions	50
CallPilot 1.0x	
location broadcasts	144
network broadcasts	144
CallPilot features, interaction with networking	198
CallPilot Manager	

Cancel button	187, 192
logging on	31
Message Delivery Configuration page, accessing	187
Message Network Configuration page, accessing	188
Save button	188, 192
Web server, description	185
CallPilot server	
and CallPilot Manager	185
logon	31
with integrated Web server, diagram	186
Cancel button, CallPilot Manager	187, 192
CDP dialing plan	
and user location	221
ESN dialing plan recommended	205
CDP information	
remote prime switch location	290
CDP steering code	109, 112, 117–119, 275
and extension length	119
and nonuniform dialing plan	112
creating	118
location code	109
overlap	275
overview	275
requirement	117
certificates, encryption	322
channel requirements	199
channel resource allocation	
minimum and maximum	241
channel types supported	241
channels	
impact of NMS on number required	200
types required	200
types supported	75
checklist for gathering information	208
checklists, network implementation	183, 325
CO Loop Start trunk	219
combining several switch locations into one user location	221
Command and Status Link, now known as Application Module Link	215
complex network	236
compose prefix	
selecting	247
Conference Call feature, interaction with NMS	219
configuration	
prime switch location overview	224
configuration worksheets, network	326
configuring	
remote satellite-switch location, overview	291

configuring satellite-switch locations, overview .....	<a href="#">224</a>	dialing plan .....	<a href="#">108</a>
confirming switch settings .....	<a href="#">207</a>	ESN .....	<a href="#">113</a>
connection DN		firewall .....	<a href="#">299</a>
relationship to system access number .....	<a href="#">364</a>	messaging network .....	<a href="#">37</a> , <a href="#">42</a>
remote messaging server .....	<a href="#">284</a>	network .....	<a href="#">35</a>
controlling how Names Across the Network works ....		prime switch location .....	<a href="#">213</a>
<a href="#">101</a>		proxy server .....	<a href="#">299</a>
Coordinated Dialing Plan .....	<a href="#">116</a> , <a href="#">117</a> , <a href="#">119</a> , <a href="#">121</a> , <a href="#">127</a>	remote user .....	<a href="#">95</a>
calling users .....	<a href="#">119</a>	satellite-switch location .....	<a href="#">213</a>
definition .....	<a href="#">116</a>	site .....	<a href="#">43</a>
example .....	<a href="#">127</a>	steering code .....	<a href="#">117</a>
mailbox address and .....	<a href="#">119</a>	switch network .....	<a href="#">36</a>
recommended relationship of dialing and addressing		tandem switch location .....	<a href="#">213</a>
plans .....	<a href="#">121</a>	uniform dialing plan .....	<a href="#">110</a>
steering code .....	<a href="#">117</a>	user location .....	<a href="#">213</a>
steering code definition .....	<a href="#">117</a>	delivery sessions .....	<a href="#">75</a>
CS 1000 (Release 3.0 or later), prime switch .....	<a href="#">217</a>	delivery start and stop times, economy messages ....	
CSL (Command and Status Link) .....	<a href="#">214</a>	<a href="#">249</a>	
customer service .....	<a href="#">21</a>	delivery start time for economy messages	
		default value .....	<a href="#">244</a>
<b>D</b>		delivery stop time for economy messages	
data network		default value .....	<a href="#">244</a>
and VPIM Networking .....	<a href="#">147</a>	delivery times for AMIS messages .....	<a href="#">249</a> , <a href="#">253</a>
definition .....	<a href="#">37</a>	denial-of-service attacks, preventing .....	<a href="#">306</a> , <a href="#">309</a>
private .....	<a href="#">37</a>	description	
public .....	<a href="#">37</a>	local server .....	<a href="#">267</a>
setup to implement VPIM Networking .....	<a href="#">162</a>	desktop messaging users	
database, network		authentication failures, description .....	<a href="#">313</a>
description .....	<a href="#">178</a>	broadcast messages .....	<a href="#">141</a>
information		time zone conversions (Network Message Service)	
consistency, ensuring .....	<a href="#">196</a>	.....	<a href="#">230</a>
coordinating .....	<a href="#">196</a>	desktop user .....	<a href="#">64</a>
when to add sites .....	<a href="#">178</a>	desktop user logon .....	<a href="#">215</a>
default value		desktop users	
AMIS delivery times .....	<a href="#">248</a>	compared with telephone users .....	<a href="#">150</a>
batch threshold .....	<a href="#">244</a>	exchanging messages with open sites .....	<a href="#">151</a>
delivery start time for economy messages .....	<a href="#">244</a>	diagram of how MTA and ANA handle messages ...	<a href="#">358</a>
delivery stop time for economy messages .....	<a href="#">244</a>	diagrams	
holding time for standard messages .....	<a href="#">244</a>	local NMS location broadcast .....	<a href="#">135</a>
holding time for urgent messages .....	<a href="#">244</a>	mesh network .....	<a href="#">178</a>
parameters .....	<a href="#">244</a>	network broadcast .....	<a href="#">137</a>
reason to use .....	<a href="#">244</a>	Network Message Service (NMS)	
scheduling parameters .....	<a href="#">244</a>	example .....	<a href="#">229</a>
stale time for economy messages .....	<a href="#">244</a>	multiple time zones .....	<a href="#">229</a>
stale time for standard messages .....	<a href="#">244</a>	non-mesh network .....	<a href="#">178</a>
stale time for urgent messages .....	<a href="#">244</a>	remote NMS location broadcast .....	<a href="#">135</a>
defining dummy ACD-DNs .....	<a href="#">227</a>	Web server setup .....	<a href="#">186</a>
definition		dialing plan	
application gateway .....	<a href="#">300</a>	already set up .....	<a href="#">109</a>
CDP .....	<a href="#">116</a>	and mailbox address with ESN .....	<a href="#">116</a>
data network .....	<a href="#">37</a>	and VPIM Networking .....	<a href="#">207</a>

CDP for remote prime switch location .....	<a href="#">290</a>	domain name system. See DNS .....	<a href="#">157</a>
changing .....	<a href="#">211</a>	dual-tone multifrequency .....	<a href="#">235</a>
definition .....	<a href="#">108</a>	dummy ACD-DNs	
distinguished from addressing plan .....	<a href="#">121</a>	defining .....	<a href="#">227</a>
ESN for remote prime switch location .....	<a href="#">289</a>	number required .....	<a href="#">226</a>
from a system perspective .....	<a href="#">108</a>	setting to night call forward .....	<a href="#">228</a>
from a user perspective .....	<a href="#">108</a>		
hybrid dialing plan requirements .....	<a href="#">222</a>		
information required from switch .....	<a href="#">206</a>		
information required to configure switch location ....	<a href="#">273</a>		
location code .....	<a href="#">109</a>	<b>E</b>	
mailbox addressing follows .....	<a href="#">273</a>	e-mail gateway server, implementation with .....	<a href="#">163</a>
mailbox addressing follows for remote prime switch		economy delivery start and stop times .....	<a href="#">249</a>
location .....	<a href="#">288</a>	economy priority messages .....	<a href="#">356</a>
recommended dialing plan .....	<a href="#">205</a>	Electronic Switched Network .....	<a href="#">113</a> , <a href="#">115</a> , <a href="#">116</a> , <a href="#">121</a> , <a href="#">126</a>
remote satellite-switch location .....	<a href="#">293</a>	addressing a local user .....	<a href="#">115</a>
requirements .....	<a href="#">210</a>	addressing a remote user .....	<a href="#">115</a>
switch configuration changes .....	<a href="#">122</a>	addressing local user .....	<a href="#">115</a>
types supported by CallPilot .....	<a href="#">109</a>	and mailbox addresses .....	<a href="#">116</a>
uniform .....	<a href="#">110</a>	calling local users with .....	<a href="#">115</a>
used to a remote switch location .....	<a href="#">288</a>	calling remote users with .....	<a href="#">115</a>
dialing plans		definition .....	<a href="#">113</a>
CDP configuration worksheet .....	<a href="#">326</a>	ESN prefix .....	<a href="#">113</a>
considerations .....	<a href="#">198</a>	example .....	<a href="#">126</a>
ESN configuration worksheet .....	<a href="#">326</a>	Electronic Switched Network. See ESN .....	<a href="#">274</a>
dialing restrictions		enabling AMIS Networking .....	<a href="#">245</a> , <a href="#">267</a>
NMS beyond messaging network .....	<a href="#">87</a>	enabling Enterprise Networking .....	<a href="#">253</a>
NMS in messaging network .....	<a href="#">87</a>	encoding VPIM message parts .....	<a href="#">149</a>
within NMS network .....	<a href="#">87</a>	encryption .....	<a href="#">300</a> , <a href="#">305</a> , <a href="#">319</a> – <a href="#">322</a>
digital protocol		authentication .....	<a href="#">322</a>
compared to analog .....	<a href="#">42</a>	certificates .....	<a href="#">322</a>
type used by CallPilot .....	<a href="#">40</a>	considerations for implementation .....	<a href="#">320</a>
direct inward system access, required for offnet access		description .....	<a href="#">319</a>
.....	<a href="#">216</a>	firewalls .....	<a href="#">322</a>
DISA (direct inward system access) .....	<a href="#">216</a>	mail relays .....	<a href="#">322</a>
disabling AMIS Networking .....	<a href="#">245</a>	security and VPIM Networking .....	<a href="#">300</a>
disabling Enterprise Networking .....	<a href="#">253</a>	SSL .....	<a href="#">321</a>
distribution lists, and broadcast messages .....	<a href="#">140</a>	VPIM-compliant systems .....	<a href="#">322</a>
distributor .....	<a href="#">21</a>	when to use it .....	<a href="#">320</a>
DN. See directory number .....	<a href="#">236</a>	end-to-end signaling capabilities and NMS .....	<a href="#">85</a>
DNS		engineering network .....	<a href="#">201</a>
overview .....	<a href="#">157</a>	Enhanced Names Across the Network .....	<a href="#">268</a>
DNS lookup tables .....	<a href="#">158</a>	Enhanced Names Across the Network (Enhanced NAN),	
DNS server .....	<a href="#">158</a> , <a href="#">159</a> , <a href="#">162</a>	see also Names Across the Network (NAN) ....	<a href="#">71</a>
and MX records .....	<a href="#">158</a>	Enhanced NAN	
implementation .....	<a href="#">162</a>	how remote users are added .....	<a href="#">98</a>
setup .....	<a href="#">159</a>	how remote users are deleted .....	<a href="#">100</a>
documentation .....	<a href="#">21</a> , <a href="#">27</a>	synchronizing user information across networked	
map .....	<a href="#">27</a>	servers .....	<a href="#">104</a>
domain name .....	<a href="#">157</a>	Enterprise Location ID	
		local prime switch location .....	<a href="#">272</a>
		remote prime switch location .....	<a href="#">287</a>
		Enterprise Networking	

broadcast messages	<a href="#">142, 145</a>
controlling text information	<a href="#">93</a>
description	<a href="#">53, 174</a>
diagram	<a href="#">53</a>
disabling	<a href="#">253</a>
enabling	<a href="#">253</a>
Enterprise Location ID	<a href="#">272, 287</a>
Enterprise Site ID	<a href="#">267</a>
how sites use Names Across the Network	<a href="#">103</a>
implementation checklist	<a href="#">325</a>
message delivery	<a href="#">81</a>
Message Delivery Configuration page, CallPilot Manager	<a href="#">186</a>
message length	<a href="#">81</a>
message length and non-delivery notifications	<a href="#">62</a>
message length supported	<a href="#">62</a>
message transmission times with text	<a href="#">93</a>
message types supported	<a href="#">60</a>
Names Across the Network	<a href="#">268</a>
Names Across the Network and message transmission times	<a href="#">94</a>
protocol	<a href="#">40</a>
receiving message text information	<a href="#">269</a>
recipients, time zone conversions (Network Message Service)	<a href="#">231</a>
Enterprise Networking protocol	<a href="#">40, 53</a>
advantages over AMIS protocol	<a href="#">53</a>
Enterprise Site ID	
description	<a href="#">267, 281</a>
ESN	
access code	<a href="#">274</a>
location code	<a href="#">274</a>
location code overlap	<a href="#">274</a>
ESN dialing plan	
and user location	<a href="#">220</a>
recommended over CDP dialing plan	<a href="#">205</a>
ESN information, remote prime switch location	<a href="#">289</a>
ESN prefix	
and access code	<a href="#">113</a>
location code	<a href="#">109, 113</a>
ESN. See Electronic Switched Network	<a href="#">113</a>
Event Monitor and non-delivery notifications	<a href="#">66</a>
exchanging messages	
with integrated sites, telephone and desktop users	
compared	<a href="#">151</a>
with open sites, telephone and desktop users	
compared	<a href="#">150</a>
exchanging messages with open sites	<a href="#">47</a>
extension length and CDP steering code	<a href="#">119</a>

---

## F

failures, authentication	
description	<a href="#">313, 315</a>
limiting	<a href="#">315</a>
potential causes	<a href="#">312</a>
reporting	<a href="#">315</a>
fax channel	<a href="#">199</a>
fax channel type	<a href="#">241</a>
fax message type	
support	<a href="#">60</a>
features	
networking solutions compared	<a href="#">67</a>
firewall	
and implementation	<a href="#">163</a>
definition	<a href="#">299</a>
description	<a href="#">298</a>
security and VPIM Networking	<a href="#">298</a>
firewalls and encryption	<a href="#">322</a>
FQDN	
overview	<a href="#">157</a>
right-hand side of VPIM address	<a href="#">152</a>
FQDN of local SMTP/VPIM server	<a href="#">269</a>
From entry, header	<a href="#">152</a>
fully qualified domain name. See FQDN	<a href="#">152</a>

---

## G

gathering information	
checklist	<a href="#">208</a>
from open sites	<a href="#">204</a>
purpose	<a href="#">204</a>
remote switch location checklist	<a href="#">209</a>
gathering required information	
new implementation	<a href="#">205</a>
upgrade	<a href="#">204</a>

---

## H

header contents	<a href="#">355</a>
header, From entry	<a href="#">152</a>
holding time	
description	<a href="#">246</a>
standard messages	<a href="#">246, 252</a>
urgent messages	<a href="#">246, 252</a>
holding time for standard messages, default	<a href="#">244</a>
holding time for urgent messages, default	<a href="#">244</a>
host name	<a href="#">157</a>
hybrid dialing plan	
example	<a href="#">128</a>

mailbox addresses and .....	<a href="#">120</a>
recommended relationship of dialing and addressing plans .....	<a href="#">121</a>
hybrid dialing plan, requirements .....	<a href="#">222</a>

## I

IMAP. See Internet Mail Access Protocol (IMAP) .....	<a href="#">161</a>
implementation	
dialing plan setup .....	<a href="#">109</a>
preliminary requirements .....	<a href="#">161</a>
with DNS server .....	<a href="#">162</a>
with e-mail gateway server .....	<a href="#">163</a>
with firewall .....	<a href="#">163</a>
implementation, network	
about .....	<a href="#">175</a>
checklists .....	<a href="#">183</a> , <a href="#">325</a>
definition .....	<a href="#">180</a>
Message Delivery Configuration page, CallPilot Manager .....	<a href="#">186</a>
Message Network Configuration page, CallPilot Manager .....	<a href="#">188</a>
prerequisites .....	<a href="#">181</a>
process .....	<a href="#">326</a>
recommendations .....	<a href="#">181</a>
scenarios .....	<a href="#">176</a>
implementing a messaging network	
network database .....	<a href="#">46</a>
relationship to existing networks .....	<a href="#">45</a>
inbound message	
from implicit open site .....	<a href="#">154</a>
from integrated sites .....	<a href="#">153</a>
from unknown open site .....	<a href="#">154</a>
industry-standard protocol .....	<a href="#">39</a>
information in network database	
local site .....	<a href="#">45</a>
remote site .....	<a href="#">45</a>
initiating password .....	<a href="#">285</a>
description .....	<a href="#">285</a>
installation and configuration guides .....	<a href="#">26</a>
installation, networking (definition) .....	<a href="#">180</a>
Integrated AMIS Networking	
implementation checklist .....	<a href="#">325</a>
mailbox length .....	<a href="#">78</a>
message contents .....	<a href="#">355</a>
message delivery .....	<a href="#">78</a>
Message Delivery Configuration page, CallPilot Manager .....	<a href="#">186</a>
switch settings required .....	<a href="#">210</a>
when to implement .....	<a href="#">182</a>
Integrated Service Digital Network (ISDN) .....	<a href="#">214</a>

Integrated Services Digital Network/Applications Protocol link, now known as Application Module Link .....	<a href="#">215</a>
integrated site .....	<a href="#">46</a> , <a href="#">47</a>
combined with open site .....	<a href="#">47</a>
integrated sites .....	<a href="#">180</a>
interaction with NMS .....	<a href="#">219</a>
Internet Mail Access Protocol (IMAP)	
already configured .....	<a href="#">164</a>
implementation order .....	<a href="#">161</a>
Internet Service Provider (ISP) .....	<a href="#">162</a>
IP address .....	<a href="#">156</a>
ISDN signaling capabilities and NMS .....	<a href="#">85</a>
ISDN-PRI, between switches .....	<a href="#">214</a>
ISDN/AP (Integrated Services Digital Network/Applications Protocol link). .....	<a href="#">215</a>

## J

junk e-mail, preventing .....	<a href="#">306</a> , <a href="#">309</a>
-------------------------------	-------------------------------------------

## K

keycode, networking .....	<a href="#">180</a>
keycodes	
Networking keycode .....	<a href="#">58</a>
NMS keycode .....	<a href="#">58</a>

## L

LAN load and impact of VPIM Networking .....	<a href="#">84</a>
LAN network traffic and impact on VPIM Networking .....	<a href="#">94</a>
left-hand side of VPIM address .....	<a href="#">148</a>
legal considerations, Open AMIS messages .....	<a href="#">249</a> , <a href="#">253</a>
legal delivery times for AMIS messages .....	<a href="#">248</a> , <a href="#">249</a> , <a href="#">253</a>
local broadcast	
user capabilities .....	<a href="#">139</a>
local messaging server .....	<a href="#">266</a>
local prime switch .....	<a href="#">270</a>
local prime switch location	
description .....	<a href="#">272</a>
dialing plan information .....	<a href="#">273</a>
Enterprise Location ID .....	<a href="#">272</a>
mailbox prefix .....	<a href="#">273</a>
name .....	<a href="#">272</a>
local server	
broadcast messages	
capabilities .....	<a href="#">142</a>

controlling .....	142
when to disable .....	143
broadcast messages, when to disable .....	143
configuration worksheet .....	326
description .....	267
logging on .....	31
name .....	266
server type .....	267
local site	
logging on to .....	184
modifying .....	191
tree view .....	189, 190
local site information	
in network database .....	45
local site name .....	266
local switch location	
configuration worksheet .....	326
tree view .....	189
local system access number	
purpose .....	248
location broadcast	
addresses, viewing .....	146
description .....	134
distribution lists .....	140
local NMS location broadcast, diagram .....	135
multimedia support .....	145, 146
Network Message Service (NMS) .....	141
networking protocols .....	142
remote NMS location broadcast, diagram .....	135
remote server capabilities .....	144
server capabilities .....	142
SMTP authentication .....	143
user capabilities .....	139
when to disable .....	143
location code	
CDP steering code .....	109
ESN .....	274
ESN prefix .....	109, 113
overlap .....	274
purpose .....	109
location name, required by desktop users to log on ....	
215	
log on, desktop users and location name .....	215
logging on	
local server .....	31
local site .....	184
remote server .....	31
remote site .....	184
logon .....	31
long-distance toll fraud	
minimizing risk with AMIS Networking .....	296

## M

mail exchange records. See MX records .....	158
mail relays and encryption .....	322
mail servers, and MX records .....	159
mailbox address	
and CDP .....	119
and ESN dialing plans .....	116
mailbox addressing follows dialing plan, local prime	
switch location .....	273
mailbox addressing, dialing plan follows for remote prime	
switch location .....	288
mailbox length	
Integrated AMIS Networking .....	78
mailbox prefix	
local prime switch location .....	273
remote prime switch location .....	289
MDN (message delivery notification) .....	155
Meridian Mail	
location broadcasts .....	144
network broadcasts .....	144
Meridian Mail Net Gateway	
location broadcasts .....	144
network broadcasts .....	144
mesh network, diagram .....	178
message	
body contents .....	356
broadcast .....	217
configuration for using priorities .....	356
contents .....	149
encoding .....	149
handling scenario .....	361
header contents .....	355
parts .....	355
priorities .....	356
message center directory number .....	217
message delivery	
Enterprise Networking .....	81
Integrated AMIS Networking .....	78
VPIM Networking .....	84
Message Delivery Configuration ....	184, 187, 188, 244,
326	
accessing, CallPilot Manager .....	187
description .....	184, 188
worksheet .....	326
Message Delivery Configuration tree view, capacity ....	217
message delivery notification (MDN) .....	155
message handling .....	358
message header contents .....	149
message length	

and non-delivery notification .....	<a href="#">62</a>	exchanging messages with open sites .....	<a href="#">47</a>
calculating .....	<a href="#">63</a>	migration guides .....	<a href="#">26</a>
Enterprise Networking .....	<a href="#">81</a>	MIME	
Message Network Configuration ....	<a href="#">185</a> , <a href="#">188</a> , <a href="#">190</a> , <a href="#">266</a> , <a href="#">326</a>	overview .....	<a href="#">160</a>
accessing, CallPilot Manager .....	<a href="#">188</a>	TCP/IP protocol .....	<a href="#">160</a>
description .....	<a href="#">185</a>	MIME (Multipurpose Internet Mail Extensions) .....	<a href="#">41</a>
sites, maximum number .....	<a href="#">190</a>	mixed authentication mode	
switch locations, maximum number .....	<a href="#">190</a>	description .....	<a href="#">304</a>
tree view, description .....	<a href="#">188</a>	enabling .....	<a href="#">309</a>
worksheets .....	<a href="#">326</a>	user impact .....	<a href="#">310</a>
Message Transfer Agent (MTA), description .....	<a href="#">357</a>	when to use .....	<a href="#">309</a> , <a href="#">310</a>
message transfer, main steps .....	<a href="#">358</a>	modes of authentication, description	
message transmission time		authenticated mode .....	<a href="#">304</a>
AMIS Networking .....	<a href="#">91</a>	mixed authenticated mode .....	<a href="#">304</a>
assumptions used to calculate .....	<a href="#">91</a>	unauthenticated mode .....	<a href="#">304</a> , <a href="#">306</a>
comparison of networking solutions .....	<a href="#">91</a>	modifications to messaging network configuration	
factors affecting .....	<a href="#">90</a>	impact on personal distribution lists .....	<a href="#">71</a>
factors affecting VPIM Networking .....	<a href="#">90</a>	MTA (Message Transfer Agent), description .....	<a href="#">357</a>
NMS .....	<a href="#">91</a>	MTA Monitor, description .....	<a href="#">357</a>
voice and text messages compared .....	<a href="#">93</a>	multimedia messages, and non-delivery notifications ....	<a href="#">155</a>
VPIM Networking and network traffic .....	<a href="#">94</a>	Multipurpose Internet Mail Extensions (MIME) .....	<a href="#">41</a>
message treatment		Multipurpose Internet Mail Extensions. See MIME ....	<a href="#">147</a>
inbound from implicit open site .....	<a href="#">154</a>	MX records	
inbound from integrated site .....	<a href="#">153</a>	and DNS server .....	<a href="#">158</a>
inbound from unknown site .....	<a href="#">154</a>	and mail servers .....	<a href="#">159</a>
message types			
and non-delivery notifications .....	<a href="#">61</a>	<b>N</b>	
networking solutions compared .....	<a href="#">60</a>	name	
messaging network		local prime switch location .....	<a href="#">272</a>
combining integrated and open sites .....	<a href="#">47</a>	remote prime switch location .....	<a href="#">287</a>
definition .....	<a href="#">37</a> , <a href="#">42</a>	name of a remote site .....	<a href="#">280</a>
dialing plan setup .....	<a href="#">109</a>	name of the local server .....	<a href="#">266</a>
dialing plans supported .....	<a href="#">109</a>	Names Across the Network .....	<a href="#">99</a> , <a href="#">101–103</a> , <a href="#">268</a>
hierarchy of protocols .....	<a href="#">42</a>	adding temporary remote users .....	<a href="#">99</a>
implementation, incremental .....	<a href="#">45</a>	considerations .....	<a href="#">102</a>
integrated and open .....	<a href="#">47</a>	controlling .....	<a href="#">101</a>
messaging network representation		how sites use .....	<a href="#">103</a>
another dialing plan example .....	<a href="#">130</a>	when remote user is added .....	<a href="#">101</a>
benefits .....	<a href="#">125</a>	when temporary remote user is added .....	<a href="#">99</a>
CDP dialing plan example .....	<a href="#">127</a>	NCRD. See Network Call Redirection .....	<a href="#">216</a>
ESN dialing plan example .....	<a href="#">126</a>	NDN. See non-delivery notification .....	<a href="#">154</a>
ESN dialing plan with NMS example .....	<a href="#">126</a>	network	
hybrid dialing plan .....	<a href="#">128</a>	data .....	<a href="#">37</a>
hybrid dialing plan example .....	<a href="#">128</a>	messaging network .....	<a href="#">42</a>
messaging network setup		switch network .....	<a href="#">36</a>
mesh .....	<a href="#">38</a>	network administration	
non-mesh .....	<a href="#">38</a>	about implementation .....	<a href="#">175</a>
messaging network, basic design tasks .....	<a href="#">177</a>	administrator responsibilities .....	<a href="#">177</a>
messaging networks			
and users .....	<a href="#">60</a>		

assumptions .....	<a href="#">181</a>	Message Delivery Configuration page, CallPilot Manager .....	<a href="#">186</a>
implementation scenarios .....	<a href="#">176</a>	Message Network Configuration page, CallPilot Manager .....	<a href="#">188</a>
network broadcast		prerequisites .....	<a href="#">181</a>
addresses		recommendations .....	<a href="#">181</a>
viewing .....	<a href="#">146</a>	Network Message Service (NMS)	
addressing rules .....	<a href="#">138</a>	broadcast messages .....	<a href="#">141</a>
description .....	<a href="#">137</a>	description .....	<a href="#">228</a>
desktop messaging users, mailbox class validation .....	<a href="#">141</a>	example diagram .....	<a href="#">229</a>
diagram .....	<a href="#">137</a>	implementation recommendation .....	<a href="#">182</a>
distribution lists .....	<a href="#">140</a>	multiple time zones, diagram .....	<a href="#">229</a>
location broadcast, description .....	<a href="#">134</a>	time zone conversion	
multimedia support .....	<a href="#">145</a> , <a href="#">146</a>	description .....	<a href="#">229</a> , <a href="#">231</a>
Network Message Service (NMS) .....	<a href="#">141</a>	Network Message Service. See NMS .....	<a href="#">24</a> , <a href="#">213</a> , <a href="#">235</a>
networking protocols .....	<a href="#">142</a>	network planning	
phoneset users, mailbox class validation .....	<a href="#">140</a>	about implementation .....	<a href="#">326</a>
remote server capabilities .....	<a href="#">144</a>	configuration worksheets .....	<a href="#">326</a>
requirements .....	<a href="#">134</a>	implementation checklists .....	<a href="#">325</a>
server capabilities .....	<a href="#">142</a>	network setup	
SMTP authentication .....	<a href="#">141</a> , <a href="#">143</a>	mesh network .....	<a href="#">38</a>
user capabilities .....	<a href="#">139</a>	non-mesh network .....	<a href="#">38</a>
when to disable .....	<a href="#">143</a>	network topology. See network setup .....	<a href="#">38</a>
Network Call Redirection .....	<a href="#">216</a>	network types	
network call forward all calls .....	<a href="#">216</a>	mesh .....	<a href="#">178</a>
network call forward busy .....	<a href="#">216</a>	non-mesh .....	<a href="#">178</a>
network call forward no answer .....	<a href="#">216</a>	networking	
network hunting .....	<a href="#">216</a>	about implementation .....	<a href="#">175</a>
types supported .....	<a href="#">216</a>	and CallPilot feature interaction .....	<a href="#">198</a>
Network Call Redirection feature and NMS .....	<a href="#">86</a>	channel requirements .....	<a href="#">199</a>
Network Call Transfer feature, interaction with NMS .....	<a href="#">218</a>	dialing plans .....	<a href="#">198</a>
Network Class of Service		engineering issues .....	<a href="#">201</a>
checking current setting .....	<a href="#">215</a>	installation versus implementation .....	<a href="#">180</a>
level required by NMS .....	<a href="#">215</a>	limitations .....	<a href="#">201</a>
network database		security, recommendations .....	<a href="#">200</a>
configuration, validating .....	<a href="#">192</a>	Networking keycode .....	<a href="#">58</a>
contents .....	<a href="#">45</a>	networking solutions .....	<a href="#">50</a> , <a href="#">53</a> , <a href="#">60</a> , <a href="#">62</a> , <a href="#">67</a> , <a href="#">71</a> , <a href="#">75</a> , <a href="#">91</a>
description .....	<a href="#">178</a>	CallPilot .....	<a href="#">50</a>
implementing CallPilot .....	<a href="#">46</a>	channel types supported .....	<a href="#">75</a>
information		comparison of message lengths supported .....	<a href="#">62</a>
consistency, ensuring .....	<a href="#">196</a>	Enterprise Networking .....	<a href="#">53</a>
coordinating .....	<a href="#">196</a>	feature support comparison .....	<a href="#">67</a>
uniqueness, ensuring .....	<a href="#">193</a>	message transmission time compared .....	<a href="#">91</a>
sites, maximum number .....	<a href="#">190</a>	message type support comparison .....	<a href="#">60</a>
when to add sites .....	<a href="#">178</a>	personal distribution lists .....	<a href="#">71</a>
Network Hunting feature, interaction with NMS .....	<a href="#">218</a>	night call forward dummy ACD-DNs .....	<a href="#">228</a>
network implementation		nightly audit	
basic tasks .....	<a href="#">177</a>	deleting permanent remote users .....	<a href="#">100</a>
checklists .....	<a href="#">183</a>	time stamps .....	<a href="#">97</a>
configuration worksheets .....	<a href="#">197</a>	NMS (Network Message Service) .....	<a href="#">56</a> , <a href="#">60</a> , <a href="#">62</a> , <a href="#">85–88</a> , <a href="#">91</a> , <a href="#">126</a> , <a href="#">200</a> , <a href="#">213</a> , <a href="#">215</a> , <a href="#">218–220</a>
definition .....	<a href="#">180</a>		

Attendant Extended Call feature .....	<a href="#">219</a>	switch requirements .....	<a href="#">216</a>
Barge-in Attendant feature .....	<a href="#">220</a>	OM reports. See Operational Measurement reports ....	
Call Forward by Call Type Allowed feature .....	<a href="#">218</a>	<a href="#">155</a>	
Call Forward feature .....	<a href="#">218</a>	online guides .....	<a href="#">30</a>
CO Loop Start trunk .....	<a href="#">219</a>	online Help, accessing .....	<a href="#">30</a>
Conference Call feature .....	<a href="#">219</a>	Open AMIS compose prefix .....	<a href="#">247</a>
dialing plan implications .....	<a href="#">88</a>	Open AMIS delivery times .....	<a href="#">248</a>
dialing restrictions beyond private network .....	<a href="#">87</a>	open site .....	<a href="#">46</a> , <a href="#">47</a>
dialing restrictions in messaging network .....	<a href="#">87</a>	combined with integrated sites .....	<a href="#">47</a>
dialing restrictions in NMS network .....	<a href="#">87</a>	exchanging messages with .....	<a href="#">47</a>
example .....	<a href="#">126</a>	protocols used with .....	<a href="#">47</a>
impact on channels .....	<a href="#">200</a>	open sites .....	<a href="#">180</a>
message length .....	<a href="#">62</a>	and protocols .....	<a href="#">180</a>
message transmission time .....	<a href="#">91</a>	open VPIIM Networking	
message types supported .....	<a href="#">60</a>	implementation checklist .....	<a href="#">325</a>
Network Call Redirection feature .....	<a href="#">86</a>	shortcuts, configuration worksheet .....	<a href="#">326</a>
Network Call Transfer feature .....	<a href="#">218</a>	Operational Measurement reports .....	<a href="#">155</a>
Network Class of Service level required .....	<a href="#">215</a>	overlap	
Network Hunting feature .....	<a href="#">218</a>	CDP steering code .....	<a href="#">275</a>
NMS network and NMS site distinguished .....	<a href="#">56</a>	ESN location code .....	<a href="#">274</a>
signaling considerations .....	<a href="#">85</a>		
NMS keycode .....	<a href="#">58</a>		
NMS network .....	<a href="#">56</a> , <a href="#">213</a>	<b>P</b>	
as type of private messaging network .....	<a href="#">213</a>	packet filter, overview .....	<a href="#">299</a>
NMS site .....	<a href="#">56</a>	parameters	
non-Avaya systems		default values .....	<a href="#">244</a>
location broadcasts .....	<a href="#">144</a>	passwords	
network broadcasts .....	<a href="#">144</a>	description .....	<a href="#">285</a>
non-delivery notification .....	<a href="#">153</a> – <a href="#">155</a>	passwords for remote site .....	<a href="#">285</a>
multimedia messages .....	<a href="#">155</a>	permanent remote user .....	<a href="#">96</a>
non-delivery notifications		permanent remote users	
and Event Monitor .....	<a href="#">66</a>	deleting with nightly audits .....	<a href="#">100</a>
and message length .....	<a href="#">62</a>	removing with User Administration .....	<a href="#">100</a>
and message types .....	<a href="#">61</a>	personal distribution lists	
and personal distribution lists .....	<a href="#">71</a>	and non-delivery notifications .....	<a href="#">71</a>
non-mesh network, diagram .....	<a href="#">178</a>	impact of modifications to messaging network	
nonuniform dialing plan		configuration .....	<a href="#">71</a>
CDP steering codes .....	<a href="#">112</a>	networking solutions .....	<a href="#">71</a>
examples .....	<a href="#">112</a>	phantom DN	
Norstar VoiceMail		how to select .....	<a href="#">237</a>
location broadcasts .....	<a href="#">144</a>	phantom DNS	
network broadcasts .....	<a href="#">144</a>	determining those used on prime switch location ....	
NSM network .....	<a href="#">213</a>	<a href="#">224</a>	
number of delivery sessions compared .....	<a href="#">75</a>	satellite-switch locations .....	<a href="#">225</a>
number of dummy ACD-DNs required on satellite-		phoneset users	
switch locations .....	<a href="#">226</a>	broadcast messages .....	<a href="#">140</a>
number of sites supported .....	<a href="#">75</a>	time zone conversions (Network Message Service)	
number of switch locations supported .....	<a href="#">217</a>	.....	<a href="#">229</a>
		ping attack	
<b>O</b>		description .....	<a href="#">301</a>
offnet access .....	<a href="#">216</a>	security against .....	<a href="#">301</a>
		planning guides .....	<a href="#">26</a>

prefix		how to work remotely .....	31
compose .....	247	site security .....	184
mailbox .....	273	remote messaging server .....	278, 280–282, 284
prefixes		connection DN .....	284
location prefix, description .....	138	name .....	280
network broadcast prefix		sending local user information to .....	282
rules .....	138	sending messages to a remote site .....	281
preliminary requirements for implementation		server FQDN .....	284
dialing plan setup .....	109	server types supported .....	280
preliminary requirements for implementing VPIM		remote prime switch .....	287
Networking .....	161	remote prime switch location	
prime switch		CDP information .....	290
satellite-switches forward to .....	225	dialing plan for dialing to this location .....	288
type supported .....	217	Enterprise Location ID .....	287
prime switch location		ESN information .....	289
communicating with satellite-switch locations using		mailbox addressing follows dialing plan .....	288
ISDN-PRI .....	214	mailbox prefix .....	289
configuration .....	224	name .....	287
definition .....	213	spoken name recorded .....	288
determining phantom DNs used on .....	224	remote satellite-switch location	
using virtual signaling to communicate with satellite-		configuration overview .....	291
switches .....	214	dialing plan .....	293
prime switch location, configuration worksheet .....	326	spoken name recorded .....	292
priorities of messages .....	356	remote servers	
privacy, guaranteeing on CallPilot .....	319	broadcast messages	
private data network .....	37	capabilities .....	142
private switch network .....	37	controlling .....	142
proprietary protocol .....	39	when to disable .....	143
protecting temporary remote user from removal .....	98	configuration worksheet .....	326
protocol		remote site	
analog and digital compared .....	42	correcting information about .....	278
analog used by CallPilot .....	40	name .....	280
digital .....	40	passwords .....	285
hierarchy .....	42	server FQDN required .....	206
industry-standard .....	39	remote site information in network database .....	45
proprietary .....	39	remote sites	
types .....	39	authentication failures, description .....	314
used with open sites .....	47	creating .....	191
protocols		integrated .....	180
TCP/IP protocols .....	160	logging on to .....	184
protocols, open sites .....	180	modifying .....	191
proxy server		network database .....	178
definition .....	299	open .....	180
overview .....	299	tree view .....	189, 191
public data network .....	37	remote switch location	
public switch network .....	36	configuration worksheet .....	326
		information required .....	209
		tree view .....	189
		remote user	
		benefits .....	96
		definition .....	95

## R

receiving message text information .....	269
relationship of dialing and addressing plans .....	121
remote administration	

distinguished from user at remote site .....	<a href="#">95</a>	sending messages to other sites .....	<a href="#">267</a>
permanent status .....	<a href="#">96</a>	server FQDN	
temporary .....	<a href="#">282</a>	local SMTP/VPIM server .....	<a href="#">269</a>
temporary status .....	<a href="#">96</a>	relationship to VPIM shortcuts .....	<a href="#">153</a>
reseller .....	<a href="#">21</a>	remote site .....	<a href="#">284</a>
responding password .....	<a href="#">285</a>	required for integrated remote sites .....	<a href="#">206</a>
description .....	<a href="#">285</a>	server type	
restricting sending messages to a remote site .....	<a href="#">281</a>	local server .....	<a href="#">267</a>
right-hand side of VPIM address .....	<a href="#">149</a>	supported for remote messaging server .....	<a href="#">280</a>
routing, TCP/IP .....	<a href="#">156</a>	service attack	
<hr/>			
<b>S</b>		ping attacks .....	<a href="#">301</a>
satellite-switch		security against ping attacks .....	<a href="#">301</a>
forwarding to prime switch .....	<a href="#">225</a>	service directory number (SDN)	
types supported .....	<a href="#">217</a>	relationship to other numbers .....	<a href="#">241</a>
satellite-switch location		Service Directory Number (SDN) Table	
configuration .....	<a href="#">224</a>	contents .....	<a href="#">223</a>
configuration worksheet .....	<a href="#">326</a>	example .....	<a href="#">239</a>
configuring remote .....	<a href="#">291</a>	satellite-switch location .....	<a href="#">225</a>
creating .....	<a href="#">191</a>	setting up DNS server .....	<a href="#">159</a>
defining dummy ACD-DNs .....	<a href="#">227</a>	shortcuts	
definition .....	<a href="#">213</a>	VPIM open and SMTP/ VPIM network compared ....	<a href="#">152</a>
included in broadcast message .....	<a href="#">217</a>	signaling considerations for NMS	
modifying .....	<a href="#">191</a>	end-to-end .....	<a href="#">85</a>
number of ACD-DNs required .....	<a href="#">226</a>	ISDN .....	<a href="#">85</a>
phantom DNs .....	<a href="#">225</a>	virtual .....	<a href="#">85</a>
setting dummy ACD-DNs to night call forward ....	<a href="#">228</a>	Simple Message Transfer Protocol (SMTP) .....	<a href="#">41</a>
satellite-switch location SDNs, in SDN Table .....	<a href="#">225</a>	Simple Message Transfer Protocol. See SMTP .....	<a href="#">147</a>
Save button, CallPilot Manager .....	<a href="#">188</a> , <a href="#">192</a>	site	
scenario of how a message is sent to a remote user ....	<a href="#">362</a>	combining open and integrated sites .....	<a href="#">47</a>
Secure Socket Layer (SSL)		definition .....	<a href="#">43</a>
and encryption .....	<a href="#">321</a>	integrated .....	<a href="#">46</a>
and user ID/password authentication .....	<a href="#">321</a>	maximum number supported .....	<a href="#">75</a>
security		open .....	<a href="#">46</a>
application gateway .....	<a href="#">299</a>	SMTP	
encryption and VPIM Networking .....	<a href="#">300</a>	overview .....	<a href="#">160</a>
packet filter .....	<a href="#">299</a>	TCP/IP protocol .....	<a href="#">160</a>
proxy server .....	<a href="#">299</a>	SMTP (Simple Message Transfer Protocol) .....	<a href="#">41</a>
recommendations .....	<a href="#">200</a>	SMTP authentication	
service attacks .....	<a href="#">301</a>	and encryption .....	<a href="#">322</a>
types of attacks .....	<a href="#">301</a>	broadcast messages .....	<a href="#">141</a>
security modes for SMTP .....	<a href="#">255</a>	description .....	<a href="#">304</a>
security, SMTP authentication		desktop or Web messaging users .....	<a href="#">304</a>
activity, monitoring .....	<a href="#">305</a> , <a href="#">316</a> , <a href="#">318</a>	disabling .....	<a href="#">306</a>
automatic monitoring .....	<a href="#">316</a>	enabling .....	<a href="#">308</a>
manual monitoring .....	<a href="#">318</a>	encryption .....	<a href="#">305</a>
unauthentication mode, recommendations ....	<a href="#">306</a> , <a href="#">307</a>	failures, description .....	<a href="#">315</a>
sending local user information to a remote site .....	<a href="#">282</a>	location broadcasts .....	<a href="#">143</a>
		modes of authentication, description .....	<a href="#">304</a>
		network broadcasts .....	<a href="#">143</a>
		user ID and password .....	<a href="#">311</a>

when to disable .....	<a href="#">306</a>	several correspond to user location .....	<a href="#">221</a>
when to use .....	<a href="#">308</a>	tandem .....	<a href="#">213</a>
SMTP authentication activity, monitoring .....	<a href="#">305</a> , <a href="#">316</a> , <a href="#">318</a>	tree view .....	<a href="#">191</a>
automatic monitoring .....	<a href="#">316</a>	switch network	
manual monitoring .....	<a href="#">318</a>	definition .....	<a href="#">36</a>
SMTP authentication, mixed		private .....	<a href="#">37</a>
enabling .....	<a href="#">309</a>	public .....	<a href="#">36</a>
user impact .....	<a href="#">310</a>	system access number	
when to use .....	<a href="#">309</a> , <a href="#">310</a>	relationship to connection DN .....	<a href="#">364</a>
SMTP/VPIM network shortcut		system access number (SAN)	
compared with VPIM open shortcut .....	<a href="#">152</a>	purpose .....	<a href="#">248</a>
SMTP/VPIM server FQDN .....	<a href="#">269</a>	types .....	<a href="#">248</a>
speech recognition channel type .....	<a href="#">241</a>	system mailbox	
speech-recognition channel .....	<a href="#">199</a>	alarm .....	<a href="#">74</a>
spoken name		broadcast .....	<a href="#">74</a>
recorded for remote satellite-switch location .....	<a href="#">292</a>		
spoken name recorded		<hr/>	
remote prime switch location .....	<a href="#">288</a>	<b>T</b>	
ways to record .....	<a href="#">272</a> , <a href="#">288</a>	tandem switch location, definition .....	<a href="#">213</a>
stale time		TCP/IP	
description .....	<a href="#">251</a> , <a href="#">253</a>	overview .....	<a href="#">156</a>
stale time for economy messages, default .....	<a href="#">244</a>	protocols .....	<a href="#">160</a>
stale time for standard messages, default .....	<a href="#">244</a>	routing .....	<a href="#">156</a>
stale time for urgent messages, default .....	<a href="#">244</a>	TCP/IP application protocols, types supported .....	<a href="#">40</a>
stand-alone server .....	<a href="#">31</a>	TCP/IP protocols	
standard message, holding time .....	<a href="#">246</a>	MIME .....	<a href="#">160</a>
standard priority messages .....	<a href="#">356</a>	SMTP .....	<a href="#">160</a>
status		technical support .....	<a href="#">30</a>
permanent remote users .....	<a href="#">96</a>	telephone user .....	<a href="#">64</a>
temporary remote user .....	<a href="#">96</a>	telephone users	
steering code .....	<a href="#">117–119</a>	compared with desktop users .....	<a href="#">150</a>
and extension length .....	<a href="#">119</a>	exchanging messages with open sites .....	<a href="#">150</a>
creating .....	<a href="#">118</a>	temporary remote user .....	<a href="#">96–99</a> , <a href="#">101</a>
definition .....	<a href="#">117</a>	adding with Names Across the Network .....	<a href="#">99</a>
requirement .....	<a href="#">117</a>	adding with User Administration .....	<a href="#">99</a>
steering code for CDP .....	<a href="#">275</a>	Names Across the Network options .....	<a href="#">101</a>
switch		protecting from removal .....	<a href="#">98</a>
confirming settings .....	<a href="#">207</a>	system capacity .....	<a href="#">97</a>
dialing plan information required .....	<a href="#">206</a>	temporary remote user, Names Across the Network ....	
gathering information directly from .....	<a href="#">206</a>	<a href="#">282</a>	
mandatory requirements .....	<a href="#">210</a>	text information in messages .....	<a href="#">269</a>
switch configuration		text message type support .....	<a href="#">60</a>
changing dialing plan .....	<a href="#">122</a>	text messages	
switch location		transmission time and control of use .....	<a href="#">93</a>
configuration worksheet .....	<a href="#">326</a>	TIFF format .....	<a href="#">149</a>
corresponds to user location .....	<a href="#">221</a>	time periods	
creating .....	<a href="#">191</a>	guidelines .....	<a href="#">195</a>
modifying .....	<a href="#">191</a>	time stamp	
prime .....	<a href="#">213</a>	updating .....	<a href="#">103</a>
satellite .....	<a href="#">213</a>	time zones, Network Message Service (NMS)	
		administrators .....	<a href="#">230</a>

AMIS Networking recipients .....	<a href="#">231</a>	user	
description .....	<a href="#">229, 231</a>	desktop user .....	<a href="#">64</a>
desktop messaging users .....	<a href="#">230</a>	teaching to address open sites .....	<a href="#">65</a>
Enterprise Networking recipients .....	<a href="#">231</a>	telephone user .....	<a href="#">64</a>
phoneset users .....	<a href="#">229</a>	terminology note .....	<a href="#">60</a>
VPIM Networking recipients .....	<a href="#">231</a>	terminology used in guide .....	<a href="#">64</a>
Web messaging users .....	<a href="#">230</a>	User Administration	
toll fraud, preventing .....	<a href="#">307, 309</a>	adding temporary remote users .....	<a href="#">99</a>
topology. See network setup .....	<a href="#">38</a>	user guides .....	<a href="#">27</a>
training .....	<a href="#">21</a>	user ID and password authentication	
training users		and SSL .....	<a href="#">321</a>
to address open sites .....	<a href="#">65</a>	description .....	<a href="#">311</a>
transmission time of messages		user location	
AMIS Networking .....	<a href="#">91</a>	and CDP dialing plan .....	<a href="#">221</a>
assumptions used to calculate .....	<a href="#">91</a>	and ESN dialing plan .....	<a href="#">220</a>
comparison of networking solutions .....	<a href="#">91</a>	corresponds to several switch locations .....	<a href="#">221</a>
factors affecting .....	<a href="#">90</a>	corresponds to switch location .....	<a href="#">221</a>
NMS .....	<a href="#">91</a>	definition .....	<a href="#">213</a>
voice and text messages compared .....	<a href="#">93</a>	users and broadcast messages	
VPIM Networking .....	<a href="#">90</a>	capabilities .....	<a href="#">139</a>
VPIM Networking and network traffic .....	<a href="#">94</a>		
Transport Control Protocol/Internet Protocol. See TCP/			
IP .....	<a href="#">156</a>		
tree view			
Message Network Configuration .....	<a href="#">188</a>		
organization of .....	<a href="#">190</a>		
troubleshooting			
authentication failures .....	<a href="#">312</a>		
technical support .....	<a href="#">30</a>		
types of sites			
integrated .....	<a href="#">180</a>		
open .....	<a href="#">180</a>		
types of system access number .....	<a href="#">248</a>		
<hr/>			
<b>U</b>		<b>V</b>	
unauthenticated access restrictions .....	<a href="#">259</a>	validation	
unauthentication mode		levels of .....	<a href="#">193</a>
description .....	<a href="#">304</a>	validation, CallPilot Manager .....	<a href="#">192, 193</a>
enabling .....	<a href="#">306</a>	unique information .....	<a href="#">193</a>
security recommendations .....	<a href="#">306, 307</a>	virtual signaling .....	<a href="#">214</a>
when to use .....	<a href="#">306</a>	virtual signaling capabilities and NMS .....	<a href="#">85</a>
uniform dialing plan		voice channel .....	<a href="#">199</a>
definition .....	<a href="#">110</a>	voice channel type .....	<a href="#">241</a>
example .....	<a href="#">110</a>	voice encoding .....	<a href="#">165</a>
unsuccessful delivery of VPIM Networking message ...	<a href="#">153</a>	voice message type support .....	<a href="#">60</a>
upgrade, information required to .....	<a href="#">204</a>	Voice Profile for Internet Mail (VPIM) .....	<a href="#">41</a>
upgrading existing satellite-switches		Voice Profile for Internet Mail. See VPIM .....	<a href="#">147</a>
using existing ACD-DNs .....	<a href="#">225</a>	VPIM (Voice Profile for Internet Mail) .....	<a href="#">41</a>
urgent messages .....	<a href="#">246, 356</a>	VPIM address	
holding time .....	<a href="#">246</a>	compared with e-mail address .....	<a href="#">148</a>
		example .....	<a href="#">148</a>
		left-hand side .....	<a href="#">148</a>
		parts .....	<a href="#">148</a>
		restrictions .....	<a href="#">148</a>
		right-hand side .....	<a href="#">149</a>
		VPIM message	
		contents .....	<a href="#">149</a>
		encoding of parts .....	<a href="#">149</a>
		header .....	<a href="#">149</a>
		VPIM Networking ... <a href="#">60, 62, 83, 84, 92, 94, 142, 145, 147,</a>	
		<a href="#">150, 155, 156, 160, 175, 186, 207, 231, 298, 325</a>	
		and dialing plans .....	<a href="#">207</a>
		broadcast messages .....	<a href="#">142, 145</a>



