IP Office 4.0

IP DECT Installation Manual

15-601085 Issue 3 (11th December 2006)

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Overview

Purpose

This document describes the installation and administration of the Avaya IP DECT solution.

Abbreviations and Definitions

Abbreviations

AC	Authentication Code
ADMM	Avaya IP DECT Mobility Manager
ADPCM	Adaptive Differential Pulse Code Modulation
DECT	Digital Enhanced Cordless Telecommunication
DHCP	Dynamic Host Configuration Protocol
DSP	Digital Signal Processor
GAP	Generic Access Profile
IPEI	International Portable Equipment Identity
IP Base Station	IP DECT Base Station
HTTP	Hyper Text Transfer Protocol
LED	Light Emitting Diode
MSSF	Media Server System Features
PARK	Portable Access Rights Key
PP	Portable Part (DECT telephone)
RFP	Radio Fixed Part (IP DECT Base Station)
RTCP	Real Time Control Protocol
RTP	Real Time Protocol
SNMP	Simple Network Management Protocol
TFTP	Trivial File Transfer Protocol
VLAN	Virtual Local Area Network
WML	Wireless Markup Language

Definitions

DECT	**Digital Enhanced Cordless Telecommunication**
	• The standard (ETS 300 175) essentially specifies the air interface, known as the radio interface. Voice and data can both be transmitted via this interface.
	• DECT key technical characteristics are:
	  • Frequency range: approximately 1,880 – 1,900 GHz (approximately 20 MHz bandwidth)
	  • 10 carrier frequencies (1,728 MHz spacing) with 12 time slots each
	  • Doubling the number of time slots (to 24) using the TDMA process
	  • Net data rate per channel of 32 kbit/s (for voice transmission using ADPCM)
	  • Voice coding using the ADPCM method
	  • Maximum transmission power of 10 mW

GAP	**Generic Access Profile** • GAP is the abbreviation for Generic Access Profile • The GAP standard (ETS 300 444) is based on the same technology as DECT, but is limited to the most important basic features. This standard was created in order to allow phones of different vendors to be used on any type of DECT system. It thus represents the smallest common denominator of all manufacturer-specific variants of the DECT standard. • An important limitation in the GAP standard is that external handover is not possible. For this reason connection handover is used, which is supported by GAP terminals. • The operation of GAP-capable phones is comparable to that of analogue terminals. For example, features can be called up via '*' and '#' procedures.
Handover	**Handover** A handover is similar to roaming, but occurs during an active call. A handover normally takes place "in the background," without disrupting the call (seamless handover).
IPEI	**International Portable Equipment Identity** • 13-digit identification code for PPs (telephones) • Example: 00019 0592015 3 (the final digit is the checksum). • The code is represented in decimal form. • This code is globally unique.
PARK	**Portable Access Rights Key** Access code for the phone. This code determines whether a telephone can access a particular DECT system. Used for unique selection of the system at registration.
DECT Networking	While in motion, the telephone performs periodic signal strength and capacity measurements to determine which is the best Base Station. To prevent the phone from rapidly switching back and forth between two Base Stations of similar suitability and threshold are used.

Introduction

About the IP DECT Wireless Solution

The IP DECT solution delivers all the benefits of IP-based converged communications with the convenience of "in-building" wireless communications.

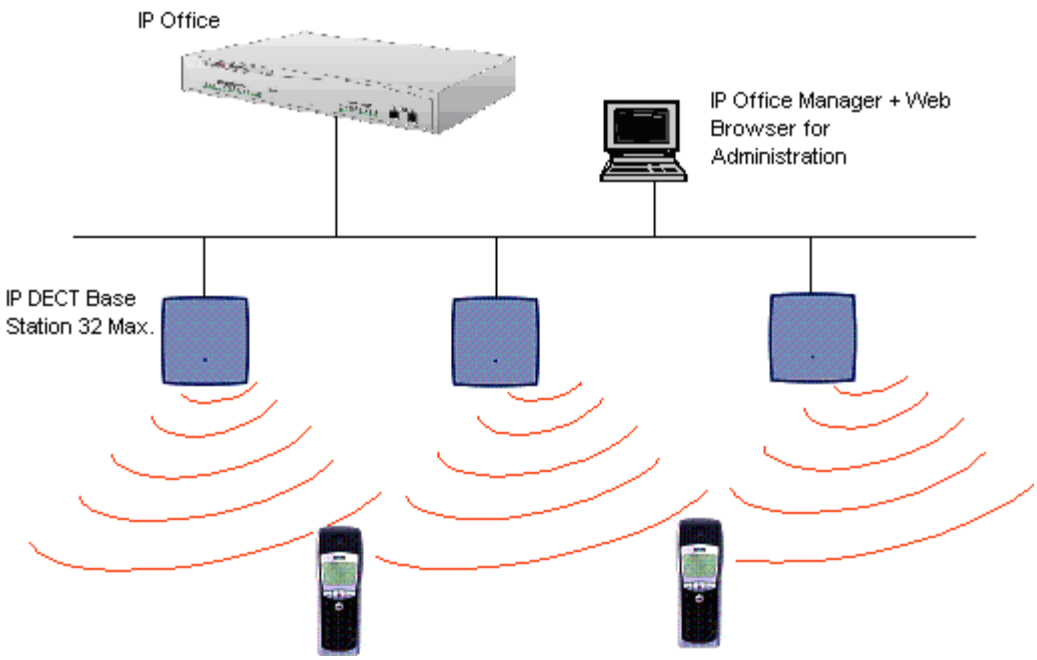
Designed to support a large number of users, the IP DECT system enables users to carry a wireless phone **and** get full access to all the features they are accustomed to using at their desk phone. The IP DECT solution, which connects to the IP Office using a variant of the H.323 protocol, can support users in different offices that are connected via a WAN. An IP DECT cordless handset can travel from one office to another, making and taking calls.

The DECT over IP system comprises the following components:

- At least one IP Base Station connected over an IP network and offering IP DECT as a wireless interface.
    - A maximum of 32 IP Base Stations are supported.
- IP Office Small Office Edition, IP Office 406v2, 403, 406v1 or 412 with available VCM resources.
- IP DECT phone: Avaya 3701 and Avaya 3711 wireless phones.
    - A maximum of 120 IP DECT phones are supported.
- Avaya IP DECT Mobility Manager (ADMM): management interface for IP DECT Wireless Solution, which runs on either one of the IP DECT Base Stations.

The following picture gives a graphical overview of the architecture of the IP DECT Wireless solution:

The IP Office, ADMM and the IP Base Stations communicate through the IP infrastructure. The IP Base Stations and the IP DECT phones communicate over air.



About the IP DECT Base Stations

There are two types of IP Base Station. All IP Base Stations have the same hardware and software capabilities.

Indoor IP Base Station

The indoor IP Base Station is for indoor use only. It can be powered by a mains adapter or by 802.3af compliant power over Ethernet.

Note

- For Australia and New Zealand the mains adaptor is not currently supported. Only 802.3af compliant power over Ethernet is supported.

Outdoor IP Base Station

The outdoor IP Base Station can be used outdoors or indoors. The outdoor IP Base Station can only be powered by 802.3af compliant power over Ethernet.

Note

- Avaya Power Over Ethernet adaptors are non 802.3af compliant, and therefore cannot power the ADMM.

One of the IP Base Station within an IP DECT installation must be chosen (at installation time) to operate as the ADMM. This ADMM mode is in addition to the normal IP Base Station functionality that all the other base stations retain.

IP Base Station Only Mode

In this mode, the IP Base Station converts IP protocol to DECT protocol and transmits the traffic to and from the phone over a 1.8 GHz Media channel. On air, the IP Base Station has 12 available time slots:

- Eight have associated DSP resources for media streams
- The remaining four time slots are reserved for control signalling between IP Base Stations and the phones.

Groups of IP Base Station are called clusters. Within a Cluster, IP Base Station are synchronized to enable a seamless hand over when a user crosses from one IP Base Station's zone of coverage to another. For synchronization, it is not necessary for an IP Base Station to communicate directly with all other IP Base Stations in the system. Each IP Base Station only needs to be able to communicate with the next IP Base Station in the chain. It is preferable for an IP Base Station to see more than one IP Base Station to guarantee synchronization in the event that one of the IP Base Stations fails.

The four control signalling channels are also used to carry bearer signals that signal the phone to start the hand over process. If the radio signal of another IP Base Station is stronger than that of the current IP Base Station, then the phone starts the hand over process to the IP Base Station that has the stronger signal.

Avaya DECT Mobility Manager Mode

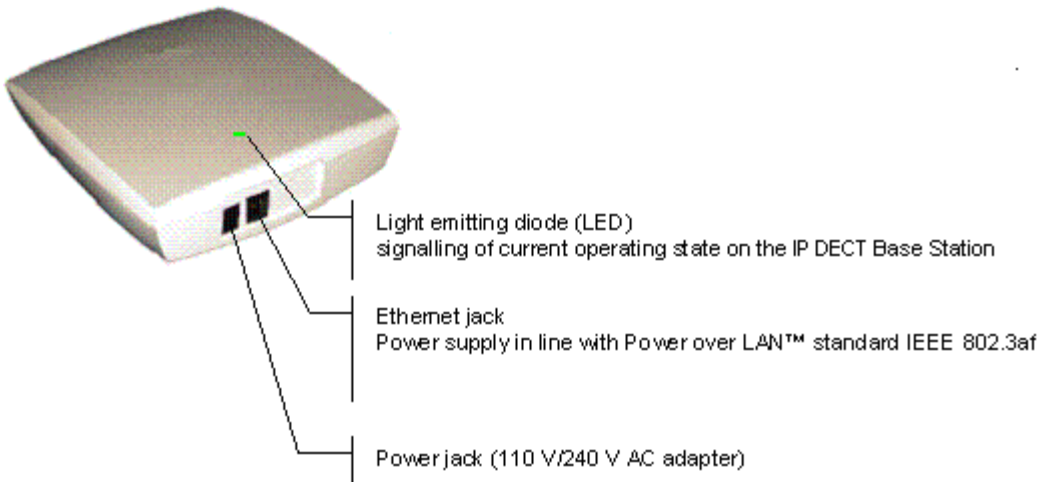
In this mode, an IP Base Station functions as a regular IP Base Station. Additionally, it is responsible for H.323 signalling between the IP DECT system, IP Office and a web management interface.

To designate a IP Base Station as the ADMM, assign an IP address to the IP Base Station DHCP settings (see Avaya IP DECT Startup) or set the data via OM Configurator (see Static Local Configuration of the IP DECT). If an IP Base Station is designated as the ADMM, it starts extra services (for example, the Web Service to support the management interface).

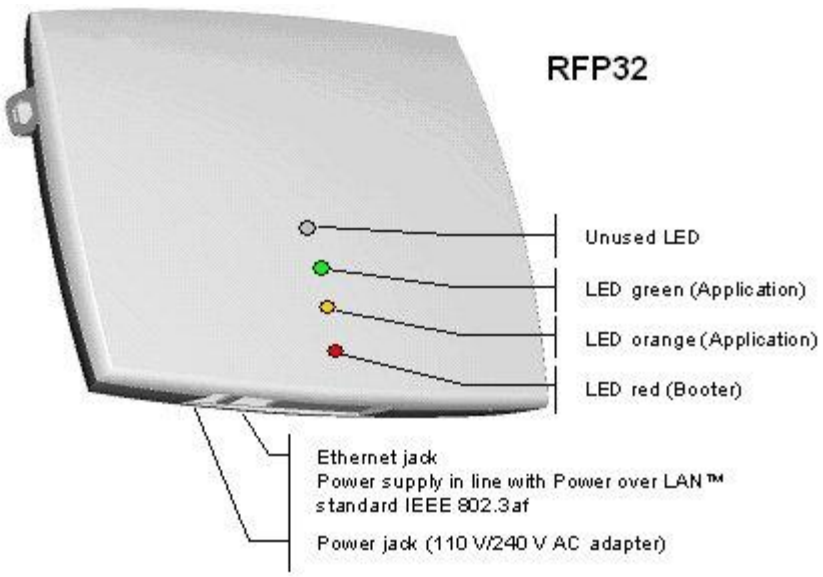
Note

- It is possible to deactivate the DECT part of a IP Base Station. If the DECT Interface is deactivated then the resources (CPU and memory) are available for the ADMM.

The RFP31 has only one LED showing all states / colors:



The RFP32 has 3 separate LEDs in red, orange and green showing the different states during startup.



Avaya IP DECT Mobility Manager

The Avaya IP DECT Mobility Manager (ADMM) performs the following tasks:

- Signalling gateway (H.323 <-> DECT GAP).
- Media stream management.
- Manages synch over air functions between IP Base Stations.
- Facilitates system configuration modifications.
- Provides additional services, for example:
  - Directory (LDAP or TFTP based).
  - WML browser.

The ADMM must run on one of the IP Base Stations.

IP Signalling and Media Stream

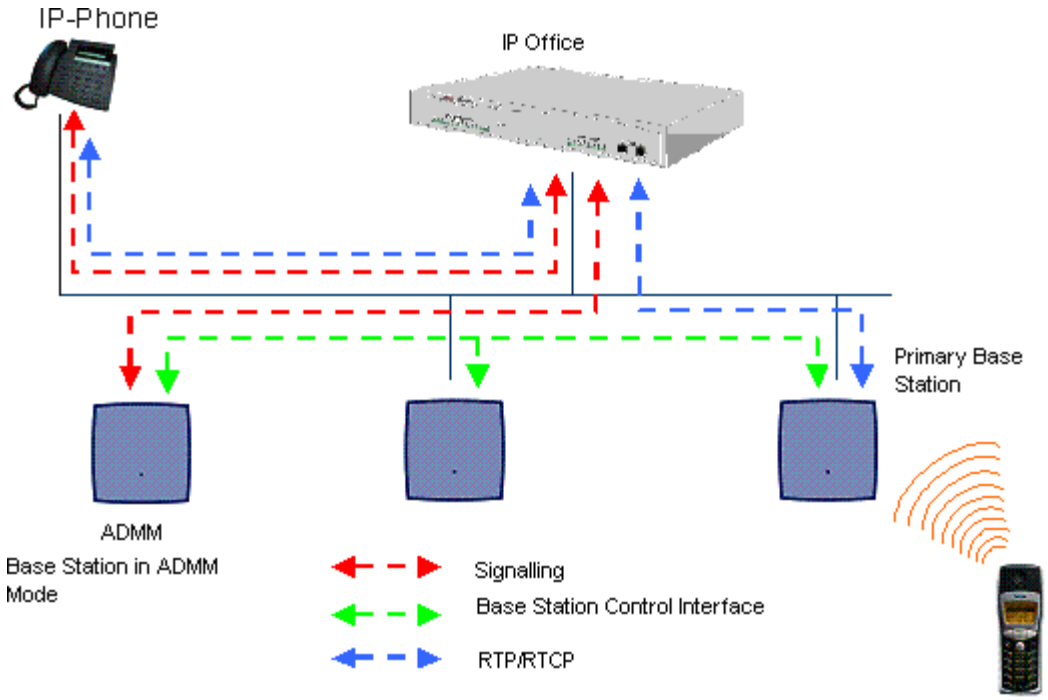
To establish a call between an IP phone and a DECT phone, the following IP streams must be established:

- A signalling channel to and from the IP phone.
- A signalling channel to and from the ADMM.
- A control interface between the ADMM and the IP Base Station that has a connection to the DECT phone (known as the primary IP Base Station).
- A Real Time Protocol (RTP)/Real Time Control Protocol (RTCP) connection between the IP phone and the IP Office and then a RTP/RTCP connection between the IP Office and the IP Base Station.

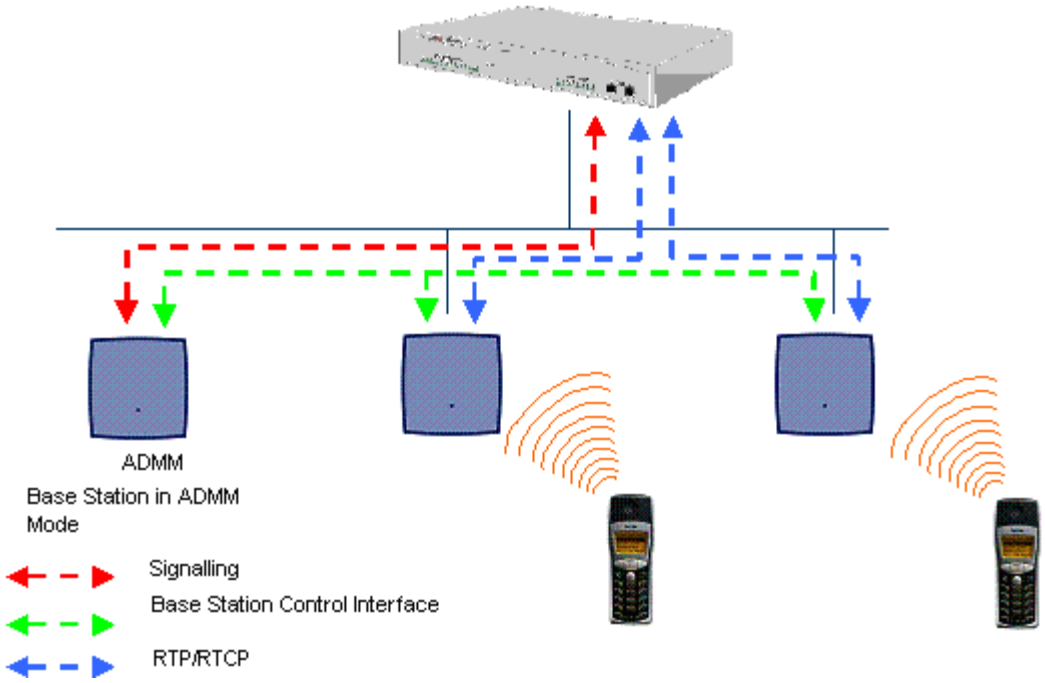
Note

- If Direct Media is active for the IP Office IP DECT line configuration, RTP/RTCP connection is directly between the IP phone and the IP Base Station.

The following figure illustrates this scenario:

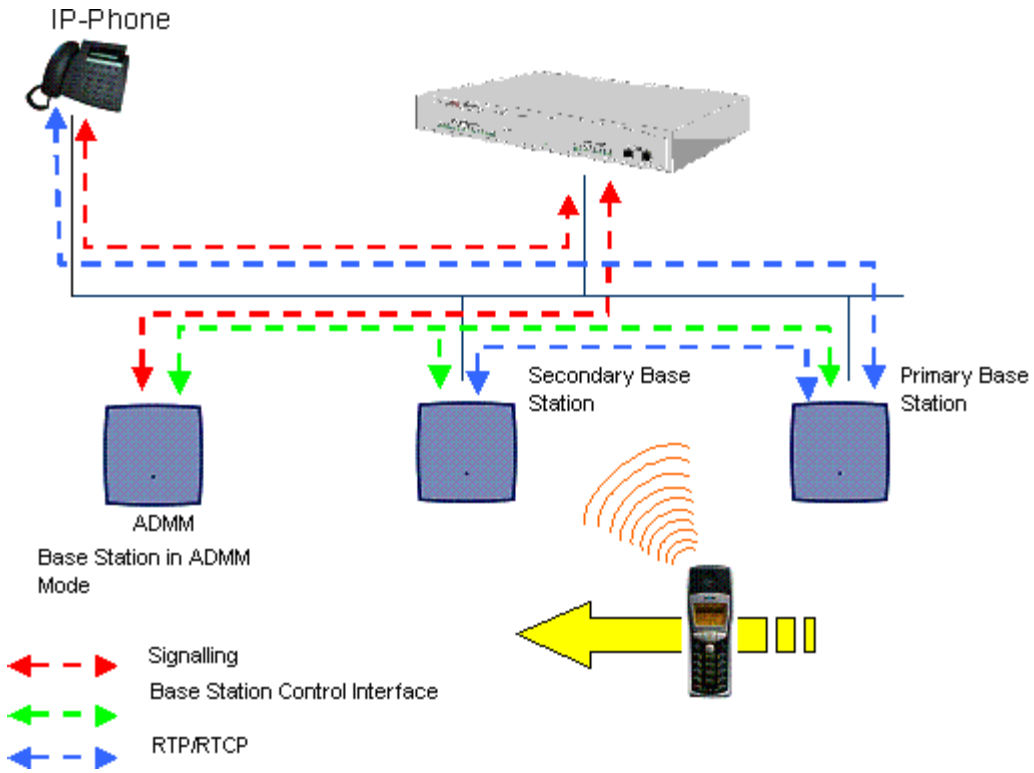


To establish a call between two DECT phones, the same IP streams must be established as in the scenario before, except the IP phone is not involved. If Direct Media is active, the RTP/RTCP connection is directly between that IP Base Station. The following figure illustrates this scenario:

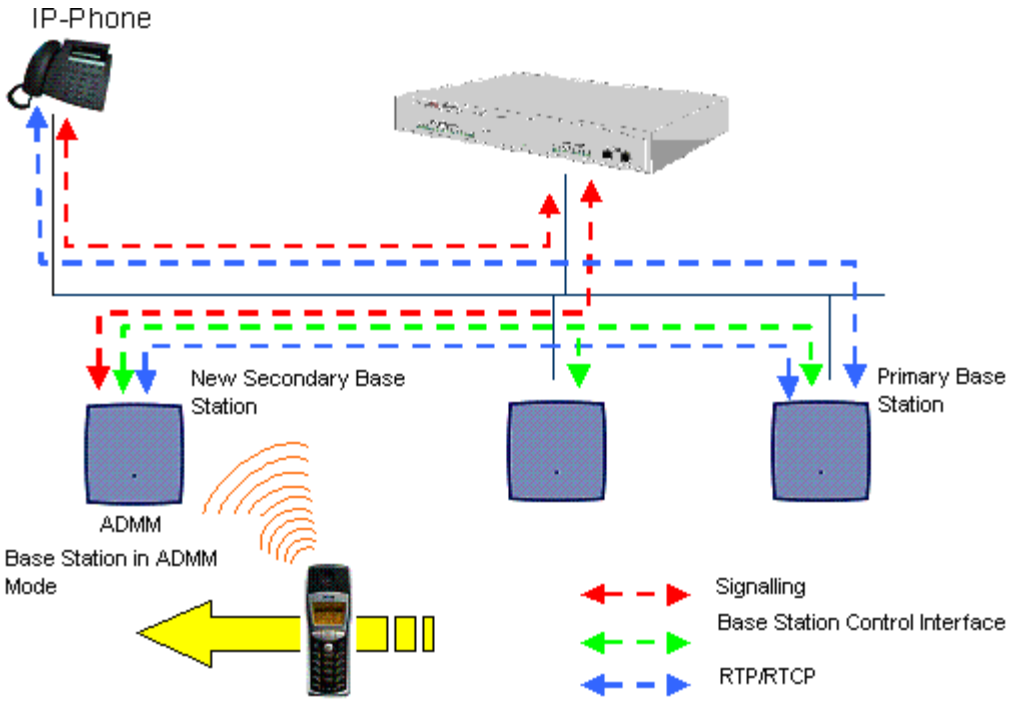


A call from one DECT phone to another that resides on the same IP Base Station will loop back within the IP Base Station, if no IP Office is involved. So the call will not pass through to the local area network (LAN). Although the voice packets will not impact LAN traffic, signal packets will.

If the DECT phone user is moving, the phone detects that another IP Base Station has a better signal strength and starts the handover process. The media stream from the IP phone cannot move to the secondary IP Base Station, so the primary uses the LAN to direct the voice to the secondary IP Base Station, as shown in the following figure.



As the phone user moves into the next IP Base Station zone of coverage, the phone detects that the IP Base Station has a better signal strength. The media stream from the IP phone cannot move to the secondary IP Base Station, so the primary IP Base Station uses the LAN to direct the voice to the new secondary IP Base Station, as shown below.



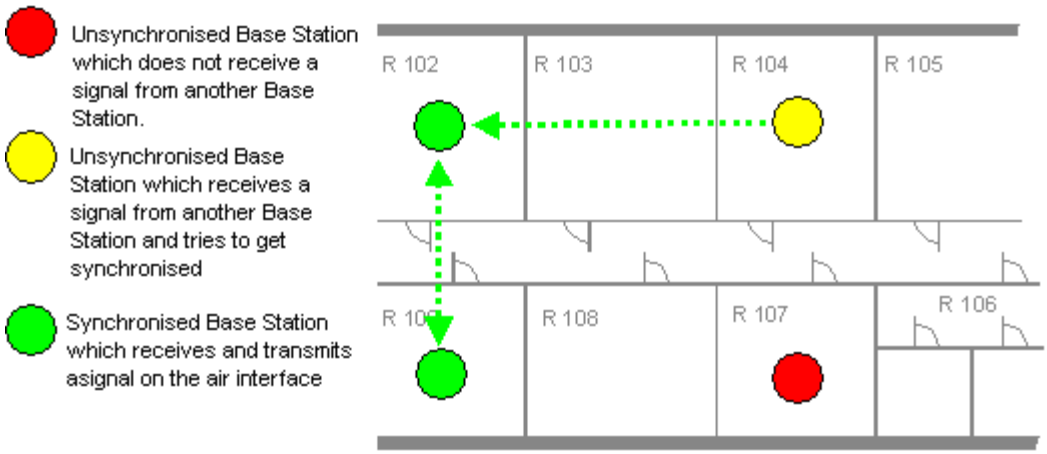
IP DECT Base Station Synchronization

To guarantee a seamless handover if a caller moves from one IP Base Station zone of coverage to another IP Base Station zone of coverage, synchronisation of the IP Base Stations is necessary.

IP Base Stations are synchronized over the air interface. During start-up, one IP Base Station will be the first, which transmits a signal on the air. The other IP Base Stations only receive the signal until they are synchronous. If an IP Base Station is in synch, it will transmit a signal on the air and will be the synch source for the next IP Base Stations. Only IP Base Stations which can receive each other will be synchronized.

For the IP Base Station to sync to another IP Base Station, the signal strength cannot drop below –70 dBm. You must consider this requirement during the site survey.

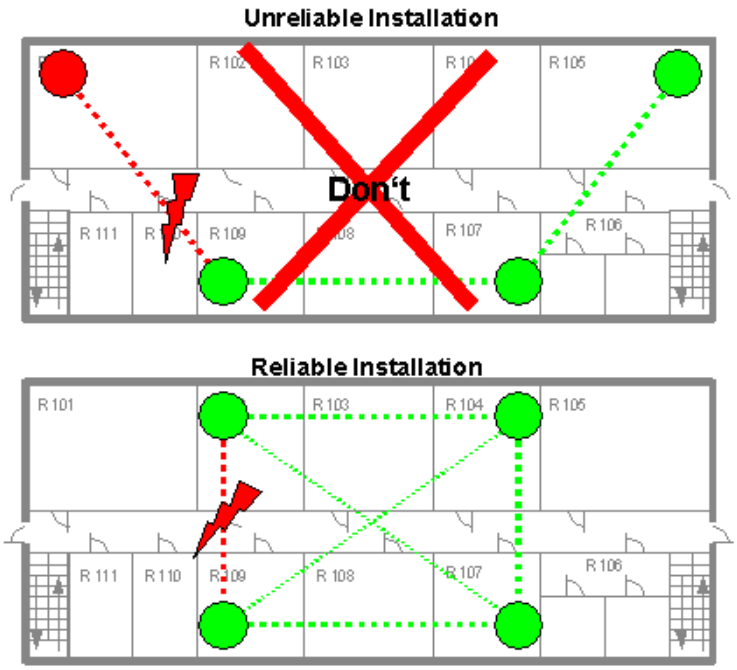
The first active IP Base Station will be chosen by the ADMM as the synchronization master.



As long as a IP Base Station is not in synch, no calls can be established using this IP Base Station.

If a Base Station loses the synchronisation, the IP Base Station does not accept new calls ('Busy-Bit'). There is a delay of a maximum 3 minutes, until the active calls on this IP Base Station are finished. Then it tries to synchronize again.

An IP DECT installation is more reliable if an IP Base Station can receive the signal from more than one IP Base Station, because the other signals are also used for synchronization.



The synch-over-air solution is reliable, because all existing redundant paths are used for synchronization. Therefore, hardware tolerances have only very little influence. No IP Base Station has a key position.

Only deployments without redundant synchronization paths can cause problems.

Sometimes IP Base Stations do not need to be synchronized, e.g. if they are in different buildings. These IP Base Stations can be put into different clusters. IP Base Stations in different clusters will not be synchronised with each other. Different clusters start up independently at the same time.

IP DECT Base Station Channel Capacity

The IP DECT base station has 12 available airtime slots:

- Eight slots have an associated DSP resource for media streams.
- Four slots are dedicated to control signalling between IP DECT base stations and phones.

If all eight Media Stream channels are used IP DECT announces a 'Busy Bit'. In this case, the phones determines whether another IP Base Station has appropriate signal strength. If so, the phone will hand over to that IP Base Station. Once the handover has been completed, the IP Base Station will then lower its Busy Bit.

When the 'Busy Bit' is set, an entry is made in the system log. If the log indicates a specific area, a further IP Base Station should be installed to increase the number of media streams available for calls.

About the Telephones

There are two models of phones: the 3701 and 3711 phones.

Avaya Kirk DECT phones (WT9620 and DT20) function on the IP DECT solution, but the functionality is limited.

About Licensing

The IP DECT solution requires a number of licenses to operate. The ADMM needs to be enabled with a license key.

The ADMM must be enabled with a license key, which relies on the MAC address of some IP Base Stations in the DECT system. The license key needs to be entered/administered via the ADMM web administration interface.

There are a number of license levels.

- License for 1 IP DECT Base Station
- License for 2 IP DECT Base Stations
- License for 3 to 5 IP DECT Base Stations
- License for 6+ IP DECT Base Stations

The license key requires the MAC addresses of some IP Base Stations on the DECT system (License IP Base Stations). Any IP Base Station can be a License IP Base Station. The number of IP Base Station MAC addresses encoded in the license depends on the size of the DECT installation:

System size (# of IP Base Stations)	Number of IP Base Station MAC addresses encoded in the license (License IP Base Stations)
1	1
2	2
3 to 5	3
More than 5	3

In addition to the MAC addresses, the Portable Access Rights Key (PARK) which identifies the DECT installation is also by part of the license.

An IP DECT system is operational if it set up with a valid license and the ADMM can communicate with the licensed IP Base Stations.

Depending on the size of the IP DECT system, it will still work if some License IP Base Stations are out of service:

System size (# of IP Base Stations)	Number of License- IP Base Stations	Number of License- IP Base Stations available at minimum
1	1	1
2	2	1
up to 5	3	2
More than 5	3	2

If the minimum number of License IP Base Stations cannot be reached by the ADMM, or more IP Base Stations are administered than licensed, the DECT system will block the voice streams.

System Capacities

There is only one ADMM in the system:

- Up to 32 IP Base Stations can be controlled (31 plus the ADMM).
- Up to 120 IP DECT phones are supported.
- Up to 100 IP DECT phones can be active simultaneously.
- The maximum number of simultaneous calls is limited by the number of VCM channels of the IP Office and the channels of the IP Base Stations. The maximum number of simultaneous calls can also be affected by the direct media configuration in the IP Office Manager.

It is possible to deactivate the DECT interface of a IP Base Station. If the DECT Interface is deactivated then the resources (CPU and memory) are available for the ADMM only.

Installation and Configuration

Installation and Configuration

To establish and maintain an IP DECT installation, a network infrastructure is assumed, which comprises at least the following components:

- IP Base Stations
- IP DECT phone
- IP Office
- TFTP server (which can be the IP Office or 3rd Party).

Depending on the operational requirements the following services should be provided:

- DHCP
- SNTP
- DNS
- WML/HTTP
- Syslog daemon

Avaya IP DECT Start Up

Startup of the IP Base Stations

For booting an IP Base Station, there must be at least a TFTP server on the attached network to load the application software.

Essential network settings can be given either by:

- A DHCP Server at startup time.

or

- The OM Configurator tool - the settings made by OM Configurator will be saved permanently in the internal flash memory of the IP DECT Base Station.

Notes

- The IP Base Station gets the boot image file from a TFTP server. The TFTP server needs to support RFC 1350, The TFTP Protocol (Revision 2), July 1992.
- The DHCP server needs to support RFC 2131, Dynamic Host Configuration Protocol, March 1997.
- The TFTP and DHCP server need not reside on the same host.

Booting Overview

Booting requires two steps:

- Starting the boot process
- Starting the application

Boot Loader@:

The IP Base Station has only a small standalone application built into the flash. This software delivers the NETBOOT process.

On start up, each IP Base Station will attempt to determine its own IP address and other settings of the IP interface, from the configuration settings in the internal flash memory. If no settings are available or these settings are disabled, the IP Base Station will attempt to determine its settings via DHCP.

The IP Base Station gets its application image file from the TFTP server.

Application:

After starting the application image the IP Base Station checks the local network settings in its internal flash memory again. If no settings are available or they are disabled, it starts a DHCP client to determine the IP address of the ADMM and other settings.

Startup of ADMM

ADMM in IP Base Station Mode

There is no difference in booting the IP Base Station (which is in ADMM mode) from those which are in the IP Base Station only mode.

The decision is driven by the ADMM IP address, which is either:

- within the local network settings, if active.

or

- via DHCP request.

The IP Base Station which has the same IP address as the ADMM IP address, will become the ADMM.

Booter

Booter Versions

The following section assumes Booter software 3.2.X.

Previous Booter software have different features:

- Booter version 2.1.y
  This software is using BOOTP instead of DHCP.
- Booter version 3.0.x
  Replacement of the BOOTP client by a DHCP client.
- Booter version 3.1.x
  Added support for VLAN.
- Booter version 3.2.x
  added support for Open Mobility Configuration.

DHCP Client

Within the initial boot process the DHCP client should support the following parameters:

Parameter	Type
IP Address	mandatory
Netmask	mandatory
Gateway	mandatory
Boot file name	mandatory
TFTP server	mandatory
NTP server	optional
Public Option 224: “OpenMobility”	mandatory
Public Option 225: VLAN ID	optional

Note

- If local configuration via OM Configurator is used, this information will be read from internal flash memory instead.

DHCP REQUEST

Vendor class identifier (code 60)

The DHCP client sends the vendor class identifier **OpenMobility**.

Parameter request list (code 55)

The DHCP client in the booter requests the following options in the parameter request list:

- **Subnet mask option (code 1)**
- **Router option (code 3)**
- **Public option 224 (code 224)**
- **Public option 225 (code 225)**
- **Public option 226 (code 226)**

DHCP OFFER

Mandatory options

The DHCP client selects the DHCP server according to the following rules:

- The **public option** (**224**) has a value equal to the string **OpenMobility**.

OR

- The **file** field in the DHCP message has a sub string equal to **ip_rfp.cnt**.

If none of the two rules above match, the DHCP offer is ignored.

Information retrieved from the DHCP OFFER:

- The IP address is taken from the **yiaddr** field in the DHCP message.
- The IP netmask is taken from the **subnet mask option (code 1)**.
- The default gateway is taken from the **router option (code 3)**.
- The TFTP server IP address is taken from the **siaddr** field in the DHCP message.
- The boot image filename is taken from the **file** field in the DHCP message. If this field is empty, the default filename **iprfp.bin** is used.

Optional option

- **Public option 225 (code 225)** with a length of 2 bytes is interpreted as VLAN ID.
  If this option is present the booter will start over with releasing the current lease and issuing a new DHCP REQUEST, now using VLAN.
-

Retries

If the DHCP client does not get an appropriate DHCP OFFER, a new DHCP REQUEST is sent after 1 second. After 3 DHCP REQUESTS are sent, the DHCP client will sleep for 60 seconds.

During this time, the booter will accept local configuration from the (OMC) Open Mobility Configurator.

TFTP Client

The TFTP client will download the application image from the TFTP server. Both the TFTP server and the name of the application image are supplied via the DHCP client. The application image is checksum protected.

Application

After successfully downloading and starting the application, the IP Base Station will determine the IP address of the ADMM from DHCP.

The DHCP client is capable of receiving broadcast and unicast DHCP replies. The flags field is therefore **0x0000**.

The DHCP request contains the well known magic cookie (**0x63825363**) and the End Option (**0xFF**).

The following parameters are supported within this step:

Parameter	Meaning	Type
Public Option 226	ADMM IP Address	mandatory
Public Option 227	Syslog Server IP Address	optional
Public Option 228	Syslog Server Port	optional
DHCP Option 6	Domain Name Server	optional
DHCP Option 15	Domain Name	optional
DHCP Option 42	Network Time Protocol Server	optional

Note

- If local configuration via OM Configurator is set, these parameters will be read from the internal flash memory instead.

Booter Update

Automatic Booter Update

Each application software comes with the latest released booter software. The application software will update the booter automatically as long as the major release number of the booter software has not changed, e.g. booter software 2.1.2 will not be automatically updated by booter SW 3.x.y, but booter software 3.0.0 will be automatically updated by booter software 3.1.0.

For details on how to check the booter SW version, see Booter.

Automatic Booter Update for Major Release Changes

The booter update of booters with major release number change, will be performed automatically when the DHCP client in the application receives an DHCP OFFER with the public option 254 with a value **UPDATE**.

Note

- This feature is currently not supported by the IP Office DHCP server.

Selecting the Correct DHCP Server

The DHCP client request its own IP address using code 50. The DHCP client will select the DHCP server that offers the currently used IP address. Additionally, the mandatory options must be offered otherwise the DHCP OFFER is ignored by the DHCP client.

If no matching reply is received, the DHCP client resends the request twice more after 1 second. The DHCP client will wait for 1 minute before resending 3 requests again.

If the DHCP client cannot accept a DHCP offer within 3 minutes, the IP DECT Base Station is rebooted.

Mandatory Options

Magic String

- **Public option 224**

  The value of this option must be **OpenMobility**.

ADMM IP Address

- **Public option 226**

  The value is interpreted as ADMM IP address; the length must be 4 bytes.

Optional Options

Syslog server IP Address and Port

- **Public option 227**

  The value is interpreted as the IP address of the syslog server, the length must be 4 bytes.

- **Public option 228**

  The value is interpreted as the port the syslog server is monitoring. The length must be 2 bytes.

DHCP Option 6: Domain Name Server

The domain name server option specifies a list of Domain Name System servers available to the client.

Servers SHOULD be listed in order of preference. The code for the domain name server option is 6.

The minimum length for this option is 4 octets, and the length MUST always be a multiple of 4.

DHCP Option 15: Domain Name

This option specifies the domain name that the client should use when resolving hostnames via the Domain Name System.

The code for this option is 15 and the minimum length is 1.

DHCP Option 42: Network Time Protocol Servers

This option specifies a list of IP addresses indicating NTP servers available to the client.

Servers SHOULD be listed in order of preference.

The code for this option is 42. Its minimum length is 4, and the length MUST be a multiple of 4.

Selecting the Correct TFTP Server

The embedded TFTP server supported by the IP Office - Small Office Edition and the IP Office 406 V2 may be used to supply the IP Base Station application. However, the boot time for larger IP DECT solutions may be too long to be practical.

It is recommended on the Small Office Edition you have a maximum of 3 IP Base Stations connected to the IP Office internal TFTP server. On the IP Office 406 V2 it is recommended you have a maximum of 5 IP Base Stations connected to the IP Office internal TFTP server.

The following table shows the Boot time taken for an increasing number of IP Base Stations using the IP Office internal TFTP server.

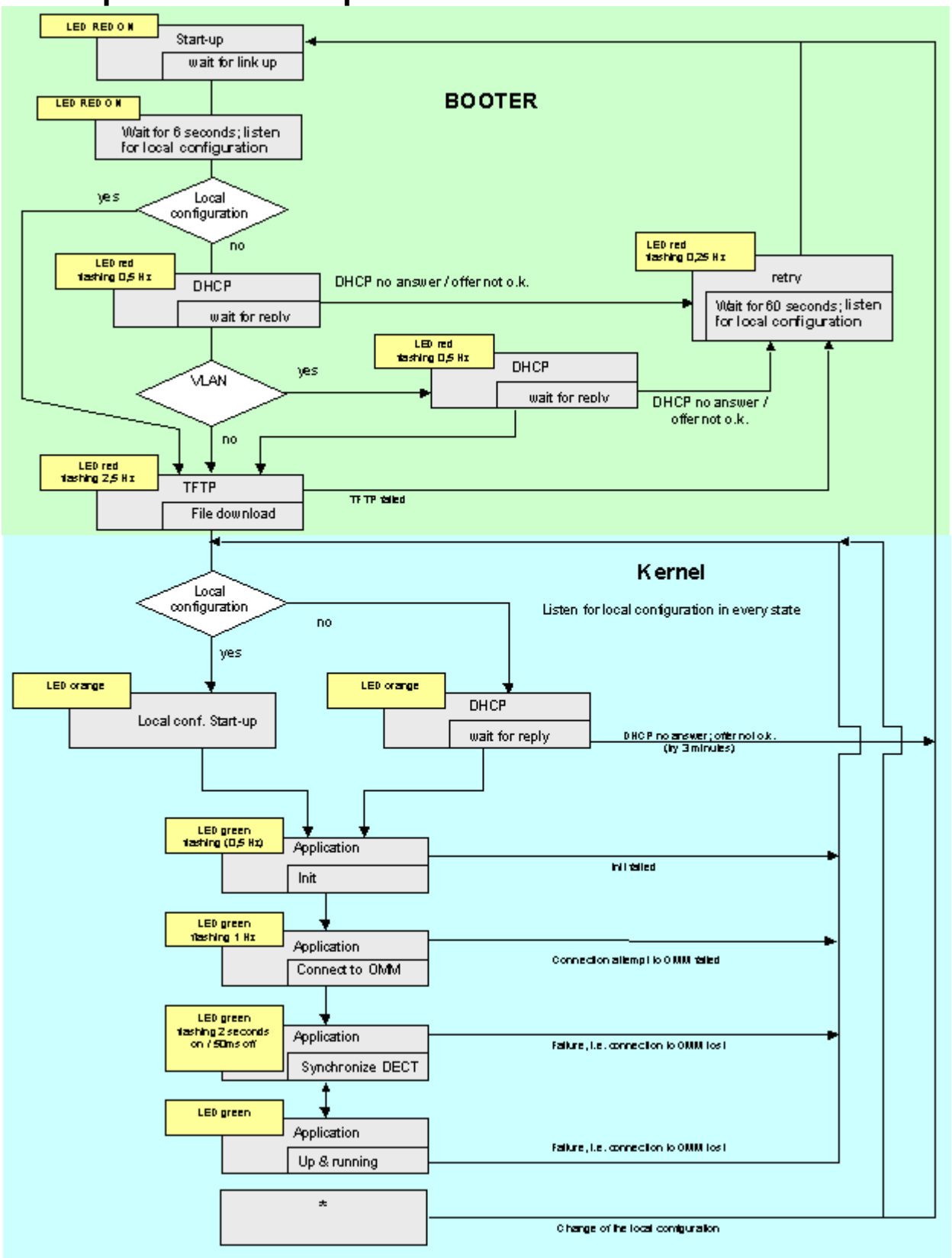
No. of IP DECT Base Stations	Boot Time - IP Office Small Office Edition	Boot Time - IP Office 406 V2
1	3 minutes	Not tested
3	5 minutes	Not tested
5	Not tested	5 minutes
8	Not tested	9 minutes
12	Not tested	13 minutes
20	25 minutes	20 minutes

IP DECT Base Station LED Status

The following diagram shows the LED status of the IP DECT Base Station according to the different states during startup:

State	LED State	Remarks
Booter (Start-up)	RED on	Wait for link up.
Booter DHCP	RED flashing 0.5 Hz	Launching a DHCP request and waiting for a DHCP offer.
Booter (TFTP)	RED flashing 2.5 Hz	Downloading the application image.
Application (DHCP)	ORANGE on	Launching DHCP request and waiting for DHCP reply.
Application (init)	GREEN flashing 0.5 Hz	IP Base Station initialising its internal components.
Application (init)	GREEN flashing 1 Hz	IP Base Station trying to connect to ADMM.
Application (init)	GREEN flashing (2 sec on, 0.5 sec off)	Attempting configuration and DECT synchronization.
Application (init)	GREEN	IP Base Station is up and running.

State Graph of the Startup Phases



Static Local Configuration of the IP Base Station

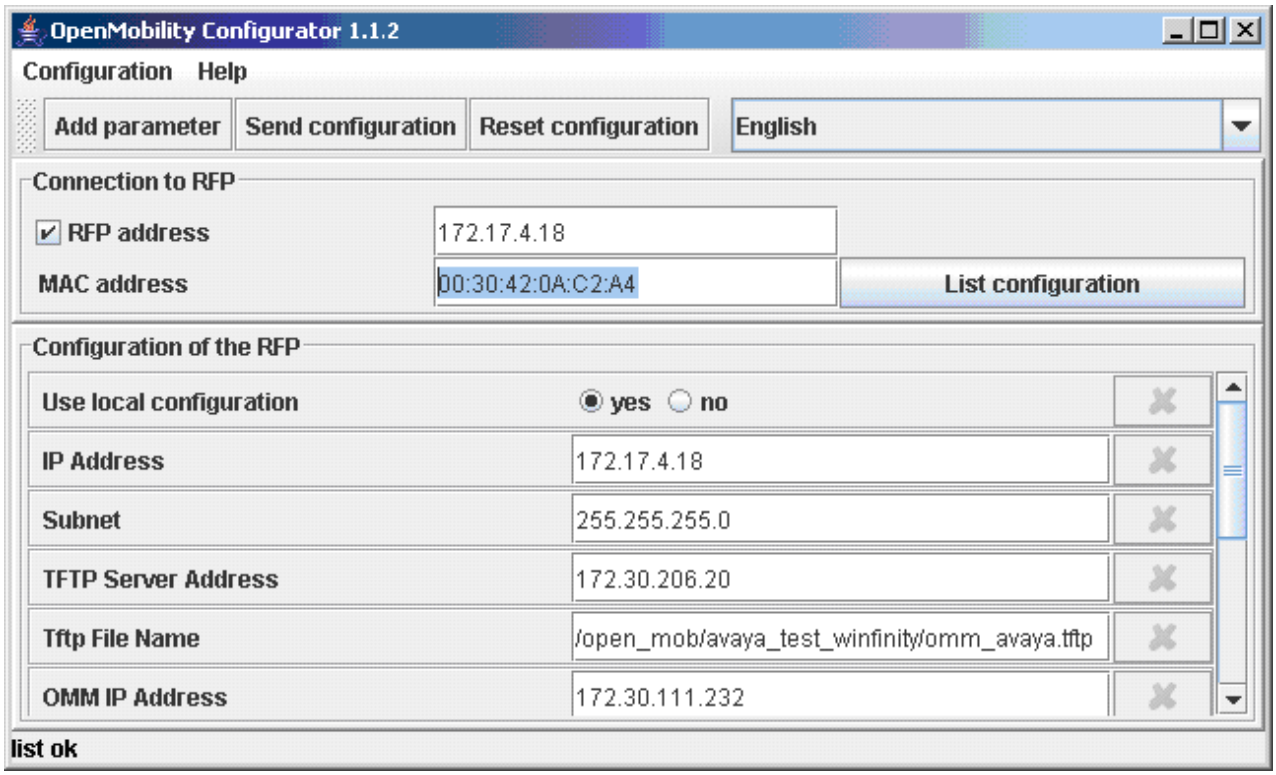
For a static local configuration, the Java configuration tool: *OM Configurator* must be used. This needs Java Runtime Environment version 1.4 or higher.

All settings, which are configured on the IP Base Station with the tool *OM Configurator,* will be saved permanently in the internal flash memory of a IP Base Station.

The parameters configurable via the OM Configurator correlate with the DHCP option, see Avaya IP DECT Start Up for details.

If a local static configuration has been completed, DHCP is not used anymore. The only way to use DHCP again is to reset the configuration.

The following figure shows the OM Configurator:



To minimally configure an IP Base Station, set the MAC address and all mandatory options (see table below). If the IP Base Station has an IP address, enter this address in the **RFP Address** field. In this case, you can reach an IP Base Station outside the local LAN segment.

- To configure additional parameters, press the **Add parameter** button and choose the required parameter name.
- To transmit parameters into an IP Base Station, press the **Send configuration** button.

The configuration can only be set after Base Station power up or at retry phase (Red led flashing 0,25 Hz) or in kernel mode, please see state graph of the start up phases for details. The Configurator Tool waits 2 seconds and retries transmitting data 3 times.

- To read the configuration parameters from the IP Base Station, set the MAC address and the IP address and press the **List configuration** button. All parameters will be uploaded and displayed.
- To clean all input fields and additional parameters, press the **Reset configuration** button. If this is sent to the Base Station, the Base Station will return to DHCP mode.

Boot Parameters (comply with DCHP option)

Parameter	Type	Meaning
Use local configuration	mandatory	Local configuration settings to be used at booting or not.
IP Address	mandatory	IP address of the IP Base Station
Subnet	mandatory	Subnet mask of the IP network
TFTP Server Address	mandatory	IP address of TFTP server
TFTP File Name	mandatory	Application file to be read from the TFTP server at startup
OMM IP Address	mandatory	ADMM IP address
Router Address	optional	Default gateway
DNS Address	optional	DNS server
DNS Domain	optional	Domain name of the network
Broadcast Address	optional	Broadcast address for that network
NTP Server Address	optional	NTP server IP address
Syslog IP Address	optional	Destination Syslog IP address
Syslog Port	optional	Destination Syslog port
VLAN ID	optional	VLAN Identifier

The local configuration settings of the IP Base Station can be verified using the telnet interface of an IP Base Station. (see Static Local Configuration)

You can remove the local configuration settings of the IP DECT Base Station using the telnet interface of an IP DECT Base Station. (see Static Local Configuration)

802.1Q Support

The IP Base Stations support VLANs according to IEEE 802.1Q.

VLAN can be administered either:

(a) On a per port basis of the LAN switch assuming that the IP Base Stations are connected to a single port of a switched Ethernet environment.

Or

(b) By setting a VLAN ID on the IP Base Station corresponding to the VLAN they should be operating in.

VLAN tagging has to be set to the IP Base Station in case (b). The following section refers to case (b) only.

The benefit of VLAN tagging by the IP DECT Base Station, is to set 802.1p priority within Ethernet frames (to set Quality of Service, see Configuring_the_Avaya_IP_DECT_Mobility_Manager - IP Regions).

The scope of the following description comprises VLAN tagging and obtaining the VLAN ID. Quality of Service mechanisms like 802.1p priority and DiffServ are not covered in this section.

VLAN implementation notes referring to IP Base Stations:

- **IP DECT base stations are not be able to support VLAN ID 0** as described later in this section. Any other valid VLAN ID can be configured.
- If 802.1Q tagging is enabled and a VLAN ID is configured, all traffic from an IP Base Station will be tagged with this VLAN ID.
- Once a VLAN ID is set on the IP Base Station, incoming frames are only accepted if they are tagged as well. Therefore the switch port has to be configured as a tagged trunk for this VLAN.
- VLAN configuration can be done using DHCP or via OM Configurator.
- The usage of VLAN does influence the boot up process of the IP Base Station because VLAN configuration takes place during the boot phase.

ADMM requirements

ADMM running on an IP Base Station

If the ADMM is running on an IP Base Station the VLAN ID configured for that IP Base Station is used for the ADMM.

Principles and Parameters

The default setting is not to tag the traffic. 802.1Q tagging is enabled if the VLAN ID is set. The configuration of the VLAN ID can be done using:

- DHCP **Public option 225**.
- Local static configuration of the IP Base Station via OM Configurator.

If no VLAN ID is set, 802.1Q is disabled.

Why not VLAN ID 0?

VLAN ID 0 means that the IP Base Station's traffic belongs on the port/native VLAN. The Ethernet switch port to which the IP Base Station is connected must be configured to accept 802.1Q tagging for this to work, and the switch must interpret VLAN ID 0 as the port/native VLAN ID, as per the IEEE 802.1Q standard.

The packets from the IP Base Station are tagged with VLAN ID 0 and the packets send to the IP Base Station are tagged with the port/native VLAN ID. **This scenario does not work, because the IP Base Station supports only one VLAN ID in both directions. That means the VLAN ID in the receive direction must be the same as the send direction.**

VLAN and the Boot Phase of an IP Base Station

DHCP

Because the IP Base Station is not VLAN active during the beginning the start up two DHCP scopes are required (This procedure applies regardless of the Ethernet switch being used):

The following scenario with arbitrary VLAN IDs details the steps an IP Base Station would go through in a typical dual-VLAN implementation.

Step A. DHCP scope within the native VLAN:

1. IP Base Station boots up and obtains an address on the native VLAN.
2. The data VLAN DHCP **Public option 225** directs the IP Base Station to go to voice VLAN.

Step B. DHCP scope within the voice VLAN:

1. IP DECT Base Station releases the data VLAN address and obtains an address on the voice VLAN and all other parameters.
2. The voice VLAN does not have the DHCP **Public option 225**, because an IP Base Station already on the voice VLAN does not need to be directed to go there.
3. IP Base Station is operational on the voice VLAN.

If a reboot or power cycle occurs, the IP DECT Base Station returns to step A.

If an IP Base Station cannot obtain an address on the voice VLAN, due to network or DHCP problems, it falls back automatically to untagged frames (native VLAN).

Note

- The IP Office DHCP server cannot be used for VLAN environments, only for native VLAN. Therefore, it can only be used for step A, not step B.

Local Configuration of the IP DECT Base Stations

The OM Configurator has to be a member of the native VLAN for the first configuration.

Configuring the IP Office Manager

The IP DECT installation requires the configuration of the IP Office Manager.

- Creation of an IP DECT Line to the ADMM.
- Creation of DECT extensions.
- Mapping of the extension to the IP DECT Line.
- Creation of DECT Users.

IP DECT Line

To create the IP DECT Line to an ADMM:

1. Select **Line** from the Manager tree.
2. Right click in the Right hand pane.
3. Select **New**.
4. Select **IP DECT Line**.

Note

- It is not possible to create more than one IP DECT Line.
- A IP DECT Line type is indicated on the Manager display by a wireless IP Line icon: 
- To view the configuration, double-click **IP DECT Line**.

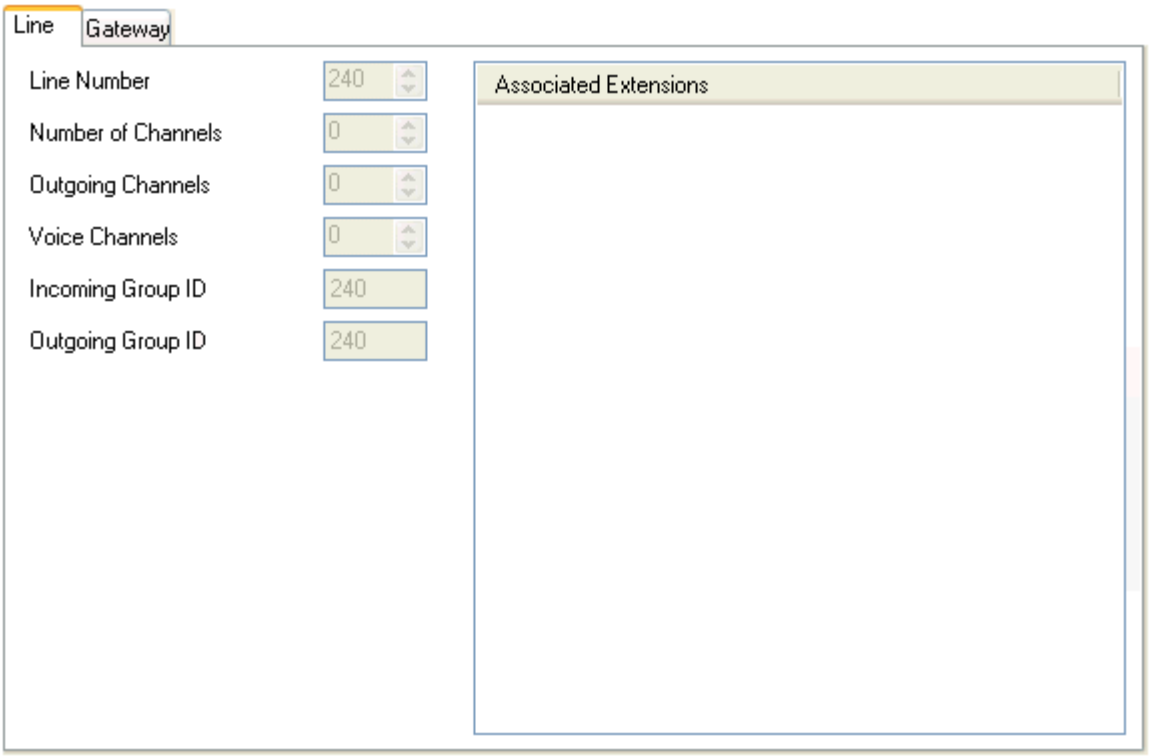
The IP DECT Line form has three tabs:

- **Line** – shows the characteristics of the IP DECT Line. All fields are read-only and cannot be configured.
- **Gateway** - allows the setting of the IP DECT system gateway and DHCP parameters.
- **Extensions** - displays a list of all DECT extensions associated with the line.

The tabs only contain IP DECT Line fields pertinent to the ADMM.

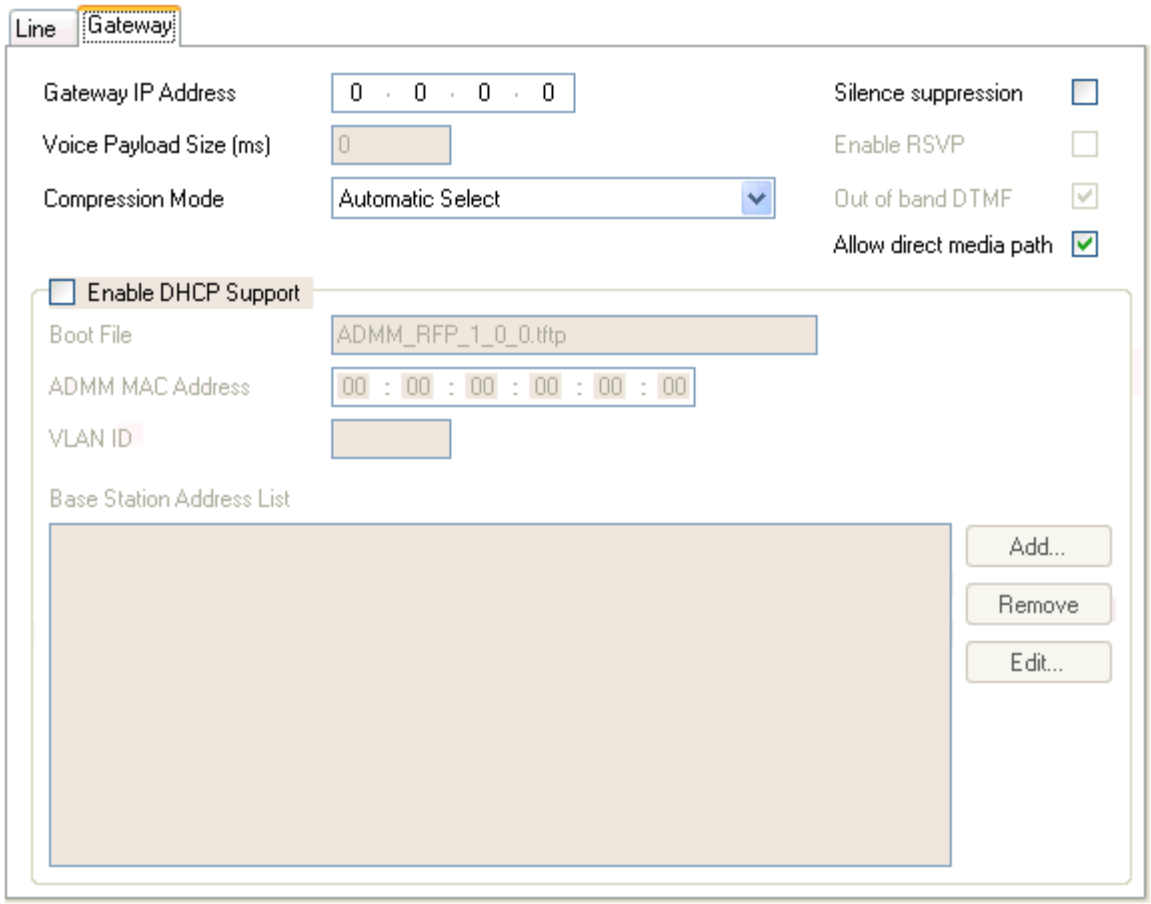
Line Tab

All fields are read-only and cannot be configured.



- **Line Number** - auto-populated on IP DECT line creation, starting at 240.
- **Number Of Channels**, **Outgoing Channels** and **Voice Channels** - indicate the number of IP DECT extensions associated with the IP DECT Line.
- **Incoming** and **Outgoing Group ID** - auto-populated on IP DECT line creation, starting at 240. This value should NOT be used for outgoing call routing as trunks calls to an IP DECT line will not be successful.
- **Extensions**
  DECT extensions can be added using the menu in the normal extension area. The DECT extension must have the same number as created within the ADMM against the phone programmed. If an existing DECT Line is deleted all associated extensions are deleted after a operator warning. The operator is then asked whether to delete the users associated with the extensions.

Gateway Tab



- **Gateway IP Address** – enter the IP Address of the ADMM. When DHCP support is active the Gateway IP Address is reserved as a static assignment. '0.0.0.0' and the IP Office LAN1 or LAN2 addresses cannot be entered.
- **Compression Mode** – select the compression mode from the drop down list.
- **Silence Suppression** – when selected, H.323 terminals will not send data if they are silent, this is useful when optimizing data traffic.
- **Allow Direct Media Path** – when disabled, the media (voice) path always passes through the IP Office Unit. When enabled, the remote end may be told of a new IP address for the media path if, for example, the call is transferred to a H.323 extension. Enabling this option may cause some vendors problems with changing the media path mid call.
- **Enable DHCP Support** – to enable DHCP support check the **Enable DHCP Support** check box. This will allow the IP Office DHCP server to provide DHCP and TFTP service to the ADMM and any associated IP Base Station.

When checked the IP Office Manager validates the following items:

- The IP address of the ADMM is within one or other (if LAN2 supported) of the DHCP server ranges, and that the DHCP server is enabled.
- The TFTP server address is populated on the **System | System tab**.
- Enough DHCP addresses are available for all IP Base Stations.

If any of these checks fail, a warning is displayed.

- **Boot File** - indicates the location and name of the IP Base Station program file. It must be populated at all times and a maximum of 31 alpha-numeric characters may be entered. The location is relative to the TFTP server root directory.
- **ADMM MAC Address** – enter the Ethernet hardware address of the IP Base Station that will act as the ADMM after the boot process completes. The value is in hexadecimal and may be entered with comma, dash or period separators.
- **VLAN ID** - enter the VLAN ID for the IP DECT. This will be supplied to all IP Base Stations in DHCP option. A decimal value between 0 and 4095 may be entered. Note that in normal operation a VLAN ID of zero is not supported by the Base Station.
- **Base Station Address List** - contains a list of all the IP Base Stations associated with the ADMM. The ADMM's own MAC address does not need to be present. Entries may be added or deleted by a right click or the insert/delete key. The value is in hexadecimal and may be entered with colon, dash or period separators.

DECT Extensions

To create a DECT extension:

1. Select **Extension** from the Manager tree.
2. Right click in the Right hand pane.
3. Select **New** and then select **DECT Extension**.

Notes

- The DECT Extension menu will only be active if at least one IP DECT Line has been configured.
- Up to 120 IP DECT extensions may be created.
- To view the configuration of the DECT Extension, double-click **IP DECT Extension**.

Program the **Name** field as entered on the ADMM Base Station. The maximum number of DECT extensions allowed is 120. When **OK** is pressed, a validation routine is used to ensure that the extension number is valid, between 2 and 9 digits, and that the number does not conflict with an existing extension number.

When the user is created, **Call Waiting On** is enabled. This is because an IP DECT extension cannot have call appearance keys.

DECT Users

Users and CfgUser objects are created when the DECT Extension window **OK** button is pressed and the configuration is completed. New users are created with certain defaults, including No Call Appearances, No Answer Time of 15 seconds. It also has a default Individual Coverage Timer of 10 seconds and a default source number of “V” followed by the extension number.

There is no operator indication that this user is associated with a DECT extension, and so will be capable of functions similar to any other user. As stated previously, any digital telephony features which are configured will be ignored.

Configuring the Avaya IP DECT Mobility Manager

- The ADMM can be configured via HTTP using a standard web browser. The ADMM acts as an HTTP server. The HTTP server binds to port 80, by default. If executed in host mode, the port can be configured via a command line interface (CLI).
- The configuration data will be either read from the internal flash memory or from a local file. A local file is only used if specified on the command line on a PC host.
- The configuration file is a human readable ASCII file. Changing the configuration file outside the ADMM is not permitted.
- The configuration file can be downloaded and uploaded via the web interface.
- Service access is restricted to one active session at a time and is password protected, with an idle time out.
- The browser used for service access has to be at least Microsoft Internet Explorer 6.0 or Mozilla Firefox 1.0 and must have frame support, javascript and cookies enabled. If either javascript is missing, or cookies are not allowed, a warning message will be displayed.

Service Login Procedure

A user must authenticate with a user name and a password. Both strings are checked case sensitive. The ADMM allows only one user at a time to configure the system. If ADMM is already in use, you will receive the message "ADMM Locked The Avaya IP Dect Mobility Manager is already in use by another user".

The connection will automatically be dropped if the maintainer/installer stays connected for 5 minutes without any activity.

After login, the following options are available:

- Configuration of general IP DECT system parameters.
- Administration of IP Regions.
- Administration of the attached IP Base Stations.
- Administration of IP Trunks.
- Administration of the IP DECT phones.
- Configuration of the System Features.
- Administration of the licence options.

If no action takes place, the ADMM will log you out after 5 minutes.

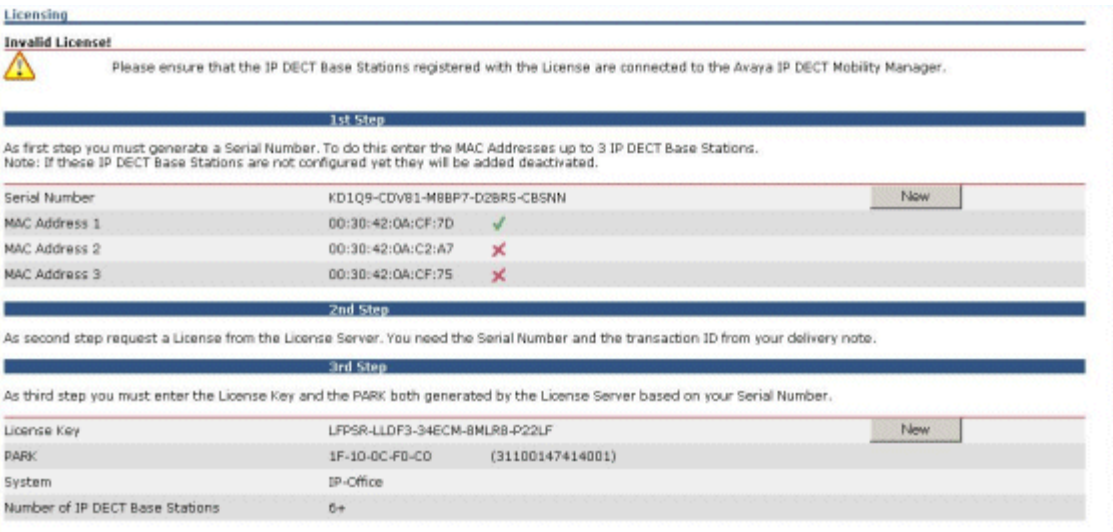
To exit the system, click **Logout.**

Note

- If the browser is closed without logging out first, the service access will be blocked for 5 minutes.

Licensing

Within the initial configuration of the IP DECT system, if the Invalid License warning is displayed.



The red cross means that the IP Base Station with that MAC address has not tried to connect with the ADMM.

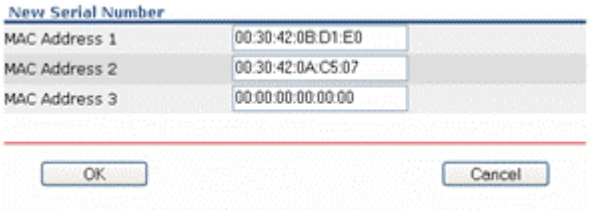
Check that Base Station is running, and the ADMM's IP address is correct.

A green tick appears as soon as the Base Station is connected with the ADMM (The Base Station's IP address will be visible on the IP DECT Base Station list).

Definition of the Licence for IP DECT Base Stations

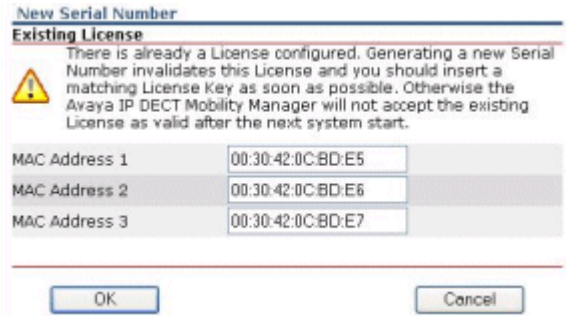
The Licences for IP Base Stations have to be defined in a manner as described in About Licensing.

Press the **New** button and add the MAC addresses of the Licence IP Base Station(s) and press **OK**:



Note

- The number of IP Base Stations on your system will determine the number of License IP Base Stations you need (1, 2, or 3). All other Base Stations must be manually configured, see IP DECT Base Station Configuration. If you attempt to add more License IP Base Stations than you require, a warning will be displayed.



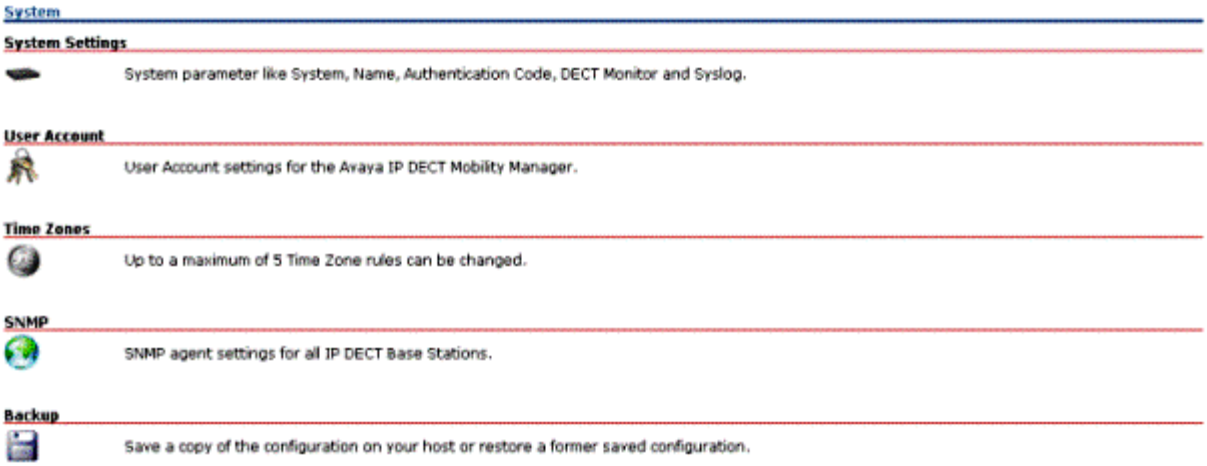
Wait for the green tick as shown:

Getting and Adding the Licence Key and PARK Number

The second step is to go to the DeTeWe website and enter the serial number generated by the first step along with a TAN from your documentation. This will generate a license key that is to be entered in the 3rd step.

If the license is valid, the warning **Missing Licence** will disappear.

System



System Settings

The system settings cover global settings of the ADMM such as the system name.

For monitoring the DECT system behaviour of the ADMM, a separate application will be delivered. This tool needs an access to the ADMM which is disabled by default and can be enabled on the system page.

The ADMM and the IP Base Stations are capable of propagating syslog messages conforming to RFC 3164. This feature together with the IP address of a host collecting these messages can be configured.

If the ADMM is running on an IP Base Station and SNTP is not used, date and time can be configured at the ADMM. This has to be done to provide date and time to the 3711.

The time zone, which is shown on this web page, has been configured at the IP region section of the web service.

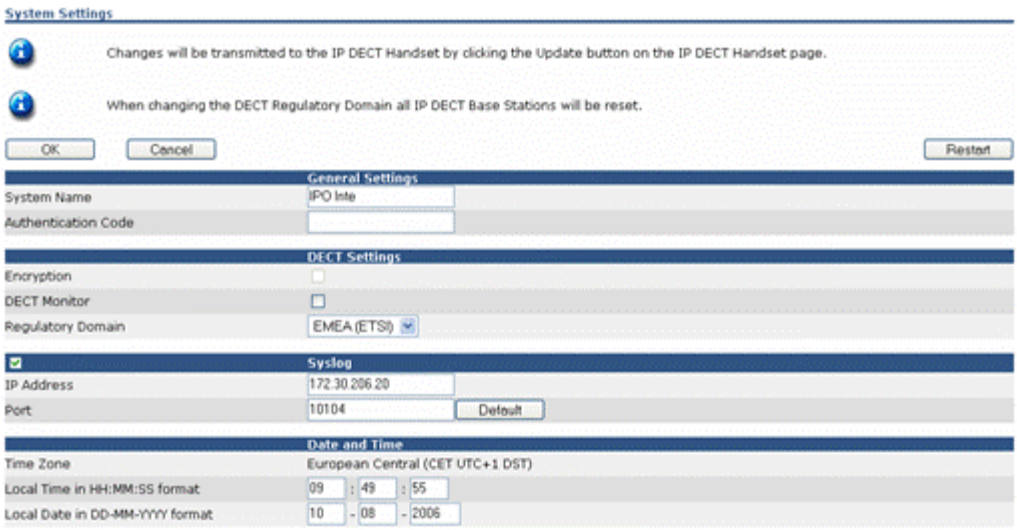
Note

- The date and time has to be configured after every restart of the IP Base Station, where the ADMM is running.

The date and time will be provided by the ADMM to the 3711 if the 3711 initiates a DECT location registration. This will be done in the following cases:

- Subscribing at the ADMM.
- Entering the network again after the DECT signal was lost.
- Power on.
- Silent Charging feature is active at the phone and the phone is taken out of the charger.
- After a specific time to update date and time.

The DECT location registration can be forced with **Update** at the **IP DECT Handsets** section of the web service. (see Configuration of Telephones)



Encryption

Encryption is only available if RFP32/34 (not RFP31/33) are used.

Therefore it can only be enabled on the “System Settings” web page if no RFP31/33(/41) has been connected to the ADMM.

If encryption is enabled and an RFP31/33(/41) connects to the ADMM, its DECT air interface will not be activated. The user always has the possibility to disable encryption. In this case all connected RFP31/33(/41) are restarted.

Note: The handsets have to support DECT encryption which is not a mandatory feature.

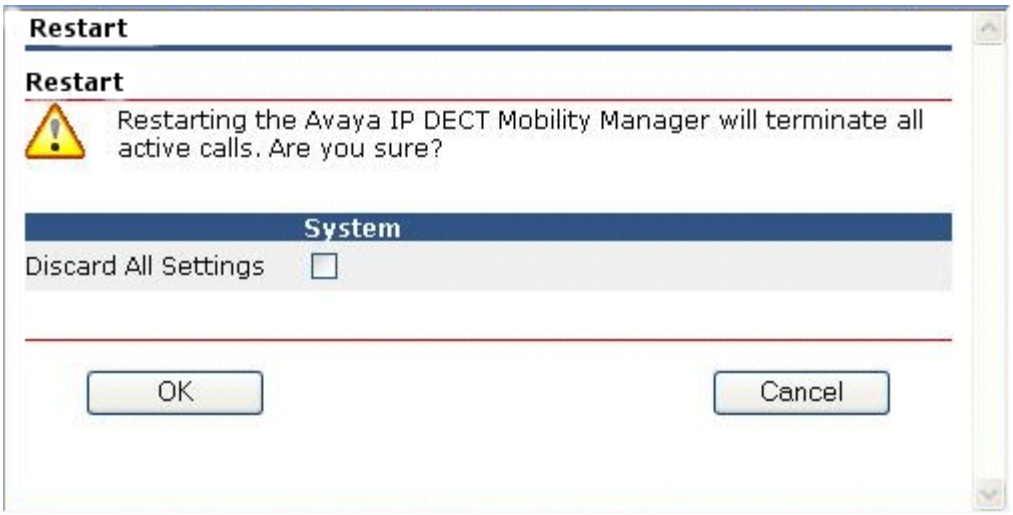
Regulatory domain

To define where the IP DECT is used the parameter regulatory domain has to be configured. Existing installations are updated to the default value “EMEA (ETSI)”. To setup an FCC compliant installation the value has to be set to “US (FCC/CI)”.

ETSI compliant IP Base Stations are inactive and can not be activated if the regulatory domain is set to “US (FCC/CI)” and vice versa.

Restarting the ADMM

To restart the ADMM, select **System Settings** from the navigation menu and then select **Restart**. There is also the option to reset the configuration.

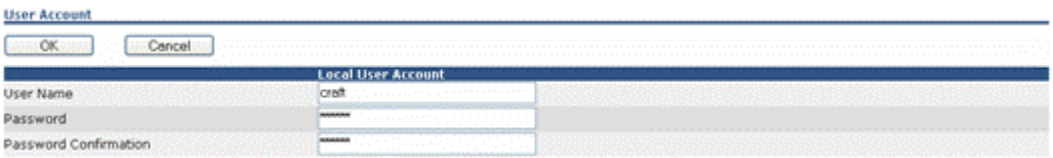


If ADMM is restarted from either the System, Backup or license web page screens, the following message is displayed:

The login Web Page is displayed automatically if the ADMM is available after Restart.

User Account

Initially the IP DECT service is accessible via a build-in user account only. After initial installation or after removing the configuration file, the user account is set to the user **craft** with the password **crftpw**. The both are case sensitive.

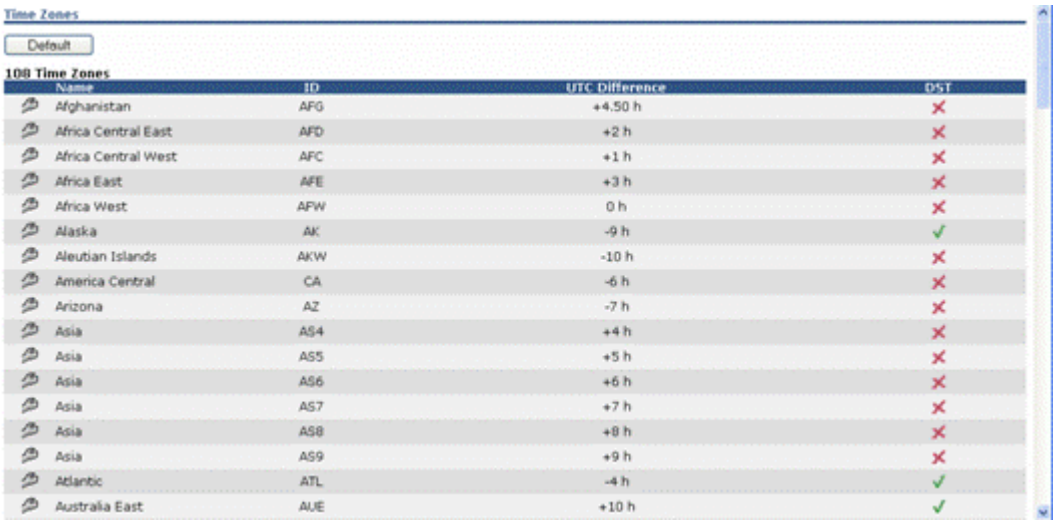


Time Zones

The local time and date displayed on the 3711 phone, depend on the IP region the IP DECT phones are located in. Each IP region is configured to a certain time zone. Based on this, the local time can be calculated individually (depending on the current date and the daylight savings time rule).

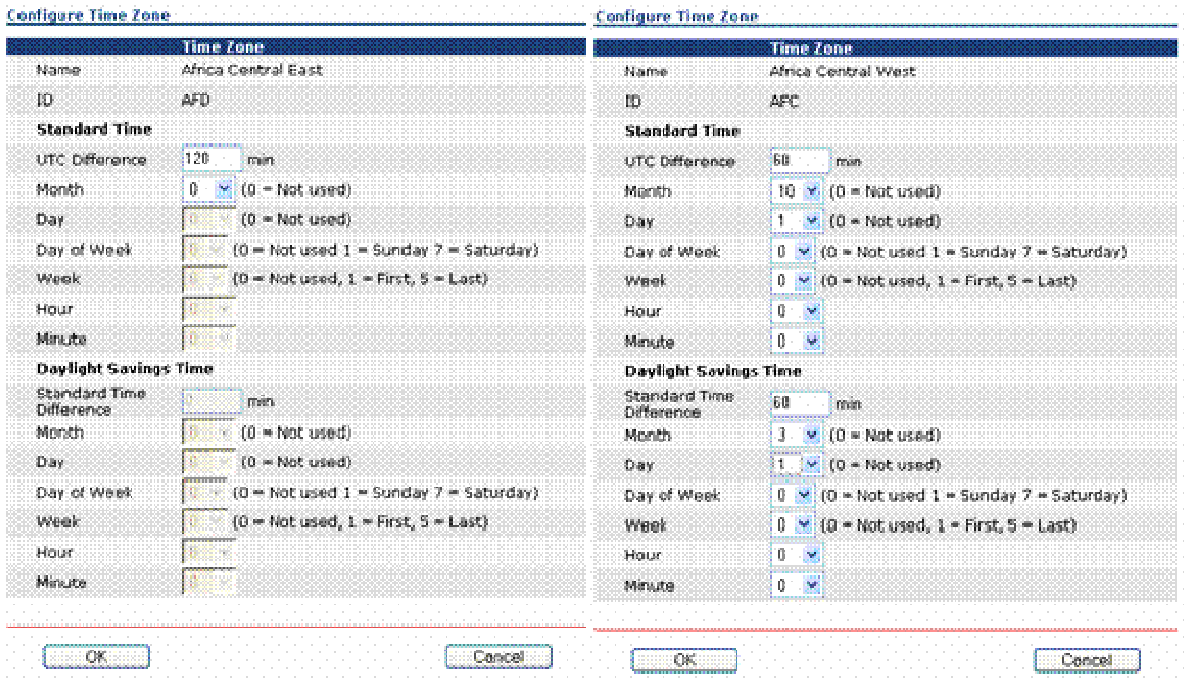
In the time zone section, the ADMM provides all available time zones. They are set per default with their known daylight savings time rules adjusted to the Universal Coordinated Time (UTC). The difference to the UTC time is shown in the “UTC Difference” column. In case of a daylight savings time rule, this is also marked for each time zone.

It is possible to change the time zone rules for up to five time zones. Changed rules are marked with a bold time zone name in the table. The changes are saved in the configuration file and are restored after each ADMM boot up. The Default button sets all time zones back to the default values and deletes the changed time zone rules in the configuration file.



Within the Configure Time Zone screen, the standard time and the daylight savings time (DST) of a time zone can be changed.

If the time zone has no DST only the UTC difference can be configured. For the DST, both points of time (begin of standard time and begin of daylight savings time) have to be specified exactly. A certain day in the month or a certain week day in a month can be used, as shown in the following figure:



SNMP

In order to manage a large network of IP Base Stations, there is an SNMP agent in each IP Base Station. This gives alarm information and allows an SNMP management system (such as HP OpenView) to manage this network.

All agents are configured in a central place. IP Base Station dependent parameters like sysLocation and sysName are generated:

- **sysLocation** corresponds to the location configured via web service. If this location is not configured sysLocation is set to “Location”.
- **sysName** is composed of MAC address and “IP Base Station” or “ADMM IP DECT Base Station” if the ADMM is running on this IP Base Station.

How long an IP Base Station is in operational state, can be requested by reading sysUpTime. This value indicates the running time of the IP Base Station application software. It does not indicate the running time of the operating system which does not correspond to the operational IP Base Station state. This value does not make a statement about the DECT network.

The SNMP agent responds to SNMPv1 and SNMPv2c read requests for the standard MIB-II objects. The MIB-II contains 11 object groups, see MIB_II.

The agent supports both SNMPv1 and SNMPv2c traps. It sends a 'coldStart' trap when it first starts up, and an enterprise-specific trap 'nsNotifyShutdown' when it stops. When it receives a SNMP request using an unknown community name it sends an 'authenticationFailure' trap. The agent generates an enterprise-specific trap 'nsNotifyRestart' (rather than the standard 'coldStart' or 'warmStart' traps) after being re-configured.

Decoding SNMP messages with your network management system or MIB browser always requires the publicly available IETF MIB definitions.

- RFC1213-MIB
- RFC1212-MIB
- RFC1155-SMI
- SNMPv2-MIB
- SNMPv2-CONF
- SNMPv2-TC
- SNMPv2-SMI.

Enterprise-specific traps can be decoded using the definitions in:

- NET-SNMP-MIB
- NET-SNMP-AGENT-MIB.

The following parameters can be configured using the ADMM web service:

- Read-only Community
- System Contact
- Activate Trap Handling
- Trap Community
- Trap Host IP Address

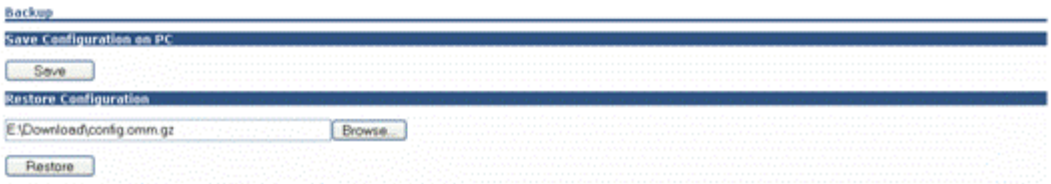
The community names are used for both SNMPv1 and SNMPv2c.

The IP Base Station needs an initial ADMM connection to receive its SNMP settings. After that, this data is persistent against resets. Changing the SNMP configuration forces all agents to be re-configured.

The agent does not support MIB-II write access, SNMPv2-MIB read/write access, NET-SNMP-MIB read/write access, NET-SNMP-AGENT-MIB read/write access and SNMPv3.

Backup

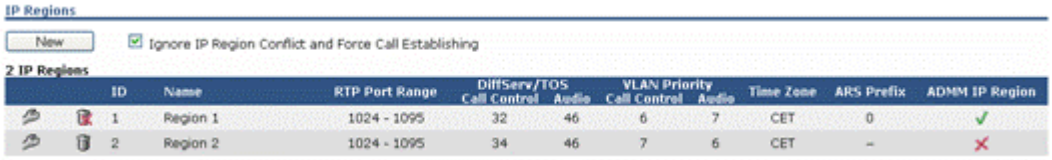
The web service interface allows to save a copy of the current configuration on the local host (host where the browser application is executed) as well as to restore an older configuration which has been previously backed up.



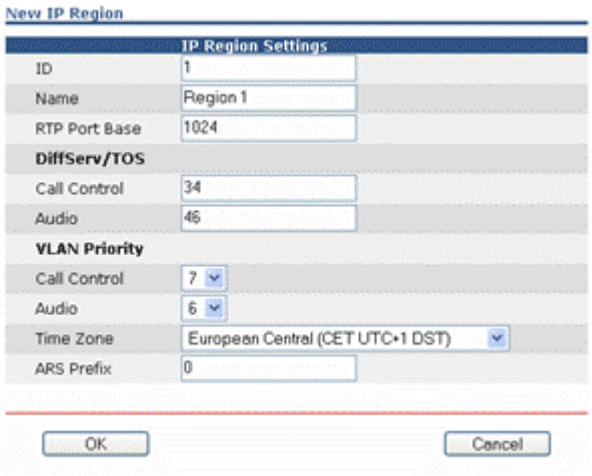
Restoring a previously saved configuration will lead to a reset of the ADMM to take effect.

IP Regions

An IP Region is used to define a relation between a IP Base Station and the IP Trunks which have to be used to communicate with the Avaya communication server. At least one region has to be administered before an IP Base Station or IP Trunk can be added.



IP Regions can be added to the system by pressing **New**. A popup window appears providing the configuration of a new Region:



The same popup window can be opened for an existing IP Region by pressing the icon of the appropriate region.

The checkbox ADMM Region is only available if the ADMM is running on a PC. Otherwise, the system will detect the ADMM Region by itself.

An IP Region can be deleted by pressing the trash icon. A similar popup window asks for confirmation showing the current configuration of this IP Region.

Note

- Deleting an IP region from the system requires all related IP trunks and IP Base Stations to be deleted first. This is indicated with a crossed out trash icon.

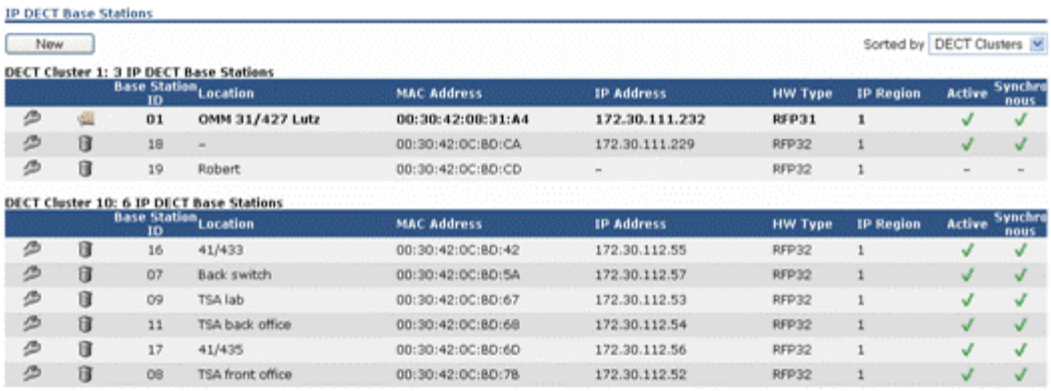
IP DECT Base Station Configuration

All configured IP Base Stations are listed in tables grouped into clusters by their topographic relations. The IP Base Stations are sorted by their Ethernet addresses.

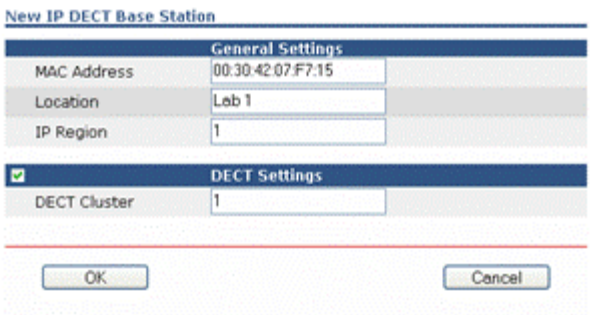
To ensure a correct hand over of a phone during a call, all involved IP Base Stations must deliver the same clock signal to the phone. This is achieved by placing the IP Base Stations so close to each other, that every IP Base Station recognises at least one other IP Base Station through its air interface.

There are conditions where this is not possible, for instance with IP Base Stations at remote locations. In this case, the IP Base Stations shall be grouped to different clusters. The ADMM will not try to synchronize IP Base Stations over cluster borders.

All non-empty clusters are displayed in the navigation bar on the left side.



- The IP DECT Station running ADMM is displayed in bold font.
- Each IP Base Station is identified by its Ethernet address (6 byte hex format, colon separated). The Ethernet address is unique and can be found on the back of the chassis.
- For easier administration, each IP Base Station can be associated with a location string. The location string can hold up to 20 characters.
- New IP Base Stations can be added to the system by pressing **New**. A popup window appears providing the configuration of a new IP Base Station. Before an IP Base Station can be added the associated IP region has to be configured.



Note

- Adding a new IP Base Station to the system requires an IP Region to be configured first.

The same popup window can be opened for an existing IP DECT Base Station by pressing the icon of the appropriate IP Base Station.

An IP Base Station can be deleted by pressing the trash icon . A similar popup window asks for confirmation showing the current configuration of the IP Base Station. However, the IP Base Station running ADMM cannot be deleted.

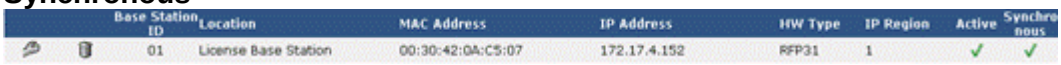
DECT Configuration

The DECT functionality for each IP Base Station can be switched on/off. If DECT is active, the IP Base Station can be added to a cluster and the master option can be set. There is only one master setting per cluster.

States of an IP Base Station

For each IP Base Station the state of the DECT subsystem is displayed. The states are:

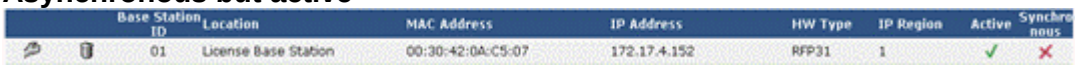
- **Synchronous**



		Base Station ID	Location	MAC Address	IP Address	HW Type	IP Region	Active	Synchronous
		01	License Base Station	00:30:42:0A:C5:07	172.17.4.152	RFP31	1	✓	✓

The IP Base Station is up and running. The IP Base Station recognises and is recognised by other IP Base Stations in its cluster through its air interface and delivers a synchronous clock signal to the phones.

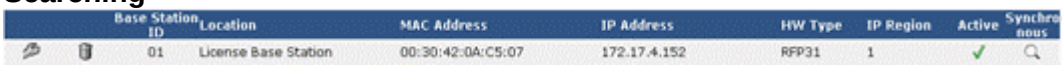
- **Asynchronous but active**



		Base Station ID	Location	MAC Address	IP Address	HW Type	IP Region	Active	Synchronous
		01	License Base Station	00:30:42:0A:C5:07	172.17.4.152	RFP31	1	✓	✗

The IP DECT Base Station has not been able to synchronize to its neighbours yet. No DECT communication is possible, nevertheless the IP Base Station has already been able to connect the ADMM. This phase should only last for a few seconds after starting up the IP Base Station or the ADMM. If this state lasts longer, it maybe an indication of a hardware or network failure.

- **Searching**



		Base Station ID	Location	MAC Address	IP Address	HW Type	IP Region	Active	Synchronous
		01	License Base Station	00:30:42:0A:C5:07	172.17.4.152	RFP31	1	✓	

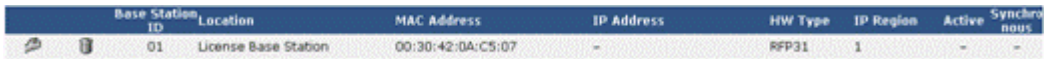
The IP Base Station has lost synchronisation to its neighbours. No DECT communication is possible. This phase should only last for a few seconds after starting up the IP Base Station or the ADMM. If this state lasts longer or is re-entered after being in a synchronous state, it maybe an indication of a bad location of the IP Base Station.

- **Inactive**

		Base Station ID	Location	MAC Address	IP Address	HW Type	IP Region	Active	Synchronous
		01	License Base Station	00:30:42:0A:C5:07	172.17.4.152	RFP31	1	✗	-

The IP Base Station is connected to the ADMM but the air interface has not been switched on yet. For any IP Base Station with activated DECT functionality, this phase should last only for a few seconds after starting up the IP Base Station. If this state lasts longer, it may indicate a hardware failure.

- **Not connected**



		Base Station ID	Location	MAC Address	IP Address	HW Type	IP Region	Active	Synchronous
		01	License Base Station	00:30:42:0A:C5:07	-	RFP31	1	-	-

The IP Base Station was configured but has not connected to the ADMM yet.

The IP address column displays the current IP address of an IP Base Station.

IP Dect Base Station Hardware Type

When the IP Dect Base Stations are connecting to the ADMM, they submit their hardware type. This information is displayed on the IP Base Station list web page.

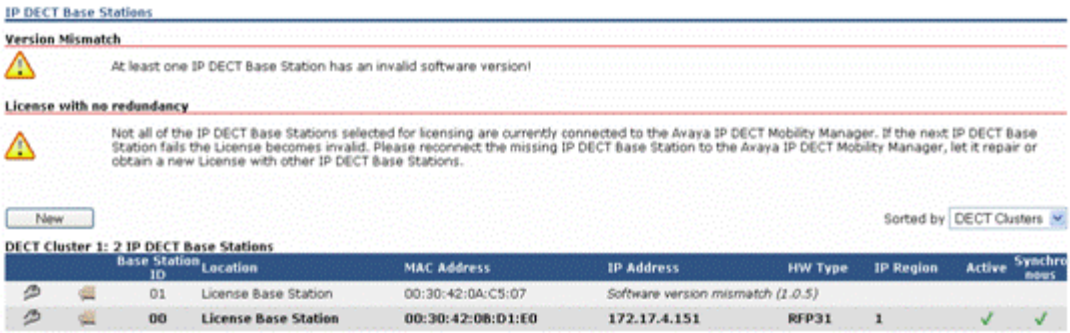
		Base Station ID	Location	MAC Address	IP Address	HW Type	IP Region	Active	Synchronous
		01	OMM 31/427	00:30:42:08:31:A4	172.30.111.232	RFP31	1	✓	✓
		18	Lab 1	00:30:42:0C:BD:CA	172.30.111.229	RFP32	1	✓	✓

ADMM/Base Station Software Version Check

The RFP32 Base station requires a software version of 1.1.0 or above. The recommended version is 1.1.2. If you wish to run a mixed scenario using both the RFP32 and RFP31 Base Stations, you must upgrade the RFP31 to the required software version.

When the Base Stations connect to the ADMM they submit their software version. If this version differs from the ADMM software version the Base Station connection attempt is rejected. This could happen when using several DHCP servers with different IP DECT software versions. In this case the Base Station is marked with an error message.

Moreover a global error message is displayed on the IP Base Station list web page if at least one version mismatch has been found.



Upgrading the ADMM\Base Station Software

When upgrading an existing installation (consisting of RFP31 and/or RFP33) and when adding a new base station RFP32 or RFP34 to the system, an ADMM configuration backup is recommended. See Backup

The latest version of the software can be found on the Administration CD.

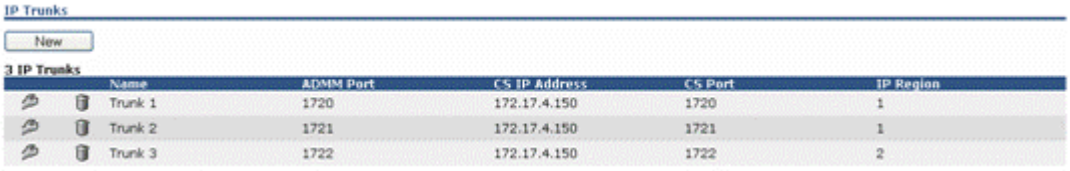
To upgrade the software version:

1. Backup all ADMM configurations.
2. Install the upgrade software on the TFTP server (minimum version of 1.1.2)
3. Restart the ADMM. The TFTP server will upgrade the ADMM at startup.
4. Restart any existing IP Base Stations.

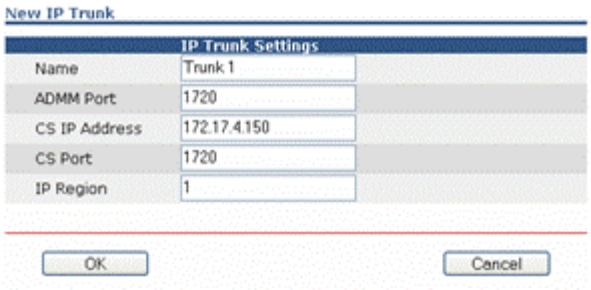
Any new Base Station added will automatically pickup the latest version at startup.

IP Trunks

An IP trunk defines a communication relation between an ADMM and IP Office for X-Mobile signalling.



IP trunks can be added to the system by pressing **New**. A popup window appears, providing the configuration of a new trunk. Before a trunk can be added, the associated IP region has to be already configured.



The following parameters have to be set:

- ADMM Signalling Port.
- Communication Server Signalling IP Address.
- Communication Server Signalling Port.

Note

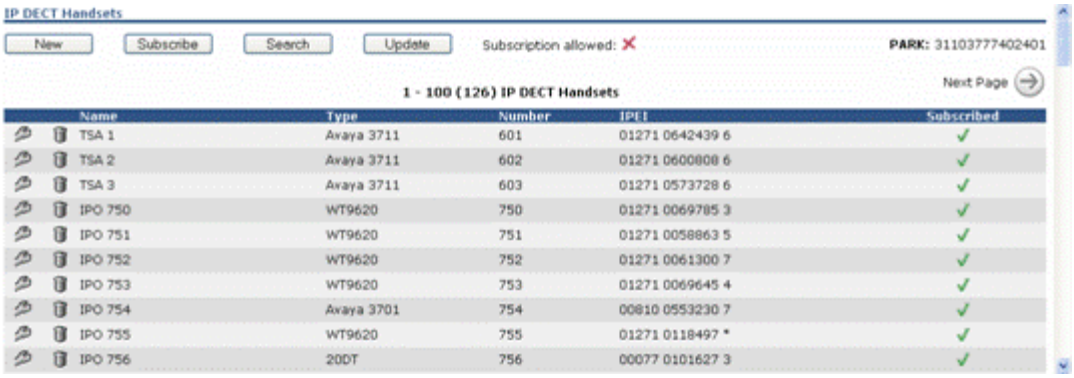
- Adding a new IP Trunk to the system requires an IP region to be configured first.

The same popup window can be opened for an existing IP Trunk by pressing the tool icon of the appropriate trunk.

An IP trunk can be deleted by pressing the trash icon . A similar popup window asks for confirmation showing the current configuration of this IP Trunk.

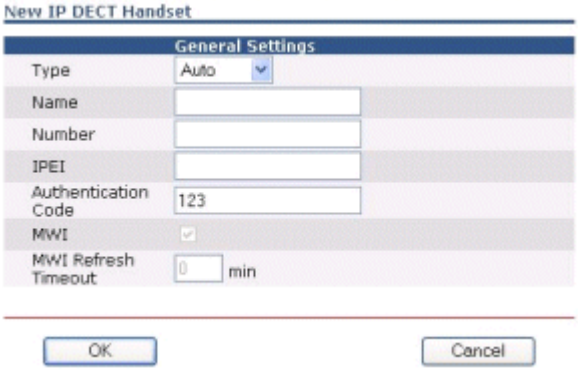
Configuration of Telephones

At the telephones web page, all configured DECT phones are sorted by their number.



Name	Type	Number	IPEI	Subscribed
TSA 1	Avaya 3711	601	01271 0642439 6	✓
TSA 2	Avaya 3711	602	01271 0600800 6	✓
TSA 3	Avaya 3711	603	01271 0573728 6	✓
IPO 750	WT9620	750	01271 0069785 3	✓
IPO 751	WT9620	751	01271 0058863 5	✓
IPO 752	WT9620	752	01271 0061300 7	✓
IPO 753	WT9620	753	01271 0069645 4	✓
IPO 754	Avaya 3701	754	00810 0553230 7	✓
IPO 755	WT9620	755	01271 0118497 *	✓
IPO 756	20DT	756	00077 0101627 3	✓

A new phone can be added to the system by pressing **New**. The following popup window appears allowing the configuration of a new phone:



The type of phone will be automatically detected (in the case of the 3701 and 3711 phones). If the type of phone cannot be detected, it will automatically be set to WT9620.

If the type (WT9620, 20DT, GAP) of phone is configured before subscription and the type cannot be detected then the configured type will be used.

The Name and Authentication Code fields are optional settings. The Number is displayed in the DECT Monitor program and the Name identifies its user. The Authentication Code is used during initial subscription as a security option.

A similar popup window appears when configuring an existing phone by pressing the tool icon . The only difference is the delete subscription checkbox. If this option is selected, the phone will be un-subscribed.

Note

- The Authentication Code can only be changed if the phone is not subscribed. The phone Name can be changed, but this will not take effect until the phone is subscribed again.

Deleting a phone can be done by pressing the trash icon. A popup window appears and asks for confirmation.

After adding a phone to the ADMM, the phone must be subscribed. This is done by pressing **Subscribe**. The ADMM will allow a subscription of configured but not subscribed phones during the next hour (see Registration_of_Avaya_3711).

During the subscription process, the system wide PARK and the Authentication Code either configured for the phone or system wide must be entered in the phone form fields. The PARK is displayed at the phone configuration page in the top right corner.

Update Phone Configuration

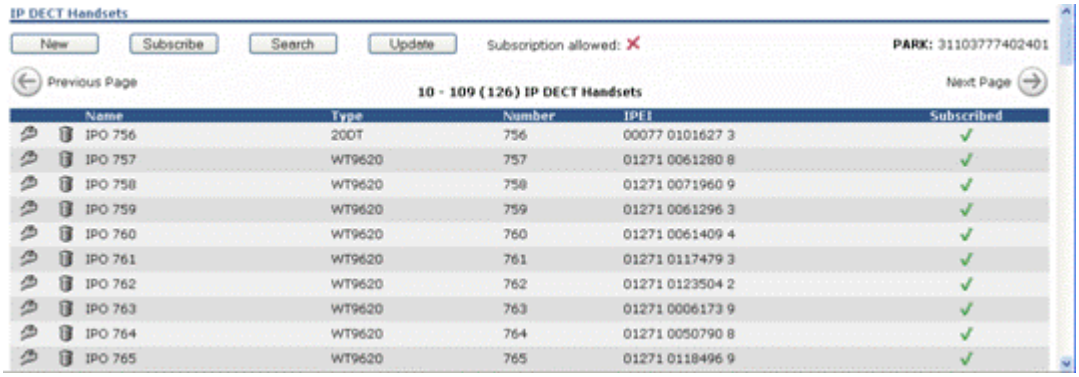
To force an update of date/time, voicemail number or the (de)activation of Media Server System Features (MSSF) items immediately on the 3711, press **Update**.

Search Facility

If you want to check the configuration settings of a particular phone, you can use the search facility. When the Search button is selected, the following popup window is displayed:

1. Enter either the phone number, the IPEA or both.
2. Click OK to search. or Cancel to close the window.

If the phone is found, the page will be displayed with the phone listed in the first entry position.

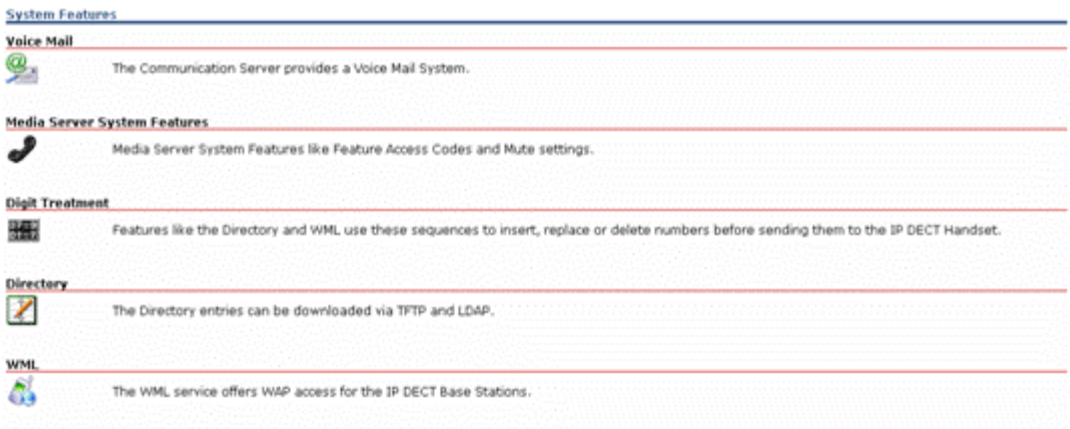


If the specified number or IPEA was not found, the following message is displayed:

If number is valid, configure the phone by selecting **New** as above.

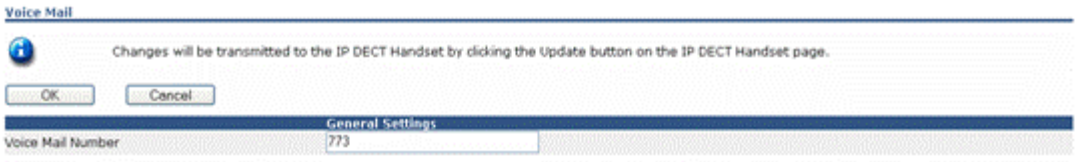
System Features

The System Features allow you to configure the system for your Media Server.



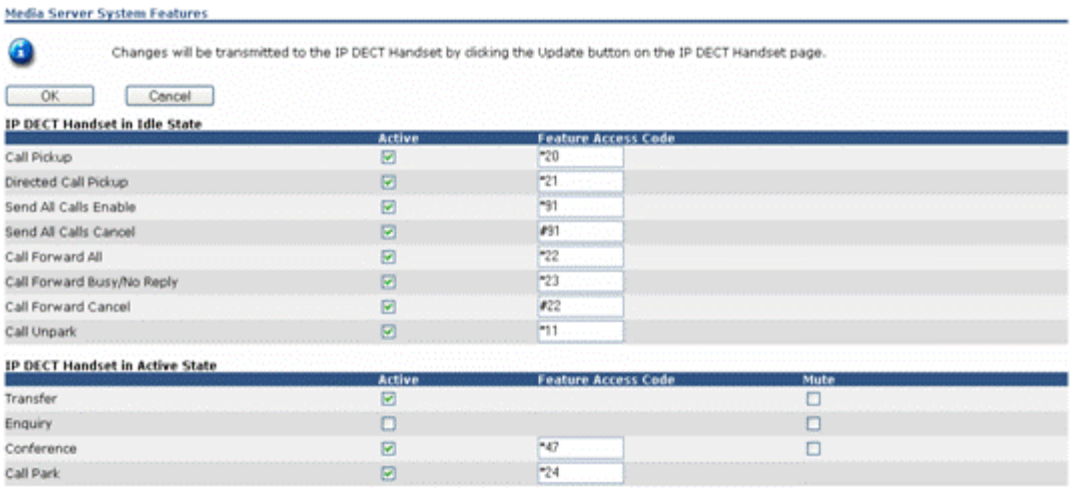
Voice Mail

The voice mail number can be administered in the ADMM web service which will be common for all subscribed DECT users. If the voice mail number for the DECT users is not a common number, it should be left blank in the ADMM web service and has to be set on the DECT handsets.



Media Server System Features

The Media Server System Features allows you to configure the call handling preferences for the IP DECT phones. The configuration is sub-divided into the Idle State and the Active State.



On the 3711 phone, press **Menu** in idle state or **Option** in active state, to show menu items on the display. These menu items are configured by the ADMM. If these features are not configured (or the **Active** check box is not checked), they will not be displayed.

For each menu item to be presented to the user, check the **Active** checkbox next to the feature. For each menu item **NOT** to be presented to the user, uncheck the **Active** checkbox next to the feature.

The active flag can only be set if the Feature Access Code field is assigned with appropriate digits and characters (0-9, *, #).

To mute the phone during the execution of some system feature, check the **Mute** checkbox.

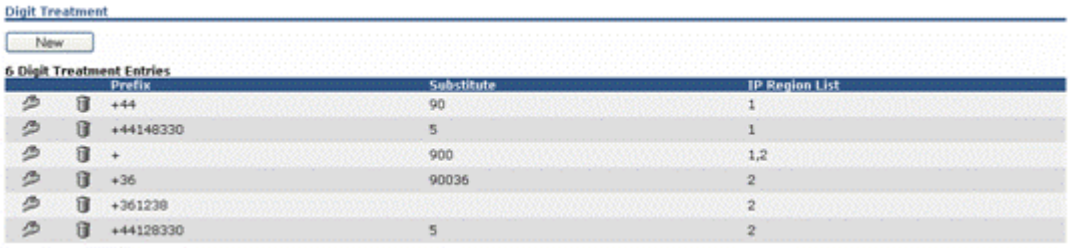
The menu items appear on the phone display in the user selected language. By changing the language the menu items will be updated.

Note

- When configuring the Media Server System Features, the ADMM options may not be the same as the Media Server. For example; the Call Forward Busy/No reply has a combined option in the ADMM. On IP Office, this is two separate options. You can choose either option by entering the relevant Feature Access Code.

Digit Treatment

The Digit Treatment replaces, deletes or inserts digits for numbers received by the Directory or WML. This function is region dependent.



The digits are treated in two steps:

- At first all invalid characters like space or hyphens are removed from the number (e.g. “+49 (30) 6104 4492” will be substituted by +493061044492).
- In second step, the best match is searched within the configured prefix list which is valid for the region the telephone is located. The prefix will be substituted (e.g. the best match for the number “+493061044492” is the prefix “+49306104” with the substitute “”; the result is “4492”).

The digit treatment takes place before the number will be transmitted to the portable part menu.

Value ranges and limits:

- Up to 128 entries if ADMM is running on a IP Base Station.
- Each prefix may be composed of the digits (0-9) and the characters ‘*’ and ‘’#’. In conformance to LDAP standards, the first character may be ‘+’. Up to 15 digits per sequence are possible. Spaces are not allowed.
- Each substitute may be composed of the digit (0-9) and the characters ‘*’ and ‘’#’.

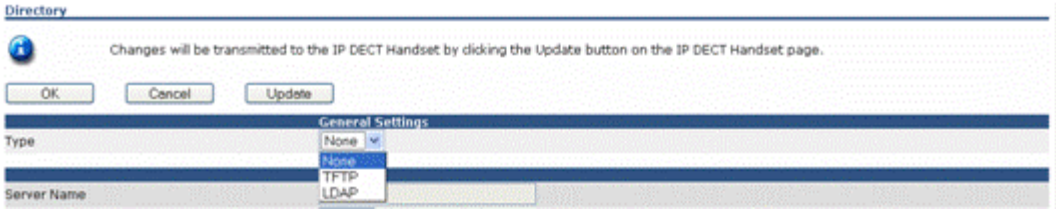
Entries may be valid for several regions. The region numbers have to be separated by ‘,’ (e.g. 1,2,3) or may be defined as range by ‘-‘ (e.g. 1-3).

Directory

As an administrator, you can configure a LDAP or TFTP based directory.

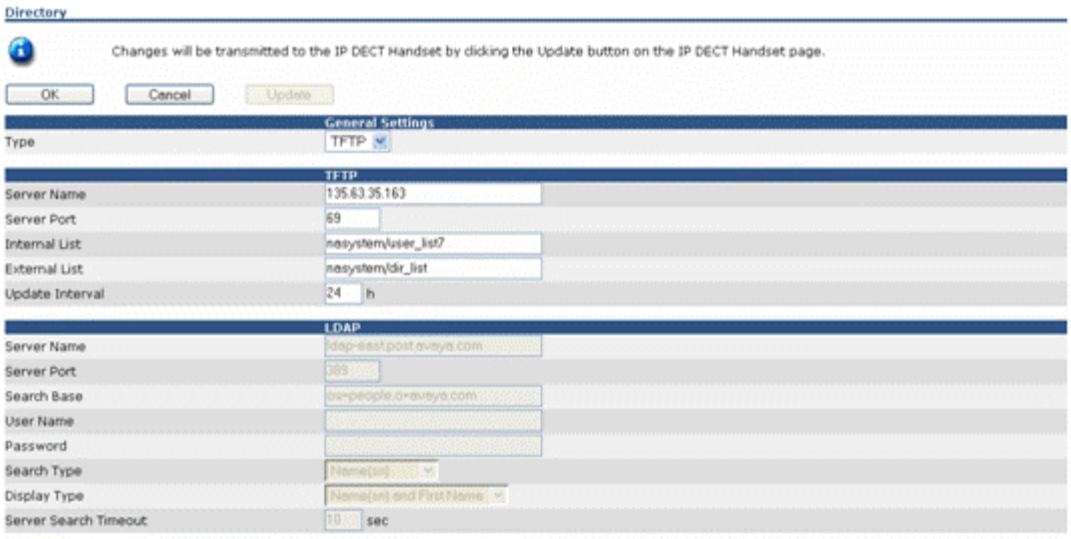
Directory Type (values: TFTP, LDAP or none; default: none)

In **none** is selected, the feature is inactive and no item for the directory is displayed in the phone menu.



TFTP Based Directory

The fields for TFTP based directory can be edited, if the **Directory Type** is set as **TFTP**.



Field description:

- **Server Name** (mandatory):
  - Server Name or Server IP Address
  - Server Port (default: 69)
- **Internal List**

Path and file; sequence of up to 127 characters, default: "nasystem/user_list7"

The entries in the file look like: "Percy,201,Percy Sudden". This is the User Name, Extension Number and User Full Name.

- **External List**

Path and file; sequence of up to 127 characters, default: "nasystem/dir_list"

The entries in the file look like: "John Smith,01983 562335", without ", and entries are separated by '\n'. The first element is the name and the second is the phone number.

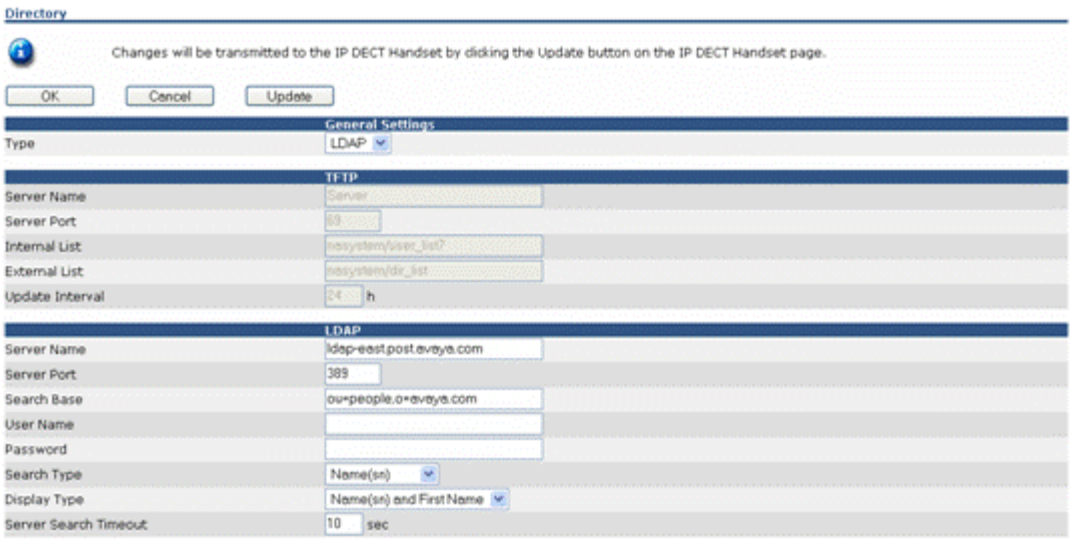
- **Update Interval** (mandatory)

The directory is updated within the time interval (hours) by reading the lists automatically from the TFTP server. If zero is typed, no update will be done.

Clicking the update button initiates an immediate reading from the TFTP server.

LDAP Based Directory

The fields for LDAP based directory can be edited, if the **Directory Type** is set as **LDAP**.



Field description:

- **Server Name and Port**(mandatory):
  - Server Name or Server IP Address
  - Server Port (default: 389)
- **Search Base**

Used in conjunction with the Server Name and Port, will retrieve the names from the company database and store the information on ADMM creating the directory.

- **User Name and Password**

A user name and password if required. Default = blank (anonymous bind).

- **Search Type**

The search attribute, select from either Surname (sn) and First Name (default) or Full Name (cn).

- **Display Attributes**

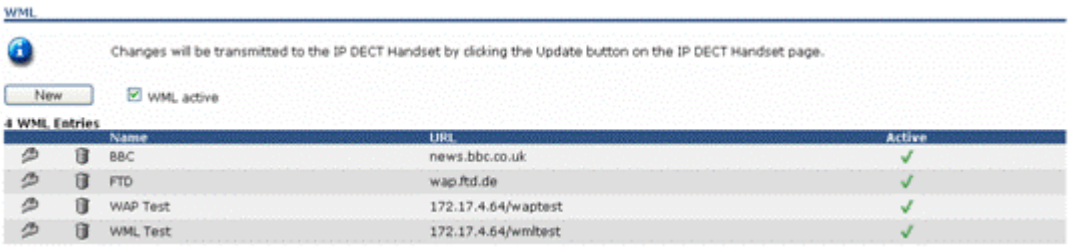
You can select from either Surname (sn) and First Name (default) or Full Name (cn).

- **Server Search Timeout**

The set time in the range 1-99 seconds, at which the search will be terminated. (default = 10)

WML

The ADMM supports a menu with up to 9 pre-configured URLs and one menu item which allows the user to enter an URL.



WML is enabled by:

- "**WML Active**" flag (to activate/deactivate the feature and the item in the PP menu; default: inactive).

To pre-configure a new URL, press **New**.

The following popup window is displayed:

Each pre-configured URLs is administered by filling the following fields:

- **Name** (Alias for the menu item be shown in PP menu)
- **URL** (for example: http//172.17.4.64/waptest).
- **Active Flag** (to activate/deactivate the item in the PP menu; default: inactive).

Further information for WML is available:

For more information on WML usage, see **WML** in the Functional Description.

For more information on WML Tags and Attributes supported, see **WML_Tags_and_Attributes.**

Functional Description

Registration of Avaya 3701 and 3711 Phones

You will need to subscribe the 3711 phone before use. To do so:

1. Short press **Menu**.
2. Select **System** and then press **OK**. **No Subscription** is displayed.
3. Press **New**.
4. Enter **PARK** and then press **go on**.
5. Enter the **Authentication Code** as set by ADMM Portable Parts menu.
6. Press **OK**.

If the registration was successful the name and the number configured on the ADMM web interface will be displayed.

WML

WML is only available for the 3711 phone. You can access a WML site as follows:

1. Press **Menu**.
2. Select **Directory** and then press **OK**.

Now you can navigate within the pre-configured URLs or select the user input to type your URL.

Notes

- To leave all levels within your navigation, short press **Esc**, which brings you up to the prior menu level. To leave the corporate, long press **Esc.**
- Edit fields are marked by **()**.
- Links are enclosed by **[**...**]**.

Pre-configured URL

- Select **WML Portal** and then press **OK**.

Now you can navigate within the WML pages if the URL is a valid link to a WML server.

User Input of URLs

1. Select **User Input**.
2. Press **OK** and then press **OK** again to open the edit field.
3. Type the complete URL and press **OK**.
4. Select the URL within the three alternatives which are offered: your original typed string being unchanged, or one of those which are added by **wap.** or **www.**.
5. Press **OK**.

Now you can navigate within the WML pages if the URL is a valid link to a WML server.

Directory

The directory is only available for the 3711 phone.

Note

- To leave all levels within your navigation, short press **Esc**, to return to the prior menu level. To exit the directory, long press **Esc**.

LDAP/TFTP Based Directory

The usage of both the LDAP and TFTP based directories are similar, but with the TFTP directory, you have to select between two phone books which distinguish between internal and external numbers.

To access the directory:

1. Long press **Menu**.
2. Select **Directory** and then press **OK**. Alternatively, press the ▼ (down) part of the  key. (With the ▲ (up) part, you have access to the local phone book.)
3. For **TFTP** based directories only, select **internal dir** or **external dir** and then press **OK**.
4. Enter a partly qualified string of the name you are looking for and press **OK**.
5. Select a user:
    - If you wish to call the user immediately, press **off hook**. The party will be called.
    - If you wish to see the corresponding number before calling the selected user, press **OK**.
    - If you are sure about the user number, press **OK** or **off hook**. The party will be called.

Otherwise press **Esc**, to return to the next lower menu level or long press **Esc** to exit the directory.

Message Waiting Indication for the 20DT Telephone

The 20DT phones Message Waiting Indication feature is not handled as per the 3701 and 3711 phones. The Message Waiting Indication feature for 20DT phones is achieved by mapping the systems message indication to a call indication from the voicemail to generate a call log entry, so you can retrieve this message by calling the voicemail entry.

The Message Waiting Indication feature is managed in the ADMM. The message waiting indication state is controlled for each 20DT phone until the voice message is retrieved from the voice box and the Avaya system is switched off this state.

Avaya System

Updating the 20DT phones message waiting indication state (For example, when switching the phone off or on or leaving and entering DECT areas), is covered by the ADMM. Therefore, the system does not repeat or refresh the MWI-on/off messages.

The system always notifies the change of the message waiting indication state for each phone, including turning off for power down/reboot, and the relevant ones on during startup.

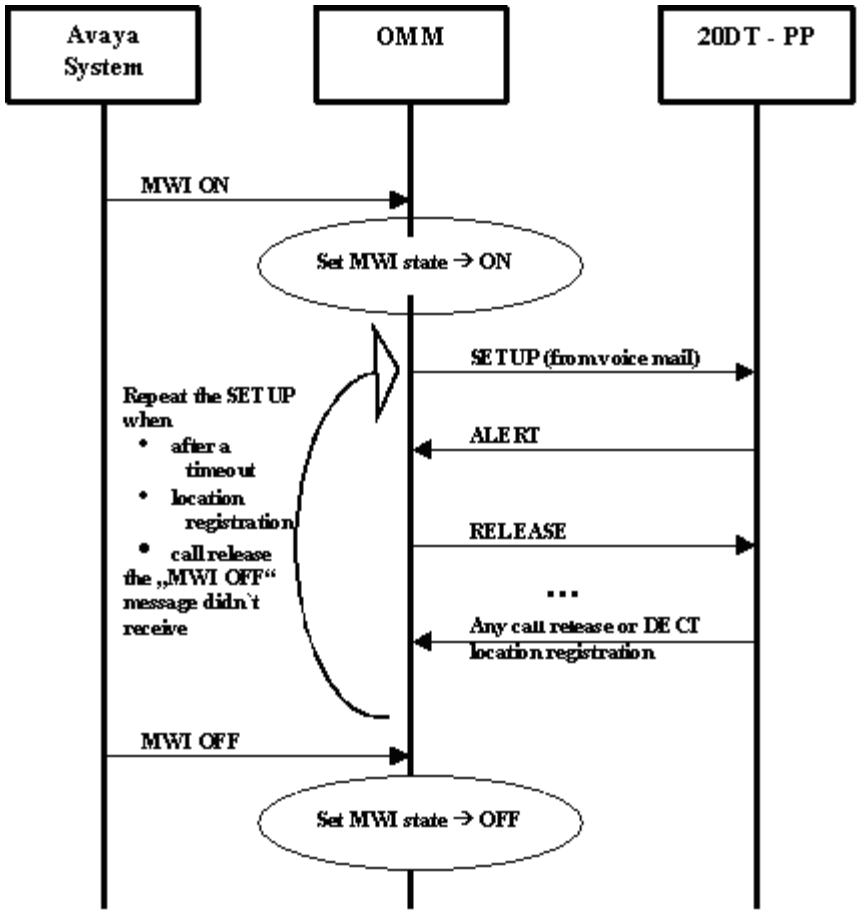
Avaya IP DECT Mobility Manager

For each 20DT phone, the ADMM handles the message waiting indication states transiently (i.e. is not saved over system reset). If the Avaya system sends an “MWI-on” message to a 20DT phone, the ADMM maps this message into a normal “SETUP” using the voicemail number as the calling party number. This call will be released immediately after it is established. It results in a short incoming call indication from the voicemail party and a new call log entry. You are able to call back to the voicemail to retrieve the voice message. This is done by the ADMM when the phone is not in a call state. Every time a call is released or a DECT location registration happens this scenario is repeated until the system switches off the message indication state.

An entry in the call log cannot be removed by the ADMM. In certain situations this could be confusing, for example; if the voicemail was already retrieved using another phone.

In addition, the 20DT phone is refreshed with the MWI on state after a certain time interval. This can be administrated for each phone using the ADMM web interface.

Message Sequence Chart



Configuration

The following administration must be done in the ADMM for the Message Waiting Indication feature (please refer to Configuring_the_Avaya_IP_DECT_Mobility_Manager):

Terminal type of 20DT phone:

Call number of the voicemail equipment to fill up the SETUP message.

Administration state for any 20DT phone to switch on and off the Message Waiting Indication feature.

Optional value for the refreshing cycle (0 – 60 minutes, default 0) for each 20DT phone to refresh the message waiting indication state on the phone.

Maintenance

Booter

Booter may be handled via DHCP Option 254 **UPDATE** automatically. In any case, you may have direct control to booter software, if you use a telnet user session.

Checking the IP DECT Base Station Booter Version

You can display the version information of the IP Base Station booter using the telnet interface of an IP Base Station.

Check the booter version to determine whether an update is required to overcome any user issues or to enhance the functionality:

1. Start a Telnet session using the IP address of the IP Base Station.
2. Enter login: **iprfp** and password: **crftpw**.
3. Enter **flash**.

The display will show the software and the hardware level of the IP Base Station:

```
> flash
version of initial booter : 2.0.12
Version of booter 1       : 3.2.8
Version of booter 2       : 3.2.8
Hardware Revision          : 51
MAC address               : 00:30:42:08:31:A4
>
```

Manual Update of the IP Base Station Booter

You can update the IP Base Station booter manually, if there is no opportunity to have an automatic update. Check the booter version to determine whether an update is required to overcome any user issues or to enhance the functionality:

1. Start a telnet session using the IP address of the IP Base Station.
2. Enter login: **iprfp** and password: **crftpw**
3. Enter **flash_update**.
4. Enter **flash_update** a second time for two booters.

Static Local Configuration

Checking the Local Configuration

You can display the local configuration settings of the IP Base Station, using the telnet interface of an IP Base Station.

1. Start a telnet session using the IP address of the IP Base Station.
2. Enter login: **root** and password: **avaya12**.
3. Enter **local_db**.

The display will show the local configuration settings of the IP Base Station:

```
>local_db
use_local_cfg=1
ip=172.30.111.234
subnet=255.255.0.0
siaddr=172.30.206.20
boot_file=/omm_avaya.tftp
ommip=172.30.111.234
```

Removing the Local Configuration

You can remove the local configuration settings of the IP Base Station using the telnet interface of an IP Base Station.

1. Start a telnet session using the IP address of the IP Base Station.
2. Enter login: **root** and password: **avaya12**.
3. Enter **local_db -c**.

All local network settings are removed.

```
> local_db -c
> local_db
```

Avaya 3701 Firmware

Checking the 3701 Phone Firmware Version

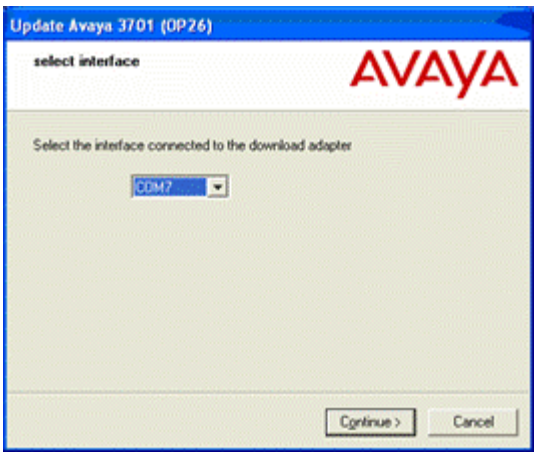
To display the version information of the 3711 phone:

1. Short press the “Menu” soft key
2. Enter the following key sequence “R***76#”
3. Select “Version Number”
4. Press “OK”. The display will show the software and the hardware level of the Avaya 3701

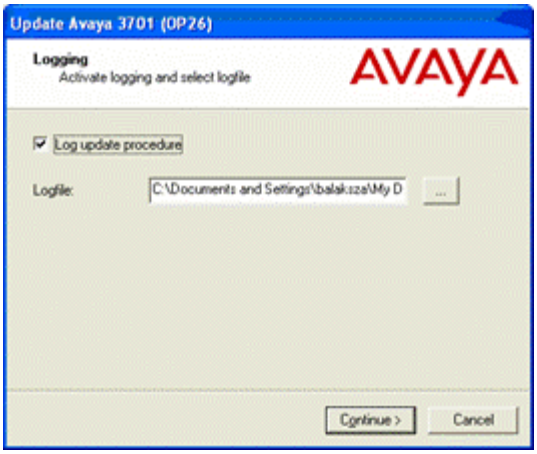
Upgrading the 3701 Phone Firmware

Connect the 3701 phone to your PC’s serial interface (via a specific download adaptor) and start the update.exe program from your PC, and follow the prompts.

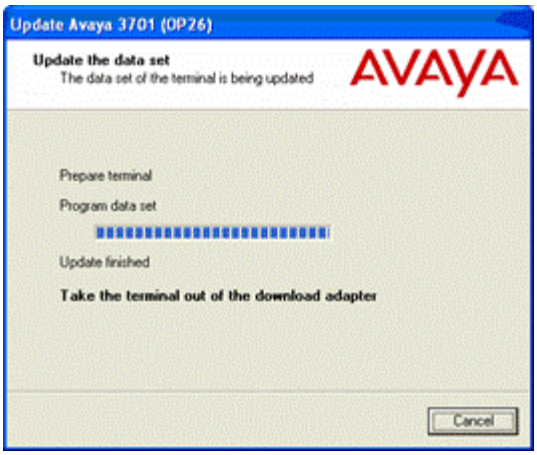
Select the COM port the download adaptor is connect to.



Check the Log Update Procedure box, if required, and specify the logfile path and name; or accept the default.



Follow the instructions on screen.



When the update has completed, you can leave the program or start the upgrade of the next phone.

3711 Phone Firmware

Checking the 3711 Phone Firmware Version

To display the version information of the 3711 phone:

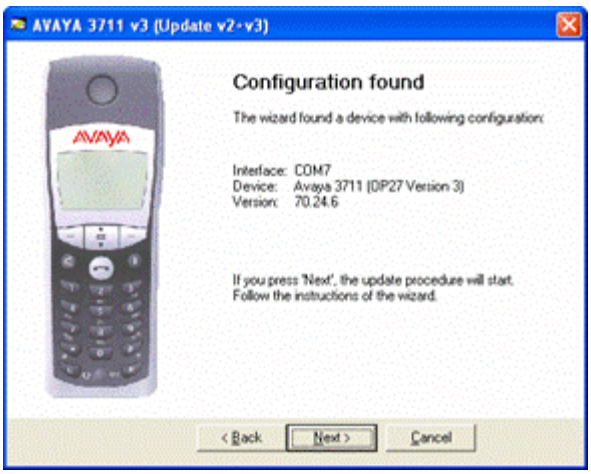
1. Short press **Menu** and enter the following key sequence: **R***76#.
2. Select **Version Number** and press **OK**. The display shows the software and the hardware level of the 3711 phone.

Check the firmware version to determine whether an update is required to overcome any user issues.

Upgrading the 3711 Phone Firmware

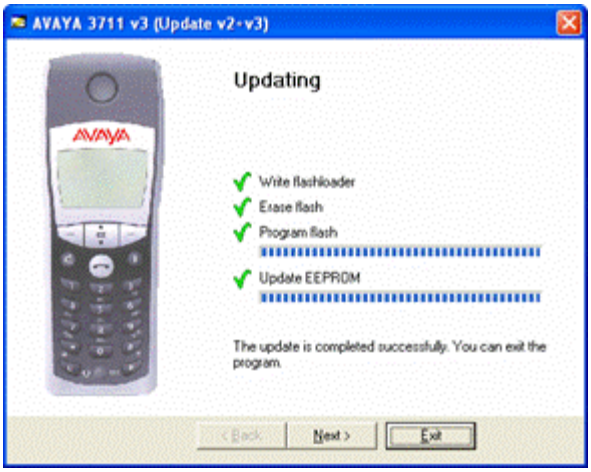
Connect the 3711 phone to your PC's serial interface (via a specific download cable) and start the installer program from your PC, and follow the prompts.

If the 3711 is connected, the following mask appears:



If the connected 3711 is identified by the Installer, the 3711 is switched off.

Press **c-key** and the up part of the  key.



If the update has completed, you can leave the program or start the upgrade of the next phone.

3711 Phone Maintenance and Diagnostic

All of the following features can be enabled by pressing '**Menu'** and typing '**R * * * 76 #.**

3711 Phone Auto Call Test Mode

To put the 3711 phone in the 'auto call test mode':

1. Short press **Menu**.
2. Enter the following key sequence: **R***76#.
3. Select **Auto Call Test** and press **OK**.
4. Enter the phone number to call and press **OK**.
5. Enter a number of seconds between two calls and press **OK**.
6. Enter a number of seconds a call shall be active and press **OK**. The test will be started automatically.
7. To stop the test, switch the phone off and on again.

In this mode, the phone calls a specified number cyclically. You can use this feature to generate traffic for test purposes. This mode is also active if the phone is on the charger.

3711 Phone Auto Answer Test Mode

To put the 3711 phone in the 'auto answer test mode':

1. Short press **Menu** and enter the following key sequence: **R***76#.
2. Select **Auto Answer** and press **OK**.
3. Enter a number of seconds the phone shall ring before it will answer the call and press **OK**.
4. Enter a number of seconds a call shall be active and press **OK**. The test will be started automatically.
5. To stop the test, switch the phone off and on again.

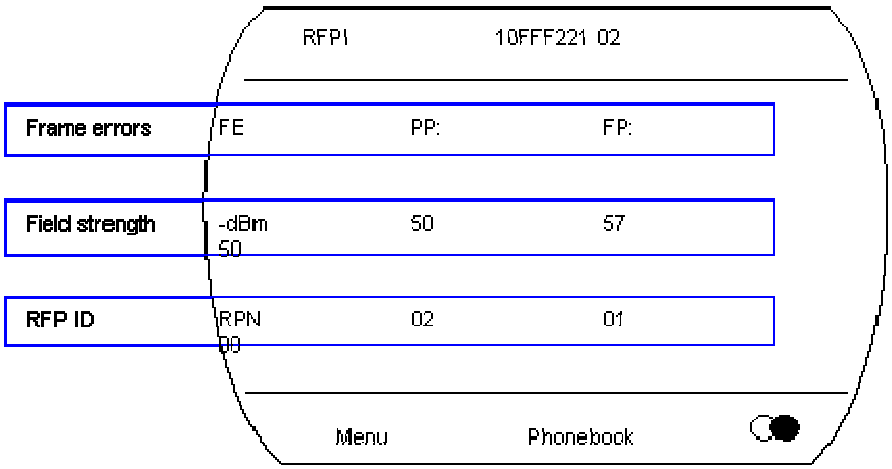
In this mode, the phone answers incoming calls automatically. You can use this feature for test purposes. This mode is also active if the phone is on the charger.

3711 Phone Site Survey Mode

To put the 3711 phone in the 'site survey mode':

1. Short press **Menu** and enter the following key sequence: **R***76#**.
2. Select **Site Survey**.
3. Press **OK**.

In this mode, the phone displays the IP Base Stations and the actual field strength of the receiving signal in dBM.



To leave site survey mode, switch the phone off and on again.

The phone is actually connected to the IP Base Station with the number 02. Also visible are the IP Base Station 01 and 00. The number 10FFF221 02 on the upper right side refers to the PARK 1F-10-F2-21 of the IP DECT system the phone with the number 02 is connected to.

3711 Phone Master Reset

To reset the 3711 phone settings to default:

1. Short press **Menu** and enter the following key sequence: **R***76#**.
2. Select **Master Reset** and press **OK**.
3. Press **OK** again.

Change the 3711 Phone Security PIN

To change the 3711 phone security PIN (e.g. to default (0000)):

1. Short press **Menu** and enter the following key sequence: **R***76#**.
2. Select **Change PIN** and press **OK**.
3. Enter the new PIN and press **OK**
4. Enter the new PIN again and press **OK**.

Diagnostic

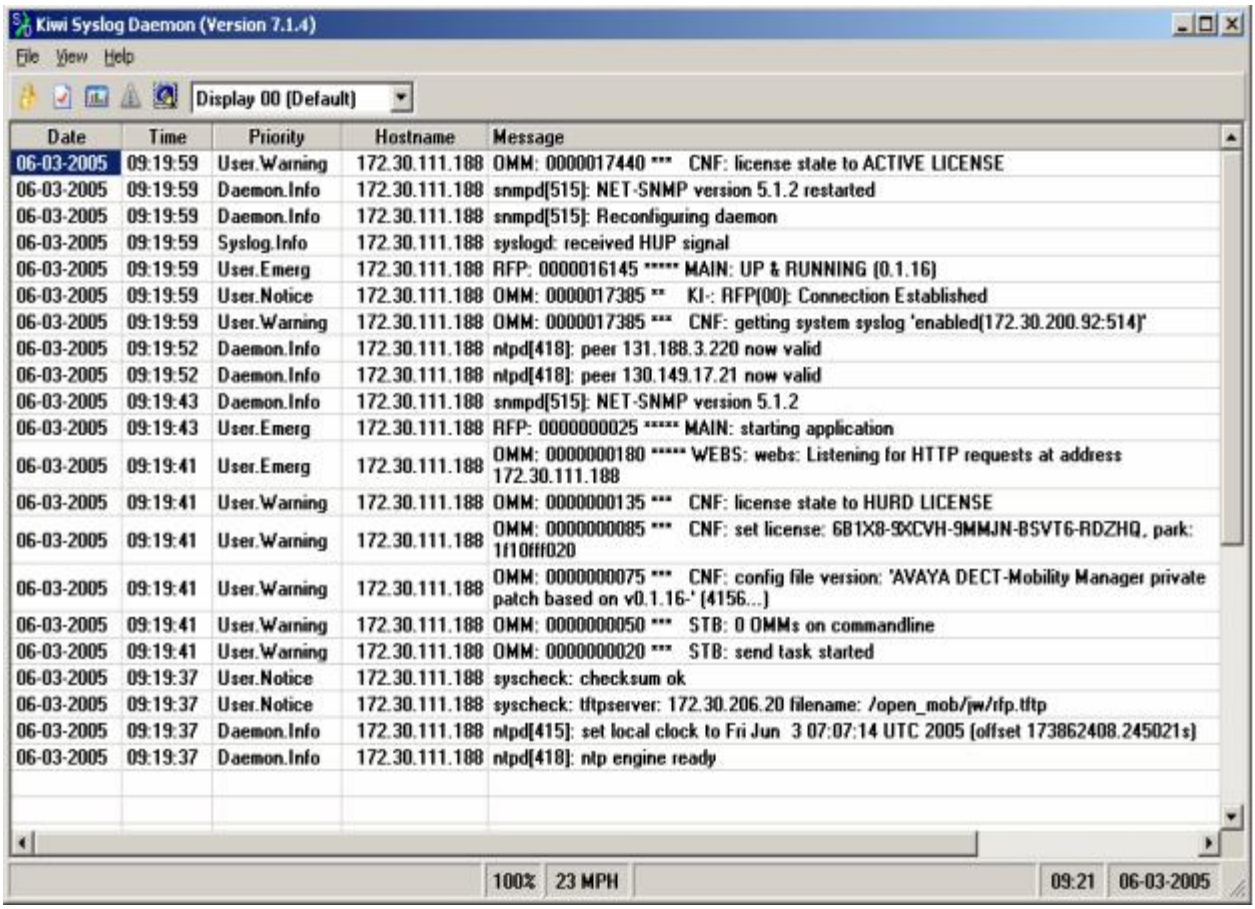
Syslog

The ADMM and the IP Base Stations are capable of propagating syslog messages conforming to RFC 3164. This feature together with the IP address of a host collecting these messages can be configured.

Syslog has to be enabled by:

- DHCP using public option 227 and 228 (see Avaya IP DECT Start_Up).
- Local configuration via OM Configurator (see Static_Local_Configuration_of_the_IP DECT Base Station).
- Setting syslog daemon server and port via WEB interface (see Configuring_the_Avaya_IP_DECT_Mobility_Manager).

To set Syslog via DHCP or OM Configurator has the advantage that syslogs are available in earlier states of IP Base Station start up.



The level of syslog messages in the default state allows the user, to have information on the general state of the system and major failures. To increase the level for diagnostic reasons, it can be done via telnet user shell by increasing the SPY level of subsystems.

You can also read syslogs if you type the command **logread** within Telnet user shell.

Telnet User Shell

Each IP Base Station (ADMM included) offers a lot of command within the telnet shell. Most of them are useful for diagnostic and my help experts, to resolve failures. The aim of this chapter is to give an overview.

Login

The procedure is:

1. Open a Telnet session to the IP Base Station.
2. Username is **iprfp**.
3. Password is **crftpw**.

```
Welcome to IP RFP OpenMobility Avaya Version x.y.z
Fr Apr 29 12:34:06 CEST 2005
Release
(BUILD 0)
172.30.111.232 login: iprfp
Password:
Welcome to the system usershell!
172.030.111.232 > help
```

Command Overview

Type help to get a command overview:

```
arp - show arp table
console_off - disable console on local terminal
console_on - enable console on local terminal
dmesg - print the kernel ring buffer
flash - show flash info
flash_update - update the booter
interface - show interface configuration
ip_rfpconsole - console to the rfp application
link - show link state
logread - show message log
mem - show memory usage
ommconsole - console to the omm application
ps - show process table
ping - ping <ipaddress>
reboot - restarts the system
route - show routing table
uptime - show system uptime
exit - exit shell
```

IP DECT Base Station Console Commands

If you type **ip_rfpconsole**, you are able to use the following commands on each IP Base Station:

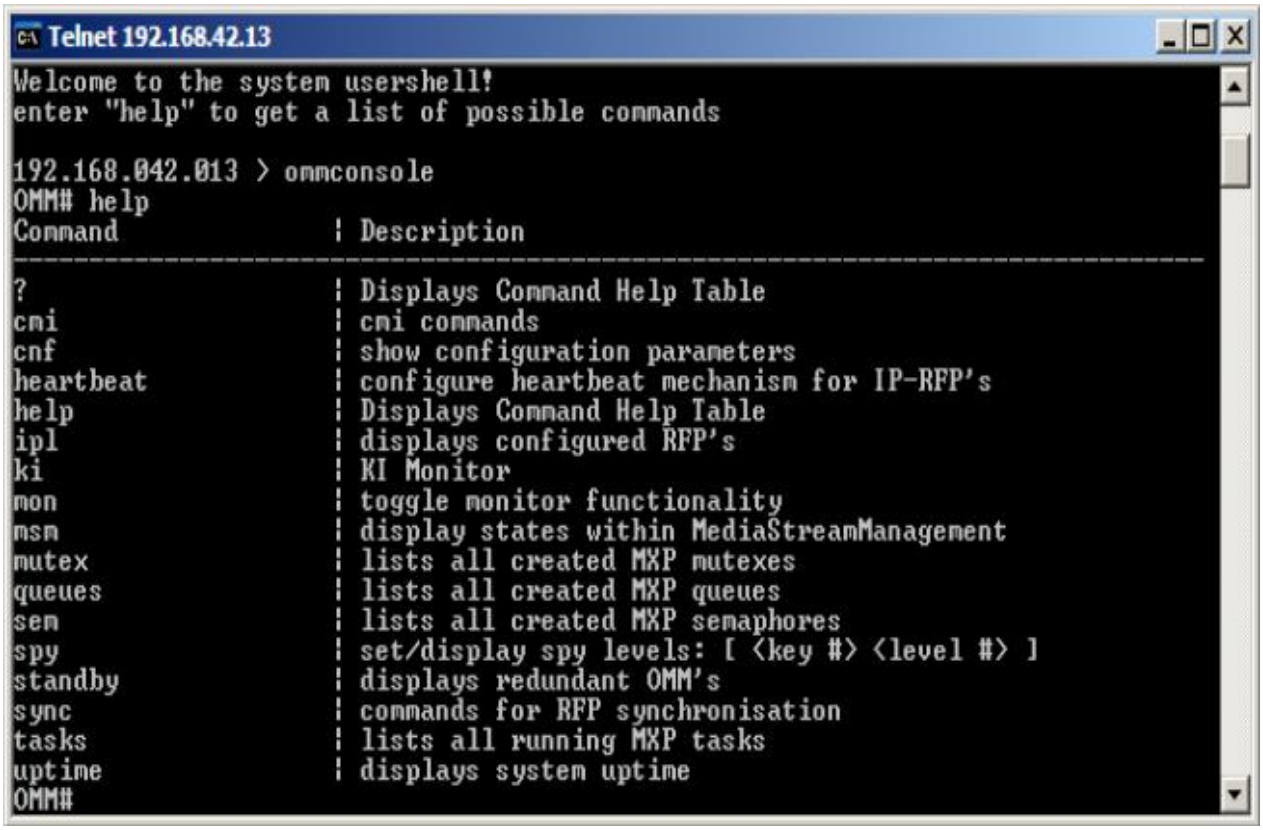
```
IP RFP console commands:
heap                - shows heap buffer statistics
help                - Displays Command Help Table
lec                 - adjust linear echo canceler parameters
media               - display state of media channels
mutex               - lists all created MXP mutexes
queues              - lists all created MXP queues
reset               - resets the IPRFP application
rsx                 - allows RSX connection to BMC via TCP
sem                 - lists all created MXP semaphores
spy                 - set/display spy levels: [ <key #> <level #> ]
tasks               - lists all running MXP tasks
voice               - displays the state of voice handling
exit                - leave the IP-RFP console
```

Note

- The **spy** command enables you to increase the level of syslog messages.

ADMM Console Commands

If you type **ommconsole** and you have opened the session on the ADMM IP Base Station you are able to use the following ADMM related commands:



Note

- The **spy** command enables you to increase the level of syslog messages especially for subsystems of the ADMM.

SNMP

- In order to manage a large network of IP DECT Base Stations, an SNMP agent is offered in each IP DECT Base Station.
- The SNMP agent responds to SNMPv1 and SNMPv2c read requests for the standard MIB-II objects.
- The agent supports both SNMPv1 and SNMPv2c traps ('coldStart', 'nsNotifyShutdown', 'authenticationFailure' and 'nsNotifyRestart').
- Decoding SNMP messages with your network management system or MIB browser always requires the publicly available IETF MIB definitions which can be downloaded.

See Configuring the Avaya IP DECT Mobility Manager for configuration of SNMP and MIB II to get an overview about the MIB II objects.

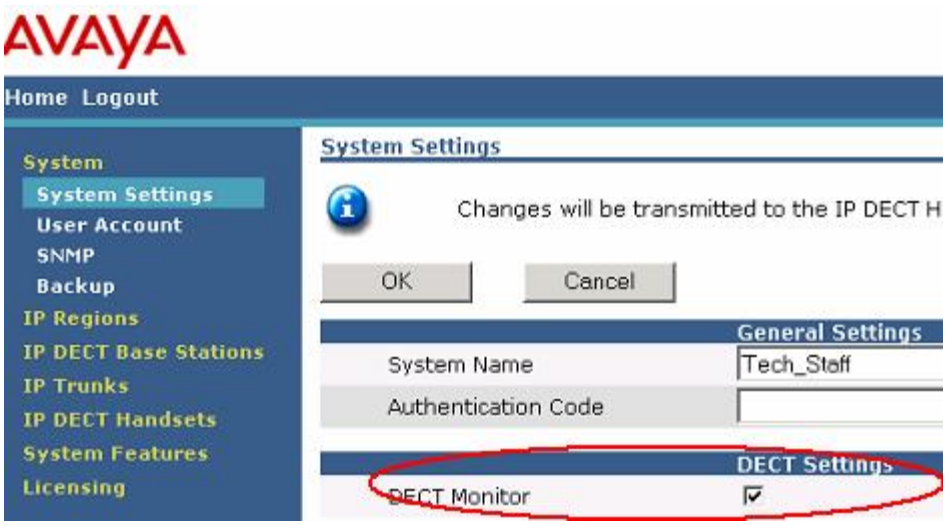
DECT Monitor of the Avaya IP DECT System

For a better error detection in the IP DECT system the DECT Monitor can be used. The DECT Monitor is an MS Windows based stand alone program. It provides the possibility to give a real time overview of the current IP DECT Base Station and phone states in the IP DECT system.

The following features are provided by the DECT Monitor:

- Reading out of the DECT configuration of a Open Mobility system.
- Configuration can be stored in an ASCII file.
- Display of DECT transactions IP Base Station Handset in clear tabular form, with highlighting of hand over situations. Real-time display.
- Display of further events concerning the status or actions of IP Base Stations and phones of the IP DECT system.
- All events can also be recorded in a log file.
- Display of the synchronization relations between the IP Base Station.
- Monitoring of systems with up to 32 IP Base Stations and 120 phones.
- Reading out and display of IP Base Station statistics data, either for a single IP Base Station or for all IP Base Stations.
- Display of DECT central data of the IP DECT system.

The DECT Monitor program can only be used when the DECT Monitor check box in the ADMM system configuration is checked. When monitoring is completed the DECT Monitor check box must be unchecked as ADMM resources are used while active.



The DECT monitor program is used together with the IP DECT system. The DECT Monitor is a 3rd party tool and is available on the IP Office Admin CD (dectmoni_ip.exe). It should be used to assist the diagnosis of problems relating to the IP DECT solution.

When the program is started, the user is requested to enter the IP address of the IP Base Station or server running the ADMM software. This address is different from the IP address of the PABX the ADMM is connected to.

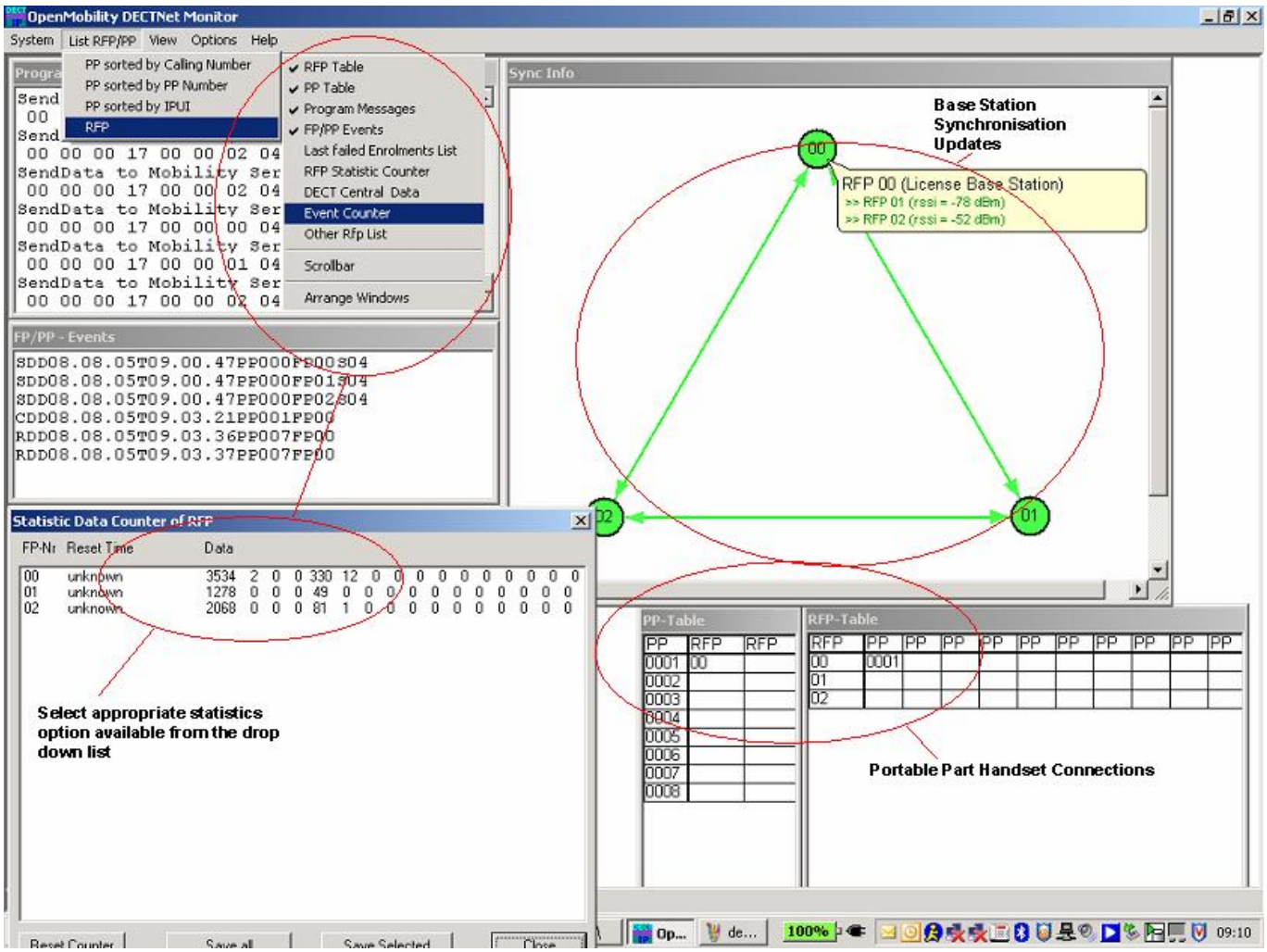
There can be several reasons for non successful link:

- Operation of DECT Monitor is not enabled inside the ADMM. Use the Web-Service to enable DECT Monitor operation.
- IP address is not correct. It has to be the address of the IP Base Station or server the ADMM is running on, not the address of the PABX.
- A link routed through the PABX is not supported. In cases of remote service on a PABX via dial-in, the ADMM cannot be accessed from the DECT Monitor.

The program displays the IP address last used.

When the program is started a link to the IP DECT system is automatically established and program window shows all user configured child windows and tables.

When all links have been established, the DECT data of the system are automatically read out and entered in the tables **RFP-Table** and **PP-Table**. This procedure is called **Config Request**.



Next, the defined trace options (Event Mask) are sent to the ADMM. The options which are sent to the ADMM are always those which were active the last time the program was exited.

If the trace option **Transaction establish/release** is activated, the ADMM will deliver all existing transactions.

The ADMM system delivers the desired trace data. The user can either communicate with the program interactively (see below) or activate a log file in which to record the data.

Following this initialisation, the user can carry out the following modifications:

- The trace settings can be modified using the menu item **Options-Event Mask**. Transmission to the ADMM takes place after confirmation of the settings with **OK**.
- A Config Request can be sent again to the ADMM.
- A log file can be activated.
- By means of various dialogues, the configuration data of the PPs, RFPs and control modules can be displayed and stored in ASCII files.

The following information is displayed dynamically in the tables:

- Transactions between PP and PABX system. These are displayed in both tables. Simple transactions are displayed in black on a white background; during hand over, both transactions involved are displayed in white on a red background.
- The Location Registration and Detach events are displayed in the tables for approximately 1-2s after their occurrence (light green background), if possible. There is no display in the FP table if there is no column free for display. If the event has already been displayed, it can be overwritten at any time. The events are not displayed if they occur during an on-going transaction. Irrelevant of whether the events are displayed in the tables, they are always entered in the **FP/PP-events** window and in the log file (provided that this is open).

The following colour scheme is used for display of the RFP in the RFP table:

- **RFP grey-blue** - RFP is not active (not connected or disturbance).
- **RFP black** - RFP is active.

The data of an RFP is displayed in a dialogue box after clicking on the respective RFP field in the RFP table. The statistics data of the RFP can be called up from this dialogue box.

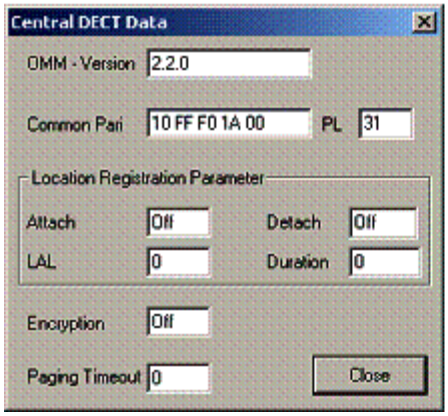
The following colour scheme is used for display of the PP in the PP table:

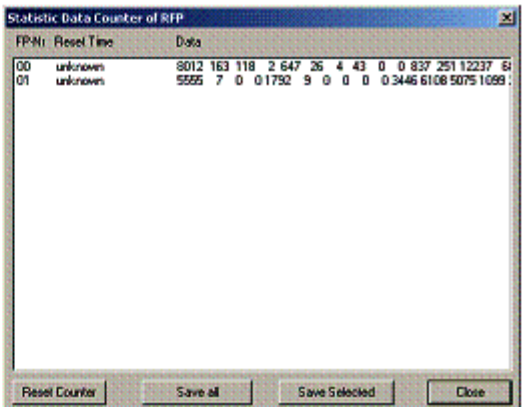
- **PP black** - PP is enrolled. It is assumed that the PP can be reached.
- **PP blue** - PP can presumably not be reached. Detach was received, or when an attempt was made to reach a PP, the PP did not answer.
- **PP grey-blue** - PP not enrolled.

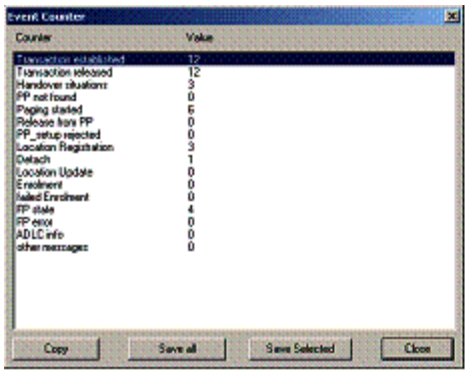
The data of a PP is displayed in a dialogue box after clicking on the respective PP field in the PP table.

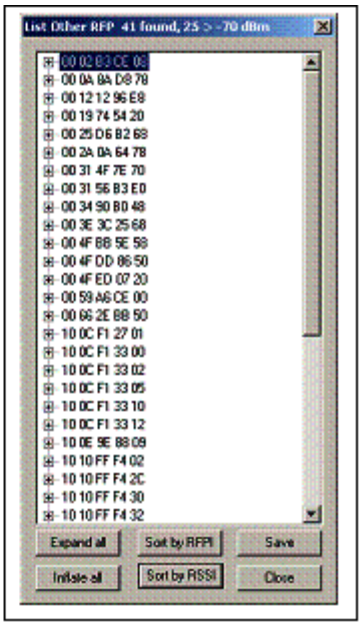
The Sync Info child window contains all IP Base Stations and shows their synchronization and relation states to each other. Selecting the IP Base Stations with the right mouse button the user can change visibility views and can even force a re-synchronization of an IP Base Station.

There are several optional child windows selectable. They are all listed below and give some more information about the IP DECT systems. Mostly they are statistics and for internal use only.


Central DECT Data
OMM - Version
2.2.0
Common Pari
10 FF F0 1A 00
PL
31
Location Registration Parameter
Attach
Off
Detach
Off
LAL
0
Duration
0
Encryption
Off
Paging Timeout
0
Close


Statistic Data Counter of RFP
FP-Nr
Reset Time
Data
00 unknown 8012 163 118 2 647 26 4 43 0 0 837 251 12237
01 unknown 5555 7 0 0 1792 9 0 0 0 0 3446 6108 5075
Reset Counter
Save all
Save Selected
Close


Event Counter
Counter
Value
Transaction established 12
Transaction released 12
Handover situations 3
PP not found 0
Paging started 6
Release from PP 0
PP_setup rejected 0
Location Registration 3
Detach 1
Location Update 0
Enrolment 0
failed Enrolment 0
FP state 4
FP error 0
ADLC info 0
other messages 0
Copy
Save all
Save Selected
Close


List Other RFP 41 found, 25 > -70 dBm
00 02 B3 CE 08
00 0A 8A D8 78
00 12 12 96 E8
00 19 74 54 20
00 25 D6 B2 68
00 2A 0A 64 78
00 31 4F 7E 70
00 31 56 B3 E0
00 34 90 B0 48
00 3E 3C 25 68
00 4F B8 5E 58
00 4F DD 86 50
00 4F ED 07 20
00 59 A6 CE 00
00 66 2E B8 50
10 0C F1 27 01
10 0C F1 33 00
10 0C F1 33 02
10 0C F1 33 05
10 0C F1 33 10
10 0C F1 33 12
10 0E 9E 88 09
10 10 FF F4 02
10 10 FF F4 2C
10 10 FF F4 30
10 10 FF F4 32
Expand all
Sort by RFPI
Save
Initiate all
Sort by RSSI
Close

Appendix

Supported Codecs and Codec Negotiation

Like the CM, the ADMM support silence suppression for G.711A and G.711MU. However, the ADMM does not support this feature for G.279 or G.729A. Instead, the G.729B/G.729AB codecs should be used to decrease the bandwidth.

It is not possible to differ between G.723.1 5.3K and G.723.1 6.3K codecs in the openLogicalChannel signal. Currently, ADMM supports G.723.1 6.3K.

Currently, the ADMM supports the following codecs, sent in the following order: G.711A, G.711MU, G.723.1(SilenceSuppression=TRUE), G.729AB, G.729A, G.729B, G.729.

The ADMM waits until it receives openLogicalChannel from the CM before sending its own openLogicalChannel signal with the same codec and SilenceSuppression bit (H.245/H.225.0 LogicalChannelParameters) received from the CM.

```
OpenLogicalChannel (CM==>OMM)   ====> openLogicalChannel(OMM==>CM)
G.711A H.225.0-SS = FALSE              G.711A H.225.0-SS = FALSE
G.711A H.225.0-SS = TRUE               G.711A H.225.0-SS = TRUE
G.711MU H.225.0-SS = FALSE             G.711MU H.225.0-SS = FALSE
G.711MU H.225.0-SS = TRUE              G.711MU H.225.0-SS = TRUE
G.729A H.225.0-SS = FALSE              G.729A H.225.0-SS = FALSE
G.729A H.225.0-SS = TRUE               G.729A H.225.0-SS = TRUE
G.729B H.225.0-SS = FALSE              G.729B H.225.0-SS = FALSE
G.729AB H.225.0-SS = FALSE             G.729AB H.225.0-SS = FALSE
G.723.1 SS=FALSE H.225.0-SS = FALSE    G.723.1 SS=FALSE H.225.0-SS =
FALSE
G.723.1 SS=TRUE H.225.0-SS = TRUE      G.723.1 SS=TRUE H.225.0-SS =
TRUE
```

Supported codecs in combination with silence suppression and vad respectively:

	CM	IP-Office	IP DECT	Standard
G.711A	X	X	X	X
G.711A SS	X	X	X	
G.711MU	X	X	X	X
G.711MU SS	X	X	X	
G.729	(X)=>G.729A		(X)=>G.729A	X
G.729 SS	(X)=>G.729A SS			
G.729A	X	X	X	X
G.729A SS	X	X		
G.729B	X		(X)=> G.729AB (SID-Frames)	X (SID-Frames)
G.729B SS				
G.729AB	X		X(SID-Frames)	X(SID-Frames)

G.729AB SS				
G.723.1 5.3	X			
G.723.1 5.3 SS	X			
G.723.1 6.3	X	X	X	X
G.723.1 6.3 SS	X	X	X(SID-Frames)	X(SID-Frames)

MIB-II

The following chapters describe the 11 object groups published in /7/ and /8/. The OID part is added in brackets.

System (1)

The vendor's authoritative identification of the network management subsystem contained in the entity. Implementation of the system group is mandatory for all systems.

sysDescr (1)
A textual description of the entity. This value should include the full name and version identification of the system's hardware type, software operating-system, and networking software. It is mandatory that this only contain printable ASCII characters.

sysObjectID (2)
The vendor's authoritative identification of the network management subsystem contained in the entity.

sysUpTime (3)
The time (in hundredths of a second) since the network management portion of the system was last re-initialized.

sysContact (4)
The textual identification of the contact person for this managed node, together with information on how to contact this person.

sysName (5)
An administratively-assigned name for this managed node. By convention, this is the node's fully-qualified domain name.

sysLocation (6)
The physical location of this node (e.g., "telephone closet, 3rd floor").

sysServices (7)
A value which indicates the set of services that this entity potentially offers. The value is a sum. This sum initially takes the value zero, Then, for each layer, L, in the range 1 through 7, that this node performs transactions for, 2 raised to (L - 1) is added to the sum. For example, a node which performs only routing functions would have a value of 4 (2^(3-1)). In contrast, a node which is a host offering application services would have a value of 72 (2^(4-1) + 2^(7-1)). Note that in the context of the Internet suite of protocols, values should be calculated accordingly:

layer	functionality
1	physical (e.g., repeaters)
2	data link/sub network (e.g., bridges)
3	internet (e.g., supports the IP)
4	end-to-end (e.g., supports the TCP)
7	applications (e.g., supports the SMTP)

For systems including OSI protocols, layers 5 and 6 may also be counted.

Interfaces (2)

Implementation of the interfaces group is mandatory for all systems.

ifNumber (1)
The number of network interfaces (regardless of their current state) present on this system.

ifTable (2)
The Interfaces table contains information on the entity's interfaces. Each interface is thought of as being attached to a "subnetwork". Note that this term should not be confused with "subnet" which refers to an addressing partitioning scheme used in the Internet suite of protocols.
A list of interface entries:

ifEntry (1)
An interface entry containing objects at the sub network layer and below for a particular interface.

ifIndex (1)
A unique value for each interface. Its value ranges between 1 and the value of ifNumber. The value for each interface must remain constant at least from one re- initialisation of the entity's network management system to the next re-initialisation.

ifDescr (2)
A text string containing information about the interface. This string should include the name of the manufacturer, the product name and the version of the hardware interface. The string is intended for presentation to a human; it must not contain anything but printable ASCII characters

ifType (3)
The type of interface, distinguished according to the physical/link/network protocol(s) immediately "below" IP in the protocol stack.

other(1),	-- none of the following
regular1822(2)	
hdh1822(3)	
ddn-x25(4)	
rfc877-x25(5)	
ethernet-csmacd(6)	
iso88023-csmacd(7)	
iso88024-tokenBus(8)	
iso88025-tokenRing(9)	
iso88026-man(10)	
starLan(11)	
proteon-10MBit(12)	
proteon-80MBit(13)	
hyperchannel(14)	
fddi(15)	
lapb(16)	
sdlc(17)	
t1-carrier(18)	
cept(19)	-- european equivalent of T-1
basicIsdn(20)	
primaryIsdn(21)	-- proprietary serial
propPointToPointSerial(22)	
ppp(23)	
softwareLoopback(24)	
eon(25)	-- CLNP over IP [12]
ethernet-3Mbit(26)	
nsip(27)	-- XNS over IP
slip(28)	-- generic SLIP
ultra(29)	-- ULTRA technologies
ds3(30)	-- T-3
sip(31)	-- SMDS
frame-relay(32)	

ifMtu (4)
The size of the largest IP datagram which can be sent/received on the interface, specified in octets.

ifSpeed (5)
An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth.

ifPhysAddress (6)
The interface's address at the protocol layer immediately "below" IP in the protocol stack. For interfaces which do not have such an address (e.g., a serial line), this object should contain an octet string of zero length.

ifAdminStatus (7)
The desired state of the interface. The testing(3) state indicates that no operational packets can be passed.

ifOperStatus (8)
The current operational state of the interface.
up(1) -- ready to pass packets
down(2)
testing(3) -- in some test mode
The testing(3) state indicates that no operational packets can be passed.

ifLastChange (9)
The value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last re-initialisation of the local network management subsystem, then this object contains a zero value.

ifInOctets (10)
The total number of octets received on the interface, including framing characters.

ifInUcastPkts (11)
The number of (subnet) unicast packets delivered to a higher-layer protocol.

ifInNUcastPkts(12)
The number of non-unicast (i.e., subnet broadcast or subnet multicast) packets delivered to a higher-layer protocol.

ifInDiscards (13)
The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.

ifInErrors (14)
The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.

ifInUnknownProtos (15)
The number of packets received via the interface which were discarded because of an unknown or unsupported protocol.

ifOutOctets (16)
The total number of octets transmitted out of the interface, including framing characters.

ifOutUcastPkts (17)
The total number of packets that higher-level protocols requested be transmitted to a subnet-unicast address, including those that were discarded or not sent.

ifOutNUcastPkts (18)
The total number of packets that higher-level protocols requested be transmitted to a non-unicast (i.e., a subnet broadcast or subnet multicast) address, including those that were discarded or not sent.

ifOutDiscards (19)
The number of outbound packets which were chosen to be discarded even though no errors had been

detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.

ifOutErrors (20)
The number of outbound packets that could not be transmitted because of errors.

ifOutQLen (21)
The length of the output packet queue (in packets).

ifSpecific (22)
A reference to MIB definitions specific to the particular media being used to realise the interface. For example, if the interface is realized by an ethernet, then the value of this object refers to a document defining objects specific to ethernet. If an agent is not configured to have a value for any of these variables, the object identifier
nullSpecific OBJECT IDENTIFIER ::= { 0 0 }
is returned. Note that "nullSpecific" is a syntactically valid object identifier, and any conformant implementation of ASN.1 and BER must be able to generate and recognise this value.

AT (3)
Address Translation, deprecated.

ip (4)
Implementation of the IP group is mandatory for all systems.

ipForwarding (1)
The indication of whether this entity is acting as an IP gateway in respect to the forwarding of datagrams received by, but not addressed to, this entity. IP gateways forward datagrams; Hosts do not (except those Source-Routed via the host).
gateway(1) -- entity forwards datagrams
host(2) -- entity does NOT forward datagrams

ipDefaultTTL (2)
The default value inserted into the Time-To-Live field of the IP header of datagrams originated at this entity, whenever a TTL value is not supplied by the transport layer protocol.

ipInReceives (3)
The total number of input datagrams received from interfaces, including those received in error.

ipInHdrErrors (4)
The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc.

ipInAddrErrors (5)
The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity. This count includes invalid addresses (e.g., 0.0.0.0) and addresses of unsupported Classes (e.g., Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.

ipForwDatagrams (6)
The number of input datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. In entities which do not act as IP Gateways, this counter will include only those packets which were Source-Routed via this entity, and the Source-Route option processing was successful.

ipInUnknownProtos (7)
The number of locally-addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.

ipInDiscards (8)
The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (e.g. for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.

ipInDelivers (9)
The total number of input datagrams successfully delivered to IP user-protocols (including ICMP).

ipOutRequests (10)
The total number of IP datagrams which local IP user- protocols (including ICMP) supplied to IP in requests for transmission. Note that this counter does not include any datagrams counted in ipForwDatagrams.

ipOutDiscards (11)
The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (e.g., for lack of buffer space). Note that this counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.

ipOutNoRoutes (12)
The number of IP datagrams discarded because no route could be found to transmit them to their destination. Note that this counter includes any packets counted in ipForwDatagrams which meet this "no-route" criterion.

ipReasmTimeout (13)
The maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity.

ipReasmReqds (14)
The number of IP fragments received which needed to be reassembled at this entity.

ipReasmOKs (15)
The number of IP datagrams successfully re-assembled.

ipReasmFails (16)
The number of failures detected by the IP re-assembly algorithm (for whatever reason: timed out, errors, etc). Note that this is not necessarily a count of discarded IP fragments since some algorithms (notably RFC 815's) can lose track of the number of fragments by combining them as they are received.

ipFragOKs (17)
The number of IP datagrams that have been successfully fragmented at this entity.

ipFragFails (18)
The number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could not be, e.g., because their "Don't Fragment" flag was set.

ipFragCreates (19)
The number of IP datagram fragments that have been generated as a result of fragmentation at this entity.

ipAddrTable (20)
The table of addressing information relevant to this entity's IP addresses.

ipAddrEntry (1)
The addressing information for one of this entity's IP addresses.

ipAdEntAddr (1)
The IP address to which this entry's addressing information pertains.

ipAdEntIfIndex (2)
The index value which uniquely identifies the interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

ipAdEntNetMask (3)
The sub net mask associated with the IP address of this entry. The value of the mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.

ipAdEntBcastAddr (4)
The value of the least-significant bit in the IP broadcast address used for sending datagrams on the (logical) interface associated with the IP address of this entry. For example, when the Internet standard all-ones broadcast address is used, the value will be 1.

ipAdEntReasmMaxSize (5)
The size of the largest IP datagram which this entity can re-assemble from incoming IP fragmented datagrams received on this interface.

ipRouteTable (21)
The IP Route Table contains an entry for each route presently known to this entity. Note that the action to be taken in response to a request to read a non-existent entry, is specific to the network management protocol being used.

ipRouteEntry (1)
A route to a particular destination.

ipRouteDest (1)
The destination IP address of this route. An entry with a value of 0.0.0.0 is considered a default route. Multiple such default routes can appear in the table, but access to such multiple entries is dependent on the table-access mechanisms defined by the network management protocol in use.

ipRouteIfIndex (2)
The index value which uniquely identifies the local interface through which the next hop of this route should be reached. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

ipRouteMetric1 (3)
The primary routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipRouteProto value. If this metric is not used, its value should be set to -1.

ipRouteMetric2 (4)
An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipRouteProto value. If this metric is not used, its value should be set to -1.

ipRouteMetric3 (5)
An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipRouteProto value. If this metric is not used, its value should be set to -1.

ipRouteMetric4 (6)
An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipRouteProto value. If this metric is not used, its value should be set to -1.

ipRouteNextHop (7)
The IP address of the next hop of this route.

ipRouteType (8)
The type of route:
other(1) -- none of the following
invalid(2) -- an invalidated route
-- route to directly
direct(3) -- connected (sub-)network
-- route to a non-local
remote(4) -- host/network/sub-network

ipRouteProto (9)
The routing mechanism via which this route was learned. Inclusion of values for gateway routing protocols is not intended to imply that hosts should support those protocols.
other(1) -- none of the following
-- non-protocol information
local(2) -- e.g., manually configured entries

netmgmt(3) -- set via a network management protocol
icmp(4) -- obtained via ICMP e.g., Redirect
egp(5) -- the remaining values are
ggp(6) -- all gateway routing protocols
hello(7)
rip(8)
is-is(9)
es-is(10)
ciscoIgrp(11)
bbnSpfIgp(12)
oigp(13)

ipRouteAge (10)
The number of seconds since this route was last updated or otherwise determined to be correct. Note that no semantics of "too old" can be implied except through knowledge of the routing protocol by which the route was learned.

ipRouteMask (11)
Indicate the mask to be logical-ANDed with the destination address before being compared to the value in the ipRouteDest field. For those systems that do not support arbitrary sub net masks, an agent constructs the value of the ipRouteMask by determining whether the value of the correspondent ipRouteDest field belong to a class-A, B, or C network, and then using one of: mask network 255.0.0.0 class-A 255.255.0.0 class-B 255.255.255.0 class-C If the value of the ipRouteDest is 0.0.0.0 (a default route), then the mask value is also 0.0.0.0. It should be noted that all IP routing subsystems implicitly use this mechanism.

ipRouteMetric5 (12)
An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipRouteProto value. If this metric is not used, its value should be set to -1

ipRouteInfo (13)
A reference to MIB definitions specific to the particular routing protocol which is responsible for this route, as determined by the value specified in the route's ipRouteProto value. If this information is not present, its value should be set to the OBJECT IDENTIFIER { 0 0 }, which is a syntactically valid object identifier, and any conformant implementation of ASN.1 and BER must be able to generate and recognise this value.

ipNetToMediaTable (22)
The IP Address Translation table used for mapping from IP addresses to physical addresses.

IpNetToMediaEntry (1)
Each entry contains one IP address to "physical" address equivalence.

ipNetToMediaIfIndex (1)
The interface on which this entry's equivalence is effective. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

ipNetToMediaPhysAddress (2)
The media-dependent "physical" address.

ipNetToMediaNetAddress (3)
The IpAddress corresponding to the media-dependent "physical" address.

ipNetToMediaType (4)
The type of mapping.
other(1) -- none of the following
invalid(2) -- an invalidated mapping
dynamic(3)
static(4)

Setting this object to the value invalid(2) has the effect of invalidating the corresponding entry in the ipNetToMediaTable. That is, it effectively disassociates the interface identified with said entry from the mapping identified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive tabular information from agents that corresponds to entries not currently in use. Proper interpretation of such entries requires examination of the relevant ipNetToMediaType object.

ipRoutingDiscards (23)
The number of routing entries which were chosen to be discarded even though they are valid. One possible reason for discarding such an entry could be to free-up buffer space for other entries.

icmp (5)

Implementation of the icmp group is mandatory for all systems.
The icmp group contains the ICMP input and output statistics.
Note that individual counters for ICMP message (sub-)codes have been omitted from this (version of the) MIB for simplicity.

icmpInMsgs (1)
The total number of ICMP messages which the entity received. Note that this counter includes all those counted by icmpInErrors.

icmpInErrors (2)
The number of ICMP messages which the entity received but determined as having errors (bad ICMP checksums, bad length, etc.).

icmpInDestUnreachs (3)
The number of ICMP Destination Unreachable messages received.

icmpInTimeExcds (4)
The number of ICMP Time Exceeded messages received.

icmpInParmProbs (5)
The number of ICMP Parameter Problem messages received.

icmpInSrcQuenchs (6)
The number of ICMP Source Quench messages received.

icmpInRedirects (7)
The number of ICMP Redirect messages received.

icmpInEchos (8)
The number of ICMP Echo (request) messages received.

icmpInEchoReps (9)
The number of ICMP Echo Reply messages received.

icmpInTimestamps (10)
The number of ICMP Timestamp (request) messages received.

icmpInTimestampReps (11)
The number of ICMP Timestamp Reply messages received.

icmpInAddrMasks (12)
The number of ICMP Address Mask Request messages received.

icmpInAddrMaskReps (13)
The number of ICMP Address Mask Reply messages received.

icmpOutMsgs (14)
The total number of ICMP messages which this entity attempted to send. Note that this counter includes all those counted by icmpOutErrors.

icmpOutErrors (15)
The number of ICMP messages which this entity did not send due to problems discovered within ICMP such as a lack of buffers. This value should not include errors discovered outside the ICMP layer such as

the inability of IP to route the resultant datagram. In some implementations there may be no types of error which contribute to this counter's value.

icmpOutDestUnreachs (16)
The number of ICMP Destination Unreachable messages sent.

icmpOutTimeExcds (17)
The number of ICMP Time Exceeded messages sent.

icmpOutParmProbs (18)
The number of ICMP Parameter Problem messages sent.

icmpOutSrcQuenchs (19)
The number of ICMP Source Quench messages sent.

icmpOutRedirects (20)
The number of ICMP Redirect messages sent.

icmpOutEchos (21)
The number of ICMP Echo (request) messages sent.

icmpOutEchoReps (22)
The number of ICMP Echo Reply messages sent.

icmpOutTimestamps (23)
The number of ICMP Timestamp (request) messages sent.

icmpOutTimestampReps (24)
The number of ICMP Timestamp Reply messages sent.

icmpOutAddrMasks (25)
The number of ICMP Address Mask Request messages sent.

icmpOutAddrMaskReps (26)
The number of ICMP Address Mask Reply messages sent.

tcp (6)

Implementation of the TCP group is mandatory for all systems that implement the TCP protocol.

Note

- Instances of object types that represent information about a particular TCP connection are transient; they persist only as long as the connection in question.

tcpRtoAlgorithm (1)
The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
other(1) -- none of the following
constant(2) -- a constant Rto
rsre(3) -- MIL-STD-1778, Appendix B
vanj(4) -- Van Jacobson's algorithm [15]

tcpRtoMin (2)
The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.

tcpRtoMax (3)
The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.

tcpMaxConn (4)
The limit on the total number of TCP connections the entity can support. In entities where the maximum number of connections is dynamic, this object should contain the value "-1".

tcpActiveOpens (5)
The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.

tcpPassiveOpens (6)
The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.

tcpAttemptFails (7)
The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.

tcpEstabResets (8)
The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.

tcpCurrEstab (9)
The number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.

tcpInSegs (10)
The total number of segments received, including those received in error. This count includes segments received on currently established connections.

tcpOutSegs (11)
The total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.

tcpRetransSegs (12)
The total number of segments re-transmitted - that is, the number of TCP segments transmitted containing one or more previously transmitted octets.

tcpConnTable (13)
A table containing TCP connection-specific information.

tcpConnEntry (1)
Information about a particular current TCP connection. An object of this type is transient, in that it ceases to exist when (or soon after) the connection makes the transition to the CLOSED state.

tcpConnState (1)
The state of this TCP connection.
closed(1)
listen(2)
synSent(3)
synReceived(4)
established(5)
finWait1(6)
finWait2(7)
closeWait(8)
lastAck(9)
closing(10)
timeWait(11)

tcpConnLocalAddress (2)
The local IP address for this TCP connection.

tcpConnLocalPort (3)
The local port number for this TCP connection.

tcpConnRemAddress (4)
The remote IP address for this TCP connection.

tcpConnRemPort (5)
The remote port number for this TCP connection.

tcpInErrs (14)
The total number of segments received in error (e.g., bad TCP checksums).

tcpOutRsts (15)
The number of TCP segments sent containing the RST flag.

udp (7)

Implementation of the UDP group is mandatory for all systems which implement the UDP protocol.

udpInDatagrams (1)
The total number of UDP datagrams delivered to UDP users.

udpNoPorts (2)
The total number of received UDP datagrams for which there was no application at the destination port.

udpInErrors (3)
The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.

udpOutDatagrams (4)
The total number of UDP datagrams sent from this entity.

udpTable (5)
A table containing UDP listener information.

udpEntry (1)
Information about a particular current UDP listener.

udpLocalAddress (1)
The local IP address for this UDP listener. In the case of a UDP listener which is willing to accept datagrams for any IP interface associated with the node, the value 0.0.0.0 is used.

udpLocalPort (2)
The local port number for this UDP listener.

egp (8)

Exterior Gateway Protocol, historical.

cmot (9)

Common Management Information Services and Protocol over TCP/IP, deprecated.

transmission (10)

Based on the transmission media underlying each interface on a system, the corresponding portion of the Transmission group is mandatory for that system. When Internet-standard definitions for managing transmission media are defined, the transmission group is used to provide a prefix for the names of those objects. Typically, such definitions reside in the experimental portion of the MIB until they are "proven", then as a part of the Internet standardisation process, the definitions are accordingly elevated and a new object identifier, under the transmission group is defined. By convention, the name assigned is:
type OBJECT IDENTIFIER ::= { transmission number }
where "type" is the symbolic value used for the media in the ifType column of the ifTable object, and "number" is the actual integer value corresponding to the symbol.

snmp (11)

Implementation of the snmp group is mandatory for all systems which support an SNMP protocol entity. Some of the objects defined below will be zero-valued in those SNMP implementations that are optimised to support only those functions specific to either a management agent or a management client.

snmpInPkts (1)
The total number of PDUs delivered to the SNMP entity from the transport service.

snmpOutPkts (2)
The total number of SNMP PDUs which were passed from the SNMP protocol entity to the transport service.

snmpInBadVersions (3)
The total number of syntactically correct SNMP PDUs which were delivered to the SNMP protocol entity and were for an unsupported SNMP version.

snmpInBadCommunityNames (4)
The total number of SNMP PDUs delivered to the SNMP protocol entity which used a SNMP community name not known to said entity.

snmpInBadCommunityUses (5)
The total number of SNMP PDUs delivered to the SNMP protocol entity which represented an SNMP operation which was not allowed by the SNMP community named in the PDU.

snmpInASNParseErrs (6)
The total number of ASN.1 parsing errors (either in encoding or syntax) encountered by the SNMP protocol entity when decoding received SNMP PDUs.

snmpInBadTypes (7)
The total number of SNMP PDUs delivered to the SNMP protocol entity which had an unknown PDU type.

snmpInTooBigs (8)
The total number valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the "ErrorStatus" component is "tooBig."

snmpInNoSuchNames (9)
The total number valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the "ErrorStatus" component is "noSuchName."

snmpInBadValues (10)
The total number valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the "ErrorStatus" component is "badValue."

snmpInReadOnlys (11)
The total number valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the "ErrorStatus" component is "readOnly."

snmpInGenErrs (12)
The total number valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the "ErrorStatus" component is "genErr."

snmpInTotalReqVars (13)
The total number of MIB objects which have been retrieved successfully by the SNMP protocol entity as the result of receiving valid SNMP Get-Request and Get-Next PDUs.

snmpInTotalSetVars (14)
The total number of MIB objects which have been altered successfully by the SNMP protocol entity as the result of receiving valid SNMP Set-Request PDUs.

snmpInGetRequests (15)
The total number of SNMP Get-Request PDUs which have been accepted and processed by the SNMP protocol entity.

snmpInGetNexts (16)
The total number of SNMP Get-Next PDUs which have been accepted and processed by the SNMP protocol entity.

snmpInSetRequests (17)
The total number of SNMP Set-Request PDUs which have been accepted and processed by the SNMP protocol entity.

snmpInGetResponses (18)
The total number of SNMP Get-Response PDUs which have been accepted and processed by the SNMP protocol entity.

snmpInTraps (19)
The total number of SNMP Trap PDUs which have been accepted and processed by the SNMP protocol entity.

snmpOutTooBigs (20)
The total number valid SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the "ErrorStatus" component is "tooBig."

snmpOutNoSuchNames (21)
The total number valid SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the "ErrorStatus" component is "noSuchName."

snmpOutBadValues (22)
The total number valid SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the "ErrorStatus" component is "badValue."

snmpOutReadOnlys (23)
The total number valid SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the "ErrorStatus" component is "readOnly."

snmpOutGenErrs (24)
The total number valid SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the "ErrorStatus" component is "genErr."

snmpOutGetRequests (25)
The total number of SNMP Get-Request PDUs which have been generated by the SNMP protocol entity.

snmpOutGetNexts (26)
The total number of SNMP Get-Next PDUs which have been generated by the SNMP protocol entity.

snmpOutSetRequests (27)
The total number of SNMP Set-Request PDUs which have been generated by the SNMP protocol entity.

snmpOutGetResponses (28)
The total number of SNMP Get-Response PDUs which have been generated by the SNMP protocol entity.

snmpOutTraps (29)
The total number of SNMP Trap PDUs which have been generated by the SNMP protocol entity.

snmpEnableAuthTraps (30)
Indicates whether the SNMP agent process is configured to generate authentication-failure traps.

WML Tags and Attributes Supported

The ADMM/3711 WML browser supports WML version 1.1. It needs to be noted that the ADMM/3711 WML browser will not support the following:

- WML images.
- The “multiple” attribute for the <select> tag.
- Softkeys, given the small display of the 3711 phone .

Click-to-dial applications are supported using the <a>, <anchor>, <onevent> and <do> tag.

Detailed Overview: Avaya IP Phones and the ADMM/Avaya 3711

Tag	Attribute	Supported by the 4610/4620	Supported by ADMM/Avaya 3711
<a>		Yes	Yes
	accesskey	No	No
	href	Yes	Yes
	title	Yes	Yes
<access>		No	No
<anchor>		Yes	Yes
	Title	Yes	Yes
<b>		No	No
<big>		No	No
 		Yes	Yes
<card>		Yes	???
	newcontext	No	
	onenterbackward	Yes	
	onenterforward	Yes	
	ontimer	Yes	
	ordered	No	
	title	Yes	
<do>		Yes	Yes
	label	Yes	Yes
	name	Yes	Yes
	optional	Yes	Yes
	type	Yes, except x-*	Yes, except x-*
		No	No
<fieldset>		No	No
<go>		Yes	Yes
	accept-charset	Yes	Yes
	href	Yes	Yes
	method	Yes	Yes
	sendreferer	Yes	Yes

<head>		No	No
<i>		No	No
<img>		Yes	No
	align	No	No
	alt	Yes	No
	height	No	No
	hspace	Yes	No
	localsrc	No	No
	src	Yes	No
	vspace	Yes	No
	width	No	No
<input>		Yes	Yes
	emptyok	Yes	Yes
	format	Yes	Yes
	maxlength	Yes	Yes
	name	Yes	Yes
	size	No	No
	tabindex	No	No
	title	Yes	Yes
	type	Yes	Yes
	value	Yes	Yes
<meta>		No	No
<noop>		Yes	No
<onevent>		Yes	Yes
<optgroup>		Yes	No
	Title	Yes	No
<option>		No	No
	onpick	Yes	No
	title	Yes	No
	value	Yes	Yes
<p>		Yes	Yes
	align	Yes	Yes
	mode	No	No
<postfield>		Yes	No
	name	Yes	No
	value	Yes	No
<prev>		Yes	Yes
<refresh>		Yes	No

<select>		Yes	Yes
	ivalue	Yes	Yes
	multiple	Yes	No
	name	Yes	Yes
	tabindex	No	No
	title	Yes	Yes
	value	Yes	Yes
<setvar>		Yes	Yes
	name	Yes	Yes
	value	Yes	Yes
<small>		No	No
		No	No
<table>		No	No
<td>		No	No
<template>		Yes	Yes
	onenterbackward	Yes	Yes
	onenterforward	Yes	Yes
	ontimer	Yes	Yes
<timer>		Yes	Yes
	name	Yes	Yes
	value	Yes	Yes
<tr>		No	No
<u>		No	No
<wml>		Yes	Yes
{Universal Attributes}	xml:lang	No	No
	class	No	No
	id	Yes	Yes

[1] surname.

[2] The default search string support the functionality in such a way that the corporate phone book looks like the local phone book.

[3] Please note: you must not type “http.//”; you need not type the prefixes “wap.” or “www.”.

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busybox/networking/udhcp/clientpacket.c
busybox/networking/udhcp/clientpacket.h
busybox/networking/udhcp/dhcpc.c
busybox/networking/udhcp/dhcpc.h
busybox/networking/udhcp/options.c
busybox/networking/udhcp/options.h
busybox/networking/udhcp/script.c
busybox/networking/udhcp/signalpipe.c
busybox/networking/udhcp/socket.c
busybox/networking/udhcp/socket.h
busybox/Rules.mak
busybox/sysklogd/syslogd.c
linux/arch/mips/config-shared.in
linux/arch/mips/kernel/setup.c
linux/arch/mips/kernel/time.c
linux/arch/mips/kernel/traps.c
linux/arch/mips/Makefile
linux/arch/mips/mips-boards/generic/display.c
linux/arch/mips/mips-boards/generic/init.c
linux/arch/mips/mips-boards/generic/Makefile
linux/arch/mips/mips-boards/generic/memory.c
linux/arch/mips/mips-boards/generic/mipsIRQ.S
linux/arch/mips/mips-boards/generic/printf.c
linux/arch/mips/mips-boards/generic/reset.c
linux/arch/mips/mips-boards/generic/time.c
linux/arch/mips/mips-boards/ti_avalanche/avalanche_iic.c
linux/arch/mips/mips-boards/ti_avalanche/avalanche_int.c
linux/arch/mips/mips-boards/ti_avalanche/avalanche_jump.S
linux/arch/mips/mips-boards/ti_avalanche/avalanche_paging.c
linux/arch/mips/mips-boards/ti_avalanche/avalanche_pci.c
linux/arch/mips/mips-boards/ti_avalanche/avalanche_setup.c
linux/arch/mips/mips-boards/ti_avalanche/avalanche_time.c
linux/arch/mips/mips-boards/ti_avalanche/inflater/f_little_zimage.script

linux/arch/mips/mips-boards/ti_avalanche/inflater/gzip.h
linux/arch/mips/mips-boards/ti_avalanche/inflater/inflate.c
linux/arch/mips/mips-boards/ti_avalanche/inflater/ld.script.in
linux/arch/mips/mips-boards/ti_avalanche/inflater/Makefile
linux/arch/mips/mips-boards/ti_avalanche/inflater/r_little_zimage.script
linux/arch/mips/mips-boards/ti_avalanche/inflater/srec2bin.c
linux/arch/mips/mips-boards/ti_avalanche/inflater/zimage.script.in
linux/arch/mips/mips-boards/ti_avalanche/leds.c
linux/arch/mips/mips-boards/ti_avalanche/Makefile
linux/arch/mips/mips-boards/ti_avalanche/ti_evm3/evm3_rtc.c
linux/arch/mips/mips-boards/ti_avalanche/ti_sead/inflater/f_little_zimage.script
linux/arch/mips/mips-boards/ti_avalanche/ti_sead/inflater/inflate.c
linux/arch/mips/mips-boards/ti_avalanche/ti_sead/inflater/inflate.c.flc
linux/arch/mips/mips-boards/ti_avalanche/ti_sead/inflater/ld.script
linux/arch/mips/mips-boards/ti_avalanche/ti_sead/inflater/ld.script.in
linux/arch/mips/mips-boards/ti_avalanche/ti_sead/inflater/Makefile
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linux/net/ipv4/utils.c
linux/net/packet/af_packet.c
linux/net/sched/sch_htb.c
linux/net/sysctl_net.c
linux/net/unix/af_unix.c
linux/scripts/mkdep.c
Access to source code for these modifications may be obtained from:

DeTeWe Systems GmbH,

Zeughofstraße 1

D-10997 Berlin

www.detewe.de

5. GNU Lesser General Public License (LGPL)

Version 2.1, February 1999

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