OpenMobility
SIP-DECT 4.0 Solution

Installation & Administration Compendium

AASTRA

Welcome to Aastra

Thank you for choosing this Aastra product. Our product meets the strictest requirements with regard to quality and design.

The following compendium will assist you in installing and configuring your SIP-DECT 4.0 solution and provide answers to all your most important questions.

If you should require further technical support or information about other Aastra products, please contact the person responsible for your system or get in touch with your local dealer.

You can also find information about this device and other products on our website at **http://www.aastra.de** or **http://www.aastra.com**.

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Aastra SIP-DECT 4.0 Solution

The Aastra SIP-DECT 4.0 solution provides a professional DECT system that extends an existing SIP communications system (PABX), thus operating DECT handsets as SIP clients. The SIP-DECT 4.0 solution includes up to 2,048 DECT base stations (RFP, "Radio Fixed Parts") that form a DECT radio system. The RFPs and the SIP communications system are interconnected via an Ethernet/IP network that is used to transport the SIP/VoIP data streams as well as management data.

Within the DECT radio system, a single entity exists that controls all RFPs and manages communication streams: the OMM (OpenMobility Manager). For smaller DECT systems (1 – 256 RFPs), the OMM can be hosted on an RFP. A larger DECT system (256 – 2,048 RFPs) requires to host the OMM on a Linux PC server system.

About this Compendium

This compendium focuses on system planers and system administrators who install, configure, and administer the Aastra SIP-DECT 4.0 solution.

The necessary steps to set up the SIP-DECT 4.0 solution differ substantially with the number of RFPs as well as the number of added services. For this reason, this compendium offers separate parts:

- The first part concentrates on the basic steps to set up a small system with an RFP-hosted OMM that uses a SIP PABX located in your LAN.
- The second part illustrates how to set up a large system that also taps the full potential of additional features.
- The third part describes how to configure additional services: Locating and Messaging.
- A further chapter describes how to interact with the OMM by using the OM Application XML Interface.

The respective configuration steps are listed in short. Links to further and detailed information in the step-relevant documentation part (see next section) are quoted in the right column: **Manual, Guide: Chapter**.

▶ **Example**
OM System Manual: Licensing Mode

Related Documentation

The SIP-DECT 4.0 solution is described in a variety of documents:

- SIP-DECT: OM System Manual
  Describes installation, administration, and maintenance of a SIP-DECT system.
  ▶ **Denoted as** *"OM System Manual"*
- SIP-DECT: OM Locating Application
  Describes installing and using the DECT handset locating application.
  ▶ **Denoted as** *"OM Locating Application"*
- SIP-DECT: OM Integrated Messaging & Alerting Application
  Describes messaging features and the integrated messaging solution.
  ▶ **Denoted as** *"OM IMA Application"*
- SIP-DECT: OM Handset Sharing & Provisioning
  Describes the enhanced user and handset management features and the OM handset provisioning concept.
  ▶ **Denoted as** *"OM Handset Provisioning"*
- SIP-DECT: OM User Monitoring
  Describes how to use the OM monitoring capabilities on DECT handsets
  ▶ **Denoted as** *"OM User Monitoring"*
- SIP-DECT: Aastra 600 c/d Messaging & Alerting Applications
  Describes the messaging features specific to the Aastra 600 c/d DECT handsets.
  ▶ **Denoted as** *"Aastra 600 c/d IMA"*
- Aastra 600 c/d series SIP-DECT® User's Guide
  Describes using the Aastra 600 c/d DECT handsets on the SIP-DECT system.

Abbreviations

The following specific abbreviations are used in this compendium:

API	Application Programming Interface
DECT	Digital Enhanced Cordless Telecommunication
GAP	Generic Access Profile
OM AXI	OM Application XML Interface
OM IMA	OM Integrated Messaging & Alerting service
OML	OM Locating application
OMM	OpenMobility Manager
OMP	OM Management Portal
PABX	Private Branch Exchange (i. e. communications system)
PP	Portable Part, handset
RFP	Radio Fixed Part, base station
SIP	Session Initiation Protocol
VoIP	Voice over IP

Trademarks

Scope of Delivery and Licenses

The SIP-DECT 4.0 product delivery varies with your purchase. You typically receive the following components:

- RFPs, software, services, and licenses according to the planned installation size (see Infrastructure starting on page 3)
- DECT handsets Aastra 610d / 620d / 630d (denoted as “Aastra 6x0d”), Aastra 612d / 622d / 632d (“Aastra 6x2d”), Aastra 650c, or Aastra 142d
- SIP-DECT 4.0 installation medium (“CD-ROM”) containing
  - Manuals in PDF format
  - RFP software files (“iprfp3G.dnld”, “iprfp2G.tftp”)
  - Aastra 6x0d, Aastra 6x2d, Aastra 650c firmware file (“aafon6xxd.dnld”)
  - PC OMM installation file (“SIP-DECT_4.0.bin”)
  - OM Configurator (Java tool, “OM_Configurator.jar”)
  - OM Management Portal (OMP Java tool, “OMP.jar”)
  - OM Locating application (TomCat web application archive, “OML.war”)

► *OM System Manual: About the Portable Parts*

About RFP Types

With SIP-DECT version 3.0, a new series of radio fixed parts is introduced: RFP (L)35 IP, RFP (L)36 IP, RFP (L)37 IP, and RFP (L)43 WLAN. The following table summarizes the major differences to the older RFP devices RFP (L)32 IP, RFP (L)34 IP, and RFP (L)42 WLAN.

► *OM System Manual: About the Radio Fixed Parts*

Current and Older RFP feature comparison

Feature	Current RFPs	Older RFPs
Available Model Numbers	35 / 36 / 37 / 43	32 / 34 / 42
Runs SIP-DECT 4.0 OMM	Yes	No
Stores Software on Flash	Yes	No
Hi-Q Audio (CAT-iq)	Yes	No
USB 2.0 Interface	Yes	No
Max. Ethernet Speed	1 GBit	100 MBit
Requested DHCP Vendor Class	OpenMobility3G	OpenMobility

While mixed operation of both current and older RFPs is supported, the SIP-DECT 4.0 OMM only runs on a current RFP or on a Linux PC server system.

Also, the Bluetooth locating feature as well as monitoring with USB video devices is only supported with current RFPs.

Infrastructure

SIP-DECT is sold in small, medium and large installations. In order to properly address these, it is split into different categories:

► *OM System Manual: Licensing Model*

Small un-activated – up to 2 standard RFPs

1. Any mixture of RFP 35 IP, RFP 36 IP, RFP 37 IP, RFP 43 WLAN
2. Telephony only; no licences required
3. Free software upgrade

Small un-activated – up to 2 L-RFPs

1. Any mixture of RFP L35 IP, RFP L36 IP, RFP L37 IP, RFP L43 WLAN
2. Advanced features built-in, no licences required
3. Free software upgrade

Note

The PARK code from a OM System CD is required to operate (unactivated) small systems.

Small activated – up to 20 L-RFPs

1. Any mixture of RFP L35 IP, RFP L36 IP, RFP L37 IP, RFP L43 WLAN
2. Advanced features built-in
3. Requires an activation

Medium – up to 256 RFPs

1. Any mixture of RFP (L)35 IP, RFP (L)36 IP, RFP (L)37 IP, RFP (L)43 WLAN
2. Licences required for
   - Installation (number of RFPs)
   - Messaging and alerting services
   - Locating service
   - Software upgrade

Large – up to 2,048 RFPs

1. Any mixture of RFP (L)35 IP, RFP (L)36 IP, RFP (L)37 IP, RFP (L)43 WLAN
2. OpenMobility Manager (core software) resides on one or two Linux-based PCs
3. Licences required for
   - Installation (number of RFPs)
   - Messaging and alerting services
   - Locating service
   - Software upgrade

Additionally the OMM can operate in a demonstration mode. Note that G.729 is not available if the OMM operates in a demonstration mode.

About G.729 Licenses

Starting with SIP-DECT® release 3.0, the G.729 codec is a licensed feature. If G.729 shall be used, an appropriate license is required. This applies to all types of SIP-DECT 4.0 installations independent from the RFP type.

Note

The number of G.729 licenses is part of the activation or license file. You can view the current number of G.729 licenses on the **Licenses** page of the OM Web service or on the **License** page of the OMP Java tool after uploading the activation or license file.

The G.729 license contains the number of G.729 channels licensed. A SIP-DECT 4.0 installation does not maintain more G.729 channels than licensed. As soon the number of licensed G.729 connections has been reached, the OMM does not offer this codec in further SIP codec negotiations. In addition, syslog and health state warnings occur.

About G.729 Licenses for un-activated small systems
For the un-activated license categories “Small - up to 2 standard RFPs” and “Small - up to 2 L-RFPs” as well as for the demonstration mode, the number of G.729 licenses is zero, thus G.729 cannot be used.

If you need to use G.729 on a small system, you can do this by either

- by activating up to 2 L-RFPs, this will make ten G.729 licenses available, or
- by licensing up to two standard RFPs ("OM G.729 Mini License" needs to be applied), this will make 4 G.729 licenses available.

Note

In both cases your system will be bound to the current release and normal update mechanisms (update license, re-activation will apply). For this reason, you loose the free software upgrade possible with un-activated small systems.

Small SIP-DECT System

This chapter describes how to set up a SIP-DECT 4.0 system with a smaller number of RFPs (1 – 256). This includes configuring an RFP-based OMM, a static IP configuration using the OM Configurator Java tool, and setting up basic DECT telephony service.

Prerequisites
You need the RFP devices as well as a number of DECT handsets – preferably Aastra 6x0d, Aastra 6x2d or Aastra 650c. For more than two L-RFPs, you should have obtained an activation file from the Aastra license server. For more than 20 RFPs, you should have obtained a license file from the Aastra license server.

► *OM System Manual: Licensing Model*

- If you plan to operate only current RFPs (see About RFP Types starting on page 3), you optionally need a HTTP, FTP, or TFTP server in your LAN to deploy updates of the RFP software ("iprfp3G.dnld") and the DECT handset firmware ("aafon6xxd.dnld").
- If you plan to operate current RFPs and older RFPs concurrently, a TFTP server in your LAN is required to host the older RFP's software files ("iprfp2G.tftp").

The HTTP, FTP, or TFTP server is not part of the SIP-DECT 4.0 solution, hence you need to set up your own.

You also need a PC with a web browser to open the OMM web console. The Sun/Oracle Java runtime environment should be installed on the PC in order to run the Java-based **OpenMobility Configurator** tool. Visit the Java website on the Internet (http://www.java.com/) for downloading and installation instructions.

Your company LAN should allow connections from the mounted RFPs to your SIP PABX and to your PC.

Note

This chapter explains how to configure RFPs using static addresses for a quick start. However, you may consider using DHCP to dynamically configure addresses as it is explained in the next chapter (see Large SIP-DECT System starting on page 10).

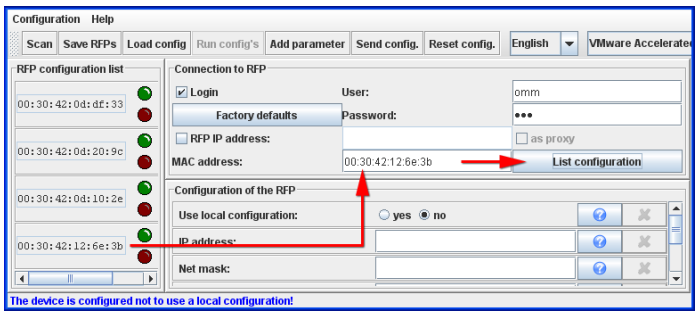
Configure RFPs using the OM Configurator

The SIP-DECT 4.0 installation medium includes the "OM_Configurator.jar" Java tool. To run this tool, you need a PC with the Sun/Oracle Java runtime environment installed. You configure the RFPs with the following basic steps.

► *OM System Manual: Static Local Configuration of an RFP*

1. Connect the RFPs to power and LAN. Note, that you can only operate the OMM on a current RFP (see About RFP Types starting on page 3). On your PC, double click the "OM_Configurator.jar" file to start the **OpenMobility Configurator** Java tool.
2. Click the **Scan** button to find connected RFPs. Select one of the entries in the **RFP configuration list**. Activate the **Login** option and enter **User** and **Password** ("omm" / "omm" by factory default).

   The **Scan** function only works for RFPs in the same Ethernet segment. Alternatively, enter the MAC address that is printed on the RFP's backside label. Note, that older RFPs in factory default configuration do respond to the scan.
3. Click the **List configuration** button. You should see a blue status message at the bottom of the **OpenMobility Configurator** window.



4. Change the configuration to match your LAN configuration. Change the **Use local configuration** option to "yes" and configure **IP address**, **Net mask**, **TFTP server address**, and **TFTP file name**.

   – For a current RFP and when you want to use a HTTP, HTTPS, FTP, or FTPS server for software updates, you do not need the optional TFTP server settings. Enter "0.0.0.0" in the **TFTP server address** and "none" in the **TFTP file name** input fields to disable this function.

   – For a current RFP and when you want to deploy software updates via TFTP, enter the **TFTP server address** and change the **TFTP file name** to "iprfp3G.dnld". Also upload the RFP software file ("iprfp3G.dnld") and the DECT handset firmware file ("aafon6xxd.dnld") to the TFTP server.

   – For an older RFP, you are required to configure these settings to match your TFTP server. Enter the **TFTP server address** and change the **TFTP file name** to "iprfp2G.tftp". Also upload the RFP software file ("iprfp2G.tftp") to the TFTP server.

5. One of the RFPs needs to operate as OMM ("Open Mobility Manager"). Enter the IP address of the RFP you selected as OMM in the **OMM IP address** setting. Note, that you can only use a current RFP for this. When configuring the RFP that operates as primary OMM, the **IP address** and **OMM IP address** settings should match.

6. Optional: if you operate two or more RFPs, configure a second RFP as standby OMM. Click the **Add parameter** button, select the **2nd OMM IP address** entry, then click the **Add** button. Configure the **2nd OMM IP address** input field.

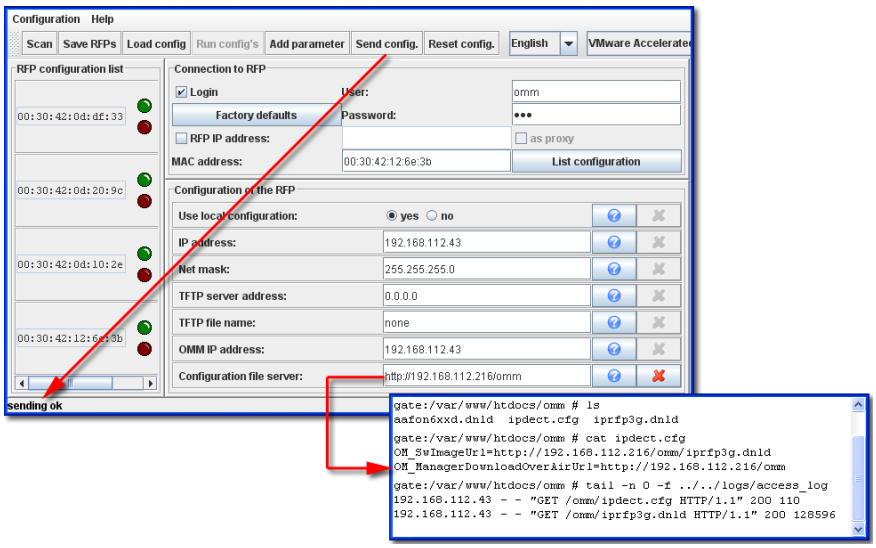
   ► *OM System Manual: OMM Standby*

7. Optional: if you want to deploy software updates via HTTP, HTTPS, FTP, or FTPS, add a configuration file server option for the RFPs that should operate as OMM. Click the **Add parameter** button, select the **Configuration file server** entry, then click the **Add** button. Configure the **Configuration file server** input field, e.g. "http://192.168.1.1/omm". Also upload the RFP software file ("iprfp3G.dnld"), the DECT handset firmware file ("aafon6xxd.dnld"), and a configuration file ("ipdect.cfg") to the file server. You can create the "ipdect.cfg" in a text editor, e.g. the following two lines will work in the above context:

   OM_SwImageUrl=http://192.168.1.1/omm/iprfp3G.dnld
   OM_ManagerDownloadOverAirUrl=http://192.168.1.1/omm

   Verify the file server, e.g. by browsing to "http://192.168.1.1/omm/ipdect.cfg".

   The following screenshot illustrates an example that uses a HTTP server to configure updates for a single RFP L43 WLAN that is also used as OMM. After sending the configuration, the RFP operation was verified on the command line of the HTTP server.



8. Optional: if you want the RFP to access IP addresses in other LANs or on the Internet, you need to add a router option (also called: default router or standard gateway). Click the **Add parameter** button, select the **Route addresses** entry, then click the **Add** button. Click the plus button below the list and enter the router IP address in the **Add list element** dialogue.
9. Click the **Send config.** button. You should see a black **sending ok** message at the bottom of the **OpenMobility Configurator** window.
10. Repeat the above steps to configure all RFPs. Alternatively, you can prepare a text file that includes the configuration settings to automate the configuration for a larger number of RFPs. Use the **Configuration**: **Safe RFPs** menu command to create a template. Change the resulting text file – refer to the OM System Manual for details. After this, use the **Configuration**: **Safe RFPs** and **Configuration**: **Run Config's** menu commands to send the configuration to the RFPs.

After clicking the **Send config.** button, the respective RFP restarts. During startup, a current RFP loads the "iprfp3G.dnld" software file from your file server and updates the software stored in the internal flash if a software change is detected. An older RFP loads the "iprfp2G.tftp" software file from your TFTP server. Watch the LEDs to verify the startup procedure.

► *OM System Manual: RFP LED Status*

Tip: You may verify the TFTP function, e.g. by entering "tftp -i 192.168.1.1 get iprfp3G.dnld" or "tftp -i 192.168.1.1 get iprfp2G.tftp" on the Windows command line.

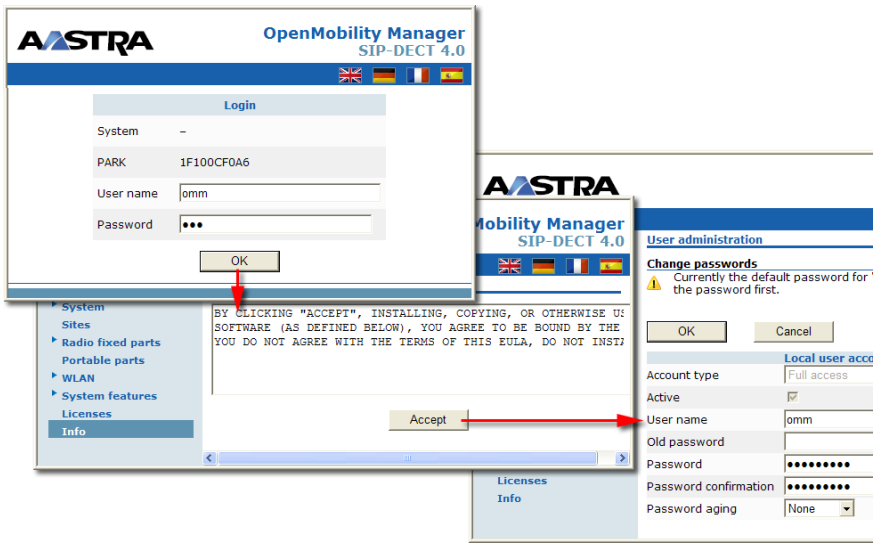
Please note: If the RFP was operated within another SIP-DECT 4.0 system previously, the user/password combination for the OM Configurator is changed accordingly. If you do not know the login data, you need to contact the Aastra support for an unlock token to regain access.

Set up RFPs and Basic Telephony

The RFP that operates as OMM offers two configuration methods: the OMM Web service that you can access with a web browser and the OMP Java tool. Use the OMM Web service for initial setup that includes the following basic steps.

▶ *OM System Manual: Initial Setup*

1. Start a browser and navigate to the IP address of the OMM. Log in using the “omm / omm” default credentials. Accept the displayed license text. Change the password for the “Full access” and the “Root/SSH” accounts.



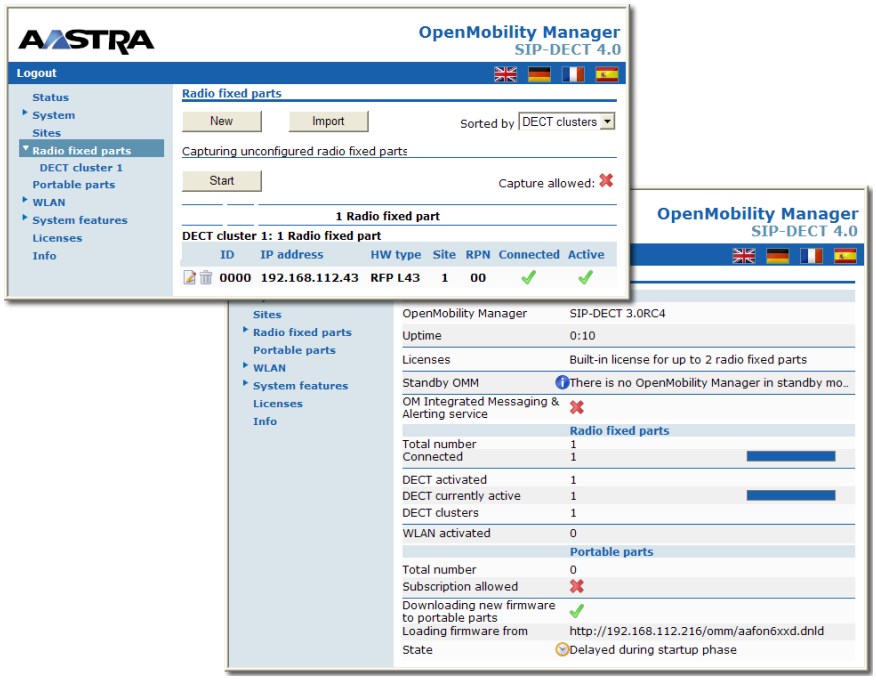
2. Navigate to the **System**: **System settings** page. Change the **DECT**: **Regulatory domain** setting.
3. For the built-in license, configure the **PARK** code printed on the installation medium on the **System**: **System settings** page. If you have received a license file, import the file on the **Licenses** page.

▶ *OM System Manual: Licensing*

4. Navigate to the **Radio fixed parts** page. Click the **Scan** button. Click the **Stop** button to view the list that should include the RFP running the OMM. Click on the **Configure** icon and activate the **DECT settings** option. Accept the default DECT cluster (“1”) by clicking **OK**. Repeat this step to configure all RFPs.

   The following screenshot depicts the **Status** and **Radio fixed parts** pages for a single RFP L43 WLAN with a built-in license that is also used as OMM.

▶ *OM System Manual: “Radio fixed parts” Menu*



5. Navigate to the **System**: **SIP** page. Change the **Proxy server** and **Registrar server** settings to match your PABX.

6. On the **Portable parts** page, create new portable parts with **Name**, **Number**, **DECT authentication code**, and **SIP authentication** settings.

   Click on the **Start** button under **Wildcard subscription**. Start the subscription procedure on the DECT handset using the configured authentication code.

▶ *OM System Manual: "SIP" Menu; "Portable parts" Menu*

Tip: Even with a smaller SIP-DECT 4.0 system, you can use more features, such as DECT XQ, Hi-Q audio (CAT-iq), or SNMP. You may read on with the next chapter "Large SIP-DECT System" or read the OM System Manual.

▶ *OM System Manual: Enhanced Feature Overview*

Large SIP-DECT System

This chapter describes how to set up a SIP-DECT 4.0 system with a very large number of RFPs (up to 2,048). This includes configuration of up to two OMMs running on a Linux PC server system, dynamic IP configuration of RFPs via DHCP, and a multi DECT cluster system deployed to several separate buildings.

Prerequisites
You need two Linux PC server systems, a larger number of RFP devices as well as a number of DECT handsets – preferably Aastra 6x0d, Aastra 6x2d or Aastra 650c. You should have obtained a license file from the Aastra license server.

Your company LAN should allow connections from the mounted RFPs to your SIP PABX, preferably a switched network with a separate VLAN for SIP/VoIP.

► *OM System Manual: 802.1Q Support*

Install OMM on a Linux PC server system

Install the OMM software on up to two dedicated i386 32-bit PC server systems running Red Hat Enterprise Linux 6. While it is possible to operate the OMM software on various PC systems, only the recommended hardware/software configuration is tested by Aastra and may only receive full support for this reason.

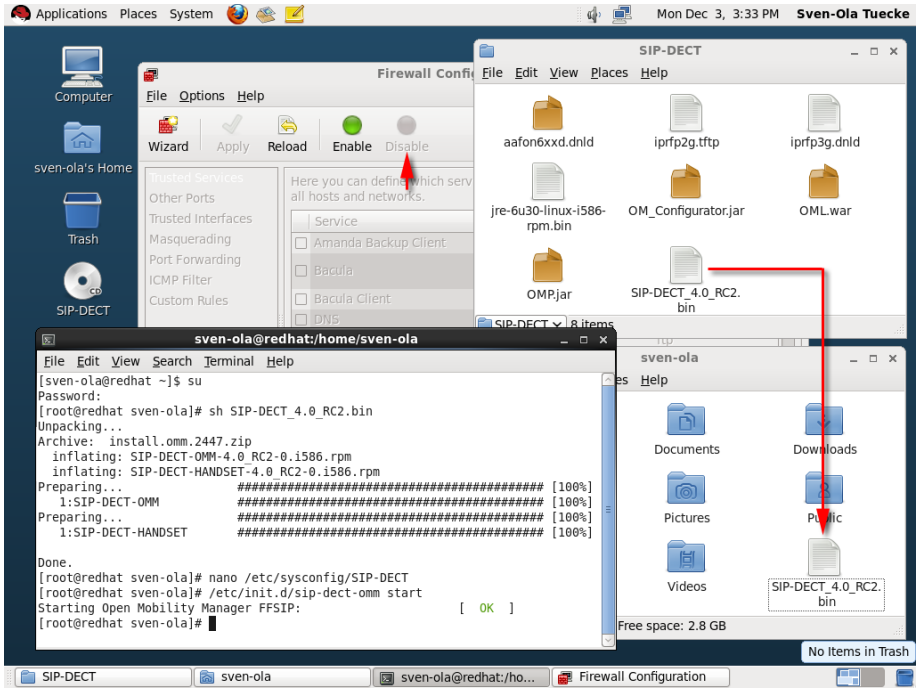
► *OM System Manual: Installing OMM in Host Mode*

Tip: A brief explanation on how to set up "Red Hat Enterprise Linux Server 6" can also be found in the "OM Locating Application" guide in the "Installing Red Hat Enterprise Linux Server 6" chapter. Do not install additional web server software to prevent blocking port 80 and port 443 that are required by the OMM software.

Please note: Choosing the right hardware, setting up and managing multiple Linux server systems, and integrating Linux servers in your company LAN/VLAN environment is beyond the scope of this compendium. You should at least read the "Red Hat Enterprise Linux 6 – Installation Guide" that is available on the Internet under http://docs.redhat.com/does/ URL.

One Linux server runs the primary OMM while a second Linux server takes over the OMM function in case of failure. On the main and optionally the backup Linux server, install the OMM software with the following basic steps.

► *OM System Manual: OMM Standby*



1. Open the **System** menu and select the **Administration**: **Firewall** command. Disable the firewall function.
2. Copy the necessary "SIP-DECT_4.0.bin" file to the Linux server, either via the SIP-DECT 4.0 product installation medium or via download.
3. Open the **Applications** menu and select the **System Tools**: **Terminal** command. Enter the "su" command to elevate your system access rights.
4. Enter "sh SIP-DECT_4.0.bin" to extract the installation files and to start the installation automatically.

▶ *OM System Manual: Installing the OMM Software*

5. Enter "nano /etc/sysconfig/SIP-DECT" to adapt the OMM configuration file. Remove the hash character and change the "OMM_RESILIENCY=" setting to the IP addresses of the primary and secondary OMM instances. If the OMM should bind to a specific Ethernet interface, remove the hash character and change the "OMM_IF=" setting accordingly. Leave the editor with the [Ctrl-X] keyboard combination and save your changes. Start the OMM with "/etc/init.d/sip-dect-omm start" or reboot the PC.

▶ *OM System Manual: Configuring the Start Parameters*

6. Start a browser and navigate to the IP address of the server that runs the OMM. Log in using the "omm / omm" default credentials. Accept the displayed license text. Change the password for the "Full access" and the "Root/SSH" accounts. Import the license file. Navigate to the **System**: **System settings** page. Change the **DECT**: **Regulatory domain** setting.

▶ *OM System Manual: Initial Setup*

Set up RFPs

For a larger number of RFPs, a DHCP service that automatically configures RFPs is important. The DHCP service sends the IP configuration, where to download the software files ("iprfp3G.dnld" and "iprfp2G.tftp") via TFTP and the IP addresses of the OMMs to the starting RFPs.

▶ *OM System Manual: DHCP Client*

The TFTP and DHCP services are not part of the SIP-DECT 4.0 solution, hence you need to set up your own.

Tip: The "OM System Manual" provides an example in the "Setting up DHCP / TFTP" chapter.

Your DHCP server configuration should include at least:

- a static MAC/IP address mapping for the RFPs / PC system running the OMM;
- an IP address range large enough to assign a separate IP address to all RFPs;
- a rule to separate DHCP queries by vendor ID "OpenMobility3G" for current RFPs (see About RFP Types starting on page 3);
- a rule to separate DHCP queries by vendor ID "OpenMobility" for older RFPs;
- DHCP answers containing IP, net mask, gateway, TFTP server IP, and boot file name;
- option 224 with "OpenMobility" or "OpenMobilitySIP-DECT" in DHCP answers;
- option 43 with vendor option 10 (OMM IP) and – if using a backup server – vendor option 19 (2nd OMM IP).

After setting up the DHCP and TFTP service, connect at least all RFPs referenced in the license file to power and LAN. Navigate to the **Radio Fixed Parts** page of the OMM Web service. Verify the RFPs **Connected** status.

▶ *OM System Manual: Creating and Changing RFPs*

Tip: For a first test, click on the configuration icon of a connected RFP. Activate the **DECT settings** option. Accept the default **DECT cluster** number "1". Confirm with **OK** to activate the RFP. Watch the RFP's LEDs for a status indication.

▶ *OM System Manual: RFP LED Status*

The DECT cluster number groups RFPs that can be synchronized over the air. With synchronization, seamless handover of DECT handsets is possible. Use a different

▶ *OM System Manual: RFP Synchronization*

DECT cluster number for RFPs that are deployed e.g. to a different building where the distance prevents overlapping radio coverage. Also configure one RFP per DECT cluster as the **Preferred synchronization source**, preferably an RFP that is located in the middle of the radio domain.

For a larger RFP deployment, you should prepare a list of RFPs, their names together with their MAC addresses. Also, a map or building plan that indicates the RFP mounting positions may be helpful. The list of RFPs in CSV format can be imported via OMP or on the **Radio Fixed Parts** page of the OMM Web service. Exporting this list is only supported in the OMP Java tool.

► *OM System Manual: RFP Export File Format*

You can use a de-centralized configuration method that utilizes configuration files directly queried by the RFPs during startup. You can use this method e.g. with script generated configuration files.

► *OM System Manual: RFP Configuration Files*

For a large SIP-DECT 4.0 system, consider to define paging areas to keep the signalling traffic separated in the different areas.

► *OM System Manual: "Paging areas" Menu*

Enable Hi-Q audio (CAT-iq)

The current RFPs support Hi-Q audio (via wideband speech according to CAT-iq) for use with Aastra 650c DECT handsets. To manage this feature, RFPs can be assigned to different sites. You can enable or disable the **Hi-Q Audio Technology** switch per site. When assigning RFPs to sites, please consider the following rules:

- Only current RFPs should be assigned to a Hi-Q-enabled site.
- You should assign all RFPs with the same cluster number to the same site.
- You also can assign RFPs with different cluster numbers to the same site, but you should refrain from assigning different sites to RFPs of the same cluster.

Basically, this means that a handover between a Hi-Q-enabled (current) RFP and an (older) Hi-Q-disabled RFP is not possible. If you operate one older RFP in a cluster, you should therefore assign all RFPs of that cluster to a site with the Hi-Q feature disabled.

To configure the Hi-Q feature, you need to add a site configuration with the following steps:

1. Navigate to **Sites** page of the OMM Web service or OMP Java tool.
2. If you plan to use Hi-Q audio throughout all RFPs, change the "default" site entry and enable the **Hi-Q Audio Technology** option. You may also change the name of the site entry, e.g. to "Hi-Q enabled site".

   If you plan to use a mixed configuration of older and current RFPs, add at least one site entry, e.g. a site entry named "Hi-Q disabled site". Disable the **Hi-Q Audio Technology** option for this site entry.
3. Navigate to the **Radio fixed parts** page. Change the **Site** assignment for all RFPs with the same cluster number either to "Hi-Q enabled site" or to "Hi-Q disabled site".

Note

You cannot combine a Hi-Q audio with DECT XQ audio within the same connection. Depending on the Aastra 650c operation mode, either Hi-Q audio or DECT XP audio is used (refer to the OM System Manual for details). Also note, that Hi-Q audio doubles the required DECT air capacity, thus only 4 Hi-Q audio connections per RFP are possible. For connections to external SIP devices, the G.722 (wideband) audio codec is supported for Hi-Q audio.

Set up WLAN

Your SIP-DECT 4.0 system may include a number of current RFP (L)43 WLAN devices or older RFP (L)42 WLAN devices that offer also WLAN connectivity. To set up the WLAN function proceed as follows:

► *OM System Manual: Creating and Changing WLAN Profiles*

1. Navigate to the **System**: **System settings** page of the OMM Web service. Under **WLAN settings** configure the **Regulatory domain**.
2. On the **WLAN** page, create at least one **WLAN profile**.
3. On the **Radio fixed parts** page, assign the WLAN profile to the desired RFPs.

Note

The RFP (L)43 WLAN offers additional WLAN capabilities, such as 802.11abg (5 Ghz and 2.4 Ghz radio channels) and 802.11n (MiMo operation) that are not available with the older RFP (L)42 WLAN. Either use different WLAN profiles for different RFP models or use a WLAN profile with WLAN features available with both RFP models.

Subscribe DECT Handsets

To use the DECT telephony service, you need to subscribe a number of DECT handsets to the SIP-DECT 4.0 system. Also, a number of user accounts needs to be created in order to login to the SIP accounts provided by the PABX system. Note, that you need to set the IP of the PABX system on the **System**: **SIP** page of the OMM Web service (**Proxy server** and **Registrar server** settings).

► *OM System Manual: Creating and Changing PPs*

Different subscription methods exist as well as two different models to link DECT handset subscriptions to SIP user accounts:

- Static subscription with wildcards: On the **Portable parts** page of the OMM Web service, create a new portable part with **Name**, **Number**, **DECT authentication code**, and **SIP authentication** settings.

  Click on the **Start** button under **Wildcard subscription**. Start the subscription procedure on the DECT handset using the authentication code within 2 minutes. This will create a static subscription, i. e. a DECT handset that is statically linked to number and SIP account.

► *OM System Manual: Subscribing PPs*

- Static subscription with IPEI: when creating the portable parts entry, also enter the IPEI number of the DECT handset.

  Click on the **Start** button under **Subscription with configured IPEIs**. Start the subscription procedure on the DECT handset using the authentication code within 24 hours. This will also create a static subscription.

- Dynamic subscription: Start the OMP Java tool and navigate to the **Portable parts**: **Users** page. Create a new user entry with **Name**, **Number**, and **SIP** settings. Navigate to the **System**: **System settings** page. Enable the **Auto-create on subscription** option and enter a **DECT authentication code**.

  On the **Portable parts**: **Overview** page, enable the **Subscription** mode. Start the subscription procedure on the DECT handset using the authentication code. This will create a new DECT device entry, i. e. a DECT handset that can be dynamically linked to number and SIP account by means of a login/logout procedure.

► *OM Handset Provisioning*

- Dynamic subscription with External User Data Provisioning: while you need to manually subscribe the DECT handsets, the process of creating new user accounts can be automated by integrating external user data.

► *OM Handset Provisioning: External User Data Provisioning*

You can also enrol DECT handsets semi-automatically by importing a configuration file via the OMM Web service or the OMP Java tool.

► *OM System Manual: Importing PP Configuration Files*

The firmware for the Aastra 6x0d, Aastra 6x2d and Aastra 650c DECT handsets can be deployed automatically and over the air. On the **System**: **System settings** page of the OMM Web service, enable the **Downloading new firmware to portable parts** option for this.

► *OM System Manual: Download Over Air*

Note

With an RFP-based OMM, you need to configure a download URL for the Aastra 600 c/d firmware file ("aafon6xxd.dnld"). With an OMM running on a Linux PC server system, this firmware file is installed by the installation file on the PC's file system.

Tip: With a large SIP-DECT 4.0 system, you will typically use more features, such as DECT XQ, Hi-Q audio (CAT-iq), SNMP, the OM IMA Application, or the OM Locating Application. Also, the monitoring capabilities of the OMP Java tool help you to manage the radio network, e.g. the **Sync. view** or **Statistics** functions available below the **Monitoring**: **Radio fixed parts** menu.

► *OM System Manual: Enhanced Feature Overview; OM Management Portal (OMP)*

OM IMA Application

This chapter describes how to configure the **OpenMobility Integrated Messaging & Alerting Application** service (in short "OM IMA" service). The OM IMA service supports the delivery of messages to or from DECT portable parts.

► *OM IMA Application: Integrated Messaging & Alerting Application*

This includes:

- delivery of text messages to or from DECT handsets;
- delivery of special messages for vcards, jobs, and paging;
- handling of message confirmations;
- automatic generation of messages;
- alarm scenarios that define reactions on alarm triggers;
- escalating unanswered / unconfirmed alarm scenarios.

► *OM IMA Application: OM IMA Service Features*

With these features, the OM IMA service forms a professional and comprehensive DECT messaging solution. The OM IMA service also provides an networked API ("Application Programming Interface") that can be used to control messaging functions from an external messaging server. For example, the OM Locating application utilizes the API to send or receive messages.

Prerequisites

To activate the OM IMA service, you need the appropriate licenses. The application can also be started with the automatically applied demo license, which is valid for 72 hours.

► *OM IMA Application: Notes on Licences*

To configure the OM IMA service, you need a TFTP, FTP(S), or HTTP(S) server that provides a configuration file that is downloaded by the OMM. This server is not part of the SIP-DECT 4.0 solution.

Activate the OM IMA Service

Activate the OM IMA service with the following steps:

► *OM IMA Application: Activating the OM IMA Service*

1. Start a web browser and navigate to the OMM address.
2. Log in (**User name** and **Password** are "omm" / "omm" by factory default) and browse to the **System**: **System settings** page.
3. Below the **OM Integrated Messaging & Alerting service** heading, activate the **Active** option.
4. Activating the OM IMA service without any configuration file is sufficient for basic text messages and for the OM Locating application. To configure extended functions, you need to provide a configuration file. Enter the URL of the configuration file in the **URL** input field.

► *OM IMA Application: Configuration File Reference*

Further Information

Most features of the OM IMA service require that you create and deploy an XML-based configuration file. For some features, you need additional services in your LAN such as a POP3 e-mail server to provide an e-mail account that can be polled in order to send messages to DECT handsets.

To debug your custom configuration, and to start or stop the OM IMA service the OMM provides a console application.

► *OM IMA Application: OMM Console Login*

Tip: The messaging API accepts XML ("OM AXI") that is transported via TCP on two ports: either encrypted or unencrypted (see OM AXI Specification starting on page 18). If required, contact Aastra A2P2 support for the XML specification.

OM Locating Application

This chapter describes how to install and configure the Web-based **OpenMobility Locating** application (in short: "OM Locating application"). The OM Locating application is designed to manage customer designed events, SOS / ManDown calls, to locate the handset which triggered such a call, and to track the handset user's movements. The application is equipped with messaging and alerting functions. These functions utilize the "OM Integrated Messaging & Alerting (OM IMA)" service, see also OM IMA Application on page 15.

► *OM Locating Application: OpenMobility Locating Application*

Prerequisites

To use the OM Locating application, you need the appropriate licenses. The application can also be started with the automatically applied demo license, which is valid for 72 hours.

► *OM Locating Application: Notes on Licences*

To operate the OM Locating application, you need the following components:

- OM Locating server to record all locating information provided by the OpenMobility Manager (OMM) and present them to the OM Locating clients.
- OM Locating clients (up to 10) provided with a Web browser to manage the locating information.
- For the Bluetooth locating feature, you need a number of Linux compatible USB Bluetooth beacons ("dongles"). If you want to monitor with USB video devices, a number of Video4Linux-compatible USB web cams are required. If you want to attach more than one USB device per RFP, you also need standard USB hubs.

► *OM Locating Application: Technical Data; Configuring the Workstation Computers*

Additionally, you should configure the OMM settings for messaging, locating and event handling to ensure that the OM Locating application features work.

► *OM Locating Application: OMM Configuration Prerequisites*

Install the OM Locating Application

To install and run the OM Locating application on the OM Locating server, you need to setup a Sun/Oracle Java 1.6 runtime environment and the Apache Tomcat 6 server on a PC running "Red Hat Enterprise Linux Server 6".

1. Install the "Red Hat Enterprise Linux Server 6" operating system on the dedicated OM Locating server. During installation of the operating system, you can also install the required "tomcat6" packages.

► *OM Locating Application: Installing Red Hat Enterprise Linux Server 6*

2. Install the Sun/Oracle Java Runtime Environment. You can download it from the Web address "http://java.com". Ensure to download the Linux version (RPM) of the "Java SE Runtime Environment (JRE)" either for 32 bit or 64 bit CPUs. If you have not installed the Tomcat software within installation of the Red Hat operating system, you can make it up now.

► *OM Locating Application: Installing the OM Locating Application*

3. Install the OM Locating application's servlet. Copy the "OML.war" file from the OM Locating installation media to the "webapps" folder below the Apache Tomcat working directory.

Add Site / Location Pictures

The OM Locating application's user interface provides graphic views of the RFPs where a portable part is located. You can save pictures of the RFP installation sites to the "webapps/OML/images/locations/" directory of the Tomcat server running the OM Locating application. These pictures can e.g. base on the plant layout.

► *OM Locating Application: Adding Site / Location Pictures*

Start the OM Locating Application

1. On an OM Locating client call up a web browser and enter the OML address:

   http://localhost:8080/OML/
   (when the browser runs on the PC which also runs the OML), or

   http://192.168.1.1:8080/OML resp. **http://dns-name-of-pc:8080/OML**
   (when browser and OML run on different PCs in the LAN).

2. Enter the OML **User name** and **Password**. Initial login data is: **admin** (default user) and **OpenMob** (default password).

Note
Cookies must be enabled in the web browser for a successful login.

Configure the OMM Connection

1. Switch to the **Administration**: **OMM Configuration** menu (after initial login this menu is displayed automatically).

2. Enter the **User name** and the **Password** for the OMM "Full access" account type ("omm" / "omm" by factory default). In the **Address** field, enter the OMM IP address or OMM DNS name.

► *OM Locating Application: Configuring the OMM Connection*

► *OM System Manual: Account Types*

Configure the OML Users

1. Switch to the **Administration**: **Users** menu.
2. Create the OML accounts for new users or edit/change existing accounts.

► *OM Locating Application: Managing Users*

Note
Two different user groups can be assigned to the OML users: **users** for operators, **administrators** for users who are allowed to administer the OML configuration and the OML users (operators).

Configure the Users' Portable Parts

1. Start the OMP. To do so, browse the OpenMobility installation media for a file named "OMP.jar". Right click the file and select the **Open with Sun Java 6 Runtime** menu item from the context menu.
2. Enter the **User name** and the **Password** for the OMM "Full access" account type. In the **Address** field, enter the OMM IP address or OMM DNS name.
3. Call up the **Portable Parts**: **Overview** page to enable the OM Locating features for the appropriate portable parts.
4. Select the desired portable part in the **Overview** table. In the portable part's details view switch to the **Locating** tab. Enable the **Tracking**, **Locatable**, and **Locating permission** options (locating properties).
5. Repeat the previous step for all portable parts that should be monitored with the OM Locating application.

► *OM Locating Application: Configuring the Portable Parts*

Notes

- Aastra provides Aastra 6x0d, Aastra 6x2d or Aastra 650c handsets for use with the OM Location application. These handsets support all application features.
- Aastra 142d and GAP handsets can also be used, but offer a limited feature set.

► *Aastra 600 c/d IMA*

► *OM Locating Application: Notes on GAP / Aastra 142d*

OM AXI Specification

This chapter describes an alternative approach to interact with the OMM: the "OM Application XML Interface", or short "OM AXI". OM AXI is an application programming interface (API) that allows external software to configure the OMM and to use the OMM's various interfaces, e.g. to realize interactive applications. Here are some examples:

- a GUI application programmed in Java with dialogues and menus to configure some of the OMM's features similar to the OMP.jar application;
- a web application programmed in PHP that offers a form-based user interface, e.g. to send and receive text messages;
- an XML key on an Aastra 675xi or Aastra 673xi SIP system telephone that calls a PHP page on a web server that in turn triggers some functions on the OMM.

Because of the nature of OM AXI, a complete programming example is beyond the scope of this compendium. However, the following basic concepts apply:

- OM AXI features an XML-based message exchange.
- Your application sends an XML snippet, e.g. "<Open seq="1" username="omm" password="x" />" terminated by a null character (0x00). The OMM responds with an XML snippet "<OpenResp seq="1" ommStbState="None" protocolVersion="35" />".
- The OMM offers two TCP ports for OM AXI communication by default:
  - Port 12621 for unencrypted communication for debugging,
  - Port 12622 for SSL encrypted communication (preferred).
- For performance reasons, you do not need to open or close single sessions for subsequent XML commands. You can just re-use the already opened command stream for this.

Details are available in the "OM Application XML Interface specification (OM AXI) ".

SIP–DECT XML terminal interface
The SIP-DECT 4.0 solution also supports the SIP–DECT XML terminal interface. With this, external applications provide interactive content displayed on the Aastra 600 c/d DECT handsets:

- In the OMP Java tool, you configure XML application hooks for the DECT handsets on the **System features**: **XML applications** menu page. With this, e.g. the redial list or an entry in the OMM system menu is linked to an URI that triggers a query on an external server.
- The queried server pushes the content back to the DECT handset by means of a SIP notify message.

Details are available in the "SIP-DECT XML terminal interface specification".

Note

If required, contact Aastra A2P2 support for the XML specification documents. There are also examples available that implement some of the mentioned programming techniques.

Notes