

Oracle Collaboration Suite 10g
Voicemail & Fax
Technical White Paper

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Oracle Voicemail & Fax 10g Technical White Paper

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INTRODUCTION

Much importance has been rightly given to providing voice services over Internet standard networks, but this is only one possible application. The potential future impact of using general purpose computing hardware and languages to develop “Telephony” and/or “Converged” systems and networks will continue to broaden.

This paper will review the value proposition for convergence in general and discuss the benefits of data center based applications compared to the proprietary world of telephony. It will then describe Oracle’s Voicemail solution and how Oracle Voicemail takes advantage of convergence.

CONVERGENCE

To understand what convergence of the voice and data networks means and the possible value proposition, one should step back and look at where each of the networks and systems came from:

Applications

From early on, computers were designed to be multi-purpose machines that could perform different tasks based on specialized software (applications). As the marketplace expanded, additional players came to market with their own hardware based on de-facto standard platforms (IBM mainframe, DOS, etc). While the early systems were based on proprietary operating systems, the ability to develop software that ran on hardware from multiple vendors spurred innovation and kept costs from spiraling out of control. The rise of the PC and Unix based “open systems” caused a true explosion in the availability of general purpose computing hardware and applications. Today, application developers have their choice of multiple standard development languages and the ability to port an application to most hardware platforms.

Networks

Networks have always been used to connect computers and their devices. Just as each vendors' machines were based on proprietary operating systems, the network infrastructure supported by these machines was proprietary as well. This began to change in the mid-late 1980's with the emergence of the local area network and the need to network PC's and other resources. True open networks came in the early 90's with the emergence of the open internet protocols. Today, any device (mainframe, server, PC, handheld, refrigerator, IP phone, etc.) can be connected to "THE" network.

As a result, applications can now be built using general purpose computing languages which take advantage of processing power, storage, and network bandwidth on a scale that were unthinkable even a few years ago.

Telephony

Telephone systems have traditionally been built to provide a single, albeit very important, service: the delivery of phone calls from one point to another. When telephony systems moved into the digital era, they did so in an environment that had comparatively few customers (mainly governments and large corporations) few vendors that built products using closed networks and solutions. This market and the single purpose nature of the platforms combined to foster extremely proprietary networks and applications that were complicated and expensive. The systems were very reliable, but difficult to enhance and maintain. The integration of solutions from different vendors required one-off development and certification which effectively maintained each vendor's market presence and yielded few combined solutions.

Even today, most legacy telecommunications vendors continue to follow this model. The proprietary service model of the phone closet requires vendor employees to enable resources that already exist on the system and perpetuates expensive maintenance contracts.

Convergence

The ability to use general purpose computing infrastructure, hardware, networks, and languages for telephony applications is revolutionizing how people think of devices, applications, and networks. Network infrastructure (data or telephony) is now built using general purpose techniques allowing applications that live on this equipment gain the best of both worlds: The ability to scale and provide the reliable service of a telephone network and the reasonable cost and innovation that are the hallmark of the data center. Thus, today's association of devices, networks (wireline or wireless), applications, and the hardware that runs on them will be replaced by the "Next Generation Network" that supports connections between applications and multiple device types.

For example, users now access the same information from any device they happen to have with them, with the only difference being the way in which the information

is rendered. Some users wish to access information over the web using a desktop machine; others wish to access information wirelessly using a laptop; while others use a wireless phone or PDA; still others choose to access information using the telephone.

Voicemail

Voicemail systems have the same requirements as other messaging systems including the need to send a message, receive a message, store messages and access them. While completely proprietary voicemail solutions have been the norm, convergence now allows vendors to take advantage of Internet and industry standards rather than tying themselves to expensive, inflexible, proprietary telephone or email infrastructure. Common messaging standards and infrastructure acronyms in use today include:

- ECTF CT Server - The Enterprise Computer Telephony Forum (ECTF) CT Server defines a set of APIs and services used to develop standards based computer telephony applications.
- IMAP - An internet standard for managing mail messages and folders on a server supported by most major mail clients including Netscape Messenger, Microsoft Outlook and Outlook Express.
- IP Networks - The Internet Protocol is the backbone of the internet and is used by most companies today as their primary network.
- MIME - The internet standard for encapsulating message content of any type.
- SIP – Session Initiation Protocol (SIP), is today’s leading standard for organizations and products implementing Voice over IP. It is extremely flexible and through extensions provides support for instant messaging (SIP/SIMPLE) as well as other media based sessions (i.e. conferencing, video, etc.).
- SMTP - The internet standard for sending and receiving email messages.
- VoIP (in its many forms) - Voice over Internet Protocol (VoIP) describes the functionality of placing a phone call over the IP network. There are many competing standards with many major vendors supporting multiple protocols for call control.
- VPIM - The internet standard for voicemail messages. As a subset of MIME, these messages can be transported between voicemail messaging servers using SMTP rather than requiring proprietary voice messaging networks.

ORACLE VOICEMAIL 10G

Oracle Voicemail 10g uses the Oracle 10g Database as a message store for voicemail messages, taking advantage of Oracle's core competencies in providing access to, storing and managing all types of information. Oracle Voicemail delivers the full power of Oracle 10g's multithreaded database to provide parallel processing, high availability, and rapid response time for thousands of simultaneous users. Using the highly scalable and reliable Oracle Collaboration Suite Data Store and Oracle Email as a foundation, Oracle Voicemail provides telephone processing, delivery, wireless notification, browser based clients, and administration utilities.

The main components of Oracle's Voicemail Solution include:

Message Store

Oracle Voicemail leverages the Oracle Collaboration Suite Data Store and Oracle Mail for storing voicemail messages. Oracle Mail provides the storage and common access methods for email, voicemail, and fax messages in the appropriate standard MIME format (i.e. VPiM for voicemail and fax messages) within the same repository. Using the message store as the base, all messages (including voicemails) are made available through standard IMAP4 or POP3 email clients. A comprehensive set of PL/SQL and Java API's are also provided to integrate Oracle Mail and Voicemail with other core eBusiness infrastructure.

Intel Telephony Infrastructure

Oracle chose to base Oracle Voicemail & Fax on Intel's standards based software (Netmerge CCS) and hardware (telephony cards) from Intel which provided one application programming interface while abstracting away most of the differences found at the board and PBX level.

While Intel Netmerge CCS infrastructure supports many API's, Oracle specifically utilizes the s.410 API (also known as JTAPI Media) which defines the application level programming interface and the s.300 specification which allows the use and management of resources including telephony boards, storage, and speech processing software. Oracle gains a number of advantages by using this infrastructure:

- Abstraction of complexity - The S.410 API abstracts away the telephony complexities and board specific API's normally used in 3rd party telephony application development. This allows the application developer to focus on the functionality to be implemented rather than board specific tasks such as resource management and low level call control.
- Ability to use General Purpose Computing Hardware- Intel telephony solutions are built using standard platforms from vendors associated with the data and/or telephony world rather than proprietary technology.

Telephony Integration

A key advantage of Oracle Voicemail & Fax is its' ability to integrate into multiple types of telephony infrastructures ranging from individual proprietary PBX's to enterprise environments supporting a heterogeneous mix of PBX's and carrier provided services (e.g. Centrex services) at multiple sites on one system. For companies with large or continuing investments in traditional PBX's or using Centrex services, Oracle Voicemail & Fax provides the ability to integrate using a range of technologies including:

- Analog telephony integration with inband DTMF
- Analog telephony integration with SMDI or other serial protocols
- Digital Integration (T1 / E1) with SMDI or other serial protocols
- Digital Handset Emulation

This flexibility is now further enhanced with the ability to support SIP based, Voice over IP across the enterprise.

Voice over IP Support

Recently, Intel announced the availability of its' Host Media Processing (HMP) software. This software provides SIP based IP telephony interfaces to IP end points such as Voice over IP Gateways, IP PBX's and IP phones while supporting traditional telephony board interfaces used by existing telephony applications. Intel and Oracle are working together to certify and enhance HMP for use with Oracle Voicemail & Fax.

Voice

Oracle Voicemail provides a basic DTMF voicemail interface with the ability to change user preferences through the telephone interface. As Oracle Voicemail is a single store solution, actions taken on a message or account preferences through the telephone are visible through all channels and voice messages are available as .wav attachments to GUI clients. Oracle Voicemail easily integrates with a variety of switches commonly found within the enterprise and carrier market.

Fax

Oracle Voicemail and Fax provides inbound facsimile capabilities. Faxes sent to a user's phone number are delivered directly into the user's inbox, where they are available for viewing as message attachments. Facsimiles are stored as .tif attachments in MIME compliant messages that can be printed or forwarded to any email address using standards based clients or the Web clients.

Access through GUI Clients

Oracle Voicemail provides access to voicemails through multiple channels including the phone, standards based clients (either IMAP4 or POP3), and through the Web. As messages are stored in industry standard formats (.wav for voicemail

and .tif for fax), they require no special player. This allows great flexibility in accessing messages from any computer system and the ability to forward these messages to anyone with access to email. Additionally, users have a single inbox for all email, voicemail and fax messages which increases productivity and provides great ease of use.

Notification via Wireless devices

Notification capabilities increase the value of voicemail systems and Oracle Voicemail, along with other components of the Oracle Collaboration Suite provides a comprehensive set of features. Taking advantage of Server Side Rules within the Oracle Mail message store, users can define their own rules that determine when and how they are notified. Besides supporting email notification via SMTP enabled pagers and cell phones, Oracle Voicemail can leverage the Mobile Collaboration components of the Oracle Collaboration Suite providing gateways for direct one-way and two-way communication with a number of devices, including many popular SMS systems and pager networks.

Administration

Oracle Voicemail administration is integrated into Oracle's Enterprise Manager Grid Control, allowing consolidated management through a web interface of the total Oracle environment and providing support for integration into systems monitoring infrastructure. Oracle Voicemail supports multiple domains in the same system and allows for central or distributed administration in a hosted environment.

Flexible Deployment

Oracle Voicemail leverages can leverage the IP network and the continually diminishing cost of bandwidth, to centralize components as appropriate. Message repositories can be scaled and professionally managed in the Data Center rather than scattered throughout the world. Internet access and VoIP termination points can be centralized while telephone access servers can be co-located with legacy PBX's leveraging a companies' existing telephony infrastructure.

SUMMARY OF ORACLE VOICEMAIL

Oracle Voicemail takes advantage of Oracle's core strengths in scalability and reliability to provide a cost effective, extensible voice messaging platform. Oracle Voicemail accomplishes this by leveraging converged platforms and standards based email and voice infrastructure with the Oracle database to provide integrated features not normally available to users in a proprietary environment.



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