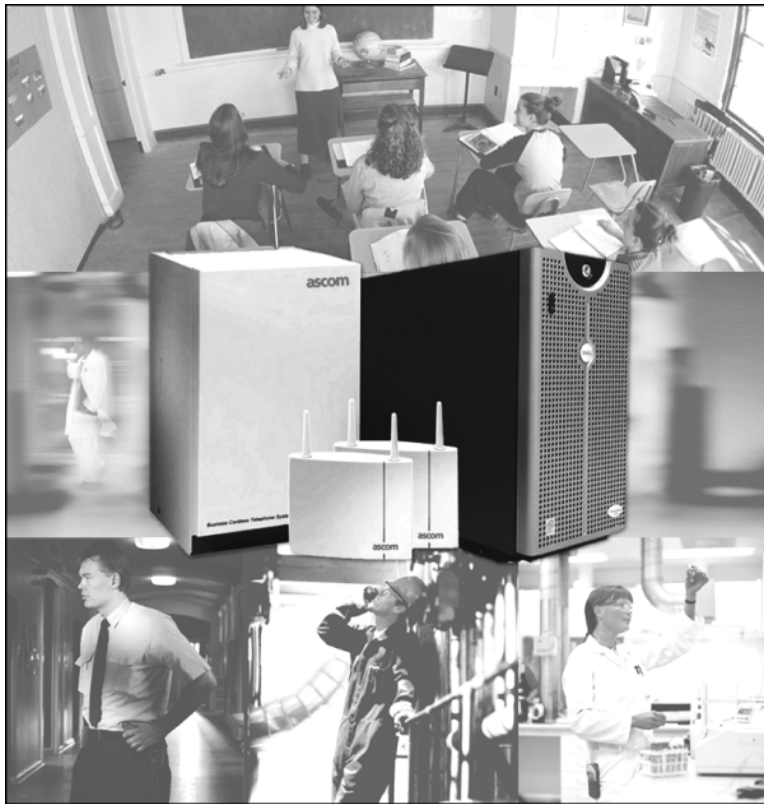


# Mobility Server **Factbook**



**ascom**

Ascom® Wireless Solutions Inc.

The Leading Provider of Mission Critical  
On-site Wireless Communication Solutions

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## 1 Executive Summary

The Ascom Mobility Server (MS) provides users with campus wide wireless mobility and text messaging via the Freeset DCT1900 portable telephones. Additionally, users have access to advanced features such as user defined call management tools.

Mobility Server Advantages:

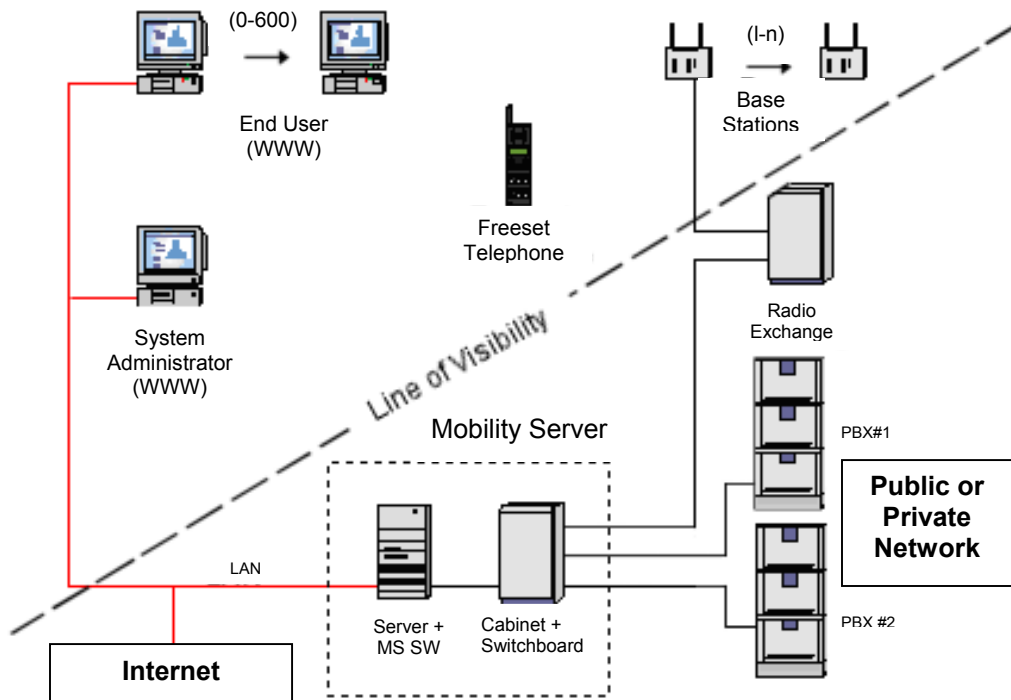
- Connection of multiple Freeset DCT1900 systems together - creates a scalable solution that protects the original investment in Freeset DCT1900.
- Networking of multiple locations for mobile automatic roaming - increases accessibility to mobile employees.
- Better utilization of existing telephone system resources because connections are based on call traffic requirements rather than a one-to-one port ratio for users. This saves valuable space on the current telephone system and can present a substantial cost savings.
- Provides enhanced mobility services with the Personal Number feature, which integrates all phone numbers into a single number solution.

By utilizing standard industry interfaces, MS can provide mobility to a variety of existing telephone systems for several hundred users in one system. It also enables the networking of multiple MS installations to provide inter-site roaming for users of the Freeset DCT1900.

Mobility Server provides a very manageable solution for the service provider and system administrator. The basic system consists of two parts: one telecom server and one switchboard card. All configuration and system management of the MS can be performed from a computer connected to a LAN and loaded with a commercially available web browser. The system configuration can be done either onsite or remotely via the Intranet or even through a dial-up connection.

The end-user has access to the Personal Assistant and Personal Number features. Personal Number allows the user to be available on a single telephone number for all Freeset, desk phone, mobile, pager and temporary telephone numbers. The calling party only has to dial one number, and the Personal Number user can forget about complex call diversions.

The figure below is an example of how the MS can be used to provide a personal mobility solution.



## 2 Introduction

The Mobility Server is a telecom server based advanced mobility solution for the Freeset DCT1900 that provides the ability to accept and manage all calls through a single number solution regardless of location or type of communication device.

### End-User Features:

- *Personal Assistant* – helps users to manage a personal profile via a telephone or web interface
- *Call Forwarding* – makes it possible to automatically manage an incoming call according to a predefined search list to any telephone or voice mail
- *Call Screening* – permits users to decide the type of calls or numbers to accept
- *Office Extension* – allows remote access to the users office extension
- *Voice Mail Access* – provides direct access to voice mail
- *Caller's Control* – allows callers to be given an option whether to have their call answered by a second party or leave a voice mail
- *Concurrent Ringing* – enables a desk phone and Freeset DCT1900 phone in the users In Office Profile to ring simultaneously
- *Call Accept* – provides users, when answering a call, with the ability to accept or reject the call

The end-user is provided with an advanced, easy-to-use service, which allows unequalled independence from traditional telecom solutions. The user is in control of the communication.

- Advanced easy-to-use service
- Time and location independent
- Control over communication
- Accessibility

## 2.1 Value in Mobility Server

### Disaster Recovery

The Ascom Mobility Server provides a unique disaster recovery solution for voice communication. In the event of a natural disaster, when communication becomes even more crucial in a facility, the MS can continue to operate independent of the PBX and provide communication between portable telephones in case of phone system failure or damage to incoming lines from the telephone company.

### Increased Accessibility

People are on the move! It is critical that employees are accessible and empowered to make decisions. The Personal Number feature ensures that the calling party will reach the user regardless of location. Mobility Server allows Freeset users to extend their freedom of movement within their home site and roam to other networked sites. The Freeset user does not need to be in any one particular location to receive calls and can move around freely in any network site, because the MS routes all calls to the site where they are visiting or working.

### Improved Customer Service

Mobility Server fulfils a company's cost, voice quality and functionality requirements for mobile employees who need to work efficiently, resulting in a higher level of customer service. MS delivers a ready-made advanced mobility offering, including Personal Number and mobility management. Customers who require in-building wireless as well as users who need to use their Freeset at different locations can benefit from roaming services by creating a Mobility Server network.

The Mobility Server provides a very high-level of customer support through advanced network management. It is cost-effective (through WWW interfaces) and easy to use (based on a commercial web browser). This capacity enables the service provider to offer improved customer support, which leads to increased customer satisfaction.

### Decreased Callback Costs

Mobility increases accessibility and reduces the costs involved in returning unsuccessful calls.

### Increased Efficiency and Productivity

Rapid response and direct communication promotes employee efficiency due to better call management, accessibility and mobility.

### Decreased Need for Calling Cards

By assigning a toll-free number to the Personal Assistant, the Office Extension feature allows you to make calls from the road and decreases the need for calling cards. Most calling cards carry a monthly charge, surcharges per call, and higher usage rates than those available from the office.

### Decreased Need for Mobile Voice Mail Boxes

The personal profile allows for utilization of existing corporate mailboxes for calls ringing the Personal Number. By adding a mobile phone to the profile, reoccurring monthly charges associated with mobile phone mailboxes can be eliminated.

### Low Cost for Configuration and Management

For the customer, the costs for managing and configuring the system are kept to a minimum due to remote accessibility via the corporate intranet or a modem. Sites can be serviced remotely, minimizing the number of site visits and the time used for repair, which increases customer satisfaction.

## **2.2 Mobility Server PBX Connectivity**

The MS can connect to a PBX via a Primary Rate Interface (PRI) such as Q-Sig and 5ESS protocol. This allows for better utilization of existing PBX resources because the connections are based on call traffic requirements rather than a one-to-one port ratio for users. This saves valuable space on your current telephone system and can present substantial savings to a customer who wishes to expand users on the existing phone system.

Additional T-1 CAS (line side T1) configurations are available for customers that have phone systems that do not support PRI.

## **3 End User Features and Functionality**

Mobile employees can take charge of their calls with the Ascom Mobility Server solution. The Personal Number feature, managed by the Personal Assistant, makes it very easy to connect all incoming calls to any telephone, independent of location.

### Personal Number

Personal Number allows the end-user access to the Personal Assistant and Personal Number features. Personal Number allows the user to be available on one single number for all Freeset, desk phone, pager, mobile and temporary telephone numbers. The calling party dials just one number; the Personal Number eliminates complex call diversions.

### Personal Number Profiles

*In Office Profile* - allows users to specify a series of office telephone numbers for call forwarding.

*Out Of Office Profile* - allows users to specify their regular external telephone numbers, such as a pager, mobile and/or home telephone numbers, for call forwarding.

*Temporary Number Profile* - allows users to specify that incoming calls be temporarily forwarded to an offsite work location.

*Absent Profile* - allows users who are not available to receive any incoming calls to have them immediately forwarded to a second party or to a voice mailbox.

*Freeset DCT1900* users can also specify the sequence of telephone numbers to which the Personal Number forwards any incoming calls.

The Personal Number feature provides the end-user with the following additional services:

*Personal Assistant*

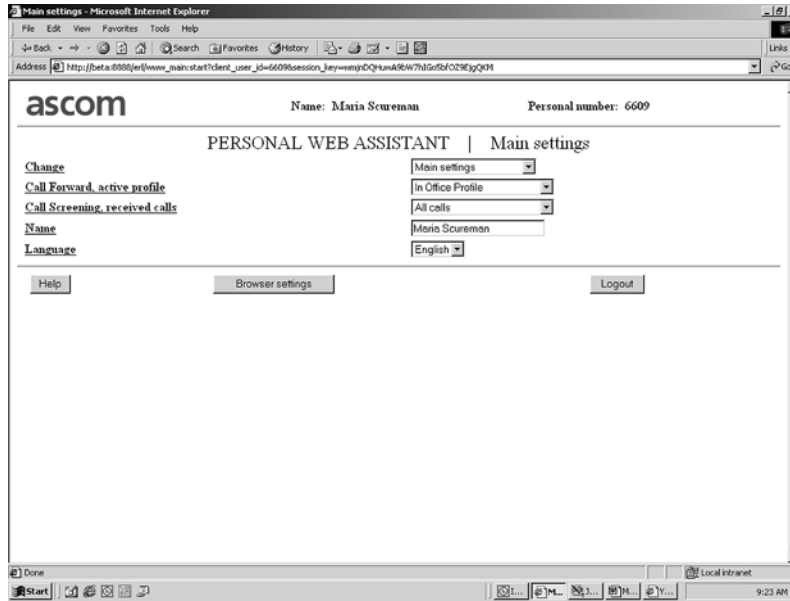
The Personal Assistant is the interface to control and manage the Personal Number features and is available to all end-users in an MS offering. The Personal Assistant can either be accessed from a web interface or via a touch-tone phone.

From the web-interface, the user can easily manage the Personal Number profile. For example, edit or change the order of the phone numbers or change the active profile. This can be done independent of location as long as the system used, with the web interface, is connected to the Mobility Server.

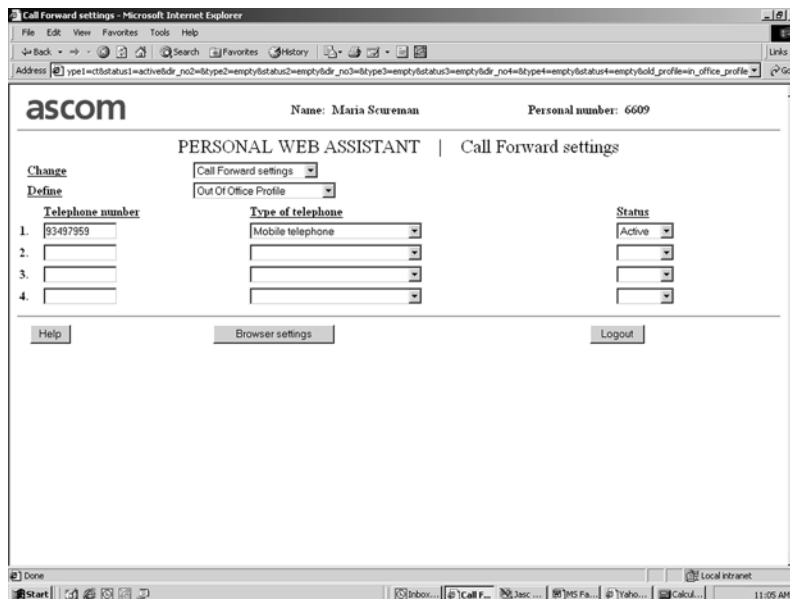


*Call Forwarding*

The Call Forwarding feature makes it possible to automatically forward a call, according to a predefined search list, to any telephone if there is no answer. The end-user can define and use four different Call Forward profiles: In Office, Out of Office, Temporary Number and Absent. Only one profile can be active at a time. Each profile is a search list with different telephone numbers where the end-user might answer. The search list can contain any telephone number from private, public and mobile networks. The configuration of the lists and the setting of the active profile are done by the end-user via the Personal Assistant web interface.



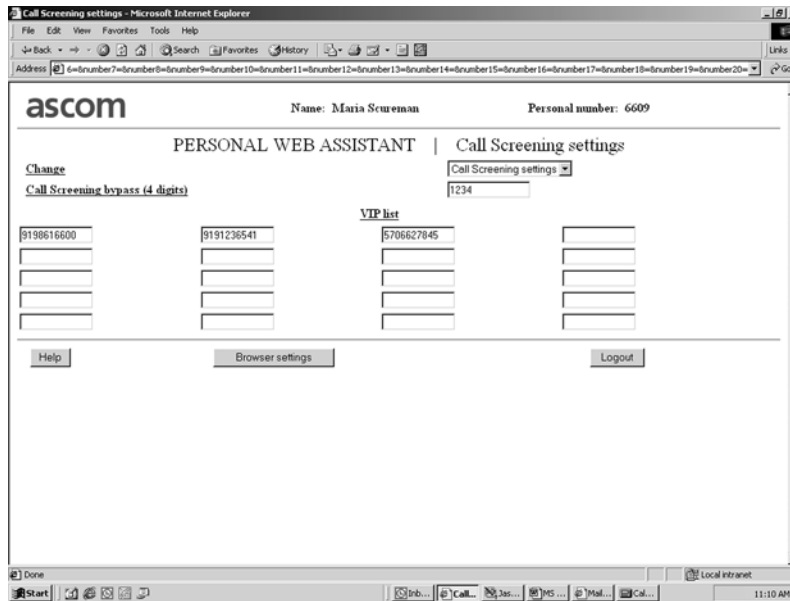
Personal Number Main Settings page. Allows the user to set which profile and call screening level is active.



Personal Number Call Forward Settings page. Allows the user to set up and modify the numbers of each profile.

**Call Screening**

The end-user can activate one of three levels of Call Screening that will determine who will be allowed to call through to the end-user. The levels are *All Calls*, *No Calls*, and *Selected Calls* specified by the end-user in a personally customized list. A Call Screening bypass function is available to be used by callers who should always be able to reach you.



Call Screening Settings page. Allows users to set up levels and enter numbers of allowed calls.

Office Extension

The Office Extension feature makes it possible to use an office extension remotely. The advantage of this feature is that the Personal Number user can call within the corporate network, and out of it, as if they were using an office telephone. Unlike Direct Inward Service Access (DISA), this is a secure feature because a username and password are required to access the Personal Assistant. In the event of a hacking attempt and after an administrator defined number of attempts, an alarm is generated.

Unlike calling cards, the Office Extension feature presents the called party with the user’s Personal Number and not the calling phone such as a hotel. Additionally, all calls are billed as if the calls were dialed from the office.

Voice Mail Access

This feature allows the Personal Number user to access voice mail directly from the Personal Assistant. Voice Mail Access also allows the user to save their voice mail password with the Mobility Server Personal Assistant.

Callers Control

If the end user is unable to answer a call, the caller can be given an option whether to forward the call to a second party or leave a voice mail.

Call Waiting

Call Waiting provides the user, while on a call, with notification and Calling Line Identification of a second call coming through to the Freeset Portable Telephone. The user can choose to answer the call, which will put the first call on hold, or choose to ignore the call and the call will be sent to the next number in your active profile.

### Call Accept

Call Accept provides the end-user, when answering a phone call, with the possibility to accept the call by pressing a single digit or reject it by hanging up. When the call is rejected, the calling party will be routed to the next number in the called party's active profile list. This feature is useful when many different people can answer the phone, for example, the home phone. (*Note: the caller is not aware that the call was answered and the rejected by the user.*)

### Handover

Handover allows the end-user, who is making or receiving a call, to move around freely within the radio coverage area controlled by one Mobility Server system without any disruption during the ongoing call.

### Roaming

Roaming means that any user in a Mobility Server network can use their Freetel wireless telephone and extension number at several sites.

## **3.1 End-User Features Accessible via the Freetel DCT1900 Portable Telephone**

When using the Mobility Server, the user has access to the following features via the Freetel DCT1900 Portable Telephone:

- Calling Line Identity
- Hold, Inquiry, Refer Back, Transfer and Conference
- Message Waiting Indication for voice and text messages
- Multiple Call Capability with Call Waiting
- Connected Line Identity
- Individual Abbreviated Dialing
- Common Abbreviated Dialing
- Alphanumeric Text Messaging
- Personal Assistant Features
  - Call Forwarding
  - Concurrent Ringing
  - Call Screening
  - Office Extension
  - Voice Mail
  - Password Change
  - Change Style (long or short guidance for the Personal Assistant)
  - Callers Control
  - Call Accept

## **3.2 System Features and Functionality**

### System Network Management (SNM)

System Network Management (SNM) is simple, as it is web-based with help files and documentation online. The system administrator provides a very manageable solution where configuration and system management of the Mobility Server can be done from any computer that is connected to the LAN and loaded with a commercially available web browser. The configuration can be done onsite or remotely via network access.

Additionally, alarms from the Freeset DCT1900 are transferred to the Mobility Server and shown on the web interface.

#### Call Logging

Call events are logged for administrator review or for input into an automated billing system.

#### Local Mobility

The MS handles user access to the in-building wireless network. This gives a user the ability to make and receive calls from anywhere within the Freeset DCT1900 coverage area.

#### Wide Area Mobility Roaming

A Mobility Server that is roaming enabled can be connected to other Mobility Servers over an ISDN Q-Sig network giving users the ability to make and receive calls from any Mobility Server within the network.

#### Handover

Handover makes gives a user the ability to move around within the entire Freeset DCT1900 coverage area controlled by one Mobility Server without disruption during an active call. The number of handovers during a call is unlimited and seamless.

#### Numbering Analysis

The numbering feature is an interface function to the number analysis database. In the database all information about destinations is stored, e.g. who is allowed to dial that number and how the number should be transformed to access the destination in the best possible way.

#### Procedures

Procedures are numbers that do not belong to a user or to a route. These numbers are used to invoke a feature.

#### Primary Routing

When the result from the number analysis is an external destination, the Primary Routing feature is used to find the first available route to use. Primary Routing creates a list of potential routes. In creating this list, the Primary Routing feature considers the capability of the wanted bearer and which services the route can handle, i.e. voice or data transmission.

#### Least Cost Routing

Least Cost Routing is not implemented as a separate feature, but a simple version can easily be done within the numbering or routing features, e.g. detect that it is a public number which belongs to the private network and remove the part of the number that makes it public and add necessary digits to reach the destination within the private network. It is not possible, however, to configure the number analysis to consider the time of day for purposes of least cost routing.

#### Trunk Called Discrimination

Trunk Called Discrimination (TCD) is used for cost control, to determine which users are allowed to make calls to certain destinations, for example, local calls only or international calls restricted.

### Traffic Matrix

Every user has a Traffic Matrix Class (TMC) value assigned to his/her number. These values define to whom a user may or may not call within the Mobility Server. Through the use of the TMC value, the system administrator can prevent users within the Mobility Server from being connected to each other even if they dial the correct number.

### Fault Management

Faults are recognized by the system through the detecting processes in the software and the built-in detecting mechanism in the hardware. Hardware faults are, in general, reported as alarms that indicate the nature of the fault. These alarms help the system administrator to correct the fault.

### Common Answering Position

For those wireless users who do not utilize Personal Number, a centralized termination point can be set up for unanswered calls. This feature is known as a common answering position, and the common answering position can be any internal or external number (e.g. voice mail or a second party).

### PBX Voice Mail

Allows calls to an end user to utilize the current PBX voice mail system. Each customer group can define their own voice mail system whether internal or external. Additionally, end users can override the main voicemail system and define an alternate one.

### Dial Tone Multi-Frequency (DTMF) Generation

Allows users to generate DTMF tones.

### Short Message Service (SMS)

Allows users in the Freeset DCT1900 system coverage area to receive alphanumeric messages up to 100 characters in length from any TAP 1.8 compliant device.

## **4 Mobility Server Benefits**

### Protection of Investment

Connect multiple Freeset DCT1900 systems together to accommodate large systems creating a scalable solution that allows you to protect your original investment in Freeset DCT1900.

### Network Multiple Locations

Network multiple locations for mobile automatic roaming which increases accessibility to mobile employees who work at multiple facilities.

### Better Utilize Existing Telephone System Resources

Existing telephone system resources are better utilized because connections from the MS to the existing phone system are based on call traffic requirements rather than a one-to-one port ratio for users. This saves valuable space on the current telephone system.

### Increase Accessibility

By extending the freedom of movement within one site and to other networked sites. The end-user is not dependent on being in any particular location to receive calls and can

move around freely in any sites networked via the MS. Additionally, users are accessible via Personal Number while they are travelling between sites as well as working off-site.

#### Improve Customer Service

Being accessible to take calls from customers and colleagues wherever you are improves customer service and speeds up internal processes.

#### Reduce Call-back Costs

Call back costs incurred with returning missed calls can be reduced.

#### Increase Efficiency and Productivity

Rapid response and direct communication promotes employee efficiency due to better call management, accessibility and mobility.

#### Time and Location Independent

The advanced mobility features such as Personal Number provided by the Mobility Server allows the user to work in a manner that is most efficient for them.

#### Effective Disaster Recovery

The Mobility Server can provide an effective disaster recovery solution for your voice communication and text messages. In the event of a natural disaster, when communication in a facility becomes even more crucial, the MS can continue to provide internal wireless voice and text messaging for the Freeset DCT1900 Portable Telephones.

## **5 Highlighted Mobility Server Applications**

#### Telecommuting and Hoteling

The Mobility Server's Personal Number feature allows highly mobile workers to remain accessible from a single number, making it ideal for telecommuting and hoteling applications. More and more, American workers do not work in a traditional office space every day of the week. Many spend the majority of their time on the road, making quick trips to an office, or working from home. Hoteling has become an increasingly prevalent alternative officing trend, effectively accommodating non-permanent personnel and employees who need to visit the office only periodically. The MS Personal Number feature enables these individuals to remain productive and efficient no matter where they are at any given point in their day.

Additional Highlighted Mobility Server Applications:

- The Mobility Server is TAP 1.8 compliant and supports Ascom's Advanced Nurse Call System Integration (ANCSI) as well as other messaging applications for Short Messaging Service offered as a feature of the Freeset DCT1900.
- Personal Number allows end-users to simplify management of on-call contact lists for personnel involved in functions such as technical support. This feature may also be helpful for healthcare facilities that maintain on-call lists for their staff members.
- The Mobility Server efficiently uses existing PBX resources because connections are based on call traffic requirements rather than a one-to-one port ratio for users. This saves valuable space on the current telephone system and can

- provide a substantial cost savings. Additionally, this capability can extend the life and adds capacity to legacy phone systems.
- Protect the initial investment of Freeset DCT1900 by providing a scalable solution to accommodate large wireless systems.
- Network multiple locations for mobile automatic roaming increasing accessibility to mobile employees.
- Call hand-off to any cellular provider, national or international.
- Call hand-off to any public telephone network or paging service provider.

## 6 Product Overview

The Ascom Mobility Server is a solution concept that offers enhanced mobility services for employees. End users are provided with in-building wireless mobility and text messaging via the Freeset DCT1900 portable telephones. Additionally, MS integrates Freeset portable telephones, mobile phones, public phones, pagers and desk phone extensions into one efficient solution.

The Ascom Mobility Server is connected to private and public networks via a single or multiple PBX's and one or more radio exchanges, all via Primary Rate Interfaces (T-1 CAS configurations are available). This makes it possible to cover large areas with one product platform. Several sites can be networked together to build large networks where users can make and receive calls using the same Freeset portable telephone.

System maintenance and administration personnel can access the system via a Web browser for the day-to-day administration and configuration work.

The Ascom Mobility Server is divided into four parts:

- *Freeset DCT1900 Basic System*  
This contains all the products needed for a Freeset DCT1900 in-building wireless communication system. *Please see the Freeset DCT1900 FactBook for additional information.*
- *Telecom Server*  
This is the core product to which other components are connected. The product is currently a Dell server, which contains both hardware and software.
- *Switchboard*  
The switchboard is a hardware platform used to handle all the voice traffic for the MS. It contains a non-blocking switch architecture, digital signal processor for tone detection, functions for voice announcements and up to 12 primary rate interfaces on a single board.
- *Licenses*  
Additional users and functionality are added to the Mobility Server through user and system licenses.

The Ascom Mobility Server is call control software running on a server that is connected to a matrix switchboard via a dedicated TCP/IP network, handling the traffic flow. System and network management as well as end user management is easily handled over a

network connection using a commonly available web browser. In addition, maintenance personnel can support the product over a dial-up modem installed in the system or a path through the customer's firewall. It is possible to connect the following products to the Mobility Server:

- UPS type power system with communications software
- PBX supporting ISDN Q-sig or AT&T ISDN PRI 5ESS
- Channel associated T1 using third party equipment
- Central Office trunks for disaster recovery

Licenses determine how many users are allowed to subscribe to a service or if the service is allowed in the system at all. The following licenses can be added to an MS system:

- Mobility Server User - used for giving a user access to the radio infrastructure and Personal Number features
- Roaming - used for giving users from other systems access on this system

## 6.1 Mobility Server

The MS is a telecommunication switch for mobile employees. It is designed to network with other PBXs and other Mobility Servers to build custom voice and messaging networks for mobile users. System and network management as well as end-user management are easily handled over the network using a browser.

The MS consists of the following physical parts:

- Telecom Server
- Switchboard Card

### Telecom Server

The Mobility Server runs its applications on a powerful Intel Pentium processor. Critical parts such as hard drives, fans and power supply are duplicated and are hot swappable to increase reliability. The hard drives support RAID 1 control, i.e. all data is written onto two separate physical disks, providing complete redundancy. If information on one disk is corrupted, the other disk will take over.

The telecom server offers connections through a network interface card and serial ports. Interfaces for video, keyboard and mouse are included and the system is delivered with a keyboard and mouse.

The telecom server is connected to and controls the switchboard via one of the Ethernet interfaces. A second Ethernet interface is connected to the company network, enabling remote management using Internet Explorer 5.0 and Netscape 4.7.8.

Additionally, the telecom features a secure, internal modem that is preinstalled and configured into the system. This allows for remote support of the system for timely customer service.

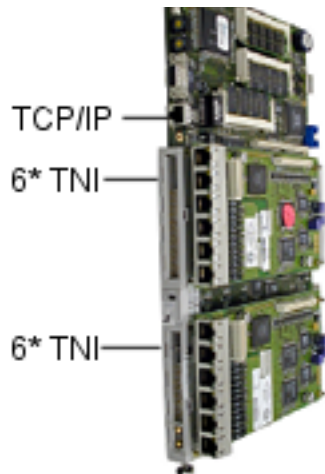
## 6.2 Switchboard Card

The switchboard is a Central Office (CO) grade hardware platform used to handle all the voice traffic for the MS. It contains a non-blocking switch architecture, digital signal

processor for tone detection, functions for voice announcements and up to 12 primary rate interfaces on a single board. The switchboard has its own CPU and memory and acts as a self-sufficient processing node, networked with the telecom server via 10-Base T Ethernet.

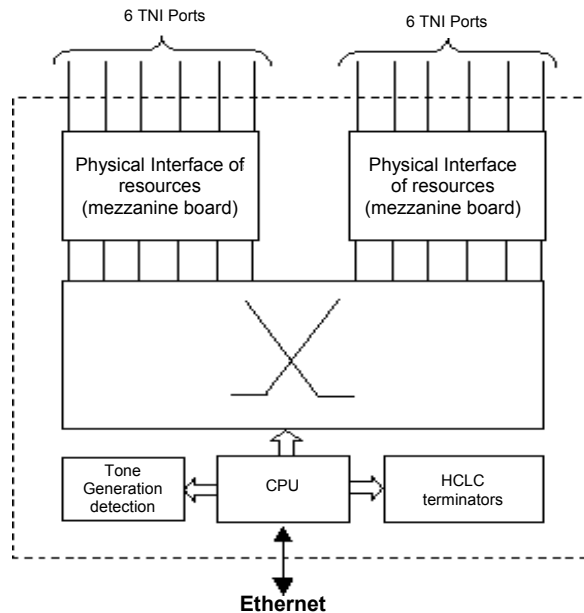
The switchboard is equipped with two mezzanine boards, which provide physical interfaces. Each mezzanine board has a capacity of six interfaces, making a total of 12 Telecom Network Interface (TNI) connections per switchboard. Supported interfaces are either E1 at 2 Mbit/s or T1 at 1.544 Mbit/s.

**Switchboard**



- |   |
|---|
| <p><b>Characteristics:</b></p> <ul style="list-style-type: none"> <li>▪ Two mezzanine boards per switchboard</li> <li>▪ Tone and voice sending</li> <li>▪ DTMF tone detection and send</li> <li>▪ A non-blocking switch</li> <li>▪ Upgradeable firmware</li> <li>▪ Flash and RAM memory</li> <li>▪ -48 input (20 watts)</li> <li>▪ Dimensions, 343X192X40</li> </ul> <p><b>Interfaces:</b></p> <ul style="list-style-type: none"> <li>▪ 6 TNI interfaces per mezzanine board</li> <li>▪ Maximum 12 TNI per switchboard</li> <li>▪ One Ethernet 10-base T interface</li> <li>▪ Com Port</li> <li>▪ 10 Base T LAN Connection</li> </ul> |
|---|

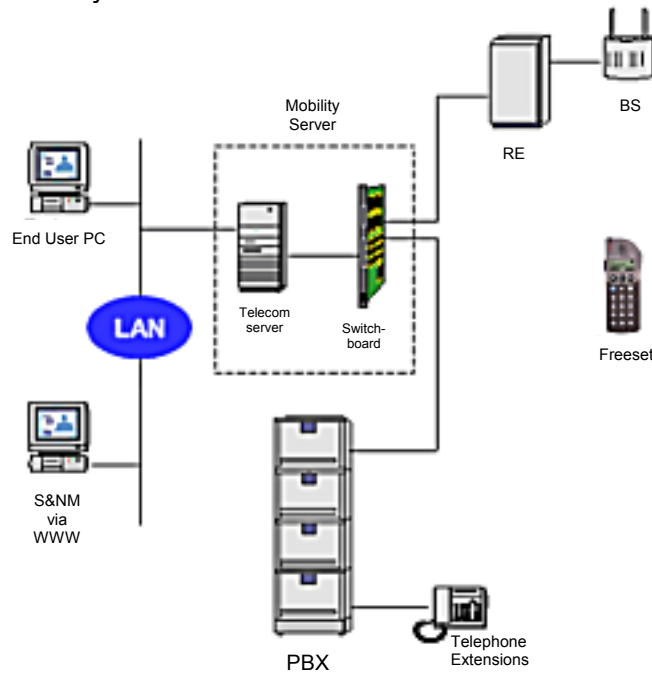
The switchboard terminates the physical layer and the time critical link layer (the two lowest layers according to the Layer OSI model). The telecom server handles Layers three and up. The telecom server and the switchboard communicate using distributed Erlang on top of TCP/IP.



Twelve TNI connections are offered and can be configured to support the following protocol types:

- ISDN Q-Sig to a PBX or another Mobility Server
- AT&T 5ESS to another PBX or Centrex
- ISDN-S2 (CCS-MOB) to the Radio Exchange

Different protocol types can be used on the same mezzanine board. The switchboard is installed in a separate cabinet, the switchboard cabinet. This cabinet is only used for mechanical stabilization, power supply and EMC requirements. The figure below shows an overview of the Mobility Server solution.



### 6.3 Supported Browsers

The Mobility Server supports Microsoft Internet Explorer 5.0 and Netscape 4.7.8

## 7 Interfacing Mobility Server and the Freeset DCT1900 System

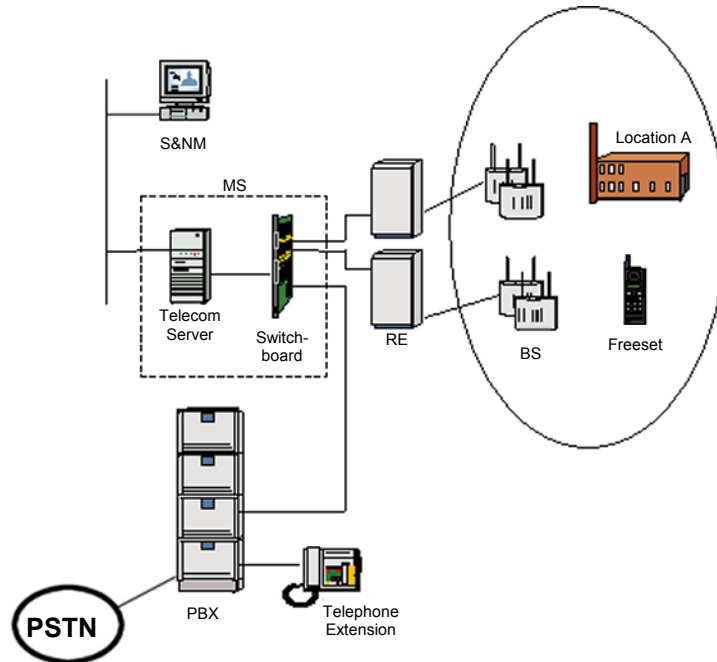
When creating a local system configuration, the Freeset DCT1900 Radio Exchange is connected to the Mobility Server via an E1 CCS interface making it possible to build large in-building wireless communication systems. Remote configurations can be accomplished by interfacing the MS and the Freeset system via a T1 connection.

### 7.1 Single MS Installation with a Local Freeset Radio Exchange

In a single installation, only one MS is used. The number of Radio Exchanges and Base Stations depends on the characteristics of the site.

This type of installation supports seamless handover and roaming within the coverage area. For example, the user can move freely inside the coverage area without effecting

an established conversation. The figure below shows an example of a single MS installation.

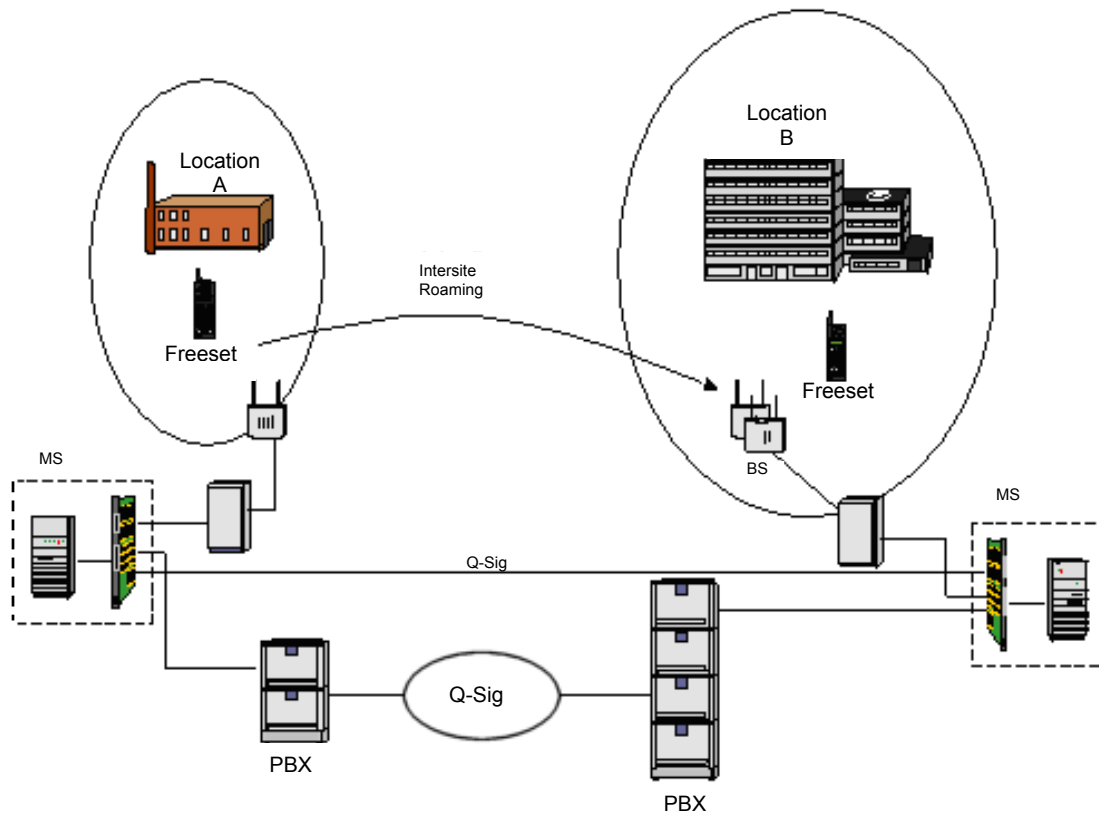


- The MS can connect to any PBX via a Primary Rate Interface (PRI) such as Q-Sig and 5ESS protocol. The existing PBX onsite is used as a gateway to the public network.
- The interface to the Radio Exchange is E1 CCS-MOB.
- System and Network Management as well as the end-user management are done via a network or dial-up connection.

## 7.2 Networked MS Installation

A Mobility Server can be connected to other Mobility Servers over dedicated PRI Q-Sig trunks, giving the user the ability to make and receive calls from any Mobility Server defined in the network.

Example of a networked MS installation:



In a networked scenario, the MS can either be connected using a dedicated PRI Q-sig trunk or using the existing Q-sig network between the PBXs if Generic Function is supported between nodes.

## 8 System Network Management (SNM)

All SNM of the Mobility Server is done from a WEB-browser. There is no need to install any dedicated management applications on the management PC; you use your standard WEB-browser (Internet Explorer 5.0 and Netscape 4.7.8) as the management system.

## 9 System Security

### Security

The Mobility Server may be accessed through an ordinary firewall, with the correct configuration. All sessions and attempts with the MS are registered in a security log. All user identities are associated with an authority level and possibly with a customer group and handset identity.

### Users Types

The following list of user types, each with a separate set of authorities, are defined as the default setup for the Ascom Mobility Server system:

- System User - an end user who has a Freeset DCT1900 portable telephone, which is subscribed to the MS. The System User can make and receive calls in the MS environment and change their own personal profiles and password.

- Group User - configures the user data in a list of end users that belong to one customer.
- System Administrator - manages an MS user registration and can add or delete system users or change user profiles in the MS system.
- System Operator - manages operation and maintenance functions such as fault and performance monitoring, configuration, security and accounting management.
- System Supplier - plans, delivers and installs the Mobility Server system and provides the Technical Assistance Center (TAC) function for the System Operator for analysis of system faults and system upgrades.

### Firewall

The MS can and should be protected from Internet intrusion using a firewall. A firewall basically protects an internal network from the Internet. The firewall contains functions such as connection logging, restriction of service by IP address in both directions and control of issued application level commands.

## **10 Reliability / Mean Time Between Failure (MTBF)**

### **10.1 Switchboard**

The MTBF has been calculated to 40.6 years.

## **11 Standard Interfaces**

This section summarizes all interfaces and standards supported by the MS:

### **11.1 E1 PRI**

Requirements on 2048 kbit/s Digital Structured:

#### *11.1.1 Electrical Characteristics*

- CTR 13 (97/521/EC)

#### *11.1.2 Conformance Requirements*

- TRR 13 (January 1996) Test Standard

#### *11.1.3 Over Voltage Protection*

- CTR 13 (97/521/EC)

#### *11.1.4 Conformance Requirements*

- ETS 300 046-3 (August 1992) Test Standard  
*Note: Only 120 Ohm twisted pairs cables can be supported.*

## 11.2 T1 PRI

The 1544 kbit/s T1 PRI interface for Common Channel Signaling conforms to EIA/TIA 464.

## 11.3 ISDN Q-signaling

- Layer 2  
ETS 300 402-2, Annex 3A  
ETS 300 408-2
- Layer 3  
ETS 300 172, 3rd edition  
ETS 300 805-2

## 12 Glossary

**5ESS** – A digital central office switching system made by AT&T. It is typically used as an end-office, serving local subscribers. However, it can also be used as a Centrex system.

**Caller's Control** - If the end user is unable to answer a call, the caller can be given an option whether to forward the call to a second party or leave a voice mail.

**Call Screening** - Allows the user to filter incoming calls. The purpose of the sub-function is to give the mobile user the means of controlling the incoming calls. In this way, the user can avoid unwanted incoming calls but still use his terminal for outgoing calls. The user can also decide to receive calls from certain directory numbers only.

**Configuration Management** - Handles the administration of all types of semi-permanent data in Mobility Server.

**Fault Management** - Provides the means, automatic and manual, to restore service after a fault occurs or to limit the effect of a fault on the system

**Graphical User Interface (GUI)** – Icons representing actual desktop objects that the user can access and manipulate with a mouse. Example: World Wide Web

**Handover** - When a live call is transferred between Base Stations and/or Radio Exchanges connected to the same Mobility Server.

**Hoteling** – Provision of office tools and accommodations for visitors, contractors, consultants, temporary employees or people who visit the office only periodically.

**Integrated Services Digital Network (ISDN)** – Digital protocol used in a network to connect Customer Premise Equipment and Central Office equipment together to provide intelligent services.

**Mean Time Between Failure (MTBF)** – The average time a manufacturer estimates before a failure occurs in a component, a printed circuit board, or a complete telephone system.

**Office Extension** - The mobile user can make a call from any phone with DTMF capability (cellular phone, PSTN/ISDN phone, and PTN phone) via the Mobility Server to the PBX. The PBX will then treat the call as if you were calling from the office.

**Personal Assistant** - A user-friendly interface to the Mobility Server system available from any DTMF phone. The interaction with the Personal Assistant is based on voice prompts and DTMF keys. When the assistant prompts, the user can respond by pushing the key button suggested by the assistant. Experienced users may push a sequence of keys and do not have to listen to each voice prompt.

**Personal Mobility** - The ability to be independent of a specific terminal and have all calls find you as an individual.

**Personal Number** - A Personal Number service for corporate network users will make them "appear" under one single personal number allowing them to use any phone inside and outside the corporate premises as their own terminal for incoming calls. The calling party does not need to dial several different telephone numbers in an attempt to reach the user and the user will not have to maintain a complex chain of call diversions. Incoming calls to the MS will be received by a simulated attendant and transferred to the appropriate terminal.

**Personal Wireless Telephony (PWT)** - Is an EIA/TIA standard (EIA/TIA-662), based on DECT (Digital Enhanced Cordless Telephony), the extremely successful standard for personal communications in Europe. PWT was designed for the new unlicensed PCS band (1920-1930 MHz). PWT was developed by a group of companies such as Ericsson, Lucent, VLSI, Symbionics, Motorola, Nortel, and Rockwell.

**Primary Rate Interface (PRI)** – The ISDN equivalent of a T-1 circuit. The PRI, which is delivered to the customer's premises, provides 23B+D. The most common method for sending signaling and control messages between systems is via an ISDN PRI D-channel. The signaling can occur in two ways: Either across end-to-end private ISDN PRI trunks, or via a Virtual Private Network (VPN).

**Private Telecommunications Network (PTN)** – A network of PBXs connected together using tie lines.

**Public Switching Telephone Network (PSTN)** - Refers to the local phone company.

**Q-sig** - An emerging signaling and control standard, which has been added to the ISDN model. Q-sig specifications emerged from European standards committees. Q-Sig defines a signaling protocol that enables PBXs to intelligently communicate.

**Radio Exchange (RE)** - The heart of the DCT1900 system, the RE consists of up to 4 cabinets housing the Central Processing Unit (CPU) and other cards necessary for system operation. The RE is typically co-located with the PBX and/or Mobility Server (MS). The MS power unit, if so configured, can power the RE.

**Roaming** - The ability to move between Radio Exchanges connected to the same Mobility Server module on a single site, between Radio Exchanges connected to different Mobility Server modules, on a single site serving one PBX system, or between several sites in a PBX network connected to different PBX systems.

**System Network Management (SNM)** – Process of managing your network using SNMP and / or WWW.

**Simple Network Management Protocol (SNMP)** – Standardized monitoring protocol for network management

**Security Management** - Controls the access to Mobility Server and protects sensitive data transfer and storage.

**Service Mobility** - The ability to access corporate network services on any terminal in any network (incoming and outgoing calls).

**Telecom Server** – A dedicated server in a client server environment. Its power, scalability, enhanced fault tolerance and standards-based openness makes the telecom server an excellent applications server providing a platform for sophisticated business solutions.

**Telephony User Interface (TUI)** – Using the telephone to receive and send information

**Virtual Private Network (VPN)** – The ability to connect PBXs together via the PSTN but transport inter-PBX signaling such as Q-Sig over this network to create the appearance of a dedicated private network.

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