

# HiPath Cordless IP

## Administrator Documentation

A31003-C1010-M100-4-76A9

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# 1 Introduction

## 1.1 Scope

This document describes all different kinds of the HiPath Cordless IP System:

- HPCIP - Small Solution
- HPCIP - Server Solution
- HPCIP - Large Solution

### 1.1.1 HPCIP Solution Overview

| Solution Type   | No. of BSIP1 | No. of HCIP Server | Description  |
|-----------------|--------------|--------------------|--|
| Small Solution  | 1...10       | n/a                | System components:<br>- One to 10 pieces of base stations (BSIP1)<br>Operation modes:<br>- One base station (BSIP1) running in BSIP-IWU mode<br>- All others base stations (BSIP1) running in BSIP-only mode   |
| Server Solution | 1...60       | 1                  | System components:<br>- One to 60 pieces of base stations (BSIP1)<br>- One HiPath Cordless IP Server (HCIP Server)<br>Operation modes:<br>- One HiPath Cordless IP Server (HCIP Server) running in HCIP Server mode (= Management Server mode + Media Server mode)<br>- All base stations (BSIP1) running in BSIP-only mode                                    |
| Large Solution  | 1...3000     | 2...100            | System components:<br>- One to 3000 pieces of base stations (BSIP1)<br>- Two to 100 HiPath Cordless IP Server (HCIP Server)<br>Operation modes:<br>- One HiPath Cordless IP Server running in HCIP Management Server mode<br>- One to 100 HiPath Cordless IP Server running in HCIP Media Server mode<br>- All base stations (BSIP1) running in BSIP-only mode |

## 1.1.2 Different Wording Conventions

There are two different wording schemes which describe the components or functionalities of the HiPath Cordless IP System.

- A new wording scheme (mainly targeted on marketing issues) and
- An old wording scheme (focuses on technical issues and current WBM wording).

This documentation uses the old wording scheme (since most WBM elements are already implemented using the old scheme).

The following table depicts the mapping between the new and the old scheme.

| New wording scheme ("marketing")                              | Old wording scheme ("technical")                   |
|---|--|
| Small Solution  | Small Solution                                     |
| Server Solution   | Server Solution                                    |
| Large Solution  | HPCIP - Media Gateway-IWU Solution                 |
| HCIP Server mode (Management Server mode + Media Server mode) | Server-IWU   |
| HCIP Management Server mode                                   | MGW-IWU (Server running in Media Gateway-IWU mode) |
| HCIP Media Server mode  | MGW (Server running in Media Gateway mode)         |
| BSIP-only mode  | BSIP-only mode                                     |
| BSIP-IWU mode   | BSIP-IWU mode                                      |

Unless otherwise noted, the instructions in this document refer to all three solutions.

## 1.2 Terminology

The terms "Voip gateway" and "PBX" are used as a synonym for the supported communication servers OpenScape Office MX (OSO MX), HiPath 3000, HiPath 4000 and OpenScape Voice (OSV).

The term **BSIP-Only** is used as a synonym for a BSIP1 which is **not running** the **HiPath Cordless IP Server Software**.

Therefore the term **BSIP-IWU** is used as a synonym for a BSIP1 which is **running** the **HiPath Cordless IP Server Software (IWU)**.

The term "**HPCIP-IWU**" or short "**IWU**" is used as a synonym for the **Inter Working Unit** process of the HPCIP system. The IWU may physically run on a BSIP (**BSIP-IWU**), a Rx 1330M1 (**Server-IWU** or **MGW-IWU**) or virtualized on an ESXi session as Media Gateway-IWU (**MGW-IWU**).

## 1.3 Network Concept

The IP network concept of the HiPath Cordless IP solution System is designed for the separation into several logical networks:

### 1. **VoIP (Infrastructure) network (Server-IWU and BSIP-IWU application mode)**

Here the existing infrastructure components (default Gateways, DHCP servers, Time server, DNS server, LDAP servers, SNMP clients,...), the **PBX** (the VoIP Gateway) and the BSIP1 or the server which is running the HiPath Cordless IP Server Software (the Interworking Unit [IWU] between VoIP and DECT) are located. This network is used for the connection of the IWU to the IP and VoIP infrastructure of the company LAN.

The factory-default network address is 192.168.2.0 with a netmask of 255.255.255.0.

The preconfigured IP address of the IWU in this network is 192.168.2.1.

### 2. **DECT network (all application modes)**

Here all BSIP1 Only Base Stations and the BSIP-IWU or the server running the HiPath Cordless IP Server Software (IWU) are located. This network is solely used for the communication between the IWU (BSIP-IWU or Server-IWU) or the Media Gateway (MGW) and the BSIP-Only. No Ethernet Layer3 components e.g. Routers are allowed between components inside this network.

The factory default network address is 192.168.1.0 with a netmask of 255.255.255.0.

The preconfigured network address of the IWU inside the DECT network is 192.168.1.1 with a netmask of 255.255.255.0.

The IP addresses for this network segment may be - apart from the exceptions in the next chapter - configured freely.

### 3. **Media Gateway IWU network (MGW-IWU and MGW application mode)**

This network hosts the communication between the MGW-IWU and its assigned MGW's as well as the existing infrastructure components (default Gateways, Time server, DNS server, LDAP servers, SNMP clients, ...), except the VoIP Gateway, which is hosted in a separate network (Media Gateway VoIP network).

The factory-default network address is 192.168.2.0 with a netmask of 255.255.255.0.

The preconfigured IP address of the IWU in this network is 192.168.2.1.

### 4. **Media Gateway VoIP network (MGW-IWU and MGW application mode)**

This network is solely intended for communication between the Media Gateways and their assigned Voip Gateways (PBX). By default, this network is bound to the same IP configuration as the MGW IWU network.

#### 5. Media Gateway CrossLink network (MGW-IWU and MGW application mode)

This network hosts the communication between Media Gateways mainly for signaling and DECT Handover communication. By default, this network is bound to the same IP configuration as the MGW IWU network.

#### 6. BSIP internal networks

For internal communication between the different hardware components of the BSIP1 there are two further networks configured.

**Important:** These addresses are fixed and cannot be changed. Keep in mind, that these addresses may not be used for the VoIP network and the DECT network. Furthermore no other components which are accessing the IWU or BSIP-Only may use one of these addresses.

192.168.123.x :

Network between the BSIP1 Local DECT module (.222) and the BSIP1-IWU (.111).

169.254.222.x.

Network between the two main processors CSP (.1) and MSP (.2) for internal communication.

**Important:** All BSIP1 devices must be located inside the same network segment and therefore **MUST NOT** be separated by layer 3 routing devices. Only Layer 2 switches are supported between the BSIPs.

### 1.3.1 Overview of Reserved Networks

Host IPs 192.168.1.1/24 and 192.168.2.1/24 are used for factory defaults of BSIP-Only and BSIP-IWU

IP network 192.168.123.0/24 for internal communication between CSP and DECT Baseband controller (BBC).

IP network 169.254.222.0/24 for internal communication between CSP and MSP.

### 1.3.2 Requirements

Proper system functionality of IP-DECT system mainly depends on the underlying network(s) the system is operating on (besides other DECT related requirements).

## Introduction

### Synchronization Over Air Concept

For all networks except the DECT network, common requirements for a "Voip ready" network apply. These networks have to be separated from other traffic by means of a specific VLAN.

For the DECT network, higher requirements apply depending on the synchronization method used. As a minimum requirement, a separate VLAN with highest priority (in case of LAN Sync) above all switches involved is required.

If using a MGW-IWU system with multiple MGW inside a side to use handover, the corresponding Crosslink networks have to be configured to have priority over the DECT network due to the fact that data and signaling is exchanged using UDP protocol and no Packet Loss is accepted. Therefore this network may not be routed through the Router the MGW is attached towards the MGW-IWU. As best practice, directly connect the participating MGW's via Ethernet L2 connections where no routed L3 connections (Routers) are involved.

For details, refer to the next sections.

## 1.4 Synchronization Over Air Concept

In contrast to a line based synchronization mechanisms (or a network based one), synchronization via air requires special requirements.

### Synchronization signal

Both synchronization partners are syncing over air. This means that the synchronization signal received by the synchronization client from the synchronization master has to have specific minimum signal strength and quality. The theoretical minimum signal strength for the synchronization signal is -85 dB. The minimum aspired signal strength for the synchronization signal is -75 dB

### Synchronization topology

For the operation of several synchronized Base Stations several topological approaches are possible.

#### 1. Star based synchronization topology

This topology uses just one Base station of the whole system as a synchronization Master (Sync Master). All other Base stations which take part at synchronization are working as synchronization Slaves (Sync Slave) and receive their synchronization signal from the only Sync Master.

#### 2. Chain based synchronization topology

This topology uses just one Base station of the whole system as a synchronization Master (Sync Master). All Base Stations are arranged - in terms of topology - in a chain.

The second Base Station receives its synchronization signal from the Sync Master and additionally provides the synchronization signal for the next Base Station in the chain that is this it serves as well as **Sync Slave** AND as **Sync Master**.

The second BSIP synchronizes to the first BSIP, the third BSIP synchronizes to the second BSIP, the fourth synchronizes to the third BSIP and so on.

Both topologies may be mixed to achieve large-scale radio coverage.

**Important Notes:**

- The topological distance between a "Air Sync Slave" to the topmost "Air Sync Master" must not be more than 5 hops (including the Master Base and the last Slave Base) else the "synchronization slip" will be too large.
- A resynchronization process will be initiated automatically if no call (at the belonging Base Station) is active.
- Avoid using a chain topology which is physically arranged as a circle. In such a scenario, the drift between the first and the last base station may be too large to ensure proper seamless handover between these two Base Stations.
- In contrast to a line or Ethernet based synchronization the synchronization signals is transmitted over air. To achieve efficient signal strength of the synchronization signal the "radio distance" between two synchronized base Stations is crucial. This fact has to be considered adequately during the radio site survey.
- If a BSIP loses synchronization it tries to resynchronize to its configured synchronization base station. This process can not start until the last call at this base station is released and no other calls (at the belonging base station) are active.

## 1.5 Synchronization via Ethernet (acc. IEEE 1588)

In contrast to an air based synchronization mechanisms, synchronization via Ethernet (acc. IEEE1588, PTP Precious Time Protocol) requires less configuration.

The main advantages of synchronization via LAN are:

- more flexibility in the location of the DECT IP base station - no need to built synchronization chains as with synchronization via DECT,
- less DECT IP base stations may be required, because the overlapped area of DECT IP base station is less
- configuration of DECT IP systems is simplified, because all DECT IP base stations can be synchronized to only one synchronization master

On the other hand, great demands are made on the Ethernet characteristics like symmetry, packet loss, delay, jitter (variance of delay), ... Therefore special requirements regarding the Ethernet components (especially the Ethernet switches used) have to be considered. Exceeding of limits (especially of jitter) will lead to loss of synchronization, which will finally lead to a resynchronization process. During this process the belonging Base Stations are unable to establish telephony connections.

#### **Synchronization topology**

The Synchronization according Ethernet solely uses a star shaped topology. Maximally one Base Station serves a Synchronization Master (Sync Master), all other Base Station which participate at the synchronization serve as Synchronization Slaves (Sync Slave).

#### **Resynchronization**

The DECT functionality of all BSIP, which are configured as IEEE1588 Sync Slaves, depends on the availability of the IEEE1588 Sync Master. If the Sync Master is not functional (e. g not Online due to Ethernet problems ...), the DECT functionality of all IEEE1588 sync slave BSIP will go down. During this time no telephony is possible.

#### **General requirements on the Ethernet system**

A maximum number of three cascaded Ethernet switches are supported between the Sync Master (SM) and a Sync Slave (SS) BSIP.

Only premium class switches, which fulfill the requirements regarding Ethernet synchronization according IEEE1588, are supported. A list of supported switches is documented in the sales information of the HPCIP system.

Synchronization according IEEE1588 may only be used with a project specific release. Details can be found in the release note of HiPath Cordless IP.

Usage of VLAN at the BSIP-IWU for Infrastructure and DECT network is mandatory. All participating switches have to be configured in a way that the VLAN of the DECT network has to be assigned the highest priority.

Further details regarding Ethernet Synchronization according IEEE1588 may be found in [Section 1.5, "Synchronization via Ethernet \(acc. IEEE 1588\)"](#).

## **1.6 WBM related issues**

### **1.6.1 Supported Web Browser**

The following web browsers are supported:

- Mozilla Firefox



- Microsoft Internet Explorer

For details refer to [Section 8.1, “Configuration Hints for Web Browser”](#) as well as the release notes.

## 1.6.2 General WBM Issues

- The following special characters are not allowed inside the configuration objects for WBM:  
“[“, “]”, “%”, ASC (0) - ASC (0x1F)
- Adding or removing of some configuration objects is only supported if services are stopped.
- Configuration and firmware files MUST NOT include spaces in their filenames

## 1.6.3 Simultaneous WBM Sessions

If you login onto the same WBM session on which another user is logged on, you are informed about that by a message box.

[OK] will logout the currently connected user.

[Cancel] Go back to the Login dialog.

## 1.6.4 Marking Changed Values

Changed values are marked with a red triangle at the top left corner of the corresponding field. But you have to leave the current field for changes to come in effect (via TAB key or mouse).

| Enabled                             | Msn | DisplayName |   |
|-------------------------------------|-----|-------------|---|
| <input checked="" type="checkbox"/> | 101 | DISP-101    | § |
| <input checked="" type="checkbox"/> | 102 | DISP-102    | § |
| <input checked="" type="checkbox"/> | 103 | DISP-103    | § |

Please keep in mind that changes are not in effect immediately. You have to

- apply the changes with the [Apply] button and for some changes you have to
- restart the services or for some changes
- reboot the IWU

Information which actions have to be taken to take the changes into effect will be described in the appropriate chapters.



### 1.6.5 Tooltips for Column Headers of Tables

All tables are equipped with tooltips for the column headers. If the mouse cursor moves over the column header, the tooltip is displayed which contains the same text as the column header caption itself. This feature offers the possibility to keep the column width very small (e.g. for counter values) and therefore place all columns fitting on one screen without the need of scrolling horizontally. In this case, the column header caption may be truncated on the right side but the column header caption may be derived by simply moving the mouse cursor over the column header to retrieve the description of the current column.

| Base Mibs   Base 1588   Base RSSI |           |           |           |           |                 |   |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------------|---|
| VOIP ...                          | DECT ...  | DECT ...  | DECT ...  | DECT ...  | VOIP IP         | V |
| [003] ...                         | [003] ... | [032] ... | [003] ... | [032] ... | DECT Call on BS | R |
| [003] ...                         | [003] ... | [032] ... | [003] ... | [032] ... | 192.168.201.94  | R |
| [003] ...                         | [003] ... | [032] ... | [003] ... | [032] ... | 192.168.201.94  | R |
| [003] ...                         | [003] ... | [032] ... | [003] ... | [032] ... | 192.168.201.94  | R |
| [002] ...                         | [002] ... | [017] ... | [002] ... | [017] ... | 192.168.201.94  | R |
| [001] ...                         | [001] ... | [004] ... | [001] ... | [004] ... | 192.168.201.94  | R |

### 1.6.6 Sorting of Tables

All tables may be sorted (Ascending or Descending) by either double-clicking the column header or by left clicking of the arrow in the right area of the column header.

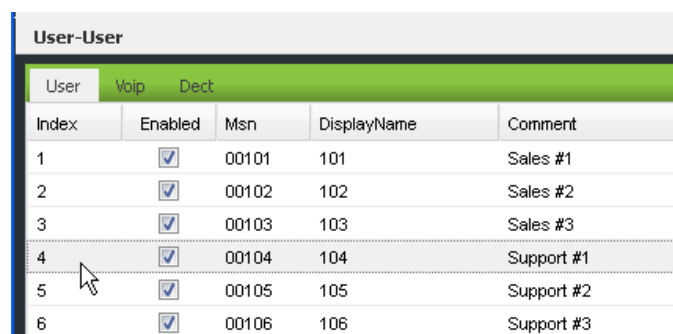
| User   Voip   Dect |                                     |     |   |          |
|--------------------|-------------------------------------|-----|---|----------|
| Index              | Enabled                             | Msn | DisplayName   | Comment  |
| 1                  | <input checked="" type="checkbox"/> | 101 |  Sort Ascending  | SL1 (00A |
| 2                  | <input checked="" type="checkbox"/> | 102 |  Sort Descending | SL1 (00A |
| 3                  | <input checked="" type="checkbox"/> | 103 | DISP-103  | SL1 (00A |
| 4                  | <input type="checkbox"/>            | 104 | DISP-104  | SL1 (00A |

**Hint:** Sort properties are not stored. After a change of pages the original sort order is restored.

## 1.6.7 Drag and Drop Support

Besides the standard mechanism of sorting user entries by clicking the column headers individual user entries may be reordered using a drag and drop mechanism.

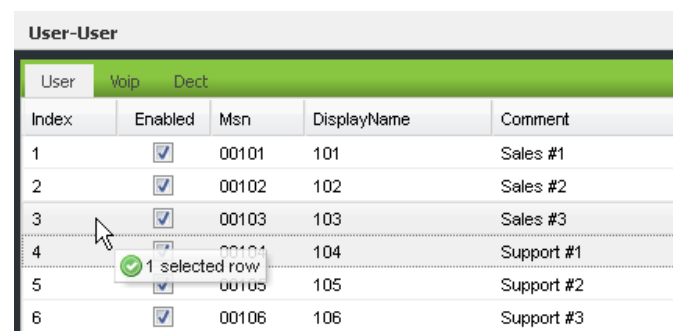
1. Select the user entry that should be moved by pressing the left mouse button.



The screenshot shows a web interface titled "User-User" with a table. The table has columns: Index, Enabled, Msn, DisplayName, and Comment. Row 4 is highlighted, and a mouse cursor is pointing at it. A tooltip "1 selected row" is visible over row 4.

| Index | Enabled                             | Msn   | DisplayName | Comment    |
|-------|-------------------------------------|-------|-------------|------------|
| 1     | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1   |
| 2     | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2   |
| 3     | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3   |
| 4     | <input checked="" type="checkbox"/> | 00104 | 104         | Support #1 |
| 5     | <input checked="" type="checkbox"/> | 00105 | 105         | Support #2 |
| 6     | <input checked="" type="checkbox"/> | 00106 | 106         | Support #3 |

2. Drag the selected entry to the new designated position.



The screenshot shows the same "User-User" table. Row 4 is still highlighted, and a mouse cursor is pointing at it. A tooltip "1 selected row" is visible over row 4.

| Index | Enabled                             | Msn   | DisplayName | Comment    |
|-------|-------------------------------------|-------|-------------|------------|
| 1     | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1   |
| 2     | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2   |
| 3     | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3   |
| 4     | <input checked="" type="checkbox"/> | 00104 | 104         | Support #1 |
| 5     | <input checked="" type="checkbox"/> | 00105 | 105         | Support #2 |
| 6     | <input checked="" type="checkbox"/> | 00106 | 106         | Support #3 |

### Hints:

- The entry will be added above the selected entry if the drag direction is upwards.
  - The entry will be added below the selected entry if the drag direction is downwards.
3. Drop the dragged entry by releasing the left mouse button.
  4. Save your changes by clicking the [Apply] button.

## 1.6.8 Configuration Changes according Service State

While system services are running, most content of tables are read-only since editing during running services is not possible without special handling of these objects at the IWU.

Therefore you have to:

## Introduction

### Partition concept of BSIP1

- Stop the system services (Offline mode) to edit these values or
- Edit the object using a specific functionality (Edit object). You may add, delete or modify existing object entries.

To modify existing entries, select a user row and click the corresponding [Edit xxx]. Now the entries in the table row are editable. Changes for the selected objects are locked until the changes are applied using the [Apply] button or are reverted using the [CANCEL] button.

Hints regarding deletion of users

Please keep in mind, if deleting a user entry the DECT registration is NOT being removed. Therefore the handset may not be reregistered on the same ARI again.

If a user should be deleted during an active call, the object will NOT be deleted. A message box will inform about this.

In HPCIP V1R5, a lot of new objects may be modified during running system services. For details, refer to [Section 2.12.5, "Dynamic Configuration Changes"](#).

## 1.7 Partition concept of BSIP1

To guarantee a functional BSIP at any time, two bootable systems are implemented at the BSIP1.

A **current system** and the **fallback system**. Therefore the BSIP has two different systems partitions:

System 1 and System 2.

Both system partitions can hold their **own configuration** (although it is copied from one partition to the other during a firmware update).

Both partitions store their application mode (BSIP-Only or BSIP-IWU)

A factory reset is always applied to the **current system** partition. It does **not** affect the settings of the other partition.

**Hint:** Similar to the BSIP-IWU, the Server-IWU contains the same partition concept as described above.

## 1.8 Factory reset of BSIP1

A Factory Reset (resetting the BSIP1 to its default configuration) may be performed either by

- a local login at the WBM of a BSIP-Only using the Factory Reset button or

- a special "power sequencing" cycle (e.g. if the BSIP WBM is not accessible) using the ethernet cable at the BSIP.

Both methods are resetting the active partition of a BSIP1 to its factory default configuration.

The factory reset by "power sequencing" is applied by the following process:

1. Power on the board by plugging the ethernet cable (see note)
2. Wait 5s (3s < wait < 7s)
3. Power off the board by unplugging the ethernet cable
4. Repeat steps 1. - 3. three (3) times
5. Boot BSIP1 to OS

The successful factory reset is indicated by fast red flashing of both LEDs.

**Note:** If you provide power to the board by connecting the ethernet cable using a PoE Switch power may NOT provided immediately. Due to the stages of powering up a PoE link defined in 802.3af it may take up to some seconds until the power is delivered from the switch to the PoE port. Take a look at the LEDs or the switch status LEDs to see at which point the power is available.

After this procedure, the default configuration parameters will be set.

**The default application mode after a reset is BSIP-Only mode.**

**Hint:** The factory reset is applied to the currently active partition. It does not affect the settings of the other partition. But both operation mode settings (BSIP-Only and BSIP-IWU) of the active partitions are reset.

| Setting                    | Value                                     |
|----------------------------|---|
| Operation mode:            | BSIP-Only                                 |
| IP address of VoIP network | 192.168.1.1                               |
| Access mode                | http                                      |
| User Unify                 | Username: "Unify", password "1q21q2"      |
| User UnifyAdmin            | Username: "UnifyAdmin", password "1q21q2" |

| Setting                    | Value                                     |
|----------------------------|---|
| Operation mode:            | BSIP-IWU                                  |
| IP address of VoIP network | 192.168.2.1                               |
| Access mode                | http                                      |
| User Unify                 | Username: "Unify", password "1q21q2"      |
| User UnifyAdmin            | Username: "UnifyAdmin", password "1q21q2" |

## 2 V1R5 - Enhancements and Changes

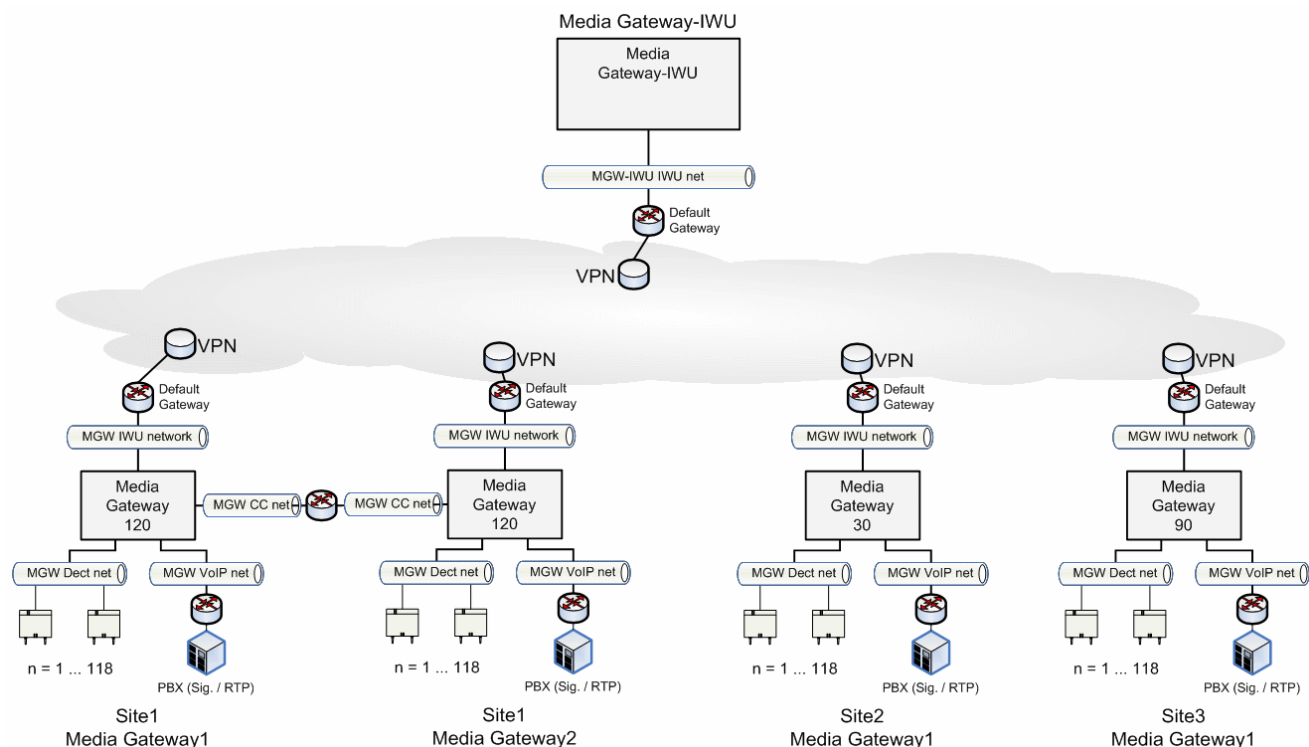
The new version V1R5 introduces some new concepts and features to the HPCIP system.

- Enhance number of Basestations from currently 60 to approx. 600 (large setups).
- Permit branch setups where a central IWU is located in the central office and the BSIP are located in several branch offices (sites) separated by Layer2 (Ethernet) or Layer3 links (IP) using LAN or WAN links.

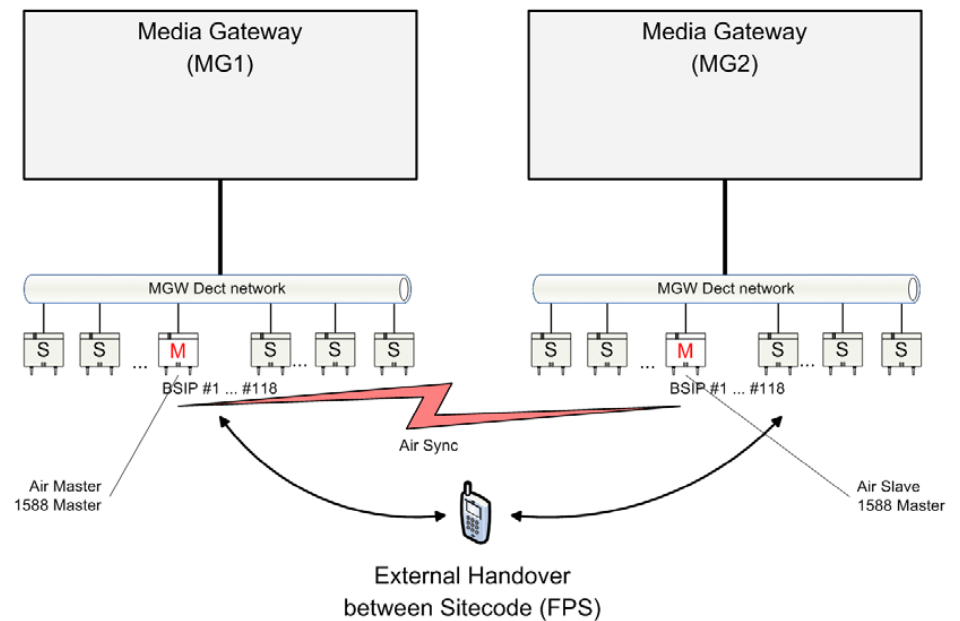
Permit changes to the different configuration objects (users, groups, network server, PBX, DECT Modules) during running system services.

### 2.1 Conceptual Overview (MGW-IWU mode)

#### 2.1.1 Graphical Overview of System Entities



## 2.1.2 Graphical Overview of Media Gateway



## 2.2 System Entities

HPCIP V1R5 introduces three new system entity types:

- Media Gateway-IWU - a new physical entity
- Media Gateway - a new physical entity
- Media Gateway Local- a new logical entity for Server-IWU and BSIP-IWU
- Site - a new logical entity

### 2.2.1 Media Gateway-IWU

A "Media Gateway-IWU" represents a new physical system entity. The main task of the IWU process is to interconnect the SIP and Dect call legs. This doesn't change for the new "Media Gateway-IWU". As opposed to a traditional Server-IWU or BSIP-IWU, the Layer3 communication is now separated by the network communication between the Media Gateway-IWU and its Media Gateways (due to the branch concept). Similarly to a V1R4 IWU, most configuration of the whole System is accomplished and centralized at the Media Gateway-IWU. This enables a centralized configuration concept across all Media Gateways.

## 2.2.2 Media Gateway

A "Media Gateway" represents a new physical system entity and introduces a new abstraction layer between the Interworking Unit (IWU) and the Basestation IP (BSIP).

For a traditional IWU (up to V1R4), the IWU process communicated directly with the BSIP as well as with the SIP PBX. Therefore, SIP connections as well as DECT connections were terminated at the IWU process.

The "Media Gateway" breaks this media termination scheme (IWU <-> SIP and IWU <-> BSIP) by inserting the Media Gateway as a new entity between the IWU and SIP / DECT. Using a Media Gateway, SIP connections are terminated at the Media Gateway entity and logical DECT communication is also terminated at the Media Gateway (although DECT connections are terminated physically at the BSIP). All BSIP at a specific Media Gateway have to be attached directly by a Layer2 network to the Media Gateway (the same requirements are needed as described for a present V1R4 DECT network).

To assure consistent system architecture, the Server-IWU as well as the BSIP IWU will be enhanced by the concept of a logical local Media Gateway (Media Gateway Local). This concept is similar to the local BSIP included in a BSIP-IWU.

**Hint:** Support of BSIP as a hardware platform for MGW is not included in V1R5.

### 2.2.2.1 Media Gateway Types

Four different types of Media Gateways are available:

- Media Gateway 30
- Media Gateway 60
- Media Gateway 90
- Media Gateway 120

The type mainly determines the maximum number of concurrent calls (30, 60, 90 or 120) at the Media Gateway. Furthermore, the hardware type influences the number of needed resources at the Media Gateway IWU.

Therefore, the hardware on which the different Media Gateway types are running is the same.

The different Media Gateways types (30, 60, 90 or 120) may be combined to build a cluster of up to 5 Media Gateways per site. This concept may permit the minimization of needed resource counters at the IWU by using several smaller Media Gateways at a site instead of one large one. In this case, the number of resource counters decreases, but the number of needed hardware for the Media Gateway(s) increases.



Each of this Media Gateway type is able to handle the number of max. concurrent DECT calls derived from its type definition (30, 60, 90 or 120 Dect calls), according the following table.

| Media Gateway Type | Max. BSIP | Max. concurrent Call streams | Max. concurrent DECT calls | Resource Counter |
|--------------------|-----------|------------------------------|----------------------------|------------------|
| MGW 30             | 120       | 120                          | 30                         | 2                |
| MGW 60             | 120       | 120                          | 60                         | 4                |
| MGW 90             | 120       | 120                          | 90                         | 6                |
| MGW 120            | 120       | 120                          | 120                        | 8                |

### 2.2.3 Site

A Site represents a new logical system entity by grouping 1 to 5 physical Media Gateways by means of a "Site Id".

Between each of this MGW inside the site, Roaming and Internal Handover may be possible.

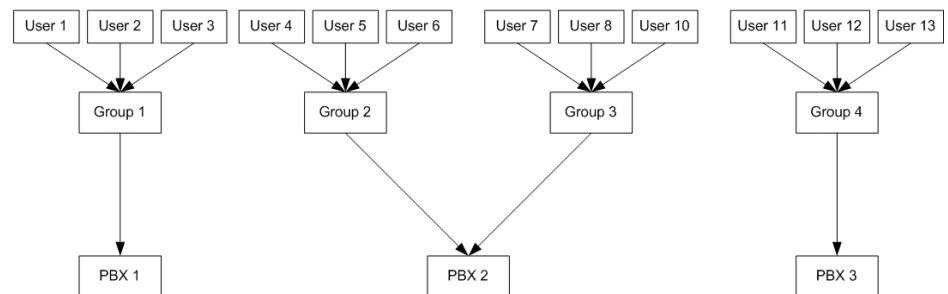
Between two sites, only Roaming is possible, but may be disabled by means of configuration.

All Media Gateways with the same "Site Id" are belonging to the same site. To assign a MGW to a specific site, this "Site-Id" is used.

## 2.3 Dependencies between User, Group, MGW and PBX

### 2.3.1 Traditional Concept

The following figure depicts the relationships between Gateways, Groups and Users in the traditional concept of HPCIP up to V1R4.



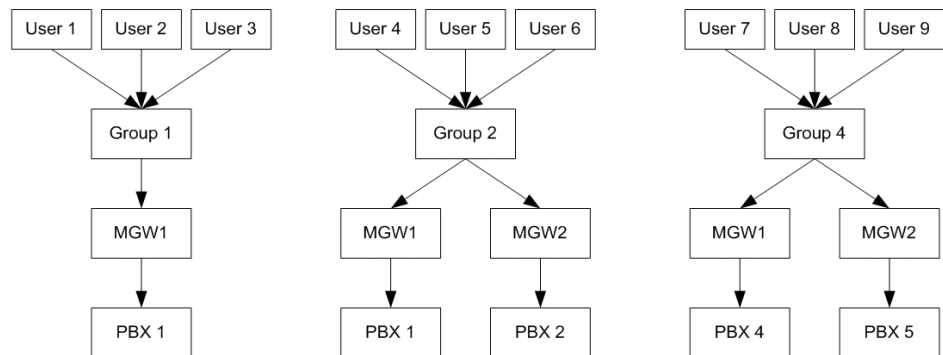
According to the figure above the following relations exist:

- Several users may be assigned to one Group (n:1).
- Several groups may be assigned to one PBX (n:1).

### 2.3.2 New Concept

The new concept of V1R5 introduces a new entity of type Media Gateway (MGW) in the group systematic. A group is assigned to one or several Media Gateways (In case of a BSIP-IWU or Server-IWU, the groups can only be assigned to the MGW-Local). A MGW may be assigned one PBX on a per group base. Therefore, a MGW may be assigned several PBX by using several groups.

The following figure depicts the relationships between Gateways, Groups and Users of HPCIP in V1R5.



According to the figure above the following relations exist:

- Several users may be assigned to one Group (n:1). (WBM > User > User > Groups)
- Each group may be assigned to several MGW' s (1:n). (WBM > Group > MediaGW List). In case of a BSIP-IWU or Server-IWU, the groups can only be assigned to the MGW-Local
- Each MGW may be assigned to one PBX (1:1) inside a specific group (WBM > Media Gateways > VoIP Gateway)

## 2.4 User Roaming

Since the new concept may support branch concepts, a user may roam between several Sites of a branch. The term user roaming does not only restrict to DECT roaming. It is also extended to the SIP roaming of the user, since each Site (or a specific Media Gateway inside a site) may have its own PBX assigned.

To support DECT roaming of a user,

- an appropriate Dect configuration (ARI / FPS) has to be chosen (for details refer to [Section 5.28.4, "MGW specific fundamentals for Roaming"](#)).
- roaming has to be enabled for a specific MGW by means of configuration at the HPCIP (Group > MediaGW List)

A user is configured uniquely at the Media Gateway-IWU. To support the SIP roaming of a user between different PBX, it is necessary that the global user configuration data is unique across all PBX of all sites. This comprises the MSN, Username, AuthName as well as the Password.

## 2.5 DECT Roaming and Handover

The new system concept uses the similar mechanisms of Dect roaming and Dect handover (Intracell and Intercell handover based on bearer handover) as former V1R4 versions. This concept has been enhanced by a freely configurable DECT LAL (Location Area Level) parameter.

Further information may be found in [Section 5.28, "Dect Fundamentals"](#).

### 2.5.1 Description of former Dect Roaming Concept

Using DECT roaming in the old concept was realized by two different concepts.

#### 1. IWU triggered Dect Roaming

To implement a branch office scenario, IWU triggered "Multi-IWU" roaming by means of DECT identification entities (ARI) was used. Therefore, several IWU s had to be configured using the same ARI. The DECT user data had to be configured identically on all IWU's.

For this concept, a geographical separation of DECT base stations between all sites is necessary due to the same ARI used on several unsynchronized DECT areas.

As one of the drawbacks, SIP users had to be registered on each IWU at the specific IWU with an IWU specific Username. To ensure reach ability, PBX centric group mechanism (e.g. MULAP groups) had to be used to ensure reach ability at all locations and for the same phone number.

#### 2. Handset triggered Dect Roaming

To implement a branch office scenario, handset triggered Multi-IWU roaming by means of different DECT registrations of the handset was used. Therefore, each IWU has to be configured using a different ARI. The DECT user data may be configured differently on all IWU's.

For this concept, a geographical separation of DECT base stations between all sites is not necessary (but suggested due to the missing synchronization between the Dect systems) due to the different ARI.

## 2.5.2 Description of new Dect Roaming Concept

Since all data of a user is configured centralized at the Media Gateway-IWU, a separate site specific user configuration is not needed anymore.

The DECT roaming capability is mainly depending on the System ARI used. Since the new concept introduces a branch concept, roaming has to be configured more specific for the different sites.

To be able to implement a specific roaming scheme, it is vital to understand the underlying DECT concepts.

## 2.6 SIP Roaming

If an External DECT roaming event (Roaming inside the same site or between different sites) was detected for a user, this will trigger an immediate SIP roaming event (unregister from the former PBX and register at the current PBX for the MGW). Therefore, it is necessary that the global user configuration data is unique across the relating PBX of all sites. This comprises the MSN, the UserName, the AuthName as well as the Password.

This doesn't apply for a MGW-Handover event; during an active call, the call remains connected on the MGW it was established until it will be disconnected. After the disconnect has finished, the SIP user will be roamed onto the new MGW.

### 2.6.1 Restrictions for PBX

Since SIP roaming on HCIP depends on the PBX' capability to handle the roaming requests (Unregister the users from the last MGW Ip address and register them from the new MGW IP address even overlapping).

**Important note:** Only OpenScape Voice is able to handle the SIP roaming efforts of HCIP system. All other Unify PBX are not supported for HCIP MGW-IWU.

## 2.7 Network Concept Media Gateway

For a traditional HPCIP system, three different networks have been assigned.

1. VoIP (Infrastructure) network
2. DECT network
3. BSIP1 internal networks (onboard network communication between the processors of the BSIP)

For the new concept of Media Gateway, the former VoIP (infrastructure) network is separated into three different networks. (The DECT network as well as the BSIP1 internal network concept don't change).

1. "Media Gateway IWU network" (new)
2. "Media Gateway VoIP network" (new)
3. "Media Gateway CrossLink network" (new)
4. "Media Gateway DECT network"
5. "BSIP1 internal networks"

One IP address and a default gateway for the Media Gateway-IWU network may be configured. Therefore, all other routing towards the Media Gateway-IWU has to be handled by the default gateway of the Media Gateway-IWU network.

Keep in mind, that for MGW of type 120 inside a site up to 120 connections may handover between two MGW' s. Therefore, the Router connection between these MGW' s has to be designed to handle this bandwidth.

Per MGW (independent of type of MGW) max 120 call streams are supported due to design limits.

If one MGW inside a site is busy with 120 call streams each, no handover to this MGW will be possible as well as no new calls (either incoming or outgoing) are possible.

If a site is using several MGW' s, the corresponding DECT networks **MUST NOT** be located in the same LAN segment. They have to be separated by different LAN segments or by means of VLAN separation. Reasons for this segmentation are:

- Several 1588 master which broadcast 1588 information. -> high broadcast rate may overflow switches and may be treated as broadcast storms
- Ease of recognition of 1588 master if only one 1588 master in one LAN segment
- Same IP addresses in the DECT network are possible

**Hint:** The Router between the Crosslink Networks is meant as a symbolic representation. Since in the current step of HPCIP V1R5, fully routing is not part of the specification (no specific gateway for the CL network may be configured). In this case, the Crosslink router is functional if it is the same router as the IWU router.

## 2.8 Feature Concepts

### 2.8.1 LDAP and LDAP Phonebook

In the traditional IWU (V1R4), it was possible to configure several LDAP servers on a per group base. The integrated LDAP client of the IWU was terminated at the IWU.

In the new concept, also several LDAP Servers are possible. The LDAP Client is located at the MGW-IWU. A LDAP Server may be assigned to a specific Media Gateway on a group base.

### 2.8.2 System Phonebook

In the traditional IWU (V1R4), only one phonebook / IWU was possible. In the new concept, several phonebooks (on a group base) are possible (limited to MGW-IWU).

## 2.9 Specified System Limits

| Item  | Limit V1R5 Step 1 |
|---|-------------------|
| Max. no. of MGW / MGW-IWU   | 20...100, see 1)  |
| Max. no. of Sites / MGW-IWU   | 20...100, see 1)  |
| Max. no. of BSIP / Site   | up to 568, see 2) |
| Max. no. of MGW / Site  | 5                 |
| Max. no. of BSIP / MGW  | 120, see 2)       |
| Max. no. of concurrent calls / MGW 30   | 30                |
| Max. no. of concurrent calls / MGW 60   | 60                |
| Max. no. of concurrent calls / MGW 90   | 90                |
| Max. no. of concurrent calls / MGW 120  | 120               |
| Max. no. of concurrent calls / Site   | 600               |
| Max. no. of concurrent calls / MGW-IWU  | 3000              |
| Max. no of handover connections from one MGW to all others inside the same site | 60..., see 3)     |
| Max. no. of users / MGW   | 1200              |
| Max. no. of users / MGW-IWU   | 20000             |
| Max. no. of PBX / MGW-IWU   | 100               |
| Max. no. of LDAP server / MGW-IWU   | 10                |

**Calculated max. values**

Max. no. of BSIP / Site:

Max. no. of BSIP / MGW \* max. no. of MGW / Site =  $120 * 5 = 600$

Max. no. of BSIP / MGW-IWU:

Max no. of MGW /MGW-IWU \* max. no. of BSIP / MGW =  $100 * 120 = 12000$

Max. no. of concurrent calls / Site:

Max. no. of concurrent calls / MGW  $120 * \text{Max. no. of MGW / Site} = 120 * 5 = 600$

1. Up to 100, if 1 MGW / Site used, up to 20 if 5 MGW / Site are used. The number is limited by the Resource Counter which may not exceed 200. For details refer to next chapter.
2. Since MGW inside a site are synced via air, each MGW inside this site has to be configured with up to two virtual External Sync Basestations as well as a number of CrossLinks which will decrement the number of physical BSIP. For detail refer to [Section 2.12.2.3, "Max. no. of BSIP per MGW"](#).
3. A maximum no. of handover connections from one MGW to all other MGWs' inside the same site is limited to 60. Keep in mind, that a single handover from MGW-A to MGW-B allocates a block of 10 handover connections.

## 2.10 Definitions

### 2.10.1 Resource Counter

"Resource Counter": At the Media Gateway-IWU, limited resources for the number of concurrent calls are available. The number of concurrent calls is determined by the Media Gateway Type (30, 60, 90 or 120).

For a Media GW 30, 30 concurrent calls are available. The no. of resource counter needed is 2.

For a MediaGW 120, 120 concurrent calls are available. The no. of resource counter needed is 8.

The maximum number of Resource Counters / MediaGW-IWU is limited to 200.

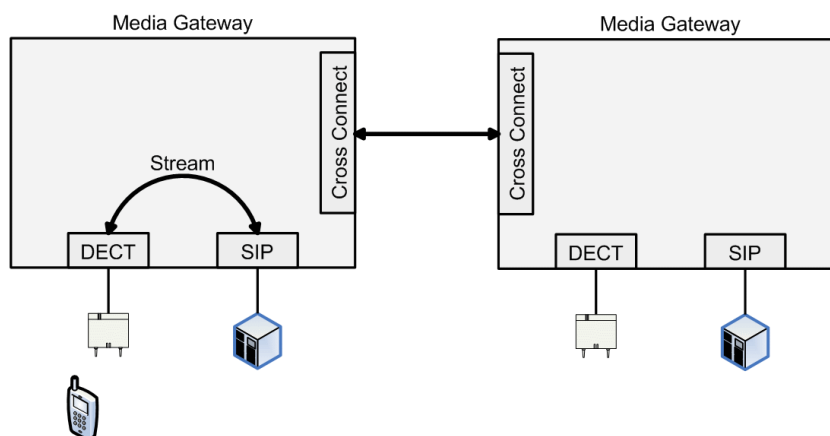
Therefore, the maximum number of MGW' s / MGW-IWU is variable and is limited to 200 by the following formula:.

$(\text{No. of MGW } 30 * 2) + (\text{No. of MGW } 60 * 4) + (\text{No. of MGW } 90 * 6) + (\text{No. of MGW } 120 * 8) = 200.$

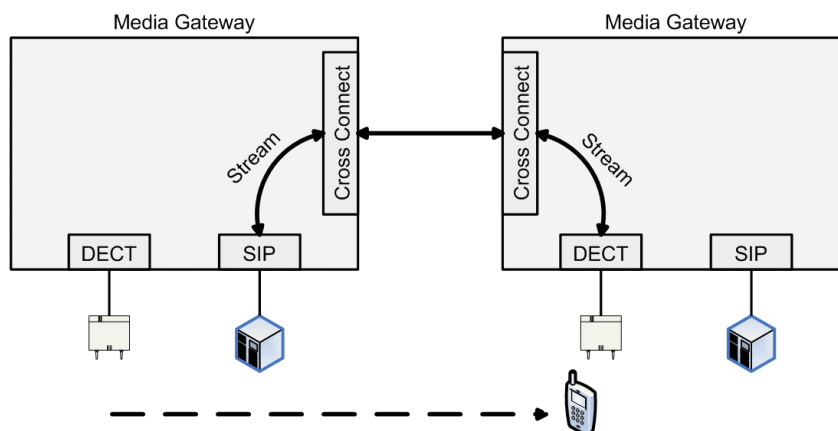
## 2.10.2 Stream

"Stream" : At the Media Gateway, limited resources for the number of media streams are available. A stream may be treated as a local connection at a Media Gateway between a SIP/RTP and DECT call leg.

For a "standard" call at a MGW where the DECT call leg is terminated at a BSIP attached to the same MGW and the SIP call leg is terminated at a PBX terminated at the same MGW, one stream is allocated (see figure below).



If a user handovers to another MGW inside the same site, the DECT call leg is not terminated at the former MGW anymore, instead it is connected via the Cross Link to the other MGW. Therefore, two streams are allocated. One at the former MGW and a further one at the new MGW (see figure below).



Therefore, each external handover from an originating MGW will reduce the no. of streams at the destination MGW.



**Example:** 60 calls have handovered from MGW1 to MGW2. Therefore, at MGW2 only 60 (120-60) streams are available. Therefore, only 60 new calls may be established at MGW2 as well as on MGW1. Hence, the theoretical sum of all calls from MGW1 and MGW2 ( $120 + 120 = 240$ ) will be reduced to  $(60 + 60) = 120$ .

This behavior has taken in account for OVL70 and OVL100 counters. Whatever value (calls or streams) reaches the system limits first, will trigger a OVL70 or OVL100 event.

## 2.11 Installation Process

Up to V1R4 two different installation images have been available. One tar image for the BSIP-IWU and one for the Server-IWU.

For V1R5 this concept is already used. One tar image for the BSIP-IWU and one for the Server-IWU / MGW-IWU / MGW.

Therefore it is possible to switch the "Application Mode" between "Server-IWU", "Media Gateway" as well as a "Media Gateway-IWU" similarly to the application mode switch between a BSIP-Only and a BSIP-IWU.

The Media Gateway-IWU may be installed directly on a supported hardware platform (Rx 1330 M1) or may be installed on a virtualized session on VMware ESXi5.

**Important note:** Due to timing issues, virtualization of Server-IWU and Media Gateway is NOT supported.

The Default Application mode after a reset is "Server-IWU". The IP Addresses of "Server-IWU", "Media Gateway" and "Media Gateway-IWU" don't differ and remain to the current IP address of 192.168.2.1. Switching the Application modes will lead to a factory reset of the destined Application mode after reboot

### 2.11.1 Initial Setup of Media Gateway

If a Media Gateway has to be setup, only core parameters, which are needed to communicate with the assigned Media Gateway-IWU, have to be configured locally via WBM at the Media Gateway site. All further configuration (including the DECT and SIP configuration) is accomplished centralized at the MGW-IWU.

All DECT Basestations have to be attached and physically available at the configured Ethernet interface.

All BSIP have to be located in the correct partition and firmware version. Therefore, all BSIP located at the current MGW are updated using the central update of the MGW or updated locally using the Fw Down button. This Concept is similar to existing handling of BSIP update/partition sync at Server-IWU or BSIP-IWU.

If the BSIP are correctly preconfigured and if network connectivity to the Median Gateway-IWU is confirmed, all further Config is accomplished centrally at the Media-Gateway-IWU.

Therefore the MGW tries to contact the MGW-IWU at the configured IP address / ports cyclically. If the network connection is established, the MGW-IWU is aware of the newly attached Media-GW due to the signaled information from the MGW to MGW-IWU. The MGW may be differentiated by their MAC address (which is part of the signaled information) as similar to the existing process of differentiating the BSIP.

At the MGW-IWU, the new Media-Gateway may be "scanned" and - if the signaled information is available at the IWU, the MGW is added to the list of available MGW' s.

**Hint:** A MGW is identified uniquely by its MAC address and not by the name. Therefore, if the HW of MGW has to be replaced, it has to be configured with same settings. The old MGW (if already existing) has to be detached from the network. After the new MGW is known by the IWU, it is displayed at the MGW IWU and may be replaced using the same concept as used for replacing BSIP.

## 2.11.2 Update Concepts

A centralized update of Media Gateways from Media Gateway-IWU is not supported.

Update of MGW and Basestations is done locally at the corresponding Media Gateway. Therefore it is necessary to ensure that WBM access from MGW-IWU to MGW is possible.

An update of basestations only (excluding the MGW itself) may be initiated at the WBM of MGW-IWU.

### 2.11.2.1 MGW-IWU System

Keep in mind, that running a MGW-IWU system requires the same versions on MGW and MGW-IWU. Mixing different versions on MGW and MGW-IWU may lead to problems on the HCIP.

For updating a MGW-IWU system, the MGW and MGW-IWU have to be updated by a specific order.

#### Target Version V1R5

Up to V1R5.4.2 V4.0.17rc1 as the target version, the following sequence has to be observed:

- Update all MGW to the new version but don't reboot the system to the new partition now

- Update the MGW-IWU to the new version
- Initiate the reboot of all MGW to the new version/partition
- If the reboot process of all MGWs' is active or has finished, reboot the MGW IWU to the new version/partition

**Target Version V1R6**

Starting with V1R6.0.0 V4.2.0 as the target version, the following sequence has to be observed:

- Update the MGW-IWU to the new version and reboot the MGW-IWU to the new version/partition
- If the reboot process of the MGW-IWU has finished Control and Signal of MGWs may remain Online, but Crosslinks and all Bases are going into state Offline. This means there is no system functionality in this state.
- Update all MGW to the new version
- Initiate the reboot of all MGW to the new version/partition
- If the reboot process of the MGWs' have finished, Control and Signal as well as Crosslinks and all Bases are going into state Online.

**2.11.2.2 Update from V1R4**

When updating from V1R4 to V1R5 you may run into a licensing issue. When updating a HPCIP system, the CLC data always is copied from the old to the new partition. In case of updating from V1R4 to V1R5, CLC data of V1R4 is copied into the partition of V1R5. Since the default grace period CLC data of V1R4 only contains 1 Server and 1000 Basestations, (in contrast to 100 Server and 12000 basestations in V1R5), only 1 MGW-IWU and 1000 Basestations will get a valid license in case of grace period. To break the barrier of 1 Server and 1000 basestations, it is necessary

- to install a valid license or
- to install a V1R5 starting from a V1R5 Installation CD (which already contains the larger grace period values of 100 Server and 12000 basestations).

**2.11.3 Licensing**

The CLA is running on the MGW-IWU and contains a license controlling the number of MGW (license object "Server") and the total no. of BSIP (license object "Basestation"), as nowadays in a Server-IWU. The effort to license the no. of MGW is realized by using the currently license object "Server". As in current version V1R4, the license method "First comes, first serves" doesn't change.

- The Media Gateway-IWU needs a license.
- The Server-IWU needs a license.
- The BSIP-IWU doesn't need a license.

## 2.11.4 Process Names

| Process     | Description   |
|-------------|---|
| capisrv     | Running on Server-IWU and BSIP-IWU.                                     |
| iwu         | Running on the MGW-IWU, Server-IWU and BSIP-IWU.                        |
| capigw      | Running on the MGW-IWU; communicates with MGW processes running on MGW  |
| mediagw     | Running on the MGW; communicates with capigw process running on MGW-IWU |
| setupapplic | Running on each of the entities   |

## 2.12 Details to System Entities

### 2.12.1 Media Gateway-IWU

DHCP is not supported at the MGW-IWU since a global concept of DHCP (including WBM-IWU and MGW) is not possible due to the L3 separation of these entities.

### 2.12.2 Media Gateway

To access the BSIP from the Media-GW IWU network for Debugging purposes, it is possible to activate an option similarly to "MGW as GW" on the present IWU.

Up to 120 BSIP per MGW are supported. Due to the high system load of the BSIP running as 1588 Master with up to 119 1588 Clients connecting to the 1588 master, a reduction of the max. concurrent calls at the BSIP 1588 master up to 0 calls has to be configured. For details refer to [Section 4.12.2.1, "Status Search Options"](#).

For each MGW, up to 120 "modules" are supported. Besides the module type "Bslp" for a physical BSIP1, there are other module types (see WBM > Dect > About > Type) which are required for Inter-Media Gateway Synchronization . These module types also reduce the maximum number of module resource per MGW (120). For details refer to [Section 2.12.2.3, "Max. no. of BSIP per MGW"](#).

Using air Sync for 120 BSIP exclusively is not specified (due to the max number of hops between Sync Slave and Sync Master which may not be realized by a high amount of BSIP).

The Firmware management (update) of a MGW as well as the update of the basestations is only available by the WBM of the MGW itself. It cannot be initiated by the WBM of MGW-IWU.

DHCP is not supported at the MGW (since several networks have to be configured - which is not a standard option in DHCP).

To prevent potential paging problems of the handsets at a high amount of basestations (120) the paging area (domains) may be configured separately by means of the Dect LAL (Location Area Level) parameter. In former versions, each BSIP built its own paging area (LAL = 39), therefore a page request has to be sent to each BSIP separately. This lead to a high paging message rate if several handsets were paged simultaneously which may had overflowed the page queues at the BSIP.

The MGW will not provide specific MIBs or traps. Only OS MIBS are available if queried directly from the MGW. Specific MGW related MIBS may be provided centralized by the MGW-IWU.

### **2.12.2.1 Synchronization between MGW inside the same Site**

Besides existing synchronization of Basestations inside a Media Gateway (which is fundamental for seamless handover), handover between Media Gateway inside the same site is supported. Hence, a new sync mechanism was introduced which handles the synchronization between Media Gateways (Inter-Media Gateway Synchronization).

Since the DECT networks of the Media Gateways have to be separated by VLAN or separate Ethernet segments, using 1588 as the sync method between Media Gateways inside a site is not an option. Therefore the concept of Inter-Media Gateway Synchronization has to be based on Dect synchronization by air.

Background information: As a precondition for air synchronization to work, all participating Base Stations require Dect specific information about their sync partners (e.g. beacon, traffic and RSSI information) to handle the movement of the sync signal. This information (which is being exchanged between IWU and the BSIP) is transmitted over Ethernet (DECT network). Therefore, this information is IP based and not exchanged by air.

Since the exchange of this information between the Media Gateways inside a site is necessary, a Virtual Dect Module as well as a CrossLink is defined which handles the exchange of this information between the Media Gateways. These module types are solely responsible for exchanging the DECT specific air sync information which is needed for Inter-Media Gateway Synchronization. Therefore they are bound to the "MGW IWU network".

#### CrossLink module type

The CrossLink modules (CrossLinkSrv and CrossLinkCli) are automatically created by the IWU for those MGW, which are located inside the same site (Site Id). For each MGW pair, a CrossLinkSrv and CrossLinkCli are created (there is no functional difference between CrossLinkSrv and CrossLinkCli).

#### Virtual Dect Module Type

The virtual Dect module entry is automatically created by the IWU, if one of the CrossLink sides (CrossLinkSrv or CrossLinkCli) sync type will be switched to from "n/a" to "ext. master". This will initiate the creation of a module of type "Virt. Base" on the MGW of the crosslink's opposite side (Destination side). The "Virt. base" module will be automatically configured by the IWU with a sync setting of "ext. slave" and a ParkSync which refers to the Index of the Crosslink to the other MGW.

Please keep in mind, that switching the CrossLinks "sync type" from "n/a" to "ext. master" requires the configuration of a "ParkSync1" for the CrossLink. This ParkSync1 entry has to point to a BSIP on the current MGW.

For further details regarding the corresponding options of "Sync" and type (Dect > Sync > Sync) refer to [Section 4.10.4, "Configuration Page "Dect - Sync"'](#).

For further details regarding the setup of a MGW-IWU system refer to [Section 6.6, "Installation of MGW-IWU system"](#).

Depending on the Inter-Media gateway synchronization topology (chain or star based) a Media Gateway may be configured as External Sync Master, External Sync Slave or a combined External Sync Master and Slave.

#### 1. Example configuration of a MGW which serves as an External Sync Master.

- One BSIP configured as type: "Bslp", SyncType: "1588 master"
- All other BSIP are configured as type: "Bslp", SyncType: "1588 slave"
- One Crosslink configured as type: "CrossLinkSrv ", SyncType: "ext. master". The ParkSync is derived from the module configured as "1588 master".

#### 2. Example configuration of a MGW which serves as an External Sync Slave.

- One BSIP configured as type: "Bslp", SyncType: "air, 1588 master". The ParkSync is derived from the Virtual Base module
- All other BSIP are configured as type: "Bslp", SyncType: "1588 slave"
- One Crosslink configured as type: "CrossLinkCli ", SyncType: "n/a"
- One Virtual Base configured as type "Virt. Base", SyncType: "ext. slave". The ParkSync is derived from the Crosslink module.

These combinations may be mixed on MGW's. Therefore it is possible to build a star based MGW synchronization, a chain based MGW synchronization topology or mixing both.

### **2.12.2.2 Limitation of calls at 1588 master base**

For up to 60 BSIP1 as 1588 slave configured at one MGW, no call limiting of the Base acting as 1588 master is necessary under normal circumstances. In case of synchronization problems, reducing the number of calls for the 1588 master is suggested.

If more than 60 BSIP1 are configured which are synchronized to the 1588 master, the number of calls at the BSIP which serves as 1588 master should be reduced up to 0. In large deployments where several MGW's are synchronized via Inter-MGW sync, it is suggested to install those BSIP which sync between the MGW in a isolated environment, e.g. the server room since there is constant temperature as well as a low number of handsets which may try to located at the basestation and therefore generate only low Dect load.

### **2.12.2.3 Max. no. of BSIP per MGW**

For each MGW, up to 120 "modules" are supported. Besides the module type "Bslp" for a physical BSIP1, there are other module types (see WBM > Dect > About > Type) which are required for Inter-Media Gateway Synchronization . Each of these module types also reduce the maximum number of module resource per MGW (120) by 1.

Each module of the following type also allocates one module resource.

- "CrossLinkSrv"
- "CrossLinkCli"
- "Virt. Base"

Therefore, the number of max. usable BSIP1 at a MGW mainly depends on the specific configuration of the Inter-Media Gateway Synchronization at a MGW.

## 2.12.3 Requirements

## 2.12.4 Network Communication Concept

### 2.12.4.1 General Requirement: VPN

The concept of V1R5 branch offices is based on transparent IP networking and routing. Since most branch offices are expected to be connected by standard ADSL or DSL lines with a public IP (which mostly is NAT ted), access to the network "behind" has to be established using special methods which may differ from branch to branch.

To ensure transparent ip networking between the Media Gateway-IWU and Media Gateways, IP tunneling based on Layer 3 (IP) is a requirement. Most popular IP tunneling implementations are based on VPN (Virtual Private Networks) implemented with IPsec or OpenVPN.

Since similar concepts for connecting branch offices to OSV by VPN already exist, using VPN should be a well known concept. Please keep in mind, that the design and implementation of the VPN networks is outside the scope of this documentation.

### 2.12.4.2 Communication Concept

**1 bidirectional UDP** connection between MGW and MGW-IWU for initial control tasks.

**1 bidirectional TCP** connection between MGW and MGW-IWU for control tasks.

**1 bidirectional TCP** connection between MGW and MGW-IWU for signaling tasks.

**Hint:** The initial communication between MGW and MGW-IWU (to SCAN the MGW at the MGW-IWU) is UDP based.

- At MGW-IWU, the following services are needed: http, https, SSH, SNMP, Syslog, and LDAP (all terminating at MGW-IWU)
- At MGW, the following services are needed: http, SSH, SNMP (Mibs at MGW only for OS)
- Each MGW Network has to be unique inside the whole system.
- Each MGW VoIP Network has to be unique inside the whole system.
- Same DECT Networks at different MGW are supported.



The MGW-IWU concept requires transparent IP connections between MGW and MGW-IWU. this is accomplished by using VPN (e.g. Layer 3 ip tunnel via ipsec) if needed. hardware and concepts of VPN tunnels are not part of the concept and should rely on already existing strategies at UNIFY.

Each entity of Media Gateway-IWU and Media Gateway solely needs a single Default gateway which handles all further routing to all other needed networks. In a further step of specification, it is planned to enable the configuration of separate IP routes.

## 2.12.5 Dynamic Configuration Changes

The system concept is designed to allow dynamic changes of settings without the restart of the system services or rebooting the system - where technically possible.

Besides the already existing dynamic editing of user and Dect modules, the concept will be enhanced to support dynamic editing of SIP Gateways, Groups and Media Gateways by means of a [Edit] button. For some options it is necessary to disable the objects additionally to change the values.

Depending of the object which has to be changed, the changes will influence the affected segment to other objects. As an example, if an IP address of a SIP PBX is changed, this will influence the affected segment (in this case all users which are assigned to the PBX by means of a group) in a way, that all user connections are disconnected and the affected users have to be reregistered at the new ip address.

The following rules if editing objects apply:

All changes at left part of MGW-IWU > MGW require a reboot of the object for changes to come in effect.

All changes at MGW-IWU > MGW > Voip Gateway will disconnect active calls at the belonging Gateway.

| Object                          | Affected Segment / Object / Required Action   |
|---------------------------------|---|
| MGW > IWU Network               | ip settings, reboot of MGW necessary  |
| MGW-IWU > MGW > Dect Network    | Reboot of all MGW necessary (mainly due to Dect sync issues), all calls (even cross linked calls) are terminated  |
| MGW-IWU > MGW > CC Network      | Not changeable at MGW-IWU   |
| MGW-IWU > MGW > CC Network      | Reboot of all MGW necessary, therefore all CrossLinks are terminated, current cross linked calls are terminated   |
| MGW-IWU > Network > lower frame | local ip settings, connections to MGW. Reboot of MGW-IWU necessary, if ip address and /or ports change, all MGW s have to be configured locally using the MGW WBM to re-establish connectivity. |

## V1R5 - Enhancements and Changes

### Details to System Entities

| Object                                       | Affected Segment / Object / Required Action   |
|--|---|
| MGW-IWU > Network > Table > LDAP Server      | No Reboot of MGW-IWU necessary  |
| MGW-IWU > Network > Table > Phonebook Server | No Reboot of MGW-IWU necessary  |
| MGW-IWU > Group > CF and CW                  | Changes apply for new calls or for existing calls after the next call establishment |
| MGW-IWU > Group > CF and CW                  | Changes apply for new calls or for existing calls after the next call establishment |
| MGW-IWU > Group > Phonebook Prefix           | Changes may apply for established calls   |
| MGW-IWU > Group > CPU and VM                 | All calls are disconnected immediately since a reregister is needed.                |

If a reboot will be necessary after applying the changes, a message box will appear offering the possibility to start the reboot ([Yes]) or suppress the reboot ([Cancel]) which will revert to edit mode.



# 3 Quick Start

## 3.1 Quick Start - Small Solution, Server Solution

The quick start chapter describes the initial operation of the HiPath Cordless IP System V1R5 for a first functional test including the necessary configuration.

In general the configuration steps for both HPCIP platforms (HPCIP - Small Solution and HPCIP - Server Solution) differ mainly in the initial configuration of the IWU. Therefore only these steps are documented separately.

The "Quick Start" assumes the availability of

- two BSIP1 or one HPCIP-Server and two BSIP1,
- a functional **PoE network switch**, (alternatively a switch and **Power injectors**) and CAT.5 cables
- a **Maintenance PC** with administration account and
- a supported PBX (e.g. OpenScape Office as OSO MX).

The "Quick Start" further assumes, that version V1R5 is already installed on all used components on the same system partition. Otherwise, update all components to V1R5 first. Corresponding information may be found in [Section 4.3.2.1, "\[System Update\]"](#)

Please read the corresponding chapter in the detailed manual parts if you need further information regarding any step of the "Quick Start".

The following conditions apply:

- For the quick start it is assumed that no VLAN functionality is needed
- No special DECT or PBX functionality is configured. If applicable, only default settings are used.

### 3.1.1 Quick start overview

1. Prepare and connect hardware
2. Configure BSIP1/Server for IWU mode
3. Configuration of VoIP (Infrastructure) Network at IWU
4. Configuration of DECT Network at IWU
5. Configuration of users at the IWU
6. Configuration of users at the PBX

7. Start system services and register handsets at the IWU
8. Attach and configure further BSIP-Only to the system

### 3.1.2 Example Configuration

Several settings are needed for configuring a HPCIP system. Inside this quick start, following settings are used:

| Configuration Option                          | Value                   |
|---|-------------------------|
| Page Network/Gateways                         |                         |
| Network/Gateway: Server IP Address:           | 192.168.100.1           |
| Network/Gateway: Server IP Netmask:           | 255.255.255.0           |
| Network/Gateway: Default Gateway:             | 192.168.100.83          |
| Network/Gateway: NTP Server (Time Server):    | 192.168.201.94          |
| Gateway (PBX) - Name:                         | OpenScope Office MX 3bx |
| Gateway (PBX) - IP Address:                   | 192.168.201.94          |
| Gateway (PBX) - Netmask:                      | 255.255.255.0           |
| Page DECT                                     |                         |
| DECT: Server IP Address:                      | 192.168.10.1            |
| DECT: Server IP Netmask:                      | 255.255.255.0           |
| DECT: ARI:                                    | 101b2ff5                |
| DECT: PIN:                                    | 87654321                |
| Page User                                     |                         |
| User No. 1: MSN/DisplayName/AuthName/Password | 761/761/761/1234        |
| User No. 2: MSN/DisplayName/AuthName/Password | 762/762/762/2345        |
| User No. 3: MSN/DisplayName/AuthName/Password | 763/763/763/3456        |

### 3.1.3 Prepare and Connect Hardware

#### 3.1.3.1 HPCIP - BSIP (Small Solution)

Attach the first BSIP1 to a PoE port of the network switch or via a Power injector to a standard port of the network switch. Wait about 2 minutes until the LED states of the BSIP1 change to permanently green and red.

## Quick Start

### Quick Start - Small Solution, Server Solution

Meanwhile you may connect the maintenance PC to a switch port via a ethernet cable.

**Hint:** The BSIP1 must reside inside the same layer 2 network segment. The devices **MUST NOT** be separated by layer 3 Routing devices. Only separation via Layer 2 switches is supported.

#### 3.1.3.2 HPCIP - Server (Server Solution)

Connect the HPCIP-Server (Fujitsu Rx1330M1) to mains, the necessary peripheral components (monitor and keyboard) and connect the network port using an Ethernet cable with a Standard or PoE-Port of a network switch.

Boot the Server with the installation CD of the HPCIP Server Software. Install and configure according the appropriate instructions (which are not part of this documentation).

Remove the CD and reboot the server again with the newly installed HPCIP Server software.

**Hint:** Possibly an update to the latest released HPCIP Server Version (V1R4) should be accomplished. Optionally update twice so that the active system partition is Partition 2. (Since all newly attached BSIP also come up with system partition 2 as the active partition).

#### 3.1.4 Configure BSIP/Server for IWU mode

##### 3.1.4.1 HPCIP - BSIP (Small Solution)

The BSIP1 is accessible via its factory default IP address 192.168.1.1 in BSIP Only mode.

To access the BSIP-Only WBM you have to configure an IP address in the network 192.168.1.0/255.255.255.0, e.g. **192.168.1.101** on your maintenance PC.

If the IP address **192.168.1.1** is already **used** in your network, you first have to directly connect the maintenance PC and the BSIP1 via ethernet. This may be done with a direct ethernet connection via the power injector or via a separate ethernet switch where only the Maintenance PC and the BSIP1 are connected.

Test via ping, if the BSIP1 is replying to the ping requests (ping 192.168.1.1).

If not, check all cabling, switch settings, (e.g VLAN configuration).

Ensure that the configured local IP of the maintenance PC address is up (e.g ping 192.168.1.101).

If you don't get replies consider to reset the BSIP to its factory defaults (see [Section 1.8, "Factory reset of BSIP1"](#)).

Start the Web browser at the Maintenance PC

Access the WBM (Web based management) at the following URL:  
<http://192.168.1.1>

Log in to the WBM with the following (case-sensitive) credentials:

Username: **Unify**, password: **1q21q2**

Press the **[Login]** button. The configuration page for the BSIP1 in BSIP-Only mode appears.

To change the application mode of the BSIP1 from BSIP-Only to BSIP-IWU select **[Applic Mode IWU]**.

**Hints:**

- The current application mode is indicated at the bottom status line (APPLICTYPE=BSIPONLY or IWU)
- The process of switching from BSIPONLY to IWU mode may take several minutes.

After changing the application mode a message box will appear.  
Press **[OK]** to reboot the BSIP1 and start it in application mode BSIP-IWU.

**Important note:** After changing the application mode, the BSIP1 will start in BSIP-IWU mode and therefore has a different default IP address. The default IP address in IWU mode is 192.168.2.1.

The BSIP1 is accessible via the factory default IP address 192.168.2.1 in BSIP-IWU mode. To access the BSIP-IWU WBM you have to configure an IP address in the network 192.168.2.0/255.255.255.0, e.g. 192.168.2.101 on your Maintenance PC.

If the IP address 192.168.2.1 is already used in your network, you first have to directly connect the Maintenance PC and the BSIP1 via Ethernet. This may be done with a direct Ethernet connection via the power injector or via a separate Ethernet switch where only the Maintenance PC and the BSIP1 are connected.

Test using ping, if the BSIP1 is replying to the ping requests at ip address (ping 192.168.2.1).

If not, check all cabling, switch settings, (e.g VLAN configuration).  
Ensure that the configured local IP of the maintenance PC address is up (e.g ping 192.168.2.101).

Start the Web browser at the Maintenance PC

Access the WBM (Web based management) at the following URL:  
<http://192.168.2.1>

## Quick Start

### Quick Start - Small Solution, Server Solution

Log in to the WBM with the following (case-sensitive) credentials:

Username: **Unify**, Password: **1q21q2**

Press the **[Login]** button.

The configuration page for the BSIP1 in BSIP-Only mode appears.

#### 3.1.4.2 HPCIP - Server (Server Solution)

The HPCIP-Server is accessible via its factory default IP address 192.168.2.1. To access the Server WBM you have to configure an IP address in the network 192.168.2.0/255.255.255.0, e.g. 192.168.2.101 on your maintenance PC.

If the IP address 192.168.2.1 is already used in your network, you first have to directly connect the maintenance PC and the Server via Ethernet. This may be accomplished by using a direct Ethernet cable or via a separate Ethernet switch where only the Maintenance PC and the Server are connected.

Test via ping, if the Server is replying to the ping requests (ping 192.168.2.1). If not, check all cabling, switch settings, (e.g. VLAN configuration).

Ensure that the configured local IP of the maintenance PC address is up (e.g. ping 192.168.2.101).

If you don't get replies you should access the Server locally by keyboard and monitor.

Start the Web browser at the Maintenance PC

Access the WBM (Web based management) at the following URL:  
<http://192.168.2.1>

Log in to the WBM with the following (case-sensitive) credentials:

Username: **Unify**, password: **1q21q2**

Press the **[Login]** button.

The configuration page for the HPCIP Server appears.

#### 3.1.5 Configuration of VoIP (Infrastructure) network

Since configuration of the IP VoIP (Infrastructure) Network settings requires a reboot of the IWU (BSIP1 or Server), these settings are configured initially.

To allow direct IP communication between the IWU and the PBX both devices have to be located in the same IP network. Therefore it is necessary to adapt the IP address of the IWU to the network of the VoIP (Infrastructure) . You need at least one unused IP address of the Infrastructure network, which has to be configured at the IWU.



1. Select the configuration page "**Network/Gateways**".
2. Change the configuration in the bottom frame to the designated values of the IWU.

Change the following values according your needs:

#### **IP Address**

Here you have to configure the IP address at which the IWU should be available inside the VoIP (Infrastructure) Network. This also is the address at which the BSIP-IWU is accessible via WBM.

This configuration example uses the IP address 192.168.100.1.

#### **Network Mask**

Enter the corresponding network mask for the IP address as configured above.

(Default for Class C networks: 255.255.255.0).

This configuration example uses the network mask 255.255.255.0.

#### **Routing Configuration**

If routing to another network is necessary (e.g. access from Maintenance PC to IP VoIP (Infrastructure) network) or if infrastructure components (e.g. PBX, NTP or SNMP servers) are located behind other routers, routing may be configured using a "**Default Gateway**" or by a specific network route ("**Network Destination**").

The usage of a "**Default Gateway**" is the recommended routing method.

Using the method "Network Destination", the values for "Network Destination", "Network Mask" and "Gateway" have to be configured. At the Maintenance PC a corresponding route has to be configured.

This configuration example uses the Default Gateway IP address 192.168.100.83.

#### **https**

To encrypt the http communication, activate the https access mode.

#### **Time Server IP**

Since the BSIP1 has no hardware clock, time has to be set according a NTP (or SNTP) time server. After activating the NTP Server, it may take some minutes upon activation of the NTP service. This is due to the nature of time synchronisation between NTP server and NTP client.

In contrast to the BSIP1, the Server has a built-in hardware clock. However usage of an accurate time by using NTP is suggested.

This configuration example uses the NTP Server IP address 192.168.201.94.

Set the Timezone to an appropriate zone (e.g. " (GMT +01:00) Amsterdam, Berlin, Rome, Stockholm, Vienna").

## Quick Start

Quick Start - Small Solution, Server Solution

Switch to configuration page Network > Local Servers.

Add an NTP server entry by clicking on [Add Server]

Enable the new entry, configure the ip address of the NTP Server in field "IpAddr", select "NTP" as Type. All other fields in this row may be left unchanged.

- **Important:** Ensure that the IP configuration is configured correctly. Otherwise - after rebooting the IWU - it may not be accessible without resetting it to its factory defaults (which have a fixed IP setting of 192.168.1.1 or 192.168.2.1).

### 3.1.6 Configuration of DECT network

Since configuration of the DECT Network settings requires a reboot of the BSIP1, the settings are configured before the BSIP1 hardware is attached to the designated network segment.

1. Select the configuration page "Media Gateways > Dect Network".
2. Change the configuration of entry "MgwLocal" in the table to the designated values of the BSIP-IWU.

#### **Dect ServerIp**

This field contains the IP address of the server (the IWU) in the DECT network.

It is used for communication between all BSIP-Only and the IWU.

This configuration example uses the Server IP address 192.168.10.1.

#### **Dect Netmask**

In this field the corresponding network mask which is assigned to the Server IP address is configured. (The default value for a Class-C network is 255.255.255.0).

This configuration example uses the network mask 255.255.255.0.

Please refer to [Section 6.1, "Free IP Addressing"](#)

3. Select the configuration page "Media Gateways > Dect".

#### **ARI excl FPS, FPS**

In the fields **ARI excl FPS** and **FPS** the System ARI (DECT ID) which has to be unique at each DECT system has to be configured. The System Ari is provided by the system implementer. Supported System Ari classes are Class B Ari.

**Hint:** All handset registrations are bound to a specific System ARI. If the System ARI is changed, all handsets lose their registration at the IWU. To achieve system functionality, the handsets have to be registered again at the IWU.

ARI excl FPS = "101b2ff"

FPS = "7"

This configuration example uses the System ARI 101b2ff7.

### **System Pin**

The "PIN" is a 8-digit number and it is needed for the registration of handsets. It is preconfigured with "00000000" and may be configured systemwide here. You can change the system pin to another decimal value.

This configuration example uses the System Pin "87654321".

4. Apply the changes by clicking the [Apply] button at the bottom section.
5. Confirm the message box by clicking on [OK].

As stated above, for the changes to become active, the BSIP has to be rebooted.

**Important:** After rebooting, the IWU will not be accessible by its IP address 192.168.2.1 anymore. Instead it is accessible by the IP address of the IP VoIP (Infrastructure) Network (configured at the step above). If you have attached the IWU directly via an Ethernet cable you have to attach the IWU physically to the designated network segment after rebooting it.

1. Select the configuration page "**Administration**".
2. Initiate the reboot by clicking on the left button which is labeled [Active (x)]. The "x" is a placeholder for the active partition number, in this example x=2.

Start the reboot process by clicking on button [Active (2)], if the current active partition is System 2 (as this example used - see output of "Active System:"). If the active system of your BSIP is 1, then click the left button which is labeled [Active (1)].

Wait about 2 minutes for the IWU (BSIP or the Server) to come up again. In case of a BSIP-IWU the board LEDs should change to permanently orange / orange.

3. Access the WBM (Web based management) by the IP address you have configured before for the IP VoIP (Infrastructure) Network.

Depending on the http access mode you have to use http:// or https:// mode

HTTPS Enabled = [ ] use http://{Server Ip of IP VoIP (Infrastructure) Network}

HTTPS Enabled = [X] use https://{Server Ip of IP VoIP (Infrastructure) Network}

Example: <https://192.168.100.1>

## **3.1.7 Configuration of users at the PBX**

It is assumed that the VoIP users at the PBX are already configured. For details refer to the corresponding chapter in the Service Manual.

## **3.1.8 Configuration of users at the BSIP-IWU**

### **3.1.8.1 Gateway and Group**

1. Access the WBM of the BSIP-IWU WBM via the web browser at the maintenance PC.

Example: <https://192.168.100.1>

**Hint:** In https mode, for the first login on a browser, a https certificate has to be imported or accepted using browser specific mechanisms.

2. Log in to the WBM with Username "**Unify**" and password "**1q21q2**".
3. Switch to configuration page "**SIP > General**".
4. Add a new gateway entry by clicking on the button **[Add Gateway]**.
5. Change the following values:

#### **Name**

Change the preconfigured name of the PBX to a descriptive name for the VoIP Gateway. This name is only used for the internal configuration of the BSIP Software.

This configuration example uses the name "OpenScape Office MX 3bx".

#### **Gateway Type**

Change the preconfigured gateway type "Default" to the type of PBX used ("OSV", "OSO", "OSBiz" or "OS4000"). If the PBX is not of these types, use type "default". In this example, an OpenScape Office MX is used, therefore type "OSO" is configured.

#### **SIP Server Id and Netmask**

Change the preconfigured SIP Server Id from 0..0.0.0 to the IP address of the used PBX as well as the corresponding "Netmask" to the IP address of your PBX.

This configuration example uses the IP address 192.168.201.94 and the network mask 255.255.255.0..

6. Switch to configuration page "**Group**"

Groups are the connecting link between the "Gateways" and the VoIP Users. A User is assigned to a Group and a Group is assigned to a "Gateway".

7. Add a new group by clicking on the button **[Add Group]**.
8. Change the contents of the following fields.

#### **Name**

Change the preconfigured name of the Group (e.g. to the name of the corresponding PBX) . This name is only used for the internal configuration of the BSIP Software.

This configuration example uses the default Group name "default".

### **Gateways**

Select the gateway from the dropdown field which you have configured in the last step.

This configuration example uses the gateway "OpenScape Office MX 3bx".

### **Intern Call Length**

With this setting the maximum number of digits of the calling Party number for internal calls is configured. Calls with a larger number of digits are signaled as external calls at the handset. The default value is "3".

## **3.1.8.2 User**

**Hint:** Alternatively it is possible to register several users at once using the Bulk Registration Mode. Since this method is out of scope of a quick start, the manual method is used here.

1. Switch to configuration page "**User**", sub page User ("User > User").

Set up one or several Users according the user configuration at the PBX for the connection with the BSIP1. Please take care of the consistency of the entries between the PBX and the BSIP1.

2. Add a new user by clicking on the button [**Add User**].

#### **Hints:**

To add a new user entry (even during running system services) it is necessary to select an existing user (otherwise an error message will appear) and then click on button [Add User]. A new entry with default values is inserted above the selected user entry.

For the correlation of the fields between the BSIP and the PBX refer to the appropriate chapter for the belonging PBX in the Service Manual.

3. Change the contents of the following fields:

#### **Msn** (necessary)

The MSN has to correlate with the Call number of the User at the PBX.

This configuration example uses MSN 761, 762 and 763.

#### **DisplayName** (necessary)

This information is shown at the idle display of the corresponding handset.

This configuration example uses MSN 761, 762 and 763.

#### **Comment** (optional)

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Here you may enter any desired text for administration purposes.

This configuration example uses the values "Sales", "Marketing" and "Support".

#### **Language**

The language used for display messages of the handset can be selected here

This configuration example uses the language "Deutsch".

#### **Groups**

Choose a Group (and with that a Gateway) from the dropdown box to which the user is associated to.

This configuration example uses the default Group name "default".

4. Switch to configuration page "User", sub page Voip ("User > Voip").
5. Change the contents of the following fields:

#### **UserName (necessary)**

Configure the Name or Number for the registration of the User at the PBX.

This configuration example uses the UserName 761, 762 and 763.

#### **AuthName (optional)**

Configure the AuthName which is used for the authentication at the PBX (together with "Password").

This configuration example uses the AuthName 761, 762 and 763.

#### **Password**

Optional, but necessary if an "AuthName" is configured. The password which is used for the authentication at the PBX (together with "AuthName").

This configuration example uses the Passwords "1234", "2345" and "3456".

**Hint:** The entries in the password field are visible only at the time of adding or overwriting a password. After applying the changes, the password fields are masked out and nor visible anymore.

6. Apply the changes by clicking the [Apply] button at the bottom section.
7. Confirm the message box by clicking on [OK].
8. To append further users to the configuration, repeat the steps above.

## 3.1.9 Configure further BSIP-Only to the system

Attach one further BSIP1 (for Small Solution) or two BSIP (for Server Solution) to a PoE port of the network switch of the DECT Network or via a power injector to a standard port of the network switch.

Inside this configuration example the first BSIP (for a Small Solution the BSIP IWU) is configured as the synchronization master for the Over-Air synchronization. The second BSIP is configured as synchronization slave.

1. Wait about 2 minutes until the LED states at the BSIP-Only change to permanently green and red.
2. At the WBM of the BSIP-IWU switch to configuration page "**Dect-About**".
3. To scan the newly attached second BSIP click on the button **[Scan]**.

The newly attached BSIP1 should be found automatically and a record will be appended for it in the table of DECT devices.

If the BSIP1 is not found please read [Section 7.1.1, "BSIP-Only Not Found Using "Scan" concerning possible reasons.](#)

4. At the WBM of the BSIP-IWU switch to configuration page "**Dect-Base**".
5. The BSIP-Only has to be configured for usage within the HiPath Cordless IP system. Select the newly created entry for BSIP-Only and change the contents of the following fields:

**Enabled (necessary)**

Set to Enabled for usage within the HiPath Cordless IP system.

**Name (necessary)**

Configure a descriptive name for the BSIP. Change the preconfigured name of the BSIP (e.g. to the name of the physical location it is designated for). This name is only used for the internal configuration of the BSIP.

**IpAddrModule (necessary)**

Configure an IP address for this BSIP inside the DECT network.

**Hint:** The HPCIP System automatically suggests a valid IP address.

6. At the WBM of the BSIP-IWU switch to configuration page "**Dect-Sync**".
7. Select the newly created entry for BSIP-Only and change the content of the following fields:

**Sync (necessary)**

Set to "air" to synchronize the actual BSIP1 to another BSIP1 via air.

**ParkSync1 (necessary)**

Select from the dropdown to which BSIP1 the selected BSIP1 should be synchronized to.

This configuration example uses Module "[001] BSIPIWU Local" as the sync master.

8. At the WBM of the BSIP-IWU switch to configuration page "**Dect-Ari**".

9. Select the newly created entry for BSIP-Only and change the content of the following fields:

**Rpn (necessary)**

Change the "Rpn" for the selected first entry from "0" to "1" if needed.

**Hint:** The HPCIP-System automatically suggests a valid RPN.

**Note:** When using several Base Stations they have to be configured with a unique "Rpn" different from "0". Valid RPNs for a class B Ari are 1 ... 255. Using the same RPN as the DECT module number (Index) is very feasible

10. At the WBM of the BSIP-IWU switch to configuration page "**Dect-About**"

The fields "IpAddr Module" and "IpAddr Server" display the current (default) values for the selected BSIP1.

To apply all the changes to all BSIP1, the BSIP1 have to be synchronized. During the synchronization process the BSIP-Only will receive its configuration values from the IWU.

11. Apply the changes by clicking the [Apply] button at the bottom section.
12. Confirm the message box by clicking on **[OK]**.
13. A debug window will appear:
14. Confirm the Debug Window by clicking on **[OK]**.
15. Start the synchronization process by clicking the **[Sync]** button at the bottom section

A message box will appear.

16. Confirm the message box by clicking on **[OK]**.

The following process will transfer the new settings to all BSIP-Only. Therefore, the BSIP-Only will be rebooted automatically by the system.

**Wait about 2 minutes** until the BSIP1 is started completely (LED states should be green/red).

17. To verify the configured values of the previous steps, click on **[SCAN]**.
18. At the WBM of the BSIP-IWU switch to configuration page "**Dect-About**".  
Verify, if the values "IpAddr Module" and "IpAddr Server" contain the correct values which have been configured before (IpAddrModule -> IpAddr Module, Server Ip -> IpAddr Server).



## 3.1.10 Start system services and register handsets

### 3.1.10.1 Start system services

1. Switch to configuration page "**System**".  
To start the functionality of the BSIP-IWU you first have to start the system services.
2. Start the services by clicking the [**System Start**] button at the bottom section. Starting the services requires some time.
3. Check if the system services are running by clicking at the [Refresh] button several times.

If the system services are started correctly (both states displayed as "Running", the LED state at the BSIP-IWU should change from orange/orange to green/off.

If a time server is configured correctly and can be contacted, the field "Up since" should display actual local time values, otherwise time will start at "01.01.1970 00:00".

### 3.1.10.2 Register handsets

**Hint:** Alternatively it is possible to register several users at once using the Bulk Registration Mode. Since this method is out of scope of a quick start, the manual method is used here.

1. Switch to configuration page "**User-Dect**".
2. Prepare **one handset** for the **registration** process.  
**Attention:** Do not confirm the following procedure at the Handset right now! Start the **Registration procedure** via the **menu at the Handset**. Choose any Base Station for the Registration at the handset. Enter the SystemPIN (preconfigured to "**00000000**" at configuration page "DECT" as PIN at the handset (Attention: Do not confirm yet!). This configuration example uses the PIN 87654321.
3. Select the corresponding user in the WBM to which the handset has to be assigned to.
4. Activate the Registration procedure at the WBM by clicking at [**Register**] at the bottom section of page "User-Dect".
5. Now confirm the already entered PIN at the Handset (normally with softbutton "**OK**").

"The WBM displays the **successful Registration** of the Handset.

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- If the handset does not ring please read [Section 7.1.2, "Registration of Handset Not Successful"](#) concerning possible reasons.

The IPUI of the registered handset is displayed in hexadecimal notation in the user entry.

6. Select the user again and click on **[TestCall]**. The registered Handset will start ringing. You can accept the call at your handset (no voice data will be transferred) or terminate the test call by clicking **[OK]**.
- If the handset does not ring please read [Chapter 7, "Troubleshooting / FAQ"](#) concerning possible reasons.

You can register further handsets for already configured VoIP users now or to a later time.

After registering several users, telephony functionality should be available. You should be able to establish calls between the handsets.

### 3.1.11 "Quick Start" Completion

After you have accomplished some successful test calls you may configure all additional Users and additional BSIP-Only in your System.

At this step it's a good idea to backup the configuration. For details refer to [Section 4.3.1.2, "Button \[Backup Config\]"](#)

## 3.2 Quick Start - MGW-IWU System

The basic steps for installation and setup of MGW-IWU and MGW are described in [Section 6.6, “Installation of MGW-IWU system”](#).

## **3.3 Further steps**

### **3.3.1 Radio frequency site survey**

A radio frequency site survey has to be performed. Within this step, also the synchronisation concept has to be designed, implemented and tested.

- The radio distance between two BSIP should be adapted to ensure a reliable handover of a handset at -70 dB.
- Omit situations where the default location of a handset is located at the roaming/handover border of two basestations. In this case, the handset will permanently toggle its assigned base station.
- In contrast to a single cell Dect system (where a maximum radio coverage is achieved), a multi cell Dect system is not optimized for maximum radio coverage of each single base station. The coverage is optimized in a way that the basestations don't interfere mutual. This distance is based on the handover distance of -70 dB

### **3.3.2 Synchronisation implementation**

The synchronisation implementation should be part of the radio frequency site survey.

For details of synchronisation via air refer to [Section 1.4, "Synchronization Over Air Concept"](#).

For details of synchronisation via Ethernet refer to [Section 1.5, "Synchronization via Ethernet \(acc. IEEE 1588\)"](#).



## 4 Configuration reference

For the configuration of the HiPath Cordless IP system you have to connect via a browser to the IWU.

### 4.1 WBM overview IWU

#### 4.1.1 Different WBM modes (WBM Users)

**Hint:** Where not other stated, all documentation is described for WBM mode Unify Standard ("Unify").

The system has two built-in factory default WBM users:

| WBM mode             | Username   | Default password |
|----------------------|------------|------------------|
| Unify Standard       | Unify      | 1q21q2           |
| Unify Administration | UnifyAdmin | 1q21q2           |

Using the WBM mode Unify Administration, more or changed configuration options are available.

For most configuration tasks, WBM mode Unify Standard is sufficient.

**Important note:** The default password for both users is set to "1q21q2". These User Names and their passwords are converted by the update process from a version ( $\leq$  V1 R5.0.0) to versions ( $\geq$  V1 R5.1.0) even if the password for the users were changed before. Future password changes inside V1 R5 are not converted anymore. Therefore, the initial login password for both users initially running V1 R5.1.0 is "1q21q2".

- The User Names and Passwords are converted
- by an update of the HPCIP software from version  $\leq$  V1 R5.0.0 to version  $\geq$  V1 R5.1.0
- after a newly installation using HCIP Installation CD V1 R5.1.0 or newer
- a factory reset of a HPCIP installation running V1 R5.1.0 or newer

**Hint:** The user transformation process will NOT be applied when loading a configuration backup of a supported version, since Linux user/password are not parts of the backup.

## 4.1.2 Limited Features in WBM mode Unify

The following features / elements will not be available resp. visible in the WBM of the Standard Mode ("Unify").

### 4.1.2.1 BSIP-IWU, Server-IWU, MGW-IWU

#### Configuration page Administration

- Administration > Button "Factory Setting"

#### Configuration page SIP

- SIP > SIP Settings > Column "Dtmf"
- SIP > SIP Settings > Column "Packet Size(ms)"
- SIP > SIP Settings > Column "Registration expiry"
- SIP > SIP Settings > Column "Registration threshold"
- SIP > Survivability (whole page)

#### Configuration page Media Gateways

- Media Gateways > Dect > Column "PLI"
- Media Gateways > Dect > Column "Segments/RPNs/LAL"
- Media Gateways > Dect Network > Column "MGW as GW" (IWU mode only)
- Media Gateways > (Lower Panel) > Button "Delete Media Gateway" (MGW-IWU mode only)
- Media Gateways > (Lower Panel) > Button "Replace Media Gateway" (MGW-IWU mode only)
- Media Gateways > General > Column "Alive Timeout" (MGW-IWU mode only)

#### Configuration page Group

- Group > Column "CF (CallForward) Enabled"
- Group > Column "CW (CallWaiting) Enabled"
- Group > Column "VM (VoiceMail) Enabled"
- Group > Column "VM Number (VoiceMail)"
- Group > Column "CC (CallCompletion) Enabled"
- Group > Column "CCBS MSN (Busy CallCompletion)"
- Group > Column "CCNRy Msn (NoReply CallCompletion)"

- Group > Column "CC DeleteAll Msn (CallCompletion)"
- Group > Column "CPU (Call Pickup Group) Enabled"
- Group > Column "CPU Msn (Call PickupGroup)"

#### Configuration page User

- User > Voip > Column "G729"
- User > Voip > Column "SC (Silence Compression)"

#### Configuration page Dect

- Dect > (Lower Panel) > Button "Edit Module"
- Dect > (Lower Panel) > Button "Replace Module"
- Dect > (Lower Panel) > Button "Fw Download"
- Dect > Radio > (whole page)
- Dect > Ari > Column "Cipher"
- Dect > Call > (whole page)
- Dect > Debug > (whole page)

#### Configuration page Debugging

- Debugging (whole page)

### 4.1.3 Login to WBM

#### 4.1.3.1 Multiple WBM sessions

If you login onto the same WBM session on which another user was logged on, you are informed about that by a message box.

**[OK]** will logout the currently connected user.

**[Cancel]** Go back to the Login dialog.

After a timeout of 30 minutes after the last WBM access the user will be logged out automatically by the WBM.

#### 4.1.3.2 Login and Password change

**Hint:** Password and Username are handled case sensitive.

The WBM configuration mode is chosen according the Login username.



Concurrent Logins are not possible. The users who tries to login last is given the ability to logout the already logged in user (see above).

#### 4.1.3.3 Changing a WBM User's password

**Important note:** Please note down the new password at a secure place. Passwords are stored at system level and also used when updating the system at a later time. If you forgot the password, you only may overcome the situation by resetting the system to factory defaults.

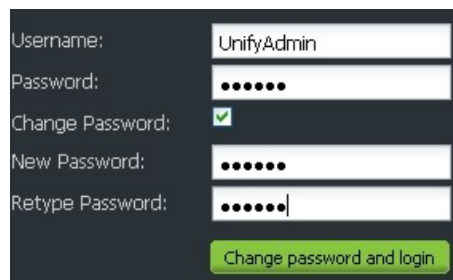
1. On the Login page, enter the Username and current password for the destined user which has to be changed.



Username: UnifyAdmin  
Password: .....  
Change Password: ☐  
Login

2. Before clicking on [Login] activate the checkbox "Change Password".
3. Two new fields will be displayed: "New password" and "Retype password". Type in the new password in both fields.

**Hint:** Username and passwords are case sensitive, the minimum password length is 6 (six) characters.



Username: UnifyAdmin  
Password: .....  
Change Password: ☒  
New Password: .....  
Retype Password: .....  
Change password and login

4. Click on [**Change password and login**].

If both new passwords are equal and valid, you will be logged in onto the WBM. Otherwise a error message will appear.

**Hint:** A password change is applied to the active system partition. Only after a System update the password changes are transferred to the other system partition.

## 4.1.4 Configuration Objects

The WBM consists of several pages with topically structured configuration options of the IWU Software. These pages can be selected via the Tabs in the upper part of the WBM.

The buttons on all configuration pages on the bottom right have the following meaning:

### Logout

This functionality will logout the current user from the WBM session. After you have finished configuration, it is good practice to logout from the WBM session.

### Help

The Help button starts the browser based online help system.

### Info

Displays current version, license and hardware information as well as the software license agreement.

### Cancel

By using the **[Cancel]** button, the modifications which have been done since the last **[Apply]** are discarded.

### Apply

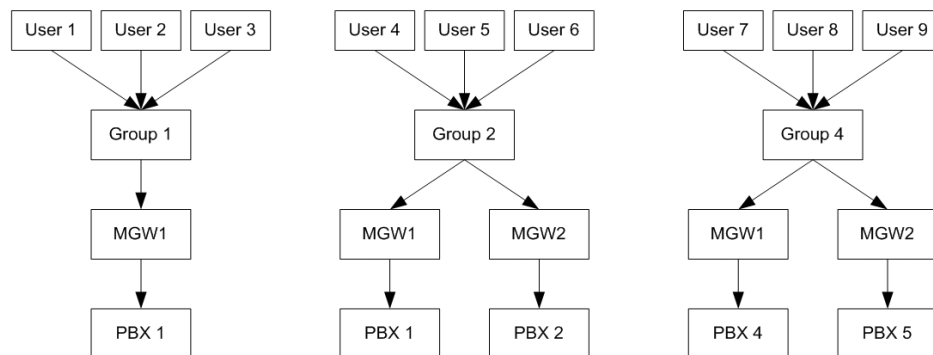
With this Button, all WBM configuration is transferred to the Software and will be checked on validity using a validation process (see output of "Debug Window"). If only some WARNINGS are detected, the configuration will be saved. If ERRORS are detected, the configuration is not saved. Observe the ERROR messages in the debug window and apply the necessary changes to the configuration and initiate a new **[Apply]** process.

## 4.1.5 Configuration Systematic

Several "Gateways" (PBXs) are supported per HiPath Cordless IP system. For establishing a call over a specific VoIP gateway, these objects have to be mapped together. This is done by means of assigning User, Group, MGW and PBX objects.

The new concept of V1R5 introduces a new entity of type Media Gateway (MGW) in the group systematic. A group is assigned to one or several Media Gateways (In case of a BSIP-IWU or Server-IWU, the groups can only be assigned to the MGW-Local). A MGW may be assigned one PBX on a per group base. Therefore, a MGW may be assigned several PBX by using several groups.

The following figure shows the relationships between Gateways, Groups and Users of HPCIP V1R5.



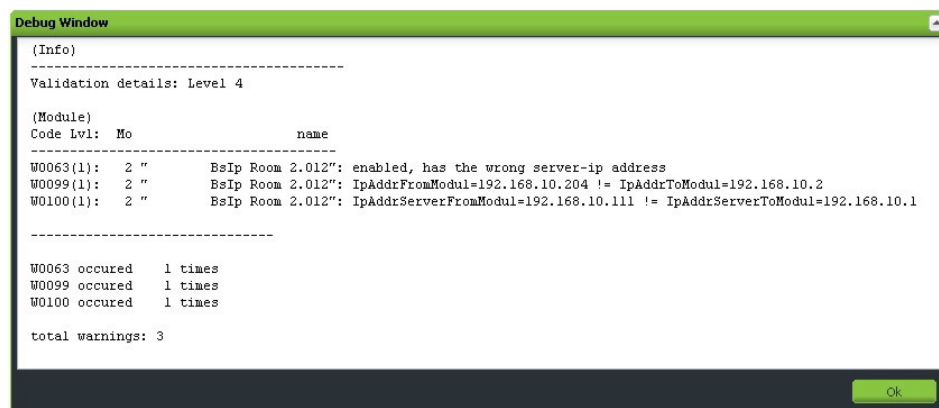
According to the figure above the following relations exist:

- Several users may be assigned to one Group (n:1). (WBM > User > User > Groups)
- Each group may be assigned to several MGW' s (1:n). (WBM > Group > MediaGWList). In case of a BSIP-IWU or Server-IWU, the groups can only be assigned to the MGW-Local
- Each MGW may be assigned to one PBX (1:1) inside a specific group (WBM > Media Gateways > VoIP Gateway)

## 4.1.6 Debug Windows

To inform the user about special events (e.g configuration warnings and/or errors) a Debug window will display the corresponding messages to the user.

After changing (and/or applying) changes to configuration objects, the WBM displays the debug windows with warnings and/or errors.



Each Warning or Error contains a specific Warning or Error Id (e.g. W0035: Warning, Id: 0035). At the end of the output, a summarization of Warnings and Errors is displayed.

If only some **WARNINGS** are detected, the configuration will be **saved**.

If **ERRORS** are detected, the configuration is **not saved**. In this case, observe the ERROR messages in the debug window and apply the necessary changes to the configuration and initiate a new [Apply] process and repeat this step until no ERRORS are displayed.

## 4.2 Administration (BSIP-Only)

On the Administration page of the BSIP-Only, administrative configuration and information about the BSIP1 is provided.

The screenshot displays the UNIFY HiPath Cordless IP Administration (BSIP-Only) interface. The top navigation bar includes the UNIFY logo and the text 'HiPath Cordless IP'. Below this, a green bar indicates the 'BsipOnly' mode. The main content area is titled 'Program Info' and shows details for two active systems. System 1 is V1-R4.10.0 V3.34.25 build M, and System 2 is V1-R5.1.0.S V4.0.13 build T. To the right of the system information, there are buttons for 'System Update', 'Reboot Board', 'Applic Mode IWU', 'Applic Mode BsipOnly', 'Factory Setting', and 'Network State'. At the bottom of the interface, a status line reads 'ApplicType=BSIPONLY UserType=Unify Active System=2 Hardware=1', and there are buttons for 'Logout', 'Info', 'Cancel', and 'Apply'.

| Active System: |  |
|----------------|--|
| Version        | V1-R4.10.0 V3.34.25 build M                  |
| System 1:      | 17:21:18 CET 2014 00:1A: E S30807-Q5494-X-5  |
| Version        | V1-R5.1.0.S V4.0.13 build T                  |
| System 2:      | 08:50:49 CEST 2014 00:1A: E S30807-Q5494-X-5 |

Buttons:

- System Update
- Reboot Board
- Applic Mode IWU
- Applic Mode BsipOnly
- Factory Setting
- Network State

Status: ApplicType=BSIPONLY UserType=Unify Active System=2 Hardware=1

Buttons: Logout, Info, Cancel, Apply

The configuration options are described at [Section 4.3, “Administration \(IWU\)”](#).

The following options differ from the options of a BSIP-IWU:

### [Switch Applic Mode]

To change the mode of the BSIP1 between BSIP-Only to BSIP-IWU select [Switch Applic Mode].

### Hints:

- The current working mode is printed out at the bottom status line (APPLICTYPE=BSIPONLY or BSIP-IWU) and in the output of [Network State] (see [EULA/Info] > Network state).

## Configuration reference

### Administration (BSIP-Only)

- The process of switching from BSIPONLY to IWU mode may take several minutes.

After changing the application mode, a message box will appear.

Click on **[OK]** to reboot the BSIP-Only into operation mode BSIP-IWU.

**Important note:** After switching the Applic mode to BSIP-IWU, the BSIP will obtain the IP configuration which was active the last time it was active in BSIP-IWU mode. This may be the default factory IP configuration for BSIP-IWU mode (192.168.2.1) or another altered IP configuration. The output of the [Network State] (see [EULA/Info] > Network state) displays the IP configuration which will be active after switching to BSIP-IWU mode.

## Output of [Network State]

```
Network State

### Network configurations of BSIP ###
## ApplicMode BSIP only ##
## In Iwu mode, the board would start with the following settings ##

## Network / Gateway settings ##
Ip Address      : 192.168.2.1
Network Mask    : 255.255.255.0
Default Gateway : 0.0.0.0
DHCP enabled    : FALSE
Dns Server 1    : 0.0.0.0
Dns Server 2    : 0.0.0.0

Network Destination : 0.0.0.0
Network Mask        : 255.255.255.0
Gateway             : 0.0.0.0
Tos Value           : 0
Qos Value           : 0
VLAN Id            : 0

Time Server enabled : FALSE
Timezone            : GMT+01:00
Time Server Ip      : 0.0.0.0

## DECT settings ##
Server Ip          : 0.0.0.0
Server Network Mask : 255.255.0.0
Listen Port        : 0
VLAN Id            : 0
IWU as Gw          : FALSE
Dect VPN Enabled   : FALSE

## Dhcp ##

# Boottime #
Status          : unknown

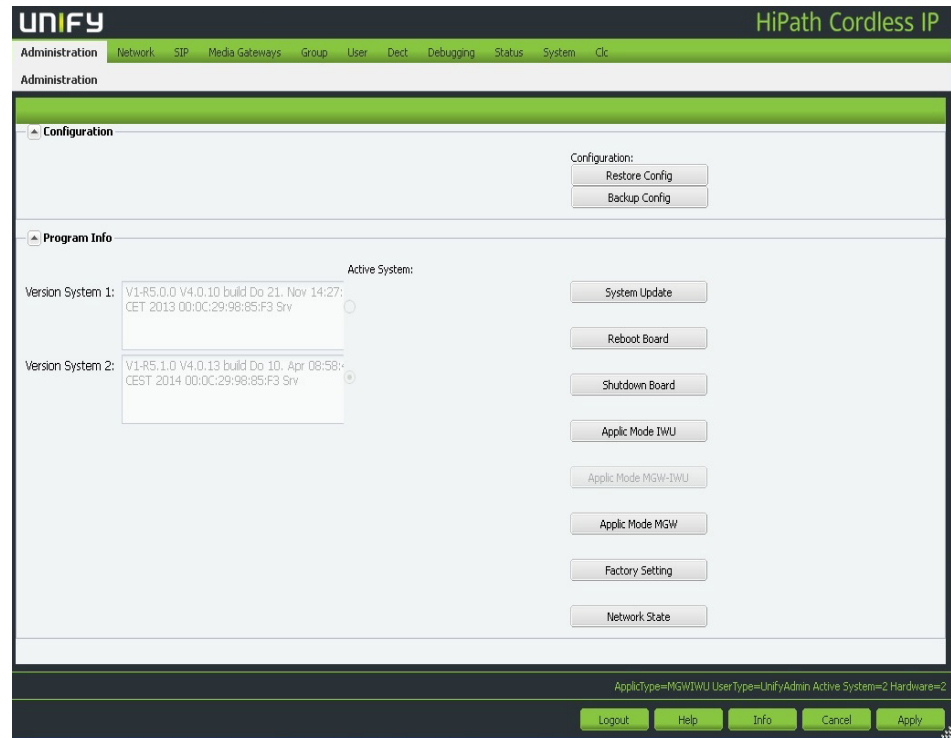
# Actual #
Status          : valid
Ip Address      : 192.168.100.227
Network Mask    : 255.255.255.0
Default Gateway : 192.168.100.105
Dhcp Server     : 192.168.100.105
Dns Server 1    : 192.168.100.105
Dns Server 2    : 0.0.0.0

## Gateway ##

Ok
```

## 4.3 Administration (IWU)

On the IWU Administration page, a centralized administrative configuration and information about the HPCIP system is provided. Due to the IWU type used (BSIP-IWU, Server-IWU and MGW-IWU), the subpages may differ in its content.



### 4.3.1 Frame Configuration

#### 4.3.1.1 Button [Restore Config]

1. With this button the whole configuration of the BSIP-IWU can be restored from a previously backed up configuration from a file.

**Hint:** The system services have to be stopped to use this feature.

2. After confirming the action with button **[OK]**, a file "Restore Configuration" Dialog opens.





3. After clicking on [**Durchsuchen**] or [**Browse**] (depending on the language version of the browser) you can select a configuration file using a browser based file open dialog. (by default "iwu\_config.tgz").
4. After you have selected the desired configuration file you can load it into the IWU using the [**Upload**] button.

During the upload process, a message box with a progress bar will be displayed.

**Important:** All stored configuration is loaded into the WBM. Ensure that you have loaded the correct configuration file. Particularly ensure that all relevant IP address values are correct (otherwise you won't be able to access the WBM after a reboot).

5. After the configuration file is downloaded, you have to apply or discard the changes. For both actions, a reboot has to be performed.

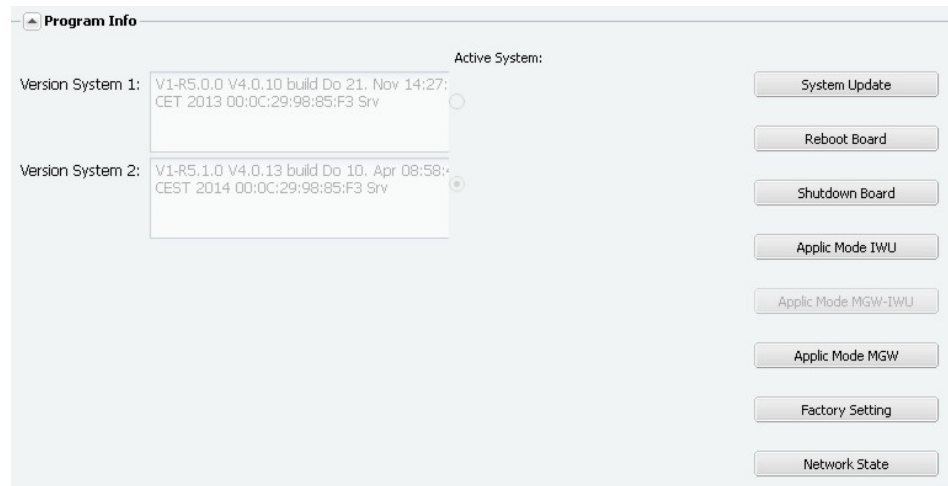
#### 4.3.1.2 Button [**Backup Config**]

With this Button the complete configuration of the IWU can be backed up and stored on the file system of the maintenance PC.

1. After clicking on the button [**Backup Config**], a browser based file open dialog will be displayed immediately.
2. You have to select the store method of the dialog, click on button [**OK**] and select from the following "save as" dialog a folder to store the configuration files on the maintenance PC or a directory available via the network.
3. Save the configuration file using the default name "iwu\_config.tgz " or change it according to your needs (Don't use blanks in the filename).

## 4.3.2 Frame Program Info

### Version System 1 and Version System 2



### System1 and System2 partitions

To guarantee a functional BSIP1 or IWU at any time, two bootable systems are present on the BSIP:

- The current (active) system and
- the fallback (non active) system.

Therefore the BSIP1 and the server based platforms have two different systems partitions:

- System 1 and
- System 2

### Version System x:

Displays information about software (version number and date) and hardware (MAC address, part number, revision of hardware, e.g. "X-7").

### Active system

The radio buttons below "Active System" indicate, which of the both System partition is the currently ACTIVE System partition. In the example of the screenshot above, System 2 is the active partition.

**Hint:** Don't activate a system partition which displayed version is "n/a" or "update unsuccessful". This may lead to an unusable system.

### 4.3.2.1 [System Update]

#### Updating the HPCIP system software

##### Important notes:

- Updating from one Major Revision to the Next higher Major Revision (e.g. from V1R4.x.y to V1R5.x.y).  
In this case, the last minor revision of the old Major Revision has to be installed as an inter-mediate update. After this inter-mediate version has been installed and is active, it is possible to update to the new Major revision.
- Updating from one Major Revision to a Major Revision where the difference is larger than 1 (e.g. from V1R4.x.y to V1R6.x.y).  
In this case, the steps described above have to be accomplished for each Major revision.
- If you update the system software, the Update is always applied to the NON active system partition.
- The current configuration of the active system will be applied to the NON active system partition.
- You have to ensure to use the SAME software version at all BSIPs. Therefore, updating the software has to take place at the BSIP-IWU AND at all BSIP-Only.
- A downgrade is not fully supported. In need of a downgrade, a factory reset is applied to the IWU as well as to all enabled BSIP-Only automatically. Please refer to the delivered Release notes of the new version for details of the update process.
- Create a backup of the old configuration (Page Registration - [Backup Config]).
- An update may be performed only, if the partitions of all enabled BSIP are synchronous to the current partition of the IWU. Otherwise the BSIP have to be updated manually or have to be synced using the [SYNC] button and afterwards have to be booted into the same system partition by rebooting the IWU.
- The software update may be conducted during running system services. Due to limited resources at the BSIP-IWU, it may be required (depending on system load and current call situation) to stop the system services before starting the system update.

##### Update instructions

1. Please create a backup of the old configuration (Page Registration - [Backup Config]).
2. Ensure that you have a firmware file of the old version available (in case of a necessary downgrade).

3. Start with the update for the IWU. All enabled BSIP are updated automatically.
4. After finishing the update process, reboot the IWU.

### 4.3.2.2 Other options

#### [Reboot Board]

After clicking the button [Reboot Board] a dialog appears where you have to select the partition which should be active after the reboot.



The current partition number is displayed separately (see "Active System: 2" in this example).

The WBM renders the contents of the buttons according the following scheme:

The left button always contains the number of the Active System, the middle button always contains the number of the inactive system.

Therefore, the button description may change depending on the active system, In this example Active System = 2 is used.

By clicking on [Active (2)] the IWU will reboot into the same partition and start with "System 2" as the active partition.

By clicking on [Inactive (1)] the IWU will reboot into the opposite partition and start with "System 1" as the active partition.

By clicking on [Cancel] the dialog will be closed.

#### [Shutdown Board] (only for Server based platforms)

By using this functionality the server based platforms Server-IWU, MGW-IWU or MGW may be shut down and the server will be switched off automatically.

#### Different [Applic Mode xxx] buttons

Depending on platform (BSIP or server based) and application mode (BSIP-Only, BSIP-IWU, Server-IWU, MGW-IWU and MGW) different [Applic Mode xxx] button will be available on the WBM which will be described in detail below.

**Hint:** The current working mode is printed out at the bottom status line (APPLICTYPE=BSIPONLY , IWU or MGWIWU) and in the output of [Network State] (see [EULA/Info] > Network state).

**[Applic Mode IWU] (only available in BSIP-Only WBM)**

To change the application mode of the BSIP1 from BSIP-Only to BSIP-IWU select [Applic Mode IWU].

After changing the application mode, in the message box that appears press **[OK]** to reboot the BSIP1 and start it in the other application mode.

**Important note:** After changing the application mode the BSIP1 will start with the IP configuration which was configured last for the corresponding application mode. This may be the default configuration for the mode (192.168.2.1) or the already configured addresses for the mode.

**[Applic Mode BsipOnly] (only available in BSIP-Only WBM)**

To change the application mode of the BSIP1 from BSIP1-IWU to BSIP-Only, select [Applic Mode BsipOnly]. After changing the application mode, in the message box that appears press **[OK]** to reboot the BSIP1 and start it in the other application mode.

**Important note:** After changing the application mode the BSIP1 will start with the default IP setting (192.168.1.1).

**[Applic Mode IWU] (only available in MGW-IWU and MGW WBM)**

To change the application mode of the Server platform from MGW-IWU or MGW to Server-IWU, select [Applic Mode IWU]. After changing the application mode, press [OK] in the message box that appears to reboot the Server and start it in the other application mode or [Cancel] to stop the reboot process. Changing this application mode will initiate a factory reset to the corresponding application mode. After reboot, the server will start in application mode Server-IWU and with an IPaddress of 192.168.2.1.

**[Applic Mode MGW-IWU] (only available in Server-IWU and MGW WBM)**

To change the application mode of the Server platform from Server-IWU or MGW to MGW-IWU, select [Applic Mode MGW-IWU]. After changing the application mode, press [OK] in the message box that appears to reboot the Server and start it in the other application mode or [Cancel] to stop the reboot process. Changing this application mode will initiate a factory reset to the corresponding application mode. After reboot, the server will start in application mode MGW-IWU and with an ip address of 192.168.2.1.

**[Applic Mode MGW] (only available in Server-IWU and MGW-IWU WBM)**

To change the application mode of the Server platform from Server-IWU or MGW-IWU to MGW, select [Applic Mode MGW]. After changing the application mode, press [OK] in the message box that appears to reboot the Server and start it in the other application mode or [Cancel] to stop the reboot process. Changing this application mode will initiate a factory reset to the corresponding application mode. After reboot, the server will start in application mode MGW-IWU and with an ip address of 192.168.2.1.

### [Factory setting]

Using this functionality, a factory reset may be initiated which deletes all configured data.

### BSIP platform

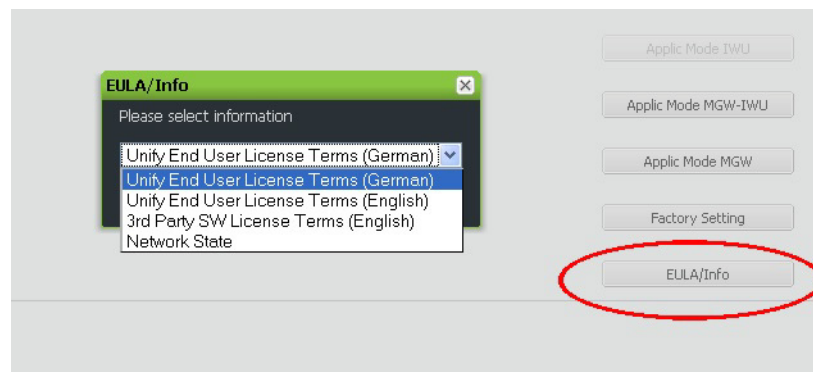
For a BSIP platform, this functionality may be used alternatively to the procedure of factory reset by power sequencing described at [Section 1.8, "Factory reset of BSIP1"](#). After initiating this function, the BSIP will start in Application mode BSIP-Only and with an IP address of 192.168.1.1.

### Server platform

For a Server based platform, the Server will start in Application mode Server-IWU and with an IP address of 192.168.2.1.

### [EULA/Info]

Using this button, a dropdown box will be displayed which contains entries for the different EULA's as well as for the [Network state] information.



The former button [Network state] therefore is needless and has been removed, since the functionality is now integrated into the [EULA/Info] button. Using the dropdown method eases the addition of future information objects by simply extending the dropdown list without the need of adding new buttons.

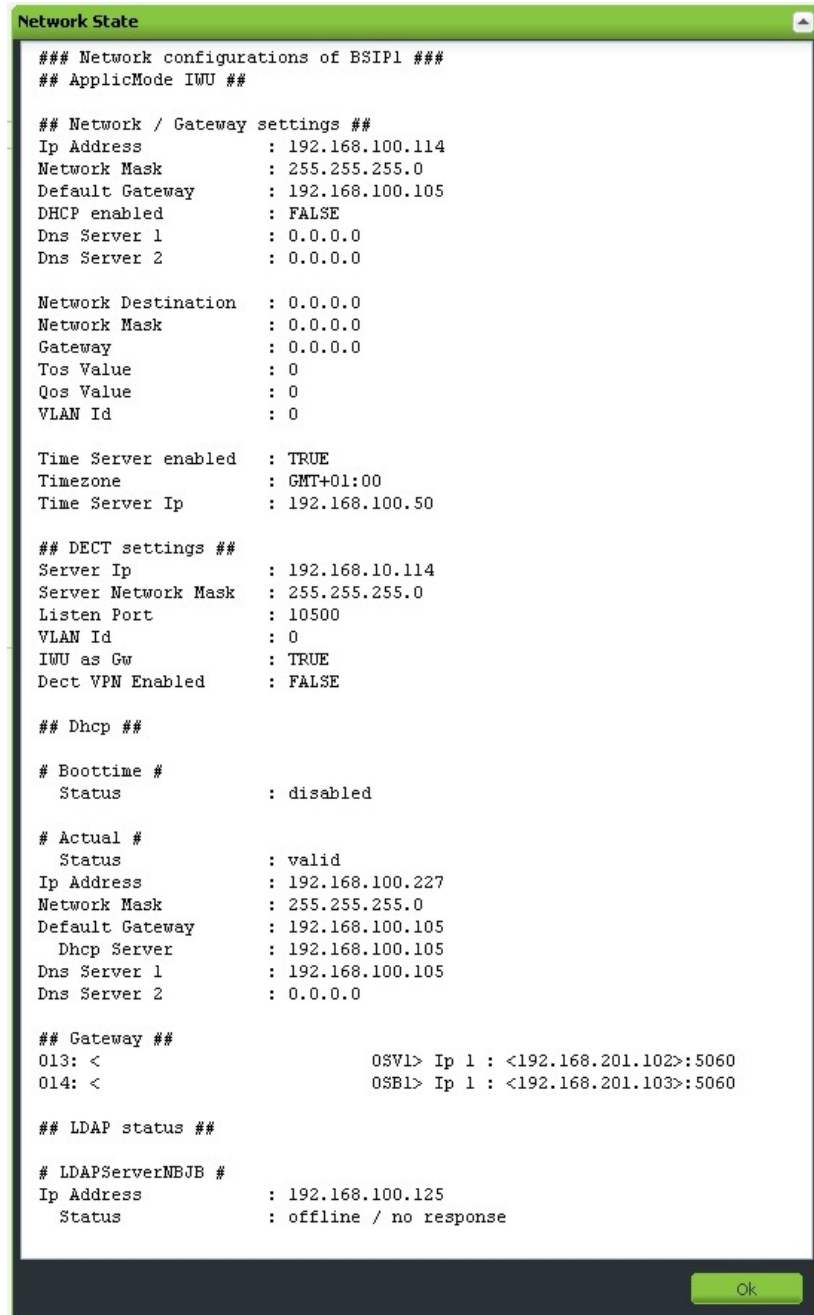
**Important note:** Depending on the settings of the browser, the EULA PDF documents may be opened directly in the same or a new window of the browser or may trigger a "File Open" resp. "File Save as" dialog. This behavior mainly depends on the browsers configuration behavior and cannot be influenced by the HCIP software. Additionally, external events like viewing of PDF files may be handled as a popup event and therefore have to be enabled in IE by appropriate procedures, e.g. adding the IP address of the HCIP to the allowed sites.

### [Network State]

By selecting the entry [Network states] of the dropdown box of [EULA/Info] a new window will be opened which displays summarized information about the network settings.

Simultaneously a DHCP request will be initiated. Further details may be found in [Section 5.2, “DHCP”](#).

The Network State also displays the status of the SIP Survivability parameters. For details refer to [Section 5.7, “SIP Survivability”](#)



```
Network State

### Network configurations of BSIP1 ###
## ApplicMode IWU ##

## Network / Gateway settings ##
Ip Address      : 192.168.100.114
Network Mask    : 255.255.255.0
Default Gateway : 192.168.100.105
DHCP enabled    : FALSE
Dns Server 1    : 0.0.0.0
Dns Server 2    : 0.0.0.0

Network Destination : 0.0.0.0
Network Mask        : 0.0.0.0
Gateway             : 0.0.0.0
Tos Value           : 0
Qos Value           : 0
VLAN Id            : 0

Time Server enabled : TRUE
Timezone            : GMT+01:00
Time Server Ip      : 192.168.100.50

## DECT settings ##
Server Ip          : 192.168.10.114
Server Network Mask : 255.255.255.0
Listen Port        : 10500
VLAN Id            : 0
IWU as Gw          : TRUE
Dect VPN Enabled   : FALSE

## Dhcp ##

# Boottime #
Status          : disabled

# Actual #
Status          : valid
Ip Address      : 192.168.100.227
Network Mask    : 255.255.255.0
Default Gateway : 192.168.100.105
Dhcp Server     : 192.168.100.105
Dns Server 1    : 192.168.100.105
Dns Server 2    : 0.0.0.0

## Gateway ##
013: <                                OSV1> Ip 1 : <192.168.201.102>:5060
014: <                                OSB1> Ip 1 : <192.168.201.103>:5060

## LDAP status ##

# LDAPServerNEJB #
Ip Address      : 192.168.100.125
Status          : offline / no response

Ok
```

## 4.4 MGWNetwork (MGW)

On the MGWNetwork page (which is available in MGW mode only), the core configuration of the MGW is applied. Only the basic, necessary configuration to establish a communication with the MGW-IWU is needed here. This configuration is restricted to the Media Gateway IWU network. All further configurations (e.g. the Media Gateway DECT network) are done at the MGW-IWU centrally.

The following configuration options are available:

**Name:**

A descriptive name for this MGW is specified here. This name will be displayed at the MGW-IWU as the "MGW name" and serves for identification purposes. Use only standard characters and omit special characters (Umlaut, etc).

**IP Address:**

The IP address of the MGW inside the Media Gateway IWU network is configured here.

Here you have to configure the IP address at which the MGW should be configured inside the Media Gateway IWU network. This is also the IP address at which the MGW is accessible via WBM.

The factory default IP address is 192.168.2.1. This IP address may not be used for further configuration of the MGW.

**Hint:** The configured IP address may NOT be located inside the DECT network. For details refer to [Section 6.1, "Free IP Addressing"](#).

**Netmask:**

Enter the corresponding netmask for the IP address as configured above. (Default for Class C networks: 255.255.255.0).

**Default Gateway:**

All routing towards the Media Gateway-IWU has to be handled by the default gateway of the Media Gateway-IWU network. The IP address of the default gateway has to be entered here.

**VLAN Id:**

The VLAN Id of MGW IWU network is configured here.

**Cos Value:**

The CoS Value (if VLAN unequal 0) for tagged packets is configured here.

**MGWIWU IP Address:**

The IP address of the Media Gateway IWU (inside the Media Gateway IWU network) is configured here.



**MGW Control Listen Port:**

The listen port of the MGW-IWU for the Control connection between MGW and MGW-IWU (TCP) is configured here. This value has to match the correspondent value configured at the MGW-IWU at page Media Gateways; otherwise no communication will be possible.

**MGW Signal Listen Port:**

The listen port of the MGW-IWU for the Signaling connection between MGW and MGW-IWU (TCP) is configured here. This value has to match the correspondent value configured at the MGW-IWU at page Media Gateways; otherwise no communication will be possible.

## 4.5 "Network" Configuration (IWU)

The "Network/Gateways" page known from V1R4 has been spilt in to separate main pages; network and SIP.

This "Network" page contains the Local Settings of the IWU, some other global parameters and the configuration of additional servers (NTP, SNMP, LDAP, DNS, ...) which is accomplished on two subpages. The configuration of the PBXs will be accomplished on the subpages below the new main page "SIP".

**UNIFY** HiPath Cordless IP

Administration **Network** SIP Media Gateways Group User Dect Debugging Status System Clc

**Network/Server**

Local Servers Group Servers

| Index | Enabled                             | Name              | IpAddr          | Type         | User | Password | Poll Timer |
|-------|-------------------------------------|-------------------|-----------------|--------------|------|----------|------------|
| 1     | <input checked="" type="checkbox"/> | SRV_LOC_NTP       | 192.168.100.50  | NTP          |      |          | 0          |
| 2     | <input checked="" type="checkbox"/> | SRV_LOC_DNS_SYS1  | 192.168.100.50  | SYSTEM DNS 1 |      |          | 0          |
| 5     | <input checked="" type="checkbox"/> | SRV_LOC_SNMP_L... | 192.168.100.129 | SNMP         |      |          | 0          |
| 7     | <input checked="" type="checkbox"/> | SRV_LOC_SYSLOG1   | 192.168.100.50  | Syslog       |      |          | 0          |
| 6     | <input checked="" type="checkbox"/> | SRV_LOC_DNS_SYS2  | 192.168.100.50  | SYSTEM DNS 2 |      |          | 0          |

Add Server Delete Server Edit Server Import ServerConfig Show ServerConfig Load Phonebook

Ip Address: 192.168.100.80 Network Mask: 255.255.255.0 Default Gateway: 192.168.100.105

HTTPS Enable: ☐ Cos Value: 0 Timezone: (GMT +01:00) Ams

VLAN Id: 1

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Logout Help Info Cancel Apply

### 4.5.1 General Network Configuration

At the bottom of the configuration page "Network", the general network configuration of the IWU network is accomplished.

Refer to the concepts of networking described in [Section 1.3, "Network Concept"](#).

**Hint:** All changes will be activated after a reboot of the IWU.

|                  |  |               |                          |            |                                |           |  |
|------------------|--|---------------|--------------------------|------------|--------------------------------|-----------|--|
| Ip Address:      | <input type="text" value="192.168.100.80"/>  | HTTPS Enable: | <input type="checkbox"/> | Cos Value: | <input type="text" value="0"/> | Timezone: | <input type="text" value="(GMT +01:00) Amst"/> |
| Network Mask:    | <input type="text" value="255.255.255.0"/>   |               |                          | VLAN Id:   | <input type="text" value="1"/> |           |  |
| Default Gateway: | <input type="text" value="192.168.100.105"/> |               |                          |            |                                |           |  |

## IP settings for IWU

### IP Address

Here you have to configure the IP address at which the IWU should be configured inside the VoIP (Infrastructure) Network (in case of a BSIP-IWU and Server-IWU) or inside the Media Gateway IWU network (in case of MGW-IWU). This is also the IP address at which the IWU is accessible via WBM.

The factory default IP address is 192.168.2.1. This IP address may not be used for further configuration of the IWU.

**Hint:** The configured IP address may NOT be located inside the DECT network. For details refer to [Section 6.1, "Free IP Addressing"](#).

### Network Mask

Enter the corresponding netmask for the IP address as configured above. (Default for Class C networks: 255.255.255.0).

### Default Gateway

#### Default Gateway for application mode MGW-IWU

All routing towards the Media Gateways have to be handled by the default gateway of the Media Gateway-IWU network. The ip address of the default gateway has to be entered here.

#### Default Gateway for application mode BSIP-IWU or Server-IWU

If all other routing is done via a default gateway , it can be configured here. Alternatively, a dedicated route may be configured using the settings "Network destination", "Network Mask" and "Gateway" as described below.

**Important:** All BSIP1 devices must be located inside the same network segment and therefore **MUST NOT** be separated by layer 3 Routing devices. Only Layer 2 switches are supported between the BSIP.

#### DHCP Enable (available only in application mode BSIP-IWU or Server-IWU)

Activate this option if the BSIP VoIP (Infrastructure) network has to be configured by a DHCP server.

For DHCP details refer to [Section 5.2, "DHCP"](#).

### Important notes:

## Configuration reference

### "Network" Configuration (IWU)

- If using DHCP for the VoIP (Infrastructure) network, the configuration of the DECT network additionally has to be accomplished manually (since configuration of DECT IP addresses may not be distributed by the DHCP server).
- After applying the DHCP changes (reboot of IWU), the IWU will be assigned a new IP address by the DHCP server. Since there is no local console access at BSIP1 possible, the only method to get the assigned IP address is to have access to the DHCP servers lease information! Contact the administrator of the DHCP server before activating this option.
- The last assigned IP addresses may be derived by the output of [Network State] which simultaneously initiates a new DHCP request.
- Alternatively, a dedicated route to another network segment which is not reachable by the default gateway may be configured using the settings "Network destination", "Network Mask" and "Gateway" as described below.

#### **Network Destination (available only in application mode BSIP-IWU or Server-IWU)**

Using this field, the destination address for this route / the other IP network (e.g. 192.52.109.0) may be configured.

#### **Network Mask (available only in application mode BSIP-IWU or Server-IWU)**

Using this field, the corresponding network mask for this route / the "Network destination" (e.g. 255.255.255.0) may be configured.

#### **Gateway (available only in application mode BSIP-IWU or Server-IWU)**

Using this field the IP address of the gateway inside the VoIP (Infrastructure) network which handles the routing to a additional network (defined by "Network destination" and "Network Mask" above) may be configured here.

#### **HTTPS Enable**

Determines if https (Hypertext Transfer Protocol over Secure Socket Layer) should be used for WBM communication between the browser and the IWU. Using https encrypts the communication between the browser and the WBM. It is suggested to use https mode.

Depending on the http access mode you have to use http:// or https:// mode at the browser.

HTTPS Enabled = [ ] use **http://**{Server Ip IP of VoIP (Infrastructure) Network}

HTTPS Enabled = [X] use **https://**{Server Ip IP of VoIP (Infrastructure) Network}

Example: **https://192.168.201.114**

**Hint:** Using https, simply uploading a firmware file on a BSIP-IWU will take up to 1 minute transfer time.

**Tos Value (available only in application mode BSIP-IWU or Server-IWU)**

With the "TOS Value" you can configure the prioritization of the IP packets via TCP/IP (Layer3) according to DSCP. It is only used for the IP DSCP field for VoIP Signalling (SIP) and VoIP data (RTP) packets towards the PBX (VoIP Infrastructure Network).

Other IP packets e.g.

- WBM or SSH towards the VoIP Infrastructure network or
- packets between BSIP-Only and BSIP-IWU (DECT Network)

are **NOT** tagged with configured the DSCP value. (Default = "0", i.e. no prioritization).

Using the dropdown you may select one of the pre-configured ToS values.

**CoS Value**

With the "CoS Value" (Class of Service) you can configure the prioritization of the Ethernet packets via Ethernet (Layer2) according to 802.1p. (Default = "0", i.e. no prioritization).

Using the dropdown you may select one of the pre-configured CoS values.

**Hint:** CoS relies on the configuration of a VLAN unequal to 0.

**VLAN Id**

The corresponding VLAN Id (according IEEE 802.1q) inside the VoIP (Infrastructure) Network (in case of a BSIP-IWU and Server-IWU) or inside the Media Gateway IWU network (in case of MGW-IWU) is configured here.

VLAN configuration is activated, if the VLAN Id is configured to a valid VLAN Id unequal to 0.

If VLAN is activated (VLAN Id unequal 0), the IWU sends and expects tagged Ethernet packets. Therefore the switch port to which the IWU is connected to, has to be configured to tag the Ethernet frames with the VLAN Ids.

If VLAN is deactivated (VLAN Id equal 0), the IWU sends and expects untagged Ethernet packets. Therefore the switch port to which the IWU is connected to, has to be configured to untag the Ethernet frames from the VLAN Ids.

In case of BSIP-IWU or Server-IWU, VLAN IDs unequal to 0 have to be configured for the VLAN Id of the VoIP (Infrastructure) network (this VLAN Id) AND for the VLAN Id of the DECT network.

**Important note:** In contrast to an IWU (BSIP-IWU, Server-IWU or MGW-IWU), the BSIP-Only is not able to handle tagged Ethernet packets. For this reason, the Switchport - at which a BSIP-Only is attached to - has to be configured untagged.

In case of BSIP-IWU or Server-IWU, all Ethernet frames towards the VoIP (Infrastructure) network between the IWU and the Ethernet switch are tagged with the configured VLAN Id (if unequal 0) configured for the Infrastructure network (option "VLAN Id" at page Network - this option).

All Ethernet frames towards the DECT network between the IWU and the Ethernet switch are tagged with the configured VLAN Id configured for the DECT network (option "VLAN Id" at page DECT).

In case of MGW-IWU, all Ethernet frames towards the Media Gateway IWU network between the MGW-IWU and the Ethernet switch are tagged with the configured VLAN Id configured for the Media Gateway IWU network (option "VLAN Id" at page Network - this option).

#### Timezone

If using a Time Server, the timezone has to be configured according the physical location of the HiPath Cordless IP solution (country). Since NTP is always using UTC time, the local time has to be calculated against the time zone information to get correct current Local time.

## 4.5.2 Local Server and Group Server

Local and Group Servers provide specific services to the IWU like NTP, DNS, SNMP, Syslog, Phonebook and LDAP.

Local Servers are such servers, which are functional without assigning them to a specific Group.

Group Servers are such servers, which have to be assigned to a specific group.

**Hint:** Deleting or disabling a Local or Group Server entry requires the a stop of the system services.

### 4.5.2.1 General Server Configuration

#### Button [Add Server]

To add a new Server entry, click on [Add Server]. A new entry line with default values is appended, which have to be modified according to your needs. The new entry line is either inserted above the selected Group or inserted at the top of the list if no Group is selected.

#### Button [Delete Server]

To delete a Server entry, select the entry and click on [Delete Server].

For details and impact of changes during running system services, refer to [Section 2.12.5, "Dynamic Configuration Changes"](#).

#### **Button [Edit Server]**

To edit a Server entry during running system services, select the entry and click on [Edit Server]. The Configuration of the selected server may be edited now. After all changes to the server are initiated, click on [Apply] to bring the changes into effect.

For details and impact of changes during running system services, refer to [Section 2.12.5, "Dynamic Configuration Changes"](#).

#### **Button [Import Server Config]**

This button is needed to import a specific Server configuration file with further information for the specific server. At present, this feature is needed for servers of type "LDAP".

For details, refer to [Section 5.14.6, "LDAP information"](#).

#### **Button [Show Server Config]**

This functionality displays the current configuration of the selected Server type in a separate window (if applicable).

#### **Button [Load Phonebook]**

Using this option the system phonebook may be loaded by selecting an appropriate phonebook file (csv) by a file open dialog.

For details refer to [Section 5.18, "System Phonebook"](#).

-----

The columns of the table have the following meaning:

#### **Index**

Index number of the server, automatically assigned by the WBM.

#### **Enabled**

This option is necessary to enable or disable the current server.

#### **Name**

A name for the server can be configured here. This name serves mainly for identifying the server by its name.

#### **IpAddr**

This option is necessary to configure the ip address of the current server.

#### Type

This option is necessary to configure the Type of the current server. At present, the following types are supported: "NTP", "System DNS 1", "System DNS 1", "SNMP" and "LDAP".

#### User

At present, this feature is needed only for the LDAP server configuration. The option is needed to configure the username of a user, which has access to the LDAP server.

For details, refer to [Section 5.14.6, "LDAP information"](#).

#### Password

At present, this feature is needed only for the LDAP server configuration. The option is needed to configure the corresponding password to the configured "User" which has access to the LDAP server.

For details, refer to [Section 5.14.6, "LDAP information"](#).

#### Poll Timer

At present, this feature is needed only for the LDAP server configuration. The option is needed to configure the polling cycle of the LDAP server in seconds, which is used to detect an outage of the LDAP server. For details, refer to [Section 5.14.6, "LDAP information"](#).

### 4.5.3 Local Server

This page holds the configuration for "Local Server". Local Servers provide specific services as NTP, DNS, SNMP and LDAP. Local Servers are servers, which are functional without assigning them to a specific Group in contrast to servers located on subpage "Group Servers".

The following server types are configured on this subpage.

| Server Type | Remark   |
|-------------|--|
| System DNS  | Available types are "SYSTEM DNS1" and "SYSTEM DNS 2"   |
| Syslog      | This Syslog server is responsible für logging the MGW-IWU specific messages. It is exclusively available for MGW-IWU specific logging (it may not be assigned to a MGW). |
| NTP         | System (S)NTP Server   |
| SNMP        | SNMP Server  |



### Hints for NTP configuration (applies only to BSIP-IWU)

Since the BSIP1 has no hardware clock, the time has to be set by contacting a NTP (or SNTP) time server. In contrast to the BSIP1, the Server has a built-in hardware clock. However the usage of an accurate time by using NTP is suggested.

**Hint:** Some supported PBX platforms may serve as a (S)NTP server. For details refer to the Service Manual.

If a time server is not configured correctly and cannot be contacted, local time will start at "01.01.1970 00:00" on a BSIP or with the local time on a Server-IWU.

### Hints for SNMP Server

Using this option, an IP address of a SNMP server may be configured here to which SNMP traps are being send. For details refer to [Section 5.1, "SNMP"](#).

### Hints for DNS configuration

#### System DNS 1

In this field the IP address of the first (primary) system global DNS server is configured.

If this server is unreachable, the system uses "System DNS 2". This address may also be based on DHCP if it is a component part of "DHCP-Offer".

For details refer to [Section 5.7.2, "DNS Administration"](#).

#### System DNS 2

In this field the IP address of the second (secondary) system global DNS server is configured.

This server is used by the system, if the first (primary) DNS Server is unreachable. This address may also be based on DHCP if it is a component part of "DHCP-Offer".

For details refer to [Section 5.7.2, "DNS Administration"](#).

## 4.5.4 Group Server

This page holds the configuration for "Group Server". Group Servers are such servers, which have to be assigned to a group to gain functionality, in contrast to servers located on subpage "Local Servers".

The following server types are configured on this subpage.

| Server Type | Remark  |
|-------------|---|
| Add. DNS    | Gateway specific DNS servers mainly intended for SIP survivability usage. It is assigned to a gateway at page WBM > SIP > Survivability |

## Configuration reference

### "Network" Configuration (IWU)

| Server Type | Remark   |
|-------------|--|
| LDAP        | The specific LDAP server is assigned to a group at page WBM > Media Gateways > Phonebooks.   |
| Phonebook   | The phonebook is loaded to the IWU using the [Import Server Config] button. It is assigned to a group at page WBM > Media Gateways > Phonebooks. |

**Hint:** Additionally, a new server type "Phonebook" will be introduced which maintains the configuration of Media Gateway specific phonebooks (see [Section 5.18, "System Phonebook"](#)).

## 4.6 "SIP" Configuration (IWU)

The configuration page "SIP" is divided into several sections.

**UNIFY** HiPath Cordless IP

Administration Network **SIP** Media Gateways Group User Dect Debugging Status System Clc

**SIP-General**

General SIP Settings Survivability

| Index | Display... | Enabled                             | Name                   | Gateway Type | ListenPortRem... | SIP Server Id     | Resolve...                          | Use OBP                             | Outbound Proxy | Netmask       |
|-------|------------|-------------------------------------|------------------------|--------------|------------------|-------------------|-------------------------------------|-------------------------------------|----------------|---------------|
| 1     | 1          | <input checked="" type="checkbox"/> | OSV Berlin HQ          | OSV          | 5060             | pbx1.dnszone2.... | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 0.0.0.0        | 255.255.255.0 |
| 4     | 2          | <input checked="" type="checkbox"/> | OSB Munic (OSV Be...   | OSV          | 5060             | pbx1.dnszone2.... | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 172.32.10.1    | 255.255.255.0 |
| 5     | 3          | <input checked="" type="checkbox"/> | OSB Stuttgart (OSV ... | OSV          | 5060             | pbx1.dnszone2.... | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 172.32.11.1    | 255.255.255.0 |
| 2     | 4          | <input checked="" type="checkbox"/> | OSO Augsburg           | OSO          | 5060             | 172.31.244.1      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 0.0.0.0        | 255.255.255.0 |
| 3     | 5          | <input checked="" type="checkbox"/> | OSO Ulm                | OSO          | 5060             | 192.168.100.50    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 0.0.0.0        | 255.255.255.0 |

Add Gateway Delete Gateway Edit Gateway

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Logout Help Info Cancel Apply

In the table view at the top, the VoIP Gateways (PBX) are configured using several sub pages.

At the bottom of the page, the list of gateways may be edited by adding, deleting or editing PBXs.

## 4.6.1 Configuration Page "SIP > General"

This subpage contains all parameters, which are necessary for the General configuration of the PBX.

| SIP-General                        |            |                                     |                        |              |                  |                   |                                     |                                     |                |               |
|------------------------------------|------------|-------------------------------------|------------------------|--------------|------------------|-------------------|-------------------------------------|-------------------------------------|----------------|---------------|
| General SIP Settings Survivability |            |                                     |                        |              |                  |                   |                                     |                                     |                |               |
| Index                              | Display... | Enabled                             | Name                   | Gateway Type | ListenPortRem... | SIP Server Id     | Resolve...                          | Use OBP                             | Outbound Proxy | Netmask       |
| 1                                  | 1          | <input checked="" type="checkbox"/> | OSV Berlin HQ          | OSV          | 5060             | pbx1.dnszone2.... | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 0.0.0.0        | 255.255.255.0 |
| 4                                  | 2          | <input checked="" type="checkbox"/> | OSB Munic (OSV Be...   | OSV          | 5060             | pbx1.dnszone2.... | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 172.32.10.1    | 255.255.255.0 |
| 5                                  | 3          | <input checked="" type="checkbox"/> | OSB Stuttgart (OSV ... | OSV          | 5060             | pbx1.dnszone2.... | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 172.32.11.1    | 255.255.255.0 |
| 2                                  | 4          | <input checked="" type="checkbox"/> | OSO Augsburg           | OSO          | 5060             | 172.31.244.1      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 0.0.0.0        | 255.255.255.0 |
| 3                                  | 5          | <input checked="" type="checkbox"/> | OSO Ulm                | OSO          | 5060             | 192.168.100.50    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 0.0.0.0        | 255.255.255.0 |

### General Gateway configuration

#### Hints:

- To add a new entry for a gateway, click on [Add Gateway]. A new entry line with default values is appended, which have to be modified according to your system needs.
- The new entry line is either inserted above the selected Gateway or inserted at the top of the list if no Gateway is selected.
- A selected Gateway entry may be deleted by clicking [Delete Gateway].
- During running system service, the gateway may be edited by using the [Edit Gateway] button.

The columns of the configuration page have the following meaning:

#### Index

This new column displays the index of the current PBX or server.

#### DisplayIndex

The Display Index of the entry is displayed here. This value is automatically incremented by the WBM.

#### Enabled

When activating this element the selected Gateway (the PBX) is added to the configuration and can be selected when configuring the Groups later on.

#### Name

Enter a unique name here for the Gateway. This name will be displayed in the dropdown box of the available Gateways when configuring the Groups.

#### Gateway Type

Since several PBX support different feature sets, the type of gateway has to be configured.

| Gateway                                 | Gateway Type |
|---|--------------|
| OpenScape Voice and/or OpenScape Branch | OSV          |
| OpenScape Office                        | OSO          |
| OpenScape Business                      | OSBiz        |
| HiPath 3000                             | default      |
| HiPath 4000                             | OS4000       |

**Hint:** For Gateway Type "OSV" in limited mode the following applies: To ensure consistent behavior to Openstage phones, when the system is running in Limited MODE, a call transfer to a C participant in Alerting state is not supported.

### ListenPortRemote

This entry determines the common SIP listen port of the configured gateway. There is no need to change this port to another value than 5060. The default setting is "5060".

### SIP Server Id

The value is equal to the IP address of the VoIP Gateway (SIP Server for INVITE and REGISTER Messages). It shall be located in the IP Infrastructure network ([Section 1.3, "Network Concept"](#)).

If a domain name is configured, the HPCIP system will try to resolve this name into an IP address by means of a DNS query if option "Use OBP" is deactivated. If option "Use OBP" is activated, the name is not resolved by DNS.

If a DNS request delivers several IP addresses, the first IP address in this list will be used and all others IP addresses will be ignored. The DNS request will be repeated hourly. If the IP address is changed by a DNS request, this IP address will be used as soon as a user loses his RAS registration or call establishments will timeout.

### Resolve SIP Server Id

This setting determines, if a hostname which is configured SipServerId and used inside the SIP message headers should be resolved to an ip address or left as configured as name. This applies to DNS-SRV setups (where the OBP has to be disabled and a hostname has to be configured as SIP Server Id) as well as to standard DNS setups (without DNS-SRV) where an OBP may or may not be configured.

If the option "Resolve SIP Server Id" is enabled, (which is the default), if a name is configured this name will be resolved to an ip address which is used in the SIP message headers.

If the option "Resolve SIP Server Id" is disabled, (non-default), the configured SipServerId is used in the SIP message headers).

If adding a new gateway manually, the "Resolve SIP Server Id" will automatically be enabled. If the gateway should use an OBP ("Use OBP" = enabled), the "Resolve SIP Server Id" has to be disabled manually to preserve the old behavior.

#### Use OBP

This option is used to control the usage of a SIP Outbound Proxy (e.g. Openscape Branch).

If this checkbox is activated, a valid IP address has to be entered in the column "Outbound Proxy". This IP address will be used for the Layer 3 Signaling (IP header).

If the Checkbox is deactivated, the column "Outbound Proxy" will be ignored. In this case the value of column "SIP Server Id" will be used for Layer 3 Signaling.

#### Outbound Proxy

Configures the IP address of the SIP Outbound Proxy. This IP address will be used for the Layer 3 Signaling (IP header).

It shall be located in the IP Infrastructure network (see [Section 1.3, "Network Concept"](#)). At the IWU a corresponding IP Infrastructure address has to be configured.

#### Netmask

Enter the netmask for the IP address for the Gateway here. (Default for Class C networks: 255.255.255.0).

## 4.6.2 Configuration Page "SIP > SIP Settings"

This subpage contains all parameters which are necessary for the specific SIP settings configuration of the PBX.

| SIP-SIP Settings                   |             |                                     |                        |              |            |      |           |                                     |            |            |
|------------------------------------|-------------|-------------------------------------|------------------------|--------------|------------|------|-----------|-------------------------------------|------------|------------|
| General SIP Settings Survivability |             |                                     |                        |              |            |      |           |                                     |            |            |
| Index                              | Displayl... | Enabled                             | Name                   | IEC (Inte... | Packet ... | Dtmf | Transp... | Direct S...                         | Registr... | Registr... |
| 1                                  | 1           | <input checked="" type="checkbox"/> | OSV Berlin HQ          | 00           | 20         | RTP  | TCP       | <input checked="" type="checkbox"/> | 300        | 2          |
| 4                                  | 2           | <input checked="" type="checkbox"/> | OSB Munic (OSV Be...   | 00           | 20         | RTP  | TCP       | <input checked="" type="checkbox"/> | 300        | 2          |
| 5                                  | 3           | <input checked="" type="checkbox"/> | OSB Stuttgart (OSV ... | 00           | 20         | RTP  | TCP       | <input checked="" type="checkbox"/> | 300        | 2          |
| 2                                  | 4           | <input checked="" type="checkbox"/> | OSO Augsburg           | 00           | 20         | RTP  | UDP       | <input type="checkbox"/>            | 120        | 2          |
| 3                                  | 5           | <input checked="" type="checkbox"/> | OSO Ulm                | 00           | 20         | RTP  | UDP       | <input type="checkbox"/>            | 120        | 2          |

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Enabled" and "Name" are repeated on all sub pages (Except Servers). A description of these parameters may be found in the previous chapter.

**IEC (International Exit Code)**

**Hint:** This option applies only to LDAP phonebook entries.

Using this option, the mapping of a "+" sign inside a LDAP number string to an International Exit Code (IEC) consisting of one or more digits is configured. Valid entries are one or more digits (0-9). Empty entries are not allowed, the default value is "00".

For details refer to [Section 5.14.9, "LDAP: Configuration option for mapping "+" to an IEC"](#).

**Packet Size (ms)**

Configuration of RTP packet size (only in WBM mode UnifyAdmin) available.

For details, refer to [Section 5.4, "Support for Different RTP Packet Sizes"](#).

**Dtmf**

Selects the method for the transmission of DTMF digits ("tones") to the Gateway:

"Signaling": The DTMF Digits are transmitted via the signaling protocol to the Gateway (For SIP via the INFO method).

"RTP": The DTMF Digits are transmitted to the Gateway via the Voice (RTP) channel (e.g. for SIP embedded in the RTP protocol according to RFC2833).

There is no need to change this setting for the supported gateways. The default setting is "RTP".

**Transport Protocol**

This option is needed to determine the Transport Protocol (UDP or TCP) of the current selected PBX for SIP signaling. The default is Transport protocol is "UDP".

For details, refer to [Section 5.22, "SIP over TCP"](#).

**Direct Signaling**

This option determines, if incoming INVITES from unknown (not configured) PBX IP address are accepted or rejected. This support is limited to UDP as SIP transport protocol.

If this flag is disabled, HPCIP accepts only calls from the IP-address where the user is registered to. This is the default setting.

If this flag is enabled, HPCIP accepts calls from any IP addresses.

Usage of this option is needed if the IWU is directly connected to geographically node separated OSV cluster (Main-Office, no OpenBranch-Proxy involved). For security reasons this flag should only be enabled in a Geo-separated OSV setup.

### Registration expiry

The "Registration expiry" determines - in conjunction with the "Registration threshold" when a Re-register event of the SIP user should be initiated. The default is 120 sec., min. value is 60 sec.

A SIP Reregister event will be triggered by one of the following events which occurs later.

- after 50% of the "Registration expiry" have elapsed or
- if the "Registration threshold" ("Registration expiry" - "Registration threshold") has been elapsed

Therefore, the event which occurs later determines the effective Re-Registration value.

### Registration threshold

The "Registration threshold" determines - in conjunction with the "registration expiry" - when a reregister event of the SIP user should be initiated. The default is 2 sec., min. value is 2 sec.

The "Registration threshold" event is triggered at "Registration expiry" - "Registration threshold".

## 4.6.3 Configuration Page "SIP > Survivability"

This subpage contains all parameters, which are necessary for the Survivability configuration of the PBX (mainly DNS SRV record settings).

| SIP-Survivability                  |                |                                     |                        |                                     |                        |                        |
|------------------------------------|----------------|-------------------------------------|------------------------|-------------------------------------|------------------------|------------------------|
| General SIP Settings Survivability |                |                                     |                        |                                     |                        |                        |
| Index                              | DisplayIndex ▲ | Enabled                             | Name                   | DNS SRV                             | DNS 1                  | DNS 2                  |
| 1                                  | 1              | <input checked="" type="checkbox"/> | OSV Berlin HQ          | <input checked="" type="checkbox"/> | [002] SRV_LOC_DNS_SYS1 | [006] SRV_LOC_DNS_SYS2 |
| 4                                  | 2              | <input checked="" type="checkbox"/> | OSB Munic (OSV Be...   | <input type="checkbox"/>            | [002] SRV_LOC_DNS_SYS1 | [006] SRV_LOC_DNS_SYS2 |
| 5                                  | 3              | <input checked="" type="checkbox"/> | OSB Stuttgart (OSV ... | <input type="checkbox"/>            | [002] SRV_LOC_DNS_SYS1 | [006] SRV_LOC_DNS_SYS2 |
| 2                                  | 4              | <input checked="" type="checkbox"/> | OSO Augsburg           | <input type="checkbox"/>            | [002] SRV_LOC_DNS_SYS1 | [006] SRV_LOC_DNS_SYS2 |
| 3                                  | 5              | <input checked="" type="checkbox"/> | OSO Ulm                | <input type="checkbox"/>            | [002] SRV_LOC_DNS_SYS1 | [006] SRV_LOC_DNS_SYS2 |

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Enabled" and "Name" are repeated on all sub pages (Except Servers). A description of these parameters may be found in the previous chapter.



### **DNS SRV**

Controls the usage of DNS Service Records. For detail refer to [Section 5.7.3, “DNS SRV”](#).

If the checkbox "DNS SRV" is **activated**, the columns "Outbound Proxy" and "ListenPort Remote" will be ignored for this gateway. The SIP Server addresses are now derived by DNS SRV requests. Therefore the column "SIP Server Id" must contain a valid domain name. The DNS request will be repeated hourly.

If the checkbox "DNS SRV" is **deactivated**, the columns "Outbound Proxy" and "ListenPort Remote" will be used for this gateway.

The maximum number of SIP Server addresses per gateway will be limited to 5.

### **DNS 1**

Using this option, the primary used DNS Server for this Gateway may be configured.

This option determines, if the "System Dns" servers are used (see subpage Servers, type: "SYSTEM DNS 1" or "SYSTEM DNS 2") or gateway specific DNS servers (see subpage Servers, type: "ADD.DNS") are used.

### **DNS 2**

Using this option, the secondary used DNS Server for this Gateway may be configured.

This option determines, if the "System Dns" servers are used (see subpage Servers, type: "SYSTEM DNS 1" or "SYSTEM DNS 2") or gateway specific DNS servers (see subpage Servers, type: "ADD.DNS") are used.

## **4.7 “Media Gateways” Configuration**

Due to the main differences between the application mode BSIP-IWU/Server IWU and MGW-IWU, these pages are documented separately

### **4.7.1 Media Gateways (BSIP-IWU and Server-IWU)**

Due to the enhancements in V1R5 for the new MGW concept, a new object entity "Media Gateway" has been introduced. To assure consistent system architecture, the Server-IWU as well as the BSIP-IWU will be enhanced by the concept of a logical local Media Gateway (Media Gateway Local). This concept is similar to the local BSIP included in a BSIP-IWU.

The Media Gateway Local (implemented in BSIP-IWU and Server-IWU) includes only a subset of the configuration options compared to the MGW-IWU:

## Configuration reference

### "Media Gateways" Configuration

| Media Gateways-Dect |          |            |     |     |                                |            |                                     |
|---------------------|----------|------------|-----|-----|--------------------------------|------------|-------------------------------------|
| Dect Dect Network   |          |            |     |     |                                |            |                                     |
| Index               | Name     | ARI exc... | FPS | PLI | Segments/RPNs/LAL              | System ... | Default Ttui                        |
| 1                   | MgwLocal | 101b2ff    | 6   | 31  | 255 - 1 RPNs/Loc.Area - LAL=39 | 00000000   | <input checked="" type="checkbox"/> |

**Hint:** Editing of the Media Gateway Local entry is supported during running system services.

#### 4.7.1.1 Media Gateways > Dect (BSIP-IWU and Server-IWU)

This page displays the table of the Media Gateway Local containing the local Dect specific configuration. There is only one entry in the table which cannot be deleted.

The columns of the configuration page have the following meaning:

##### Index

This new column displays the index of the MGW Local. This value cannot be changed.

##### Enabled

For a Media Gateway Local, this entry is always enabled and cannot be changed.

##### Name

For a Media Gateway Local, this entry is always set to "MgwLocal" and cannot be changed.

##### ARI excl FPS

In the field ARI excl FPS and FPS the System ARI (DECT ID) which has to be unique at each DECT system has to be configured. The SystemAri is provided by the system implementer. Supported System Ari classes are Class B Ari.

**Hint:** All handset registrations are bound to a specific System ARI. If the System ARI is changed, all handsets loose their registration at the IWU. To achieve system functionality, the handsets have to be registered again at the IWU.

This field contains the Dect ARI excluding the FPS part ( = ARC + EIC + FPN)

##### FPS

This field contains the Dect "Fixed Part Sub-number" which is a 4 bit, 1 digit value containing values from 1 to F.

**Hint:** The ARI is built of the combined values of ARC, EIC, FPN, FPS. Example: The ARI 101b2fe1 is segmented into:

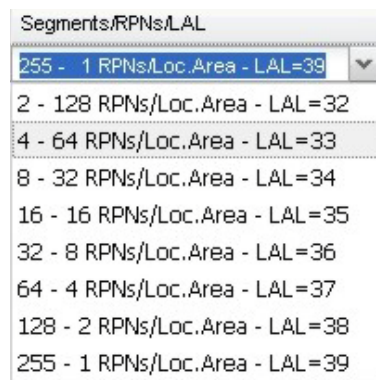
ARC: 1, EIC: 01b2, FPN: fe, FPS: 1

**Important note:** Please keep in mind, that the implementer / installer has to ensure that the FMID is geographically unique. The FMID is built from the last digit of the ARI (FPS = Fixed Part Sub-Number) and the RPN of the base stations. If the same FMID is used, this may lead to spurious call losses and to instable system behavior if both radio parts of the DECT systems are running synchronous for a specific amount of time.

For details refer to Dect specification [EN 300 175-2] and [EN 300 175-6].

### Segments/RPNs/LAL

Using this dropdown, the number of Location Areas and their corresponding number of RPN/Location area as well as the LAL may be configured. The dropdown shows 8 possible selections.



The output is arranged into a separated list.

Number of Location Areas - Number of RPN/Location area - Location Area Length (LAL).

### System Pin

The "PIN" is a 8-digit number and it is needed for the registration of Handsets. It is preconfigured with "00000000" and may be configured on a MGW base here.

**Hint:** The ciphering method uses the "System Pin" to cipher the speech connections of the handsets on air. The "System Pin" is transmitted to the handset during the registration process. If the "System Pin" is changed later, this will lead to disturbed voice connections. In this case, the handsets have to be reregistered at the IWU.

### 4.7.1.2 Media Gateways > Dect Network (BSIP-IWU and Server-IWU)

This page displays the table of the Media Gateway Local containing the local Dect network specific configuration. There is only one entry in the table which cannot be deleted.

| Media Gateways-Dect Network |          |                |               |                  |                          |         |
|-----------------------------|----------|----------------|---------------|------------------|--------------------------|---------|
| Dect Dect Network           |          |                |               |                  |                          |         |
| Index                       | Name     | Dect ServerIp  | Dect Netmask  | Dect Listen Port | VPN en...                | VLAN Id |
| 1                           | MgwLocal | 192.168.10.111 | 255.255.255.0 | 10500            | <input type="checkbox"/> | 0       |

The columns of the configuration page have the following meaning:

#### Index

This column displays the index of the MGW-Local. This value cannot be changed.

#### Enabled

For a Media Gateway Local, this entry is always enabled and cannot be changed.

#### Name

For a Media Gateway Local, this entry is always set to "MgwLocal" and cannot be changed.

#### Dect ServerIp

This field contains the IP address of the Media Gateway Local inside the DECT network. This IP address is used for communication between the Media Gateway Local and all BSIP-Only.

The factory default IP address is 192.168.1.1, which may not be saved inside the configuration of the IWU.

**Hint:** The configured IP address may not be located inside the network of the configure Voip (Infrastructure) IP address.

For details refer to [Section 6.1, “Free IP Addressing”](#).

#### Dect Netmask

By default, a netmask of 255.255.255.0 (24 bit) is configured for the DECT network.

Please keep in mind, that using another netmask than 255.255.0.0 will prevent BSIP-ONLY running with firmware V1R1 being found in SCAN.

For detail refer to chapters

[Section 6.1, “Free IP Addressing”](#)

[Section 6.2, “Adding new BSIP”](#)

### **Dect Listen Port**

This field defines the IP port on which the communication between the Media Gateway Local and all BSIP-Only inside the MGW is established. The default value is 10500.

### **VPN enable**

This option enables the encryption of data communication (signaling and voice data) between the Media Gateway Local and all BSIP-Only. Encryption is realized by using an IPsec connection in transport mode using static keys.

**Hint:** Some system relevant functions (e.g. SCAN and SYNC) are transmitted unencrypted.

### **VLAN Id**

The corresponding VLAN Id (according IEEE 802.1q) for the DECT network is configured here.

**Important note:** Regardless of the value configured here, the BSIP-Only is not able to handle tagged Ethernet packets. This is due to the fact that a BSIP-Only has no local console access (as compared to a standard cable based SIP phone) and therefore may not be accessible anymore if VLAN is not configured correctly. For this reason, the Switchport - at which a BSIP-Only is attached to - has to be configured untagged and assigned the VLAN Id configured here.

This does not apply to a BSIP-IWU or a Server-IWU. The BSIP-IWU and Server IWU are able to handle tagged Ethernet packets.

All Ethernet frames towards the VoIP (Infrastructure) network between the IWU and the Ethernet switch are tagged with the configured VLAN Id (if unequal 0) configured for the Infrastructure network (option "VLAN Id" at page Network Gateways).

All Ethernet frames towards the DECT network between the IWU and the Ethernet switch are tagged with the configured VLAN Id configured for the DECT network (option "VLAN Id" at page DECT - this option).

Please take account of the correlating VLAN configuration of the VoIP (Infrastructure) network.

### **MGW as GW (only in Admin mode)**

Activate this option to use the IWU as a router to the BSIP-Only.

Background: Using the option "MGW as GW" enables the routing (ip forwarding) via the IP VoIP (Infrastructure) Network to the DECT Network. This ensures access to the network in which the BSIP-Only are located, without having an ip address (in the DECT network) configured at the maintenance PC. Additionally you have to add a route at the maintenance PC

## 4.7.2 Media Gateways (MGW-IWU)

For application mode MGW-IWU, the subpages are separated into two groups indicated by a spacer between the group subpages.

- The subpages located in the first group (left to the spacer) display information about all Media Gateways.
- The subpages in the second group (right to the spacer) display information about a specific Media Gateway (which has to be selected using a dropdown at the bottom of the page).

UNIFY HiPath Cordless IP

Administration Network SIP **Media Gateways** Group User Dect Debugging Status System Clc

Media Gateways-General

| General | Dect                                | Dect Network | IWU Network | CL Network               | About     | VoIP Network      | VoIP Gateway | Phonebooks |
|---------|-------------------------------------|--------------|-------------|--------------------------|-----------|-------------------|--------------|------------|
| Index   | Enabled                             | Name         | MGW Type    | MGW a...                 | Syslog    | Mac Addr          | Alive Ti...  |            |
| 1       | <input checked="" type="checkbox"/> | MGW_Berlin_1 | MGW 30      | <input type="checkbox"/> | no Syslog | 00-0c-29-05-a5-1c | 15           |            |
| 2       | <input checked="" type="checkbox"/> | MGW_Berlin_2 | MGW 30      | <input type="checkbox"/> | no Syslog | 00-0c-29-a0-6c-43 | 15           |            |
| 3       | <input checked="" type="checkbox"/> | MGW_Ulm      | MGW 30      | <input type="checkbox"/> | no Syslog | 00-0c-29-32-f2-7c | 15           |            |

Delete Media Gateway Replace Media Gateway Edit Media Gateway Scan

MGW Signal Listen Port: 10600

MGW Control Listen Port: 10601

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Logout Help Info Cancel Apply

**Hint:** Adding, editing and deleting of Media Gateway entries is supported during running system services.

### 4.7.2.1 General Media Gateway Configuration

In the lower part of the sub-pages in the first group (left to the spacer) the following options are available:



The screenshot shows a configuration panel with four buttons at the top: "Delete Media Gateway", "Replace Media Gateway", "Edit Media Gateway", and "Scan". Below the buttons are two input fields: "MGW Signal Listen Port:" with the value "10600" and "MGW Control Listen Port:" with the value "10601".

#### Delete Media Gateway

By selecting a Media Gateway and clicking on [Delete], the selected Media Gateway entry is deleted.

#### Replace Media Gateway

Replaces the Media Gateway with another hardware. Concept is similar to replacing a basestation.

#### Edit Media Gateway

Replaces the Media Gateway with other hardware. Concept is similar to replacing a base station.

#### Scan

This functionality (Scan) initiates a Seek or Scan of all MGW which have registered before at the MGW-IWU. During the SCAN, all information are requested using an IP unicast mechanism. If the MGW answers it sends its current configuration information (mainly its own IP address, IP address and listen port of the MGW-IWU, its name and VPN configuration) to the MGW-IWU where it is displayed.

#### MGW Control Listen Port

This field defines the IP port on which the signaling control communication between the MGW-IWU and all MGW is established. The default value is 10600 .

#### MGW Config Listen Port

This field defines the IP port on which the configuration communication between the MGW-IWU and all MGW is established. The default value is 10601.

In the lower part of the sub-pages in the second group (right to the spacer) the following options are available:



The screenshot shows a dropdown menu labeled "Media Gateways:". The selected entry is "[003] MGW\_Ulm".

### Media Gateways

This option is used to select a specific Media Gateway on those subpages which are specific to a Media Gateway.

#### 4.7.2.2 WBM > Media Gateways > General

This page displays the table of all configured Media Gateways containing the General Media Gateway configuration.

| Media Gateways-General |                                     |              |             |                          |           |                   |               |            |
|------------------------|-------------------------------------|--------------|-------------|--------------------------|-----------|-------------------|---------------|------------|
| General                | Dect                                | Dect Network | IWU Network | CL Network               | About     | VoIP Network      | VoIP Gateway  | Phonebooks |
| Index                  | Enabled                             | Name         | MGW Type    | MGW as GW                | Syslog    | Mac Addr          | Alive Timeout |            |
| 1                      | <input checked="" type="checkbox"/> | MGW_Berlin_1 | MGW 30      | <input type="checkbox"/> | no Syslog | 00-0c-29-05-a5-1c | 15            |            |
| 2                      | <input checked="" type="checkbox"/> | MGW_Berlin_2 | MGW 30      | <input type="checkbox"/> | no Syslog | 00-0c-29-a0-6c-43 | 15            |            |
| 3                      | <input checked="" type="checkbox"/> | MGW_Ulm      | MGW 30      | <input type="checkbox"/> | no Syslog | 00-0c-29-32-f2-7c | 15            |            |

The table contains the following columns:

#### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

#### Enabled

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

#### Name

A unique name for the Media Gateway may be configured here (e.g. Site-Id the MGW is located and name of MG). This name serves only for internal configuration purposes but doesn't uniquely identify a MGW.

#### MGW Type

Determines the type of the Media Gateway. Four different types are available:

"MGW 30": Supports up to 30 concurrent calls/MGW.

"MGW 60": Supports up to 60 concurrent calls/MGW.

"MGW 90": Supports up to 90 concurrent calls/MGW.

"MGW 120": Supports up to 120 concurrent calls/MGW.



### Syslog

A specific Syslog server (configures at page WBM > Network > Group Server) may be assigned to a specific Media Gateway. One Syslog server may be assigned to several MGW s.

### Mac Addr

This field displays the MAC address of the Media Gateway as read from the MGW with "Scan".

### Alive Timeout

This parameter determines the timeout in seconds a MGW is treated Offline after no data has been received by the Control- or Signaling connection.

## 4.7.2.3 WBM > Media Gateways > Dect

This page displays the table of all configured Media Gateways containing the Dect specific configuration.

| Media Gateways-Dect |                                     |              |             |            |         |              |     |                                |            |                          |  |
|---------------------|-------------------------------------|--------------|-------------|------------|---------|--------------|-----|--------------------------------|------------|--------------------------|--|
| General             | Dect                                | Dect Network | IWU Network | CL Network | About   | VoIP Network |     | VoIP Gateway                   | Phonebooks |                          |  |
| Index               | Enabled                             | Name         | ARI exc...  | FPS        | Site Id | Site SubId   | PLI | Segments/RPNs/LAL              | System ... | Default Ttui             |  |
| 1                   | <input checked="" type="checkbox"/> | MGW_Berlin_1 | 101b2fc     | 4          | 1       | 1            | 31  | 16 - 16 RPNs/Loc.Area - LAL=35 | 00000000   | <input type="checkbox"/> |  |
| 2                   | <input checked="" type="checkbox"/> | MGW_Berlin_2 | 101b2fc     | 4          | 1       | 2            | 31  | 16 - 16 RPNs/Loc.Area - LAL=35 | 00000000   | <input type="checkbox"/> |  |
| 3                   | <input checked="" type="checkbox"/> | MGW_Ulm      | 101b2fc     | 4          | 2       | 1            | 31  | 16 - 16 RPNs/Loc.Area - LAL=35 | 00000000   | <input type="checkbox"/> |  |

The table contains the following columns:

### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

### Enabled

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

### Name

A unique name for the Media Gateway may be configured here (e.g. Site-Id the MGW is located and name of MG). This name serves only for internal configuration purposes but doesn't uniquely identify a MGW.

### ARI excl FPS

In the field ARI excl FPS and FPS the System ARI (DECT ID) which has to be unique at each DECT system has to be configured. The SystemAri is provided by the system implementer. Supported System Ari classes are "Class B" Ari.

## Configuration reference

### "Media Gateways" Configuration

**Hint:** All handset registrations are bound to a specific System ARI. If the System ARI is changed, all handsets loose their registration at the IWU. To achieve system functionality, the handsets have to be registered again at the IWU.

This field contains the Dect ARI excluding the FPS part ( = ARC + EIC + FPN)

#### FPS

This field contains the Dect "Fixed Part Sub-number" which is a 4 bit, 1 digit value containing values from 1 to F.

**Hint:** The ARI is built of the combined values of ARC, EIC, FPN, FPS. Example: The ARI 101b2fe1 is segmented into:

ARC: 1

EIC: 01b2

FPN: fe

FPS: 1

**Important note:** Please keep in mind, that the implementer / installer has to ensure that the FMID is geographically unique. The FMID is built from the last digit of the ARI (FPS = Fixed Part Sub-Number) and the RPN of the base stations. If the same FMID is used , this may lead to spurious call losses and to instable system behavior if both radio parts of the DECT systems are running synchronous for a specific amount of time.

For details refer to Dect specification [EN 300 175-2] and [EN 300 175-6].

#### Site Id

All Media Gateways with the same "Site Id" are belonging to the same site. To assign a MGW to a specific site, the "Site Id" may be configured here once. If the Site Id has to be changed for a specific MGW, the MGW has to be deleted and newly created.

#### Site Sub ID

This value is calculated by the WBM to identify a specific Media Gateway inside a site and to differ it from the other MGW' s inside the same site. The value is calculated by the WBM an cannot be changed.

#### Segments/RPNs/LAL

Using this dropdown, the number of Location Areas and their corresponding number of RPN/Location area as well as the LAL may be configured. The dropdown shows 8 possible selections.

Segments/RPNs/LAL

255 - 1 RPNs/Loc.Area - LAL=39

2 - 128 RPNs/Loc.Area - LAL=32

4 - 64 RPNs/Loc.Area - LAL=33

8 - 32 RPNs/Loc.Area - LAL=34

16 - 16 RPNs/Loc.Area - LAL=35

32 - 8 RPNs/Loc.Area - LAL=36

64 - 4 RPNs/Loc.Area - LAL=37

128 - 2 RPNs/Loc.Area - LAL=38

255 - 1 RPNs/Loc.Area - LAL=39

The output is arranged into a separated list.

Number of Location Areas - Number of RPN/Location area - Location Area Length (LAL).

### System Pin

The "PIN" is a 8-digit number and it is needed for the registration of Handsets. It is preconfigured with "00000000" and may be configured on a MGW base here.

**Hint:** The ciphering method uses the "System Pin" to cipher the speech connections of the handsets on air. The "System Pin" is transmitted to the handset during the registration process. If the "System Pin" is changed later, this will lead to disturbed voice connections. In this case, the handsets have to be reregistered at the IWU.

## 4.7.2.4 WBM > Media Gateways > Dect Network

This page displays the table of configured Dect networks at all Media Gateways.

| Media Gateways-Dect Network |                                     |              |                 |               |                  |                          |              |            |
|-----------------------------|-------------------------------------|--------------|-----------------|---------------|------------------|--------------------------|--------------|------------|
| General                     | Dect                                | Dect Network | IWU Network     | CL Network    | About            | VoIP Network             | VoIP Gateway | Phonebooks |
| Index                       | Enabled                             | Name         | Dect ServerIp   | Dect Netmask  | Dect Listen Port | VPN en...                | VLAN Id      | Cos Value  |
| 1                           | <input checked="" type="checkbox"/> | MGW_Berlin_1 | 192.168.221.254 | 255.255.255.0 | 10500            | <input type="checkbox"/> | 221          | 0          |
| 2                           | <input checked="" type="checkbox"/> | MGW_Berlin_2 | 192.168.222.254 | 255.255.255.0 | 10500            | <input type="checkbox"/> | 222          | 0          |
| 3                           | <input checked="" type="checkbox"/> | MGW_Ulm      | 192.168.223.254 | 255.255.255.0 | 10500            | <input type="checkbox"/> | 223          | 0          |

The table contains the following columns:

### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

#### **Enabled**

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

#### **Name**

A unique name for the Media Gateway may be configured here (e.g. Site-Id the MGW is located and name of MG). This name serves only for internal configuration purposes but doesn't uniquely identify a MGW.

#### **Dect ServerIp**

This field contains the IP address of the Media Gateway inside the DECT network. This IP address is used for communication between the Media Gateway and all BSIP-Only.

**Hint:** The configured IP address may not be located inside other networks of the HPCIP system.

For detail refer to [Section 6.1, “Free IP Addressing”](#).

#### **Dect Netmask**

By default, a netmask of 255.255.255.0 (24 bit) is configured for the DECT network.

Please keep in mind, that using another netmask than 255.255.0.0 will prevent BSIP-ONLY running with firmware V1R1 being found in SCAN.

For detail refer to chapters:

- [Section 6.1, “Free IP Addressing”](#)
- [Section 6.2, “Adding new BSIP”](#)

#### **Dect Listen Port**

This field defines the IP port on which the communication between the Media Gateway and all BSIP-Only inside the MGW is established. The default value is 10500.

#### **VPN enable**

This option enables the encryption of data communication (signaling and voice data) between the Media Gateway and all BSIP-Only. Encryption is realized by using an IPsec connection in transport mode using static keys.

**Hint:** Some system relevant functions (e.g. SCAN and SYNC) are transmitted unencrypted.

#### **VLAN Id**

The corresponding VLAN Id (according IEEE 802.1q) for the DECT network is configured here.

**Important note:** Regardless of the value configured here, the BSIP-Only is not able to handle tagged Ethernet packets. This is due to the fact that a BSIP-Only has no local console access (as compared to a standard cable based SIP phone) and therefore may not be accessible anymore if VLAN is not configured correctly. For this reason, the Switchport - at which a BSIP-Only is attached to - has to be configured untagged and assigned the VLAN Id configured here. This does not apply to a BSIP-IWU or a Server-IWU. The BSIP-IWU and Server-IWU are able to handle tagged Ethernet packets.

All Ethernet frames towards the VoIP (Infrastructure) network between the IWU and the Ethernet switch are tagged with the configured VLAN Id configured for the Infrastructure network (option VLAN Id" at page Network/Gateways).

All Ethernet frames towards the DECT network between the IWU and the Ethernet switch are tagged with the configured VLAN Id configured for the DECT network (option "VLAN Id" at page DECT - this option).

Please take account of the correlating VLAN configuration of the VoIP (Infrastructure) network.

### **Cos Value**

With the "CoS Value" (Class of Service) you can configure the prioritization of the Ethernet packets via Ethernet (Layer2) according to 802.1p. (Default = "0", i.e. no prioritization).

Using the dropdown you may select one of the pre-configured CoS values.

**Hint:** CoS relies on the configuration of a VLAN unequal to 0.

### **MGW as GW (only in Admin mode)**

Activate this option to use the IWU as a router to the BSIP-Only.

Background: Using the option "MGW as GW" enables the routing (ip forwarding) via the IP VoIP (Infrastructure) Network to the DECT Network. This ensures access to the network in which the BSIP-Only are located, without having an ip address (in the DECT network) configured at the maintenance PC. Additionally you have to add a route at the maintenance PC

### 4.7.2.5 WBM > Media Gateways > IWU Network

This page displays the table of configured IWU networks at all Media Gateways. The contents inside the table are read-only and only for informational purposes. The corresponding options have to be configured at the WBM of the corresponding MGW directly.

| Media Gateways-IWU Network |                                     |              |                |               |            |           |              |  |              |       |
|----------------------------|-------------------------------------|--------------|----------------|---------------|------------|-----------|--------------|--|--------------|-------|
| General                    |                                     | Dect         | Dect Network   | IWU Network   | CL Network | About     | VoIP Network |  | VoIP Gateway | Phone |
| Index                      | Enabled                             | Name         | IpAddr Main    | Netmask Main  | VLAN Id    | Cos Value |              |  |              |       |
| 1                          | <input checked="" type="checkbox"/> | MGW_Berlin_1 | 192.168.100.81 | 255.255.255.0 | 1          | 0         |              |  |              |       |
| 2                          | <input checked="" type="checkbox"/> | MGW_Berlin_2 | 192.168.100.82 | 255.255.255.0 | 1          | 0         |              |  |              |       |
| 3                          | <input checked="" type="checkbox"/> | MGW_Ulm      | 192.168.100.83 | 255.255.255.0 | 1          | 0         |              |  |              |       |

The table contains the following columns:

#### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

#### Enabled

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

#### Name

A unique name for the Media Gateway may be configured here (e.g. Site-Id the MGW is located and name of MG). This name serves only for internal configuration purposes but doesn't uniquely identify a MGW.

#### IpAddr Main

Displays the IP address of the Media Gateway-IWU network of the Media Gateway as read with "Scan".

#### Netmask Main

Displays the IP address netmask of the Media Gateway-IWU network of the Media Gateway as read with "Scan".

#### VLAN Id

The corresponding VLAN Id (according IEEE 802.1q) for the Media Gateway Voip network is displayed here.

#### COS Value

Displays the Cos Value of the Media Gateway VoIP network of the Media Gateway as read with "Scan".

#### 4.7.2.6 WBM > Media Gateways > CL Network

This page displays the table of configured Media Gateways CL networks of all Media Gateways.

| Media Gateways-CL Network |                                     |              |              |                                     |            |       |              |              |            |
|---------------------------|-------------------------------------|--------------|--------------|-------------------------------------|------------|-------|--------------|--------------|------------|
| General                   |                                     | Dect         | Dect Network | IWU Network                         | CL Network | About | VoIP Network | VoIP Gateway | Phonebooks |
| Index                     | Enabled                             | Name         |              | Use IWU Network                     | IpAddr     |       | Netmask      | VLAN Id      | Cos Value  |
| 1                         | <input checked="" type="checkbox"/> | MGW_Berlin_1 |              | <input checked="" type="checkbox"/> | 0.0.0.0    |       | 0.0.0.0      | 0            | 0          |
| 2                         | <input checked="" type="checkbox"/> | MGW_Berlin_2 |              | <input checked="" type="checkbox"/> | 0.0.0.0    |       | 0.0.0.0      | 0            | 0          |
| 3                         | <input checked="" type="checkbox"/> | MGW_Ulm      |              | <input checked="" type="checkbox"/> | 0.0.0.0    |       | 0.0.0.0      | 0            | 0          |

The table contains the following columns:

##### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

##### Enabled

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

##### Name

A unique name for the Media Gateway may be configured here (e.g. Site-Id the MGW is located and name of MG). This name serves only for internal configuration purposes but doesn't uniquely identify a MGW.

##### Use IWU network

If this checkbox is enabled, no specific configuration for the CL network will be assigned. Instead, the IP configuration of the MGW IWU network is used.

##### IpAddr

If the checkbox "Use IWU network" is deactivated, a separate IP address for the CL network may be configured here.

##### Netmask

If the checkbox " Use IWU network " is deactivated, a separate netmask for the IpAddr of the CL network may be configured here.

##### VLAN Id

VLAN-Id of the Media Gateway-IWU network of the Media Gateway as read with "Scan". The corresponding VLAN Id (according IEEE 802.1q) for the Media Gateway CL network is configured here.

##### Cos Value

Cos Value of the Media Gateway-IWU network of the Media Gateway as read with "Scan ". The corresponding CoS Value for the Media Gateway CL network is configured here.

#### 4.7.2.7 WBM > Media Gateways > About

This page displays the table of configured Media Gateways. The contents inside the table are read-only.

| Media Gateways-About |                                     |              |                              |            |                |                |                   |            |
|----------------------|-------------------------------------|--------------|------------------------------|------------|----------------|----------------|-------------------|------------|
| General              | Dect                                | Dect Network | IWU Network                  | CL Network | About          | VoIP Network   | VoIP Gateway      | Phonebooks |
| Index                | Enabled                             | Name         | Version                      | PartInfo1  | PartInfo2      | IpAddr Main    | Mac Addr          |            |
| 1                    | <input checked="" type="checkbox"/> | MGW_Berlin_1 | V4.0.13 Apr 10 2014 08:57:57 | V4.0.10    | V4.0.13 Active | 192.168.100.81 | 00-0c-29-05-a5-1c |            |
| 2                    | <input checked="" type="checkbox"/> | MGW_Berlin_2 | V4.0.13 Apr 10 2014 08:57:57 | V4.0.10    | V4.0.13 Active | 192.168.100.82 | 00-0c-29-a0-6c-43 |            |
| 3                    | <input checked="" type="checkbox"/> | MGW_Ulm      | V4.0.13 Apr 10 2014 08:57:57 | V4.0.10    | V4.0.13 Active | 192.168.100.83 | 00-0c-29-32-f2-7c |            |

The table contains the following columns:

##### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

##### Enabled

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

##### Name

A unique name for the Media Gateway may be configured here (e.g. Site-Id the MGW is located and name of MG). This name serves only for internal configuration purposes but doesn't uniquely identify a MGW.

##### Version

This field displays the version number and the version date of the current firmware running on the active partition of the Media Gateway as read with "Scan".

##### PartInfo1

This field displays the version number of the firmware running on partition1 of the Media Gateway as read by a "Scan". Additionally, the label "Active" indicates, that this is the active partition of the MG.

##### PartInfo2

This field displays the version number of the firmware running on partition1 of the Media Gateway as read by a "Scan". Additionally, the label "Active" indicates, that this is the active partition of the MG.

##### IpAddr Main

This field displays the IP address of the Media Gateway-IWU network of the Media Gateway as read with "Scan".



### MAC Addr

This field displays the MAC address of the Media Gateway as read from the MGW with "Scan".

## 4.7.2.8 WBM > Media Gateways > VoIP Network

This page displays the table of configured VoIP networks at a specific Media Gateway. The contents inside the table are currently read-only.

The values of the MGW Voip networks are equal to the MGW IWU network settings, since no support of specific MGW Voip network configuration is included in this version of V1R5.

The subpages in this group (right to the spacer) display information about a specific Media Gateway (which has to be selected using a dropdown at the bottom of the page).

| Media Gateways-VoIP Network   |                                     |              |                |               |         |                    |           |
|---|-------------------------------------|--------------|----------------|---------------|---------|--------------------|-----------|
| General   Dect   Dect Network   IWU Network   CL Network   About   VoIP Network   VoIP Gateway   Phonebooks |                                     |              |                |               |         |                    |           |
| Index   | Enabled                             | Name         | IpAddr         | Netmask       | VLAN Id | Tos Value          | Cos Value |
| 1   | <input checked="" type="checkbox"/> | MGW_Berlin_1 | 192.168.100.81 | 255.255.255.0 | 1       | Best Effort (0x00) | 0         |

Media Gateways:

The table contains the following columns:

### Index

This field contains a unique Index of the Media Gateway entry. This value is automatically incremented by the WBM.

### Enabled

When activating this element, the selected Media Gateway entry is enabled at the MGW-IWU.

**Name**

This field displays the name of the Media Gateway

**IpAddr**

Displays the IP address of the VoIP network of the Media Gateway. This IP address is equal to the ip address and netmask of the corresponding "Media Gateway-IWU network".

**Netmask**

Displays the netmask of the VoIP network of the Media Gateway. This netmask is equal to the netmask of the corresponding "Media Gateway-IWU network".

**VLAN Id**

The corresponding VLAN Id (according IEEE 802.1q) for the Media Gateway Voip network is displayed here. This VLAN-ID is equal to the VLAN-Id of the corresponding "Media Gateway-IWU network".

**ToS Value**

The ToS value of the Media Gateway Voip network is displayed here.

**COS Value**

Displays the Cos value of the Media Gateway VoIP network of the Media Gateway as read with "Scan". The Cos value is equal to the Cos value of the corresponding "Media Gateway-IWU network".

#### 4.7.2.9 WBM > Media Gateways > VoIP Gateway

This page displays the mapping of Groups to VoIP gateways specific to a (selected) Media Gateway.

Depending on the selected Media Gateway (which is chosen with the dropdown in the lower part of the page), a list of all Groups which are assigned to the current Media Gateway will be displayed.

**Hint:** This assignment is accomplished using the "Media GW" assignment to a specific group on page Group.

This list of groups is created internally by the IWU by stepping through each entry of a group and checking, if this group has an assignment to a specific Media Gateway (which are determined by a number entry in field "Media Gw"). If an assignment is detected, the corresponding group will be displayed on this page.

**Important note:** The assignment of PBX' s to a specific Media Gateway is dependent of the Group the Media Gateway is assigned to.

| Media Gateways-VoIP Gateway   |                 |            |                     |  |
|---|-----------------|------------|---------------------|--|
| General   Dect   Dect Network   IWU Network   CL Network   About   VoIP Network   VoIP Gateway   Phonebooks |                 |            |                     |  |
| Group I...  | Group Name      | Voip Ne... | Gateways            |  |
| 2   | OSV_Headquarter | 0          | [001] OSV Berlin HQ |  |
| 3   | OSV_Branches    | 0          | [003] OSO Ulm       |  |

Media Gateways: [001] MGW\_Berlin\_1

The table contains the following columns:

#### Group Index

Unique Index of Media Gateway entry. This value is automatically incremented by the WBM.

#### Group Name

Display Index of Media Gateway entry. This value is automatically incremented by the WBM.

#### VoIP Networks

Using this dropdown box, a VoIP network may be assigned to the selected Group name.

#### Gateways

Using this dropdown box, a Gateway may be assigned to the selected Group name.

### 4.7.2.10 WBM > Media Gateways > Phonebooks

Using this table, different LDAP Server and Phonebook Servers may be assigned to a specific group of a (selected) Media Gateway.

| Media Gateways-Phonebooks   |              |                      |                           |
|---|--------------|----------------------|---------------------------|
| General   Dect   Dect Network   IWU Network   CL Network   About   VoIP Network   VoIP Gateway   Phonebooks |              |                      |                           |
| Group I...  | Group Name   | LDAP Server          | Phonebook Server          |
| 3   | OSV_Branches | [004] SRV_GRP_LDAP_1 | [003] SRV_GRP_Phonebook_1 |
| 4   | Grp_Ulm_OSO  | [004] SRV_GRP_LDAP_1 | [003] SRV_GRP_Phonebook_1 |

Media Gateways:

[003] MGW\_Ulm

The table contains the following columns:

**Group Index**

Unique Index of Media Gateway entry. This value is automatically incremented by the WBM.

**Group Name**

Display Index of Media Gateway entry. This value is automatically incremented by the WBM.

**LDAP Server**

Using this dropdown a specific pre-configured LDAP Server may be assigned to the selected group.

**Phonebook Server**

Using this dropdown a specific pre-configured Phonebook Server may be assigned to the selected group.

## 4.8 "Group" Configuration (IWU)

On the configuration page "Group" the Groups are defined, which provide the connection between the "VoIP Users" and the "Gateways" on a peer MGW base. Additionally, specific properties may be configured on a per group base which may be applied to one or several users, depending on their group assignment.

| ID | Display Name | Enabled                             | Name            | MediaGW List | HomeMediaGW In...   | Phon... | Inte... | CF (Call...                         | CW (Cal...                          | VM (Voi...                          | VM ... | CC (Call...                         | CCBS... | CCNR... | CC D... | CPU...                              | CPU... |
|----|--------------|-------------------------------------|-----------------|--------------|---------------------|---------|---------|-------------------------------------|-------------------------------------|-------------------------------------|--------|-------------------------------------|---------|---------|---------|-------------------------------------|--------|
| 3  | 1            | <input checked="" type="checkbox"/> | OSV_Branches    | 1,2,3        | [001] MGW_Berlin... | 0       | 5       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 85382  | <input checked="" type="checkbox"/> | *30     | *30     | *31     | <input type="checkbox"/>            |        |
| 2  | 2            | <input checked="" type="checkbox"/> | OSV_Headquar... | 1,2          | [001] MGW_Berlin... | 0       | 5       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 85382  | <input checked="" type="checkbox"/> | *30     | *30     | *30     | <input checked="" type="checkbox"/> | *22    |
| 4  | 3            | <input checked="" type="checkbox"/> | Grp_Ulm_OSO     | 3            | [003] MGW_Ulm       | 0       | 3       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 71     | <input type="checkbox"/>            |         |         |         | <input type="checkbox"/>            |        |

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Due to the enhanced MGW concept, the concept of assigning Groups to Gateways differs between BSIP-IWU/Server-IWU and MGW-IWU.

BSIP-IWU / Server-IWU: Since only one MGW (MGW-Local) exists, the groups may be assigned directly to a SIP Gateway.

MGW-IWU: Since several MGW's may exist, the groups cannot be assigned to a gateway directly. Instead, the assignment has to be done MGW specific. That means, a specific assignment on a per MGW base between group and PBX is established.

Therefore, the WBM of the group differs slightly. Where not other stated, the files belong to both types of application modes.

The lower panel contains buttons for the group management.

## 4.8.1 General Group Configuration

**Hint:** Adding, editing and deleting of group entries is supported during running system services.

1. To add a new Group entry, click on **[Add Group]**.

A new entry line with default values is appended, which have to be modified according to your System. The values have to be configured according your needs. The new entry line is either inserted above the selected Group or inserted at the top of the list if no Group is selected.

2. A selected Group entry may be deleted by clicking **[Delete Group]**.
3. To edit a Group entry during running system services, select the entry and click on **[Edit Group]**. The Configuration of the selected Group may be edited now. After all changes to the group are initiated, click on **[Apply]** to bring the changes into effect. For certain values it is necessary to disable the group first, change the value and then re-enable the group.

## 4.8.2 Configuration Page "Group"

| Group |                |                                     |                 |              |                    |                  |               |                                     |                                     |
|-------|----------------|-------------------------------------|-----------------|--------------|--------------------|------------------|---------------|-------------------------------------|-------------------------------------|
| Index | DisplayIndex ▲ | Enabled                             | Name            | MediaGW List | HomeMediaGW Index  | Phonebook Prefix | InternCallLen | CF (CallForward) Enabled            | CW (CallWaiting) Enabled            |
| 3     | 1              | <input checked="" type="checkbox"/> | OSV_Branches    | 1,2,3        | [001] MGW_Berlin_1 | 0                | 5             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2     | 2              | <input checked="" type="checkbox"/> | OSV_Headquar... | 1,2          | [001] MGW_Berlin_1 | 0                | 5             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4     | 3              | <input checked="" type="checkbox"/> | Grp_Ulm_OSO     | 3            | [003] MGW_Ulm      | 0                | 3             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

The columns of the configuration page have the following meaning:

### Index

This field contains a unique Index of the group entry. This value is automatically incremented by the WBM.

### DisplayIndex

The Display Index of the group is displayed here. This value is automatically incremented by the WBM.

### Enabled

When activating this element, the selected group entry is enabled at the IWU.

### **Name**

Enter a descriptive name of the group.

### **Gateways (only available for BSIP-IWU / Server-IWU)**

Select the assigned Gateway for this Group via the select box. Hereby the assignment between a specific user to a specific gateway (PBX) is configured.

### **MediaGW List (only configurable for MGW-IWU)**

For each Media Gateway which should be assigned to the current group, an entry of the Media Gateway Index has to be inserted using a comma separated list.

Example: "1,2,4,7". In this example, only the MGW with index 1,2,4 and 7 belong to the belonging group.

**Hint:** The permission for a specific handset to "use" the Bases of a MGW (and therefore gain system functionality at this site/MGW) relies on the assignment of its user entry and its group assignment by using this MediaGW List. If no entry of the MGW index of the users group exists, the users handset will display "No Roaming" at this MGW.

### **HomeMediaGW Index (only available for MGW-IWU)**

Using this dropdown box, a Media Gateway has to be selected where the default SIP register is applied to. The Dect register is also limited to the Home MGW.

### **LDAP Server (only available for BSIP-IWU / Server-IWU)**

This option is needed to assign an LDAP server (configured at page Network/Gateway > Servers) to a group of users. Therefore, the users inside this group get access to the LDAP server phonebook.

For details, refer to [Section 5.14.6, "LDAP information"](#).

### **Phonebook Server (only available for BSIP-IWU / Server-IWU)**

This option is needed to assign a Phonebook server (configured at page Network/Gateway > Servers) to a group of users. Therefore, the users inside this group get access to the Phonebook server phonebook.

### **Phonebook Prefix**

The Phonebook Prefix is prepended to the Dial String if the Telephone Number contains more digits than the InternCallLen. For details, refer to [Section 5.18, "System Phonebook"](#).

### **InternCallLen**

With this setting the maximum number of digits of the calling Party number for internal calls is configured. Calls with a larger number of digits are signalled as external calls at the handset. The default value is "3".

### CF (CallForward) Enabled

This option enables the functionality for newly introduced user specific Call Forward settings. If this option is deselected, the corresponding context menu in the Handset UI is not available.

For details, refer to [Section 5.12, "Call Forward \(CF\)"](#).

### CW (CallWaiting) Enabled

This option enables the functionality for newly introduced user specific CallWaiting settings. If this option is deselected, the corresponding context menu in the Handset UI is not available.

For details, refer to [Section 5.17, "Call Waiting \(CW\)"](#).

| Group                               |                                     |                     |                                     |                        |                       |                        |                                     |                       |
|-------------------------------------|-------------------------------------|---------------------|-------------------------------------|------------------------|-----------------------|------------------------|-------------------------------------|-----------------------|
| CW                                  | VM (VoiceMail) Ena...               | VM Number (Voice... | CC (CallCompletion) Ena...          | CCBS MSN (Busy Call... | CCNRy Msn (NoReply... | CC DeleteAll Msn (C... | CPU (Call Pickup Gr...              | CPU Msn (Call Pick... |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 85382               | <input checked="" type="checkbox"/> | *30                    | *30                   | *31                    | <input type="checkbox"/>            |                       |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 85382               | <input checked="" type="checkbox"/> | *30                    | *30                   | *30                    | <input checked="" type="checkbox"/> | *22                   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 71                  | <input type="checkbox"/>            |                        |                       |                        | <input type="checkbox"/>            |                       |

### VM (VoiceMail) Enabled

This option enables the functionality for newly introduced user specific VoiceMail settings. If this option is deselected, the corresponding context menu in the Handset UI is not available.

For details, refer to [Section 5.8, "Message Waiting Indication \(MWI\)"](#).

### VM Number (VoiceMail)

This option is needed to configure the number of the VoiceMail system which has to be dialed by the IWU if the call should be forwarded to the VM.

For details, refer to [Section 5.8, "Message Waiting Indication \(MWI\)"](#).

### CC (CallCompletion) Enabled

This option enables the functionality for newly introduced user specific CallCompletion (CC) settings. If this option is deselected, the corresponding context menu in the Handset UI is not available.

For details, refer to [Section 5.13, "Call Completion \(CC\)"](#).

### CCBS MSN (Busy CallCompletion)

The option is needed to configure the MSN, which has to be dialed to activate the CCBS feature at the PBX. For details, refer to [Section 5.13, "Call Completion \(CC\)"](#).



**CCNRy Msn (NoReply CallCompletion)**

The option is needed to configure the MSN which has to be dialed to activate the CCNRy feature at the PBX. For details, refer to [Section 5.13, "Call Completion \(CC\)"](#).

**CC DeleteAll Msn (CallCompletion)**

The option is needed to configure the MSN which has to be dialed to deactivate all CC events at the PBX. For details, refer to [Section 5.13, "Call Completion \(CC\)"](#).

**CPU (Call Pickup Group) Enabled**

This option enables the functionality for newly introduced Call Pickup Group feature.

For details, refer to [Section 5.16, "Call Pickup Group \(CPU\)"](#).

**CPU Msn (Call PickupGroup)**

The option is needed to configure the MSN, which has to be dialed to activate the CPU feature at the PBX. For details, refer to [Section 5.16, "Call Pickup Group \(CPU\)"](#).

## 4.9 Users Configuration (IWU)

On the sub configuration pages below "VoIP Users" ("User", "Voip" and "Dect") the individual users and their properties regarding "User" (general user properties), "Voip" (registration via VoIP) and "Dect" can be configured.

**UNIFY** HiPath Cordless IP

Administration Network SIP Media Gateways Group **User** Dect Debugging Status System Ctl

**User-User**

User Voip Dect

| Index | Enabled                             | Msn   | DisplayName | Comment           | Language | Groups               |
|-------|-------------------------------------|-------|-------------|-------------------|----------|----------------------|
| 1     | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1          | Deutsch  | [003] OSV_Branches   |
| 2     | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2          | Deutsch  | [003] OSV_Branches   |
| 3     | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3          | Deutsch  | [003] OSV_Branches   |
| 4     | <input checked="" type="checkbox"/> | 00104 | 104         | Support #1        | Deutsch  | [003] OSV_Branches   |
| 5     | <input checked="" type="checkbox"/> | 00105 | 105         | Support #2        | Deutsch  | [003] OSV_Branches   |
| 6     | <input checked="" type="checkbox"/> | 00106 | 106         | Support #3        | Deutsch  | [003] OSV_Branches   |
| 7     | <input checked="" type="checkbox"/> | 00107 | 107         | Support #4        | Deutsch  | [003] OSV_Branches   |
| 8     | <input checked="" type="checkbox"/> | 00108 | 108         | Support #5        | Deutsch  | [003] OSV_Branches   |
| 10    | <input checked="" type="checkbox"/> | 00109 | 109         | Administration #1 | Deutsch  | [003] OSV_Branches   |
| 11    | <input checked="" type="checkbox"/> | 00110 | 110         | Administration #2 | Deutsch  | [003] OSV_Branches   |
| 12    | <input checked="" type="checkbox"/> | 00111 | 111         | Administration #3 | Deutsch  | [003] OSV_Branches   |
| 13    | <input checked="" type="checkbox"/> | 34511 | 34511       | 34511             | Deutsch  | [002] OSV_Headqua... |
| 14    | <input checked="" type="checkbox"/> | 34512 | 34512       | 34512             | Deutsch  | [002] OSV_Headqua... |

Add User Delete User Edit User Register Multi Register Unregister Testcall Hangup

Search Scope Column: MSN Search String: 0 Search Max Lines: 50 Step Size: 50

Previous Next

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Logout Help Info Cancel Apply

### 4.9.1 General user configuration

#### 4.9.1.1 User Management Options

**Hint:** Adding, editing and deleting of user entries is supported during running system services.

The buttons in the lower part of the page have the following functions:

### [Add User]

To add a new user entry (even during running system services), click on **[Add User]**.

A new entry with default values is appended. The values have to be modified according to your system needs.

The new entry line is either inserted above the selected user or - if no user entry is selected - inserted at the end of the list.

If a group with name "default" is available and enabled, a new user entry is automatically assigned to group "default".

### [Delete User]

A selected user entry may be deleted by clicking **[Delete User]**, even during running system services if the user has no active call established.

**Hint:** The functionality [Delete user] does not remove the DECT registration of the handset. It only removes the user entry from the WBM configuration. Therefore if you delete an user entry by WBM, the registration is already stored at the handset. Therefore the handset may not be registered at the same ARI anymore. To overcome this situation, restore a configuration temporarily and remove the handset by using the [Unregister] button or register the handset at another Base Station with a different ARI.

### [Edit User]

To enable the configuration of User settings during running system services, there is a special functionality ([Edit user]) available. To modify an existing user entry, select a user row and click on [Edit user] to change the values.

Selection of user entry prior to [Edit User]

| User-User      |                                     |       |             |          |          |                    |
|----------------|-------------------------------------|-------|-------------|----------|----------|--------------------|
| User Voip Dect |                                     |       |             |          |          |                    |
| Index          | Enabled                             | Msn   | DisplayName | Comment  | Language | Groups             |
| 1              | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1 | Deutsch  | [003] OSV_Branches |
| 2              | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2 | Deutsch  | [003] OSV_Branches |
| 3              | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3 | Deutsch  | [003] OSV_Branches |

Selection of user entry after [Edit User]

| User-User      |                                     |       |             |          |          |                    |
|----------------|-------------------------------------|-------|-------------|----------|----------|--------------------|
| User Voip Dect |                                     |       |             |          |          |                    |
| Index          | Enabled                             | Msn   | DisplayName | Comment  | Language | Groups             |
| 1              | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1 | Deutsch  | [003] OSV_Branches |
| 2              | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2 | Deutsch  | [003] OSV_Branches |
| 3              | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3 | Deutsch  | [003] OSV_Branches |

The user is locked until you press [Apply] to submit or press [Cancel] to discard the changes.

### [Register]

The DECT registration process for a selected User is started by clicking on button [Register].

The registration mode will be activated for a certain period of time. At the handset of the User, the registration has to be started and the PIN number (as configured in [Section 4.10.5, "Configuration Page "Dect - ARI"'"](#)) has to be entered when requested.

**Notes:** The handset may be registered exclusively at the users Home MGW due to security and performance issues. Registering the handset at another MGW will not be functional.

Restart the registration process if you did not succeed registering your handset in the provided period of time. The time is limited to avoid foreign handsets registering.

### [Multi register]

The Multi register process eases the process of creating and registering a large amount of users.

To start the Multi Register process, at least one user entry (with start values) has to be configured manually. This entry serves as a template for the creation of further users during the Multi register process.

Select an existing, enabled User entry (this serves as the template user).

After clicking on [Multi register] a handset may be registered directly. After successful registering of the handset, a user entry with the IPUI of the handset is automatically created. The user values are automatically incremented from the last created user.

A new handset may be directly registered afterwards. This process may be repeated several times.

The Multi Register process may be stopped by using the [CANCEL] button.

Detail regarding the Multi register process may be found in [Section 6.3, "Multi-Register \(Bulk Registering\) of Handsets"](#).

### Unregister

To remove the DECT registration of the handset for the selected User (Deregistering the handset), the button [Unregister] has to be activated. Please wait until the handset registration is removed.

### TestCall

This option performs a test call to the handset. The handset of the selected User must start ringing (if already registered). The call may be accepted at the handset (but no speech connection will be established) or the test call may be terminated by clicking on button [OK].

### Hangup

An active Test Call may be terminated by clicking on using this button.

## 4.9.1.2 User Search Options

Due to the high amount of users which may be configured at a MGW-IWU (up to 20000), it is neither technically possible nor practically recommended (due to long load times) to display a table inside the WBM with e.g. 20000 rows.

Therefore, for display issues at the WBM, the whole table with all entries is separated into several sub-tables with a configurable number of lines per sub-table which will facilitate to step through all entries on a sub-table base.

To minimize the time for finding a specific user entry, search functionality is part of the new concept. Only an exact match search is available. The search parameters are not stored and therefore are lost after a logout of WBM or restart / reboot of MGW-IWU.

### Search functionality

Using the Search functionality, a specific user entry may be located inside the table by selecting the Search Scope Column (the column in which the search should be applied to) and the Search String which should be searched for.

If a search was successful, the first matched entry is displayed at top of the table. If a search was unsuccessful, a message box will inform about this condition.

If a user is locked by an [Edit user] lock, switching between group of rows using [previous] and [Next] is not supported.



Search Scope Column: MSN Search String: 0 Search Max Lines: 50 Step Size: 50

Previous Next

The objects in the frame have the following meaning:

### **Search Scope Column**

This Dropdown contains all fields (columns) which may be used as the search scope. The search scope is limited to this column.

### **Search String**

This textbox contains the string which should be searched. Only a full text match is supported.

### **Search**

The search is started using this button.

### **Max Lines**

Determines, how much lines should be displayed on one page at maximum. Hint: This limit also applies for both types of tables - the standard table (displaying rows not limited to a search) and the search result table.

### **Step Size**

Determines the offset of lines which should be displayed after a [Previous] or [Next] table display is established. If set equal to "Max Lines", the next or previous table will only include other user entries. If set to a values less than "Max Lines", some user entries of the old table are repeated ("Max Lines" - "Step Size") and new entries are displayed ("Step Size").

### **Button Previous**

Displays the next group of rows with an offset of "Step Size".

### **Button Next**

Displays the previous group of rows with an offset of "Step Size".

### **Sort functionality**

If a specific user entry was selected while a sort was applied, the selected row will be the first entry in the sorted list.

If no user entry was selected while a sort was applied, the row containing the first sort criteria will be the first entry in the sorted list

If possible, the search will be maintained if switching between subpages.

**Hint:** Combining both Sort and Search functionality is possible

## **4.9.2 Configuration Page "User - User"**

On this page the VoIP parameters for the Users are configured.

| User-User      |                                     |       |             |          |          |                    |
|----------------|-------------------------------------|-------|-------------|----------|----------|--------------------|
| User Voip Dect |                                     |       |             |          |          |                    |
| Index          | Enabled                             | Msn   | DisplayName | Comment  | Language | Groups             |
| 1              | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1 | Deutsch  | [003] OSV_Branches |
| 2              | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2 | Deutsch  | [003] OSV_Branches |
| 3              | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3 | Deutsch  | [003] OSV_Branches |

The columns of the configuration table have the following meaning:

### Index

Current number of the User entry. This value is automatically incremented by the WBM.

### Enabled

When activating this element, the selected User is enabled at the IWU.

### MSN

The "MSN" needn't to correspond to the Subscriber Number of the User at the PBX (usually the "User Name" in the PBX). The MSN is internally used by the IWU to identify the users internally. For uniqueness, the length of the MSN has to be the same for all users. Different length MSN's may result in unavailability of the user for incoming calls. To avoid different length MSN's, you may prefix the MSN with "0" digits to achieve the assigned fixed length.

The handsets will display this value in its idle display. The activation of the DisplayName at the handset is initiated by different events.

For details refer to [Section 5.23.2, "Handling of Idle Display"](#).

The following characters are treated as valid characters for the "DisplayName".

" " (Blank), "#", "\$", "&", "(", ")", "\*", "+", ",", "-", ".", "/", "0"-"9", ":", ";", "<", "=", ">", "?", "@", "A"-"Z", "\_", "a"-"z",

Since the length of the display name in the Idle display of the handset is limited to 10 characters, larger display names will cause a validation warning.

### Comment

The field "Comment" serves only as a reference for the system administrator of the IWU. It may contain for example the type of the Handset, the full name of the belonging user or the name of the department if the Handset is not associated directly to a person.

This field has no influence on the functionality of the WBM.

### Language

The language used for display messages of the handset is selected here.

## Groups

Choose a Group (and therefore an associated VoIP gateway) from the dropdown box to which the user is associated to.

## 4.9.3 Configuration Page "User - VoIP"

On this page the parameters for the SIP registration of the User at the PBX and the assignment of the subscriber numbers can be configured.

| User-Voip |                                     |       |             |          |          |          |          |                          |                          |
|-----------|-------------------------------------|-------|-------------|----------|----------|----------|----------|--------------------------|--------------------------|
| User      | Voip                                | Dect  |             |          |          |          |          |                          |                          |
| Index     | Enabled                             | Msn   | DisplayName | Comment  | UserName | AuthName | Password | G729                     | SC (Sile...              |
| 1         | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1 | 101      | 101      | *****    | <input type="checkbox"/> | <input type="checkbox"/> |
| 2         | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2 | 102      | 102      | *****    | <input type="checkbox"/> | <input type="checkbox"/> |
| 3         | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3 | 103      | 103      | *****    | <input type="checkbox"/> | <input type="checkbox"/> |

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Enabled", "Msn", "DisplayName" and "Comment" are repeated on all sub pages. A description of these parameters can be found in the previous [Section 4.9.2, "Configuration Page "User - User"'](#).

Details regarding the correlation between the values used in the PBX configuration and in WBM may be found in the corresponding chapter in the Service Manual.

### UserName

Assign a User Name which is used for the registration at the PBX. This may be a name or a number depending on the PBX or the provider. For the supported gateways only numbers are allowed.

### AuthName

The authentication Name is necessary if a PBX requires authentication of the user (Digest authentication). In case of digest authentication, the AuthName and Password are sent to the PBX as part of the registration process.

### Password

Here the password is configured which is required (together with the "AuthName") if the PBX requires digest authentication.

The password entries are masked out by using five asterisk ("\*") characters. Only at time of editing a new password entry (or overwrite the existing one), the characters are displayed. A maximum of 63 characters consisting of the following digits are supported:

" ", a-z, A-Z, 0-9, "!", "\$", "%", "&", "/", "(", ")", "=", "?", "{", "}", "\*", "+", "~", "#", "-", "\_", ".", ":", ";", "<", ">", "|".



## G729

The usage of low bandwidth codec G729 is intended for devices which are connected to the PBX via low bandwidth lines (DSL) e.g. for home office users using a SIP phone (e.g. OpenStage). Therefore bandwidth is an issue for such scenarios.

Inside the LAN efficient bandwidth should not be an issue; therefore codec G711 should generally be used. In this scenario there should be no need to configure G729 in the codec list of the PBXs "Gateway - Codec" configuration page. Activating the codec G729 at the handset changes the codec list from G711A, G711U to G729ab; G711A, G711U.

Details regarding G.729 may be found in [Section 5.5, "Codec G.729"](#).

## SC (Silence Compression)

Using this option determines, if the silence compression feature of codec G.729 should be enabled (G.729ab) or disabled (G.729a).

Details regarding Silence Compression for G.729 may be found in [Section 5.5, "Codec G.729"](#).

## 4.9.4 Configuration Page "User - Dect"

This page contains the user configuration for DECT functions.

| User Voip Dect |                                     |       |             |          |             |            |                 |
|----------------|-------------------------------------|-------|-------------|----------|-------------|------------|-----------------|
| Index          | Enabled                             | Msn   | DisplayName | Comment  | HandsetType | Ipu        | Park registered |
| 1              | <input checked="" type="checkbox"/> | 00101 | 101         | Sales #1 | Sen         | 00A7C043EB | 101B2FC400      |
| 2              | <input checked="" type="checkbox"/> | 00102 | 102         | Sales #2 | Sen         | 00A4503F03 | 101B2FC400      |
| 3              | <input checked="" type="checkbox"/> | 00103 | 103         | Sales #3 | Sen         | 00A7C30935 | 101B2FC400      |

**Note:** The columns "Index", "Enabled", "Msn", "DisplayName" and "Comment" are repeated on all sub pages. A description of these parameters can be found in [Section 4.9.2, "Configuration Page "User - User" "](#).

### HandsetType

For the supported handsets (S3, SL3, S4, SL4, M2 and M3) this option has to be configured to "Unify" (which is the default) which enables the Unify PN-CAP signaling mode. Only in "Unify" mode, the full functionality of handsets is available.

For other GAP compatible handsets, "Gap" has to be selected. Handsets registered with this option have a very limited system functionality.

**Hint:** The HandsetType is set at time of registering the handset. Therefore it has to be already configured correctly before the handset is registered.

### Ipui

The IPUI (International Portable User Identity) of the Handset of the User is automatically recorded during the registration process.

For details regarding the uniqueness of a PMID (which is built by the IWU from the IPUI) refer to [Section 5.26, “Validation for Uniqueness of PMID and TPUI”](#).

## 4.10 DECT Configuration (IWU)

On the main configuration page "Dect" the Base Stations are configured. This page contains the sub configuration pages “Base”, "Radio", "Sync", "ARI", “Call”, "About" and “Debug”.

UNIFY

HiPath Cordless IP

Administration

Network

SIP

Media Gateways

Group

User

Dect

Debugging

Status

System

Clc

Dect-Base

Base

Radio

Sync

Ari

Call

About

Debug

| Index | Module ... | Enabled                             | Name              | IpAddr         | Module | Mac Addr          |
|-------|------------|-------------------------------------|-------------------|----------------|--------|-------------------|
| 2     | 009        | <input checked="" type="checkbox"/> | CL_1-2            | 192.168.100.81 |        | fe-02-c0-a8-64-51 |
| 5     | 001        | <input checked="" type="checkbox"/> | Bslp 2/001        | 192.168.222.1  |        | 00-1a-e8-21-c4-f2 |
| 6     | 002        | <input checked="" type="checkbox"/> | Bslp 2/002        | 192.168.222.2  |        | 00-1a-e8-21-c5-2e |
| 7     | 003        | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | 192.168.100.81 |        | ff-00-c0-a8-64-51 |

Delete Module

Edit Module

Replace Module

Scan

Sync

Fw Download

Media Gateways:

[002] MGW\_Berlin\_2

No new modules on scan:

☐

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Logout

Help

Info

Cancel

Apply

The configuration page "Dect" is divided into two parts.

In the table view at the top, all BSIP1 modules specific to a MGW base are configured.

At the bottom of the page, the DECT Management is accomplished.

## 4.10.1 General DECT Configuration

At the bottom of the page, general DECT management of DECT modules as well as the selection of a specific MGW is accomplished.

The screenshot displays the UNIFY HiPath Cordless IP configuration interface. The top navigation bar includes tabs for Administration, Network, SIP, Media Gateways, Group, User, Dect, Debugging, Status, System, and Clc. The 'Dect-Base' section is active, showing a table of DECT modules. The table has the following data:

| Index | Module | Enabled                             | Name              | IpAddr         | Module | Mac Addr          |
|-------|--------|-------------------------------------|-------------------|----------------|--------|-------------------|
| 2     | 009    | <input checked="" type="checkbox"/> | CL_1-2            | 192.168.100.81 |        | fe-02-c0-a8-64-51 |
| 5     | 001    | <input checked="" type="checkbox"/> | Bslp 2/001        | 192.168.222.1  |        | 00-1a-e8-21-c4-f2 |
| 6     | 002    | <input checked="" type="checkbox"/> | Bslp 2/002        | 192.168.222.2  |        | 00-1a-e8-21-c5-2e |
| 7     | 003    | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | 192.168.100.81 |        | ff-00-c0-a8-64-51 |

Below the table, there are buttons for 'Delete Module', 'Edit Module', 'Replace Module', 'Scan', 'Sync', and 'Fw Download'. At the bottom, there is a 'Media Gateways' dropdown menu with '[002] MGW\_Berlin\_2' selected, and a checkbox for 'No new modules on scan' which is currently unchecked. The footer of the interface shows 'ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2' and buttons for 'Logout', 'Help', 'Info', 'Cancel', and 'Apply'.

### 4.10.1.1 Adding, Deleting and Scanning

#### [Delete Module]

By selecting a base station and clicking on [Delete Module], the selected Base Station entry is deleted.

#### [Edit Module]

This button is needed to edit the configuration settings of a BSIP during running system services.

For details, refer to [Section 5.20, "Dynamic BSIP Changes"](#).

### **[Replace Module]**

This button is needed to replace a BSIP with another one during running system services.

For details, refer to [Section 5.20, "Dynamic BSIP Changes"](#).

### **[Scan]**

This functionality (Scan) initiates a Seek or Scan of the network for all attached BSIPs using an IP broadcast mechanism.

All BSIP-Only are answering and sending their current configuration information (mainly its own IP address, the IP address and listen port of the IWU, its name and VPN configuration) to the IWU where it is displayed. For newly scanned BSIPs to which no configuration (according the MAC address) is assigned, a new entry is automatically added.

**Hint:** The values stored in the configuration of the WBM are overwritten with those found by the SCAN of the corresponding BSIP. This fact has to be considered especially for the configuration of the name of the BSIP. First Scan the BSIP, change the name and afterward initiate a Sync.

Depending on the VLAN configuration of IP Infrastructure and IP Dect network, the BSIP-Only are only found if they are attached to the appropriate network segment. For details refer to option "VLAN Id" of the Voip (Infrastructure network) at [Section 4.5.1, "General Network Configuration"](#) and of the DECT network at [Section 4.7.1.2, "Media Gateways > Dect Network \(BSIP-IWU and Server-IWU\)"](#).

**Hint:** If communication specific options of a BSIP are changed at the IWU, a [Sync] process has to be established. Otherwise the formerly active IP address of the BSIP will be still displayed.

If newly added BSIP are not found using [SCAN], repeat the [SCAN] process with stopped system services. Otherwise take note of the hints described at chapter [Section 7.1.1, "BSIP-Only Not Found Using "Scan"'](#).

For BSIP-IWU, a maximum of 12 BSIP are displayed, where a max. no. of 10 may be enabled. For Server-IWU and MGW-IWU, a max. no. of 120 BSIP may be scanned; the max. no. of BSIP which may be enabled depends on the license of the system.

### **[Sync]**

This functionality (Sync) initiates the transmission of the relevant configuration data (mainly its own IP address, the IP address and listen port of the IWU, its name and VPN configuration) from the IWU to all enabled BSIP-Only.

### **[Fw Download]**

This button is needed to update the firmware of one or several BSIP during running system services.

For details, refer to [Section 5.20, "Dynamic BSIP Changes"](#).

## Media Gateways

Using this dropdown, a specific Media Gateway has to be selected. All information on these pages is then related to the assigned modules of the selected MGW.

### No new modules on scan (only in advanced configuration mode)

This new function is mainly intended for testing purposes in a lab environment with a lot of different Base stations for different HPCIP systems. Normally, all modules are scanned and each entry is added at the DECT modules table. Activating this option, the [SCAN] functionality doesn't add new entries of Base station into the table.

## 4.10.2 Configuration Page "Dect - Base"

On this page the properties of the Base Station connections are configured.

| Dect-Base |            |                                     |                   |                |        |                   |
|-----------|------------|-------------------------------------|-------------------|----------------|--------|-------------------|
| Base      | Radio      | Sync                                | Ari               | Call           | About  | Debug             |
| Index     | Module ... | Enabled                             | Name              | IpAddr         | Module | Mac Addr          |
| 2         | 009        | <input checked="" type="checkbox"/> | CL_1-2            | 192.168.100.81 |        | fe-02-c0-a8-64-51 |
| 5         | 001        | <input checked="" type="checkbox"/> | Bslp 2/001        | 192.168.222.1  |        | 00-1a-e8-21-c4-f2 |
| 6         | 002        | <input checked="" type="checkbox"/> | Bslp 2/002        | 192.168.222.2  |        | 00-1a-e8-21-c5-2e |
| 7         | 003        | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | 192.168.100.81 |        | ff-00-c0-a8-64-51 |

The columns of the configuration table have the following meaning:

### Index

This field contains the absolute resp. global index number of the DECT module (BSIP). This number identifies a BSIP on a specific IWU globally and independent from the assigned MGW. The number is assigned by the IWU and cannot be changed.

### Module Number MGW

This field contains the relative index number of the DECT module (BSIP) at a specific MGW. The number may be changed manually.

This uniqueness of this number inside a Media Gateway is also considered for disabled modules and has to be unique inside the range of 1 ... 120. To avoid the uniqueness, the special value "0" may be configured for disabled modules several times.

### Enabled

By activating this option this Base Station is enabled for the assigned MGW.

**Hints:**

- The BSIP-IWU displays a maximum of 12 modules, whereby maximal 10 modules may be enabled.
- The Server-IWU displays a maximum of 100 modules, whereby maximal 60 modules may be enabled.
- The MGW-IWU displays a maximum of 120 modules per MGW, whereby a maximum of 120 modules may be enabled. In case of using several MGW's inside a site, the number of DECT modules will be decreased by each Crosslink and each Virtual base configured by the IWU.

**Name**

A descriptive name for the Base Station can be configured here (e.g. physical location like building, Floor, Room no., where the BSIP is installed later). This name serves only for internal configuration and identification purposes.

**NumOfChannel (only in WBM Standard mode)**

Number of voice channels of the Base Station. The maximum value is "10". If less than "10" parallel voice channels shall be supported, a smaller value may be configured here. The default value is "10".

**IpAddr Module**

The IP address of choice for the Base Station in the IP-DECT network is entered here. Please take care that the "IpAddr Module" address has to be unique and is in the same subnet as the IP address of the InterWorking Unit ("Server Ip").

Please note that the IP address of the Base Station is transmitted to the Base Station after a [SYNC] (see [Section 4.10, "DECT Configuration \(IWU\)"](#)).

**MAC Addr**

In this field the ethernet MAC address of the Base Station is displayed as it is found during a "Scan". The values cannot be changed.

### **4.10.3 Configuration Page "Dect - Radio" (Advanced mode)**

This page is only displayed in Unify Admin mode at the WBM.

| Dect-Radio                           |                   |                                     |                   |                          |                          |             |
|--------------------------------------|-------------------|-------------------------------------|-------------------|--------------------------|--------------------------|-------------|
| Base Radio Sync Ari Call About Debug |                   |                                     |                   |                          |                          |             |
| Index                                | Module Number MGW | Enabled                             | Name              | Diversity                | Ctr6                     | Frequency   |
| 2                                    | 009               | <input checked="" type="checkbox"/> | CL_1-2            | <input type="checkbox"/> | <input type="checkbox"/> | 1.88 - 1.90 |
| 5                                    | 001               | <input checked="" type="checkbox"/> | Bslp 2/001        | <input type="checkbox"/> | <input type="checkbox"/> | 1.88 - 1.90 |
| 6                                    | 002               | <input checked="" type="checkbox"/> | Bslp 2/002        | <input type="checkbox"/> | <input type="checkbox"/> | 1.88 - 1.90 |
| 7                                    | 003               | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | <input type="checkbox"/> | <input type="checkbox"/> | 1.88 - 1.90 |

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Module Number MGW", "Enabled" and "Name" are repeated on all sub pages. A description of these values may be found in [Section 4.10.2, "Configuration Page "Dect - Base""](#))

### Diversity

If this option is enabled, the antenna diversity feature for the selected BSIP1 is activated. The default value is disabled.

### Ctr6

This option is exclusively needed for specific tests according CTR6. After activation of this feature, specified test cases may be initiated.

This option must not be activated during normal productivity operation of the HPCIP system.

### Frequency

Selects the frequency of the DECT module the BSIP1 is working with.

Default: "1.88 - 1.90" for European countries.

Other Frequencies which are available:

"1.91 - 1.92 BRAZ S" for Brazil

"1.91 - 1.93 LAM S" for Latin America countries (where released)).

**Hint:** The selection of frequencies may be limited to standard EUR frequencies ("1.88 - 1.90") depending on the BSIP hardware used.

Starting with Hardware Revision "13" (Q-number) of BSIP1, the Deviation registers 3 and 4 of BSIP1 are adjusted for LAM frequencies as part of the production process. In former hardware versions, no adjustment was implemented. Therefore, no LAM Dect frequencies were supported and functional.

Starting with HPCIP V1R4.5.0, the IWU has to ensure that only BSIP1 with hardware version 13 and higher may be initialized using the BRAZIL frequencies.

The HPCIP scans the Hardware revision of each activated BSIP and checks, if Dect frequency "1.91 - 1.92 BRAZ S" is selected. If a hardware version smaller than 13 was detected for this Dect module, a validation error will be generated.

## 4.10.4 Configuration Page "Dect - Sync"

On this configuration page the synchronization of the Base Stations as well as the Virtual Bases are configured.

| Dect-Sync                            |                   |                                     |                   |                  |                         |           |           |
|--------------------------------------|-------------------|-------------------------------------|-------------------|------------------|-------------------------|-----------|-----------|
| Base Radio Sync Ari Call About Debug |                   |                                     |                   |                  |                         |           |           |
| Index                                | Module Number MGW | Enabled                             | Name              | Sync             | ParkSync1               | ParkSync2 | ParkSync3 |
| 2                                    | 009               | <input checked="" type="checkbox"/> | CL_1-2            | n/a              | n/a                     | n/a       | n/a       |
| 5                                    | 001               | <input checked="" type="checkbox"/> | Bslp 2/001        | air, 1588 master | [003] CL_1-2/Bslp 1/002 | n/a       | n/a       |
| 6                                    | 002               | <input checked="" type="checkbox"/> | Bslp 2/002        | 1588 slave       | [001] Bslp 2/001        | n/a       | n/a       |
| 7                                    | 003               | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | ext. slave       | [009] CL_1-2            | n/a       | n/a       |

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Module Number MGW", "Enabled" and "Name" are repeated on all sub pages. A description of these values can be found in [Section 4.10.2, "Configuration Page "Dect - Base""](#).

### "Sync" (Default value: "air")

Here you can configure the type of synchronization for the different types of modules (physical Base Station (BSIP1), CrossLink and VirtualBase) with a dropdown box. The type of module is displayed at page Dect > Base > About > Type.

### Module of type "Bslp"

- "no": No synchronization of the Base Station. This may be configured if no "seamless handover" is needed or if this BSIP serves as the "Sync Master" for air synchronization which is the topmost synchronization source.
- "air": Default Synchronization of activated Base Stations over air, i.e. directly via DECT, but with additional Status information by the IWU.

This method occupies – depending on the Beacon configuration – one or more available timeslots (which cannot be used for telephony), but it allows the seamless handover between the radio areas of synchronized Base Stations.

The Base Station to be synchronized at must be an enabled Base Station at the IWU.

- "air ext": Non-Default Synchronization of Base Stations over air, i.e. directly via DECT, but without additional Status information by the IWU.



This method occupies – depending on the Beacon configuration – one or more available timeslots (which cannot be used for telephony), but it allows the seamless handover between the radio areas of synchronized active Base Stations.

The Base Station to be synchronized to must be a Base Station configured at the IWU, but it need NOT be activated.

Alternatively a Base Station may also be synchronized to another Base Station that is NOT configured at the IWU (e.g. Base Stations of other manufacturers).

If the PARK of the external Base Station is known, it may be entered as "PARK Default" of the Base Station to be synchronized on the page "Ari". For the external Base Station a "Dummy" module has to be configured.

Please notice that this may result in problems regarding the so called "Beacon Announcement" which may lead to frequent losses of synchronization.

To minimize this problem an (internal) Base Station may be used as synchronization Base Station. Therefore you have to configure "0" channels (page "DECT – Device", entry "NumOfChannel"). No voice connections can be established via this Base Station.

"1588 master": Configures the Base station to use Ethernet Synchronization over Ethernet (acc IEEE 1588) as Sync master (Clock master).

Only one BSIP may be configured as "1588 master".

A BSIP-IWU may not be configured as "1588 master".

- "1588 slave": Configures the Base station to use Ethernet Synchronization over Ethernet (acc IEEE 1588) as Sync Slave (Clock Slave).
- "air, 1588 master": This type of module combines an "air slave" with a "1588 sync Master". It is needed for inter-MGW synchronization. Using this module type, one base on a "MGW Slave" may act at this MGW as a 1588 master and additionally retrieve the sync from the "MGW Master" to assure all BSIP at MGW Slave are running synchronously to those of the ""MGW Master" to ensure DECT handover capability.

#### **Module of type "CrossLinkSrv" or "CrossLinkCli"**

- "n/a": A synchronization method is not applicable.
- "ext. master": This Crosslink side (Source side) serves as the destination for a virtual base. This correlation is only virtual, since no physical correlation is made directly. Instead, this crosslink side references to a physical base by means of "ParkSync x".

If the value is changed from "n/a" to "ext. master", the IWU will automatically create a module of type "Virtual Base" on the MGW of the crosslink's opposite side (Destination side). This module will be automatically configured by the IWU with a sync setting of "ext. slave" and a ParkSync which refers to the Index of the Crosslink to the other MGW.

#### **Module of type "Virt. base" (Virtual Base)**

- "n/a": A synchronization method is not applicable.
- "ext. slave": See above; This module will be automatically configured by the IWU with a sync setting of "ext. slave" and a ParkSync which refers to the Index of the Crosslink to the other MGW after the "ext. master" sync has been configured on the module of type "CrossLinkSrv" or "CrossLinkCli". The other modules on this MGW may use this virtual module as the sync source ("ParkSync").

#### **"ParkSync" (3 columns)**

You can choose a module from the select box on which the selected Base Station shall synchronize to (synchronization master). The Base Station will first try to synchronize to the Base Station in the leftmost "ParkSync" column. If this is not successful or if the synchronization gets lost while in operation, the Base Station will try to synchronize to the Base Station in the middle "ParkSync" column and finally to the rightmost column.

Only when the synchronization to all 3 entered Base Stations is not successful, a synchronized operation and therefore a seamless handover will no longer be possible.

For 1588 synchronization, only ParkSync1 is applicable.

Normally synchronization over air should be reduced to only one ParkSync (ParkSync1). If further BSIP are configured as ParkSync2 and ParkSync3 which have a low RSSI level of the received sync signal, this may lead to counterproductive system behavior. In no case a fallback synchronization (ParkSync2 or ParkSync3) to a BSIP which is physically located behind a BSIP which is already configured as ParkSync1.

Please keep in mind, that the current BSIP may be selected in the dropdown menu. Since this would lead to a sync recursion, the local BSIP may not be configured as its own ParkSync.

**Important note:** If a BSIP which is configured as Air Sync Slave loses synchronization, it tries to resynchronize to its configured synchronization Master Base Station (ParkSync). This process can not start until the last call at the Sync Slave BSIP is released and no other calls are active.

When referencing to Dect modules in columns "Park Sync x" (x = 1 ... 3) the Dect modules are referenced by the local index of the MGW (Module Number MGW) the Dect Module is assigned to.

Further information regarding the Synchronization may be found in the following chapters:

Synchronization over air:

[Section 1.4, "Synchronization Over Air Concept"](#)

Synchronization over Ethernet:

[Section 1.5, "Synchronization via Ethernet \(acc. IEEE 1588\)"](#)

## 4.10.5 Configuration Page "Dect - ARI"

On this configuration page the access rights (ARI - Access Right Identity) for the individual Base Stations as seen from the Handsets are configured.

| Dect-Ari                                    |                   |                                     |                   |                                     |                   |                        |     |
|---|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|------------------------|-----|
| Base Radio Sync <b>ARI</b> Call About Debug |                   |                                     |                   |                                     |                   |                        |     |
| Index                                       | Module Number MGW | Enabled                             | Name              | Cipher                              | Segment           | Segment Relative Index | Rpn |
| 2   | 009               | <input checked="" type="checkbox"/> | CL_1-2            | <input checked="" type="checkbox"/> |                   |                        | 0   |
| 5   | 001               | <input checked="" type="checkbox"/> | Bslp 2/001        | <input checked="" type="checkbox"/> | 2 - RPN 16 ... 31 | 1                      | 16  |
| 6   | 002               | <input checked="" type="checkbox"/> | Bslp 2/002        | <input checked="" type="checkbox"/> | 2 - RPN 16 ... 31 | 2                      | 17  |
| 7   | 003               | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | <input checked="" type="checkbox"/> |                   |                        | 0   |

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Module Number MGW", "Enabled" and "Name" are repeated on all sub pages. A description of these can be found in [Section 4.10.2, "Configuration Page "Dect - Base""](#).)

### Cipher (only available in Unify Admin mode)

By activating the ciphering feature, the communication between the handset and the configured base station is encrypted.

The setting is automatically applied to all base stations to the same value.

The default value is enabled.

**Hint:** The ciphering method uses the "System Pin" to cipher the DECT speech connections of the handsets on air. The "System Pin" is transmitted to the handset during the registration process.

### Segment

Using this dropdown box, the Dect module has to be assigned to a specific location segment inside the MGW. The number of location segments is defined using the dropdown box at page Media Gateways > Dect > "Segments/RPNs/LAL". Depending on the selected "Segments/RPNs/LAL", the dropdown box contains different entries.

Example for "Segments/RPNs/LAL" = "16 - 16 RPNs/Loc.Area - LAL=35".

### Segment Relative Index

Using this dropdown box, the Dect module has to be assigned a relative Index related to the selected location segment inside the MGW. The number of Relative Index entries is defined by the dropdown box at page Media Gateways > Dect > "Segments/RPNs/LAL". Depending on the selected "Segments/RPNs/LAL", the dropdown box contains different entries.

Example for "Segments/RPNs/LAL" = "16 - 16 RPNs/Loc.Area - LAL=35".

The combination of "Segment" and " Segment Relative Index " will be calculated by the WBM to the resulting RPN.

### RPN

Since the configuration of the RPN is implicitly accomplished by assigning the Segment Relative Index to a specific Segment (see above), this information cannot be changed and serves for information purposes only.

## 4.10.6 Configuration Page "Dect - Call" (Advanced mode)

This page is only displayed in Unify Admin mode at the WBM

| Dect-Call |                   |                                     |                   |              |        |       |
|-----------|-------------------|-------------------------------------|-------------------|--------------|--------|-------|
| Base      | Radio             | Sync                                | Ari               | Call         | About  | Debug |
| Index     | Module Number MGW | Enabled                             | Name              | NumOfChannel | Jitter |       |
| 2         | 009               | <input checked="" type="checkbox"/> | CL_1-2            | 0            | 0      |       |
| 5         | 001               | <input checked="" type="checkbox"/> | Bslp 2/001        | 10           | 8      |       |
| 6         | 002               | <input checked="" type="checkbox"/> | Bslp 2/002        | 10           | 8      |       |
| 7         | 003               | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/002 | 0            | 0      |       |

The columns of the configuration page have the following meaning:

- Note: The columns "Index", "Module Number MGW", "Enabled" and "Name" are repeated on all sub pages. A description of these can be found in [Section 4.10.2, "Configuration Page "Dect - Base" .\)](#)

### NumOfChannel (only in WBM mode Admin)

In UnifyAdmin mode the configuration for number of channels is configured at this sub-page. In Normal mode the configuration may be found at configuration page "Dect - Base". The standard value is 10.

For MGW setups, the max. number of dect channels has to be reduces (refer to [Section 2.12.2.3, "Max. no. of BSIP per MGW"](#)).

## Jitter

In UnifyAdmin mode the jitter buffers for the Dect Module may be configured here. Don't change the value from its default.

## 4.10.7 Configuration Page "Dect - About"

This configuration page is only for information purposes on the created DECT configuration.

Click on **[Scan]** to update all values.

| Dect-About |        |                                     |                    |             |              |                      |       |           |                |                |                 |          |                   |
|------------|--------|-------------------------------------|--------------------|-------------|--------------|----------------------|-------|-----------|----------------|----------------|-----------------|----------|-------------------|
| Base       |        | Radio                               | Sync               | Ari         | Call         | About                | Debug |           |                |                |                 |          |                   |
| Index      | Mod... | Enabled                             | Name               | Type        | Basestati... | Version              | HwRev | PartInfo1 | PartInfo2      | IpAddr Module  | IpAddr Server   | Serve... | Mac Addr          |
| 2          | 009    | <input checked="" type="checkbox"/> | CL_1-2             | CrossLin... | 000000000    |                      | 0     | n/a       | n/a            | 192.168.100.81 | 192.168.100.82  | 0        | fe-02-c0-a8-64-51 |
| 5          | 001    | <input checked="" type="checkbox"/> | Bslp 2/001         | Bslp        | 759239403    | V4.0.13 Apr 10 20... | 8     | V4.0.10   | V4.0.13 Act... | 192.168.222.1  | 192.168.222.254 | 10500    | 00-1a-e8-21-c4-f2 |
| 6          | 002    | <input checked="" type="checkbox"/> | Bslp 2/002         | Bslp        | 759239960    | V4.0.13 Apr 10 20... | 8     | V4.0.10   | V4.0.13 Act... | 192.168.222.2  | 192.168.222.254 | 10500    | 00-1a-e8-21-c5-2e |
| 7          | 003    | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/0... | Virt. Base  | 000000000    | V4.0.13 Apr 10 20... | 0     | n/a       | n/a            | 192.168.100.81 | 192.168.100.82  | 0        | ff-00-c0-a8-64-51 |

The columns of the configuration page have the following meaning (only display):

- Note: The columns "Index", "Module Number MGW", "Enabled" and "Name" are repeated on all sub pages. A description of these can be found in [Section 4.10.2, "Configuration Page "Dect - Base""](#).)

## Type

This field displays the type of the Base Station: "BslpLocal" for a BSIP-IWU or "Bslp" for a BSIP-Only.

## BasestationSerialNr."

This field displays the serial number of the Base Station as read with "Scan".

## Version

This field displays the version number and the version date of the current firmware running on the active partition of the BSIP as read with "Scan". Furthermore, if the Hardware version is not compatible (e.g. if BSIP from other Ip-DECT OEM systems are used), it additionally displays "hardware not compatible". In this case, this BSIP cannot be used with IP-DECT system.

## HwRev

This field displays the hardware revision (Q-No.) of the BSIP as read with Scan. This information is displayed only, if the BSIP is running version 3.34.15 or higher; otherwise "0" will be displayed.

### **PartInfo1**

This field displays the version number of the firmware running on partition1 of the belonging BSIP-Only as read by a "Scan". Additionally, the label "Active" indicates, that this is the active partition of the BSIP. For a BSIP-IWU (Type="BslpLocal") this information may be derived from page Administration > "Version System 1" resp. "Version System 2".

### **PartInfo2**

This field displays the version number of the firmware running on partition2 of the belonging BSIP-Only as read by a "Scan". Additionally, the label "Active" indicates, that this is the active partition of the BSIP. For a BSIP-IWU (Type="BslpLocal") this information may be derived from page Administration > "Version System 1" resp. "Version System 2".

### **IpAddr Module**

This field displays the current IP address of a BSIP-Only , as read with "Scan".

- **Hint:** If this Ip address differs from the configured IP address (IpAddr Module)on page DECT-Base, a SYNC process has to be established, which transfers the settings of the BSIP configured at the IWU towards the BSIP.

### **IpAddr Server**

This field displays the IP address of the DECT Server IP (DECT network) read with "Scan".

- **Hint:** If this IP address differs from the configured Server IP (see page DECT), a SYNC process has to be established, which transfers the settings of the BSIP configured at the IWU towards the BSIP.

### **Server Port Broad**

This field displays the IP port of the BSIP-Only on which the BSIP-Only is communicating with the IWU (see option "ListenPort" on WBM page "Dect") as read from the Base Station with "Scan".

### **Mac Addr**

This field displays the MAC address of the BSIP as read from the Base Station with "Scan".

## **4.10.8 Configuration Page "Dect - Debug" (Advanced mode)**

This page is only displayed in Unify Admin mode at the WBM.

| Dect-Debug                           |                   |                                     |                    |                          |            |  |  |
|--------------------------------------|-------------------|-------------------------------------|--------------------|--------------------------|------------|--|--|
| Base Radio Sync Ari Call About Debug |                   |                                     |                    |                          |            |  |  |
| Index                                | Module Number MGW | Enabled                             | Name               | Debug Disable            | Debug Lvl  |  |  |
| 2                                    | 009               | <input checked="" type="checkbox"/> | CL_1-2             | <input type="checkbox"/> | 0x00000000 |  |  |
| 5                                    | 001               | <input checked="" type="checkbox"/> | Bslp 2/001         | <input type="checkbox"/> | 0x00000000 |  |  |
| 6                                    | 002               | <input checked="" type="checkbox"/> | Bslp 2/002         | <input type="checkbox"/> | 0x00000000 |  |  |
| 7                                    | 003               | <input checked="" type="checkbox"/> | CL_1-2/Bslp 1/0... | <input type="checkbox"/> | 0x00000000 |  |  |

On the sub page "Debug" various logging and debugging functions may be activated for the individual DECT modules. Based on these functions potential problems in the DECT section may be investigated. For the analysis of the Log files profound knowledge of the DECT technologies is essential. Therefore debugging is intended primarily for our support staff.

**Note:** Please note that depending on the activated Logging configuration big amounts of data may be produced which may have negative influence on the performance of the IWU Software and the System. Therefore you should only activate Logging functions when requested by a support engineer.

The columns of the configuration page have the following meaning:

**Note:** The columns "Index", "Module Number MGW", "Enabled" and "Name" are repeated on all sub pages. A description of these can be found in [Section 4.10.2, "Configuration Page "Dect - Base""\)](#).

#### Debug Disable (Default value: Deactivated)

When activating this entry the Logging functionality for the active DECT module is disabled, independent of the configured Debug level.

#### Debug Lvl (Default value: "0x00000000")

Debug level of the selected entry. The value may be entered directly as a hexadecimal value.

## 4.11 Debugging Configuration (IWU)

This page is only displayed with Unify Admin mode at the WBM.

**UNIFY** HiPath Cordless IP

Administration Network SIP Media Gateways Group User Dect **Debugging** Status System Clc

Debugging-Server

Server IWU Voip Setupapplic

| Disable                  | Name                | Level      | DefaultDebug             | DefaultDebugExt          |
|--------------------------|---------------------|------------|--------------------------|--------------------------|
| <input type="checkbox"/> | Capi2032DIDebug     | 0x00000000 | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | CapiAplfDebug       | 0x00000000 | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | CapiDDebug          | 0x00000000 | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | CapiBDebug          | 0x00000000 | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | L3MgwIwuRouterDe... | 0x00000000 | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | OslntDebug          | 0x00000000 | <input type="checkbox"/> | <input type="checkbox"/> |

☒ Console Listen Port:  Logfile Size Total:  Log Path All:   
☒ Logfile Logfile Name:  Logfile Size:   
☐ Syslog ☐ Start Syslog Validation details:   
 Syslog Server Ip:

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

On the page "Debugging" various Logging and Debugging functions may be activated. Based on these functions potential problems regarding DECT, VoIP or interworking functionality maybe isolated. For the analysis of the Log files profound knowledge of VoIP and DECT connections is essential. Therefore they are intended primarily for our support staff.

The sub pages "**Server**", "**Iwu**" "**Voip**" and "**Setupapplic**" differentiate the various parts of the Software for which Debugging may be activated. They differentiate the names of the Software levels and the according Log file names. You will get more detailed information from our support engineer when the activation of a Debug level is requested.

Activation / deactivation of Logfiles and console settings (except IP address of the Syslog server) are taken in effect without the need to restart the system services.



The amount of Logfile data will be automatically increased for the HPCIP-Server solution. (This strategy is used, if the partition size of /mnt/conf partition is > 600MB). Instead of 5 Logfiles with 1 MB each, the server Logfiles are extended to 25 Logfiles with 20 MB each.

**Note:** Please note that depending on the activated Logging configuration big amounts of data may be produced which may have negative influence on the performance of the IWU Software and the System. Therefore you should only activate Logging functions when requested by a support engineer.

The options of the table have the following meaning:

**Disable (Default value: Deactivated)**

When activating this entry the logging functionality for the selected entry is disabled, independent of the configured Debug level.

**Name (fixed)**

Preconfigured descriptive name of the Software level for which the Debug level is valid. You will get more detailed information from our support engineer when the activation of a Debug level is requested.

**Level (Default value: "0x00000000")**

Debug level of the selected entry. The value may be entered directly hexadecimal or via the checkboxes on the right.

**DefaultDebug**

Enabling the checkbox in this column activates the Default Debug for the corresponding debug module.

**DefaultDebugExt**

Enabling the checkbox in this column activates the Default Debug Extended for the corresponding debug module.

The options of the lower part of the configuration page have the following meaning:

**Console**

By activating this entry the Debugging functionality via the Console application is enabled.

The entry contains the associated UDP port number for Remote Debugging.

**Listen port**

The entry contains the associated UDP port number for Remote Debugging. This value is specific for the different debugging modules. The default values are:

Server: 11000; IWU: 11050; Voip: 0 (n/a); Setupapplic: 11100.

#### Logfile

By activating this entry the Debug output is written to the associated Log files.

You may choose exclusively between Option Logfile or Syslog

#### Logfile Name

This entry (read-only) shows the name format of the Log file created.

#### Syslog

By activating this entry the Debug output is written to the associated Syslog server.

You may choose exclusively between Option Logfile or Syslog.

**Hint:** IWU debugging messages are logged to a configurable syslog daemon with Facility="LOCAL1" and SEVERTY Level="ALERT".

#### Start Syslog

If option "Syslog" is enabled activating this option starts a process which sends the syslog messages to the syslog server configured by option "Syslog Server Ip".

If this option is deactivated, no syslog messages are sent to the syslog server.

**Hint:** If a syslog server is configured and enabled (Start syslog) , OS specific messages are always logged to syslog, independent from the chosen destination (Logfile or syslog).

#### Syslog Server IP

The IP address of the syslog server (to which syslog output will be sent) is configured here.

#### Logfile Size Total

Displays the limit of the the maximum allocated disk space in bytes for all log files (stored in the "Log Path") here. A process checks periodically if the total size is reached. If the limit is reached, the oldest Log Files are deleted to free up disk space.

#### Logfile Size

Displays the limit of the the maximum file size in bytes of a single Logfile here. As soon as this size is reached the log output is continued in a new file.

#### Validation details

Using this dropdown the output of Warnings may be reduced. This is especially useful for a high number of Warnings in large systems, where all output of Warnings will prevent the output of the more important Error output (since the number of list entries in the Validation windows is limited).

Possible Values range from "No" for no warning output to "4" for full warning output.

**Hint:** The selection level is only applied to output of type WARNING and has no influence to the output of type ERROR.

### **LogPath All**

Displays the LogPath the files are stored on the BSIP1.

### **Download logfiles**

With this Button all Logfiles of the BSIP may be downloaded and stored on the file system of the maintenance PC.

After clicking on the button [**Download logfiles**], an browser based file open dialog will be displayed immediately.

You have to select the store method of the dialog, click on button [**OK**] and select from the following "save as" dialog a folder to store the configuration files on the maintenance PC or a directory available via the network (default: "logfiles.tgz").

Save the configuration file using the default name "logfiles.tgz" or change it according your needs (Don't use blanks in the filename).

### **Clear logfiles**

Use this function to clear the Logfiles in the log directory.

### **Download Corefiles**

Use this functionality to download coredump files which may have been created during a crash of the system processes.

If one of the main system processes of the IWU (Setup Application, Capiserver or InterWorking Unit) terminates contrary to expectations this will lead to loss of system functionality. The IWU has to be rebooted to gain system functionality again.

After reboot has finished, the diagnostic data (Corefiles) of the last crash may be downloaded by clicking on [Download Corefiles] and transmitted to the support team of the HPCIP system for analysis.

## 4.12 "Status" Configuration (IWU)

On the page "Status" of the Configuration Utility various status information may be displayed. It consists of four sub pages:

The screenshot displays the UNIFY HiPath Cordless IP Status-User Status page. The top navigation bar includes tabs for Administration, Network, SIP, Media Gateways, Group, User, Dect, Debugging, Status, System, and Clc. The main content area is titled "Status-User Status" and contains a table with columns: Index, Msn, DisplayN..., Home MGW, VOIP Loc on ..., DECT Loc..., DECT Loc ..., DECT Call ..., DECT ..., VOIP IP, Voip sta..., Call states, CaSync, and TsSync. Below the table, there are search and filter options, including a search scope column (MSN), search string (0), search scope MGW ([001] MGW\_Berlin\_1), and checkboxes for hide disabled users, users with active calls only, users with dect location only, Home-users only, and all users. The bottom of the page shows the status bar with the text "ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2" and buttons for Logout, Help, Info, Cancel, and Apply.

| Index | Msn   | DisplayN... | Home MGW           | VOIP Loc on ... | DECT Loc... | DECT Loc ...   | DECT Call ... | DECT ...  | VOIP IP        | Voip sta... | Call states | CaSync | TsSync |
|-------|-------|-------------|--------------------|-----------------|-------------|----------------|---------------|-----------|----------------|-------------|-------------|--------|--------|
| 1     | 00101 | 101         | [001] MGW_Berlin_1 | [002] MGW_B...  | [002] MG... | [001] Bslp ... | [002] MG...   | [001] ... | 192.168.100.50 | Ras up      | Located on  | --     | --     |
| 2     | 00102 | 102         | [001] MGW_Berlin_1 | [001] MGW_B...  | [001] MG... | [001] Bslp ... | [001] MG...   | [001] ... | 192.168.100.50 | Ras up      | Located on  | --     | --     |
| 3     | 00103 | 103         | [001] MGW_Berlin_1 | [002] MGW_B...  | [002] MG... | [001] Bslp ... | [002] MG...   | [001] ... | 192.168.100.50 | Ras up      | Located on  | --     | --     |
| 4     | 00104 | 104         | [001] MGW_Berlin_1 | [001] MGW_B...  | --          | --             | --            | --        | 192.168.100.50 | Ras up      | No location | --     | --     |
| 5     | 00105 | 105         | [001] MGW_Berlin_1 | [001] MGW_B...  | --          | --             | --            | --        | 192.168.100.50 | Ras up      | No location | --     | --     |
| 6     | 00106 | 106         | [001] MGW_Berlin_1 | [001] MGW_B...  | --          | --             | --            | --        | 192.168.100.50 | Ras up      | No location | --     | --     |

The two sub pages User Status and User Mibs deliver User specific information. The lower frame contains user specific options which differ from the options on other subpages.

The two sub pages MGW Status and MGW Mibs deliver Media Gateway specific information. The lower frame contains MGW specific options which differ from the options on other subpages.

The four sub pages Base Status, Base Mibs, Base 1588 and Base RSSI deliver Dect Base specific information. The lower frame contains Base specific options which differ from the options on other subpages and also within these subpages.

## 4.12.1 General Status Information

Depending on the subpage, the following options may differ slightly from page to page. The most common options are:

The screenshot shows a web interface for configuring status information. It includes a text input for 'Cycle (s):' with the value '0'. Below it are two buttons: 'Refresh' and 'Clear Statistics'. To the right, there are two text inputs for 'from:' and 'to:', with values '10.04.2014 11:17:44 initied' and 'now' respectively. Below these are three buttons: 'Previous', 'Next', and 'Absolute'.

### Cycles(s)

If a numeric value different than "0" is configured, the display will automatically refresh after the configured number of seconds. After changing this value, the button [Refresh] has to be clicked. Besides the refresh of the display, internal values are refreshed if the selected scope is [Absolute].

**Note:** High frequency update rates ( e.g. 1, 2 or 3 sec.) should be avoided.

### Refresh / Stop

Manually refreshes the counters displayed.

After changing the value of option "Cycle (s)" unequal to 0, the automatic refresh will be active after clicking on [Refresh]. The caption of the [Refresh] button then changes to "Stop". After a reapply of button [Stop] the automatic refresh will stop and the caption of button [Stop] changes back to [Refresh].

### Clear Statistics

Clears (resets) all counters to 0 after a confirmation dialog.

On the right side of the lower frame some options are located to select the time frame of the displayed values. The time frame is displayed in the fields "from:" and "to".

The format of the time frame is "Date [Event]" (e.g. "19.01.2011 07:13:11 cleared").

The following events are available:

- cleared - state has been deleted by clicking on [Clear Statistics]
- initied - state has been deleted by a System Update
- timediff - state has been deleted by setting the system time
- timezone - state has been deleted by changing the Timezone
- restore - state has been deleted by a configuration restore
- regular - state is valid

The following date formats are used:

- "dd.mm.yyyy hh:mm:ss" is used for output of a specific date / time
- "now" Indicates that output is displayed up to the current point of time

**from:**

Displays the start of the time frame for the displayed values.

**to:**

Displays the end of time frame of the displayed values.

**[Previous]**

Selects the previous time frame of the status values (if available).

**[Next]**

Selects the next time frame of the status values (if available).

**[Absolute]**

Selects an absolute time frame of the status values (from the earliest available point of time up to now).

## 4.12.2 Configuration Pages "Status > User Status and User Mibs"

These two pages contain the status as well as the corresponding Mibs/counters for the users.

The user states are displayed at sub page User Status.

The user Mibs/counters are displayed at sub page User Mibs.

### 4.12.2.1 Status Search Options

The lower panel contains two panels. The upper panel contains the search functionality, the lower panel contains further display options.

The screenshot displays the 'Status' Configuration (IWU) interface. It is divided into two main sections. The upper section contains search controls: 'Search Scope Column' (set to MSN), 'Search Scope MGW' (set to [001] MGW\_Berlin\_1), 'Search String' (set to 0), 'Search' button, 'Max Lines' (set to 50), 'Step Size' (set to 50), and 'Previous'/'Next' buttons. The lower section contains display options: checkboxes for 'hide disabled users', 'users with active calls only', 'users with dect location only', 'Home-users only', and 'all users'; a 'Cycle (s):' field (set to 0) with 'Refresh' and 'Clear Statistics' buttons; a date range selector with 'from:' (10.04.2014 11:17:44 initied) and 'to:' (now) fields, and 'Previous', 'Next', and 'Absolute' buttons.

For details of the upper panel containing the search functionality, refer to [Section 5.27, "User Search Options \(V1R5\)"](#).

For details of the lower panel containing further display options refer to [Section 4.12.1, "General Status Information"](#).

A specific user may be searched using the search functionality. Additionally to the user specific search scope, the search may be limited to a specific Media Gateway which may be selected additionally. If a specific MGW is selected (in contrast to the "All" entry), the user will be displayed only, if the selected MGW is the Home MGW of the user or its current SIP location is located at this MGW.

Further options which are available on this panels:

**hide disabled users**

If this option is enabled, disabled users are not displayed at all.

**users with active calls only**

Only those users are displayed, which have an active call.

**users with dect location only**

Only those users are displayed, which are Dect located.

**Home-users only**

Only those users are displayed, whose Home MGW is configured to the selected MGW or who have or had an active call or a Location at the selected MGW.

**all users**

Normally, only those users are displayed, whose Home MGW is configured to the selected MGW or who have or had an active call or a Location at the selected MGW. To overcome this restriction, enable the option to display all users.

## Configuration reference

### "Status" Configuration (IWU)

#### 4.12.2.2 Configuration Page "Status > User Status"

| Status-User Status |        |              |                    |               |             |                |                |                |                |             |               |        |        |
|--------------------|--------|--------------|--------------------|---------------|-------------|----------------|----------------|----------------|----------------|-------------|---------------|--------|--------|
| User Status        |        | User Mibs    | MGW Status         | MGW Mibs      | Base Status | Base Mibs      | Base 1588      | Base RSSI      |                |             |               |        |        |
| In...              | Msn    | DisplayNa... | Home MGW           | VOIP Loc o... | DECT Loc... | DECT Loc ...   | DECT Call o... | DECT Call o... | VOIP IP        | Voip sta... | Call states   | CaSync | TsSync |
| 1                  | 001... | 101          | [001] MGW_Berlin_1 | [001] MGW...  | [001] MG... | [002] Bslp ... | [001] MGW_...  | [002] Bslp ... | 192.168.100.50 | Ras up      | Connected out | 4      | 3      |
| 2                  | 001... | 102          | [001] MGW_Berlin_1 | [001] MGW...  | [001] MG... | [001] Bslp ... | [001] MGW_...  | [002] Bslp ... | 192.168.100.50 | Ras up      | Connected in  | 9      | 5      |
| 3                  | 001... | 103          | [001] MGW_Berlin_1 | [001] MGW...  | [001] MG... | [002] Bslp ... | [001] MGW_...  | [002] Bslp ... | 192.168.100.50 | Ras up      | Located on    | --     | --     |
| 4                  | 001... | 104          | [001] MGW_Berlin_1 | [001] MGW...  | [001] MG... | [002] Bslp ... | [001] MGW_...  | [002] Bslp ... | 192.168.100.50 | Ras up      | Alerting in   | 0      | 7      |
| 5                  | 001... | 105          | [001] MGW_Berlin_1 | [001] MGW...  | --          | --             | --             | --             | 192.168.100.50 | Ras up      | No location   | --     | --     |
| 6                  | 001... | 106          | [001] MGW_Berlin_1 | [001] MGW...  | --          | --             | --             | --             | 192.168.100.50 | Ras up      | No location   | --     | --     |
| 7                  | 001... | 107          | [001] MGW_Berlin_1 | [001] MGW...  | --          | --             | --             | --             | 192.168.100.50 | Ras up      | No location   | --     | --     |

The columns of the table have the following meaning:

##### Index

This field contains the unique, absolute index number of the user inside the IWU. The number is assigned by the IWU and cannot be changed.

##### Msn

This field displays the configured "MSN" of the associated user.

##### DisplayName

This field displays the "DisplayName" of the associated User.

##### Home MGW (only for MGW-IWU)

This field displays the index and name of the users Home MGW.

##### VOIP Loc on MGW (only for MGW-IWU)

This field displays the index of the MGW the VoIP call was last located on. If no LOCATION of the handset is received or if the corresponding Dect handset has no roaming authorization at a specific MGW, the users VOIP Location will be assigned at the corresponding HOME MGW.

##### Dect Loc on MGW (only for MGW-IWU)

This field displays the number of the MGW the handset was last located on.

If a handset is switched off (detached), the value will be set to "0".

##### Dect Loc on BS

This field displays the number of the base Station the handset was last located on.

##### DECT Call on MGW (only for MGW-IWU)

This field displays the number of the MGW the current/last call was active on.

If a handset is switched off (detached), the value will be set to "0".



During start of system services, after a call interruption or if a handset is switched off (detached), the value will be set to "0".

If a handset initiates a handover, the number of the new MGW will be displayed.

### **DECT Call on BS**

This field displays the number of the Base Station the current/last call was active on

### **VOIP IP**

This field displays the current IP address of the SIP server which was used for the last SIP message of the user.

### **Voip states**

This field displays the Voip state of the User ("No ras", "Ras up", "Ras down").

### **Call states**

This field displays the current Call state of the User ("Located on", "No location", "Calling out", "Alerting out", "Connected out", "Calling in", "Alerting in", "Connected in", "Switched off", "Removed", "Located off").

- If the handset has located successfully to the HPCIP System and there is no active call or call request, the IWU will signal "Located on"

For an incoming call request from SIP:

- The handset will be paged, during the page process the IWU will display "Calling in".  
If the handset confirmed the page process successfully and has established a connection to the HPCIP system and sends the alert back, the IWU will display "Alerting in"
- If the handset doesn't respond in about 12 seconds, the call will be disconnected by the IWU for both call legs (SIP reason 480 Temporarily unavailable).
- If the call was successfully established, IWU will display "Connected in"
- If the called handset disconnects the call, IWU will display "Located on"
- If the calling party disconnects the call, IWU will first display "Disconnected" and after a short period of time "Located on".
- If the MGW of the located users goes offline, the IWU will display "Located Off"

### **CaSync**

This field displays the Carrier number on which the connection for User "User" is active.

## Configuration reference

### "Status" Configuration (IWU)

#### TsSync

This field displays the Timeslot number on which the connection for User "User" is active.

### 4.12.2.3 Configuration Page "Status > User Mibs"

| Status-User Mibs |        |              |                    |                  |            |             |            |              |              |             |              |             |             |             |
|------------------|--------|--------------|--------------------|------------------|------------|-------------|------------|--------------|--------------|-------------|--------------|-------------|-------------|-------------|
| User Status      |        |              | User Mibs          | MGW Status       | MGW Mibs   | Base Status | Base Mibs  | Base 1588    | Base RSSI    |             |              |             |             |             |
| In...            | Msn    | DisplayNa... | Home MGW           | VOIP Loc on M... | VOIP St... | Incomin...  | Outgoin... | Intracell... | Intercell... | External... | Internal ... | Ext MGWR... | Ext MGWR... | Ext SITE... |
| 1                | 001... | 101          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 2           | 7          | 0            | 0            | 0           | 2            | 1           | 0           | 2           |
| 2                | 001... | 102          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 5           | 2          | 0            | 0            | 0           | 2            | 0           | 0           | 2           |
| 3                | 001... | 103          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 3           | 1          | 0            | 0            | 4           | 3            | 0           | 1           | 2           |
| 4                | 001... | 104          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 3           | 0          | 0            | 0            | 0           | 1            | 0           | 0           | 1           |
| 5                | 001... | 105          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 0           | 0          | 0            | 0            | 0           | 0            | 0           | 0           | 0           |
| 6                | 001... | 106          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 0           | 0          | 0            | 0            | 0           | 0            | 0           | 0           | 0           |
| 7                | 001... | 107          | [001] MGW_Berlin_1 | [001] MGW_Be...  | 1          | 0           | 0          | 0            | 0            | 0           | 0            | 0           | 0           | 0           |

The columns of the table have the following meaning:

#### Index

This field contains the unique, absolute index number of the user inside the IWU. The number is assigned by the IWU and cannot be changed.

#### Msn

This field displays the configured "MSN" of the associated user.

#### DisplayName

This field displays the "DisplayName" of the associated User.

#### Home MGW (only for MGW-IWU)

This field displays the number of the MGW the user's Home Media Gateway is assigned to.

#### VOIP Loc on MGW (only for MGW-IWU)

This field displays the number of the MGW the VoIP call was last located on.

#### VOIP state changes

This counter displays the number of Voip state changes of the user (see Voip states).

#### Incoming calls

This counter displays the number of incoming connections (direction PBX -> BSIP -> handset) which have been signaled for the User. If a handset paging was unsuccessfully (e.g. not reachable, outside Dect range, ...), this call is counted to the Incoming calls of the user.

### **Outgoing calls**

This counter displays the number of outgoing connections (from direction handset -> BSIP -> PBX) which have been signaled for the User.

### **Intracell handover**

This counter displays how often an Intracell handover (transfer of a channel within the same Base Station) was detected for the User.

### **Intercell handover**

This counter displays how often an Intercell handover (transfer of a channel between different Base Stations) was detected for the User.

### **External handover (only for MGW-IWU)**

This counter displays how often an External handover (transfer of a channel between different Media Gateways) was detected for the User.

### **Internal Roaming**

This counter displays how often a roaming event (change of a Location Area without an active connection) was established for the current handset.

#### **Hints:**

- Handover events (Intercell handover during an active call) are not considered by this counter. These events are handled by counter "Intercell handover".
- If a user entry is disabled and the handset has a valid subscription, the handset initiates a LOCATION Request cyclically (about. 90 sec). This LOCATION REQUESTS are counted to the ROAMING counter of the module and not for the user (Stats > Calls Dect), since the user is disabled.

### **Ext. MGW Roaming DECT (only for MGW-IWU)**

This counter displays how often a roaming event (change of a Base Station without an active connection) between MGW's inside the same site was established for the current handset.

### **Ext. MGW Roaming SIP (only for MGW-IWU)**

This counter displays how often a External SIP roaming event (change of a PBX associated to one MG to another PBX associated to another MGW) was established for the current handset.

### **Ext. SITE Roaming (only for MGW-IWU)**

This counter displays how often a External Site roaming event (change of a Base Station without an active connection from one MGW to another which are located at different sites) was established for the current handset.

### 4.12.3 Pages "MGW Status and MGW Mibs" (MGW-IWU only)

These two pages contain the status as well as the corresponding Mibs/counters for the MGW s. These sites are available only at a MGW-IWU.

The MGW states are displayed at sub page MGW Status.

The MGW Mibs/counters are displayed at sub page MGW Mib.

#### 4.12.3.1 Options at Lower Frame

Cycle (s):

from:

to:

Refresh

Clear Statistics

Previous

Next

Absolute

For details of the lower panel containing further display options refer to [Section 4.12.1, "General Status Information"](#).

#### 4.12.3.2 Configuration Page "Status > MGW Status"

Left part of table:

| Status-MGW Status |              |              |                |                |               |             |              |            |              |       |        |        |
|-------------------|--------------|--------------|----------------|----------------|---------------|-------------|--------------|------------|--------------|-------|--------|--------|
| User Status       | User Mibs    | MGW Status   | MGW Mibs       | Base Status    | Base Mibs     | Base 1588   | Base RSSI    |            |              |       |        |        |
| Index             | DisplayIndex | Name         | Site/SiteSubId | Control Online | Signal Online | SIP Reg All | DECT Loc All | Roaming To | Roaming From | Calls | CC 1   | CC 2   |
| 1                 | 1            | MGW_Berlin_1 | 1/1            | Online         | Online        | 11          | 5            | 0          | 0            | 0     | N/A    | Online |
| 2                 | 2            | MGW_Berlin_2 | 1/2            | Online         | Online        | 0           | 0            | 0          | 0            | 0     | Online | N/A    |
| 3                 | 3            | MGW_Ulm      | 2/1            | Online         | Online        | 0           | 0            | 0          | 0            | 0     |        |        |

Right part of table:

| Status-MGW Status |           |            |          |             |           |           |           |         |         |                     |                      |                    |                     |
|-------------------|-----------|------------|----------|-------------|-----------|-----------|-----------|---------|---------|---------------------|----------------------|--------------------|---------------------|
| User Status       | User Mibs | MGW Status | MGW Mibs | Base Status | Base Mibs | Base 1588 | Base RSSI |         |         |                     |                      |                    |                     |
| CC 1              | CC 2      | CC 3       | CC 4     | CC 5        | ExthO 1   | ExthO 2   | ExthO 3   | ExthO 4 | ExthO 5 | Control Online last | Control Offline last | Signal Online last | Signal Offline last |
| N/A               | Online    |            |          |             | 0         | 0         | 0         | 0       | 0       | 10.04.2014 18:46    | 10.04.2014 18:46     | 11.04.2014 15:06   | N/A                 |
| Online            | N/A       |            |          |             | 0         | 0         | 0         | 0       | 0       | 10.04.2014 18:46    | 10.04.2014 18:46     | 11.04.2014 15:06   | N/A                 |
|                   |           |            |          |             | 0         | 0         | 0         | 0       | 0       | 10.04.2014 18:46    | 10.04.2014 18:46     | 11.04.2014 15:06   | N/A                 |

The columns of the table have the following meaning:

**Index**

This column displays the index of the current MGW. This value is automatically incremented by the WBM.

**DisplayIndex**

The Display Index of the entry is displayed here. This value is automatically incremented by the WBM.

**Name**

Displays the name for the MGW as configured.

**Site/SiteSubId**

Displays the compound value of current Site Id and Site SubId as configured for the MGW to uniquely identify a Media Gateway inside a site.

**Control Online**

This field displays the current state (Online or Offline) of the Media Gateway Control connection. Online, if services are running and communication to MGW-IWU via the CONTROL connection is established

**Signal Online**

This field displays the current state (Online or Offline) of the Media Gateway Signaling connection. Online, if services are running and communication to MGW-IWU via the SIGNALING connection is established

**SIP Reg All**

This field displays the current number of active SIP registrations at the current MGW (including SIP Home registrations and roamed registrations).

**DECT Loc All**

This field displays the current number of active Dect locations at the current MGW.

**Roaming To**

This field displays the current number of active roamings from the Home-MGW to another MGW.

**Roaming From**

This field displays the current number of active roamings from the Home- MGW to the current MGW.

**Calls**

This field displays the number of current DECT calls of all bases belonging to the MGW.

## Configuration reference

### "Status" Configuration (IWU)

#### **CCx (x = 1 .. 5)**

This field displays the current state of Cross Connects via the Cross Link network from the current MGW (identified by Site/SiteSubId) to another MGW (identified by value x) inside the same site.

Following states for Cross connect are defined:

"Online" - Cross connect to MGW active

"Offline" - Cross connect to MGW inactive

"X" - Cross connect not applicable since CCx = SiteSubId of Current MGW

<Empty string> ("" ) - No Cross connect configured.

#### **ExtHOx (x = 1 .. 5)**

This field displays the current number of External Handover from the current MGW (identified by Site/SiteSubId) to another MGW (identified by value x) inside the same site.

Following values are defined:

<Numeric value> - Number of active External Handover

"X" - External Handover not applicable since CCx = SiteSubId of Current MGW

<Empty string> ("" ) - No External HO applicable since no Cross Link configured.

#### **Control Online last**

This field displays the date and time, the Control connection towards the MGW-IWU has been signaled Online last.

#### **Control Offline last**

This field displays the date and time, the Control connection towards the MGW-IWU has been signaled Offline last.

#### **Signal Online last**

This field displays the date and time, the Signal connection towards the MGW-IWU has been signaled Online last.

#### **Signal Offline last**

This field displays the date and time, the Signal connection towards the MGW-IWU has been signaled Offline last.

#### **Hints regarding Status Online / Offline:**

A MGW is treated Online, if

- System Services on MGW-IWU are started and
- MGW was successfully scanned and synced and

- MGW is enabled and
- IP connection between MGW and MGW-IWU (both for Control and Config channel) is established.

### 4.12.3.3 Configuration Page "Status > MGW Mibs"

Left part of table:

| Status-MGW Mibs |         |              |                |                 |                   |                |                  |                 |                 |                |              |            |
|-----------------|---------|--------------|----------------|-----------------|-------------------|----------------|------------------|-----------------|-----------------|----------------|--------------|------------|
| User Status     |         | User Mibs    | MGW Status     | MGW Mibs        | Base Status       | Base Mibs      | Base 1588        | Base RSSI       |                 |                |              |            |
| Index           | Disp... | Name         | Site/SiteSubId | Control BootCnt | Control OnlineCnt | Signal BootCnt | Signal OnlineCnt | CC Online Cnt 1 | CC Online Cnt 2 | CC Online C... | CC Online... | CC Onli... |
| 1               | 1       | MGW_Berlin_1 | 1/1            | 2               | 3                 | 2              | 4                | 0               | 4               | 0              | 0            | 0          |
| 2               | 2       | MGW_Berlin_2 | 1/2            | 2               | 3                 | 2              | 4                | 4               | 0               | 0              | 0            | 0          |
| 3               | 3       | MGW_Ulm      | 2/1            | 2               | 3                 | 0              | 3                | 0               | 0               | 0              | 0            | 0          |

Right part of table:

| Status-MGW Mibs |      |               |                |             |             |           |           |           |               |                |            |             |           |            |
|-----------------|------|---------------|----------------|-------------|-------------|-----------|-----------|-----------|---------------|----------------|------------|-------------|-----------|------------|
| User Status     |      | User Mibs     | MGW Status     | MGW Mibs    | Base Status | Base Mibs | Base 1588 | Base RSSI |               |                |            |             |           |            |
| C ...           | C... | Outgoing c... | Incoming calls | ExtHO Cnt 1 | ExtHO C...  | ExtHO ... | ExtHO ... | ExtHO ... | Roaming To... | Roaming Fro... | MGW-OVL 70 | MGW-OVL 100 | BS-OVL 70 | BS-OVL 100 |
| 0               | 10   | 16            | 0              | 0           | 0           | 0         | 0         | 0         | 11            | 0              | 0          | 0           | 0         | 0          |
| 0               | 0    | 2             | 4              | 0           | 0           | 0         | 0         | 2         | 3             | 0              | 0          | 0           | 0         | 0          |
| 0               | 0    | 0             | 0              | 0           | 0           | 0         | 0         | 0         | 0             | 0              | 0          | 0           | 0         | 0          |

The columns of the table have the following meaning:

#### Index

This column displays the index of the current MGW. This value is automatically incremented by the WBM.

#### DisplayIndex

The Display Index of the entry is displayed here. This value is automatically incremented by the WBM.

#### Name

Displays the name for the MGW as configured.

#### Site/SiteSubId

Displays the compound value of current Site Id and Site SubId as configured for the MGW to uniquely identify a Media Gateway inside a site.

#### Control BootCnt

This counter displays how often the MGW Control connection was lost since the start of the system services of the MGW-IWU.

#### Control Online Cnt

This counter displays how often a Online/Offline change of the current MGW Control connection has been detected since the start of the system services of the MGW-IWU.

#### Signal BootCnt

This counter displays how often the MGW Signaling connection was lost since the start of the system services of the MGW-IWU.

#### Signal Online Cnt

This counter displays how often a Online/Offline change of the current MGW Signaling connection has been detected since the start of the system services of the MGW-IWU.

#### CC Online Cnt x

(x = 1 .. 5); This counter displays how often an Online/Offline change of the Cross Connect to a specific MGW (identified by value x) has been detected since the start of the system services of the MGW-IWU.

Following values for CC Online Cnt x are defined:

<Numeric value> - Number of Online changes

"X" - Online Cnt not applicable since CCx = SiteSubId of Current MGW

<Empty string> ("") - No Cross connect configured.

#### Outgoing Calls

This counter displays how often an outgoing connection from a Basestation belonging to the current MGW has been signaled.

#### Incoming Calls

This counter displays how often an incoming connection from a Basestation belonging to the current MGW has been signaled.

This counter is also incremented for calls where the connection was not successfully established.

#### ExtHo Cnt x

(x = 1 .. 5) This counter displays how often an External Handover from the current MGW (identified by Site/SubId) to another MGW (identified by value x) inside the same site was detected since the start of the system services of the MGW-IWU.

Following values for ExtHo Cnt x are defined:

<Numeric value> - Number of External Handover from current MGW to MGW x

"X" - ExtHO Cnt not applicable since x = SiteSubId of current MGW



<Empty string> ("" ) - No Cross connect configured.

### **Roaming To Cnt**

This counter displays how often an roaming event (change of a Base Station without an active connection) from the current MGW to another MGW was detected.

**Hint:** Handover events (Inter-cell handover during an active call) are not considered by this counter. These events are handled by counter "Inter-cell handover".

### **Roaming From Cnt**

This counter displays how often an Roaming Event (change of a Base Station without an active connection) from another MGW to the current MGW was detected.

**Hint:** Handover events (Inter-cell handover during an active call) are not considered by this counter. These events are handled by counter "Inter-cell handover".

### **MGW-OVL 70**

This counter displays how often the MGW has allocated equal or more than 70 % of the available channels or streams (whatever event comes first).

### **MGW-OVL 100**

This counter displays how often the MGW has allocated 100 % of the available channels or streams (whatever event comes first).

### **BS-OVL 70 Cnt**

This counter displays how often the BSIP has allocated equal or more than 70 % of the available channels.

For a standard configuration of a BSIP with 10 calls per BSIP, the counter is triggered if 7 calls are active on the DECT side.

### **BS-OVL 100 Cnt**

This counter displays how often the BSIP has allocated 100% of the available channels.

For a standard configuration of a BSIP with 10 calls per BSIP, the counter is triggered if 10 calls are active on the DECT side.

### 4.12.4 Pages "Base Status, -Mibs, -1588, -RSSI"

These four pages contain the status, the corresponding Mibs/counters, the 1588 states and counters as well as the RSSI values for the MGW s.

The Base states are displayed at sub page Base-Status.

The Base Mibs/counters are displayed at sub page Base-Mibs.

The Base 1588 Ethernet synchronization counters are displayed at sub page Base-1588.

The Base RSSI values are displayed at sub page Base-RSSI.

#### 4.12.4.1 Options at Lower Frame

Search Scope MGW:
 

[001] MGW\_Berlin\_1

Cycle (s): 

0

Refresh

Clear Statistics

from: 

10.04.2014 11:17:44 initied

to: 

now

Previous

Next

Absolute

For details of the lower panel containing further display options refer to [Section 4.12.1, "General Status Information"](#).

#### 4.12.4.2 Page "Base Status"

| Status-Base Status |              |            |            |          |             |        |           |           |           |         |         |         |                  |              |
|--------------------|--------------|------------|------------|----------|-------------|--------|-----------|-----------|-----------|---------|---------|---------|------------------|--------------|
| User Status        |              | User Mibs  | MGW Status | MGW Mibs | Base Status |        | Base Mibs | Base 1588 | Base RSSI |         |         |         |                  |              |
| Index              | Module Nu... | Name       | Online     | Sync     | Calls       | MoSync | TsSync    | CaSync    | Ts1TxBc   | Ca1TxBc | Ts2TxBc | Ca2TxBc | Online last      | Offline last |
| 1                  | 9            | CL_1-2     | YES        | N/A      | 0           | --     | --        | --        | --        | --      | --      | --      | 11.04.2014 15:06 | N/A          |
| 3                  | 1            | Bslp 1/001 | YES        | N/A      | 0           | --     | --        | --        | 0         | 9       | 8       | 8       | 11.04.2014 15:06 | N/A          |
| 4                  | 2            | Bslp 1/002 | YES        | YES      | 2           | --     | --        | --        | 11        | 5       | --      | --      | 11.04.2014 15:06 | N/A          |

The columns of the table have the following meaning:

##### Index

This field contains the absolute resp. global index number of the DECT module. This number identifies a module on a specific IWU globally and independent from the assigned MGW. The number is assigned by the IWU and cannot be changed.

### **Module Number MGW**

This field contains the relative index number of the DECT module (BSIP) at a specific MGW. The number may be changed manually.

### **Name**

Displays the name of the Base Station.

### **Online**

"Yes" if the selected Base Station is in state "Online".

"No" if the selected Base Station is in state "Offline".

**Hint:** A Base station is only functional, if its state is online. Therefore, the BSIP has to be synced, running the same firmware version on the same partition as the IWU and Ethernet and IP communication between the Server and the BSIP is established.

### **Sync**

"Yes" if the selected Base Station is in "Sync" (synchronized), which means that this base station has synchronized to another base station.

"No" if the selected Base Station is "OutOfSync" (unsynchronized), which means that this base station has NOT been synchronized to another base station.

At the base Station which is not synchronized to another base, (an exclusively Sync Master or no sync configured), the value is "n/a".

### **Calls**

This field displays the number of DECT calls which are currently active at the specific module.

### **MoSync**

This field displays the number of the DECT module to which the current module is synced to its air sync master. For synchronization via Ethernet, this field is empty.

### **TsSync**

This field displays the Timeslot on which the current module is synced to its air sync master.

For synchronization via Ethernet, this field is empty.

### **CaSync**

This field displays the Carrier on which the current module is synced to its air sync master.

For synchronization via Ethernet, this field is empty.

## Configuration reference

### "Status" Configuration (IWU)

#### Ts1TxBc

This field displays the Timeslot on which the current module emits its first (main) beacon signal.

#### Ca1TxBc

This field displays the Carrier on which the current module emits its first (main) beacon signal.

#### Ts2TxBc

This field displays the Timeslot on which the current module emits its second (secondary) beacon signal.

#### Ca2TxBc

This field displays the Carrier on which the current module emits its second (secondary) beacon signal.

#### Online last

This field displays the timestamp (date and time) at which a BSIP1 lastly changed its state to Online.

This time stamp is initially set when the system services are started. After this state, an "Online last" entry will be generated if the BSIP changes its state from Offline to Online.

#### Offline last

This field displays the timestamp (date and time) at which a BSIP1 lastly changed its state to Offline. If the status changes to Offline, the "Online last" counter will be cleared.

Possible reasons for an Offline event are mainly Ethernet ip connectivity problems between the IWU and the BSIP-Only.

### 4.12.4.3 Page "Base Mibs"

| Status-Base Mibs |              |            |            |          |           |         |             |            |           |              |              |           |        |         |
|------------------|--------------|------------|------------|----------|-----------|---------|-------------|------------|-----------|--------------|--------------|-----------|--------|---------|
| User Status      |              | User Mibs  | MGW Status |          | MGW Mibs  |         | Base Status |            | Base Mibs | Base 1588    |              | Base RSSI |        |         |
| Index            | Module Nu... | Name       | Online     | ISyncCnt | OnlineCnt | BootCnt | Outgoin...  | Incomin... | ExtHO Cnt | Intracell... | Intercell... | Roaming   | Ovl 70 | Ovl 100 |
| 1                | 9            | CL_1-2     | YES        | 0        | 4         | 0       | 0           | 0          | 1         | 0            | 0            | 0         | 0      | 0       |
| 3                | 1            | Bslp 1/001 | YES        | 0        | 4         | 4       | 0           | 1          | 0         | 0            | 1            | 2         | 0      | 0       |
| 4                | 2            | Bslp 1/002 | YES        | 4        | 4         | 4       | 11          | 16         | 0         | 0            | 0            | 10        | 0      | 0       |

The columns of the table have the following meaning:

### **Index**

This field contains the absolute resp. global index number of the DECT module. This number identifies a module on a specific IWU globally and independent from the assigned MGW. The number is assigned by the IWU and cannot be changed.

### **Module Number MGW**

This field contains the relative index number of the DECT module (BSIP) at a specific MGW. The number may be changed manually.

### **Name**

This field displays the name of the Base Station.

### **Online**

"Yes" if the selected Base Station is in state "Online".

"No" if the selected Base Station is in state "Offline".

**Hint:** A Base station is only functional, if its state is online. Therefore, the BSIP has to be synced, running the same firmware version on the same partition as the IWU and Ethernet and IP communication between the Server and the BSIP is established.

### **ISyncCnt (In Sync Count)**

This counter displays how often the Base Station did a resynchronization since the start of the system services.

### **OnlineCnt (Online Count)**

This counter displays how often a Online/Offline change has been detected since the start of the system services.

**Hint:** The counter "OnlineCnt" and "BootCnt" are incremented by starting the system services, which reset the BBC on the BSIP and therefore are incremented by "1".

### **BootCnt (Boot Count)**

This counter displays how often the Base Station was booted since the start of the system services.

### **Outgoing calls**

This counter displays how often an outgoing connection (direction handset -> BSIP -> PBX) has been signaled.

#### Incoming calls

This counter displays how often an incoming connection (direction PBX -> BSIP -> handset) has been signaled. This counter is also incremented for calls where the connection was not successfully established or for location calls of a handset. If a handset paging was unsuccessfully (e.g. not reachable, outside DECT area, ...), this call is counted to the Incoming calls of the User.

#### ExtHO Cnt

This counter displays how often an External handover (transfer of a channel between the BSIP of different Media Gateways) was established.

#### Intracell handover

This counter displays how often an Intracell handover (handover of a DECT channel within the same DECT Base Station) was detected at the BSIP.

#### Intercell handover

This counter displays how often an Intercell handover (handover of a channel between different DECT Base Stations) was detected at the BSIP.

#### Roaming

This counter displays how often a roaming event (change of a Base Station without an active connection) was detected at the BSIP.

#### Hints:

- Handover events (Intercell handover during an active call) are not considered by this counter. These events are handled by counter "Intercell handover".
- If a user entry is disabled and the handset has a valid subscription, the handset initiates a LOCATION Request cyclically (about. 90 sec). This LOCATION REQUESTS are counted to the ROAMING counter of the module and not for the user (Stats > Calls Dect), since the user is disabled.

#### Ovi 70

This counter displays how often the BSIP has allocated equal or more than 70 % of the available channels.

For a standard configuration of a BSIP with 10 calls (see configuration option "NumOfChannel" at [Section 4.10.2, "Configuration Page "Dect - Base""](#)) per BSIP the counter is triggered if 7 calls are active on the DECT side.

#### Ovi 100

This counter displays how often the BSIP has allocated 100 % of the available channels.

For a standard configuration of a BSIP with 10 calls per BSIP (see configuration option "NumOfChannel" at [Section 4.10.2, "Configuration Page "Dect - Base""](#)) the counter is triggered if 10 calls are active on the DECT side.

#### 4.12.4.4 Page "Base 1588"

| Status-Base 1588 |      |            |            |      |            |               |              |           |              |           |            |            |            |            |             |             |             |
|------------------|------|------------|------------|------|------------|---------------|--------------|-----------|--------------|-----------|------------|------------|------------|------------|-------------|-------------|-------------|
| User Status      |      | User Mibs  | MGW Status |      | MGW Mibs   |               | Base Status  |           | Base Mibs    | Base 1588 | Base RSSI  |            |            |            |             |             |             |
| Ind...           | M... | Name       | Online     | Sync | State 1... | Drift initial | Drift cor... | Delay min | Jitter av... | Time diff | Delay r... | Delay m... | Delay m... | Delay r... | Limit1 r... | Limit2 r... | Limit3 r... |
| 3                | 1    | Bslp 1/001 | YES        | N/A  | 0          | 0             | 0            | 0         | 0            | 0         | 0          | 0          | 0          | 0          | 0           | 0           | 0           |
| 4                | 2    | Bslp 1/002 | YES        | YES  | 5          | -665          | 163          | 19220     | 46           | -20       | 1          | 1          | 0          | 3          | 0           | 0           | 0           |

The following counters are only displayed for BSIP's which are configured as 1588 Sync slaves.

**Hint:** These counters are solely provided for analysis of possible Ethernet synchronization (acc. IEEE1588) issues and therefore are not described in detail.

The columns of the table have the following meaning:

##### Index

This field contains the absolute resp. global index number of the DECT module. This number identifies a module on a specific IWU globally and independent from the assigned MGW. The number is assigned by the IWU and cannot be changed.

##### Module Number MGW

This field contains the relative index number of the DECT module (BSIP) at a specific MGW. The number may be changed manually.

##### Name

Displays the name of the Base Station.

##### Online

"Yes" if the selected Base Station is in state "Online".

"No" if the selected Base Station is in state "Offline".

##### Sync

"Yes" if the selected Base Station is in "Sync" (synchronized), which means that this base station has synchronized to another base station.

"No" if the selected Base Station is "OutOfSync" (unsynchronized), which means that this base station has NOT been synchronized to another base station.

At the base Station which is not synchronized to another base, (an exclusively Sync Master or no sync configured), the value is "n/a".

"N/A" if the SYNC state is not applicable to the module type or the sync type (e.g. for a Sync Master).

## Configuration reference

### "Status" Configuration (IWU)

#### **State 1588**

This counter displays the current state of the 1588 sync mechanism of a 1588 Sync Slave. (Standard state during runtime is "5" [In Sync]; Boot states are "2", "3", "4").

#### **Drift Initial**

This counter displays the Initial Drift between the 1588 Sync Slave and its 1588 Sync Master.

The value is displayed in nano sec. per 100 msec.

#### **Drift correction**

This counter displays the correction value between the Drift initial value and the current corrected value. The value is displayed in nano sec. per 100 msec.

#### **Delay min**

This counter displays the minimum sync delay (in nano sec.) of the current 1588 Sync Slave to its 1588 Sync Master.

This value corresponds to the one-way delay time of a 1588 Sync Slave to its 1588 Sync Master between all switch hops.

More number of switch hops between a 1588 Sync Slave and its 1588 Sync Master will increase this value.

#### **Jitter average**

This counter displays the average jitter (in nano sec.) of the current 1588 Sync Slave to its 1588 Sync Master.

#### **Time diff**

This counter displays the current time difference or offset (in nano sec.) of the current 1588 Sync Slave to its 1588 Sync Master.

#### **Delay req retry**

This counter displays how often an incomplete DELAY\_REQ cycle was detected.

#### **Delay min retry**

This counter displays how often a retry to gather the absolute time difference was established.

#### **Delay min new**

This counter displays how often a retry to gather the absolute time difference with a new calculated Delay min window was established.

#### **Delay resp miss**

This counter displays how often a missing DELAY\_RESP message was detected.



#### Limit1 reached

This counter displays how often a short term absolute time difference in a range smaller than 1000 nano sec. was detected.

#### Limit2 reached

This counter displays how often a short term absolute time difference in a range between 1000 and 5000 nano sec was detected.

#### Limit3 reached

This counter displays how often a short term absolute time difference in a range between 5000 and 20000 nano sec. was detected. If this period was detected over a time period of longer than 50 seconds, the 1588 Slave will go OutOfSync and a resynchronization process for this BSIP will be initiated.

### 4.12.5 Configuration Page "Status > RSSI"

**UNIFY** HiPath Cordless IP

Administration Network SIP Media Gateways Group User Dect Debugging **Status** System Clc

Status-Base RSSI

| User Status | User Mibs | MGW Status | MGW Mibs | Base Status | Base Mibs | Base 1588 | Base RSSI |     |     |     |
|-------------|-----------|------------|----------|-------------|-----------|-----------|-----------|-----|-----|-----|
| TsSync      | C0        | C1         | C2       | C3          | C4        | C5        | C6        | C7  | C8  | C9  |
| Tx 00       |           |            |          |             |           | -84       |           | -81 | -53 | -30 |
| Tx 01       |           |            |          | -85         |           |           |           |     |     |     |
| Tx 02       |           |            |          |             |           |           |           | -79 | -50 | -79 |
| Tx 03       |           |            |          |             |           |           |           |     |     |     |
| Tx 04       | -27       | -38        | -74      | -81         | -84       |           |           |     |     |     |
| Tx 05       | +++       |            | +++      | +++         | +++       | +++       | +++       | +++ | +++ | +++ |
| Tx 06       |           |            | -85      |             | -71       |           |           |     |     |     |
| Tx 07       | -48       | -25        | -37      | -66         | -56       | -82       | -84       |     |     |     |
| Tx 08       | -76       | -53        | -82      |             |           |           |           |     |     | -76 |
| Tx 09       |           |            |          |             |           |           |           | -69 | -43 |     |
| Tx 10       |           |            |          |             |           |           |           |     |     |     |
| Tx 11       | bbb       | bbb        | bbb      | bbb         | bbb       |           | bbb       | bbb | bbb | bbb |
| Rx 00       |           |            | -76      |             |           |           |           |     |     |     |
| Rx 01       |           |            |          |             |           |           |           |     |     |     |

Search Scope MGW: [001] MGW\_Berlin\_1

☐ Rssi Limit: -85 Cycle (s): 0 from: 10.04.2014 11:17:44 initied  
☒ dB Module: [002] Bslp 1/002 to: now  
 Refresh Clear Statistics Previous Next Absolute

ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2

Logout Help Info Cancel Apply

On this page the table with the DECT RSSI values is displayed.

**Hint:** The selection of Basestations may be narrowed to the DECT modules belonging to a specific Media Gateway using the Dropdown box "Module" below.

The table has the following structure:

#### **Lines (Tx 00 - Rx 11)**

On these lines the timeslots Tx00 - Tx11 and Rx00 - Rx11 are displayed.

#### **Columns (C0 ... C9)**

On these columns the carriers C0 - C9 are displayed.

#### **Cell values:**

##### **"bbb"**

"bbb" inside a line (timeslot) indicates that this is a timeslot with a beacon (sent signal).

One cell in the line shows the signal level (receive level) of the received value of the channel allocation of other DECT devices. This value shall be as small as possible.

##### **"sss"**

**Hint:** This option is only applicable for air synchronization.

"sss" in a line (timeslot) indicates that this is a timeslot with a synchronization signal (received SYNC signal).

One cell in the line shows the carrier on which the sync signal is received on as well as the signal level (receive level) of the Sync signal. This value shall be as high as possible (-50 dB ... -80 dB).

**Important note:** For accurate and stable synchronization over air a minimum signal strength of -75 dB (resp. 16 [RSSI]) should be achieved.

##### **"+++"**

"+++" in a line (timeslot) indicates that this is a Tx timeslot with a voice channel (unidirectional) signal (The timeslot number of the Rx channel is Tx Channel + 12).

One cell in a "Tx" line displays the value of the used Carrier for the voice channel.

One cell in a "Rx" line displays the receive level of the Base Station in relation to the active call.

##### **"<value>"**

Shows the current value (receive resp. send signal of the Rx resp. Tx timeslot) depending on the configuration of "RSSI", "Db" and "Limit".

Value ranges:

minimal value (corresponds to poor signal strength)-85 dB (resp. 9 [RSSI])

maximum value (corresponds to good signal strength)-50 dB (resp. 31 [RSSI])

Values outside a bbb, sss, or +++ line display the signal level (receive level) of other DECT devices. The number of values as well as their value itself shall be as small as possible.

The options at the lower part of the configuration page have the following meanings:

**"RSSI"**

The values displayed in the RSSI table are RSSI values.

**"Db"**

The values displayed in the RSSI table are Db values. This is the default setting.

**"Limit"**

Here you can configure a minimum value. Only values greater (in the case of "Db" only values smaller) than "Limit" are displayed in the RSSI table.

Normally the following default values are used:

RSSI:"9"

Db:"-85"

**"Module"**

Here you may select the Base Station which values are displayed at the table.

## 4.13 "System" Configuration (IWU)

On the configuration page "System", both software processes of the IWU may be configured, started and stopped.

Click [Start] to start the enabled processes and [Stop] to stop them again. The current state of the services may be queried by clicking on [Refresh].

Activate "Service" for both entries if the services should start automatically at system start. Other modifications are usually not needed here.

The screenshot displays the UNIFY HiPath Cordless IP System Configuration page. The top navigation bar includes tabs for Administration, Network, SIP, Media Gateways, Group, User, Dect, Debugging, Status, System (selected), and Ctl. The main content area is titled "System" and contains a table with the following data:

| Enabled                             | Applic Name | Status  | Up since         | Service                             |
|-------------------------------------|-------------|---------|------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | capigw.exe  | Running | 11.04.2014 15:05 | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | iwu.exe     | Running | 11.04.2014 15:06 | <input checked="" type="checkbox"/> |

Below the table, there are three buttons: "System Start", "System Stop", and "Refresh". The footer of the page displays the text "ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2" and a row of buttons: "Logout", "Help", "Info", "Cancel", and "Apply".

The columns of the configuration page have the following meaning:

### "Enabled"

Usually both processes are activated. This default configuration should only be changed for locating problems after consultation of the support team.

### "Applic Name"

The Name of both IWU processes are displayed here.

**"Status"**

In this column the states of the IWU processes are displayed ("Stopped", "Started" or "Running").

**Up since**

Displays the time the service was started lastt

**"Service"**

Usually both services are activated which means that the corresponding process is started automatically after rebooting the BSIP.

## Configuration reference

“CLC” Configuration (Server-IWU, MGW-IWU)

### 4.14 “CLC” Configuration (Server-IWU, MGW-IWU)

If a Server based IWU for application type Server-IWU or MGW-IWU is used, a specific license is needed. Without a valid license, the HPCIP System will be not functional.

**Hint:** The MAC address of the SERVER may be found in the output of "Version System" on WBM page "Administration".

The screenshot displays the UNIFY HiPath Cordless IP administration interface. The top navigation bar includes tabs for Administration, Network, SIP, Media Gateways, Group, User, Dect, Debugging, Status, System, and CLC. The CLC tab is selected, showing a table of licenses and a configuration section at the bottom.

| product name          | feature name | used licenses | available licenses | Status                    |
|-----------------------|--------------|---------------|--------------------|---------------------------|
| HiPath_Cordless_IP V1 | Server       | 100           | 100                | grace period, 7 days left |
| HiPath_Cordless_IP V1 | Basestation  | 12000         | 12000              | grace period, 7 days left |

Below the table, there is a section for CLA (Central License Administration) settings:

- Use local CLA: ☒
- Remote CLA Ip:
- Buttons: Refresh, Load License

At the bottom of the page, there is a status bar with the text: "ApplicType=MGWIWU UserType=UnifyAdmin Active System=2 Hardware=2". Navigation buttons (Logout, Help, Info, Cancel, Apply) are located at the bottom right.

The columns of the table have the following meaning:

#### product name

This column displays the product name of the license option (e.g. "HiPath\_Cordless\_IP V1").

#### feature name

This column displays the name of the license option (e.g. "Server" or "Basestation").

### **used licenses**

This column displays the currently used number of license units of the corresponding license option.

### **available licenses**

This column displays the currently available number of license units of the corresponding license option.

### **Status**

This column displays the license state of the corresponding license option. Possible states are "failure", "grace period", "grace period, %d days left", "valid", "valid, %d days left", "failover".

The options in the lower part of the configuration page have the following meaning:

### **Use local CLA**

If this option is enabled, the license file will be loaded and stored on the IWU.

If this option is disabled, a remote license server ("Remote CLA") may be configured as license server.

### **Remote CLA Ip:**

If option "Use local CLA" is disabled, the IP address for the remote license server (from which the IWU gathers license information) may be configured here.

### **[Refresh]**

A click of in on this button refreshes the display of all values.

### **[Load License]**

If option "Use local CLA" is enabled, the license file may be uploaded via a file save dialog and stored locally on the IWU.

Further details regarding the CLC configuration may be found in:

- [Section 5.29, “CLC Implementation Details”](#)
- Section 2.5 “Software License Management” of the HiPath Cordless IP, Service Documentation.

## 5 Feature descriptions

### 5.1 SNMP

#### 5.1.1 SNMP - General

SNMP (Simple Network Management Protocol) is used by the HPCIP system mainly to detect overload situations of the system. These may be queried by a SNMP Server (SNMP MIB - Management Information Base) or may be signaled by the IWU (SNMP Trap). Furthermore, the MIBs and traps of the OS (LINUX - openwrt) may be used - but are provided "as is".

The implementation uses SNMP version 2 with fixed ports. For the HPCIP system, a specific MIB file is available. The Name of the used MIB is "HPCIP-MIB". Traps are delivered as traps defined by SNMP V1. All MIBs are read-only; read-write is not supported.

The IWU provides besides SNMP values and tables (which may be queried with a SNMP manager) also SNMP traps which are signaled to a SNMP management system which IP address has to be configured in the WBM of the IWU. These traps are sent only if a IP address for a SNMP server has been configured.

Since a lot of data has to be queried by the IWU for each SNMP request, this will lead to a high system load of the IWU (especially on a BSIP-IWU), a special mechanism was implemented to refresh the tables only if needed. Therefore, a specific SNMP value has to be queried by the SNMP management system to trigger the actualization of the SNMP tables by the IWU.

#### 5.1.2 SNMP - Application mode differences

Server-IWU and BSIP-IWU deliver basestations specific MIBs and traps.

MGW-IWU delivers additional (besides the basestation specific information) MGW specific MIBs and traps. Therefore, MGW-IWU systems deliver more SNMP information.

**Hint:** All three IWU types (BSIP-IWU, Server-IWU and MGW-IWU) use the same MIB.



### 5.1.3 SNMP Tree View (all IWU modes)

```

+--hpcipMib(36378)
|
+--bsipMibs(1)
|   |
|   +--bsipStatistics(1)
|   |   |
|   |   +-- -R-- String      bsipStatistics-Version(1)
|   |   +-- -R-- Integer32 bsipStatistics-MgwIndex(2)
|   |   |
|   |   +--bsipStatistics-01(3)
|   |   |   |
|   |   |   +--bsEntry01(1)
|   |   |   |   |
|   |   |   |   Index: bsIndex-01
|   |   |   |   |
|   |   |   |   +-- -R-- Integer32 bsIndex-01(1)
|   |   |   |   |   |
|   |   |   |   |   Range: 0..32000
|   |   |   |   |   |
|   |   |   |   |   +-- -R-- String      bsFrom-01(2)
|   |   |   |   |   +-- -R-- String      bsTo-01(3)
|   |   |   |   |   +-- -R-- String      bsRPN-01(4)
|   |   |   |   |   +-- -R-- String      bsMAC-01(5)
|   |   |   |   |   +-- -R-- String      bsName-01(6)
|   |   |   |   |   +-- -R-- String      bsOVL70-01(7)
|   |   |   |   |   +-- -R-- String      bsOVL100-01(8)
|   |   |   |   |   +-- -R-- String      bsRoaming-01(9)
|   |   |   |
|   |   |   +--bsipStatistics-02(4)
|   |   |   |   |
|   |   |   |   +--bsEntry02(1)
|   |   |   |   |   |
|   |   |   |   |   Index: bsIndex-02
|   |   |   |   |   |
|   |   |   |   |   +-- -R-- Integer32 bsIndex-02(1)
|   |   |   |   |   |   |
|   |   |   |   |   |   Range: 0..32000
|   |   |   |   |   |   |
|   |   |   |   |   |   +-- -R-- String      bsFrom-02(2)
|   |   |   |   |   |   +-- -R-- String      bsTo-02(3)
|   |   |   |   |   |   +-- -R-- String      bsRPN-02(4)
|   |   |   |   |   |   +-- -R-- String      bsMAC-02(5)
|   |   |   |   |   |   +-- -R-- String      bsName-02(6)
|   |   |   |   |   |   +-- -R-- String      bsOVL70-02(7)
|   |   |   |   |   |   +-- -R-- String      bsOVL100-02(8)
|   |   |   |   |   |   +-- -R-- String      bsRoaming-02(9)
|   |   |   |   |
|   |   |   |
|   |   |   +--bsipStatistics-03(5) - bsipStatistics-13(15) omitted
|   |   |
|   |   +--bsipStatistics-14(16)
|   |   |   |
|   |   |   +--bsEntry14(1)
|   |   |   |   |
|   |   |   |   Index: bsIndex-14
|   |   |   |   |
|   |   |   |   +-- -R-- Integer32 bsIndex-14(1)
|   |   |   |   |   |
|   |   |   |   |   Range: 0..32000
|   |   |   |   |   |
|   |   |   |   |   +-- -R-- String      bsFrom-14(2)
|   |   |   |   |   +-- -R-- String      bsTo-14(3)
|   |   |   |   |   +-- -R-- String      bsRPN-14(4)
|   |   |   |   |   +-- -R-- String      bsMAC-14(5)
|   |   |   |   |   +-- -R-- String      bsName-14(6)
|   |   |   |   |   +-- -R-- String      bsOVL70-14(7)
|   |   |   |   |   +-- -R-- String      bsOVL100-14(8)
|   |   |   |   |   +-- -R-- String      bsRoaming-14(9)
|   |   |   |
|   |   |
|   +--bsipTraps(2)
|   |   |
|   |   +--trBsipOnlineState(1)
|   |   +--trBsipSyncState(2)
|   |   +--trBsip100v1100(3)
|   |

```

```

+--trBsip(4)
|
+-- -R-- String      trBsipMAC(1)
+-- -R-- String      trBsipName(2)
+-- -R-- String      trBsipEvent(3)
+-- -R-- String      trBsipSeverity(4)

+--mgwMibs(3)
|
+--mgwStatistics(1)
|
+-- -R-- String      mgwStatistics-Version(1)
|
+--mgwStatistics-01(2)
|
+--mgwEntry01(1)
|   Index: mgwIndex-01
|
+-- -R-- Integer32   mgwIndex-01(1)
|   Range: 0..32000
+-- -R-- String      mgwFrom-01(2)
+-- -R-- String      mgwTo-01(3)
+-- -R-- String      mgwMgwIndex-01(4)
+-- -R-- String      mgwMAC-01(5)
+-- -R-- String      mgwName-01(6)
+-- -R-- String      mgwOVL70-01(7)
+-- -R-- String      mgwOVL100-01(8)

+--mgwStatistics-02(3)
|
+--mgwEntry02(1)
|   Index: mgwIndex-02
|
+-- -R-- Integer32   mgwIndex-02(1)
|   Range: 0..32000
+-- -R-- String      mgwFrom-02(2)
+-- -R-- String      mgwTo-02(3)
+-- -R-- String      mgwMgwIndex-02(4)
+-- -R-- String      mgwMAC-02(5)
+-- -R-- String      mgwName-02(6)
+-- -R-- String      mgwOVL70-02(7)
+-- -R-- String      mgwOVL100-02(8)

Hint: Output of mgwStatistics-03(4) - mgwStatistics-13(14) omitted
. . .
|
+--mgwStatistics-14(15)
|
+--mgwEntry14(1)
|   Index: mgwIndex-14
|
+-- -R-- Integer32   mgwIndex-14(1)
|   Range: 0..32000
+-- -R-- String      mgwFrom-14(2)
+-- -R-- String      mgwTo-14(3)
+-- -R-- String      mgwMgwIndex-14(4)
+-- -R-- String      mgwMAC-14(5)
+-- -R-- String      mgwName-14(6)
+-- -R-- String      mgwOVL70-14(7)
+-- -R-- String      mgwOVL100-14(8)

+--mgwTraps(4)
|
+--trMgwControlOnlineState(1)
+--trMgwSignalOnlineState(2)
+--trMgwOvl100(3)
|

```

```

+--trMgw(4)
|
+-- -R-- String      trMgwIndex(1)
+-- -R-- String      trMgwMAC(2)
+-- -R-- String      trMgwName(3)
+-- -R-- String      trMgwEvent(4)

```

#### 5.1.4 SNMP MIB Tree (MGW-IWU mode, {Root-OID}.1)

The "Root-OID" is assigned the OID 1.3.6.1.4.1.36378.

All MIBS ("bsipMibs") are located inside the OID {Root-OID}.1.n

##### 5.1.4.1 bsipStatistics-Version ({Root-OID}.1.1.1)

This MIB has a dual purpose function:

- **BSIP-IWU and Server-IWU:**  
This value (Integer) has to be queried by a SNMP manager to refresh the content of the IWU counters into the SNMP counter tables.
- **MGW-IWU:**  
This value (Integer) has to be queried by a SNMP manager to reset the MgwIndex to 0.  
The Index for the MGW may be incremented by querying the bsipStatistics-MgwIndex value (see below).  
The SNMP object name is "bsipStatistics-Version", the OID is {Root-OID}.1.1.1.

##### 5.1.4.2 bsipStatistics-MgwIndex ({Root-OID}.1.1.2)

This MIB has a dual purpose function:

This value (Integer) has to be queried by a SNMP manager to

- **increment the MGW index** (and initiates a wrap-around of the index if necessary) and to
- **refresh the content** of the IWU counters into the SNMP counter tables.

The SNMP object name is "bsipStatistics-MgwIndex", the OID is {Root-OID}.1.1.2.

#### 5.1.4.3 bsipStatistics-nn ({Root-OID}.1.1.n (n=3 ... 16))

The SNMP MIBs provide statistical data of the IWU (one table per day) to retrieve them by SNMP queries. A maximum of 14 statistical counter tables for the current and the last 13 days are stored. Therefore one table holds the data for the current time period (current day), the other tables provide data for the last 13 days.

The naming conventions of the SNMP values according the OID (Object Identifier) is composed as follows:

The table with the **current period of time** is assigned the relative OID .3 ({Root-OID}.1.1.3).

The table of the **last day** is assigned the relative OID .4 ({Root-OID}.1.1.4).

The table of the **day before yesterday** is assigned the relative OID .5 ({Root-OID}.1.1.5) and so on.

| Value     | Type | Description  |
|-----------|------|--|
| bsFrom    | Text | Date/time/reason of start of the current MIB table   |
| bsTo      | Text | Date/time/reason of stop of the current MIB table  |
| bsRPN     | Text | RPN of the associated BSIP   |
| bsMAC     | Text | MAC address of the associated BSIP   |
| bsName    | Text | Name of the associated BSIP  |
| bsOVL70   | Text | This counter indicates how often 70% or more of the available channels of the MGW had been occupied  |
| bsOVL100  | Text | This counter indicates how often 100% of the available channels of the MGW had been occupied   |
| bsRoaming | Text | This counter indicates how often a roaming process (location event of a handset without an active connection) have been indicated at the associated BSIP.<br>Hint: Handover events (Inter-cell handover during an active call) are not considered by this counter. |

#### 5.1.5 SNMP Trap Tree (All IWU modes, {Root-OID}.2)

The "Root-OID" is assigned the OID 1.3.6.1.4.1.36378.

All TRAPS ("bsipTraps") are located inside the OID {Root-OID}.2.n

All SNMP TRAPS contain several data which are described here.

#### 5.1.5.1 trBsipOnlineState ({Root-OID}.2.1)

| Value       | Description   |
|-------------|---|
| Name        | trBsipOnlineState   |
| OID         | {Root-OID}.2.1  |
| Description | This trap is triggered if a BSIP-ONLY changed its state (Online, Offline) |

| Value          | Description   |
|----------------|---|
| trBsipMAC      | MAC address of the associated BSIP                  |
| trBsipName     | Name of the associated BSIP                         |
| trBsipEvent    | Possible events are: <b>ONLINE</b> , <b>OFFLINE</b> |
| trBsipSeverity | The assigned severity value is "1"                  |

#### 5.1.5.2 trBsipSyncState ({Root-OID}.2.2)

| Value       | Description  |
|-------------|--|
| Name        | trBsipSyncState  |
| OID         | {Root-OID}.2.2   |
| Description | This trap is triggered if a BSIP-ONLY changed its sync state (InSync, OutOfSync) |

| Value          | Description   |
|----------------|---|
| trBsipMAC      | MAC address of the associated BSIP                    |
| trBsipName     | Name of the associated BSIP                           |
| trBsipEvent    | Possible events are: <b>InSync</b> , <b>OutOfSync</b> |
| trBsipSeverity | The assigned severity value is "2"                    |

#### 5.1.5.3 trBsip10Ovl100 ({Root-OID}.2.3)

| Value       | Description  |
|-------------|--|
| Name        | trBsip10Ovl100   |
| OID         | {Root-OID}.2.3   |
| Description | This trap is triggered, if the <b>OVL100</b> counter has been triggered for <b>more than 10 times within the current day</b> . |

| Value          | Description                        |
|----------------|------------------------------------|
| trBsipMAC      | MAC address of the associated BSIP |
| trBsipName     | Name of the associated BSIP        |
| trBsipEvent    | Possible events are: <b>OVL100</b> |
| trBsipSeverity | The assigned severity value is "2" |

### 5.1.6 SNMP MIB Tree (MGW-IWU mode, {Root-OID}.3)

The "Root-OID" is assigned the OID 1.3.6.1.4.1.36378.

All MGW-IWU specific MIBS ("mgwMibs") are located inside the OID {Root-OID}.3.n

#### 5.1.6.1 mgwStatistics-Version ({Root-OID}.3.1.1)

This value (Integer) has to be queried by a SNMP manager to refresh the content of the IWU counters into the SNMP counter tables.

The SNMP object name is "mgwStatistics-Version", the OID is {Root-OID}.3.1.1.

#### 5.1.6.2 mgwStatistics-nn ({Root-OID}.3.1.n (n=2 ... 15))

The SNMP MIBs provide statistical data of the IWU (one table per day) to retrieve them by SNMP queries. A maximum of 14 statistical counter tables for 14 days are stored. Therefore one table holds the data for the current time period (current day), the other tables provide data for the last 13 days.

The naming conventions of the SNMP values according the OID (Object Identifier) is composed as follows:

The table with the current period of time is assigned the relative OID .2 ({Root-OID}.3.1.2).

The table of the last day is assigned the relative OID .3 ({Root-OID}.3.1.3).

The table of the day before yesterday is assigned the relative OID .4 ({Root-OID}.3.1.4) and so on.

| Value       | Type    | Description   |
|-------------|---------|---|
| mgwIndex-nn | Integer | MIB internal index of the MGW                             |
| mgwFrom-nn  | Text    | Date/time/reason of <b>start</b> of the current MIB table |
| mgwTo-nn    | Text    | Date/time/reason of <b>stop</b> of the current MIB table  |

| Value          | Type | Description  |
|----------------|------|--|
| mgwMgwIndex-nn | Text | Index of the belonging MGW   |
| mgwMAC-nn      | Text | MAC address of the associated MGW  |
| mgwName-nn     | Text | Name of the associated MGW   |
| mgwOVL70-nn    | Text | This counter indicates how often <b>70%</b> or more of the available channels of the MGW had been occupied |
| mgwOVL100-nn   | Text | This counter indicates how often <b>100%</b> of the available channels of the MGW had been occupied        |

### 5.1.7 SNMP Trap Tree (MGW-IWU mode, {Root-OID}.4)

The "Root-OID" is assigned the OID 1.3.6.1.4.1.36378.

All TRAPS ("mgwTraps") are located inside the OID {Root-OID}.4.n

All SNMP TRAPS contain several data which are described here.

#### 5.1.7.1 trMgwOnlineState ({Root-OID}.4.1)

| Value       | Description   |
|-------------|---|
| Name        | trMgwControlOnlineState   |
| OID         | {Root-OID}.4.1  |
| Description | This trap is triggered if the MGW Control Connection changes its state (Online, Offline). |

| Value      | Description   |
|------------|---|
| trMgwIndex | Index of the associated MGW                         |
| trMgwMAC   | MAC address of the associated MGW                   |
| trMgwName  | Name of the associated MGW                          |
| trMgwEvent | Possible events are: <b>ONLINE</b> , <b>OFFLINE</b> |

#### 5.1.7.2 trMgwSyncState ({Root-OID}.4.2)

| Value       | Description   |
|-------------|---|
| Name        | trMgwSignalOnlineState  |
| OID         | {Root-OID}.4.2  |
| Description | This trap is triggered if the MGW Signaling Connection changes its state (Online, Offline). |

| Value      | Description   |
|------------|---|
| trMgwIndex | Index of the associated MGW                         |
| trMgwMAC   | MAC address of the associated MGW                   |
| trMgwName  | Name of the associated MGW                          |
| trMgwEvent | Possible events are: <b>ONLINE</b> , <b>OFFLINE</b> |

#### 5.1.7.3 trBsip10Ovl100 ({Root-OID}.2.3)

| Value       | Description  |
|-------------|--|
| Name        | trMgwOvl100  |
| OID         | {Root-OID}.4.3   |
| Description | This trap is triggered, if the <b>OVL100</b> counter for the MGW has been triggered. |

| Value      | Description                        |
|------------|------------------------------------|
| trMgwIndex | Index of the associated MGW        |
| trMgwMAC   | MAC address of the associated MGW  |
| trMgwName  | Name of the associated MGW         |
| trMgwEvent | Possible events are: <b>OVL100</b> |



## 5.2 DHCP

Due to the specific architecture of the HPCIP system, some special conditions have to be considered for the design of the DHCP functionality.

- In contrast to common VoIP phones (which are equipped with a local console - keypad and display), the BSIP has no local Console access. In case of IP configuration errors (e.g. due to a incorrectly configured DHCP server), if the WBM of the BSIP-IWU is not accessible anymore there is no possibility to correct the error by changing the IP configuration locally.
- In contrast to common VoIP phones (which only have one registration at the PBX), the HPCIP registers several users at the PBX. Errors in the IP configuration of the IWU impact ALL user registration of the IWU.

Taking all the circumstances into account, the implementation of the DHCP client at the IWU was realized in the following way:

- The Default state of DHCP is disabled.
- The DHCP client at the HPCIP-IWU cyclically send a DHCP Request.
- DHCP may only be activated for the Infrastructure network. The IP configuration of the DECT network has to be done manually with a fixed IP address.
- If the DHCP client received a valid DHCP lease from a DHCP server, these values will overwrite the manual IP configuration of the infrastructure network.

### 5.2.1 Implementation Detail for Deactivated DHCP

If DHCP configuration was deactivated when the system booted, the following rules apply.

- The manual configured IP configuration will be used
- After selecting the option [Network State], from the dropdown of [EULA/Info] and by committing it via the [OK] button, a DHCP request will be initiated. The result of the request will be displayed (after a specific timeout) in the output window, independently of the DHCP state (enabled or disabled)
- If the DHCP request has been answered by a DHCP server (DHCP LEASE) the assigned values are displayed, otherwise a timeout message will appear.
- Possible resulting differences between the last IP configuration values and the new values are marked specially.
- For the IP changes to come in effect, a reboot of the IWU is required

- After initiating a reboot process by clicking the [Reboot] button, a new DHCP request will be issued. If new values have been assigned meanwhile, these values are displayed. This ensures, that that the current assigned values are printed out at the WBM.
- If the DHCP flag has been toggled to enabled, and a DHCP REQUEST was successful, the newly assigned IP address values are stored inside the configuration.
- Activating the DHCP flag disables the editing of the manual values
- **Important Note:** All DHCP settings (as well as the manual IP settings) apply to the active system partition.

## 5.2.2 Implementation Detail for Activated DHCP

If DHCP configuration was activated when the system booted, the following rules apply.

### During the start up phase of BSIP-IWU

- The DHCP client automatically starts and emits a DHCP REQUEST
- If the DHCP client receives a positive acknowledge within a specific period of time (response time), the assigned IP configuration will be applied to the IWU.
  - ip address and netmask
  - default gateway
  - primary and secondary DNS server (theses will override locally configured addresses)
- If no DHCP server responds within the response time then, the last stored IP configuration will be applied to the IWU
- The output of the [Network state] displays the results of the last DHCP REQUEST

### During the operation mode of BSIP-IWU

- Refer to the procedures described before (after applying network state)

## 5.3 Ethernet Synchronization (acc. IEEE1588)

Towards an Ethernet based Synchronization (acc. IEEE1588, PTP Precious Time Protocol) great demands are made on Ethernet characteristics like symmetry, packet loss, delay, jitter (variation of delay). Therefore special requirements regarding the Ethernet components (especially the Ethernet switches used) have to be considered. Exceeding of limits (especially of jitter) will lead to loss of synchronization, which will finally lead to a resynchronization process. During this process the belonging Base Stations are unable to establish telephony connections.

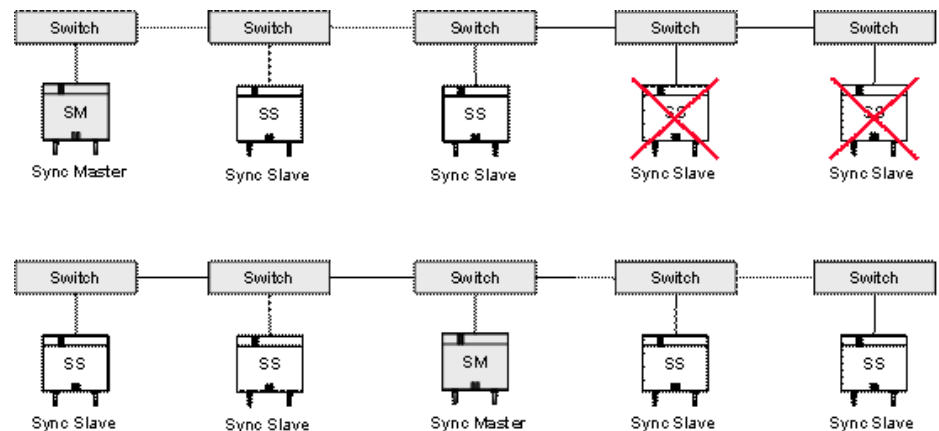
The Synchronization according Ethernet solely uses a star shaped topology. Maximally one Base Station (BSIP-Only) serves a Synchronization Master (Sync Master), all other Base Station which participate at the synchronization serve as Synchronization Slaves (Sync Slave).

### Resynchronization

The DECT functionality of all BSIP, which are configured as IEEE1588 Sync Slaves, depends on the availability of the IEEE1588 Sync Master. If the Sync Master is not functional (e. g not Online due to Ethernet problems ...), all 1588 sync slaves will go OutOfSync. During this time no telephony is possible.

### General requirements on the Ethernet system

A maximum number of three cascaded Ethernet switches are supported between the Sync Master (SM) and a Sync Slave (SS) BSIP. The following figure illustrates a valid and an invalid setup according the "3 switch hop" rule.



As shown in this figure, also a 5 switch setup may be realized by choosing the correct position of the Sync-Master inside the switch topology.

Only premium class switches, which fulfill the requirements regarding Ethernet synchronization according IEEE1588, are supported. A list of supported switches is documented in the HPCIP Wiki pages at <http://wiki.unify.com>.

## Feature descriptions

### Support for Different RTP Packet Sizes

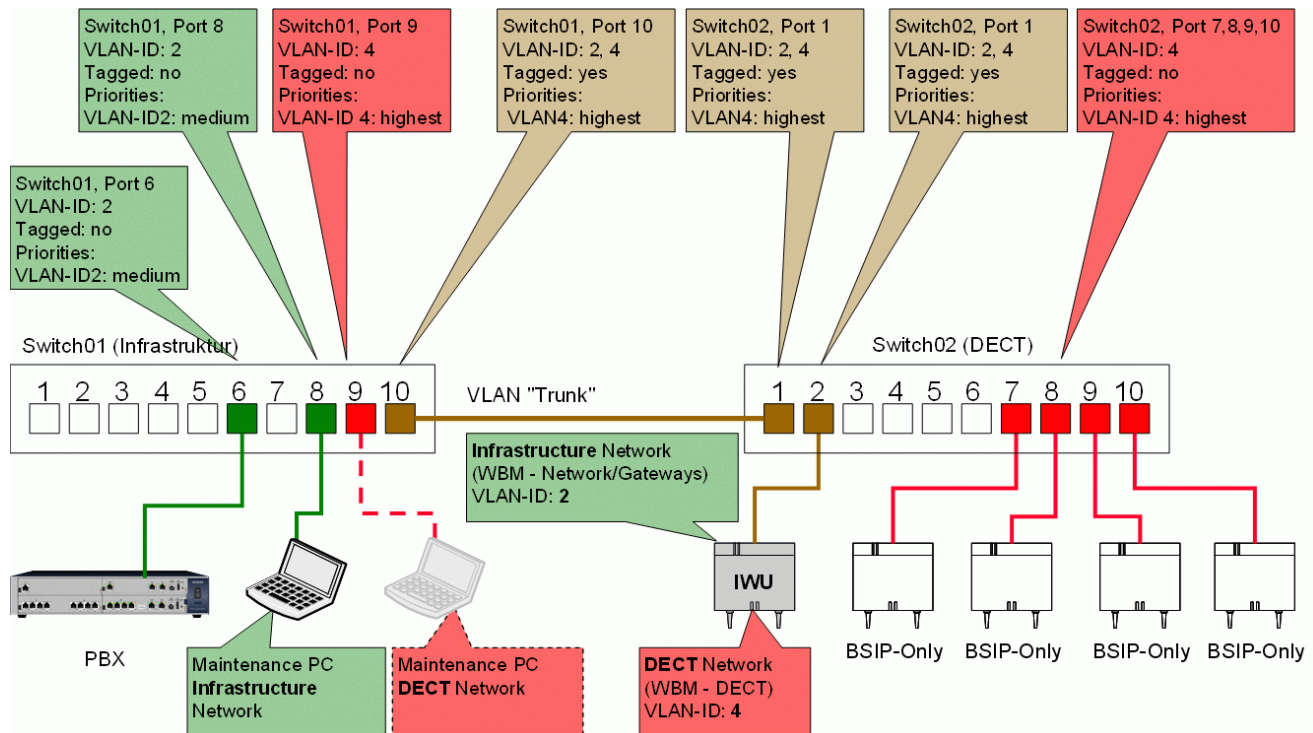
Usage of VLAN at the BSIP-IWU for Infrastructure and DECT network is mandatory. All participating switches have to be configured in a way that the VLAN of the DECT network has to be assigned the highest priority.

A maximum jitter value of 700 nsec should be achieved. higher values will definitely lead to resynchronizations.

If the switch supports L3 features, the L3 function of the relevant switch ports have to be deactivated, since they increase the jitter values.

### 5.3.1 VLAN Configuration Example

The following figure depicts a sample setup of a system which uses Ethernet Synchronization acc. IEEE1588 in combination with VLAN, CoS and multiple switches.



## 5.4 Support for Different RTP Packet Sizes

IP-DECT supports RTP packet sizes of 10, 20 and 30 msec for G.711 a-law, G.711 u-law and G.729ab. The detection of the RTP packet size is based on the received ptm value of the SIP SDP.

The default packet size is 20 msec for the sent ptm value sent by IP-DECT in the SIP SDP for a specific Gateway.

**Hints:**

Restoring configuration files created with version before 3.34.11 will lead to gateway configurations with a default packet size of 20 msec.

For both platforms of IWU, different G.729 Codecs are used. BSIP-IWU uses the "Mindspeed" G.729ab codec; the Server-IWU uses the "ITU" G.729ab codec.

### **5.4.1 Implementation for Incoming Calls towards IP-DECT**

If a ptime equal to 10, 20 or 30 msec is received in the SDP, IP-DECT will use this ptime in the SDP of the outgoing OK and will send the RTP packets using the received ptime, regardless of the configured ptime of its gateway.

If no ptime is received, IP-DECT will send its RTP packets equal to the configured packet size of the corresponding gateway. If the received RTP packets are unequal to 10, 20 or 30 msec, this will lead to halfway or distorted voice connections (no or distorted voice at IP-DECT side).

If a ptime other than 10, 20 or 30 msec is received, this call is rejected with SIP reason "415 Unsupported Media Type".

### **5.4.2 Implementation for Outgoing Calls from IP-DECT**

If a ptime equal to 10, 20 or 30 msec is received in the SDP answer, IP-DECT will send its RTP packets equal to the received ptime packet size of the SDP answer.

If no ptime is received in the SDP answer, IP-DECT will send its RTP packets equal to the configured packet size of the corresponding gateway.

If a ptime other than 10, 20 or 30 msec is received, this call is disconnected with BYE. IP-DECT will send a ptime of 10, 20 or 30 msec equal to the configured packet size of the corresponding gateway (WBM > Network / Gateway > SIP Settings > Packet Size (ms)) in the SDP of the outgoing SIP INVITE.

### **5.4.3 Restrictions**

IP-DECT has built in support for Conferencing. The conferencing feature requires a constant voice data stream from the participants. If one of the participants is using G.729 with activated Silence Compression (G729ab), a constant voice data stream is not assured. This will lead to distorted conferences if one or several of the participants are using G729 with Silence suppression (G729ab).

## Feature descriptions

### Support for Different RTP Packet Sizes

To overcome this situation, it is suggested to Disable the silence compression feature at the local users by Disabling the Option at the users configuration (WBM > User > VoIP (Table) > SC (Silence Compression) - see next chapter).

## 5.5 Codec G.729

### 5.5.1 General G.729 hints

The codec implementation which is used for the HPCIP system uses G.729ab mode (including silence suppression).

Please keep in mind that G.729.ab requires less bandwidth between the IWU and the PBX. As a drawback, the voice quality of G.729ab connection is not as good as compared to G.711 connections. Using G.729ab for voice connections requires more system resources at the IWU. Therefore, the maximum number of parallel connections for the IWU of HPCIP (BSIP-IWU) will lower the maximum number of calls from 10 to a specific value (depending on the number of G.729 and parallel G.711 calls). For details refer to [Section 5.5.2, "Call Control for G.729 Call Limiting \(BSIP-IWU only\)"](#).

In contrast to the BSIP-IWU (which has very limited CPU performance compared with the Server-IWU), on a Server-IWU all 50 calls may be established using G.729.

The codec may be activated on a per-user base (see column "G729" at page User - Voip), even during running system services using the [Edit User] button.

The usage of G.729 codec is mainly intended for low bandwidth connections (WAN). In contrast, G.711 connections are mainly preferred inside the LAN where bandwidth should not be an issue.

Depending on the gateway used, internal calls between two enabled G.729 users are also established with G.729. To overcome this situation the PBX has to control the codec negotiation between different users. The only capable gateway with codec negotiation between SIP subscribers is OpenScapeVoice using the "CAC Codec Manipulation" feature.

Activating codec G.729 extends the codec list (which is used for the SIP SDP), provided that the Call Control feature doesn't alter the codec list.

The codec list excluding G.729 is (in descending priority order):

"G.711a, G.711u"

The codec list including G.729 is (in descending priority order):

"G.729ab, G.711a, G.711u"

Depending on call direction and remote station (especially the G.729 priority) calls are negotiated with the following codecs:

Table - codec negotiation

| <div>Call initiator</div> <div>Call receiver</div> |                    | HCIP                           |                | SIP phone (optiPoint, OpenStage) |                |                               |
|--|--------------------|--------------------------------|----------------|----------------------------------|----------------|-------------------------------|
|  |                    | G.711                          | G.729<br>G.711 | G.711<br>G.729                   | G.729<br>G.711 | G.729<br>exclusive            |
| HPCIP  | G.711              | G.711                          | G.711          | G.711                            | G.711          | Hangup<br>after<br>connect 1) |
|  | G.729<br>G.711     | G.711                          | G.729          | G.729                            | G.729          | G.729                         |
| SIP phone<br>(optiPoint<br>OpenStage)              | G.711<br>G.729     | G.711                          | G.711          |                                  |                |                               |
|  | G.729<br>G.711     | G.711                          | G.729          |                                  |                |                               |
|  | G.729<br>exclusive | No call<br>establishment<br>2) | G.729          |                                  |                |                               |

1) Call Processing receiver is alerting After Connect of B-party call Disconnects.

2) Call Processing receiver is NOT Alerting due to common codec.

### Interoperability with optiPoint 150 S

If using the OP150S with activated G.729, the option "Silence suppression" has to be disabled. Otherwise, the G.729 voice connection between an OP150S and a HPCIP handset will be disturbed.

|               |  |                          |                                  |
|---------------|--|--------------------------|----------------------------------|
| Priority:     | G.72X > G.711A > G.711U                |                          | <input type="button" value="v"/> |
| G.72X Select: | G.729AB                                |                          | <input type="button" value="v"/> |
| G.711U:       | 20 <input type="button" value="v"/> ms | <input type="checkbox"/> | Silence Suppression              |
| G.711A:       | 20 <input type="button" value="v"/> ms | <input type="checkbox"/> | Silence Suppression              |
| G.723:        | 30 <input type="button" value="v"/> ms | <input type="checkbox"/> | Silence Suppression              |
| G.729AB:      | 20 <input type="button" value="v"/> ms | <input type="checkbox"/> | Silence Suppression              |

### 5.5.2 Call Control for G.729 Call Limiting (BSIP-IWU only)

A call control feature has been added limit the number of G.729/G.711 connections at a BSIP-IWU. The limits are adapted dynamically (depending on the number of G.729 and G.711 calls). G.729 requires more CPU resources than G.711 connections.



The Call Control limits the following values:

- Number of calls depending on the actual combination of G.729 and G.711 calls (see codec table below) and
- Limits the codec list to G.711 only, if these values are reached, so further calls are restricted to G.711.

Two call conditions have to be differentiated (see table below):

1. The Maximum Call Limit is reached. No further calls may be established or accepted.
2. A Partial Call Limit is reached. Further calls may only be established or accepted with codec G.711.

#### Handling of Maximum Call Limit

- For an outgoing call (Handset -> PBX) at the handset "Channel occupied" is displayed and a Busy tone is played.
- For an incoming call (PBX -> Handset), the call is refused at the SIP-Interface with a SIP message "503 Service unavailable".

#### Handling of Partial Call Limit

- For an outgoing call (Handset -> PBX), codec G.729 is removed from the codec list at the SIP-Interface in the INVITE message. Therefore the codec list will only include G.711 codecs G.711a and G.711u.
- For an incoming call (PBX -> Handset), codec G.729 is removed from the codec list at the SIP-Interface in the OK message after the Call was accepted at the handset. Therefore the codec list will only include G.711 codecs G.711a and G.711u.
- Depending on the PBX used and the configuration of the remote party (especially for devices which use G.729 exclusively), the call may be not signaled at all or disconnected after the hook-off procedure.

#### Table of Call Control Limits

| Partial Call Limit      |                         | Maximum Call Limit |
|-------------------------|-------------------------|--------------------|
| Max. no. of G.729 calls | Max. no. of G.711 calls | Max. no. of calls  |
| 5                       | 0                       | 5                  |
| 4                       | 1                       | 5                  |
| 3                       | 4                       | 7                  |
| 2                       | 6                       | 8                  |
| 1                       | 8                       | 9                  |
| 0                       | 10                      | 10                 |

**Hint:** The values inside this table are valid for a BSIP-IWU which sync configuration is "No sync", "AIR Slave" or "AIR Master".

#### Examples for call Control Limits

1x G.729 calls and 1 x G.711 call are already active. A further call is limited to G.711, since a possible combination of 6 x G.729 and more than 0 x G.711 calls is not supported (see table).

2x G.729 calls and 2 x G.711 calls are already active. A further call is rejected, since the Maximum call limit (7) for this codec combination is reached.

3x G.729 calls and 2 x G.711 calls are already active. A further call may be established using G.729, since a combination of 5 x G.729 and 2 x G.711 calls is supported (see table).

3x G.729 calls and 5 x G.711 calls are already active. A further call is limited to G.711, since a combination of 4 x G.729 and more than 3 x G.711 calls is not supported (see table).

**Hint:** Running a BSIP-IWU with a high number of BSIP-Only (>5) and a high number of configured users (>30) configured users while having a maximum amount of call established will slow down the WBM interaction. For planned service issues (e.g. re-configuration, adding users or BSIP) it is recommended to schedule these actions in a time frame of low call utilization, since this will improve WBM; interaction.

### 5.5.3 Support for G.729a SDP

IP-DECT supports two variants of the G.729 codec. Besides the existing support of G.729ab (G.729 with silence compression), HPCIP also additionally supports G.729a (G.729 without silence compression).

Besides the existing user specific configuration option for G.729 (WBM > User > VoIP (Table) > G729), an option (WBM > User > VoIP (Table) > SC (Silence Compression)) is available which enables (G.729ab) or disables (G.729a) the silence compression feature. After updating to 3.34.14, existing users have Silence Compression enabled, new users are added with Silence compression disabled due to the issues described in the above chapter.

Disabling the Silence Compression is the suggested for all users which have G.729 activated, since conferences may be distorted otherwise (see section above).

The call limiting feature is not affected for G.729a calls. The same rules apply as for G.729ab.

## 5.6 Timezone Support

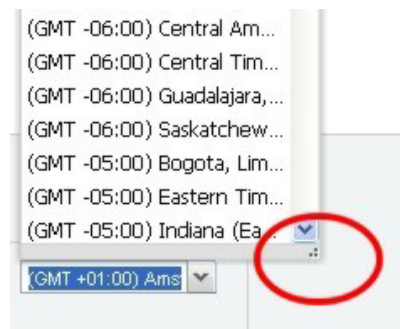
A Timezone may be selected on WBM page Network/Gateways. This Timezone defines the time shift to GMT (Greenwich Mean Time) as well as the parameters for daylight savings. About 75 different time zones are available, which should cover nearly all regions of the world.

The appropriate Timezone for Germany is:

"(GMT +01:00) Amsterdam, Berlin, Rome, Stockholm, Vienna".

### Hints:

- Activating a changed Timezone setting requires a reboot of the IWU. Configuration of a Timezone on a BSIP-IWU is reasonable only in the context of a configured NTP server.
- The width of the Timezone column may be changed by dragging the scale element at the lower right corner (see figure).



## 5.7 SIP Survivability

### 5.7.1 Support of Outbound Proxy

Choosing the outbound proxy option in the HiPath Cordless IP solution means, that all SIP related traffic is routed directly to the outbound proxy, independent from the domain name or IP address that is configured for the SIP server/proxy/registrar.

For each SIP gateway of the HPCIP solution the option "Outbound Proxy" can be activated / deactivated per checkbox.

In case outbound proxy is activated, a valid IP address must be entered in the field "Outbound Proxy" (For this option, the usage of a domain name is not possible).

If the outbound proxy checkbox is unchecked, the IP address in the "Outbound Proxy" field is ignored. In that case the IP address for signaling will be derived from the input in the "SIP server Id" field. If this input is a domain name (FQDN), DNS is used to resolve the domain name. If more than one IP addresses are returned, only the first will be used and the other will be ignored. The DNS request will be repeated each hour (to recognize configuration changes in the network).

If the IP address of the "SIP Server Id" changes after a DNS request, the new IP address will be used for the next Re-Register or if a call setup has failed with a timeout. The Re-Register timer is here 120 seconds.

## 5.7.2 DNS Administration

For system standard name resolution, two DNS Servers are configured system wide ("SYSTEM DNS 1" or "SYSTEM DNS 2") at page Network/Gateway > Servers.

For gateway specific name resolution, the System DNS servers as well as several additional DNS Servers may be configured.

The assignment of a DNS Server to a PBX is accomplished at page Network/Gateway > Survivability.

## 5.7.3 DNS SRV

To use DNS SRV, outbound proxy mode must be deactivated.

DNS SRV will be activated with a checkbox for each "SIP gateway". In that case the input fields for outbound proxy will be ignored. The DNS administration for resolving domain names is the same as described above.

If DNS SRV is activated, the HPCIP uses the fully qualified domain name in the "SIP Server Id" field to send a DNS SRV request for a service (SIP) and the protocol name (UDP).

The answer contains a prioritized list of hosts (FQDN) providing the service. If the hosts are not already resolved to an IP address in the same DNS SRV response, HPCIP needs to perform an "A record lookup" for these hosts.

The DNS SRV request will be repeated each hour. If the DNS response contains a Time-to-live parameter, this value will be used for the refresh timer.

If the HPCIP system detects a failure in the communication with the SIP server, the next IP address in the SIP server record list is used.

In the WBM the status page (Calls Dect) is updated to show the IP address actually used for REGISTER and INVITES (in case of an active call) and the list of SIP server ID addresses resolved with DNS SRV. IP addresses in the penalty box are marked (see output of [Network state]).

The number of IP addresses, that can be used out of a DNS SRV answer, is limited to 5.

**Important note:** If using DNS SRV, the whole system functionality mainly depends on the availability of the configured DNS servers. If the DNS servers are not reachable during start of HPCIP system services, the gateways configured with DNS SRV are not functional at all. If the DNS servers are not functional during a DNS poll cycle, the last DNS list received by the DNS servers is used instead.

### 5.7.4 Penalty Box

If the communication with a SIP server fails (timeout or server error messages), the IP address of this SIP server gets into the penalty box for 10 minutes and the next prior IP address of the DNS server record list is used for registration and call setup. After 10 Minutes the IP address is back for that specific "SIP gateway". This address will be used for each new Re-Register message and for each new INVITE message for all handsets assigned to this "SIP gateway", active calls are not affected. Therefore active calls are disconnected (at least after a RAS\_DOWN event for the user).

**Hint:** The current state of the penalty box may be derived from the output of [Network State] (see [Section 5.7.7, "Survivability Information"](#)).

### 5.7.5 SIP NOTIFY Message in Limited Mode

If the connection between a branch proxy and the OSV fails, the branch proxy turns into limited mode with reduced feature set. To inform the clients in the branch a SIP NOTIFY message is sent to the phones. In the case of HPCIP system there will be no indication in the handsets in idle mode about the limited mode. Since it is necessary in DECT to place a call to write something on the idle screen, performance issues forbid an idle mode display text. In addition the display of a portable handset is not watched regularly, so an idle display text is not really useful. Therefore "Limited Mode" is shown on the display in case of Call setup for incoming or outgoing calls. In case of an active call during reception of the SIP NOTIFY message, no action for that handset take place at all.

If OpenScape Branch OSB goes into survivability mode the OSB sends a Notify message for each phone to the HPCIP server (Event: server-mode-backup). The HPCIP server sends 200 OK back for each NOTIFY message.

When OSB goes back to normal mode another NOTIFY (Event: server-mode-normal) is sent from the OSB for each subscriber and a 200 OK is received for each NOTIFY.

#### 5.7.6 Detection of Failure of SIP Servers

Since HiPath Cordless IP support SIP over UDP only, a failure of the connection to a SIP server is only detected by SIP signaling timeouts (The reception of a SIP 503 response code will not be interpreted as a server failure.). Therefore the detection of a SIP server outage will be detected at latest with the next re-register cycle (default: 120 sec.).

**Hint:** OSV is able to send a "retry-after" value in the REGISTER response message (OpenScape Office and H4K will not do so). Therefore the Re-Register interval may be controlled by the OSV.

## 5.7.7 Survivability Information

The output of [Network State] on page Administration > [EULA/Info] contains important information about SIP Survivability.

### Example output:

```
### Network configurations of HPCIP - Server ###
## ApplicMode Iwu ##
## Network / Gateway settings ##
Ip Address           : 192.168.100.112
Network Mask         : 255.255.255.0
Default Gateway      : 192.168.100.101
DHCP enabled         : FALSE
Dns Server 1         : 192.168.100.226
Dns Server 2         : 192.168.100.227
...
## Gateway ##
001: <                OSOMX3bx> Ip 1 : <192.168.100.230>:5060
002: <                OSOMX1bx> Ip 1 : <192.168.100.226>:5060
003: <                OSV50>  Ip 1 : <192.168.100.204>:5060
004: <                DNS-SRV-GW> Ip 1 : <192.168.100.111>:5060 PenaltyBox
<yes>
004: <                DNS-SRV-GW> Ip 2 : <192.168.100.112>:5060 PenaltyBox
<no>
004: <                DNS-SRV-GW> Ip 3 : <192.168.100.113>:5060 PenaltyBox
<no>
```

## 5.8 Message Waiting Indication (MWI)

Besides the existing functionality of the MWI LED (MWI will be signaled for missed calls), the feature will be enhanced to additionally support voicemail and to signal the presence of new Voicemails. To activate this new feature, two new configuration options are available:

### **Group > [GroupOfHandset] > "VM(VoiceMail) Enabled"**

If this option is enabled, the corresponding menu for VoiceMail of all handset inside the current group (HandsetUI > Call Lists > VoiceMail) will be displayed. Otherwise, the menu is not available at the handset UI and no VoiceMail functionality is available.

### **Group > [GroupOfHandset] > "VM Number (VoiceMail)"**

The extension of the VoiceMail system at the corresponding PBX of the group may be configured here (optional). This number serves for a dual-purpose issue.

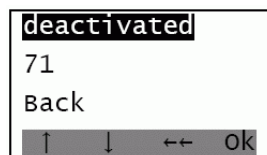
1. It is used for the default CallForward destinations at the handset's UI (HandsetUI > Telephony > Call Forward).
2. It is used further as the default extension, which will be dialed if the user activates the VoiceMail entry inside the missed calls list.

### 5.8.1 Activation of VoiceMail by Call Forward

Using the new functionality for user initiated Call Forwarding, incoming calls at the users handset may be configured independently of the Call Forward setting of the PBX on a per user base at the handset. If the user decides to forward his calls to his Voice Mailbox (or to another number), this is accomplished by using the UI of the handset.

For example, to activate an unconditional CallForward for external calls to the Mailbox, open the handsets service menu by pressing the handsets Center Key on the left and select the following menu.

Telephony > Call Forward > External > Uncondition.CFU



The first entry "deactivated" is selected by default. To change the state to activated, simply press the soft key labeled "Ok". The state changes to "activated". You may leave the menu by pressing the back button ("??") several times or use the red on-hook button.



The number of the VoiceMail system is already available in line 2 of the menu and is preselected with the configured VoiceMail number from the WBM. Normally, there is no need to change this number. Otherwise, select the entry and change the number according your needs. Leave the service menu by pressing the back button.

### 5.8.1.1 Connecting to the VoiceMail Box

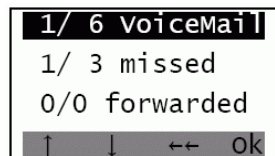
There are three different ways to connect to the voicemail box:

1. Simply dial the number of the Voicemail system as usual.
2. Open the service menu and select Call lists > Voice Mail and press the green off-hook button.
3. If the MWI is blinking, press the MWI button (the service menu Call lists is activated automatically) and select Call lists > Voice Mail and press the green off-hook button.

### 5.8.1.2 Retrieving the number of messages

The IP-DECT system is able to display the number of unread and read messages using the service menu Call Lists.

The first entry in the list displays the number of unread / read messages. Please keep in mind, that not all information is signaled from each PBX. For details, refer to [Section 5.8.1.4, "PBX specific MWI functionality"](#).



#### Hints:

- The corresponding menu for VoiceMail at the handset UI will be displayed only, if the belonging WBM configuration in the handset's group (Group > [GroupOfHandset] > "VM(VoiceMail) Enabled") is enabled.
- If Voicemail is deactivated at the gateway's group, the SIP notifications from the PBX are ignored.
- The MWI LED state (on / off) is solely updated using a silence call to the handset if the associated MWI information (MWI yes/no) has changed. This suppresses needless silent calls to the handset, which otherwise would occupy a DECT channel.

## Feature descriptions

### Message Waiting Indication (MWI)

- The common configuration of Voicemail (Activation and number) is configured exclusively at the WBM. All other user specific configurations are user specific settings which are exclusively configured at the handset's service menu.

#### 5.8.1.3 MWI LED Activation / Deactivation

The MWI LED is activated and deactivated depending on the VoiceMail state and the entries in the missed call lists. The content of the call lists for forwarded and received calls have no influence on the MWI LED.

The MWI LED will be switched on if at least one unread entry (the leftmost entry in the line) in the

- call list "VoiceMail" or
- call list "missed"

is available.

The MWI LED will not be switched off until all unread entries (the leftmost entry in the line) in the

- call list "VoiceMail" and
- call list "missed"

are set to 0.

**Hint:** If the PBX delivers only the Boolean state (yes/no) for voice messages, this will be reflected by setting the number of unread messages in the call list to 1 or 0.

**Important note:** Due to specific issues for the MWI message inside the DECT signaling flow, the MWI state may only be signaled if the handset is alerting for at least two seconds (under normal DECT conditions).

#### 5.8.1.4 PBX specific MWI functionality

##### OSOMX V3R2

OSO sends MWI NOTIFY messages even unsolicited. The NOTIFY message does not include the number of unread/read messages at all. Instead, only the Boolean state (MWI yes/no) will be signaled.

##### OSV

OSV sends MWI NOTIFY messages even unsolicited. The NOTIFY message does not include the number of read messages. Instead, only the number of unread messages will be signaled.

### 5.8.1.5 Technical Background Information

The SIP Subscriber will subscribe to the MWI service using a SIP SUBSCRIBE message. In case, the status of the Message Inbox changes (change of new messages count), the SIP Subscriber will be informed about that change with a SIP NOTIFY message. The NOTIFY message contains two information fields: new message yes/no and the number of unread/read messages (if available). The IWU has to interpret these changes and has to decide, which information has to be signaled to the DECT phone.

## 5.9 Enhanced Display Information

During the alerting phase and the connected state of an incoming call, the name of the caller is displayed on the handset.

Since several names may exist for the number, the name is displayed according the following priority order.

1. Local phonebook entry of handset (may be displayed some seconds after another name of priority 2 or 3 - see Technical Background Information)
2. System phonebook entry
3. Display name of SIP message
  1. Display name as delivered from PBX or remote party.
  2. Configured Display Name of user as configured by WBM, if no display of PBX or remote party name is delivered.

### 5.9.1 Technical Background Information

Requesting the local phonebook is an asynchronous process. Therefore, the display name from the local phonebook may be presented after the display of an already available element (system phonebook or SIP display info).

**Note:** LDAP is not used to resolve phone number to names.

## 5.10 Distinctive Ringing

The Distinctive Ringing feature provides the ability for subscribers to hear different ringing indications for internal (within the same PBX) and external calls. This feature permits the subscriber to distinguish internal and external calls based on the melody defined in the handset.

Up to version V1R3 of HPCIP, the differentiation between internal and external ringing was exclusively based upon the length of the calling number (WBM > Group > "InternCallLen). A call which calling number is less or equal to the configured InternCallLen was handled as an Internal call. Therefore, if the InternCallLen is configured to 0, all calls are handled as External calls.

Starting with HPCIP V1R4, the distinctive ringing information of the SIP message is used primarily. If no distinctive ringing information from the SIP message is available, the differentiation is based according the configured InternCallLen.

#### 5.10.1 Technical Background Information

The SIP PBX signals the information about the source of the incoming call (PBX internal, external). This information is coded in the alert-info header. Some platforms use a Bellcore-drx coding, some use the info=alert-internal/external, some use both.

The information about the source is transferred by IWU to the DECT handset, where the information is used to select the ringing tone.

Example for a combined info:

##### **Internal call**

Alert-Info: <Bellcore-dr1>;info=alert-internal

##### **External call**

Alert-Info: <Bellcore-dr2>;info=alert-external

**Hint:** OpenScape Branch doesn't send distinctive ringing information.

## 5.11 "3 Party Call Control" (3PCC)

3rd party call control (3PCC) will be used for CTI applications where a call may be dialed from the CTI software on the PC instead of dialing from the handset directly. Therefore, a CTI client is needed which is supported by the PBX. Examples for CTI clients are myPortal for OSO and OpenScape WebClient for OSV.

To use CTI software, no specific configuration at the IWU is needed. The following CTI clients were tested: myPortal for OSO and WebClient for OSV.

### Important note:

The support of HPCIP 3rd party call control (3pCC) feature is limited to

- initiate an outgoing call and to
- release a call.

All other call scenarios, which may be offered by the 3pCC software, may work but are not supported.

When the user initiates a call on his PC, the PBX first establishes a call to the user's phone (incoming call, A-party) with a called ID "system". When the A-party goes off-hook, the call changes the state to an outgoing call and the PBX starts to establish the second call leg to the B-party. When the call is established, all call features for an A-Party call can be used.

In opposition to a standard call scenario (where the calling user initiates an outgoing call), the calling user receives an incoming call from the CTI/PBX first. After the A-user accepts the call, the further call flow and handling of HPCIP doesn't differ from a standard call.

**Important note:** The call to the second user is not established until the A-user accepts the call.

**Hint:** Autoanswer functionality is not supported

|                        |
|------------------------|
| CTI Call In            |
| [Number B]             |
| [Name B]               |
| <b>Reject Tone off</b> |

Incoming CTI Call at A-party

The number of the B-party and (if available) the name of the B-party is displayed. As for a normal incoming call, the functions "Reject" and "Tone off" can be used.

## Feature descriptions

### "3 Party Call Control" (3PCC)

|  |
|--|
| CTI Call out<br>[Number B]<br>[Name B] |
|--|

After the incoming call has been accepted by pressing the green off-hook key, the display switches to the state of an outgoing call.

The further call flow doesn't differ from a standard outgoing call flow.

#### 5.11.1 Technical Background Information

3pCC means using the "late SDP" mechanism. The initial INVITE for call setup does not contain any SDP. In the 200 response the phone signals its SDP and a re-negotiation is needed to negotiate a valid SDP.

For HiPath Cordless IP it is necessary to distinguish an incoming CTI call from a normal incoming call.

A CTI call is identified by the following methods:

- SIP INVITE message without SDP and Header which contains "Alert-Info:<Bellcore-dr3>" (used by OSO)
- SIP INVITE message without SDP and a FROM Header which contains "CTI Assisted" (used by OSV)
- SIP INVITE message without SDP and a Header with "Alert-Info:<Bellcore-dr4>;info=alert-autoanswer" (used by OSO)

An incoming 3pCC call to the A-party is also signaled, when this user already has an active connection (given that CW is configured for the A-user). This enables the A-user to use the CTI software to dial another user, which may then be connected into a conference call or may be transferred.

## 5.12 Call Forward (CF)

Besides the possibility to configure a PBX based call forward, the handset user is given the possibility to activate/deactivate a local call forwarding for the following four cases.

- Call Forward Unconditional (CFU)
- Call Forward Busy (CFB)
- Call Forward No Reply (CFNRy) - (user doesn't respond after a specific amount of time) and
- Call Forward Not Reachable (CFNRc) - handset could not be reached by air, e.g. out of dect area, battery empty, switched off.

All four types further distinguish between internal and external calls, i.e. different forwarding destinations. Therefore, a combination of up to 8 different call forwards may be possible.

The default settings are:

- CFU: default inactive, default CF number: Voicemail number of group (see Group > "VM Number")
- CFB: default inactive, default CF number: Voicemail number of group (see Group > "VM Number")
- CFNRy: default inactive, default CF number: Voicemail number of group (see Group > "VM Number"), default timer: 25 seconds
- CFNRc: default inactive, default CF number: Voicemail number of group (see Group > "VM Number")

All forwarded calls are recorded in the call list of type "forwarded" call at the handsets service menu. An entry in this list contains information about the phone number of the caller which was forwarded, the number of calls the date/time information of the last entry.

The user is able to change the default CF number and the timeout setting for CFNRy. This information is saved on a per user base until the user decides to delete all user specific settings using the service menu.

To activate the Call Forward functionality, it has to be enabled in the WBM on a per group base. Group > [GroupOfHandset] > "CF (CallForward) Enabled"

If this option is enabled, the corresponding menu for CallForward of all handset inside the current group (HandsetUI > Telephony > Call Forward) will be displayed. Otherwise, the menu is not being available at the handset UI and no CallForward functionality is available.

## Feature descriptions

### Call Forward (CF)

#### Hints

- Rejecting a call. If an incoming alerting call (regardless if it is the first call or second call) is rejected by using the Reject soft key, the call is forwarded to the CFB destination if CFB is set to activated. Otherwise, the call is being rejected with SIP reason "603 Decline".
- CFNRy: If the user has activated CallWaiting, the configured values of CFNRy are used, to forward a waiting call after the amount of time if the second call is not answered or rejected.
- The timeout for CFNRy may be configured for values from 0 to 30 seconds. Depending on the PBX used, very short timeouts (e.g. up 4 seconds) may be without functionality. Therefore, it is recommended to use a smallest value of five seconds. To ensure proper functionality, test the call forward functionality afterwards.
- CFNRc: If the called handset does not respond by air within 12 seconds, the call is being forwarded to the CFNRc destination, but not until the 12 seconds have been elapsed.
- All user specific CF settings are stored as part of the backup file. Therefore, a restore of a backup file will overwrite the current user-specific CF settings.
- If a user is added to the IWU and a VoiceMail number for the users group is configured, this number will be used for this user as the default Call Forward destination. Changing the Voicemail number at the WBM later has no influence on the default Call Forward number of already configured users.

### 5.12.1 Technical Background Information

The user specific Call Forward mechanism is handled by the IWU. For a call forward case, the incoming INVITE message will be answered with SIP message 302 MOVED TEMPORARILY. The PBX is responsible to handle the further call forward scenario.



## 5.13 Call Completion (CC)

### 5.13.1 Feature description

The CCBS/CCNR (Call Completion to Busy Subscriber / Call Completion on No Reply) feature provides subscribers the capability to activate an automatic callback if the called endpoint is busy or is not answering an alerting call.

### 5.13.2 WBM configuration

The configuration of CC is accomplished on a group specific base at the WBM.

The CallCompletion feature may be used for busy calls and for calls with no reply. The activation of the feature is accomplished by dialing feature access codes from the calling user's handset. To automate the task of dialing the correct code via the handset UI, the codes have to be configured at the WBM.

WBM > Group > "CC (CallCompletion) Enabled"

WBM > Group > "CCBS MSN (Busy CallCompletion)"

WBM > Group > "CCNRy MSN (NoReply CallCompletion)"

WBM > Group > "CC DeleteAllMsn (CallCompletion)"

If option "CC (CallCompletion) Enabled" is activated, the feature CC is generally activated and the corresponding service menu for CallCompletion (of all handset inside the current group) as well as additional information after a call setup will be displayed.

The codes for Busy, NoReply and DeleteAll CallCompletion are a PBX specific configuration options.

**Hint:** The call flow after the callback call from the PBX is similar to the call of a 3PCC call. When the callback is initiated by the PBX, this call is an incoming call towards the A-party. The A-party has to accept this call and afterwards the call direction turns into an outgoing call.

### 5.13.3 Call description

The calling to another subscriber was not successfully finished. The A-user activates the Callback feature by pressing the "Callback" soft key and afterwards the "Call back" in the service menu.

Monitoring begins and the calling party hears a confirmation announcement (depending on PBX) that the request is received.

## Feature descriptions

### Call Completion (CC)

If the called party did not answer the alerting call (CCNR):

The called party becomes available for callback after initiating some activity on the device, then transitioning to idle state. As soon as the transition to the idle state occurs, (e.g. when the called party goes on hook), the calling party is notified of the called party's availability and receives a recall with Display Information "Call Completion" and the name and number of the called party.

When the calling party answers, a new call to the original destination is dialed automatically.

If the called party was busy (CCBS):

The called party has no notification of the callback request. As soon as the called party goes on hook, the calling party is notified of the called party's availability and receives a recall with Display Information "Call Completion" and the name and number of the called party.

When the calling party answers, a new call to the original destination is dialed automatically.

**Hints:** Depending on the PBX, the calling user can activate more than one callback to different called parties. There is no indication on the calling user phone that a callback is activated. Since the calling parties phone has no information about the activated callbacks, no selective cancelling of specific callbacks is possible. The calling user only can delete all callbacks.

## 5.14 LDAP Phonebook

### 5.14.1 General

The LDAP (Lightweight Directory Access Protocol) feature provides the phone user with the ability to query a centralized Directory Service (such as a Corporate Directory hosted on a remote LDAP server) and to display the directory entries that match the search criteria. It provides the user with a convenient method of finding and using telephone numbers.

The Directory Access feature does not support updating the central directory. The results of the queries are not stored persistently at the phone and queries have to be repeated if the data is needed again.

Since each customer's central (or corporate) directory has its own structure with respect to its data item names, which items can be used in a query and which items can be returned in a response, the phone's user interface and the query and response content has to be adapted to match.

It is the LDAP Server that determines what data is available, and not the phone. The adaptation will be achieved using an "LDAP template" file that defines the item name mappings and the corresponding prompts on the display.

### 5.14.2 Up to 3 Phone Numbers per LDAP Entry

In the version of HCIP up to V1R5, the LDAP phonebook can only contain one phonebook entry for a LDAP user entry. This phonebook number is derived from a fixed LDAP field configured in the LDAP Config file of HCIP. It is not possible to display several phonebook entries for a LDAP user entry. In V1R6, this restriction doesn't apply anymore.

Up to **three different phone numbers entries** (e.g. Mobile, Home, Office, ...) may be used per LDAP entry. The handset will display the phone number entry as well as the assigned phone number itself for each of the three possible entries.

Additionally, each of these three phone numbers may be mapped statically or dynamically.

#### 1. Static LDAP mapping

A static LDAP mapping is used by definition (e.g. the first phone number is Office, the second is Mobile, the third is Home). Each of the 3 phone numbers are mapped to a specific LDAP field (by configuring the LDAP fields in the LDAP Config file; the description of the first, second and third entry is also configured statically in the LDAP Config file). This fixed mapping may not cover situations, where other phone numbers (Mobile2, Secretary, ...) should be used instead of the fixed mapped ones. Therefore, it is possible to use dynamic LDAP mapping.

## 2. Dynamic LDAP mapping

Similar to static mapping, up to three LDAP fields may be configured in the LDAP Config file to retrieve three different phone numbers. To each of the 3 LDAP fields an additional LDAP field may be assigned which holds the name of the phonebook number type (e.g. Home, Office, Mobile2). Therefore, there is no fixed mapping for all LDAP entries as in the static mapping; each LDAP entry may hold its own phone number type. If the LDAP field containing the phonebook number type is empty, the description of the LDAP Config file for this entry will be used instead.

For details refer to [Section 5.14.5.3, "Example for legacy LDAP server with three numbers"](#).

## 5.14.3 Configuration of LDAP server

**LDAP configuration of HPCIP is a three step process:**

1. Configuration of a LDAP server (IP address, authentication credentials and a Poll Timer)  
This data is configured at WBM > Network/Gateway > Servers
2. Configuration of a mapping file, which provides the specific mapping between the LDAP specific fields and the output in the LDAP phonebook.  
This file is created and edited on a separate PC and has to be assigned to a specific LDAP server defined in the previous step by importing this server Config using the WBM.
3. Assigning the LDAP server to a group  
All properties of an LDAP Server are assigned to a users handset by assigning the LDAP server to a group which the user is part of.

**Hints for LDAP configuration:**

- The "LdapServerName" configured in the LdapMapFile and further LDAP specific information will be displayed in the output of the NetworkState in section [ ## LDAP status ##].
- The LDAP map files are stored in the backup file of the IWU.
- The "Poll Timer" option is needed to configure the polling cycle of the LDAP server in seconds which is used to detect an outage of the LDAP server.

### 5.14.3.1 Adding a new LDAP Server

Add a new LDAP Server under WBM > Network/Gateways > Servers > Type: LDAP and configure "IpAddr" and "PollTimer" (in seconds).

**Hint:** General changes in the LDAP Server configuration require a reboot of the IWU (except assigning a LDAP Map file, which may be loaded during running services).

### 5.14.3.2 Assigning a LDAP Map File

To use the LDAP search, a LDAP Map file has to be loaded for the LDAP server. Therefore, select an existing LDAP server and click on button [Import Server Config]. A file open dialog will appear. Browse to the map file you have edited before according your needs and load the file.

**Hint:** The state of the LDAP server may be derived from the output of the NetworkState in section [ ## LDAP status ##].

### 5.14.3.3 Assigning a LDAP Server to a Group

Besides the LDAP map file the further usage of the LDAP phonebook is accomplished on a group specific base at the WBM.

WBM > Group > "LDAP Server"

A LDAP phonebook is made available to the user by assigning the LDAP server to the group the user is belongs to. If a LDAP server is configured for the user, a new service menu (Phonebook) is made available. Depending on the presence of a System phonebook, the LDAP phonebook may be located at the handsets UI under Phonebook > LDAP phonebook or directly under Phonebook.

## 5.14.4 LDAP Map File

### Hints:

- The LDAP configuration files have to be coded in ANSI with LINUX style linebreaks (ASCII 10, LF) or Windows/DOS style linebreaks (ASCII 13, CR + ASCII 10, LF).
- The "LdapServerName" configured in the LDAP MapFile will be displayed in the output of the NetworkState in section [ ## LDAP status ##].
- The LDAP map files are stored in the backup file of the IWU.
- The LDAP map file has to be assigned a file extension of ".conf", e.g. Ldap.conf. Otherwise the file could not be loaded ("Unsupported configuration file format").

Generally, up to three LDAP fields may be configured inside the section [LdapConfigPhoneNum]. At least one section has to be defined to gain the old behaviour of using one LDAP field. Therefore Section 2 and 3 of [LdapConfigPhoneNum] are optional.

**Hint:** It is possible to load an old LDAP Config file in format of V1R5 in V1R6; since HCIP automatically converts the format of V1R5 to V1R6.

The formerly global "PhoneNumberAttrName" now moves to the LDAP specific entry of [LdapConfigPhoneNum].

## 5.14.5 Sample LDAP Configuration File

### 5.14.5.1 Built in LDAP server of OpenScopeOffice (OSO MX)

Starting with V3R2 of OSO, a LDAP server is part of this PBX. Using the local LDAP Server feature of OSO requires a special OSO license of type "OpenDirectory Base".

Please keep in mind, that depending on the string which is configured in field "Name" of the OSO station configuration, different fields in the UC configuration as well as the resulting LDAP fields are mapped. OSO converts the following strings from "WBM > ExpertMode > Station > IPClients > SIP Clients > Name" to the following fields in "WBM > Applications > UC Suite > User Directory > "First Name" AND "Last Name"" as well as the corresponding standard LDAP fields.

#### The LDAP mapping is based onto the following scheme:

##### **1. String in field Station Configuration > "Name" doesn't contain a blank:**

Name (Station Config) > "Last Name" (UC Config)

Example for Name "JohnSmith"

UC > First Name " "

UC > Last Name "JohnSmith"

LDAP > sn "JohnSmith"

LDAP > givenName n/a

LDAP > cn "JohnSmith"

LDAP > DisplayName "JohnSmith"

##### **2. String in field Station Configuration > "Name" contains one blank**

Name (Station Config) > "First Name Last Name" (UC Config)

Example for Name "John Smith"

UC > First Name "John"

UC > Last Name "Smith"

LDAP > sn "Smith"

```
LDAP > givenName "John"
LDAP > cn "Smith,John"
LDAP > displayName "Smith,John"
```

Depending on the configured user name, the LDAP mapping should be adapted to avoid empty LDAP entries (if LDAP field "givenName" is used for "Name" strings without a blank).

The following template takes this behaviour into account and uses two separate LDAP fields ("sn" and "givenName").

### LDAP Server configuration

The defaults credentials of the LDAP Server of OSMX (see OSOMX WBM > Expert Mode > Open Directory Service > Basic settings) are:

User: uid=ldap,dc=web

Password: (as configured at OSO MX)

These credentials have to be configured in the corresponding LDAP server entry under page WBM > Network/Gateway > Servers > [Entry of LDAP Server] > User and Password.

After changing the credentials, a reboot of the HPCIP system is necessary.

### LDAP Config File Example

```
[LdapConfigGlobal]
# LdapServerName - Contains a descriptive name for the LDAP server
LdapServerName                LDAPServerOSO
# LdapSearchRootDN - Contains the DN for the root of the search
LdapSearchRootDN              dc=web
# MaxSearchResultNum - Determines the maximum number of records which should
# be retrieved by the LDAP server
MaxSearchResultNum            20

[LdapConfigPhoneNum]
# Section for a PhoneNumber. Up to three sections of this type may be configured
# PhoneNumberAttrName - Determines the field name the phone number should
# be retrieved from
PhoneNumberAttrName            telephoneNumber

[LdapConfigSearch]
# Description - Informative description for this section
Description                    SearchDescription
# Attribute - Determines the field name for the LDAP search
Attribute                      sn

[LdapConfigDisplay]
# MaxLen - Determines the max. length of string which should be retrieved.
# The allowed len for all "DisplayDescription" fields is 16.
# In case several fields are used, the allowed len may exceed 16 chars.
# In each case, the string is truncated at the handsets to 15 chars.
MaxLen                          7
```

```
# Description - Determines the first field of the search result
Description                               DisplayDescription1
# Attribute - Determines the field name where data should be retrieved from
Attribute                                 sn

# The following section is optional.
# It is only neededd if First Name and Last Name have to be derived from
# different LDAP fields
[LdapConfigDisplay]
MaxLen                                     10
# Description - Determines the second field of the search result
Description                               DisplayDescription2
# Attribute - Determines the field name where data should be retrieved from
Attribute                                 givenName
```

#### 5.14.5.2 Sample for Windows Directory service

```
[LdapConfigGlobal]
LdapServerName                           LDAPServerAD
LdapSearchRootDN                         cn=Users,dc=acme,dc=de
MaxSearchResultNum                       30

[LdapConfigPhoneNum]
# Section for a PhoneNumber. Up to three sections of this type may be configured
PhoneNumberAttrName                       telephoneNumber

[LdapConfigSearch]
Description                               SearchDescription
Attribute                                 cn

[LdapConfigDisplay]
MaxLen                                     15
Description                               DisplayDescription1
Attribute                                 cn
```

#### 5.14.5.3 Example for legacy LDAP server with three numbers

The LDAP admin configures three specific fields for phone number mappings in LDAP; "telephoneNumber", "homePhone" and "mobile".

- The LDAP field "telephoneNumber" holds the **Office number** of the user. The description which is displayed in the HD-display is derived from the LDAP field "officeDescription". This field was configured by the LDAP admin manually. If the field "officeDescription" doesn't contain a value, the HD-display shows "Office" instead.
- The LDAP field "mobile" holds the **Mobile number** of the user. The description which is displayed in the HD-display is derived from the LDAP field "mobileDescription". This field was configured by the LDAP admin manually. If the field "mobileDescription" doesn't contain a value, the HD-display shows "Mobile" instead.



- The LDAP field "homePhone" holds the **Home number** of the user. The description which is displayed in the HD-display is derived from the LDAP field "employeeNumber". This field normally is available in an LDAP directory. If the field "employeeNumber" doesn't contain a value, the HD-display shows "Home" instead.

```
[LdapConfigGlobal]
LdapServerName          LDAPServerIKON
LdapSearchRootDN        dc=ikon-gmbh,dc=local
MaxSearchResultNum      30
```

```
[LdapConfigPhoneNum]
# Section for the first PhoneNumber.
PhoneNumberAttrName      telephoneNumber
PhoneNumberDescriptionAttrName officeDescription
PhoneNumberDescriptionDefault "Office"
```

```
[LdapConfigPhoneNum]
# Section for the second PhoneNumber.
PhoneNumberAttrName      mobile
PhoneNumberDescriptionAttrName mobileDescription
PhoneNumberDescriptionDefault "Mobile"
```

```
[LdapConfigPhoneNum]
# Section for the third PhoneNumber.
PhoneNumberAttrName      homePhone
PhoneNumberDescriptionAttrName employeeNumber
PhoneNumberDescriptionDefault "Home"
```

```
[LdapConfigSearch]
Description              SearchDescription
Attribute                sn
```

```
[LdapConfigDisplay]
MaxLen                  8
Description              DisplayDescription1
Attribute                sn
```

```
[LdapConfigDisplay]
MaxLen                  7
Description              DisplayDescription2
Attribute                givenName
```

**Hint:** The LDAP admin may not only use the three "Office", "Mobile" and "Home" number of an user as in the example above. It is possible to user other numbers instead by writing them in the LDAP field which is configured by the variable "PhoneNumberAttrName" and write the corresponding description of this specific

number inside the LDAP field which is configured by the variable "PhoneNumberDescriptionAttrName". Using this method, up to three different and individual numbers for each LDAP entry may be used.

## 5.14.6 LDAP information

The output of [Network State], section "LDAP status" on page Administration displays further information about the current LDAP status.

| Output of section   | Description   |
|---|---|
| ## LDAP status ##<br># LDAPServerOSO #<br>Ip Address : 192.168.100.30<br>Status : online / data available       | The section contains the name of the LDAP server as defined in the map file.<br>The current IP address of the configured ip address is also shown.<br>Server is Online and data is available.<br>The HPCIP LDAP search is fully functional. |
| ## LDAP status ##<br># LDAPServerOSO #<br>Ip Address : 192.168.100.30<br>Status : online / no data available    | Server is Online but no data is available (e.g. the LDAP Server doesn't deliver LDAP entries due to several possible reasons on the Server side).<br>The HPCIP LDAP search is NOT functional.   |
| ## LDAP status ##<br># LDAPServerOSO #<br>Ip Address : 192.168.100.30<br>Status : offline / no response         | Server is Offline (e.g. the LDAP Server doesn't respond to a LDAP query).<br>The HPCIP LDAP search is NOT functional.   |
| ## LDAP status ##<br># LDAPServerOSO #<br>Ip Address : 192.168.100.30<br>Status : offline / invalid credentials | Server is Offline (e.g. the LDAP authentication couldn't be established due to invalid credentials).<br>The HPCIP LDAP search is NOT functional.  |
| ## LDAP status ##<br>System services not running!   | System services not running.<br>The HPCIP LDAP search is NOT functional.  |
| ## LDAP status ##<br>Ip Address : 192.168.100.30<br>Status : unknown  | System services are running, but no LDAP map file imported.<br>The HPCIP LDAP search is NOT functional.   |

## 5.14.7 Using the LDAP Phonebook

**Hint:** If a Phonebook Prefix (WBM > Group > "Phonebook Prefix") is configured, this prefix is prepended to the Dial String if the Telephone Number contains more digits than the InternCallLen. If the Phone Number is equal or less the InternCallLen, it is treated as an internal number and therefore no prefix is used.

To use the LDAP phonebook, simply open the handsets service menu by pressing the left center key. Inside the service menu, select "Phonebook".

If a system phonebook is configured for the user's group, a further sub-menu will appear. Select "LDAP Phonebook" to open the LDAP phonebook. If no system phonebook is configured, the LDAP phonebook Search Mask is automatically opened. If a system phonebook is configured, select entry "LDAP phonebook".

## 5.14.8 LDAP Entries with Empty Callnumbers

Starting with HCIP V1R6 empty LDAP entries are not displayed anymore. This new behavior affects handsets with SD-display as well as handsets with the new HD-display.

For handsets with SD-display, the LDAP entry of the user is not shown (since only one LDAP field is available in this mode)

For handsets with HD-display, if several LDAP entries are configured, empty entries are simply omitted.

### 5.14.8.1 Wildcard search

To search for all entries, leave the SearchMask empty and select the Softkey "Ok". This will start a LDAP query with a wildcard search mask "\*", which will retrieve a certain amount of LDAP entries. Depending on the LDAP server, using the wildcard search will retrieve the entries in the internal sort order of the LDAP server.

### 5.14.8.2 Specific pattern search

Since the Pattern Search mainly differs between handsets in SD-display and HD-display mode, both methods are described below.

#### Handsets with SD-Display

- **Input of digits**

To search for a specific pattern, enter the search pattern using the alphanumeric keypad. A small cursor is displayed.

Each selection of a digit using the keypad will start a timer of 1 second.

If the next digit is entered using the same keypad button as the last one, before the timer (1 second) expires, the current cursor position will remain (old behavior).

If the next digit is entered using another keypad button as the last one, the cursor will automatically be moved to the next (right) position and the corresponding digit (depending on the number of key presses) will be entered at the current position (new behavior).

If no digit is entered after the timer (1 second) expires, the cursor will automatically be moved to the next (right) position (new behavior).

- **Deletion of digits**

To delete the digit left of the cursor, use soft key "<C".

- **Navigation**

To navigate inside the search string, use the soft keys "<" and ">".

To move the cursor right for entering the next letter, use soft key ">" and press the corresponding alphanumeric keypad multiple times to select the desired letter or digit. (For available digits, refer to [Section 8.5, "Key mappings for Handset menus"](#)).

**Important note:** The IWU appends the wildcard string "\*" to the entry which was configured at the handset. It is not necessary, to type the wildcard letter manually.

To start the search, press soft key "Ok".

As soon as the LDAP server delivers the requested data, the first three entries of the phonebook are displayed. The sort order is determined by the LDAP server.

To navigate step by step, use the Softkeys "?" and "?".

After an entry is selected, it may be dialed directly by pressing the green off-hook key.

Using the soft key "Ok" instead will open the phonebook entry and display the name and phone number. The display entry may be dialed also by pressing the green off-hook key.

#### **Handsets with HD-Display**

To search for a specific pattern, enter the search pattern using the alphanumeric keypad. A small cursor is displayed.

- **Input of digits**

Since the handsets local implemented input method is used, behaviour mainly depends on the handsets implementation.

Each selection of a digit using the keypad will start a timer of 1 second.

If the next digit is entered using the same keypad button as the last one, before the timer (1 second) expires, the current cursor position will remain.

If the next digit is entered using another keypad button as the last one, the cursor will automatically be moved to the next (right) position and the corresponding digit (depending on the number of key presses) will be entered at the current position (new behavior).

If no digit is entered after the timer (1 second) expires, the cursor will automatically be moved to the next (right) position.

- **Deletion of digits**

To delete the digit left of the cursor, use soft key "<C".

- **Navigation**

To navigate inside the search string, use the navigation keypad left and right keys.

To move the cursor right for entering the next letter, use soft key ">" and press the corresponding alphanumeric keypad multiple times to select the desired letter or digit. (The available digits depend on the handsets).

Special functions:

"\*" invokes the table of special characters

"#" toggles between input modes "abc" "Abc" and 123

**Important note:** The IWU appends the wildcard string "\*" to the entry which was configured at the handset. It is not necessary, to type the wildcard letter manually.

To start the search, press soft key "Ok".

As soon as the LDAP server delivers the requested data, the first three entries of the phonebook are displayed. The sort order is determined by the LDAP server. To navigate step by step, use the keypad button up and down..

After an entry is selected, up to three phone numbers may be displayed. Select the designated one by using the keypad buttons up and down. The selected entry it may be dialed directly by pressing the green off-hook key.

## 5.14.9 LDAP: Configuration option for mapping "+" to an IEC

The handsets of HCIP are not able to handle the "+" sign in any case. Therefore, the "+" sign has to be converted into an International Exit Code (IEC) consisting of one or more digits. This mapping is configurable using the option "WBM > SIP > SIP Settings > "IEC (International Exit Code)"".

The mapping is configurable as part of the SIP server configuration. Implementing it as part of the group is not possible, since in a MGW-IWU scenario, the SIP Server may change (by roaming to another MGW) inside the same group.

Valid entries are one or more digits (0-9). Empty entries are not allowed, the default value is "00".

Example: LDAP number "+4989700712345" will be further modified to "004989700712345" if the IEC is configured to "00". The IWU uses this modified dial string for further call handling, which leads to a valid phone number and the storage of the number at the handsets local redial buffer.

**Important notes:** Please keep in mind, that the leading "+" will be replaced by the configured IEC code of. The default IEC of "00" works in Germany (since the international trunk access code here is defined by "00") but may not work in other countries where different international trunk access codes are defined. her a corresponding IEC has to be configured manually.

#### Hints:

- Depending on the customer's configuration, a further trunk access code may be necessary (e.g. "0"). This may be accomplished by configuring the "DialPrefix" at the group page to the needed trunk access code. In the example given above, a LDAP number of "+4989700712345" will be further modified to "0004989700712345".
- A configured "DialPrefix" will be used by both phonebooks at the HCIP:
- The Local System Phonebook as well as the
- LDAP phonebook

## 5.15 M5T SIP Stack

The following table denotes the SIP User-Agent strings of HPCIP in different versions:

| HPCIP Version  | User-Agent String                |
|----------------|----------------------------------|
| V1R3 and older | (Ikon Voip V1.0/[unknown])       |
| V1R4           | ikon Voip M5T SIP Stack/4.1.8.14 |

## 5.16 Call Pickup Group (CPU)

The handsets in a group may be configured as a member of a Call Pickup (CPU) Group. When a call is made from a user (A-party) to one member of the group (B-party), any member of the group (C-party) can answer the call by pressing the group pickup menu item.

The configuration of CPU is accomplished on a group specific base at the WBM.

WBM > Group > "CPU (Call pickup Group) Enabled"

WBM > Group > "CPU Msn (Call pickup Group)"

If option "CPU (Call pickup Group) Enabled" is activated, the feature CPU is generally activated and the corresponding menu for CPU (of all handset inside the current group) will be displayed if necessary.

The MSN for registering to the CPU is a PBX specific configuration option. Please keep in mind, that only those handsets in the "HPCIP" group are signaled, if they are additionally configured as a member of the group at the PBX.

If the state of the pickup group changes from inactive (no handset is ringing) into active (at least one handset is ringing), all other handsets in the group, which are not already occupied, receive a SIP notify and IWU initiates a service call by air.

To signal the pickup call at the C-party handset, the idle display of the C-party handsets changes from displaying the name to "Pickupcall". The handset's service menu will be enhanced by a new entry "Pickupcall". If the C-party user steps into the pickup call menu, the number of the calling A-party is displayed in line 1 and the number of the originally called B-party user is displayed in line 2.

If the Softkey "Ok" or the green off-hook key is pressed, the call will be picked, so the current C-party user will be connected with the A-party. If other C-party handsets also have been signaled a Pickup call, their idle display will be reset to the name by means of service calls.

## 5.17 Call Waiting (CW)

The configuration of CallWaiting (2nd line) is accomplished on a group specific base at the WBM.

WBM > Group > "CW (CallWaiting) Enabled"

If option "CW (CallWaiting) Enabled" is enabled, the feature CW is generally available for the group users and the corresponding menu for CW will be displayed in the handsets service menu. To activate the CW feature at a specific handset, it has to be activated on a per user base first.

### Hints:

- To enable CW at the handset, the feature CallWaiting (2nd line) has to be enabled at the PBX for this user.
- The Call Waiting tone is defined in [Section 8.4.4, "Call waiting tone"](#).

If the CW feature is activated on both the group and at the handset (A-party) and the B-party already have a call established, a further incoming call will be signaled optically on the handsets display as well as acoustically. The Call Waiting tone is defined in [Section 8.4.4, "Call waiting tone"](#).

If the second call is waiting, there are three several possibilities to react onto the second call.

1. Rejecting the waiting call:  
Using the Softkey "Reject" will reject the waiting call.
2. Put the active call on hold and accept the waiting call automatically.  
Use the green on-hook button or the Softkey Menu > "Call accept" to put the A-party call into hold and automatically connect to the waiting call. The further call flow is identically to a held call.
3. Disconnect active call and accept waiting call manually after alert.  
Use the red on-hook button for the Softkey Menu > "Call hangup" to disconnect the active call and manually connect to the waiting call after alert.

#### Hints:

- Call Waiting is signaled at the handset only during an active call to another user. If the user is serving a second call already (e.g. first call was put on hold), the incoming Call Waiting is not signaled. In this case, the handset answers with BUSY.
- An incoming second call, which is not accepted, is added to the call list of missed calls.

## 5.18 System Phonebook

In addition to the local handset phonebook and the LDAP access to a central directory a central System Phonebook on the IWU has been implemented. Using an import interface, a simple CSV file is used to generate a central phonebook on the IWU. The entries of that phonebook are accessible in the same way as the LDAP directory. In contrast to the LDAP phonebook (which is used for outgoing calls solely), the system phonebook is also used to look up names during incoming calls and to display them on the handset.

The configuration of the system phonebook is divided in two different parts:

1. The configuration of a server of type "phonebook"
2. The assignment of this phonebook on a group specific base at the WBM.

#### Server of type phonebook

To create a new phonebook server entry, add an entry of type "phonebook" at page WBM > Network > Group Servers.

**Hint:** The BSIP-IWU supports only one Phonebook. Server-IWU and MGW-IWU support several phonebook servers.

The phonebook data is contained in a phonebook file (see below) which has to be assigned to the phonebook server entry. To accomplish this, select the corresponding phonebook entry at page WBM > Network > Group Servers and load the phonebook file via the button [Load Phonebook].



### Assignment of phonebook to Users

To assign a specific phonebook to a user group, the following options are available:

- WBM > Group > Phonebook Server
- WBM > Group > "Phonebook Prefix"

Using the column "Phonebook Server", one of the configured Phonebook Servers may be assigned to the group. The handsets of the belonging users may use the phonebook in the handsets service menu.

### Hints:

- The System phonebook file is NOT stored in the backup file of the IWU due to the dynamic nature of phonebook changes.
- Depending on the data source the System Phonebook is derived from, the Phone Numbers included may or may not contain a Dial Prefix to dial the PSTN. If the Phone Numbers don't include the Dial Prefix, a Dial Prefix may be added by using the corresponding configuration option (Group > PhonebookPrefix).
- The System Phonebook supports the usage of a Phonebook Prefix. Therefore it is possible to use standard telephone numbers inside the Phonebook without the need of prepending a special Dial Prefix to each number in the import file.
- If a Phonebook Prefix is configured, the Phonebook prefix is prepended to the Dial String if the Telephone Number contains more digits than the InternCallLen. If the Phone Number is equal or less the InternCallLen, it is treated as an internal number and therefore no prefix is used.
- The configured phonebook prefix applies only to the System phonebook and the LDAP phonebook. The handsets local phonebook is not affected by the phonebook prefix.
- A maximum of 400 phonebook entries are supported
- The first line of the Phonebook File will be ignored
- The first column "AbbreviatedDialing" is without functionality
- The maximum number of characters of a phonebook name entry is limited to 30. otherwise, the phonebook import process will not be successful
- The handsets may only display 15 characters of the phonebook name entry

- To delete a phonebook, simply overwrite it with an valid phonebook file with following entries:

```
#  
;0;X
```

#### 5.18.1 Sample Phonebook File

```
# AbbreviatedDial (optional); Phonenumber (mandatory); Name  
(mandatory, max. 30 chars)  
;0731123456789;Clooney George  
;0897007123456;Schiffer Claudia  
;0897007123457;Depp Johnny
```

**Hint:** All Phone Number entries provided in the Phonebook will be dialed the same way; independent of the number of digits in a Phonebook number.

#### 5.18.2 Using the phonebook

To use the phonebook, simply open the handsets service menu by pressing the left center. Inside the service menu, select "Phonebook".

If a LDAP phonebook is configured for the user's group, a further sub-menu will appear. Select "SystemPhonebook" to open the System phonebook.

If no LDAP phonebook is configured, the system phonebook is automatically opened. The first three entries of the phonebook are displayed. The entries are sorted ascending according the entry name.

To navigate step by step, use the Softkeys "▲" and "▼".

To select an entry beginning with a specific letter or digit you may use the alphanumerical keypad. Using the keypad keys will select the first entry in the phonebook list, which matches the corresponding digit. (For possible digits, refer to [Section 8.5, "Key mappings for Handset menus"](#)).

After an entry is selected, it may be dialed directly by pressing the green off-hook key.

Using the soft key "Ok" instead will open the phonebook entry and display the name and phone number. The display entry may be dialed also by pressing the green off-hook key.

## 5.19 RTP Negotiation (Part 1)

HPCIP only supports a RTP packet rate of 20 msec. If SDP parameter don't match to a common size of 20 msec., the call is disconnected by the IWU with SIP reason "415 Unsupported Media Type". In version before V1R4, the call was accepted, but voice data was missing or distorted from remote side to HPCIP.

## 5.20 Dynamic BSIP Changes

Starting with HPCIP V1R4 it is possible to add, remove or replace (e.g. due to service issues) a BSIP during running system services. Therefore, no downtime of the system is necessary if a new BSIP has to be added or an existing BSIP has to be exchanged.

To support these procedures, an additional new functionality is available, which permits to do a firmware update on a single BSIP.

The following new WBM elements are available:

WBM > Dect > Button [Edit module]

WBM > Dect > Button [Replace module]

WBM > Dect > Button [Fw Download]

**Important note:** A BSIP-Only configured as a "1588 Master" cannot be replaced.

**Hint:** Since possible changes in the synchronization history during dynamic changes of base stations are necessary, these may consecutively lead to voice distortion of active calls and possible call disruption for a short period.

### 5.20.1 Dynamic changes ([Edit module])

Similar to changes of VoIP users during running services, DECT modules may be changed using the [Edit module] button. Modules may be enabled or disabled dynamically. All necessary configuration to integrate the module in the running system are possible.

### 5.20.2 Firmware Download to a single BSIP ([Fw Download])

If new modules with older firmware have been added, it is possible to update them individually without the need of updating the whole IWU including all BSIP. As a pre-condition, the BSIP has to be configured with a valid IP configuration. Simply configure an Ip address (and SYNC it if necessary) using the [Edit module]

functionality. Afterwards, select the module and press [Fw Download]. The BSIP will automatically boot into the other partition with the new firmware. If necessary (to ensure the same partition between IWU and BSIP) this process has to be repeated.

### **5.20.3 Replacing module ([Replace module])**

Two use cases may be handled using the process initiated with "[Replace module]":

- A defective or non existing BSIP may be replaced by a new BSIP
- Exchange of 1588 Sync master in the system

#### **5.20.3.1 Procedures for Replacing a BSIP**

##### **Prerequisites**

The new BSIP ("new module") has to

- have the same version as the MGW/IWU
- be active on the same partition as the MGW/IWU
- be disabled

##### **Procedures**

- Add the new module by attaching it to the network and make it available by scanning it using the [SCAN] button.
- To fulfill the prerequisites listed above, use the built in functions "Fw Download" and "Sync" for the new module to prepare this BSIP for further treatment.
- Select the entry of the module which should be replaced ("old module") and press [Replace module]. Now enter the Index number the new module which was newly added.
- The values of the new entry will be replaced with the values of the old module (PARK, MAC, Serial, IP address). The old entry (which was designated for the old module) will be deleted in the list of modules.

**Important note:** After the process of replace module has finished, the new module will have the same IP address as the old module. If the old module is already attached to the network, it has to be detached immediately to avoid the same ip address which definitively will lead to temporarily or constant malfunction of the system (especially, if the module was configured as 1588 master).

### 5.20.3.2 Procedures for Exchanging the 1588 Sync Master

If a BSIP configured as Sync type "1588 master" fails, all other BSIP configured as 1588 Slave will get Out of Sync. Therefore, another BSIP configured as 1588 slave may be reconfigured as 1588 slave. This process will require a stop of the system services.

To overcome the situation of stopping the system services, the reconfiguration of a 1588 slave to the new 1588 master may be accomplished using the replace module process.

#### Prerequisites

Keep in mind, that the maximum number of switch hops (3) between the 1588 master and all 1588 slaves may be changed by this procedure.

Therefore it is suggested to use a BSIP as the new module which is attached at the same switch as the failing 1588 sync master to ensure consistent sync topology and avoid a higher number of switch hops.

#### Procedures

- Edit the designated new 1588 master, disable it and apply the changes
- Select the entry of the module which served as 1588 sync master ("old module") and press [Replace module]. Now enter the Index number of the new module which should become the new 1588 Sync master.
- The values of the new entry will be replaced with the values of the old module (PARK, MAC, Serial, Ip address). The old entry (which was designated for the old module) will be deleted in the list of modules.

**Important note:** After the process of replace module has finished, the new module will have the same IP address as the old module. If the old module is already attached to the network, it has to be detached immediately to avoid the same ip address which definitively will lead to temporarily or constant malfunction of the system (especially, if the module was configured as 1588 master).

## 5.21 Wan Download

Starting with version V1R4, downloading a firmware image over a WAN link is supported. In earlier versions, the download timed out after a period of time and therefore updating over WAN was not possible. Two different setups have to be distinguished but which are supported both.

- **Setup 1:** WAN link is located between the "firmware image" and the maintenance PC/browser
- **Setup 2:** WAN link is located between the maintenance PC/browser and IWU

## Feature descriptions

### SIP over TCP

For Setup 1 (WAN link is located between the "firmware image" and maintenance PC/browser) the IWU has no knowledge about the progress of the file transfer. Therefore a message box will appear until the file transfer to the maintenance PC has been downloaded completely.

For Setup 2 (WAN link is located between the maintenance PC and IWU) a window will display the progress of uploading the firmware file from the maintenance PC/browser to the IWU. The counters reflect the amount of bytes received and the total amount of the file.

## 5.22 SIP over TCP

Starting with HPCIP V1R4, the SIP transport protocol "SIP over TCP" is supported additionally to "SIP over UDP". The SIP signaling transport protocol is configured on a per gateway base. The protocol may be changed at WBM > Network/Gateway > SIP Settings > [Gateway] > "Transport Protocol".

The default value is UDP.

For OSO, use transport protocol UDP.

For OSV, use transport protocol TCP.

### 5.22.1 Reusing SIP TCP Ports

After a stop of the system services, the SIP TCP ports towards the PBX remain connected for about 1 minute by the OS (see output of netstat). If the system services are started (more precise, if the RAS register is starting) if the ports are occupied already, this will lead to an infinite RAS\_DOWN condition (if DNS-SRV is configured, the corresponding PBX will be put in the penalty box). To overcome this situation, wait about 2 minutes between Stop and Start of the system services.

## 5.23 Handset Specific Issues

### 5.23.1 General

- User specific PINs supported.  
The PIN is stored on a per user basis (The user specific PIN is not visible). Therefore, it is possible to change the SystemPIN later without the need to register each handset again (with the new pin). During the update process to V1R4 the global DECT PIN is additionally copied to each user entry.

- Auto entry user are not generated anymore.  
Due to the changes for user specific PIN support, Auto Entry users are not generated anymore.
- SIP Call limiting per user. To protect the SIP stack from bulk SIP signaling messages, the max. number of parallel SIP messages (which would trigger a new call, e.g. INVITE) will be limited to three.
- Service Menu: If the handset is in one of the service menus (e.g. Call List) the menu will be automatically closed by an incoming call and the call is signaled at the handset.

### 5.23.2 Handling of Idle Display

The Idle Display of the handset is updated by using a "silence call" which will occupy a DECT channel. To suppress unneeded silence calls, the Idle Display (including MWI information) is written only if necessary in the new version. If a LOCATION change was signaled by the handset, the idle display will only be refreshed by means of a silent call if the Display information has changed (MWI state or Call Pickup).

Additionally, the silence display is actualized automatically after the handset has been switched OFF. Therefore, the DETACH message of the DECT handset is taken into account. If a DETACH was not detected by the IWU (e.g. after removing the handsets battery or loss of radio), the handsets display is NOT automatically actualized.

All handset displays are automatically also updated after starting the IWU services or changing the user configuration (Edit User).

#### Hints:

- To update the idle display manually, simply open the service menu using the left navigation key at the handset once. No outgoing or incoming call is necessary anymore.
- If the Status Update for an idle display (MWI, Pickup Call, ...) fails, it will be retried for a maximum of five times.. Anyway, a refresh of the idle display may be enforced by invoking the service menu at the handset
- A LOCATION REQUEST of a handset will trigger a refresh of the Idle Display by means of a Silent Call to ensure valid display elements (e.g. MWI status, ...).  
Each Silent Call triggers an ALERT INDICATION and therefore the Roaming counter (Status > CallDect > Roaming) and the Incoming call counter (Status > CallDect Incoming calls) for a user.
- The Idle Display will be actualized by a SWITCH-ON event of the handset (in former versions, an incoming or outgoing call was necessary).

## 5.24 System Startup Procedure

- During system start of the IWU, the DECT modules will be brought ONLINE not until all Voip users are initialized (This is necessary to ensure that each DECT user has its own DECT system PIN for ciphering configured).
- During system start of the IWU, the DECT modules will be brought ONLINE not until 30 seconds since System Stop (This ensures, that the handsets detected the offline event [in that time period] and send a LOCATION Request to the base stations).

## 5.25 Support of Assigned TPUI instead of Default TPUI

Improved support for Dect devices

1. The IP-DECT System starting with V 4.0.16 uses the "Assigned TPUI" instead of "Default TPUI" method.
2. Improved support for 3rd party GAP devices

### 5.25.1 Support of Assigned TPUI instead of Default TPUI

There are two main issues with require the usage of an Assigned TPUI instead of a Default TPUI.

#### 1. Requirement of 3rd party devices

The usage of an Assigned TPUI may be required by some 3rd party Dect devices to be fully interoperable with other DECT systems or HPCIP.

#### 2. Guarantee the uniqueness of TPUI

The Default TPUI (PMID) is built by a prefix ("e") and the last two bytes (4 digits) which are derived from the handsets IPUI. Due to the IPUI assignment scheme, the last two bytes may be used by several handsets. In this case, the uniqueness of TPUI is broken and IP-DECT has to disable those users, which will lead to ambiguous TPUIs. Therefore, these users may not be used for telephony functions at all. The higher the number of handsets used, the higher the probability of ambiguous TPUIs.

Therefore, HCIP permanently uses the "Assigned TPUI" mode starting with V 4.0.16.

**Hint:** The current TPUIs used may be derived from the output of the Capiserver "3dm[module-index] pi" command in column "PMID" (hex value) for connected calls.



Example output (shortened) of a Dect call with Default TPUI (PMID of HS=00A7C043EB):

```
005c0dd2 0 0 0 0 0 162 37 0 0 0 021 1 8 3 --- 0 0 0 0e43eb
```

Example output (shortened) of an Dect call with Assigned TPUI (User Index = 1)

```
005c0dd2 0 0 0 0 0 133 7 0 0 0 020 3 8 3 --- 0 0 0 000001
```

## 5.26 Validation for Uniqueness of PMID and TPUI

The PMID and TPUI will be checked during the "Register", the "Multi Register" process and after updating to this version. The Detection of same PMID or TPUI will trigger a validation Warning or ERROR, depending if the "collision" is based on a differing PMID or IPUI.

| PMID differ        | IPUI differ      |
|--------------------|------------------|
| Validation WARNING | Validation ERROR |

## 5.27 User Search Options (V1R5)

Due to the high amount of users which may be configured at a MGW-IWU (up to 20000), it is neither technically possible nor practically recommended (due to long load times) to display a table inside the WBM with e.g. 20000 rows. Therefore, for display issues at the WBM, the whole table with all entries is separated into several sub-tables with a configurable number of lines per sub-table which will facilitate to step through all entries on a sub-table base.

To minimize the time for finding a specific user entry, search functionality is part of the new concept. Only an exact match search is available. The search parameters are not stored and therefore are lost after a logout of WBM or restart / reboot of MGW-IWU. The search functionality is not intended to filter the user database, instead it is implemented to search and afterwards locate to a specific entry.

### Search functionality

Using the Search functionality, a specific user entry may be located inside the table by selecting the Search Scope Column (the column in which the search should be applied to) and the Search String which should be searched for.

If a search was successful, the first matched entry is displayed at top of the table. If a search was unsuccessful, a message box will inform about this condition.

## Feature descriptions

### User Search Options (V1R5)

If a user is locked by an [Edit user] lock, switching between groups of rows using [previous] and [Next] is not supported.

The search is based on an alphanumeric, case insensitive search with an implicitly. It works on a two step base:

- Initially, all those entries are matched, which contain at least the number of search digits. The search scope is filtered to the digit list.
- Afterwards, the algorithm searches the first entry in the list which is equal or higher than the search filter.

#### Specific search criteria

| Search String | Matched | Not Matched  | Description   |
|---------------|---------|--|---|
| 0             | all     | none   | 0 selects the first user > 0;   |
| 00            | 10      | 1,2,3,...9   | 00 : selects the first user entry >= 0 but with at least two leftmost digits (e.g. 10, 11, 100, ...)    |
| 20            | 20      | 1,2,3,...19; all 1-digit entries are not displayed | 000 selects the first user entry >= 0 but with at least three leftmost digits (e.g. 100, 101, 900, ...) |

The objects in the frame have the following meaning:

#### Search Scope Column

This Dropdown contains all fields (columns) which may be used as the search scope. The search scope is limited to this column.

#### Search String

This textbox contains the string which should be searched. Only a full text match is supported.

#### Search

The search is started using this button.

#### Max Lines

Determines, how much lines should be displayed on one page at maximum. Hint: This limit also applies for both types of tables - the standard table (displaying rows not limited to a search) and the search result table.

#### Step Size

Determines the offset of lines which should be displayed after a [Previous] or [Next] table display is established. If set equal to "Max Lines", the next or previous table will only include other user entries. If set to a values less than "Max Lines", some user entries of the old table are repeated ("Max Lines" - "Step Size") and new entries are displayed ("Step Size").

**Previous**

Displays the next group of rows with an offset of "Step Size".

**Next**

Displays the previous group of rows with an offset of "Step Size".

**Sort functionality**

If a specific user entry was selected while a sort was applied, the selected row will be the first entry in the sorted list.

If no user entry was selected while a sort was applied, the row containing the first sort criteria will be the first entry in the sorted list

If possible, the search will be maintained if switching between subpages.

**Hint:** Combining both Sort and Search functionality is possible

## 5.28 Dect Fundamentals

### 5.28.1 Location Area

In V1R4 and former versions of HPCIP, a fixed Dect LAL (Location Area Length) of 31 was used. Using this LAL value, each base station built its own location area. In case the handset changed its physical location to another base, it initiated a Roaming to the other base station by sending a Dect LOCATION request. For each change of the base, a separate LOCATION was send. If the handset was located between two or several bases, it toggled its roaming area very often by sending a LOCATION request. In large setups, where a high number of handsets are used, these may lead to a unnecessarily high signaling rate of LOCATION request.

In V1R5, the LAL is freely configurable in MGW-IWU mode. The new default LAL is 35, which corresponds to the LAL used on a SLC device on a HiPath 3000/4000 system. Using this LAL, 16 bases are located inside one location area (location segment). The assignment to a specific Location area is specified by the LAL and the RPN use (for details see table below).

For example using LAL=35, RPN 1 ... 15 are located inside the same Location area.

In case the handset changes its physical location from a base to another base inside the current Location area (e.g. from base with RPN 1 to RPN 15) no LOCATION request is sent by the handset; therefore no change of the LOCATION area is established.

## Feature descriptions

### Dect Fundamentals

In case the handset changes its physical location from a base to another base outside the current Location area (e.g. from base with RPN 1 to RPN 20) a LOCATION request is sent by the handset; therefore a change of the LOCATION area is established.

To ease the affiliation of a specific RPN to a specific roaming segment, the WBM uses the concept of location segments (which corresponds to a specific location area). Using this concept, it is not necessary anymore to determine which basestations belong to the same location segment by using a LAL / RPN / Location area lookup table. Instead, the affiliation is established by assigning the modules to a specific roaming area using a dropdown box.

The following table illustrates the correlation between LAL and the number / RPN of BSIP located inside a location area.

| LAL (bits) | No. of Loc. Areas | No. of RPN per Loc. Area | RPN belonging to a Local Area 1)   |
|------------|-------------------|--------------------------|--|
| 39 2)      | 254               | 1                        | 01<br>02<br>03<br>... (further 248 location areas)<br>FD<br>FE<br>FF   |
| 38         | 128               | 2 (1)                    | 01<br>02,03<br>04,05<br>... (further 118 location areas)<br>FA,FB<br>FC,FD<br>FE,FF  |
| 37         | 64                | 4 (3)                    | 01,02,03<br>04,05,06,07<br>... (further 58 location areas)<br>F8,F9,FA,FB<br>FC,FD,FE,FF   |
| 36         | 32                | 8 (7)                    | 01,02,03,04,05,06,07<br>08,09,0A,0B,0C,0D,0E,0F<br>... (further 28 location areas)<br>F0,F1,F2,F3,F4,F5,F6,F7<br>F8,F9,FA,FB,FC,FD,FE,FF   |
| 35         | 16                | 16 (15)                  | 01,02,03,04,05,06,07,08,09,0A,0B,0C,0D,0E,0F<br>10,11,12,13,14,15,16,17,18,19,1A,1B,1C,1D,1E,1F<br>... (further 12 location areas)<br>E0,E1,E2,E3,E4,E5,E6,E7,E8,E9,EA,EB,EC,ED,EE,EF<br>F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,FA,FB,FC,FD,FE,FF |

| LAL (bits) | No. of Loc. Areas | No. of RPN per Loc. Area | RPN belonging to a Local Area 1)  |
|------------|-------------------|--------------------------|---|
| 34         | 8                 | 32 (31)                  | 01,02,03,04,05,06, ... 17,18,19,1A,1B,1C,1D,1E,1F<br>20,21,22,23,24,25,26, ... 37,38,39,3A,3B,3C,3D,3E,3F<br>... (further 4 location areas)<br>C0,C1,C2,C3,C4,C5,C6, ... E7,E8,E9,EA,EB,EC,ED,EE,EF<br>E0,E1,E2,E3,E4,E5,E6, ... F7,F8,F9,FA,FB,FC,FD,FE,FF |
| 33         | 4                 | 64 (63)                  | 01,02,03,04,05,06, ... 37,38,39,3A,3B,3C,3D,3E,3F<br>40,41,42,43,44,45,46, ... 77,78,79,7A,7B,7C,7D,7E,7F<br>80,81,82,83,84,85,86, ... B7,B8,B9,BA,BB,BC,BD,BE,BF<br>C0,C1,C2,C3,C4,C5,C6, ... F7,F8,F9,FA,FB,FC,FD,FE,FF                                   |
| 32         | 2                 | 128 (127)                | 01,02,03,04,05,06, ... 77,78,79,7A,7B,7C,7D,7E,7F<br>80,81,82,83,84,85,86, ... F7,F8,F9,FA,FB,FC,FD,FE,FF   |

1. "0" is not supported as RPN for a Class B Dect network.
2. Default value for HPCIP V1R4.

## 5.28.2 Requirements for Roaming

A DECT Roaming between two MGWs is functional (resp. is signaled by the handset only), if the following requirements are met:

- the old and new base station are NOT located inside the same Roaming Segment (Physical Roaming)
- the complete ARI (resp. the FPS) of both bases are located inside the same range defined by the PLI. Since a fixed PLI of 31 is used, the ARI has to be the same on both MGW.
- the DECT user is assigned to a group who has the ability to roam to the new MGW (Group > MediaGW List)

## 5.28.3 Requirements for Handover

A DECT Handover between two MGWs is functional (resp. is signaled by the handset only), if the following requirements are met:

- a change of the Roaming Area is taking place ("Modulo problem")
- both MGW are located in the same ARI.

### 5.28.3.1 Modulo Problem

This problem is also known in the context of HiPath SLC devices. The SLC devices use a LAL of 35; therefore, 16 RPN belong to one specific location area.

If an external handover between two bases attached to different SLC should be established, a change of the location area has to be taken place. This is only possible, if the destined bases station is located in another location segment. If the destined base station is located in the same location segment, a handover cannot be established. This behavior is known as the modulo problem.

The same applies to the MGW concept of HPCIP. A handover between MGW inside the same site is only possible, if the destined bases station is located in another location segment. If the destined base station is located in the same location segment, a handover cannot be established.

Therefore, the configuration of the LAL and the corresponding location segment (RPN) of the basestations have to be considered in the site survey to avoid the modulo problem. The installer has to ensure, that basestations inside the same location segment of MGWx are geographically separated by the basestations inside the same location segment of MGWy.

#### 5.28.4 MGW specific fundamentals for Roaming

A DECT ARI is built by several Dect entities. For details refer to Dect specification part 6 (ETSI EN 300 175-6).

The belonging Dect entities are: ARI, ARC, ARD, EIC, FPN, FPS, PLI.

In the new concept, the

- ARI determines the roaming capability of a handset and a
- configuration option determines the roaming authorization of a handset.

The HPCIP system uses a fixed PLI of 31. This means, that roaming and handover is limited to the same ARI.

**Important Note:** As a prerequisite to enable roaming within a site or between different sites, these sites have to be configured to the same ARI (EIC and FPN).

Each Media Gateway inside a site has to obtain the same ARI, otherwise massive DECT related distortion (Call setup and handover) are possible.

Each Media Gateway between different sites has to obtain the same ARI if roaming is needed between this sites.

This concept utilizes the usage of ARI efficiently, because one single ARI may be re-used for several MGWs at different sites. As a drawback, all handsets may be able to roam into all sites. To overcome this situation, the roaming authorization may be configured separately for each group.

**Important Rule:** Roaming is supported inside those Bases, which are covered by the same ARI.

## 5.29 CLC Implementation Details

### Process Description

The CLA (either local on HCIP or remote) is inquired by the IWU cyclically every 5 seconds.

The HCIP Server requests **one basestation license** from the CLA for **each enabled module** as far as the limit is not exceeded.

For a large deployment, **each configured HCIP MGW** (in the order of its index) requests one basestation license from the CLA for each enabled module as far as the limit is not exceeded.

**Important:** The number of requested basestation licenses solely depends from the enabled/disabled state of the basestation, which are currently applied. The Online/Offline state of the basestation has no effect on this method.

If the maximum number of available basestation licenses is **exceeded**,

- There is exactly one MGW which **can't be applied the whole number of** requested licenses instead it is applied the remaining licenses.
- All other MGW with a higher Index can't be allocated any basestation license.

**Important:** Basestations which can't be assigned a basestation license are not able to go Online, instead they remain in state Offline.

### Disabling of Modules

If a basestation is being **disabled**, its license may be assigned to **another basestation** on the **same MGW** after the next CLA request (max. 5 seconds).

The further procedure follows the steps described in "Process Description".

### Enabling of Modules

If a basestation is being **enabled**, its license may be assigned after the next CLA request (max. 5 seconds) as far as there are free basestation licenses for **this MGW**.

The further procedure follows the steps described in "Process Description".

### Module State Offline

If a module is changing its Online State to "No" ("**Offline**"), its basestation license will be available for **another module** on the **same MGW** or on the Server-IWU.

The license of this MGW cannot be assigned to **another MGW** until the module is being **disabled**.

#### Changes in Number of Available Basestation Licenses

If the number of available basestation licenses on a specific MGW **increases** (procedure see "Process Description"), modules without license will be set to state **Online** until the number of available licenses is being reached.

If the number of available basestation licenses on a specific MGW **decreases** (procedure see "Process Description"), modules will be set to state **Offline** until the number of available licenses is being reached.

The order of the bases which are set Online or Offline is not predictable.

## 5.30 SIP Response Codes

### 5.30.1 Detached/Not Reachable Handsets

If a handset is not reachable due to several reasons, HCIP will signal this state with a SIP response code "480 Temporarily unavailable" which mostly will be converted to a voice prompt describing the **number is temporarily unavailable**.

| Reachability state  | SIP response code     |
|---|-----------------------|
| Handset is DETACHED (Switched Off)                                  | 480 - immediately     |
| Handset has no location (No Location e.g. due to low or no battery) | 480 - immediately     |
| Paging of HS unsuccessful (e.g. out of radio coverage)              | 480 - (after 12 sec.) |

## 5.31 SIP Reason Header Field (RFC 3326)

In HCIP version up to V1R5 it was not possible to identify if a call abort was forced by the user or by a radio / DECT problem on base of the Wireshark trace. Starting with V1R6 HCIP includes a reason header field in several SIP response codes. The cause code (which is coded inside the SIP reason header field) is coded according Q.850 with ikon specific enhancements.

The following table will depict the relation between a specific SIP response code, the reason code and possible causes.

| Id | Call State | SIP Response Code | Reason Code (Hex) | Affected HCIP-Processes | Event | Behavior | Remarks |
|----|------------|-------------------|-------------------|-------------------------|-------|----------|---------|
|    |            |                   |                   |                         |       |          |         |



|    |            |                             |      |                |                          |            |   |
|----|------------|-----------------------------|------|----------------|--------------------------|------------|---|
| 1  | CallActive | BYE                         | 0x9b | VoIP-Interface | RAS_DOWN                 | Unexpected | Network or PBX problems, ...  |
| 2  | InviteOut  | CANCEL                      | 0x9b | VoIP-Interface | RAS_DOWN                 | Unexpected | Network or PBX problems, ...  |
| 3  | InviteIn   | TERMINATED(487)             | 0x9b | VoIP-Interface | RAS_DOWN                 | Unexpected | Network or PBX problems, ...  |
| 4  | InviteIn   | SERVICE_UNAVAILABLE(503)    | 0xa2 | VoIP-Interface | No Channel               | Unexpected | All channel instances in HCIP Voip-interface occupied                 |
| 5  | InviteIn   | SERVICE_UNAVAILABLE(503)    | 0x81 | VoIP-Interface | No User                  | Unexpected | The expected user does not currently not exist in HCIP Voip-interface |
| 6  | InviteIn   | SERVICE_UNAVAILABLE(503)    | 0xaf | VoIP-Interface | No Codec                 | Normal     | e.g. max. no. of G729 calls at BSIP-IWU exceeded                      |
| 7  | InviteIn   | SERVICE_UNAVAILABLE(503)    | 0xac | VoIP-Interface | MaxCallsPerUser exceeded | Unexpected | max Calls per user (3) exceeded                                       |
| 8  | CallActive | BYE                         | %    | VoIP-Stack     | Error in SDP Negotiation | Unexpected | ReasonCode not available due to internal restrictions                 |
| 9  | CallActive | BYE                         | 0xfb | VoIP-Stack     | Error in Packetsize      | Unexpected | Unidentified reasons  |
| 12 | InviteIn   | NOT_ACCEPTABLE_HERE(488)    | %    | VoIP-Stack     | Error in SDP Negotiation | Unexpected | ReasonCode not available due to internal restrictions                 |
| 13 | InviteIn   | INTERNAL_SERVER_ERROR(500)  | 0xfc | VoIP-Stack     | No User                  | Unexpected | Unidentified reasons  |
| 14 | InviteIn   | INTERNAL_SERVER_ERROR(500)  | 0xfa | VoIP-Stack     | No Connection            | Unexpected | Unidentified reasons  |
| 15 | InviteIn   | UNSUPPORTED_MEDIA_TYPE(415) | 0xfb | VoIP-Stack     | Error in Packetsize      | Normal     | Packetsize not supported (e.g. 40 msec packets)                       |
| 16 | CallActive | BYE                         | 0x10 | IWU            | Normal Hangup            | Normal     | CallActive is disconnected by the Handset                             |

## Feature descriptions

### SIP Reason Header Field (RFC 3326)

|    |            |                              |      |             |                                 |            |   |
|----|------------|------------------------------|------|-------------|---------------------------------|------------|---|
| 17 | CallActive | BYE                          | 0x10 | IWU         | Loss of Radio / Battery Empty   | Normal     | During an CallActive the handset loses radio or battery goes empty                                    |
| 18 | InviteOut  | CANCEL                       | 0x10 | IWU         | Normal Hangup                   | Normal     | InviteOut Call is disconnected by the Handset   |
| 19 | InviteOut  | CANCEL                       | 0x10 | IWU         | Loss of Radio / Battery Empty   | Normal     | During an InviteOut call the handset loses radio or battery goes empty                                |
| 20 | InviteIn   | BUSY_HERE (486)              | 0x11 | IWU         | Busy                            | Normal     | Handset is Busy (e.g. already has an active call and CW is not activated)                             |
| 21 | InviteIn   | DECLINE(603)                 | 0x15 | IWU         | Reject                          | Normal     | InviteIn call is REJECTED by the Handset  |
| 22 | InviteIn   | SERVICE_UNAVAILABLE (503)    | 0x22 | IWU         | No Channel                      | Unexpected | Unidentified reasons  |
| 23 | InviteIn   | NOT_FOUND(404)               | 0x01 | IWU         | No User                         | Unexpected | Unidentified reasons  |
| 24 | InviteIn   | TEMPORARILY_UNAVAILABLE(480) | 0x12 | IWU         | Paging Timeout                  | Normal     | Paging of Handset is unsuccessful (Timeout: 12 seconds)   |
| 25 | InviteIn   | TEMPORARILY_UNAVAILABLE(480) | 0x03 | IWU         | No Location                     | Normal     | Handset is in state "No Location" (e.g. Handset was never Switched ON after start of system services) |
| 26 | InviteIn   | TEMPORARILY_UNAVAILABLE(480) | 0x14 | IWU         | Switched off                    | Normal     | Handset is in state "Switched Off" (Handset has been Switched Off during running services of HCIP)    |
| 27 | InviteIn   | REQUEST_TERMINATED (487)     | 0x10 | IWU         | Loss of Radio / Battery Empty   | Normal     | During an InviteIn call the handset loses radio or battery goes empty                                 |
| 29 | CallActive | BYE                          | 0xfd | SetupApplic | Group or Gateway disable/delete | Normal     | During an CallActive the assigned group or gateway of the user was disabled at the WBM.               |
| 32 | InviteOut  | CANCEL                       | 0xfd | SetupApplic | Group or Gateway disable/delete | Normal     | During an InviteOut call the assigned group or gateway of the user was disabled at the WBM.           |

|    |              |                              |      |             |                                 |        |  |
|----|--------------|------------------------------|------|-------------|---------------------------------|--------|--|
| 35 | Invite<br>In | TEMPORARILY_UNAVAILABLE(480) | 0xfd | SetupApplic | Group or Gateway disable/delete | Normal | During an InviteIn call the assigned group or gateway of the user was disabled at the WBM. |
|----|--------------|------------------------------|------|-------------|---------------------------------|--------|--|

**CallState:**

- CallActive: Call is connected (regardless of initial calldirection)
- InviteIn: Incoming call but not connected already (e.g. Alerting, Progress)
- InviteOut: Outgoing but not connected already (e.g. Alerting, Progress)

## 5.32 Handset User Interface Improvements

Starting in HCIP V1R6, handsets S5 and SL5 are supported which gain new user interface improvements. The new user interface improvements are restricted to specific handsets. The only handsets which contain the improvements are OpenScape DECT Phone S5 ("S5") and OpenScape DECT Phone SL5 ("SL5"). All other handsets, e.g. S3, SL3, S4, SL4, M2, M3 don't obtain these user interface improvements.

For the sake of convenience, a new terminology for the user interface is used inside this documentation:

"SD-Display" (SingleDensity Display): Synonym for the UI of handsets S3, SL3, S4, SL4, M2, M3

"HD-Display" (HighDensity Display): Synonym for the UI of handsets S5, SL5

**Hint:** If not stated explicitly, the new user interface improvements affect handsets S5 and SL5 only.

### 5.32.1 Improved Velocity

Due to optimizations in the DECT stack, the data rate of L3 Dect telegrams was nearly be doubled. This new improvement also affects the former handsets with the SD-Display (all handsets except S5 and SL5). These handsets benefit from this improvement in smaller delays when stepping through the iwu controlled handsets menu or lists.

Besides the higher data rate, handsets with the new HD-Display (S5, SL5) are furthermore optimized in multi line handling which also decrease the delays.

### 5.32.2 Proportional Fonts, 6 Rows and Headline

New maximum Text Length (depending on proportional font) so more than 15 chars may be displayed.

Implementation of "High Density (HD)" display to enhance the number of rows from 3 to 6.

A new headline (language specific) is included top of each screen which contains a descriptive name for the current menu screen.

### 5.32.3 Support of 4-way Navigation Keypad

The 4-way navigation key will be used for navigation inside the handset menus controlled by the iwu.

Hint: Local functions of the keypad (e.g. Volume Control ) are not available in iwu controlled mode. The Openstage S5 has its own side-based volume control, so it is not affected from this issue.

### **5.32.4 Softkeys: Conversion from Double-Assignment to Single-Assignment**

The two Softkeys of the handsets have two pressure points on each side (left and right). For some menus of the iwu, the double-assignment was needed (to allocate two different functions on one Softkey). Using the 4-way navigation key, this is not needed anymore, so each Softkey is single allocated. This eases the usability since the user hasn't to differ between the left or right pressure point of the Softkey.

### **5.32.5 Edit-Window for Searching Options in Phonebook (LDAP)**

The UI will use the handset local edit window for editing entries (e.g. telephony configuration, editing phone number during held call [where an additional menu entry is needed], dialing from phonebook, LDAP search mask).

Please keep in mind that the local handset editing menu is used. Therefore, the specific local character map will be used which may differ from the character map assigned by iwu edit mode on SD-handsets.

### **5.32.6 Up to 3 Phone Numbers per LDAP Entry**

In the version of HCIP up to V1R5, the LDAP phonebook can only contain one phonebook entry for a LDAP user entry. For handsets using the HD-Display, up to three numbers may be configured. For detail refer to [Section 5.14, "LDAP Phonebook"](#).

## 6 Configuration techniques

### 6.1 Free IP Addressing

Starting with V1R2 the possibility of free IP addressing and therefore full functionality of the Default Gateway support is supported.

#### Free IP addressing

In V1R1 the DECT network was statically configured to 192.168.0.0/16 (192.168.0.0 255.255.0.0). Starting with V1R2 the DECT network is now freely configurable by means of configuring DECT ip address and the corresponding netmask.

The following restrictions apply:

- Infrastructure network and the DECT network have to be different (they also may not overlap).
- If adding factory equipped Base stations (running V1R1) to a V1R2, V1R3 or V1R4 HPCIP-IWU, they will not be scannable if the DECT network is different from 192.168.0.0/16.

For details regarding these issues refer to [Section 6.2.1, "Scanning of BSIP \(V1R1\) with IWU \(V1R2 and newer\)"](#).

#### Default gateway support

In V1R1 the DECT network was statically configured to 192.168.0.0/16 (192.168.0.0 255.255.0.0).

If some components of the infrastructure (PBX, NTP Server, Configuration PC, ...)

- were located inside a network of 192.168.x.y and
- were located behind the default gateway,

the default route - using a configured "Default Gateway" - was without function (since the IP stack of HPCIP-IWU treated all 192.168.x.y addresses as local due to the DECT network configuration).

As a workaround, one single static route could be configured (see "Network destination" / "Network mask" / "Gateway" at page Network/Gateways).

## 6.2 Adding new BSIP

If version V1R2, V1R3 or V1R4 is running, it is possible to configure a netmask for the DECT IP network. In V1R1 the network address as well as the netmask was fixed (192.168.0.0 with a netmask of 255.255.0.0).

Now it is possible to configure the DECT IP network freely and assign it a netmask.

Due to routing issues, this netmask may be changed to 255.255.255.0 when also using a CLASS C IP network (192.168.x.y) for the Infrastructure network.

### 6.2.1 Scanning of BSIP (V1R1) with IWU (V1R2 and newer)

As a drawback, when adding factory equipped Base stations (running V1R1) to a HPCIP-IWU (running at least V1R2), they will not be scannable (since they didn't respond to SCAN requests others than 192.168.255.255).

**Important note:** The following instructions apply to newly added BSIP which have version V1R2 running. If they are already running V1R2 or newer there are no special steps to consider.

There are two different procedures to overcome of this situation:

- **Manually update the newly added BSIP locally**

This method is suitable if a small amount (one to three) BSIP should be added.

Manually connect the first new BSIP and connect to its local WBM. Initiate a local update to the same version as running on the IWU. If the active partitions differ between IWU and BSIP after updating and rebooting, login again and initiate the update again to synchronize the partitions between IWU and the newly added BSIP.

Disconnect the currently updated BSIP from the network and attach the next one (otherwise there will be IP address conflicts since all factory reset BSIP are equipped with 192.168.1.1) and then follow the instructions below.

- **Temporarily move the DECT network to V1R1 settings**

This method is suitable if a great amount (more than three) BSIP should be added.

Temporarily revert to a DECT IP address inside the range of 192.168.0.0 and assign a network mask of 255.255.0.0 but remember that the temporarily DECT network can't overlap with the Infrastructure network, Apply the changes, SYNC the Base stations and reboot the system. If applicable, do a further update into Partition 2 (since all factory delivered BSIP are active in System partition 2).

## Configuration techniques

### Adding new BSIP

After a SCAN the newly added BSIP are displayed on page Dect. Configure the necessary settings SYNC the newly added base stations and reboot into the updated partition. If all BSIP are in the desired state ONLINE=YES (see page Status) initiate a firmware update with V1R4. After reboot revert to the former DECT network parameters, SYNC and reboot the system.



## 6.3 Multi-Register (Bulk Registering) of Handsets

The multi register feature eases the configuration process if registering a large amount of users remarkably. Adding a large amount of users in V1R1 required a lot of manual configuration and intervention of the administrator. Firstly, all users have to be added and configured inside the WBM. Afterwards, while registering the handsets the correct user entry has to be located and marked and then registering both at the WBM and at the handset has to be initiated. The new bulk registration process now simplifies these processes by auto-adding a new user entry and then simply assign the next DECT handset registration to the last user.

To start the multi register process, at least one user entry (with start values) has to be configured manually. This user entry serves as the template user for the users which will be added.

Select an existing, enabled user entry.

After clicking on [Multi register] a handset may be registered directly. After successful registering of the handset, a new user entry will be added which is populated with the IPUI of the registered handset. For this entry, values are incremented by default. Now the next handset may be registered. This process may be repeated several times.

The Multi Register process may be stopped by using the [CANCEL] button.

**Hint:** This feature is available in Unify Admin mode only.

The following table gives an overview how the new values are created. The user template is the user which was selected initially before starting the Multi Register process.

| Option             | Action for new value  |
|--------------------|---|
| Index/DisplayIndex | Will be <b>incremented</b> automatically  |
| Enabled            | <b>Copied</b> from option "Enabled" of the user template  |
| Msn                | <b>Incremented</b> from option "MSN" of the user template   |
| DisplayName        | <b>Incremented</b> from option "MSN" of the user template (depending on the InternCallLen of the assigned group, only the right no. of "InternCallLen" digits are used) |
| Comment            | <b>Incremented</b> from option "MSN" of the user template   |
| Language           | <b>Copied</b> from option "Language" of the user template   |
| Groups             | <b>Copied</b> from option "Groups" of the user template   |
| UserName           | <b>Incremented</b> from option "UserName" of the user template  |
| AuthName           | <b>Incremented</b> from option "AuthName" of the user template  |
| Password           | <b>Copied</b> from option "Password" of the user template   |
| G729               | <b>Copied</b> from option "G729" of the user template   |

## Configuration techniques

### Multi-Register (Bulk Registering) of Handsets

#### Further Hints:

- If the TemplateUser is not assigned a handset already (IPUI = "00000000") the first DECT Registration of the MultiRegister will be applied to this User.
- If the TemplateUser is assigned a handset already (IPUI does not equal "00000000") the first DECT Registration of the MultiRegister will be applied to the first new user. This ensures that an already existing registration at the TemplateUser will not be overwritten.
- If one of the intended auto incremented numbers already exist in the configuration, it is omitted automatically.
- After creation of an added user it is registered automatically at the PBX.
- The multi register process is not stopped by a timeout. It has to be finished using the [CANCEL] button.

## 6.4 Downgrading a HPCIP System

After a BSIP factory reset has been initiated, the factory defaults are restored. If a complete HPCIP system (IWU and Base Station) has been downgraded, the following items have to be considered.

After a factory downgrade of a BSIP-IWU system, take attention to which MAC address you are connecting to change the working mode of the BSIP (BSIP-Only to BSIP-IWU). If you simply connect to 192.168.1.1 you may be connected to ONE of all attached BSIPs. This may not be the designated BSIP (former BSIP-IWU).

Therefore disconnect all other BSIP from the Ethernet or attach the designated BSIP-IWU to a direct Ethernet connection at the Maintenance PC. Login to this BSIP via WBM and change the application mode to IWU mode. Afterwards you may connect the other BSIP-Only to the Ethernet.

**Hint:** The MAC address is shown at page Administration - Program Info - Version System.

## 6.5 Virtualization of MGW-IWU

The MGW-IWU may be running virtualized on a VMware vSphere environment on an ESXi Server.

The supported platform versions of the hypervisor (ESXi server) may be derived from the release notes of HCIP.

At the time of writing, the following ESXi versions have been tested and released for the usage of a virtualized MGW-IWU.

- ESXi 5.1
- ESXi 5.5 with HW version 8 (compatibility mode)

**Important note:** Due to the real time processing and networking demands of the HPCIP system (especially to the DECT communication with extremely bursty network streams using 10 msec packetizing as well as the high precise 1588 communication towards the DECT basestations), only the application mode MGW-IWU is supported to run virtualized. The other application modes Server-IWU and MGW are neither supported nor are they working trouble-free.

Therefore, operation of Server-IWU and MGW on a virtualized platform is forbidden.

Minimum requirements for virtualization:

| Option            | Setting  |
|-------------------|--|
| Configuration     | "Custom"   |
| Name              | "MGW-IWU"  |
| VM Version        | Virtual Machine Version: 8   |
| Guest OS          | Linux, "Other 2.6.x Linux (32 bit)"  |
| CPU               | Number of virtual sockets: 1<br>Number of cores per virtual socket: 2  |
| Memory            | 4 GB   |
| Network           | No. of Nics: 1<br>Adapter type: Flexible<br>Assign network type as suggested   |
| SCSI              | LSI Logic Parallel   |
| Storage           | Select an appropriate destination storage depending on your ESXi Configuration<br>Virtual disk size: 250 GB<br>Virtual device node:<br>( ) SCSI (0:0), (o) IDE (0:0)?<br>Hint: Important: IDE has to be used |
| Virtual Disk Size | 250 GB   |

## 6.6 Installation of MGW-IWU system

### 6.6.1 Base installation onto Server (Rx 1330 M1)

Detailed documentation of core installation of the HPCIP software onto the hardware based server Rx 1330 M1 is outside the scope of this document. Only the necessary steps are described.

1. Download the ISO image of HPCIP Server-Install-CD and create a bootable CD
2. Boot the server from the Server-Install-CD V1-R5.x.y
3. The core installation of HPCIP V1R5 Server will start automatically without user intervention; a reboot is initiated automatically
4. Attach the network to the belonging ETH interface of Rx 1330 M1(the ETH interface "LAN1" at the inner side of the PC).
5. The factory default settings to access the WBM of HPCIP server software (IWU) are:  
VLAN: not configured (untagged)  
IP address: 192.168..2.1  
Netmask: 255.255.255.0  
Default gateway: n/a
6. The HPCIP server software is now operating in Server-IWU mode.

At this point, the WBM is accessible via a maintenance PC attached to the same network

### 6.6.2 Base installation MGW-IWU virtualized onto ESXi

To run the MGW-IWU virtualized, specific requirements according the virtualization environment have to be fulfilled. See [Section 6.5, "Virtualization of MGW-IWU"](#).

#### 6.6.2.1 Create virtualized machine environment

At the ESXi, start the wizard to create a new virtual machine (File > New > Virtual machine). If an option is not documented, use the standard (default) setting of ESXi.

## Configuration techniques

### Installation of MGW-IWU system

| Option            | Setting   |
|-------------------|---|
| Configuration     | "Custom"  |
| Name              | "MGW-IWU"   |
| VM Version        | Virtual Machine Version 8   |
| Guest OS          | Linux, "Other 2.6.x Linux (32 bit)"   |
| CPU               | Number of virtual sockets: 1<br>Number of cores per virtual socket: 2   |
| Memory            | 4 GB  |
| Network           | No. of Nics: 1<br>Adapter type: Flexible<br>Assign network type as suggested  |
| SCSI              | LSI Logic Parallel  |
| Storage           | Select an appropriate destination storage depending on your ESXi Configuration<br>Virtual disk size: 250 GB<br>Virtual device node:<br>( ) SCSI (0:0)<br>(o) IDE (0:0)<br>Hint: Important: IDE has to be used |
| Virtual Disk Size | 250 GB  |

### 6.6.3 Installation of MGW-IWU

Follow the necessary steps for a Base installation of the IWU onto

1. a hardware based server (see [Section 6.6.1, "Base installation onto Server \(Rx 1330 M1\)"](#))
2. a virtualized environment (see [Section 6.6.2, "Base installation MGW-IWU virtualized onto ESXi"](#))
3. The HPCIP server software is now operating in Server-IWU mode. At this point, the WBM is accessible via a maintenance PC attached to the same network
4. Login via the maintenance PC to the WBM and switch the application mode to "MGW-IWU" and reboot the currently running Server-IWU
5. After reboot, the virtual machine works in MGW-IWU mode.

### 6.6.4 Installation of MGW

Follow the necessary steps for a Base installation of the IWU onto

1. a hardware based server (see [Section 6.6.1, "Base installation onto Server \(Rx 1330 M1\)"](#))
2. The HPCIP server software is now operating in Server-IWU mode. At this point, the WBM is accessible via a maintenance PC attached to the same network
3. Login via the maintenance PC to the WBM and switch the application mode to "MGW " and reboot the currently running Server-IWU
4. After reboot, the virtual machine works in MGW mode.
5. Access WBM via 192.168.2.1 (has to be changed later), Login via WBM
6. Configure necessary parameters (e.g. IP address of MGW-IWU)
7. Reboot
8. Access WBM via configured IP of MGW and verify parameters

### **6.6.5 Initial Setup of MGW-IWU**

Install the MGW's as described above and attach the first MGW to the network. Further MGW's should be detached or be shut downed at this point. Repeat the step for each MGW.

1. Login to the WBM of MGW-IWU and select page MediaGateways > General
2. Initiate a [Scan]; an entry of the MGW should be added
3. Attach BSIP to MGW DECT network
4. Scan the BSIPs'
5. Configure the DECT sync method inside the MGW

### **6.6.6 Configuration of Inter-MGW Sync**

This chapter describes the configuration steps necessary to synchronize several Media gateways inside a same site ("Inter-Media Gateway Synchronization ") to enable DECT handover between these MGWs.

The Inter-Media Gateway Synchronization sync topology may be star or chain based, comparable to the sync topology of the DECT basestations inside a MGW.

Start the configuration at the MGW which serves as sync master towards the other MGWs.

#### 6.6.6.1 Master MGW

##### Preconditions:

- At least one BSIP for this MGW is configured, enabled and operational
- System Services are stopped
- Select the designated MGW in the dropdown box on page Dect at the lower frame

##### Add Crosslink Server:

- WBM > Dect > Base > [Add CrossLinkSrv] (a new module of type "CrossLinkSrv" will be created)
- Select the newly created "CrossLinkSrv" and configure the IP address (in the IWU network) of the participating MGW at "IpAddr Module"

##### Configure Crosslink Server as Dect-Master (clock master)

- At page WBM > Dect > Sync select the newly created " CrossLinkSrv " and configure "Sync" to "ext.master"

##### Configure basestation which serves as sync master for other MGWs'

- At page WBM > Dect > Sync select the newly created " CrossLinkSrv " and configure "ParkSync1" to the basestation to which the other MGW should be synchronised.
- Apply changes

#### 6.6.6.2 Slave MGW1

##### Preconditions:

- At least one BSIP for this MGW is configured, enabled and operational
- The corresponding Master MGW has been configured for this MGW (see steps above)
- System Services are stopped
- Select the designated Slave MGW1 in the dropdown box on page Dect at the lower frame

##### Add Crosslink Client and Virtual base

Scan for the newly created Crosslink. Therefore go to page WBM > Dect > Base and initiate a [Scan].



**Hint:** The Scan emits a specific broadcast. Those MGWs are answering this broadcast whose IP addresses are configured as one of the configured Crosslink Server ip address on the master MGW(s). If a MGW has answered the broadcast, two new Dect module types will be created automatically at the current MGW:

1. **Crosslink** of type "CrossLinkCli". All necessary data except the Enabled state will be pre configured automatically.

2. **Virtual base** of type "Virt. Base". For each "ParkSync" which was configured at the opposite Master MGW of the Crosslink, one virtual base will be created. All necessary data except the Enabled state will be pre configured automatically.

- Verify configuration parameters of "CrossLinkCli" and enable this module.
- Verify configuration parameters of " Virt. Base " and enable this module.
- Apply changes

#### **Configure sync of BSIP1 to virtual base**

The DECT air synchronization between one BSIP1 of the current Slave MGW1 to the BSIP1 of the Master MGW is accomplished using the Virtual Base.

- At page WBM > Dect > Sync select a base which should synchronize to the Master MGW and configure "ParkSync1" to the Virtual Base.
- Configure other bases inside this MGW to use the selected base as the sync master by means of "ParkSync" as usual.
- Apply changes

### **6.6.6.3 Slave MGW2 and further MGW**

Depending on the chosen sync topology between the MGW, two different procedures are possible:

- **Star based topology**

At the Master MGW, add an additional Crosslink Server by [Add CrossLinkSrv] as described above for master MGW.

At the current Slave MGW, initiate a scan as described above for Slave MGW1.

Proceed with Slave MGW configuration (Crosslink, virtual base sync of local bases) as described above.

- **Chain based topology**

At the Master MGW, add an additional Crosslink Server by [Add CrossLinkSrv] as described above for master MGW.

At the current Slave MGW, initiate a scan as described above for Slave MGW1.

## **Configuration techniques**

### **Installation of MGW-IWU system**

Proceed with Slave MGW configuration (Crosslink, virtual base sync of local bases) as described above.



## 7 Troubleshooting / FAQ

### 7.1 DECT

#### 7.1.1 BSIP-Only Not Found Using "Scan"

Please check the following:

- Is the "missing" BSIP1 connected with the power supply? (LED states OK?)
- Is the network cable connected at the IP-DECT Base Station?
- Is the network cable connected to an Ethernet Switch? Please check the Status LEDs at the relevant Ports of the Ethernet Switch.
- The IP-DECT Base Station must be located in the same Ethernet segment as the IWU. IWU and Base Station cannot operate in different Ethernet segments connected via an IP Router.
- VLAN configuration issues
- Newly added BSIP are not recognized and displayed by SCAN during running system services. Stop the system services and repeat the SCAN.
- If firmware V1R1 is already running on BSIP, some further restrictions may apply. For details refer to [Section 6.2.1, "Scanning of BSIP \(V1R1\) with IWU \(V1R2 and newer\)"](#).

#### 7.1.2 Registration of Handset Not Successful

- The PIN configured for the IWU differs from the PIN entered at the Handset (Did you mistype?).
- The handset has no radio connection to the Base Station (too far away etc.).
- Are all activated Base Station in state "Online" and "InSync" (except the Base Station which is the Synchronization masters) ?

#### 7.1.3 Idle Display of Handset is Blinking

The following causes may apply:

- the handset is outside the DECT coverage

- the handset has no DECT registration at the BSIP
- at the handset the wrong base is selected or
- the system services are not running

#### **7.1.4 Display Message "Netzfehler" / "Out of Order"**

The RAS registration from the handset at the PBX is down (see Status - Calls Dect - Voip states)

This situation may exist for a short period of time in a HCIP Large Setup if the handset changes its location to another MGW (Dect roaming). This triggers a SIP roaming process at which the handsets SIP registration is removed from the previous MGW to the new MGW.

#### **7.1.5 Display Message "No Location"**

The handset couldn't establish a Dect Location at the HCIP.

#### **7.1.6 Display Message "No Roaming"**

In a large HCIP setup, the assigned group of the users has to have roaming permission configured for a specific MGW. If no entry of the MGW index of the users group exists, the users handset will display "No Roaming" at this MGW.

For details refer to [Section 2.4, "User Roaming"](#) and [Section 4.8.2, "Configuration Page "Group" "](#).

#### **7.1.7 Display Message "User deactivated"**

This message will be displayed if the handsets user entry is disabled at the WBM.

#### **7.1.8 Display Message "Roaming Overload"**

This message will be displayed if the max. no of roaming users has been exceeded at the MGW.

## **8 Appendix**

### **8.1 Configuration Hints for Web Browser**

#### **8.1.1 Mozilla Firefox**

Mozilla Firefox Versions 2.x up to 39.x are supported. Firefox versions up to 35 are not actively tested but should work.

The minimum supported screen resolution the Browser is running on is 1024x768.

#### **8.1.2 Microsoft Internet Explorer**

The following version of Microsoft Internet Explorer are supported:

- Version 8.x
- Version 9.x
- Version 10.x
- Version 11.x

**Hint:** Version 11.x is not tested already.

The minimum supported screen resolution the Browser is running on is 1024x768.

Depending of the security settings of MS IE, the IP address of the BSIP1 has to be added to the list of Trusted sites (Tools - Internet options - Security - Trusted sites).

This comes in effect when backing up a configuration file. If the security settings are not valid, the configuration file will not be downloaded and the WBM session will be closed.






























There is an issue on some installations when backing up the configuration. After initiating the backup process, the information panel will be displayed and afterwards you are logged out from the WBM. To overcome this situation, you have to change the following settings in IE:

- Tools - Internet Options - Security
- Select the appropriate zone in which the IWU is located (e.g. "Trusted sites") and select [Custom level]

- In the outline view browse to "Downloads" and change the setting of "Automatic prompting for file downloads" from Disabled to Enabled.

**Hint:** IE9 and higher may require the "Compatibility mode" for configuration of HPCIP; otherwise, only a blank screen may be displayed after Login to WBM.

## 8.2 LED States

| Operating State  | LED 1             |  | LED 2             |   |
|--|-------------------|--|-------------------|---|
| LED states during start sequence of BSIP   |                   |  |                   |   |
| No power on base station   | off               |    | off               |    |
| BSIP is booting the <b>Active</b> partition  | red blinking      |    | red blinking      |    |
| BSIP is booting the <b>Fallback</b> partition                                      | red blinking      |    | off               |    |
| BSIP is booting the Active partition with <b>factory defaults</b>                  | red fast blinking |    | red fast blinking |    |
| BSIP is booting the Fallback partition with <b>factory defaults</b>                | red fast blinking |    | off               |    |
| BSIP is booting kernel with <b>Active</b> partition                                | off               |    | red               |    |
| BSIP is booting kernel with <b>Fallback</b> partition                              | red               |   | off               |   |
| LED states during operation state  |                   |  |                   |   |
| BSIP not ready<br>Services not started or starting                                 | orange            |  | orange            |  |
| BSIP ready<br>No LAN link  | red               |  | red               |  |
| BSIP ready<br>No Connection to IWU   | green             |  | red               |  |
| BSIP ready<br>All DECT-frequencies blocked or all available DECT channels occupied | red               |  | green             |  |
| BSIP ready<br>Link unsynchronized (DECT/LAN), no active call                       | off               |  | green             |  |
| BSIP ready<br>Link unsynchronized (DECT/LAN), at least one active call *           | off               |  | green blinking    |  |
| BSIP ready<br>Link synchronized (DECT/LAN), no active call                         | green             |  | green             |  |
| BSIP ready<br>Link synchronized (DECT/LAN), at least one active call               | green             |  | green blinking    |  |

Blinking frequency : 500 msec / 500 msec

Blinking frequency fast : 250 msec / 250 msec

\* On a BSIP-IWU this LED state indicates that a call may be located on another BSIP but is handled by the IWU itself.

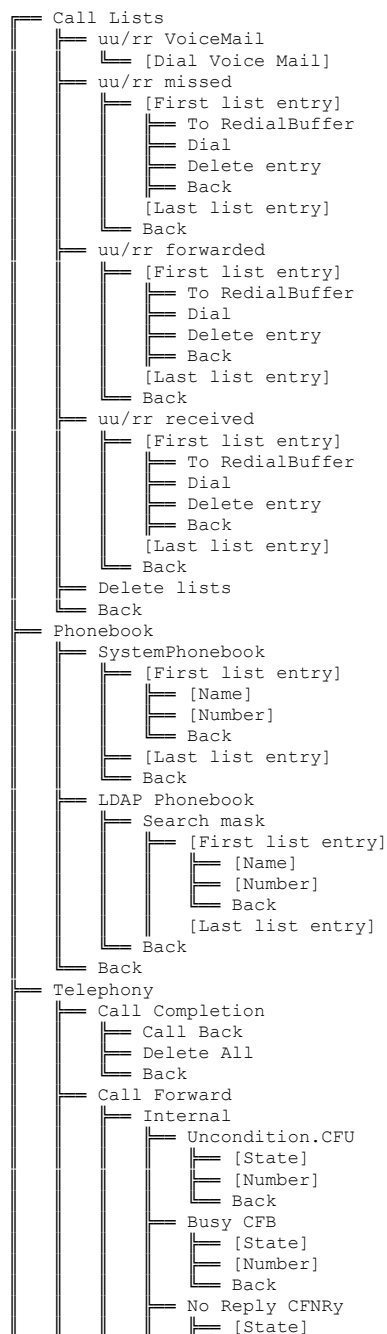


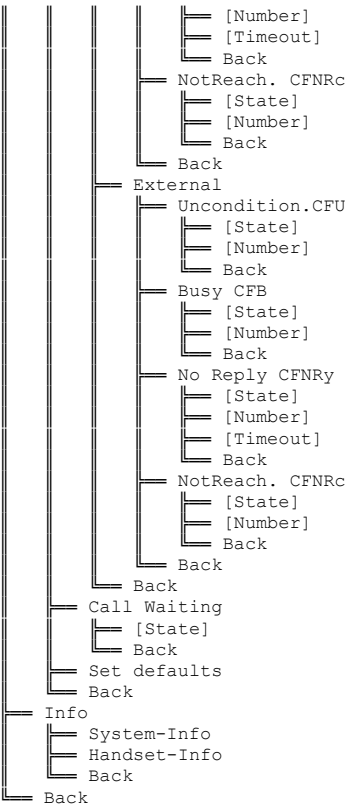
## 8.3 Handset UI

Overview of all possible entries of the handset UI if all options are activated.

Hint: Entries in the handset UI are limited to 15 chars. (SD-display)

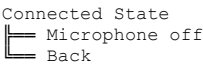
### 8.3.1 Service Menu



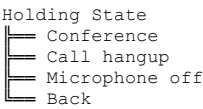


8.3.2 Context Menus

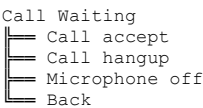
8.3.2.1 Connected State



8.3.2.2 Holding State



8.3.2.3 Call Waiting



### 8.3.2.4 Call Completion

```
Call Back
├─ Call Back
├─ Delete All
└─ Back
```

### 8.3.2.5 Pickup Call

```
Pickupcall
├─ [Calling No.]
├─ [CalledNo.]
└─ Back
```

### 8.3.2.6 Phonebook Access during Local HOLD

```
Phoneb.
├─ SystemPhonebook
├─ LDAP Phonebook
└─ Back
```

### 8.3.2.7 Conference

```
Phoneb.
├─ SystemPhonebook
├─ LDAP Phonebook
└─ Back
```

## 8.3.3 Specific Service Menu Actions

### 8.3.3.1 Set Defaults

Using this feature, all user specific handset configuration will be reset to their default values.

- CallForward settings: All settings set to Deactivated, all numbers set to configured "VM number" in corresponding group
- CallWaiting settings: Deactivated

### 8.3.3.2 Conferencing

It is possible to initiate a conference with two other participants. Therefore, the conference imitator has to put the first connected user (conference participant 1) into hold and initiate a call to a second user. If the second user (conference participant 2) is connected, a conference between all three parties may be invoked by pressing the "Menu" and "Conference" softkey consecutively.

Hints:

If the conference initiator disconnects the conference, all calls will be disconnected.

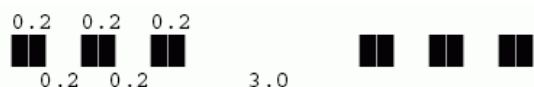
If one of the conference participants disconnects the call, the conference between the two remaining parties persists.

## 8.4 System tones

The following tones are generated by the IWU and streamed at the handset. Please keep in mind that regarding the type and configuration of the used PBX the alerting tone may differ.

**Hint:** The Ring tone is generated at the mobile phone. The mobile phone may be configured to differ ring tones between internal and external calls.

### 8.4.1 Dial tone



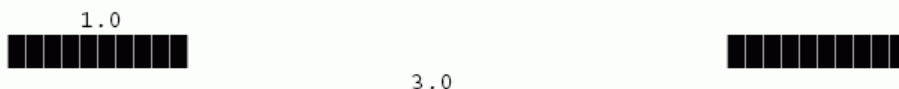
Tone definition: {0.2 sec. Pulse / 0.2 sec. Pause / 0.2 sec. Pulse / 0.2 sec. Pause / 0.2 sec. Pulse / 1.0 sec. Pause} @ 450 Hz

The dial tone is generated at the following scenarios:

- After pressing the „Off-hook“ key (only if the system supports overlapped dialing) as well as
- Pressing the „R“ key or the Softkey [Hold].

The dial tone is used to signal the user that the system is ready to accept a number.

### 8.4.2 Calling tone



Tone definition: {1.0 sec. Pulse / 3.0 sec. Pause} @ 450 Hz

The calling tone is used to signal the Calling party the alerting of the Called party.

### 8.4.3 Busy tone

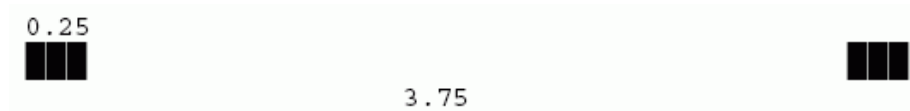


Tone definition: {0.5 sec. Pulse / 0.5 sec. Pause} @ 450 Hz

The busy tone is generated at the following scenarios:

- The Called party is „busy“ as well as
- After the active call is disconnected by the remote party.

### 8.4.4 Call waiting tone



Tone definition: {0.25 sec. Pulse / 3.75 sec. Pause} @ 450 Hz

The CallWaiting tone is generated at the handset while a call is waiting. It is played as long as the CallWaiting is active.

## 8.5 Key mappings for Handset menus

The following key mappings apply to input characters for handsets using the SD Display in the following scenarios:

- Navigation inside the System phonebook
- Navigation inside the LDAP phonebook
- Editing of LDAP Search string

| Handset key | Digits       |
|-------------|--------------|
| 0           | "0"          |
| 1           | "1.-"        |
| 2           | "ABCabc2Ää"  |
| 3           | "DEFdef3"    |
| 4           | "GHIghi4"    |
| 5           | "JKLjkl5"    |
| 6           | "MNOmno6Öö"  |
| 7           | "PQRSpqrs7ß" |
| 8           | "TUVtuv8Üü"  |
| 9           | "WXYZwxyz9"  |
| *           | "*"          |
| #           | "#"          |

## 8.6 Abbreviations

| Abbreviation | Description                                      |
|--------------|--|
| ARC          | Dect terminology: Access Rights Class            |
| ARD          | Dect terminology: Access Rights Details          |
| ARI          | Dect terminology: Access Rights Identity         |
| EIC          | Dect terminology: Equipment Installer's Code     |
| FP           | Dect terminology: Fixed Part                     |
| FPN          | Dect terminology: Fixed Part Number              |
| FPS          | Dect terminology: Fixed Part Sub-number          |
| IPsec        | IP Security                                      |
| LAL          | Dect terminology: Location Area Level            |
| Media GW     | Short term for "Media Gateway"                   |
| Media GW-IWU | Short term for "Media Gateway-IWU"               |
| MGW          | Short term for "Media Gateway"                   |
| MGW-IWU      | Short term for "Media Gateway-IWU"               |
| PARI         | Dect terminology: Primary Access Rights Identity |
| PLI          | Dect terminology: Park Length Indicator          |
| PP           | Dect terminology: Portable Part                  |
| RFPI         | Dect terminology: Radio Fixed Part Identity      |
| RPN          | Dect terminology: Radio fixed Part Number        |
| VPN          | Virtual Private Network                          |

## 8.7 Acronyms

| Acronym  | Description   |
|--|---|
| Media Gateway-IWU or "HCIP Management Server mode" | A new entity introduced in HPCIP V1R5. Handles logical call connection and communicates with the Media Gateway via IP. Centralized configuration for nearly all parameters (Sites, Media Gateways, Basestations, User, PBX, ..) |
| Media Gateway or "HCIP Media Server mode"          | A new entity introduced in HPCIP V1R5. Handles and terminates physical call connections (SIP and logical Dect calls)  |
| Site   | A logical and geographical grouping of several Media Gateways to enable DECT Call Roaming and Handover between the Basestations of different Media Gateways belonging to the site.  |
| Roaming  | Movement of a PP from one FP coverage area to another FP coverage area, where the capabilities of the FPs enable the PP to make or receive calls in both areas  |
| Intracell Handover                                 | Seamless handover of a DECT physical channel on the same BSIP from one timeslot/carrier combination to another  |
| Intercell Handover                                 | Seamless handover (Dect Bearer handover) of a DECT connection from one BSIP to another BSIP inside the same MGW   |
| MGW Handover                                       | Seamless handover (Dect bearer handover) of a DECT connection from one BSIP to another BSIP located at another MGW inside the same site   |
| SD-Display   | Unify handset which uses the Single Density display method (S3, SL3, S4, SL4, M2, M3)   |
| HD-Display   | Unify handset which uses the High Density Display method and new features (S5, SL5)   |



