Oracle Internet Messaging - UM Option

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Executive Summary

Overview

Oracle Corporation has developed a Unified Messaging platform that can be integrated with the traditional communication systems to provide a unified view of all the available messaging systems. The objective of this platform is as following:

- Provided unified access and management control all the messaging systems available to the subscriber, ie. Unify electronic mail, voice mail and fax mail.

- Allow the subscriber to access to the unified mailbox from any of the access points, i.e. fixed/voice, PC/Laptops, set-top boxes, screen/java phones, wireless phones, etc.

Oracle Internet Messaging - UM Option provides the internet component to the UM solution and provides APIs to intergate with the service provider's network. The UM platform has been developed over Oracle's core products, i.e Oracle 8 and Application Server.

Platform Overview

The Oracle Internet Messaging - UM Option has been developed over Oracle's core products, i.e Oracle Internet Messaging based on Oracle 8 and Application Server for internet access. The following diagram is a high level pictorial representation of Oracle Internet Messaging - UM option.

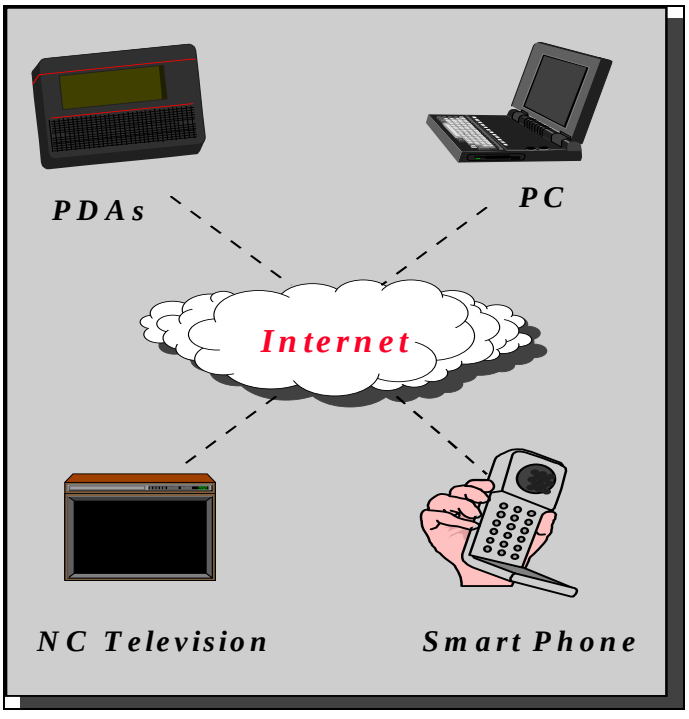

Figure 1: Oracle Internet Messaging - Unified Messaging Option

The user interface can be from any access point of the integrated view of all the messages. The UM option also provides various filters for e-mail and SMS which can be expanded to the other forms of messaging. Oracle Internet Messaging - UM option provides the underlying data management layer for an integrated UM solution.

Architecture

Oracle UM option is based on Oracle core products, i.e Oracle Internet Messaging, an e-mail system built on top of Oracle 8 server and the Application Server to provide unified view via the internet.

There are two approaches to provide a Unified Messaging Solution:

1. Create a master mailbox that acts as the repository for all messages. This master repository (unified messaging/e-mail server) will be responsible for synchronizing all the messaging platform.
2. Provide a unified view (via Internet, fixed/voice, GSM) of all the messaging systems with each system containing it's own data (no master required).

Oracle Internet Messaging - UM option can support both these architectures. Oracle recommends the second alternative, due to latency involved for synchronizing various messaging platforms.

Oracle Internet Messaging

Oracle Internet Messaging is based upon internet standards. This means standard internet e-mail clients (many available freely on the internet) can be used to access the e-mail. Some typical e-mail clients that can be used to access the e-mail are:

- Microsoft Outlook (includes Microsoft Internet Explorer)
- Microsoft Outlook Express (Microsoft Internet Explorer e-mail client)
- Netscape Messenger (Netscape Communicator Suite e-mail client)
- Eudora Lite/Pro (Can be used with users choice of Internet Browser)

These e-mail clients are available on a range of platforms apart from the Microsoft mail clients. Thus users should not need to change their client software in order to gain a unified view of all their messages.

Any e-mail client is suitable with the following Internet standards support**:**

- POP3
- IMAP4
- HTML & Javascript message content support
- Browser support for Internet cookies

Thus NC (from NCI) and Java based e-mail clients are also appropriate**.**

Oracle Internet Messaging Web SDK provides various API to access e-mail messages and management functions. In addition it provides the facility to develop web based user interface providing HTML and Java based access to subscribers e-mail. Oracle Internet Messaging - UM Option user interface has been developed using this SDK.

Application Server

The Application Server goes beyond delivering traditional web content. It has **fully XA-compliant transaction management features**, enabling complex, secure database applications in the stateless web environment. The AS architecture is based on a web listener (from Oracle, or many other industry-standard web listeners such as those from Netscape and Microsoft) and a **Web Request Broker**. The WRB is a highly scalable, multi-threaded execution engine that maintains low-level, persistent database connections between calls. Much faster and robust than CGI, the WRB can be extended via Application Server Cartridges. Thus, application logic can be moved off thick-client machines and into the WAS. The server has built-in execution support for PL/SQL, Java, LiveHTML, Perl, legacy CGI programs, and more. Third-party vendors such as Verifone have created Application Server cartridges for electronic commerce.

Oracle Application Server is the driver of majority of the Web Sites world wide. Additional information is provided in the Application Server product definition document.

SMS Interface

Oracle Internet Messaging - UM option allows the subscriber the ability to receive SMS notification whenever an event occurs. This notification is sent out via an SMS-C interface. Oracle Internet Mesaging - UM option, currently support the CMG SMS-C and is in a process of developing SMS interface to Aldiscon and Nokia SMS. Oracle product team plan to develop interface to all major SMS-C vendors.

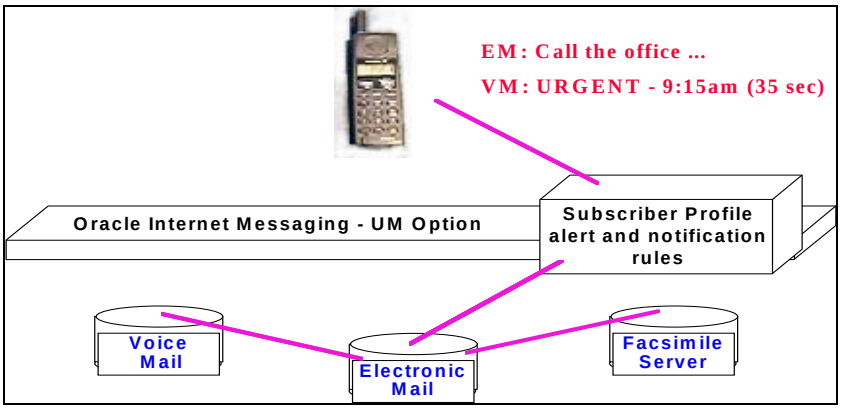

Figure 2: SMS Notification

Oracle UM can be configured to send notification on receiving e-mail, voice mail, fax mail and also provides the subscriber the capability to read the entire e-mail or reply to an e-mail via the SMS.

Voice Mail Interface

Oracle Internet Messaging - UM Option's Java Based UI will access the VM box using the standard IMAP4 interface. This user interface provides a Unified View of all the messaging stores.

For older VM models that do not support the IMAP4 or VPIM standards, the VM vendor will have to open up their APIs to Oracle Internet Messaging. Oracle product team is planning to develop VM interface for all major VM vendors. For these older VM models that do not support IMAP4 or VPIM the message server acts as the master repository and a synchronization engine ensure that the message server and VM status are synchronized. The VM boxes send forward a 'WAV' or an 'AU' file to the message server using SMTP/MIME interface. The VM is streamed to the subscriber over the internet using standard streaming technology.

Presently Oracle Internet Messaging - UM Option has interfaces built to the Bull Voice Mail systems.

Fax Server Interface

Presently the Fax Server sends the fax to the message server using SMTP/MIME interface. The fax is displayed to the user over the internet using the standard protocols. The messages are sychronized with the fax server using the synchronization engine.

Directory Service

In the current architecture the user profile is store in UM specific tables in Oracle 8. Oracle plans to release directory service based on LDAP v3, the widely-adopted Internet standard. Oracle Directory Server, will enable Oracle Internet Messaging - UM option to leverage high performance, general-purpose directory service to share and manage information about users, files, digital certificates, as well as other applications across a distributed network. Oracle Directory Service provides a scalable and robust directory service hosted on an Oracle RDBMS. This product is currently in beta an is schedule for release is September '98.

IVR Interface

Oracle Internet Messaging - UM option does not support IVR interface and has no plans to provide these interface. Oracle Internet Messaging provides APIs using which the message server can be integrated with the IVR. The same applies to text to speech capability.

Security

Oracle Internet Messaging - UM option provides various levels of security from Grants at Oracle 8 server level, Username/password at the Oracle Internet Messaging level and SSL, X.509 at the application server level. In addition, major firewall vendors support Oracle. Firewalls can be places between the internet and the application server as well as the application server and the Oracle 8 server.

Management

Oracle Internet Messaging - UM option provides the subscriber the capability to modify some limited functionality, such as filters and notification settings. In addition, Oracle Internet Messaging - UM option provides APIs for provisioning purposes. The Oracle 8 server can be managed using the Oracle Enterprise Manager (OEM). OEM provides the operator the capability to develop intelligent agents for scheduling jobs and sending messages to OSS systems using SNMP-MIB.

System Architecture

The following diagram illustrates Oracle Internet Messaging - UM option system Architecture. The various UM cartridges (function modules) are various event drivers that interface to various IVRs, Text to speech, Voice Mail systems, etc.

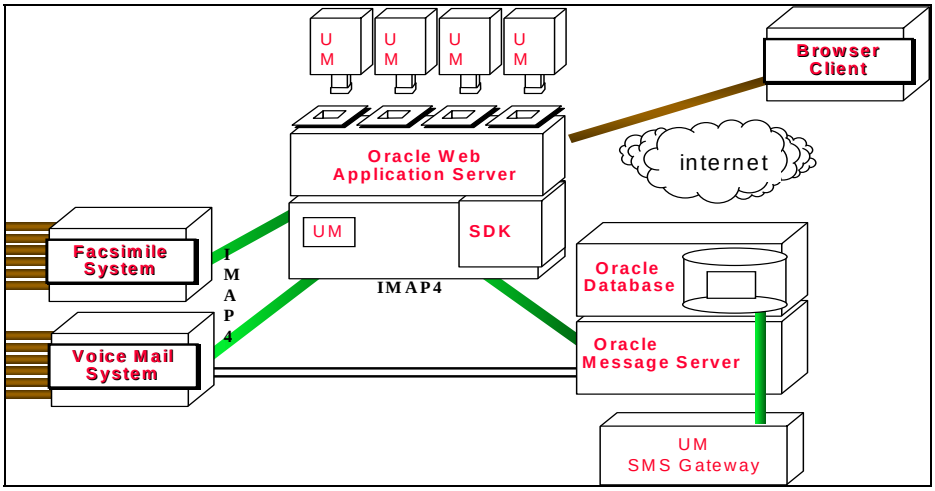

Figure 3: Oracle Internet Messaging - UM Option Architecture

Unified Push

Unified Push integration has been implemented for proprietary Wireless Internet services using TTML (Nokia) and HDML (Unwired Planet). Production implementations are using TTML, though it is reasonable to expect that the wireless internet standards will eventually move towards the emerging WAP protocol which now has wide industry support. From existing implementations integrating with proprietary platforms, the Oracle Internet Messaging platform is flexible enough to integrate with this emerging standard.

An overview of a unified push system is shown in the following figure which focuses on Wireless Internet push services element.:

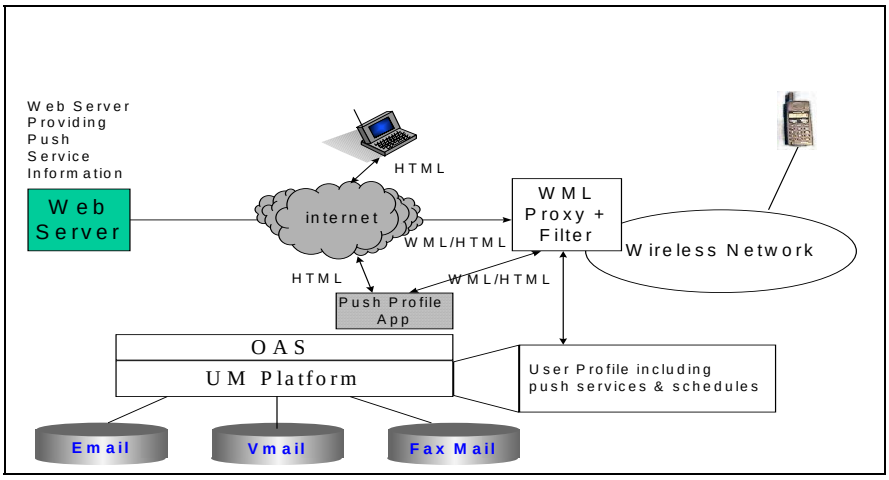

Figure 4: Oracle Unified Push Architecture

The unified messaging platforms User Profile can extend to provide profiling of a users chosen push services. The profile provides options for:

- Available Push Services (agreed between service provider and Information provider)
- Push Service Scheduling / updates

The available services could include stock quotes, sports, weather or news. The schedule can be based on a 24 hour and weekly schedule which provides a suitable level of flexibility, without being to complex.

Users have access to this information through a Application Server cartridge that provides the UI that allows a user to choose their desired services. This UI can be present information using a conventional browser (HTML) or use a wireless data format. Thus users can self provision push services using either a smart phone or a Web Browser.

The user profile is polled by triggers that run at scheduled times to find out which push services should be transmitted. This initiates the Wireless Internet proxy to extract the required information from available information services and then format the information to be transmitted to the user via the wireless network at the requested time.

Conventional Internet push services for standard HTML browsers could also be implemented using products technologies such as Castanet from Marimba (Oracle Partner).

Summary

In conclusion, Unified Messaging is about convergence for various platforms. It is also about e-commerce. UM provides the service provider the opportunity to provide value added services from the UM view.

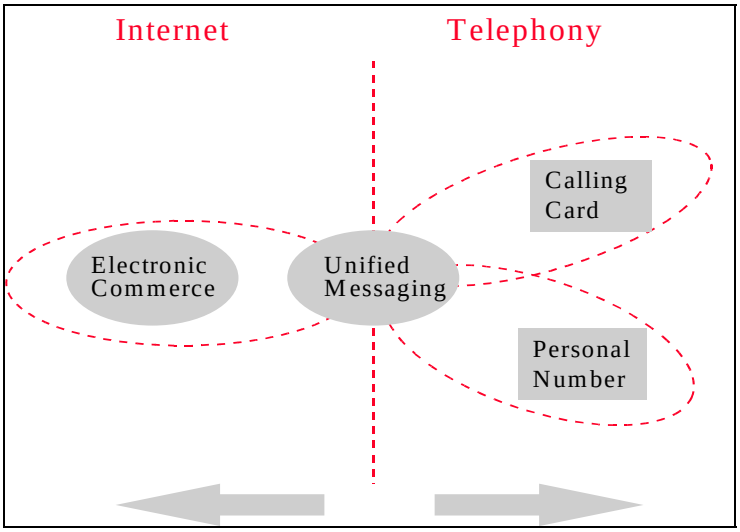

Figure 5: Internet Centric View

Oracle UM is a platform that assist the integrator to developing a complete UM solution for the service provider. Oracle provides the basis data management layer and some interfaces to SMS and Voice Mail systems as a baseline for the integrator.

The Java Based user interfaces is targeted to be incorporated in various set-top boxes, screen/java phones, PDAs, etc. This UI is expected to be widely distributed to various subscribers and available for download over the internet.