



Configuring SIP Enablement Services Edge 5.x for Avaya Aura™ Communication Manager Branch

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Installing SIP Enablement Services (SES)

About SIP Enablement Services Edge 5.x for Communication Manager Branch

Avaya SIP Enablement Services (SES) Edge 5.x for Avaya Aura™ Communication Manager Branch unifies all enterprise real-time communications over an open, SIP-based infrastructure.

SES Edge 5.x incorporates SIP functionality and other enhancements to support a scalable network totalling as many as 2000 platform installations. Typically, one Communication Manager Branch platform is installed at each branch location. The SES Edge 5.x performing core routing is typically installed at a main or headquarters location, along with a media server running Avaya Aura Communication Manager 4.0 (or a later release) and any SES Home Server(s), both of which are needed to support SIP and non-SIP users at this location. Centralized user services, such as Avaya Voice Portal, typically are also installed in the main or headquarters location.

The SES performing core routing is combined with the standard functions of an Edge proxy server with SIP trunking support. In addition, SES support for duplex-server features creates a highly reliable SIP communications network supporting inter- and intra-location telephony and instant messaging, and in the main location, intra-location conferencing and collaboration.

In a Communication Manager Branch network, SIP Enablement Services functions in two distinct ways. In a core-routing role, SES performs routing functions for both instant messaging (IM) and voice communications between the Communication Manager Branch branch locations with enterprise private networking enabled, and between those branches and the main or headquarters location (and vice versa). It also maintains and extends support for the SIP-enabled applications across the enterprise, like inter-office IM and presence tracking, and the centralized Avaya Voice Portal.

The Communication Manager Branch platform at each branch location serves as a:

- Local call-processing server, essentially becoming a telephony-feature server, accessible from any supported phone or endpoint present in that Communication Manager Branch branch location.
- Local SIP server, handling user registration for that branch location and duties related to intra-office instant messaging and presence.
- Voice mail adjunct, with efficient local voice-mailbox capabilities built in to the Communication Manager Branch platform, and Avaya Application Enablement Services (AES) as well, both of which support users of each branch location.

In a server role, SES performs the usual proxy and redirection functions associated with SIP applications, such as IM and presence. Users of branch locations are supported by Communication Manager Branch platforms for their locations, and can employ the supported

Avaya IP Softphone client software with IM. Users in the main location are supported by the SIP (Home) Server(s) for their location, and can employ Avaya SIP Softphone or the IP Softphone client software for IM. The support for advanced SIP telephony in SES extends value-added features such as bridging, conferencing, unique ringing, and VIP calling to SIP-enabled phones and supported endpoints.

Note:

Communication Manager Branch 2.0 supports UUI on SIP trunks.

Task Overview

To enable core routing and SIP Enablement Services support in a Communication Manager Branch network, the first step is to install and initially administer an SES Edge 5.x host type. This can be done with either a simplex server or a duplex-server pair (with a virtual IP address for the pair).

The following tasks are performed in SES using its web-based administration interface:

[Task 1: Installing SES Edge 5.x](#) on page 8.

[Task 2: Using the SES Master Administration interface](#) on page 13.

After you complete the initial SES installation and system administration, you must install and use Branch Central Manager, a component of Avaya Integrated Management for Communication Manager Branch, to complete the configuration of your Communication Manager Branch network on the SES Edge 5.x server performing core routing. See [Configuring SES for Communication Manager Branch](#) on page 21 for more details on those tasks.

Task 1: Installing SES Edge 5.x

Note that any server with SIP Enablement Services Edge 5.x installed must have been upgraded to 3GB RAM using the Avaya performance pack. For more detailed instructions, illustrations, and scenarios pertaining to installation procedures, see the following chapters in *Installing and Administering SIP Enablement Services R5.0*, ID 03-600768, Issue 3.0 or later:

- Installing SES R4.0 on an S8500C simplex edge with simplex home(s). See a high-level roadmap for [Installing a simplex SES Edge 5.x server](#) on page 9.
- Installing SES R4.0 on an S8500C duplex edge with simplex home(s), or
- Installing SES R4.0 on an S8500C duplex edge with duplex home(s). See a high-level roadmap for [Installing a duplex SES Edge 5.x server pair](#) on page 10.

Note:

In a Communication Manager Branch network solution you can have a single SES Edge 5.x and also optional SIP (Home) Servers, typically in the main or headquarters location of your enterprise. For information on adding users to these SIP Servers, see the User screens section of the "Administration web interface" chapter in [Installing, Administering, Maintaining, and Troubleshooting SIP Enablement Services, 03-600768](#).

For more detailed information on administering Communication Manager Branch users at a local branch, see [Stations screen](#) on page 41 for branch-location station additions and changes, as well as the online help system provided with Branch Device Manager.

Installing a simplex SES Edge 5.x server

Install the edge

Complete these steps to install a simplex (single-server) edge server:

1. Verify BIOS settings and version on the server.
2. Load the Avaya SIP Enablement Services Release 5.x installation CD.
3. Verify the firmware version on the SAMP remote maintenance board.
4. Run the initial_setup script for the SES Edge; remember the mvss password you choose.
5. Verify the start of SES services on the SES Edge server.
6. Perform initial administration for the SES Edge server, including completing the items under the Setup menu in the Master Administration web interface, with information applicable to your enterprise's SIP domain and host(s).
7. Perform RFA license-file installation on the edge server. Note that the file requires both an Edge Proxy license and a Basic Proxy license. [For more information](#), see the documentation for the RFA tool and SES installation and administration.

Install any homes

Complete these steps for the simplex SIP (Home) Server(s) for the main location users:

1. Verify BIOS settings and version on the server.
2. Load the Avaya SES Release 5.x installation CD.
3. Verify the firmware version on the SAMP remote maintenance board.
4. Run the initial_setup script for the home(s).
5. Verify the start of SES services on the home(s).

Installing SIP Enablement Services (SES)

6. Perform any remaining initial administration for the SIP (Home) Server(s). Home SIP Servers employ the Limited Administration web interface for this step.
7. Perform RFA license-file installation on the home server(s). Note that the file requires only a Basic Proxy license. [For more information](#), see the documentation for the RFA tool and SES installation and administration.

Test SES system

When the SES servers are installed, you may complete these steps for your main location:

1. (Optionally) Administer any SIP endpoints you may have at this location.
2. Verify your SES system at the main or headquarters location by making test calls, as well as sending and receiving instant messages (if this is applicable to you), within this location.

For more information

For more detailed instructions, illustrations, and scenarios pertaining to these installation procedures, see the chapters applicable to your SES server configuration in [Installing, Administering, Maintaining, and Troubleshooting SIP Enablement Services, 03-600768](#).

Installing a duplex SES Edge 5.x server pair

An optional feature in SIP Enablement Services is local failover as implemented by a pair of duplicated servers. This feature supports replicating the database and server software for any system node (home, edge, or combination home/edge). To take advantage of local failover, the servers must have a duplicated architecture. Two types of redundancy are possible in SESEdge 5.1:

- Single, cable duplicated (same location)
- Network duplicated (separate locations).

If the servers are to be cable duplicated, then install the second server in the same rack as the existing server or in a rack close by so that the cables can reach it.

Network duplication enables the physical separation of duplicated SES servers. This feature allows you to set up Edge and Home duplicated servers in separate geographic locations. This configuration ensures business continuity and disaster recovery.

Install the edge A server of the pair

Complete these steps for the edge server, referred to as server A during installation:

1. Verify BIOS settings and version on the server.

2. Load the Avaya SES Release 5.x installation CD.
3. Verify the firmware version on the SAMP remote maintenance board.
4. Run the initial_setup script; remember the mvss password you choose.
5. Verify the dual Network Interface Card (NIC) settings on server A.
6. Perform initial administration on server A, including completing information applicable to your enterprise's SIP domain and host(s) in the Master Administration web interface.
7. Perform RFA license-file installation - only on the A server of the duplex-server pair. Note that the file for the Edge requires both an Edge Proxy license and a Basic Proxy license. [For more information](#), see the documentation for RFA and SES installation and administration.

Install the edge B server of the pair

Complete these steps for the edge server, referred to as server B during installation:

1. Verify BIOS settings and version on the server.
2. Load the Avaya SES Release 5.x installation CD.
3. Verify the firmware version on the SAMP remote maintenance board.
4. Run the initial_setup script on server B; remember the mvss password you choose.
5. Run **checkconfig** and start SES services on the duplex pair now that both servers are up.
6. Verify the start of SES services.
7. Verify the dual NIC settings on server B.
8. Perform any remaining initial administration on the pair of servers.

Install the home A server

Complete these steps for the duplex SIP home server referred to as server A during installation:

1. Verify BIOS settings and version on the server.
2. Load the Avaya SES Release 5.x installation CD.
3. Verify the firmware version on the SAMP remote maintenance board.
4. Run the initial_setup script on server A.
5. Verify the dual NIC settings on server A.
6. Perform initial administration on home server A. Home SIP Servers employ the Limited Administration web interface for this step, and require only a Basic Proxy license in RFA.

Install the home B server (if applicable)

Complete these steps for the duplex SIP home server referred to as server B during installation:

1. Verify BIOS settings and version on the server.

Installing SIP Enablement Services (SES)

2. Load the Avaya SES Release 5.x installation install CD.
3. Verify the firmware version on the SAMP remote maintenance board.
4. Run the initial_setup script.
5. Verify the dual NIC settings on server B.
6. Run **checkconfig** and start SES services on all servers in the home domain.
7. Verify the start of SES services on the home servers.
8. Perform any remaining initial SES administration on the pair of servers. [For more information](#), see the documentation for SES installation and administration.

Test SES system

When the server(s) have been installed and initially administered, you may also complete these steps for your main location:

1. (Optionally) Administer any SIP endpoints you may have at this location.
2. Verify your SES system at the main or headquarters location by making test calls, as well as sending and receiving instant messages (if this is applicable to you), in this location.

For more information

For more detailed instructions, illustrations, and scenarios pertaining to these installation procedures, see the chapters applicable to your SES server configuration in [Installing, Administering, Maintaining, and Troubleshooting SIP Enablement Services, 03-600768](#).

Task 2: Using the SES Master Administration interface

Menus in the SES Edge 5.x web interface

To help minimize conflicts between administrative information given by Branch Central Manager and in SES, the Master Administration web interface displays the following for an SES Edge 5.x server that does not have additional SIP (Home) Servers in the main location:

- An enhanced System Properties screen.
- A menu in the left navigation pane, titled **Core Router**, that contains these items:
 - Prefix Map: This new screen is a read-only summary page of the current map that SES is using, provided to it by Branch Central Manager.
 - IM Handle Map: This new screen is a read-only summary page listing the current alphanumeric handles associated with users at Communication Manager Branch branch locations, provided to SES by Branch Central Manager.

Information on the System Properties screen

The System Properties screen for an SES server performing core routing displays the following:

- SES Version (should be greater than 4.0 to support core routing functions)
- System Configuration: (simplex / duplex (read-only))
- Host Type: edge (Read-only field)
- SIP Domain: <domain>
This must be the same SIP domain you use for your Communication Manager Branch network.
- License Host (name of the computer designated as the license server for WebLM)
- Management System Access Login — You MUST first specify the login for Branch Central Manager here (on SES Edge 5.x server) before you specify it on the [SES tab](#) on page 33 of Branch Central Manager.
- Management System Access password — You MUST first specify the password for Branch Central Manager here (on SES Edge 5.x server) before you specify it on the [SES tab](#) on page 33 of Branch Central Manager.
- Network Properties / Redundant Properties (unchanged from existing SES hosts)
- DiffServ/TOS Parameters and 802.1 Parameters (These QoS settings are not specific to SES Edge 5.x performing core routing; these new fields appear for all SES 5.x hosts.)

See the accompanying illustration of this enhanced SES Edge 5.x system screen.

 **Edit System Properties**

SES_Version	SES-4.0.0.0-028.1
System Configuration	redundant
Host Type	edge

SIP Domain*

Note that the DNS domain is:csdsip.com

If you are unsure about this field, most often the SIP domain should be the root level DNS domain. For example, for a DNS domain of eastcoast.example.com, the SIP domain would likely be configured to example.com. This allows SIP calls and instant messages to users with handles of the format handle@example.com

License Host*	
Management System Access Login	
Management System Access Password	

DiffServ/TOS Parameters

Call Control PHB Value*	46
-------------------------	----

802.1 Parameters

Priority Value*	6
-----------------	---

Network Properties

Local IP	172.31.160.22
----------	---------------

Fields on this screen include the following:

- READ ONLY: SES_Version, System Configuration, Host Type (which should be edge)
- REQUIRED TO MATCH THE DOMAIN YOU WILL CONFIGURE IN BRANCH CENTRAL MANAGER: SIP Domain
- REQUIRED: License Host
- REQUIRED TO ENABLE CORE ROUTER CAPABILITIES: Management System Access Login (the same login you will configure when you install the Branch Central Manager from Avaya Integrated Management R4.0.1).
- REQUIRED TO ENABLE CORE ROUTER CAPABILITIES: Management System Access Password (the same password you will configure when you install the Branch Central Manager from Avaya Integrated Management R4.0.1).

- DiffServ/TOS Parameters Call Control PHB Value (This Per Hop Behavior value is used for determining intermediary forwarding characteristics; Avaya's default value is 46, implying "expedite routing" and the allowed range of PHB values is 0-63.)
- 802.1 Parameters Priority Value (The associated value in the Ethernet header tag is used to prioritize Ethernet layer messages. Avaya's default is 6, and the allowed range is 0-7.)

Information on the List Prefix Maps screen

AVAYA IntegriSIP

Help Exit Update

Top

- Core Router
 - Prefix Map
 - Handle Map
- Users
- Conferences
- Media Server Extensions
 - Emergency Contacts
- Hosts
- Media Servers
 - Address Map Priorities

List Prefix Maps

Branch Prefix	Branch Address	Core Router	Total Length
450000	0.0.0.0	135.8.113.128	10
450001	1.1.1.1	135.8.113.128	11
450002	2.2.2.2	135.8.113.128	12
450003	3.3.3.3	135.8.113.128	13
450004	4.4.4.4	135.8.113.128	14
450005	5.5.5.5	135.8.113.128	15

The following fields are read-only; they may be edited using Branch Central Manager:

- Branch Prefix (the prefix used to uniquely identify each Communication Manager Branch platform, including each optional SIP Server supporting users in the main or headquarters location)
- Branch Address (the IP address of the Communication Manager Branch platform at each location)
- Core Router (the IP address of the SES Edge 5.x server performing core routing)
- Total Length (the digit length of the assigned branch prefix PLUS the extension). The length of the prefix+extension string cannot exceed 15, given the typical single-digit dial code (8, for example) to access Automatic Alternate Routing (AAR).

Information on the Handle Maps screen

The screenshot shows the Avaya Integ SII web interface. The top header includes the Avaya logo and 'Integ SII'. Below the header is a navigation bar with 'Help', 'Exit', and 'Update'. The left sidebar contains a tree view under 'Top' with categories like 'Core Router' (Prefix Map, Handle Map), 'Users', 'Conferences', 'Media Server Extensions' (Emergency Contacts), 'Hosts', 'Media Servers' (Address Map Priorities), 'Adjunct Systems', 'Trusted Hosts' (Services), 'Server Configuration', 'Certificate Management' (IM logs), 'Trace Logger', and 'Export/Import to ProVision'. The main content area is titled 'List Handle Maps' and contains a table:

Branch Prefix	Handle
450000	user0
450001	user1
450002	user2
450003	user3
450004	user4
450005	user5
450006	user6
450006	user7
459007	user8
459008	user9

Fields on this list screen are read-only; they may be edited using the appropriate screen(s) in Branch Central Manager:

- Branch Prefix (the string of digits uniquely identifying each Communication Manager Branch platform, including each optional SIP Server in the main or headquarters location)
- IM Handle (the alphanumeric IM handle for each branch user with IM client software).

IM Handles for individual users who are not at the Communication Manager Branch locations are administered differently. See [IM Handles in SES for instant messaging between locations](#) on page 19 for more details.

Supplementary Details on Communication Manager Branch Core Routing

SES installation information

SIP Domain: During installation of SES Edge 5.x in a Communication Manager Branch network, the SIP Domain is a required entry. If it has not been provided, it must be entered on the Edit System Properties screen. Also, entering an appropriate administration login and password will allow the access to SES Edge 5.x data that is required by Branch Central Manager.

SES Master Administration

SES Master Administration web-based interface for core routing has specific functionality for Communication Manager Branch constructs, and Avaya Integrated Management for Communication Manager Branch provides the administration data required for inter-branch routing. There is no Master Administration web interface on the platform at the branch location itself, since both the Communication Manager Branch Device Manager and Central Manager interfaces are used for certain portions of the data.

For more detailed information on initial SIP administration in SES Edge 5.x, see the Setup screens section of the “Administration web interface” chapter of [*Installing, Administering, Maintaining, and Troubleshooting SIP Enablement Services*, 03-600768](#).

Other information required for SES performing core routing

Note:

Branch Central Manager validates that prefixes do not contain # and * characters.

Branch Central Manager sets the limits on the prefix length for locations. In this release of Communication Manager Branch, the following are allowed:

- Prefixes of a maximum length of 10 digits.
- Prefix lengths that must be the same, system-wide.
- Extensions that may be of different lengths for different branch locations, although all extensions must be the same length within the Communication Manager Branch platform at one location.
- A total length of enterprise Private Numbering scheme (i.e., Prefix+Extension) that cannot exceed 15 digits.

Installing SIP Enablement Services (SES)

If an address map is administered on the SES Edge 5.x performing core routing, then matching calls are routed to the destination to which the map points. Address maps are not needed on the SES Edge 5.x server for routing within the Communication Manager Branch network of locations.

Connectivity between the SES Edge and the branches

Any branch location can connect only to one SES Edge 5.x server (or duplex pair) performing core routing. The secure link for that connection is provided via Transport Layer Security (TLS).

You can test network connectivity between Branch Central Manager and SES Edge 5.x with the button on the Enterprise Private Networking screen, [SES tab](#) on page 33.

Alphanumeric handle-based IM is supported, both locally (intra-branch) as well as for inter-location IM within and across the Communication Manager Branch network of locations.

Note:

- IM by alphanumeric handles requires Branch Central Manager for administering the user handles, whether it is a standalone branch or a Communication Manager Branch network construct.
- Dialing by alphanumeric URI for audio calls between branches is NOT supported in this release of Communication Manager Branch.
- The IM client software for this release of Communication Manager Branch is the SIP-based IM client used in conjunction with the H.323 version of Avaya IP Softphone.

Interfaces to platforms at the branches in a Communication Manager Branch network

Branch Central Manager provides the branch platforms with the:

- SIP Domain name
- SES (Core Router) IP Address
- Branch Prefix dialing codes
- IM handles for users at the branch location

Information in the Branch Central Manager tool for SIP Domain and for branch users' IM Handles will take precedence over information input via the SES Master Administration web tool if there is a conflict between the information provided by either of these tools.



Important:

Branch Central Manager is **not** authoritative for the user contact information (like the IM handles for the SIP users) in the main location. That information must be provided through the SES Master Administration web interface in order to be propagated to the SIP (Home) Server(s) supporting all the users in the main or headquarters location.

IM Handles in SES for instant messaging between locations

SES Master Administration provides an interface to Branch Central Manager, and populates Prefix Table and user IM Handle table data in the SES database for core routing.

Branch Central Manager is used to administer IM handles for all Communication Manager Branch users, regardless of location. IM users at branch locations use SIP-based IM client software included with Avaya IP Softphone. IM users registered with SIP Servers can use SIP Softphone.

Administering IM handles to avoid conflicts

Users supported by SIP (Home) Servers in the main or headquarters location also may have SIP handles assigned in the SES Master Administration web interface. Avaya strongly recommends the use of global user email addresses as users' IM handles, in order to allocate and maintain user IM handles that are guaranteed to be unique, system-wide. Otherwise and if conflicts do arise, then instant messages may not reach the intended users and system alarms also may be generated.

If you assign a user a station type such as Avaya Softphone, then the SIP Handle field becomes enabled on the [General tab](#) of the [Stations screen](#). The stations that support handle-based addressing are administered using Station Templates in Branch Central Manager. SIP handles are used for supported applications such as instant messaging and presence.

Administering the SIP Domain to avoid conflicts

A SIP Domain no longer than 40 characters should be administered at the time of initial system configuration and setup. Verify this entry is correct, as altering it later causes extensive and time-consuming database changes, as well as affecting SIP endpoints and any SIP adjuncts, like Avaya Voice Portal. Also, changing a global setting such as SIP Domain on any SES Edge 5.x or SIP (Home) Server may require you to stop and restart SIP Services on that server.

Administering CM extensions to avoid conflicts

Make sure that extensions at any Communication Manager Branch location do not conflict with prefixed branch extensions. For example, avoid having an extension of 5123 on a media server running CM in the main location if you also have a branch with a prefix of 51 and an extension of

23. In this situation, “5123” calls would be routed locally instead of routing to the user at the branch.

Configuring CM for routing between main and branch locations

In order for the routing of calls and messages between the main or headquarters location and each of the branch locations to work as expected, certain Communication Manager 4.0 administration is needed in the main location of the Communication Manager Branch network. Basically, in general, you must ensure the information on the following screens is accurate and complete:

- AAR/ARS Digit Analysis Table screen (see the user documentation and online help system for the administration of Communication Manager 4.0 routing and dial plans)
- Incoming Call Handling Treatment screen (which specifies information about the handling of calls for both ISDN and the SIP Enablement Services trunk groups used in a Communication Manager Branch network).
- Numbering — Public/Unknown screen, (specifies extension information for the trunks you are using for call routing in your Communication Manager Branch network).

For more detailed information about Communication Manager, refer to the “Administering Communication Manager for SIP Enablement Services” chapter in [*SIP Support in Communication Manager Running on Avaya S8xxx Servers, 555-245-206.*](#)

Configuring SES for Communication Manager Branch

In Communication Manager Branch networks, messages between users at a single branch location (that is, intra-location) are routed by the platform at that location. Messages to all other locations (inter-location) are routed by means of SES (and any SIP Servers) in the main or headquarters location. In order for this function to be performed, you must provide information about your branch locations using the Branch Central Manager.

Task Overview

To configure an SES Edge 5.x server to perform inter-location routing in an Communication Manager Branch network, as well as to support enterprise-wide instant-messaging, you must use the web-based Branch Central Manager. You cannot use SES Master Administration or Branch Device Manager to perform these tasks for your SES Edge 5.x server.

[Task 1: Installing Branch Central Manager](#) on page 21.

[Task 2: Using Branch Central Manager](#) on page 23.

Before you can configure SES for Communication Manager Branch using Avaya Integrated Management for Communication Manager Branch, you must complete the initial SES installation and system administration. Branch Central Manager uses the Management Access login and password information which you have configured for SES. See [Installing SIP Enablement Services \(SES\)](#) on page 7 for more details on these tasks.

Task 1: Installing Branch Central Manager

Branch Central Manager is a component installed with Avaya Integrated Management for Communication Manager Branch. It can be installed by itself, or with other optional components. Central Manager supports certain remote administration functions.

You use the web-based interface of Branch Central Manager to configure the core-routing functions (that is, routing between the locations) on your SES Edge 5.x server.

Note:

Branch Device Manager cannot be used to administer SES or the optional SIP server(s).

Configuring SES for Communication Manager Branch

For details on how to install Branch Central Manager, refer to *Avaya Integrated Management for Communication Manager Branch Release TBA Installation*, 14-601539.

Task 2: Using Branch Central Manager

Overview of steps to configure SES

[Using the Enterprise menu screens](#) in Branch Central Manager, you must enable and configure enterprise private networking on the SES Edge 5.x server for support of its core-routing functions. An overview of the steps required to do this using Branch Central Manager is as follows:

1. First, ensure that the box next to the label “Enable Private Networking” is checked. For more information, see [Enable private networking](#) on page 25. Under the [General tab](#) on page 32, enter the SIP domain name and the length of the branch prefixes you are using for your Communication Manager network.
2. Under the [SES tab](#) on page 33, enter the IP address, login and password for the SES you are using to perform core-routing functions for your Communication Manager network. For more information, see [Establish access to SES](#) on page 25.
3. (Optionally) Under the [SIP Servers tab](#) on page 35, complete the information about any SIP (home) servers you have for users at your main (or headquarters) location. For more information, see [Configure SIP server\(s\)](#) on page 27.
4. Under the [Branches tab](#) on page 35, view the information about each branch location you have previously installed and configured in your Communication Manager network. If you have just enabled private networking, or if have not previously added branches using Branch Device Manager, then this screen will not show any entries yet. Before you can test and verify core routing and inter-location capabilities, you must ensure that entries for at least one branch are listed. For more information, see [View branch locations](#) on page 27.

Overview of steps to verify SES routing

After configuring SES, you can verify that SES is performing its core routing functions properly.

1. If you have not already done so, under the [General tab](#) on page 38 of the [Branches screen](#), add a branch location to your Communication Manager network. Saving this information to the system will create a new synchronization job. After it is complete, proceed to the next step.
2. Also under the [General tab](#) of the [Branches screen](#), enable enterprise private networking for the new branch. Complete any optional fields on the screen and save your changes again.
3. If you have not already done so, under the [General tab](#) on page 41 of the [Stations screen](#), add a branch-location user's station and its associated extension to the Communication Manager system. Save these changes

4. Repeat [Add a new branch location](#) on page 28 and [Include the branch in Private Networking](#) on page 29 for each new branch in your Communication Manager network. You may use groups and templates to help you complete these steps for multiple branches. For more details, see the online help system for Branch Central Manager.
5. Repeat [Add a station and its extension to the branch](#) on page 29 for each user's station at a branch. You may use station templates to help you complete this step for multiple stations.
6. (Optionally) If you have properly configured SIP users in the main location and in one or more of the branch locations with private networking enabled, then you can test the routing of SIP messages by making calls from a station in the main location to a station at a branch, or a call between two branches. If you have supported IM client stations configured in both locations, you can also test instant messaging between them.

For more information

For more details on these steps, see the online help system for Branch Central Manager.

Using the Enterprise menu screens

Under the Enterprise menu in Branch Central Manager are three objects to help manage your network of locations:

- [Selecting Network Management Console data](#) on page 30.
The Network Management Console (NMC) component helps manage various hardware components in your Avaya network. It performs network-node discovery and offers a single, consolidated view of the entire system. For more information, see the online help system or other documentation for Avaya Integrated Management for Communication Manager Branch.
- [Private Networking](#) on page 32
Private Networking is an Branch Central Manager function for configuring your SES to perform core routing in a Communication Manager Branch network. Optionally, you may have SIP (Home) Servers (typically serving SIP user needs in the main or headquarters location not served by one of the branch Communication Manager Branch platforms), in addition to the SES Edge 5.x performing core routing, and the total number of hosts can range from one to 1000.
- [Software Update Manager](#) on page 37.
The Software Update Manager (SUM) component keeps the software current on various platform components in your Avaya network. For more information, see the documentation or the online help system for Avaya Integrated Management for Communication Manager Branch.

Enable private networking

1. Start a web-browser session and enter the IP address (or fully-qualified domain name, if your enterprise supports DNS) of the computer with Branch Central Manager installed.
2. On the launch page that appears, select **Branch Central Manager** from the set of installed Integrated Management applications.
3. Login to the system using your Avaya SSO administrative login and password. See your system administrator for more details on setting up this login at system installation time.
4. Select and expand the Enterprise folder in the left-hand navigation pane of the window.
5. Select the Private Networking item under the Enterprise menu, and the Enterprise Private Networking screen appears.
6. Ensure that the checkbox for Enable Private Networking is checked on this screen.
7. Enter the SIP Domain for your Communication Manager Branch network on the [General tab](#) on page 32. The domain must exactly match the [Information on the System Properties screen](#) on page 13 that you entered in the SES Master Administration web interface.
8. Enter the digit length for branch prefixes for your Communication Manager Branch network on the [General tab](#) on page 32. The range is 1 to 10 digits, and the default length is 3 digits. In this release of Communication Manager Branch, this branch prefix length must be the same for all Communication Manager locations, but the length of the extensions used at each of the branch locations may vary, so long as the total of the two lengths are no greater than 15 characters.

Establish access to SES

For any Communication Manager Branch network that is not a simple standalone construct, you must ensure that SES is able to communicate with the rest of your Communication Manager Branch network, as follows:

1. On the [SES tab](#) on page 33, enter the IP address of the SES Edge 5.x server performing core routing for your Communication Manager Branch network.
2. Enter the Management Access login and password information for the SES master database. This information must exactly match the [Information on the System Properties screen](#) on page 13.
3. Select the **Test SES Connectivity** button and a pop-up window should appear with the message "Successfully Connected to Core Router."

Note:

If this test fails, so will any other changes you try to submit to the SES server. Double-check that you have entered the login and password correctly, and that they exactly match those you entered in the SES Master Administration interface. You may also check your network for any IP connectivity issues.

Configure SIP server(s)

On the [SIP Servers tab](#) on page 35, enter the following information for each optional SIP server you may have installed to support Communication Manager Branch network users in your main or headquarters location:

- Name for the SIP (home) server to identify it in Branch Central Manager only
- IP address for the server
- Prefix (a numeric string) to uniquely identify this branch location. The prefixes can be from 1 to 10 digits long, and the default length is 3 digits. In this release of Communication Manager Branch, branch prefixes must be the same length for all locations in the network.
- Extension Length (the number of digits for the extensions of the users supported by this SIP server). The length of these extensions may vary among the locations in your network, but the total length of Prefix+Extn must be no greater than 15 characters

View branch locations

Optionally, under the [Branches tab](#) on page 35, you can view the following information about each of the existing branch locations you have added to your enterprise, and for which you have enabled private networking, in Communication Manager Branch:

- The name identifying the branch.
- The IP address for the Communication Manager Branch platform at the branch.
- A prefix of a fixed length that is to be used in referencing users at that branch. This field can be edited for each location, but the digit length of the prefixes must be the same as on the [General tab](#) of [Private Networking](#) on page 32.
- A number indicating the length, in digits, of users' numeric extensions at that location.

If you have just enabled private networking, but have not yet added branches using Branch BranchDevice Manager, then this screen will not show any information.

Verify SES routing

After configuring SES for core routing in Branch Central Manager, test whether your configuration is correct and core-routing functions are performed properly with these tasks:

1. [Add a new branch location](#)
2. [Include the branch in Private Networking](#)
3. [Add a station and its extension to the branch](#)
4. [Test SIP messaging](#)

Add a new branch location

To add a new branch location (one that is not yet listed when you [View branch locations](#) on page 27) to your Replace variable w/ product name network, select [Branches screen](#) on page 37 from the left-hand navigation pane and specify information identifying each branch location, as follows:

1. Select the Add button at the top of the [Branches screen](#). A screen with four tabs appears.
2. On the [General tab](#) on page 38, enter information in the first four enabled fields.
3. (Optionally) You can use [Selecting Network Management Console data](#) on page 30 to browse your Avaya network of devices for the name of the Communication Manager platform you wish to add as a branch location.
4. You can test connectivity to Communication Manager hardware using the button on the screen.
5. Save this new information or use cancel to discard the information. When you select the save button, a job will be created to synchronize this new information with SES. Once that job has been completed successfully, you can do any of the following:
 - Make changes to fields that are newly enabled on the [General tab](#) on page 38 for this branch.
 - Repeat these steps for another branch location in your Communication Manager network.
 - Continue with the steps that follow.

Include the branch in Private Networking

Include the branch or branches you just added in your Enterprise Private Network, as follows:

1. On the [General tab](#) of the [Branches screen](#), complete the other fields enabled for data entry, as needed. These fields only become available after the branch has been added.
2. Under the heading Private Networking (PN) on the right-hand side of the screen, ensure that the checkbox to **Include in Private Network** is checked for this branch location.
3. Enter the unique numeric branch prefix and number of PN trunks for the Communication Manager platform at this location in the respective fields. Note that the prefix must be the same number of digits in length for all branches in your enterprise private network.
4. Save the information. Continue with the next task, or repeat this step to include another branch in your Communication Manager private network. Cancel to discard your changes.

Add a station and its extension to the branch

Typically, users' stations are configured at each branch location and then synchronized with SES. Once you add branches in Branch Central Manager, existing branch users' stations are also synchronized here. You can also manually add users' stations and their associated extensions to the branch location(s) you have just configured in Branch Central Manager, using the [Stations screen](#) on page 41, as follows:

1. On the [General tab](#) on page 41 of the [Stations screen](#), enter data in the enabled fields.
2. You can browse for a branch or an extension using the **Select...** button for that field.
3. You can select user privileges, coverage path template, display language, as well as the station template, type and port number, from their respective drop-down lists of choices.
4. The choices for levels of branch user privileges are Administrative, High-, Medium-, Low, and No-privileged. See Communication Manager Central Manager online help for details.
5. Save the information. Repeat this step, as needed, for other users' stations at this branch location. Cancel at any time to discard unsaved station additions or changes.

Test SIP messaging

(Optionally) If you have configured users' stations and their extensions on SIP (Home) Server(s) in the main location, as well as the prefix(es) and stations at one or more branch locations with private networking enabled, then you can test the routing of SIP messages between them, as follows:

1. Make test calls between the main location and a branch location, or between two branch locations in your Communication Manager Branch network.

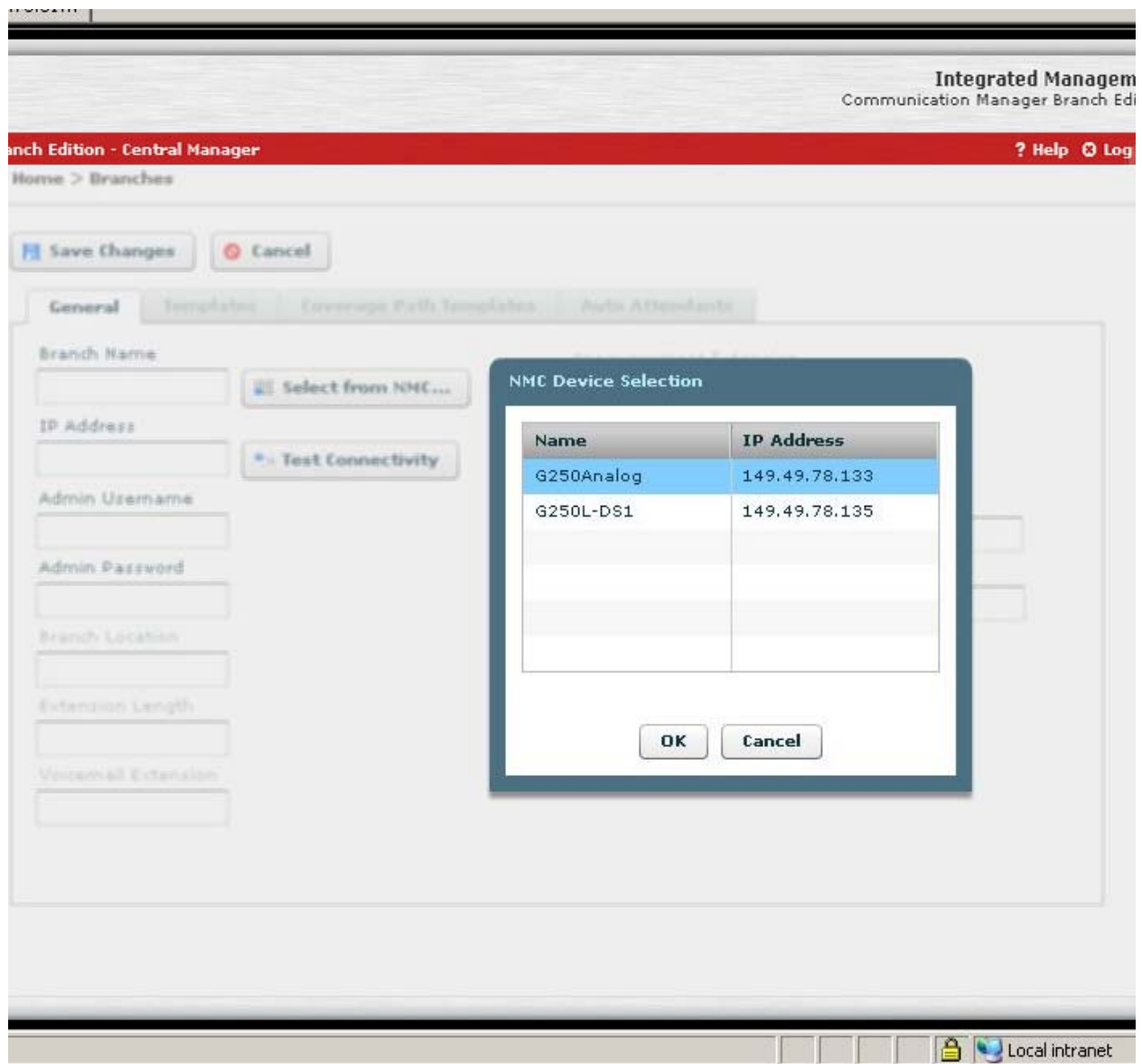
2. Use supported IM clients to send instant messages between the main location and a branch location, or between two branches in the network.

These tasks will exercise the core routing capabilities of SES Edge; you may also want to test intra-location routing by making calls or sending messages between users at one location.

Selecting Network Management Console data

NMC data can help manage hardware component devices in your Avaya network from a system point of view. For more information, see the online help with Avaya NMC, or refer to *Avaya*

Integrated Management for Communication Manager Branch Network Management Console, 14-300189.



NMC Device Selection (this pop-up window lists only those locations in your network that have not already been configured as branches in Branch Central Manager). Select a name and/or IP Address from the list that you want to add as a Communication Manager Branch branch location, and then select the OK button to populate the fields on the [General tab](#) of the [Branches screen](#). You can select the Cancel button and no network device will be selected on this screen.

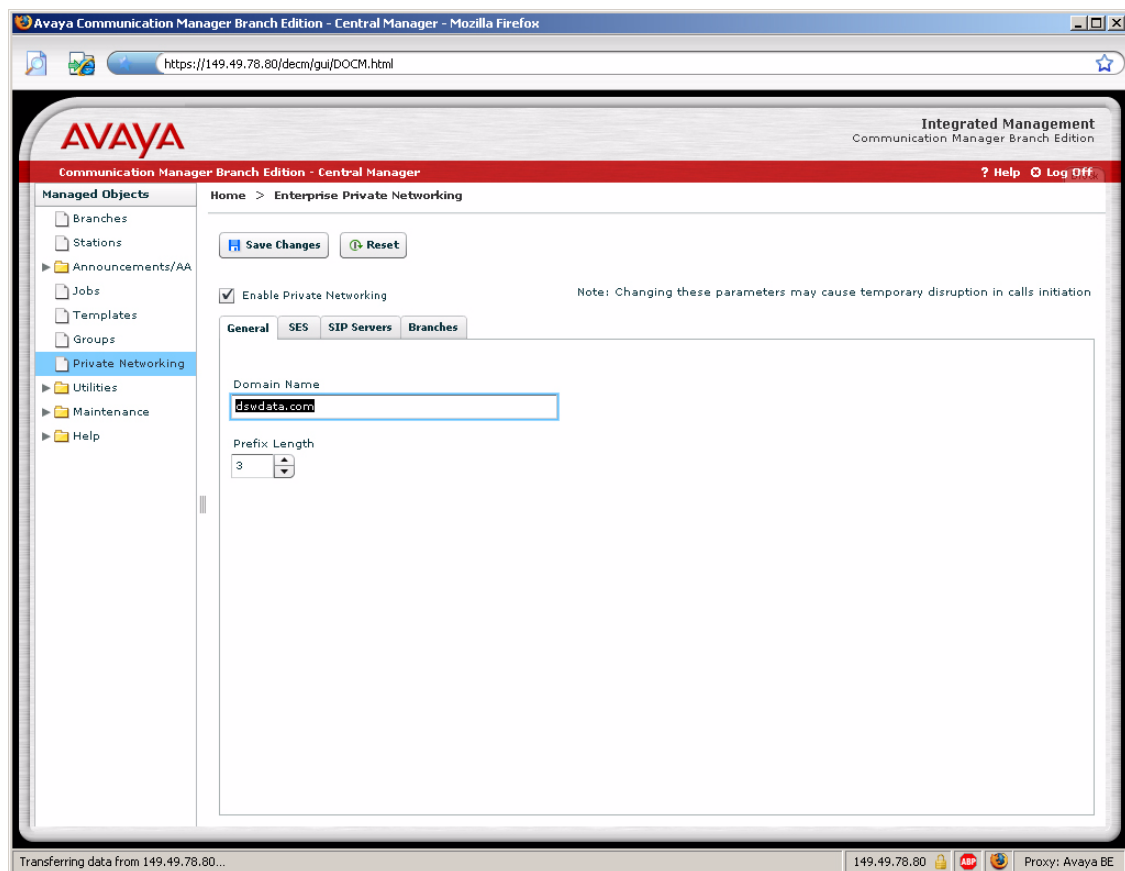
Private Networking

The Enterprise Private Networking screen is used primarily to configure Avaya SIP Enablement Services for a Communication Manager solution. In addition to Enabling (or disabling) Private Networking, you can use this screen to submit or cancel entries or changes made on four tabs:

- [General tab](#)
- [SES tab](#)
- [SIP Servers tab](#)
- [Branches tab](#)

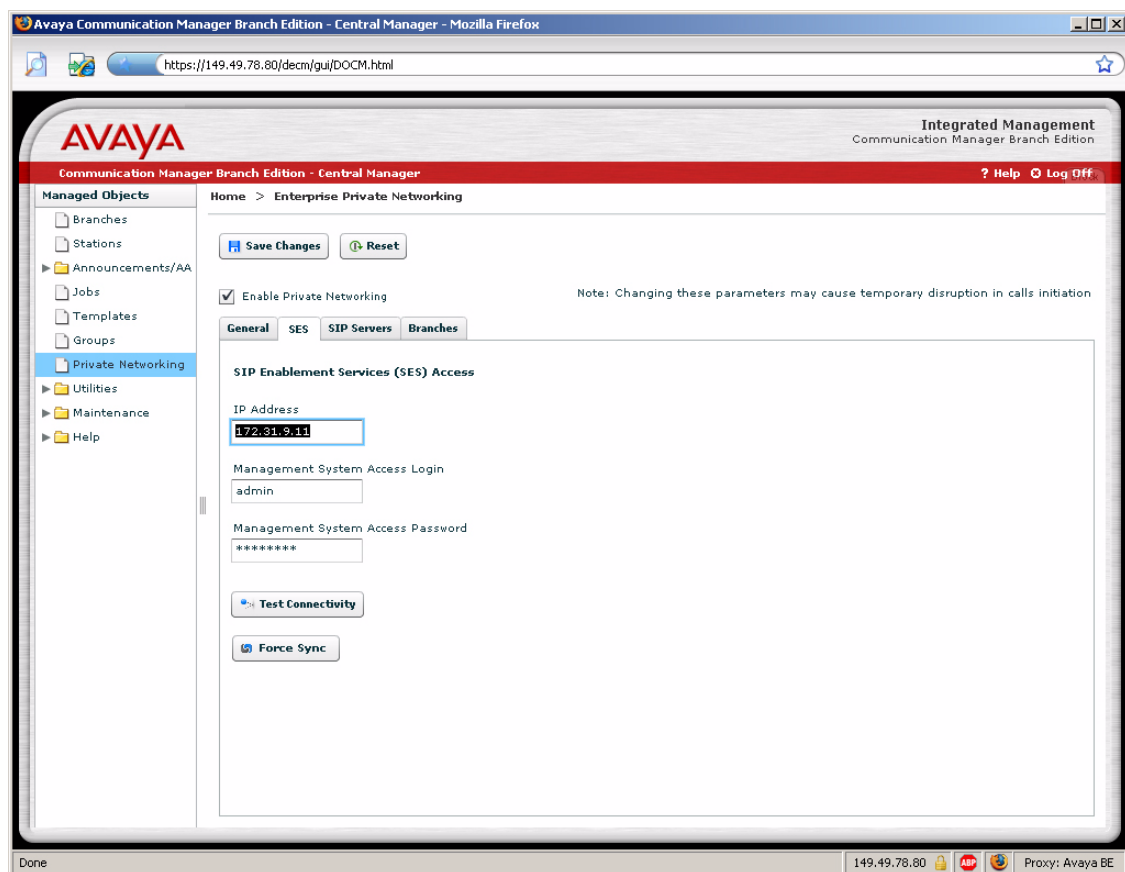
General tab

Use the General tab under Enterprise Private Networking to specify system-wide settings for your new Communication Manager Branch network, such as the Domain Name and Branch Prefix Length.



SES tab

Use the SES tab under Enterprise Private Networking to configure access, and then test connectivity, to the SES Edge 5.x server that is performing core-routing functions for your Communication Manager Branch network. You can also force the SES Edge 5.x Master Administration data to be synchronized with Branch Central Manager on this screen, if this is ever needed.



The following fields appear on this tab:

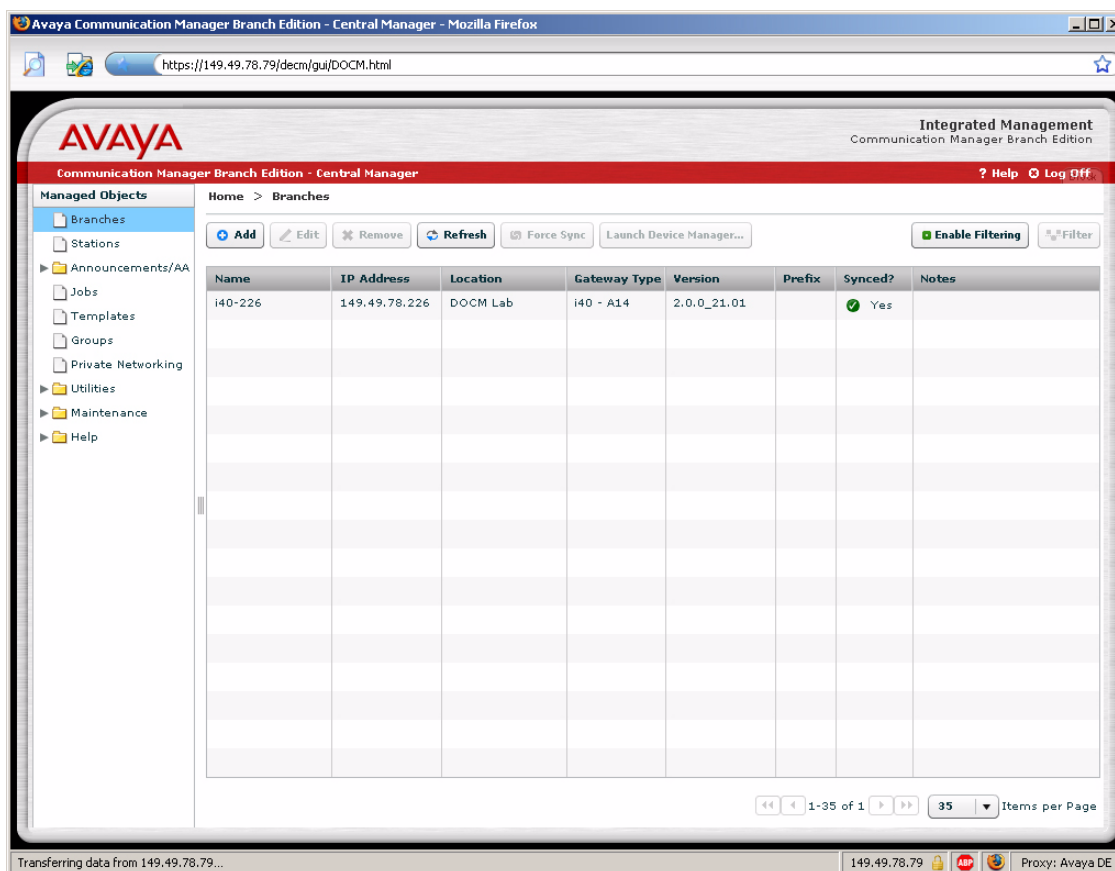
- IP Address used for the SES Edge 5.x server — This is either the unique IP address of one simplex server or virtual IP address for a duplex-server pair. Note that this address in **not** assigned or modified directly via Branch Central Manager.
- Management Access Login — Enter the same login as you entered on SES Edge 5.x. [Information on the System Properties screen](#) on page 13 must match the information you enter here.
- Management Access Password — Enter the same password as you entered on SES Edge 5.x. [Information on the System Properties screen](#) on page 13 must match the information you enter here.
- **Test Connectivity** button — verifies that the login and password are correct.
- **Force Sync** button — updates SES with the latest Branch Central Manager data, in the event that job sync or other errors have caused the two to become out of sync.

Note:

Performing a “force sync” affects inter-location calls and instant messages until the job is complete. Current calls at the time the force-sync job starts are preserved, but any new calls or new instant messages will fail. Note that intra-branch calls and instant messages are not affected by a force-sync job.

SIP Servers tab

Use the SIP Servers tab under Enterprise Private Networking to add or remove the optional SIP (home) servers for your Communication Manager Branch network. These servers manage and support users and their SIP devices and IM client software at the main or headquarters location.



The following fields appear on this tab:

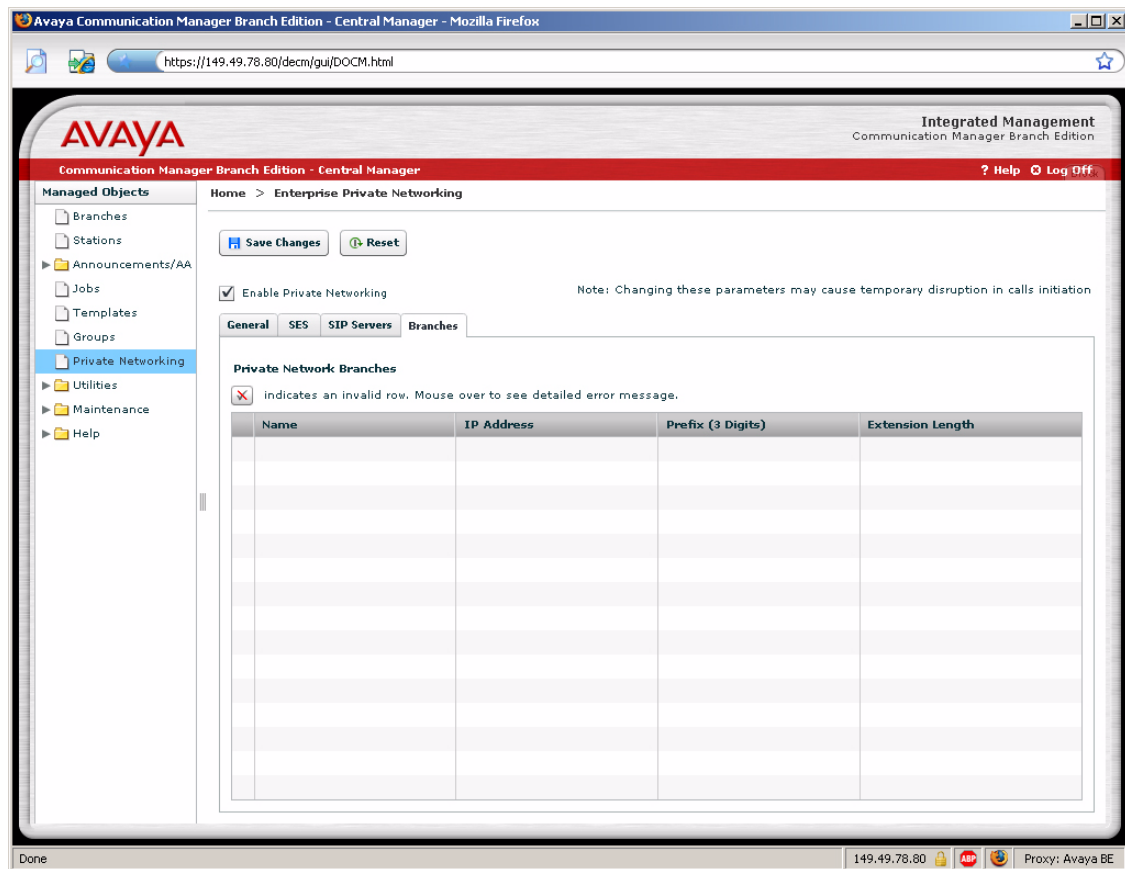
- Name — This uniquely identifies the SIP home server.
- IP Address — This is the IP address of the SIP Enablement Services home server.
- Prefix (X digits) uniquely identifying a location in a Communication Manager network.
- Extension Length, or the digit length for users' extensions on this SIP home server.

Branches tab

Use the Branches tab under Enterprise Private Networking to view information on your network branches. You can have as many as 1000 location platforms in a Communication Manager

Configuring SES for Communication Manager Branch

Branch network. Only branch locations for which Private Networking (PN) is enabled are listed on this screen.



The following fields appear on this tab:

- Branch Name — This is the name administered on the [General tab](#) of the [Branches screen](#)
- IP Address — This is the IP address for the Communication Manager platform at the branch location, as administered on the [General tab](#) of the [Branches screen](#).
- Prefix (X digits) identifying this branch for inter-branch and main-to-branch location routing purposes, which was entered on the [General tab](#) **after** the branch was added.
- Extension Length, or the digit length for users' extensions at this location; lengths may vary among branches, but total length of the Prefix+Extn must not exceed 15 characters, assuming one character, such as the digit 8, is used to access the AAR/ARS routing.

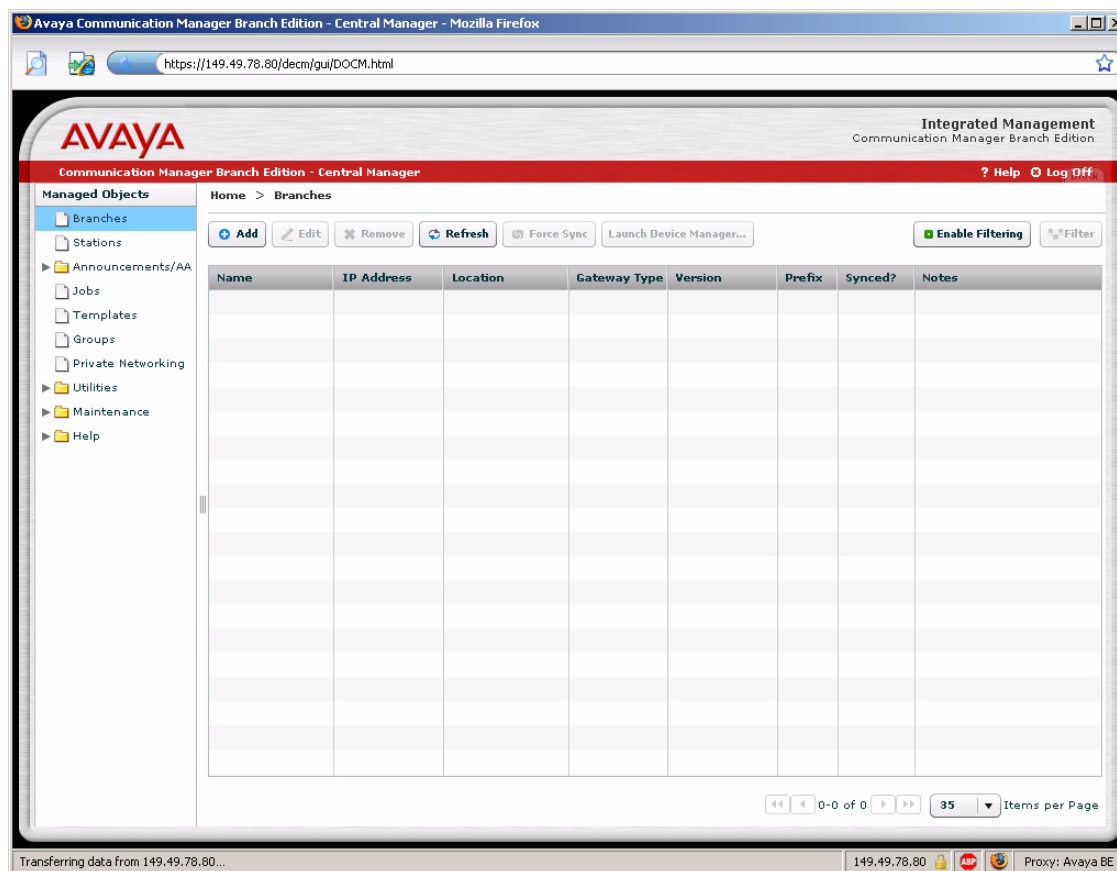
Software Update Manager

Use Branch Device Manager to keep the software current on various components in your Communication Manager Branch network, and Software Update Manager (SUM) to help with the rest of your Avaya devices that are not Communication Manager Branch platforms. For more information on the latter, refer to the online help system for Avaya SUM, or the [IM Software Update Manager User Guide, 14-300168](#).

Branches screen

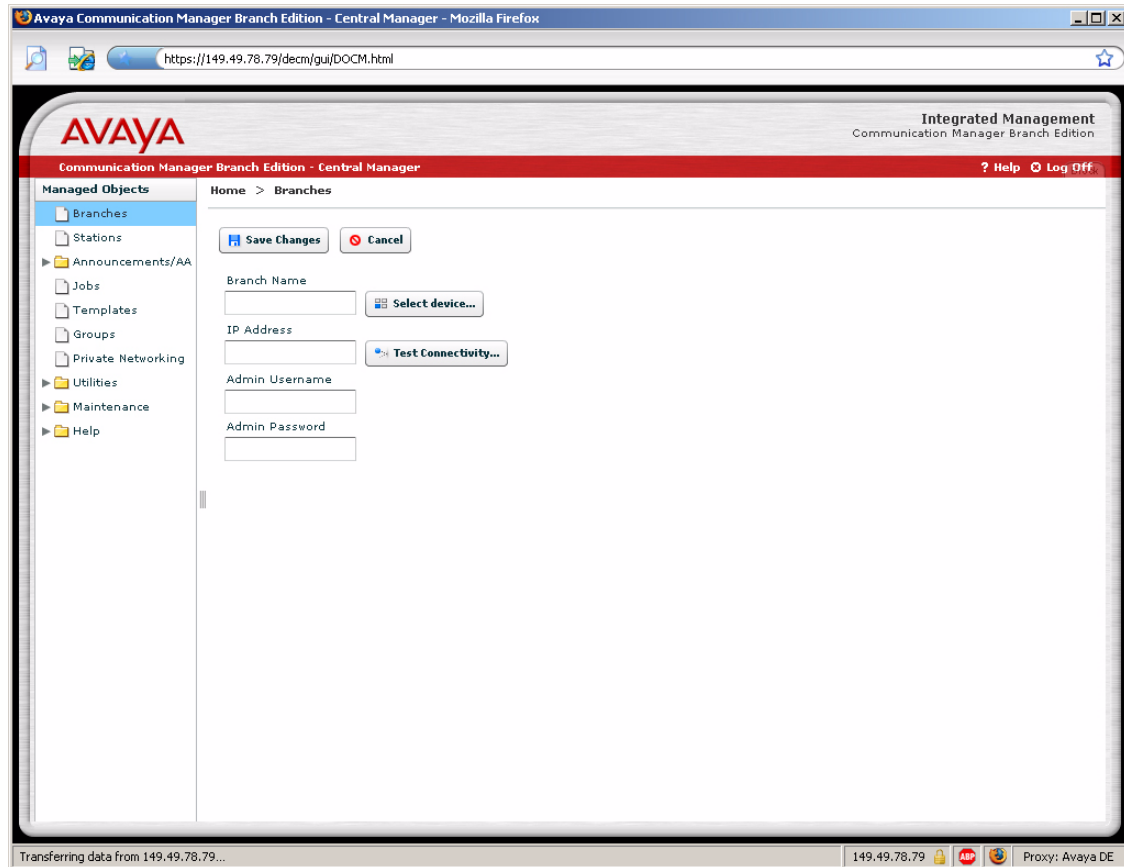
Use the Branches screen to configure the Communication Manager platform at any branch location(s). Begin by selecting the Add button to save or cancel entries or changes to the information for your Communication Manager Branch locations.

- [General tab](#) on page 38



General tab

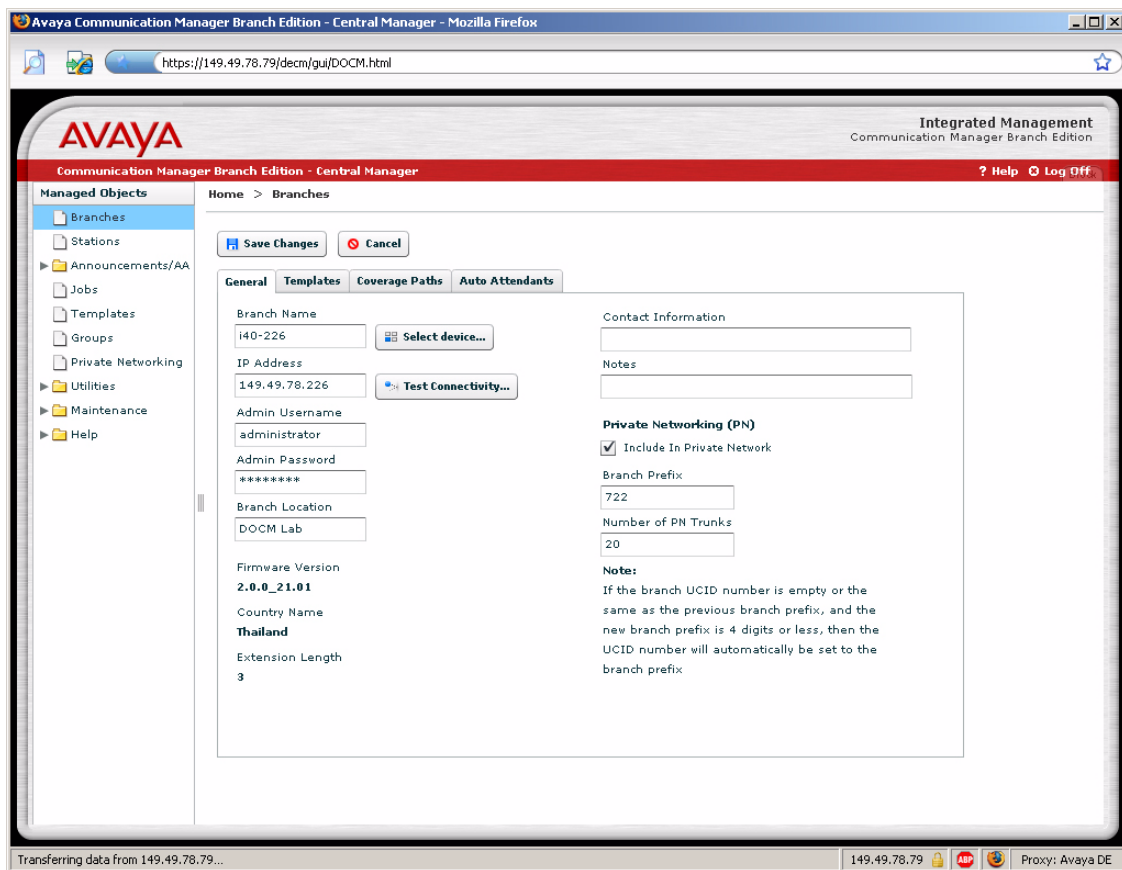
Use the Add button on the Branches screen to specify information about a new branch in your Communication Manager network, such as its name, IP address and administrator's login data.



The following required fields appear on this tab when it is first displayed:

- Branch Name — This may be, but is not required to be, the hostname of the network hardware as shown on the [Selecting Network Management Console data](#) on page 30, so a button you can click to direct you to the NMC interface is provided for browsing purposes.
- IP Address — The IP address of the Communication Manager platform hardware must be reachable on your network, so a button is provided to test that you can connect to it.
- Admin Username — The administrative user's login for this location in Communication Manager, as chosen when the platform for this branch location was set up and initially configured.
- Admin Password — The password associated with this administrative user's login.

After you have submitted these entries and the sync job completes successfully, additional fields on the General tab are enabled on the screen, available for configuration data entry:



The other fields on the General tab of the screen are as follows:

- Branch Location, an alphanumeric entry used to specify where the branch is located.
- (Read-only) Extension Length, or the number of digits that extensions at this branch location have, and it cannot be changed on this screen.
- (Optional) Voicemail Extension — This is the extension number assigned to the general voice mailbox system for this branch location.
- (Optional) Announcement Extension — This is the extension number assigned to the voice announcement for this branch location.
- (Optional) Operator Number — This is the extension assigned to the operator for this branch location.
- Contact Information — This can contain additional, administrable contact information for this branch location.
- (Optional) Comments — This can contain additional information for a branch location, for example, clarifying its purpose or use.

Once the synchronization job for this new branch information has been completed successfully, you can begin to complete several additional Private Networking (PN) items that are enabled on this tab, as follows:

- **Include in Private Network** — Ensure this box is checked if this branch is not a standalone location and you wish it to be able to send and receive SIP messages in your network.
- **Branch Prefix** — This must be the unique number identifying this branch to other branch locations and the main location for routing purposes, and it must be the same number of digits in length as are other branch prefixes in your Communication Manager network.
- **Number of PN Trunks** — This can be configured for each branch platform; the range for this number's value is 1 to 40, with a default value of 20. This value represents the limit of simultaneous private-network calls, and may depend on network bandwidth or IP call quality considerations, or on the individual branches' PN communication needs. You may wish to verify with your enterprise's network administrator that the number you use here is appropriate.

Stations screen

Use the Stations screen to configure the users' stations at any branch location(s). Use the General tab on this screen to begin and save or cancel entries or changes to information.

- [General tab](#) on page 41

General tab

Use the General tab on the Stations screen to specify information about a new user/station at a branch in your Communication Manager network, such as the user's name and station template/type.

The screenshot shows the Avaya Communication Manager Branch Edition - Central Manager web interface. The browser window title is "Avaya Communication Manager Branch Edition - Central Manager - Mozilla Firefox". The address bar shows "https://149.49.78.79/decn/gui/DOCM.html". The interface has a red header bar with the Avaya logo and "Integrated Management Communication Manager Branch Edition". Below the header, there's a navigation bar with "Home > Stations". The main content area has tabs for "General", "Abbreviated Dialing", "Voice Mail", "Station Groups", and "Station Template". The "General" tab is selected, showing a form with the following fields and values:

- Last Name: Carmeli
- First Name: Shimi1
- Native Name: Shimi Carmeli
- Name (ASCII): Shimi Carmeli
- Branch Name: i40-226
- Extension: 203
- Security Code: (empty)
- Confirm Security Code: (empty)
- Authorization Code: (empty)
- IM Handle: (empty)
- Branch User Privileges: Medium
- Station Template: (empty)
- Station Type: 6221
- Coverage Path: None
- Display Language: english
- Station Port: 1V309
- Call Waiting Indication: ☒

Buttons for "Save Changes", "Cancel", and "Populate 'First Last'" are visible. The bottom status bar shows "Transferring data from 149.49.78.79..." and "Proxy: Avaya DE".

The fields on the General tab of the Stations screen are as follows:

- Name (ASCII) is the administered name for this user on the branch.

Configuring SES for Communication Manager Branch

- Branch — This is the administered branch for this station; you can browse for a branch location listed in NMC by using the Select... button.
- Extension — This is the administered extension associated with this station; you can browse for the extension by using the Select... button.
- Password — This is the user password for this station.
- Native Name — This may differ from the user's ASCII user name if the display language selected for this station uses non-ASCII characters.
- Security Code — This is an optional security code for this station.
- SIP Handle — This field is enabled when this station has been assigned a station type which supports handle-based message addressing. Avaya IP Softphone with IM client software is supported for Communication Manager Branch branch users; in addition, Avaya SIP Softphone is supported for the users with SIP (Home) Servers in the main or headquarters location.
- Branch User Privileges — This field specifies one of the five assigned levels of user privileges: Administrative, High-, Medium-, Low-, or No-privileged; the default is Medium-privileged, or you may select a different level for this user's station from the drop-down list.
- Station Template — This drop-down list assigns station templates available for this branch.
- Station Type — Selecting from this drop-down list assigns a type of station from those available for use at this branch location.
- Coverage Path Template — Selecting from this drop-down list assigns a coverage path template from those available for use at this branch location.
- Display Language — This drop-down list assigns a language available for station displays to use at this branch location.
- Station Port — This drop-down list assigns an available port to use for this station type.
- Call Waiting Indication — This box should be checked if the call-waiting feature is to be enabled for and supported on this station.

Appendix A: Branch/Main and Main/Branch Routing

What is in this appendix

Read about the following in this sections and its subsections:

- [Routing between Main and Branch Locations](#) on page 43
- [Example of Branch-to-Main Administration and Dialing Sequences](#) on page 45
- [Supported Call Scenarios](#) on page 47

To find more information about screens used in installing and configuring an SES Edge 5.x performing core routing, see the administration and maintenance documentation for SIP Enablement Services, available from <http://www.avaya.com/support>

Routing between Main and Branch Locations

In addition to intra-branch and inter-branch routing, Communication Manager Branch R2.0 supports the following routing scenarios involving local branches and the main or headquarters location:

1. Voice calls: Branch-to-Main and Main-to-Branch Voice calls.

Routing of voice calls between users on branches and both SIP and non-SIP users in the main involves branch components, an SES performing core routing, a SIP (Home) Server and a server running Communication Manager 4.0 or later.

2. Avaya Voice Portal (AVP) access: Users on the branch can access a centralized Voice Portal application off an SIP (Home) Server in the main or headquarters location. AVP is supported by the generic adjunct interface of SES 5.x.
3. Centralized Call Center applications: Calls to branches can be re-routed to a centralized Customer Relationship Management (CRM) application in the main location, supported via the server running Communication Manager. One possible example scenario would be a call to the local auto-attendant that gets transferred to a centralized call-center application (that is, to a hunt group extension in Communication Manager).
4. IM and presence: IM and presence tracking between users on the local branches and users in the main location is NOT a tested and supported feature. Intra- and inter-branch IM and presence in a Communication Manager Branch branch network continues to be a supported feature.

Branch/Main and Main/Branch Routing

Note on Media Encryption: - If media encryption is supported and administered via the server running Communication Manager and by phones/endpoints themselves, and is supported in the intra-branch, inter-branch, branch-to-main and main-to-branch routing scenarios, as well.

Example of Branch-to-Main Administration and Dialing Sequences

Routing between branches and the main location, in either direction, is accomplished by administration of both of the servers running Communication Manager and SES. And both schemes require system administrators to coordinate between Avaya Integrated Management for Communication Manager Branch and the SES Master Administration web interface.

Note:

An address map on the SES Edge 5.x performing core routing is similar to a branch prefix, but is not provided by Integrated Management for Communication Manager Branch. For example, you might assign a “prefix” (in an address map) of 300 for an SIP (Home) Server in the main location, if 100 and 200 are branch prefixes. System administrators must coordinate digit-map (branch prefix) and address map (main location) assignments between Integrated Management for Communication Manager Branch and the SES Master Administration web interface so that they are unique system-wide. This cannot be enforced by Integrated Management for Communication Manager Branch or the SES Edge 5.x server.

Sample configuration and branch-to-main routing to illustrate

Let's use the following construct to illustrate.

On the Branches:

1. Branch 1: Prefix 100; Users 101-105; AAR access code = 8
2. Branch 2: Prefix 200; Users 201-205; AAR access code = 8

In the main location (only the “branch-to-main location” specific details are provided here):

1. Main - Home-1 (prefix = 300)
 - a. On the Media Server map administration screen: If <prefix digits> match, SIP (Home) Server routes the request to Communication Manager
 - b. SIP users on Home-1: 1001 - 1005
2. Main - CM-1:
 - a. non-SIP users: 4001 - 4005.
 - b. AAR administration with AAR FAC=8; and trunk group and signaling group administration (similar to how it is done for Communication Manager and SIP (Home) Server(s).
 - c. NOTE: You will need two SIP trunks between the server running Communication Manager and each SIP (Home) Server:
 - One (TG-X) for local calls between users in the main or headquarters location:

Branch/Main and Main/Branch Routing

- For incoming calls to the server running Communication Manager, on the incoming-call-handling form, if length of digit string is <prefix + extension>, delete “prefix” digits.
 - Another, (TG-Y) for routing between branches and the main or headquarters location, with digit treatments as follows:
 - For incoming calls to Communication Manager, on the incoming-call-handling form, if the length of the digit string is <prefix + extension>, delete “prefix” digits.
 - For outgoing calls from Communication Manager to branches, on the “public-unknown-numbering” form, for extensions on trunk group TG-Y, insert its “prefix” (300, in our example).
 - TG-Y must be greater than TG-X such that we always prefer X to route local calls.
3. On the SES Edge 5.x server performing core routing, to handle Branch-to-Main location routing: If the prefix mapping (prefix match **and** Private Number length match) succeeds, route to Home-1.

Example of Branch-to-Main routing

With the Prefix allocation by Branch Central Manager, there is no need for an address map on the SES Edge 5.x performing core routing. (Only the “branch-to-main location” specific details are provided here.)

User 101 on Branch-1 dials 8+300+1001 (routing sequence same for SIP as for non-SIP).

1. The Communication Manager Branch platform strips the AAR access code, and inserts its own branch prefix to the From: Header - that is, 100101 in this example.
2. The INVITE message is received and routed to the SES performing core routing, just as it would be for inter-branch calling.
3. The SES Edge 5.x performing core routing: Since the prefix table from Branch Central Manager contains the prefix data for the SIP (Home) Server(s) in the main or headquarters location, and the Request-URI in the INVITE message coming to the SES Edge 5.x performing core routing contains *prefix*+extension, the prefix match succeeds.
4. On the Home, the same routing sequence happens, and based on the assigned Media Server address map (as per [a](#)), the call gets routed to Communication Manager.
5. On Communication Manager: call received on TG-X, whose ICHT strips the prefix digits.
6. Extension-based termination processing is performed via the current method, between Communication Manager and SES.

Example of Main-to-Branch routing

User 4001 on CM dials 8+200+201 (could be SIP or non-SIP on any of the Branches).

1. Communication Manager does AAR-based routing (because of the AAR access code having been dialed).
2. On the public/unknown numbering form, TG-Y's outgoing call treatment (inserting its own prefix to the originating extension) results in prefix being added to the From: header (that is, 3004001 in our example).
3. Home-1, since it is not authoritative for the dialed string (that is, it is not a local user), routes - Device Manager to the SES Edge 5.x performing core routing.
4. The SES Edge 5.x performing core routing does prefix mapping, and then routes the call to Branch 1 (same as is also currently done for branch-to-branch calls).
5. Termination processing occurs on the Communication Manager Branch branch, similar to inter-branch calls.

Local calling in the main location

Non-SIP user 4001 dials SIP User 1001. (The user could also dial 8+300+1001. See [Main to main call routing using prefix numbers](#) on page 49. Communication Manager 4.0 in the main location knows that these are local users, and therefore treats it as a local call.)

Since the routing is purely based on Communication Manager extensions, the call routing sequence is not provided in greater detail here.

Supported Call Scenarios

Intra-branch call: Non-SIP to non-SIP endpoint

1. The Communication Manager Branch platform at the branch location routes the (local) call to another station using its own dial plan.

Intra-branch call from SIP to non-SIP endpoint

1. The originating (local) user is found by means of user-contact resolution on the Communication Manager Branch branch platform, and therefore does not have to go to the address-map lookup step.
2. The destination (local) user is specified in the message's Request URI during user-contact resolution, and therefore this does not have to go to the address-map lookup step either.
3. The Communication Manager Branch platform at the branch location routes the call to the proper endpoint using the administered contact information in the user database.

Intra-branch call to a SIP endpoint:

1. The Communication Manager Branch platform at the branch location routes the call to a station using the dial plan.
2. The Communication Manager Branch platform at the branch location routes the call using off-PBX station (or OPS) mapping.
3. The Communication Manager Branch platform at the branch location routes the call to the endpoint using the administered contact in the SES user database.

Inter-branch call to any SIP (or non-SIP) endpoint:

1. The Communication Manager Branch platform at the branch location routes the call using AAR.
2. This is an unknown number to the local branch, so it routes it to the SES Edge 5.x performing core routing.
3. The SES Edge 5.x performing core routing matches on the prefix and maximum length, and sends it to the proper (remote) branch location.
4. The Communication Manager Branch branch platform uses contact resolution, digit-map (prefix) lookup and then does termination processing to deliver the call to the destination user.
5. The Communication Manager Branch branch platform routes the call to a station using its own dial plan.
6. The Communication Manager Branch branch platform routes the call using off-PBX station (or OPS) mapping.
7. The Communication Manager Branch branch platform routes the call to the proper endpoint using the administered user contact information in the database.

Branch to main location call routing:

1. The Communication Manager Branch platform at the branch location routes the call using AAR.
2. This is an unknown number to the Communication Manager Branch platform at this branch location, so it routes the call to the SES Edge 5.x performing core routing.
3. The SES Edge 5.x performing core routing matches on the prefix and length, and sends it to the proper SIP (Home) Server, typically in the main or headquarters location.
4. The SIP (Home) Server uses an administered address map to send it to a server running Communication Manager in the main location.
5. Communication Manager, after matching the prefix and length, strips off the branch prefix according to its ICHT.
6. Communication Manager then routes the call to the station using its own dial plan.

Main to branch location call routing

1. Communication Manager routes to the SIP (Home) Server using AAR or ARS.
2. This is an unknown number to the SIP (Home) Server, so it routes it to the SES Edge 5.x performing core routing.
3. The SES Edge 5.x performing core routing matches on the prefix and maximum length, and sends it to the proper branch location.
4. The Communication Manager Branch platform at the branch location does termination processing and based on a digit map, sends the call on for further processing.
5. After matching on the prefix and length, the branch prefix is stripped off according to its ICHT.
6. The call is routed to a station using the dial plan for this branch location.

Main to main call routing using prefix numbers

1. The CM1 server in the main location routes to the SIP home1 server using AAR or ARS.
2. This is an unknown number to SIP home1, so it sends it to the SES Edge 5.x performing core routing.
3. The SES Edge 5.x performing core routing matches on the prefix and maximum length, and sends it to SIP home2 server.
4. The SIP home2 server uses an address map to send it to the CM2 server in the main location.
5. The CM2 server, after matching the prefix and length, strips off the branch prefix according to its ICHT.
6. The CM2 server then routes the call to a station using the CM2 server's own dial plan.

Main to main using external number via private SIP network

1. The CM1 server routes to the SIP home1 server using AAR (or Automatic Route Selection or ARS, in this case).
2. This is an unknown number to the SES home1, so it sends it to the SES Edge 5.x performing core routing.
3. The SES Edge 5.x performing core routing determines that this number is too long to be a *prefix+extension*.
4. The SES Edge 5.x performing core routing sends it to the SIP home2 server based on the administered address map.
5. The SIP home2 server uses another (Media Server) address map to send it to the CM2 server.

Branch/Main and Main/Branch Routing

6. The CM2 server, after matching the external number and its (longer) length, strips off the (longer) external prefix according to its ICHT.
7. The CM2 server then routes the call to a station using the CM2 server's own dial plan.

Main to external number via SIP service provider (with foreign domain)

1. The CM1 server routes the call to the SIP home1 server using AAR or ARS.
2. This is a foreign domain to the SIP home1 server, so it sends it to the SES Edge 5.x performing core routing.
3. This is also a foreign domain to the SES Edge 5.x performing core routing, so it routes the call to the administered outbound proxy for this SIP domain.
4. The administered outbound proxy server of the SIP service provider routes the call from there.

External number to main via SIP service provider (with foreign domain)

1. The SIP service provider routes the call to the SES Edge 5.x performing core routing.
2. The SES Edge 5.x performing core routing determines that this number is too long to be a *prefix+extension*.
3. The SES Edge 5.x performing core routing sends it to the SIP (Home) Server based on the administered address map.
4. The SIP (Home) Server uses its own address map (one for each media server) to send it to a server running Communication Manager in the main location.
5. Communication Manager, after matching the external number and its (longer) length, strips off the (longer) external prefix according to its ICHT.
6. The server running Communication Manager routes the call to a station using its dial plan.

Main to external number via enterprise SIP gateway (with local domain)

1. Communication Manager routes the call to the SIP (Home) Server using AAR or ARS.
2. This is an unknown number to the SIP (Home) Server, so it sends it to the SES Edge 5.x performing core routing.
3. The SES Edge 5.x performing core routing determines that this number is too long to be a *prefix+extension*.
4. The SES Edge 5.x performing core routing sends it to the enterprise SIP gateway based on the administered address map.
5. The enterprise SIP gateway routes the call from there.

External number to main via enterprise SIP gateway (with local domain)

1. The enterprise SIP gateway routes the call to the SES Edge 5.x performing core routing.
2. The SES Edge 5.x performing core routing determines that this number is too long to be a *prefix+extension*.
3. The SES Edge 5.x performing core routing sends it to the SIP (Home) Server based on the administered address map.
4. The SIP (Home) server uses its address map to send it to Communication Manager in the main or headquarters location.
5. The server running Communication Manager in the main location, after matching the external number and its (longer) length, strips off the (longer) external prefix according to its ICHT.
6. The server running Communication Manager in the main location then routes the call to a station using its dial plan.

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