

# CALLUP VMS™

## Product Description



**CALLUP**  
ONE1 TELECOM DIVISION

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# CALLUP VMS™ Product Description

## 1. Overview

### 1.1. CALLUP CanVAS Platform

CALLUP VMS™ (Voice Mail System) is part of the CALLUP CanVAS platform offers a complete messaging and voice solution that inter-connects Land Line, Mobile and Internet subscribers. This document describes the CALLUP VMS™ component of this platform.

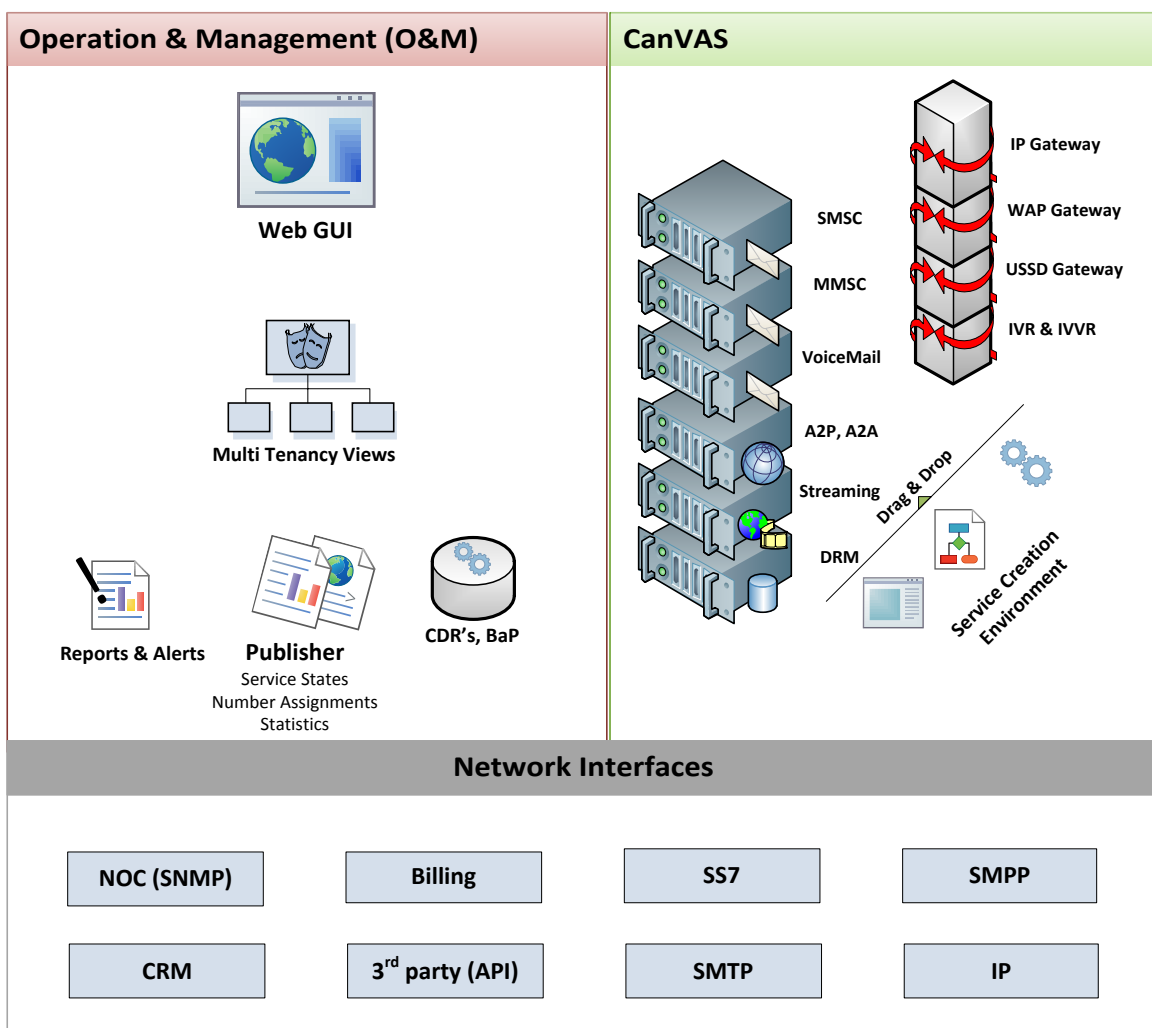


Figure 1: CALLUP CanVAS Platform

## 1.2. About CALLUP VMS™

CALLUP's VMS™ is a state of the art voice mail platform for telecom operators.

Some of the high level attributes it contains:

- **Full Voice Mail feature set:** CALLUP VMS™ includes all the major Voice Mail functions expected from a state of the art Voice Mail product.
- **Modern interfaces** including branded smartphone apps (VVM – Visual Voice Mail), web interface, voicemail to MMS and to Email.
- **Compatibility with all major Switches:** The CALLUP VMS™ platform is compatible with all major Switches demonstrating full interoperability and facilitates seamless migration from one Switch vendor to another. Fully supporting VoIP as well as TDM interfaces.
- **Unlimited scalability.** A system with 50,000 voice mail boxes can be upgraded to a system with 5,000,000 mail boxes in the same rack.
- **Compactness:** A 5,000,000-message box system fits into one industrial network cabinet taking up less than 1 square meter of floor space.
- **State of the art** HP industrial servers featuring Intel processors and Intel E1 and SS7 hardware if TDM is required.
- **Distributed systems:** The deployment of small systems in many locations drastically reduces inter-city communication costs.
- **Seamless integration** from other Voice mail systems (e.g. such as Comverse)
- **Minimal training:** Since the system utilizes standard components, a few hours of training is normally sufficient
- **Unique remote support** hardware enabling complete control and monitoring of the system from anywhere on the network

## 2. CALLUP VMS™ Technical Description

### 2.1. System Architecture of CALLUP VMS™

#### 2.1.1. Entry level system with 120,000 Voice Mail boxes

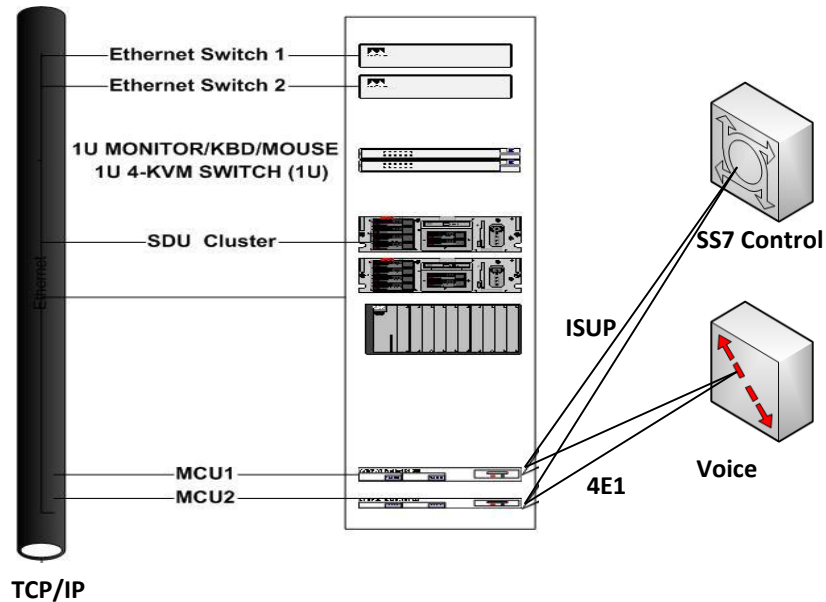


Figure 2: CALLUP VMS™ entry level system with 120,000 Voice Mail boxes

#### 2.1.2. System with 1,000,000 Voice Mail boxes

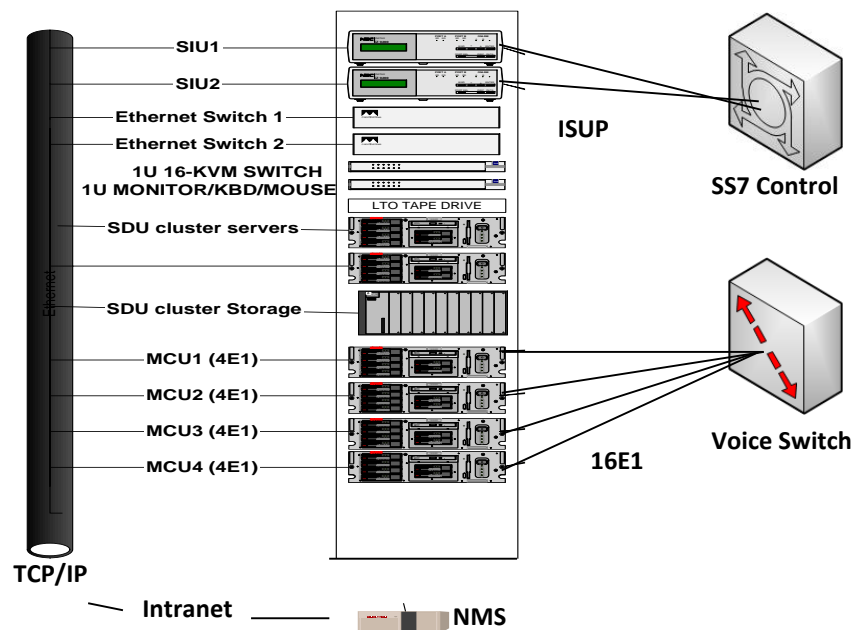


Figure 3: CALLUP VMS™ system with 1,000,000 Voice Mail boxes

## 2.2. The main system components are:

### MCU1-10 (Message Control Unit)

- Interfaces with voice and signaling network.
- Up to 10 MCU units. Each MCU unit has 1-16 E1 voice lines.
- Plays IVR for incoming calls.
- Number of E1 interfaces and MCU units according to customer specifications.
- Records incoming messages to SDU.
- Receives outgoing messages (message playback) from SDU.
- Receives signaling (SS7) from SIU server via Ethernet switch.

### SIU (SS7 Signaling server)

- Interface to SS7 network (ISUP).
- Interface to MCUs via Ethernet switch (TCP/IP).
- Redundant configuration including 2 SIU units.
- Load balancing between the 2 SIU units.

### SDU (Storage Device Unit)

- Houses CALLUP VMS™ database and all messages.
- Accessed by MCUs (message saving and retrieval) via Ethernet switch
- Fully redundant
- Up to 12TB of storage for messages.
- Load balancing between the 2 servers in the SDU cluster
- Fast and reliable tape backup on AIT/SLDT or LTO tape

### Ethernet Switch

- 2 Cisco switches
- Full redundancy and load balancing between switches
- Enhanced network throughput from servers (teaming)

### NMS (Network Monitoring System)

- Accessible from anywhere on the network
- Control Center monitors all servers and sends alarms

### WEB Server

- Duplicates messages from the SDU
- Provides access to messages via WEB interface
- Provides administrator functions via WEB interface
- OMTF and other front end app interfaces



## 2.3. Redundancy and fault recovery

The CALLUP VMS™ system is a fully redundant fault tolerant system.

- **Redundant SDU cluster.** The SDU is comprised of a Microsoft fiber cluster and features 2 HP Proliant servers and shared external storage .Both servers are operated simultaneously (Load Balancing) and functions (resources) such as the SQL server and message file share are distributed between the two servers. The SDU will continue functioning in the event that 1 server fails with a fail over time of less than 2 minutes. The process of failover and fail back of cluster resources is completely automatic and requires no user intervention. All cluster events and alarms are reported to the CALLUP NMS. The external storage (HP MSA1000) has RAID 1 (mirroring) and RAID 10 (striping and mirroring) volumes for redundancy and enhanced I/O performance. The storage unit also has redundant power supply, fans, fiber hub and RAID controllers to ensure 24/7 availability.  
The data path for the SDU utilizes fiber optics for high performance, reliability and full data path redundancy. Each cluster server has redundant fiber controllers, on-line spare memory, RAID 1 system disks with on-line spare and redundant power supply, fan and NIC. Smaller VMS™ systems employ SCSI I/O connections instead of fibre.
- **Redundant Signaling server.** Two signaling servers (Intel SIU G21) are provided which service both the MCU units. The MCU CICs are divided between the signaling servers (load balancing) and one server will automatically take over in the event that the 2<sup>nd</sup> server fails with no loss of service.
- **Redundant Ethernet Switch** – Two 100Mbit Ethernet switches are provided where all servers are connected to both Switches. The Ethernet switches are both redundant (one switch can fail) and load balancing (each server can transmit on 2 Ethernet interfaces). Ethernet teaming is defined on 2 NICS on each server with transmit load balancing such that the server transmits on both NICs (load balancing) and does not lose connection with the switch when 1 link fails (redundancy)
- **Redundant MCUs.** CALLUP VMS™ features N+1 MCU redundancy. All MCUs operate simultaneously (Load Balancing). The system will continue functioning in the event that one MCU unit fails with no loss of capacity.
- **Redundancy features on SDU/MCU:** All servers have redundant power supplies and fans. RAID 1 disks ensure that there will be no loss of service in the event that a system disk fails. On-line spare disks automatically replace a failed system disk until it is replaced. The SDU servers have redundant Hot Swap fiber controllers. Hot swap spare memory ensures that the server will not fail even if a memory bank fails.

## 2.4. Prevention of Data Loss

The CALLUP VMS™ system has many mechanisms to prevent data loss or corruption following power loss or system breakdown:

- The RAID controller on the MSA1000 has 64MB on board memory and backup battery power to store the write cache in the event of power loss.
- SQL maintains a transaction log which is used to roll back transactions in the event of system failure or power loss.

## 2.5. SS7 signaling and Voice Interface

The CALLUP VMS™ system includes 2 Intel SIU signaling servers with ISUP protocol stack. These servers are configured in a redundant fault tolerant configuration that requires 2 SS7 links but only 1 point code. The SIU units communicate with the MCU units via TCP/IP on the CALLUP VMS™ LAN.

The SIU complies with ITU-T recommendations and ETSI standards.

Alternatively, single Dialogic Septel Quad E1 cards may be installed in each of the MCU units. Each MCU unit will then require a separate point code. The SS7 signaling and E1 voice may be combined on a single E1 cable.

The CALLUP VMS™ E1 voice interface is based on Dialogic DMV1200/600 BTEP boards and is compatible with G703 standards (120 ohm impedance, 2,048 Mbit/s)

The CALLUP VMS™ system also supports PRI and MFC-R2

## 2.6. Interface to VoIP networks.

As an alternative to SS7, the CALLUP VMS™ system can also be connected to VoIP networks. Each MCU can handle up to 120 voice sessions. The following VoIP protocols are supported:

- H.323, SIP, H.450.2 for IP call control
- RTP G.711, G.723.1, G.729a/b
- QoS (threshold alarms, packet loss reduction)
- Voice (play, record, volume/gain control, tones)
- T.38 fax termination

## 2.7. Scalability

Additional E1 lines may be provided simply by adding E1 cards in the 2 MCU units or adding additional MCU units (up to 10 MCUs with 120 E1 voice lines).

Additional disks may be added at any time if extended data storage facilities are required. Due to HP's advanced storage and RAID technology, increasing the SDU's storage capacity can be achieved by simply inserting new hot swap disks into the SDU's storage unit (up to 6 Terabyte).

The proposed disk capacity is according to the customer's specifications.

The CALLUP VMS™ platform can host a variety of Value Added Services, all of which can be integrated into the CALLUP VMS™ platform. In the event that enhanced processing power is required, additional CPUs and memory can be added at any time.

The SDU, MCU and signaling servers are available in both AC and DC (-48V) power.

CALLUP can provide Cisco Catalyst 2950 24 port switches instead of the HP Procurve switch according to customer preference.

Alternative tape solutions, such as SDLT and LTO auto changers, can also be provided instead of the AIT tape.

## 2.8. Reliability

The CALLUP VMS™ system utilizes best of breed hardware from world leaders HP and Dialogic. All CALLUP VMS™ servers (SDU, MCU and SIU) are specially designed to offer 24/7 service.

Full h/w redundancy ensures that the failure of any system component will not result in the loss of service.

Fully automatic recovery mechanisms eliminate the need for human supervision.

## 2.9. Security

The CALLUP VMS™ servers (SDU, VCU and SIU) employ multi-level user access thus ensuring that sensitive systems operations are available only to authorized users.

Illegal access, network attacks and virus infection are prevented using standard tools.

## 2.10. Flexibility

The CALLUP VMS™ system can be modified to provide an IVR identical to existing VM systems.

A Windows provisioning API means that the same provisioning application may be used for both the CALLUP VMS™ and other VM systems.

Many COS (Class of Service) groups may be defined and subscribers may be freely moved between the different groups.

Subscriber information, such as preferred language and password preference, may be easily modified via the provisioning API.

## 2.11. User Interface

The CALLUP VMS™ system employs industry standards such as HTML, SNMP and JAVA in order to provide easy to use , intuitive administration applications that can be run anywhere on the Intranet or Internet via a Web browser. These applications include:

- ControlCase: displays the hardware and system status of all CALLUP VMS™ components and sends alarms.
- System Configuration: view/modify Class OF Service (COS) and general system parameters such as CDR options.
- RAID array utility: view/modify RAID array definitions for all servers
- Ethernet switch: view definitions, status and statistics of Ethernet switches
- View detailed statistical reports on CALLUP VMS™ traffic.
- View detailed event logs

## 2.12. CALLUP VMS™ software

The CALLUP VMS™ SDU and MCU units run the Microsoft Windows 2008 Server R2 operating system.

The HP Proliant server family is specially designed and undergoes rigorous testing with Windows 2008 Server R2 operating system in order to ensure that this winning combination provides premium performance and reliability in thousands of mission critical applications around the world.

CALLUP VMS™ utilizes industry standard protocols such as TCP/IP for inter process communication, ODBC for data communication and SNMP for alarms.

The CALLUP VMS™ open architecture enables unlimited integration to 3<sup>rd</sup> party solutions such as TTS and Voice Recognition.

The SIU signaling server runs UNIX and communicates with the MCU units via TCP/IP.

The CALLUP VMS™ system will contain the latest version of software. New software versions will be distributed according to the Support and Maintenance contract.

## 2.13. CALLUP VMS™ Database

The CALLUP VMS™ system utilizes the world renowned Microsoft SQL enterprise database. This robust database is ideally suited for storing messages and can store a virtually unlimited number of messages.

The SQL server is managed by the SDU cluster. In the event that the SQL server fails for any reason, it is automatically moved to the 2<sup>nd</sup> SDU cluster server.

The CALLUP VMS™ automatically creates a backup of the SDU database both on disk and tape. The backup schedule may be modified by the administrator.

All database administration is performed via the SQL enterprise manager.

Database queries may be ran using the Microsoft SQL *Query Analyzer*

## 2.14. CALLUP VMS™ Features

The basic building block of the CALLUP VMS™ system is voicemail. CALLUP VMS™ enables the use of all the familiar functions subscribers are used to such as recording greetings, reply (boomerang) to the sender, erase and skip. In addition to this, more advanced voice features are also available to the more sophisticated users.

### 2.14.1. CALLUP Voicemail features

The following table illustrates some of the many features supported by CALLUP VMS™:

Feature	Description
EMAIL NOTIFICATION	Voice mail messages will be sent to the subscribers Email account and may be heard via standard applications such as Microsoft Outlook.
MMS NOTIFICATION	Voice mail messages will be routed to the subscriber by MMS relieving him from retrieving the Voice mail message through the IVR system.
PROFILE SENSITIVE MENUS	The menus provided by the system to the subscriber are in accordance with the subscriber's profile, for example, if Faxes are not permitted for a certain subscriber, then the option to leave a fax will not be available to that subscriber.
MAIL BOX ON THE FLY	New mail boxes will be created automatically when a call is received for a subscriber that does not already have a mail box.
VVM	Visual Voicemail. Smartphone app that displays the voice mailbox as a list of messages, that can be played, saved, deleted and managed like a visual message inbox. Mailbox greetings and voice signatures can be managed from the app as well.
SKIP PASSWORD	The system will avoid the password request when receiving a retrieval call from the telephone number of the owner of the box
ACCESS ANY PHONE	The CALLUP VMS™ box owner may access his box from a landline telephone by entering his password during the playing of the box greetings.
MESSAGES TO CALLERS	Callers wishing to leave voice messages will receive notification in the event that the Message box is nearing a <i>full</i> status or when the caller is reaching the maximum length for the message in accordance with the subscriber's profile.
ONE STEP DIALING	Both the calling and called party numbers are available via the Operator's SS7 network. This means that the subscriber does not need to enter his telephone number when accessing his message box from his own phone. It is also possible to call back the person who left the message without entering that person's telephone number (boomerang).

<b>Feature</b>	<b>Description</b>
NOTIFICATION OF FULL MESSAGEBOX	The system will notify the owners of the CALLUP VMS™ that their box is full in order to allow them to free space for the storage of new messages.
MESSAGE EXPIRATION DATE	By default the system will delete all messages older than "X" number of days where "X" is defined in the subscriber's profile (Message expired time).
RETRIEVAL MESSAGES	Includes a message to welcome the owner as well as notification of the number and types of messages that are already stored in their box.
NOTIFICATION	The system will send notification upon arrival of a new message and optionally send the message itself to the subscriber's Email address. The subscriber may schedule the message notification or disable the feature altogether. Notification can be in the form of the standard envelope icon on the phone's display, as well as a text message stating that there is a new message, the length of the message, the number of unread messages etc.
MESSAGE PRIORITY	Messages can be marked Urgent or Private
MULTIPLE MAILBOXES IN SAME ACCOUNT	This option is especially useful for families who wish to have more than 1 voice mail box for a single telephone number.
SEND DIRECT TO MAILBOX	Messages may be sent directly to the subscriber's mailbox
FUTURE DELIVERY	Messages may be programmed to be delivered at a set date and time. This option may be configured via the IVR.
CONFIRMATION	The message sender will be notified that the recipient has received the message. This option may be configured via the IVR.
TIME OUT	In the event that the subscriber does not respond or makes a certain number of mistakes, the session will be terminated.
CALL WAITING	The introductory message will be played long enough to enable the subscriber to answer a call waiting call.
GROUP MESSAGEBOX	Message box shared by several subscribers, with an administrator to the group that can manage the box, and any number of subscribers that can listen to the messages in the box, including individual notifications.
MISSED CALL ALERT	Notify subscribers that someone called them while their phone was turned off or out of service.

## 2.14.2. IVR Functions

The CALLUP VMS™ supports the following major IVR functions in any language:

Each subscriber may select the IVR language.

<b>IVR Function</b>	<b>Description</b>
Guest Access	Leave a voice message for another subscriber
User Authentication	Enter password prior to accessing voice mail box. A subscriber may call from any telephone and access his message box by pressing # during the greeting message and then entering the correct password.
Subscriber login	Login prior to retrieving messages
Multiple Greetings	The system will prompt the caller with the box owner OGM. In the event that it does not exist, the system will play the owner's Voice Signature. If this Voice signature does not exist then a standard greeting will be played with the mailbox number. Different greetings (general, away, busy) can be recorded.
Tutorial	Provides a new user with step-by-step directions for accessing their message-box for the first time and for customizing their personal greeting and password.
Mail Box Status	System reports on the number of email, voice, fax and old messages in the Message Box.
Listen Menu	Menu for listening to voice mail including delete, skip, save, "x" seconds back/forward and back to previous message. The owner may also listen to partial messages.
Message save and delete	The message box owner may delete messages. Old messages are deleted automatically according to configurable parameters.
Message header	Caller-id/Callback number, timestamp, voice signature and urgency.
Help	Context sensitive Help menu
Message recording	After recording the message, the caller may edit, save or delete the message.
Subscriber setup	Voice signature, OGM, password and distribution list.
Voice signature	Name of subscriber
Distribution List	Send message to distribution list.

IVR options are chosen by the subscriber by pressing keys on the telephone handset (DTMF) in accordance to voice prompts from the CALLUP VMS™ system.

#### 2.14.2.1. IVR languages

The CALLUP VMS™ is supplied with a complete recorded IVR with a female voice with British accent.

Additional languages may be provided by the customer or recorded by CALLUP.

The required format is: WAV PCM 11Khz mono 8bit

Note that this standard format is supported by all Windows Media players.

#### 2.14.2.2. IVR timeout

The voice session will be terminated in the event that the subscriber does not respond during a pre-defined period of time or the subscriber makes a pre-defined number of mistakes.

#### 2.14.2.3. IVR Customizations

The IVR flow is fully customizable. It is based on XML files which can be edited to make changes and add additional functionality to the call flow and logic. This type of IVR platform enables full flexibility to the operator, eliminating the need for changing a software version with each small change of the call flow.

### 2.14.3. Voice SMS

The Voice SMS service provides a unique alternative for sending voice messages to all subscribers including those who do not have an active voice mail account. The voice message is encapsulated in an SMS and does not cause the destination handset to ring. The service works as follows:

- Person "A" dials an access number and the telephone number of "B" and connects to the VMS.
- The VMS™ IVR plays a beep and then records the voice message from person "A". Person "A" then hangs up.
- The VMS™ stores the voice message in the message database and sends an SMS to "B" informing "B" that a voice message has been sent from "A".
- "B" presses "send" in order to connect to the VMS™ and listens to the voice message recorded by "A".
- "B" may also press "1" to listen to previous voice SMS messages
- "A" optionally receives notification that the voice message has been heard.

#### 2.14.4. Missed Call Alerts

The CallUp Missed call Alert (MCA) is an add-on to CallUp Voice Mail platform. It provides the mobile subscriber an SMS notification with information about all incoming calls that were missed, while the phone was turned off or out of service.

This service eliminates missed calls and generates additional air-time for the operator, when the subscriber calls back to the calling party.



MCA is configured by default to be sent only if the phone was turned off or out of service. So if the user rejected a call on purpose, he will not get the SMS notification, obviously this is not required.

#### Typical MCA call flow:

- Caller (A) calls to subscriber (B).
- (B) is turned off or out of service
- The switch transfers the call to CallUp VMS with MCA add-on.
- The call is registered in CallUp MCA System
- If (A) didn't leave a voice message for (B) and its caller ID is valid, subscriber (B) will receive an SMS message with the information, once he becomes online
  - If A called several times, only 1 SMS will be sent with the number of times

The MCA includes dedicated provisioning (control feature on/off per subscriber), and detailed statistics and reports.

#### 2.14.5. CDR

The system creates a CDR for each transaction

#### 2.14.6. Validity period

The default validity period is 1 day. After this time messages are deleted from the database.

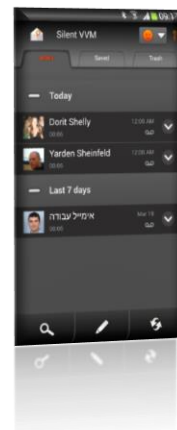
### 2.15. VVM – Visual Voice Mail

The platform can optionally include the VVM feature. VVM, or Visual Voice Mail, is the ability to view your voicemails directly on your smartphone screen, as if it is the inbox of your text messages. You can view the list of messages, save or delete messages, and off course listen to messages by clicking the “play” button. You can see who the message is from and when was it left.

For more information about VVM please refer its dedicated product description document.

#### 2.15.1. Key VVM features (client side):

- Support for all modern smartphone OS's including iOS, Android, Windows, and Blackberry.
- Inbox view with a list of messages
  - Integration with contacts on phone, to see the names of the contact who left the message
  - Quick delete
  - Multiple edit
  - Refresh
- Play a left message
- Save a message



- Forward a message to email
- Call back to the sender of the message
- Manage greeting messages, set current voicemail greeting message
- Manage voice signature, set current voice signature
- Notifications upon new messages

#### 2.15.2. Server Side features:

- Supporting all versions of OMTF, the standard for VVM
- Supporting customized IMAP based protocols, for adapting to proprietary clients
- Provisioning (subscribing/unsubscribing to the service)
- Detailed CDRs about any event
- Notification

Provisioning for the service can be from the server side (meaning, using the system's provisioning interfaces) as well as using self-care provisioning.

Detailed CDRs and billing events are recorded, enabling the service to be charged as premium service if required.

#### 2.16. CALLUP VMS™ Control Center (NMS)

A CALLUP VMS™ system is typically comprised of multiple devices such as the SDU, MCU and CALLUP VMS™ Web Service servers. A mobile or land-line operator will typically deploy many CALLUP VMS™ devices at each location and may have many locations. Since all of these devices must grant service 24/7, the System Administrator must be immediately aware of any system failures that degrade the quality of service.

Once a failure has been identified on a certain device, the System Administrator will then need to rectify the problem as soon as possible. The Control Center provides the System Administrator with the necessary tools to monitor system failures and to perform maintenance operations. One Control Center running on a networked PC can monitor all CALLUP VMS™ devices on the Operator's Intranet.

The Control Center application may be ran on any Windows PC and is comprised of three modules:

- Device status monitor – displays the status of all monitored CALLUP VMS™ devices.
- Device maintenance mode – displays detailed information on a specific CALLUP VMS™ device and allows the user to reset various services, such as the IVR processor, on that device.
- Event viewer – sorted and filtered list of alarms and events from all monitored CALLUP VMS™ devices.

The Control Center reports 3 types of events:

- Alarms – system faults that affect system performance and require the immediate attention of the system administrator.
- Major – events that are not alarms but may cause degradation in the quality of service.
- Informative messages.

#### 2.16.1. Notification

Control Center sends email and SMS messages to a list of recipients for all alarms

#### 2.16.2. Platform

The Control Center runs on the NMS server.

### 2.17. Missed Call Alerts and Message Waiting Indications

The CALLUP VMS™ system offers a variety of different methods for sending message or missed called alerts notifications to the subscriber. The Administrator may choose which method is most appropriate and the subscriber may choose to disable the notification option.

#### 2.17.1. Email notification

The CALLUP VMS™ system will send an email containing the voice or Fax message. The voice message is in standard WAV format and may be opened by all standard email applications such as MS Outlook. The subscriber may update the email address via a WEB interface.

#### 2.17.2. MWI

The message waiting indicator (MWI) on the subscriber's handset will be activated in the event that the subscriber has received new messages.

The following protocols are supported: IS-41, SMDI.

#### 2.17.3. SMS Notification

CALLUP VMS™ system will send an SMS messages via SMTP for each new message. The SMS message will include the calling number to facilitate dial-back. There will be a single notification for multiple calls from the same CLI. The Missed called alert will be provided even if the caller did not leave a message as well as to subscribers without a voicemail that were out of coverage.

#### 2.17.4. Message Waiting Tone

The tone on the land-line telephone is changed in the event that a new message has arrived in the subscriber's message box.

The following protocol are supported: IS-41, SMDI

#### 2.17.5. Call back

For land line phones, the CALLUP VMS™ systems can be configured to call the subscriber in order to play a message notification messages.

#### 2.17.6. SMPP

The CALLUP VMS™ system sends message waiting messages to an external system on the Operator's network that then relays the messages to the switch.

### 2.18. Billing interface

#### 2.18.1. CDR – Post-Paid Billing

The CALLUP VMS™ system generates CDR files for the purpose of invoicing and generating reports. A CDR record is created for all system transactions.

The CALLUP VMS™ system can send this file to a pre-defined location via FTP or external applications may retrieve this file, also via FTP. The format of the CDR may be modified according to customer requirements.

#### 2.18.2. Pre-Paid billing

The CALLUP VMS™ system may be integrated to pre-pay IN billing systems. This is necessary only in the event that functions such as call back are implemented. Billing interfaces include Diameter, HTTP, SOAP, XML and proprietary protocols.

### 2.19. Remote Maintenance (ILO)

CALLUP VMS™ servers feature special hardware (HP Integrated Lights Out or ILO) that enables full remote support and maintenance including power up/down and full software installation from remote locations.

### 2.20. Provisioning

The CALLUP VMS™ provides the following provisioning tools for creating, modifying and deleting Voice Mail boxes:

#### 2.20.1. Voice Mail box on the fly

A new voice mail box is automatically created the first time the subscriber attempts to access the mail box or when an outside caller attempts to leave a message. The voice mail box is created with the default Class of Service (COS).

#### 2.20.2. Class of Service (COS)

Various COS may be defined on the CALLUP VMS™ system. For example COS1 will be defined as the basic Voice Mail box that is offered to all subscribers and COS2 will be defined as a Premium service will offers the subscriber longer recording time and message retention. Subscriber message boxes are typically created on the fly with the basic COS (COS1). The

CALLUP VMS™ provisioning application can then be used to upgrade certain subscribers to a different COS.

### 2.20.3. Provisioning Windows module

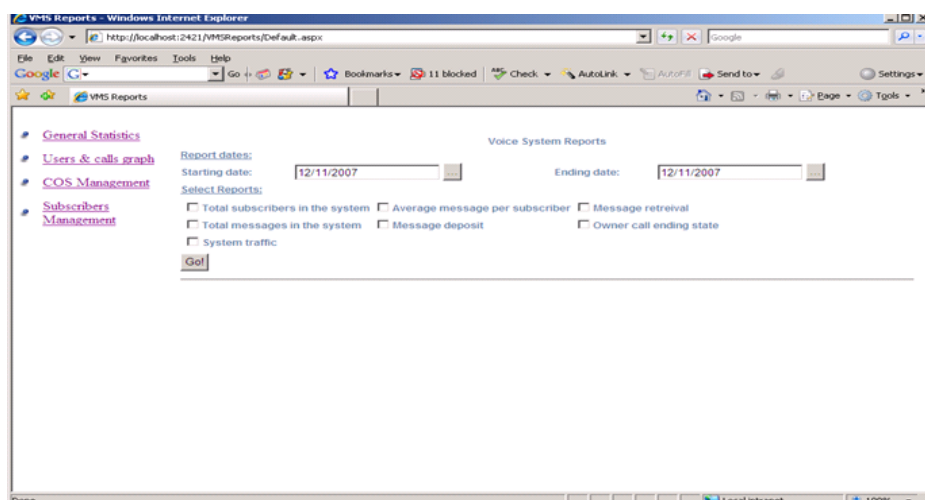
This module enables Windows applications to perform provisioning operations such as creating new voice mail boxes, deleting existing mail boxes and resetting password.

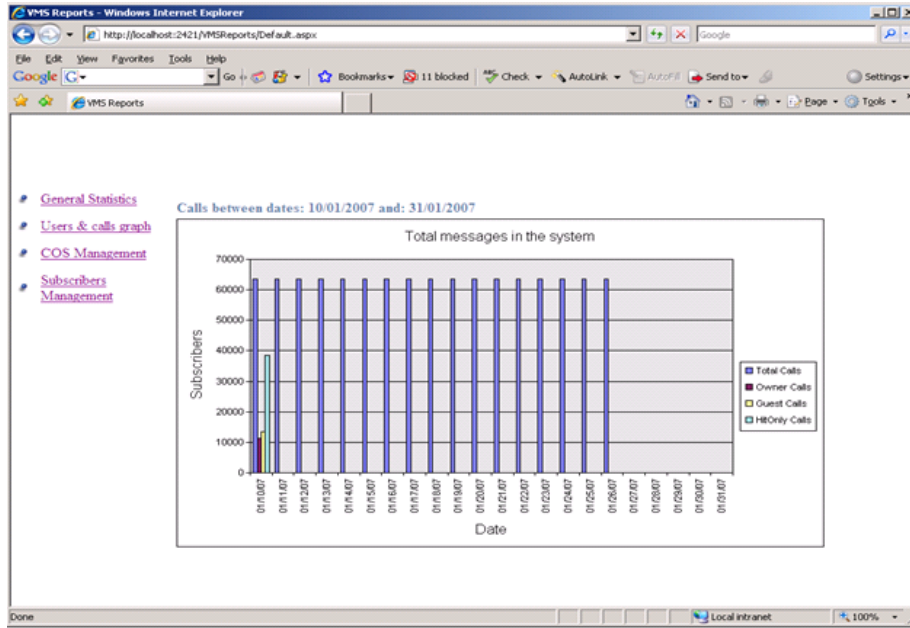
### 2.20.4. WEB provisioning

Both Administrators and subscribers may modify voice mail boxes via a WEB interface over the Intranet or Internet.

## 2.21. Reports

The CALLUP VMS™ system prepares daily traffic reports in HTML format. These reports can be sent automatically to the Email account of the administrator and be viewed using any standard WEB browser.





Voice System Reports

Starting date: 12/11/2007 Ending date: 12/11/2007

Total subscribers in the system

Total Subscribers
29

Total messages in the system

Total	New	Heard	Deleted
62	58	0	4

System traffic

Stat Date	Total Calls	Owner Calls	Guest Calls	HitOnly Calls
Nov 12 2007	0	0	0	0
Range Stats	0	0	0	0

Average message per subscriber

Stat Date	Average Message
Nov 12 2007	0.0000
Range Stats	0.0000

Message deposit

Stat Date	Total Deposit Calls	Total Deposit Calls Duration	Average Deposit Calls Duration
Nov 12 2007	0	0	0.0000
Range Stats	0	0	0.0000

Message retrieval

Stat Date	Total Retrieval Calls	Total Retrieval Calls Duration	Average Retrieval Calls Duration
Nov 12 2007	0	0	0.0000
Range Stats	0	0	0.0000

Owner call ending state

Stat Date	Total Calls	Owner Retrieve	Owner Change Greeting	Owner Wrong Password	Owner No Action
Nov 12 2007	0	0	0	0	0
Range Stats	0	0	0	0	0

Figure 4: CALLUP VMS™ Reports

## 2.22. MTBF

The following table lists the MTBF for all system components

<b>Component</b>	<b>MTBF (hours)</b>
HP DL380 G5 server including disks and boards,	40,000
Dialogic SIU G31 signaling server	35,900
Dialogic DMV1200BTEP Quad E1 voice boards	162,000
Intel ProCurve Ethernet switch	N/A
CALLUP VMS™ System	30,000*

\*Note that the failure of one system component on the CALLUP VMS™ system will not cause system failure due to the provided hardware redundancy and automatic fail over mechanisms.

### 2.22.1. CALLUP VMS™ Availability

The CALLUP VMS™ availability is "99.999%" provided that the system includes full redundancy and spare parts.

### 3. VMS™ Administration

All VMS™ administration may be performed via the Internet or Intranet using standard Web browsers.

#### 3.1. Global Parameters

The VMS™ Global parameters are set in VMS™ database table **Globals**

The Globals table contain parameters that are set for all VMS™ subscribers defaults and VMS™ directory settings, Log directory, prompt directory etc.

The following table shows typical global parameters:

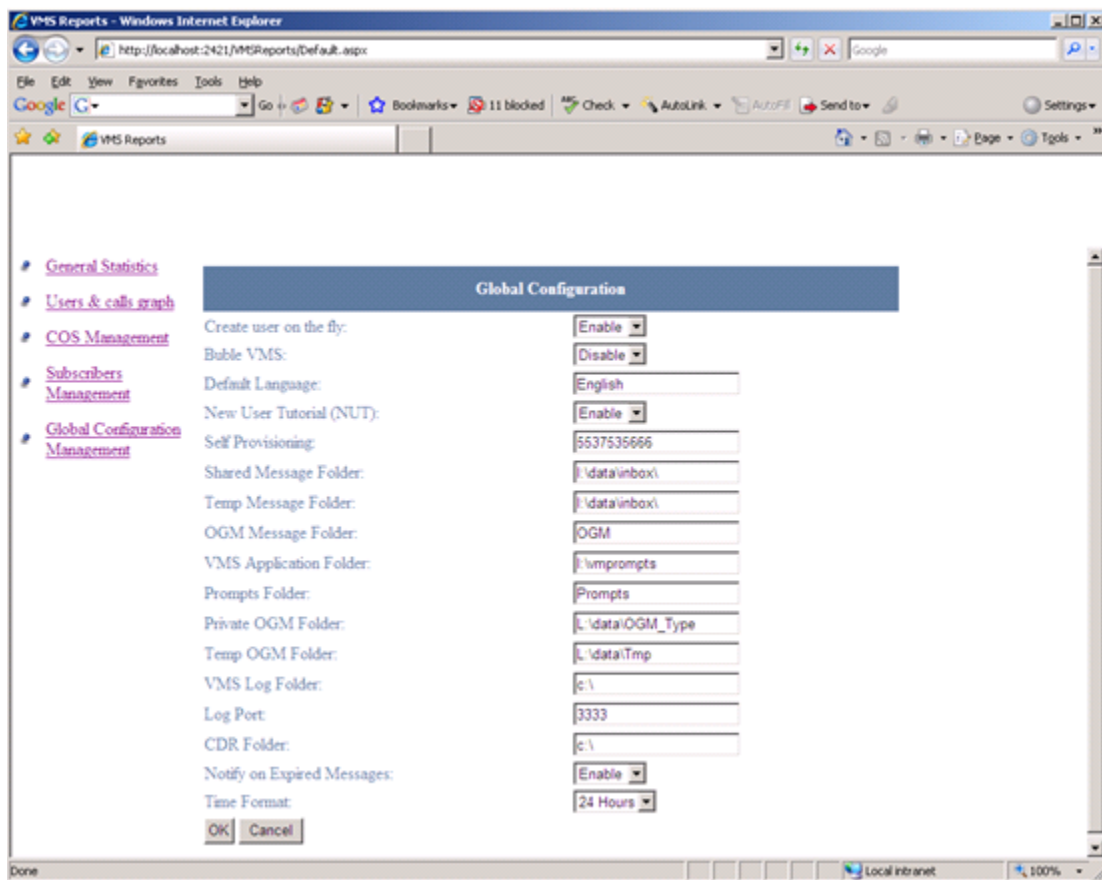
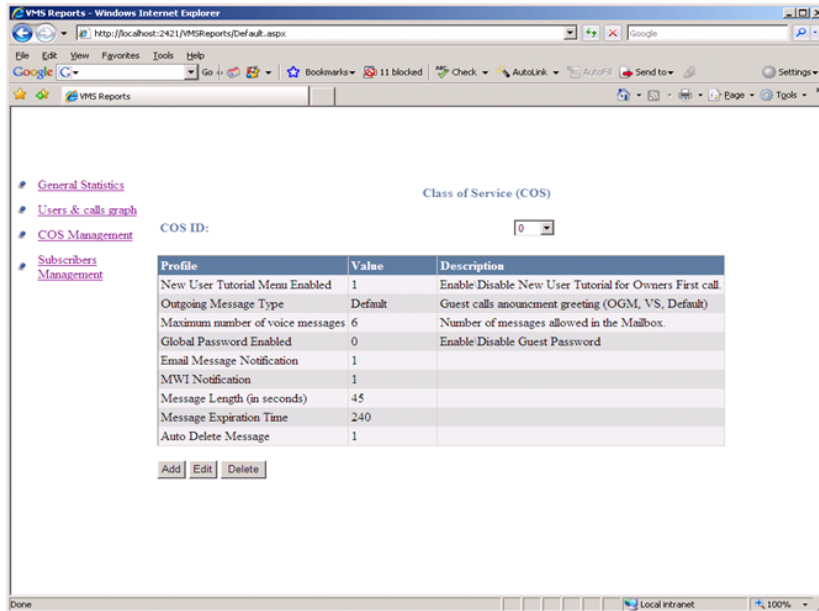


Figure 5: Global parameters



### 3.2. Class of Service (COS)

The VMS™ administrator may define various COSs (Class of Service), each one having different characteristics, and then assign a COS to a group of new subscribers. For instance, subscribers who purchase a business package may be granted 30 minutes of message time instead of the 15 minutes granted to standard users.



To add, edit or delete COS:

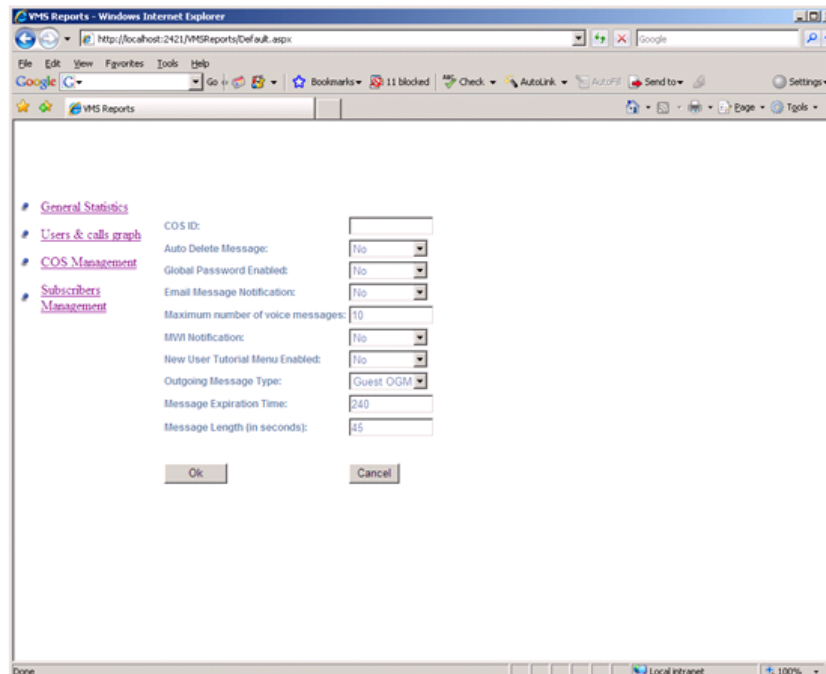


Figure 6: Class of Service (COS)

### 3.3. Subscriber Management

The Subscriber management page allows the VM Administrator to add, edit and delete subscribers.

Using the Subscriber Management page the Administrator may see the subscriber mailbox status.

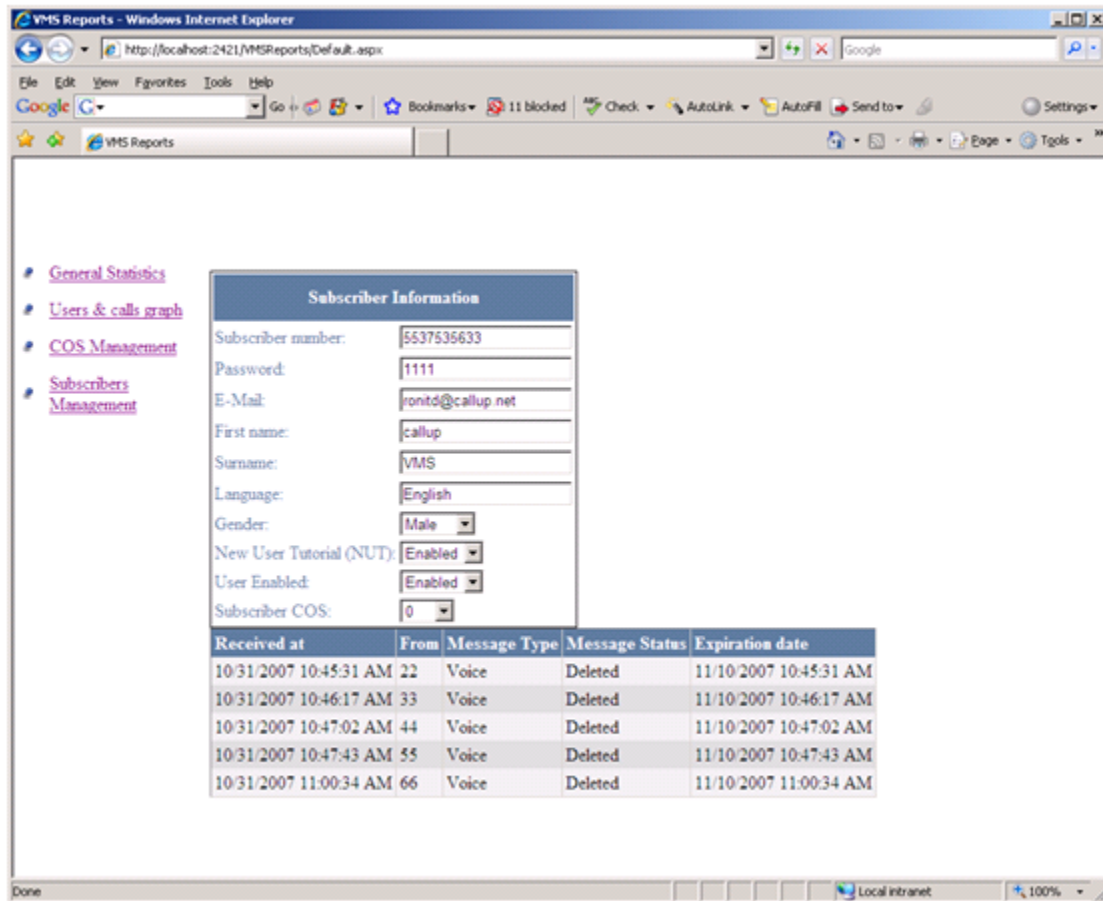


Figure 7: Subscriber Management

## 4. Documentation

The following documentation will be provided in English in printed form and on CD-ROM.

- Technical Manual
- Administrator's Guide

## 5. Terms and Acronyms

<b>Term / Acronym</b>	<b>Description</b>
BHSM	Busy Hour Short Messages
CCS	Call Control Service
COS	Class Of Service
DTMF	Dual Tone Multi-Frequency
GSM	Global System for Mobile communications
IVR	Interactive Voice Response
MCU	Message Control Unit – houses the telecom and IVR interfaces
MWI	Message Waiting Indicator for Cellular devices
SDU	Storage Device Unit – RAID cluster for system databases.
SMS	Short Message Service
SMSC	Short Message Service Center
STP	Signaling Transfer Point
SS7	Signaling System 7
TTS	Text To Speech
NOC	Network Operational Center
24/7	24 hours a day, 7 days a week
PCM	Pulse Code Modulation
UM	Unified Messaging
VAS	Value-Added Services
VMS	Voice Mail System
VM	Voice Mail
WEB unit	CALLUP VMS™ Web Service server