Real-time Collaboration for Enterprises and Service Providers
Oracle Communications Instant Messaging Server – Technical Primer

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Executive Overview

Oracle Communications Instant Messaging Server provides a standards-based, real-time communication and collaboration application, as well as a platform for presence-based application development. It delivers presence information, voice and mobile client integration, and extended real-time messaging capabilities—including IM, conferencing, alerts, and file transfers. As both an application and a platform, the Oracle Communications Instant Messaging Server provides the reliability and availability expected by end users and the security necessary to protect the privacy of information and meet regulatory requirements.

Introduction

When deploying an instant messaging (IM), Presence and real-time communications platform, an enterprise or service provider must ensure that the platform addresses the needs of many users and applications, each with a unique set of challenges, as well as the organization’s strategic operations. Examples include:

» The business’s need to deploy a secure IM system that provides secure transmissions as well as a secure data archive

» An extended enterprise that must provide real-time communication, including mobile IM communications, to its partners and customers

» A service provider whose goal is to provide sticky services around IM, public IM connectivity and deploy a highly scalable, highly available IM system to its customer base

» A developer who must create an application that utilizes presence, message routing and a robust real-time messaging platform that filters incoming and outgoing messages based on content

In addition, an enterprise or service provider must meet a variety of other demands such as interoperability, enhanced security, vast scalability, and a feature-rich interface.

Oracle Communications Instant Messaging Server is a comprehensive real-time communications platform with a full featured IM application & Presence capabilities out of the box that can easily be extended and integrated with other components of Oracle Communications Unified Communications Suite to enable an enterprise to solve such complex communications challenges.

Oracle Communications Instant Messaging Server provides all the key Instant Messaging & Presence capabilities already enjoyed by many consumers to service providers as well as enterprises while addressing the critical issues of security, reliability, extensibility, scalability, directory integration, and archive capability. It can provide interoperability with external networks including SIP/SIMPLE networks through gateways and federation to communicate and collaborate instantly and securely, combining presence awareness with IM capabilities such as single user chat, multi-user chat, and file sharing to create a rich collaborative environment.

IM & Presence when embedded in consumer and business applications can significantly improve the value, utilization and effectiveness of the underlying service. Oracle Communications Instant Messaging Server provides several open APIs for accessing the internal presence service, roster management and IM for use in other applications, making the applications more real-time and social.

Oracle Communications Instant Messaging Server provides a scalable platform that is based on open standards such as XMPP, HTTP, WebSocket, TCP/IP, and Java. So it can integrate with other software as part of a total
messaging & real-time collaboration solution. With a reliable presence engine and robust message routing system, this platform can be used as a foundation to develop innovative services and applications including: Contextual collaboration services, Push notification systems, Multi-party Messaging systems, Audio/Video applications, Social Gaming applications, Customer Support applications, Bots or Auto-agents.

This paper explores the capabilities, architecture, design, deployment features, and benefits of Oracle Communications Instant Messaging Server.

**Oracle Communications Instant Messaging Server Overview**

Oracle Communications Instant Messaging Server provides a secure, scalable, extensible, and rich communication and collaboration platform. It enables telecommunications service providers, financial services firms, enterprises, government agencies, and educational institutions to leverage the power of presence and instant communication to create a highly responsive real-time business environment of connected employee, customer, and partner communities.

**What Is Oracle Communications Instant Messaging Server?**

Oracle Communications Instant Messaging Server is a Java-based product that enables users to communicate and collaborate instantly and securely. It provides the ability to participate in IM, group chat sessions and share instant information through file transfers.

Oracle Communications Instant Messaging Server delivers the following capabilities, many of which differentiate it from competitive offerings:

- Secure instant collaboration for service providers and users across the extended enterprise to enable rapid information dissemination and decision-making
- Interoperability with external IM networks such as SIP/SIMPLE networks and other XMPP-based public IM and Presence communities through built-in federation capability
- A fully integrated solution comprising all the key aspects of IM (chat, multi-user chat, Avatars), Presence, e-mail, calendar, and address book through Convergence, a state-of-the-art Ajax-powered Web 2.0 client that is part of Oracle Communications Unified Communications Suite
- HTTP-XMPP binding (BOSH server) for providing IM, Presence and other real-time communication services with HTTP clients, mobile clients, or firewall traversal
- Facilitation of group or project-based collaboration through dynamic contact lists, group chat, conference rooms (pre-established, persistent, public or private discussion rooms where multiple users can chat), moderated conference rooms where room participation and roles can be defined based on corporate groups and file sharing
- A Short Message Service (SMS) gateway that enables the delivery of chat messages and alerts in the form of SMS messages to offline IM users
- XMPP WebSocket gateway that enables reliable bi-directional data communication for browser-based real-time, interactive applications like audio/video clients and games
- External Service Discovery that enables the XMPP server to support and share information about services external to the XMPP server such as TURN (Traversal Using Relays around NAT) and STUN (Session Traversal Utilities for NAT) server details, with clients
- Integration with Oracle Communications Messaging Server to provide message archiving in the message store; message archiving capability that works with virtually any messaging server
- Integration with Oracle Communications Calendar Server to provide automatic calendar reminders and presence status based on user’s calendar availability
- Native LDAP support for directory authentication and search; support for LDAP failover so that if one LDAP server becomes unavailable, the IM server can fail over to another LDAP server
A standards-based design using XMPP, HTTP, TCP/IP, and Java

Transport Layer Security (TLS) & Legacy Secure Sockets Layer (SSL) support for secure server-to-server communications and secure client-to-server communications

Developer APIs to enable applications to access IM and presence services

Support for Linux and the Oracle Solaris operating system as well as choice of any XMPP standards compliant client for Microsoft Windows, Linux, Mac OS X, and Oracle Solaris platforms

Support for federation of deployments, enabling multiple IM communities to be joined together into a single federated entity

Support for hosted or virtual domains

Support for hundreds of thousands of users through a highly available, scalable, distributed architecture

Modular Architecture

Oracle Communications Instant Messaging Server architecture consists of a set of internal core components that integrate and interoperate with external services to provide an IM environment. The role of each of these components and services is as follows:

IM Server
The IM server is a component that provides core services required for real-time communications such as the presence engine, message handling and routing, roster management, security and authorization. The IM server supports the connection of an IM multiplexer that concentrates connections over one socket.

IM Multiplexer
The role of the IM multiplexer is to add scalability to the IM environment. The administrator can install multiple multiplexers as needed, depending on the configuration. As the user population grows beyond what is easily supported by a single IM server, additional IM servers can be deployed within the IM environment to which additional multiplexers are connected.

XMPP/HTTP Gateway
The XMPP/HTTP gateway, also referred to as the HTTP-BIND or BOSH server, is an optional component of Oracle Communications Instant Messaging Server. It is not required to establish basic IM functionality, but it is used to provide extensibility to other client types such as mobile clients or Web-based HTML clients that are compliant with XEP 124 in terms of HTTP binding.

This gateway is also useful for firewall traversal. Typically, firewalls may not allow XMPP traffic in but will allow HTTP traffic. Users outside the firewall cannot connect to the XMPP server directly but will be able to communicate with the server through the gateway. In the case of mobile and HTML clients, most of these cannot have a dedicated TCP connection to the XMPP server. However, they can connect to an HTTP server and post data to or retrieve data from it. Essentially, the gateway proxies IM traffic to the XMPP server on behalf of HTTP clients. The XMPP/HTTP gateway is deployed as a Web application in the Web container.

SIP/SIMPLE Gateway
Oracle Communications Instant Messaging Server provides a SIP/SIMPLE federation gateway that can be used to bridge the users communicating between the XMPP network and a SIP/SIMPLE network. Specific SIP domains (for which federation is allowed) may be enabled, or open federation can be enabled. Certain domains can also be blacklisted from open federation.
SMS Gateway
The SMS gateway is an optional component of Oracle Communications Instant Messaging Server that provides a connection between the XMPP network and the SMS, enabling users to deliver chat messages and alerts to offline contacts in the form of SMS messages. The SMS gateway uses the Short Message Peer-to-Peer (SMPP) protocol and XMPP to convert the XMPP message to a series of SMPP protocol data units (PDUs) and submits these SMPP PDUs to a Short Message Service Center (SMSC), which is responsible for delivering the messages to the mobile phone. Because the SMPP PDU has a character limit, the SMS gateway splits the instant messages into several SMS messages if the length of the XMPP instant message exceeds a certain value. The SMS gateway can be configured to reject XMPP messages that exceed a given value, and it can also be configured to limit the number of SMS messages that can be sent per sender per hour.

XMPP WebSocket Gateway
The XMPP WebSocket Gateway, an optional component of Oracle Communications Instant Messaging Server, enables the Instant Messaging Server to support the WebSocket protocol for XMPP. XMPP over WebSocket is an efficient solution for HTTP access to the Instant Messaging Server. The use of WebSockets provides a more performant low latency alternative to XMPP over HTTP that is suitable for building modern, browser-based real-time, event driven applications that require reliable bi-directional data communication. Examples of applications that can take advantage of this gateway include audio/video clients, interactive games, and applications that utilize push-style notifications.

Service Monitoring and Reporting
Oracle Communications Instant Messaging Server provides out-of-the-box support for monitoring and aggregation of key service metrics of individual instances of the server using any JMX compliant console (e.g. JConsole) or consolidated monitoring of the overall IM & Presence service with aggregated metrics collection in a distributed deployment using the Oracle Enterprise Manager Plug-in.

Using the Oracle Enterprise Manager Plug-in, various useful metrics including number of active users, chat rooms, number of participants in chat rooms, average message transfer rate, average users login rate, federated connections etc., can be collected for the overall service in a distributed deployment and can help the administrator in better capacity planning to improve the overall QoS.

The Oracle Enterprise Manager Plug-in for Oracle Communications Instant Messaging Server also provides trouble ticketing and reporting functions out of the box.

Web Container
The Web container is an auxiliary component of Oracle Communications Instant Messaging Server and is required if the XMPP/HTTP gateway, WebSocket gateway, SIP/SIMPLE gateway or embedded Presence service for web applications is deployed.

LDAP Directory Server
The LDAP directory server is responsible for user authentication and searching for users. It can also be used for storing user preferences such as contact lists. In an LDAP-based deployment, Oracle Communications Instant Messaging Server requires an external LDAP directory server such as Oracle Directory Server. In such a case, the external directory server provides authentication, user search, preferences storage and static or dynamic corporate group functionality. Oracle Communications Instant Messaging Server supports LDAP failover and hence can be configured to have multiple back-end LDAP servers. If one LDAP server becomes unavailable, the IM server will be able to fail over to another LDAP server.
Oracle Communications Messaging Server

The IM server uses an SMTP server and Message Store provided by the Oracle Communications Messaging Server to archive messages for the IM environment. Virtually any SMTP server that can access a message store can be used to provide the archive.

Oracle Communications Calendar Server

Oracle Communications Instant Messaging Server can also interface with Oracle Communications Calendar Server through a calendar agent to provide

- Automatic reminders for calendar appointments
- Automatically change the Presence status based on user’s calendar availability

The calendar agent is a separate component that can run independently on a system other than the IM server host machine. The agent registers itself to the Oracle Communications Calendar Server’s notification service. Upon receiving an event notification, the agent generates an alert message and sends it to the server. This alert message manifests itself as an IM message or a Presence status packet. The advantage of using an agent to generate the calendar alert is that this approach is modular, distributed, and extensible—and doesn’t mean changing the server.

Oracle Communications Instant Messaging Server is suitable for both intranets and the internet and can be deployed in a single-server configuration, a multi-server configuration with multiple servers supporting the same domain, a hosted domain configuration, or a federated environment consisting of multiple IM servers communicating with each other over separate domains. It can work in cooperation with other components of Oracle Communications Unified Communications Suite such as Oracle Communications Messaging Server, Oracle Communications Calendar Server and Oracle Communications Convergence.

Built for Service Providers and the Extended Enterprise

For an IM system to meet the needs of service providers and the extended enterprise—internal employees, partners, and customers—the IM system must be able to

- Interoperate with other IM communities
- Identify the user and provide the appropriate interface based on the user’s role
- Scale with the number of users
- Provide secure access and secure communication for internal employees and external partners and customers
- Provide a feature-rich customizable client; a secure document archiving system; and an open, extensible platform that enables developers to integrate other applications into the IM platform

Standards-Based Interoperability

As enterprises attempt to improve real-time communications among departments, field personnel, partners, customers, and other communities, interoperability plays a key role in extending communications beyond traditional boundaries. Certain communities of users may use public XMPP IM services; others may use vendor solutions providing SIP/SIMPLE IM. Without interoperability, IM communities would continue to exist in isolation and provide a real-time communication service to only those in the immediate community.

Oracle Communications Instant Messaging Server, as an XMPP-based solution, uses XMPP as its native communications protocol. Consequently, it takes advantage of the features and services XMPP provides, such as the following:

- Interoperability with XMPP-compliant systems through server to server federation
» Interoperability with SIP/SIMPLE IM systems though a SIP/SIMPLE federation gateway
» Ability to leverage off-the-shelf third-party components and tools from the open source Jabber community, thereby giving customers maximum flexibility; components may include agents such as calendar agents, directory agents, and business application agents
» Robust security and congestion control
» Straightforward client/server architecture
» Low resource requirements and low overhead in packet size for presence packets
» Comprehensive service monitoring using the standard JMX technology

By leveraging the advantages of XMPP, Oracle Communications Instant Messaging Server can offer customers the means to achieve immediate interoperability with several non-Oracle IM systems. This level of interoperability is not currently available with products that do not communicate via XMPP. It also provides great advantages to customers through its integration with other components of Oracle Communications Unified Communications Suite. Finally, standards-based interoperability assists developers by greatly reducing the development time of new applications that enhance the overall functionality of the IM solution.

Architected for High Performance, Scalability, and Availability

Service providers and large enterprises require an IM platform that is highly scalable, delivers outstanding performance, and is highly available. Oracle Communications Instant Messaging Server is based on a flexible architecture in which the underlying components can coexist on a single system or be distributed across a variety of systems to provide additional scalability. The core component of Oracle Communications Instant Messaging Server is the IM server, which provides all the intelligence, such as the ability to manage presence, control client privileges and security, and enable client chat.

Multiplexor and High Scalability

The IM server requires a multiplexer to enable highly scalable communication with thousands of clients. The IM multiplexer is responsible for bundling many client connections into a single connection to the IM server. Without the IM multiplexer, the IM environment would be able to support only as many client connections as can be supported by the Java virtual machine instances on the IM servers.

The IM multiplexer solves this problem by multiplexing thousands of client connections onto a single connection to the IM server. The IM multiplexer is solely a connection multiplexer—not a proxy—and a transparent pass-through. It listens for instant messenger clients and opens only one connection to the back-end IM server. The IM multiplexer reads data from the instant messenger client and writes it to the IM server. Similarly, when the IM server sends data to the instant messenger client, the IM multiplexer reads the data and writes it to the appropriate client connection. The IM multiplexer does not perform any user authentication or parse the client/server protocol; it always acts as a front-end component to the IM server.

All client connections must pass through a multiplexer, and all communications with the IM server through the IM multiplexer are over TCP/IP; there are no direct connections from a XMPP instant messenger client to the IM server. If the HTTP/XMPP gateway is deployed, it will actually perform the role of the multiplexer for HTTP clients. The multiplexer can run on the same physical hardware as the IM server, but it is not necessary. There can be several multiplexers communicating with the same IM server. In such a case, it is best to deploy the multiplexers on machines separate from the IM server and usually in the DMZ thus protecting the core server from unwanted attacks from the public network.

Server to Server Communication: Federation

Multiple IM servers can communicate with each other. There are two distinct configurations that support this ability: server federation and server pooling. In the federated case, multiple IM servers are federated to form a larger IM
community. In this configuration, each server represents a separate IM domain, although it is possible for a server to host multiple domains. In an LDAP-only deployment, end users from different servers can communicate with each other or use conference rooms on other domains on remote servers, according to access privileges. In the federated case, because each IM server represents a separate domain, each will naturally use a separate LDAP directory server or at least point to a different part of the directory tree to ensure that the namespace within the IM domain is unique (where the namespace is defined by a node in the directory under which all user IDs are unique). It is possible to configure the IM servers to use the same directory server, as long as each server points to a different namespace within the directory tree; the IM server will simply use everything underneath that part of the directory tree. Server-to-server federated communications enable the enterprise to join organizations together into a single federated entity.

Server to Server Communications: Redundancy and High Availability with Server Pooling

Server pooling is very distinct from server federation. There is no requirement to limit additional IM servers to their own unique directory namespaces. Rather, the administrator creates a server pool consisting of multiple IM servers that communicate with each other over the server-to-server port and get user data from the same storage location. All servers point to the same directory namespace. The number of users that can be supported in an IM deployment is no longer constrained by the capacity of a single server system. Instead, the resources of several systems can support the users in a single domain. In addition, server pools provide redundancy, so that if one server in the pool fails, affected clients will be able to reconnect and continue their sessions through another server in the pool with a minimum of inconvenience. Deploying more than one server in a server pool creates a multi-node deployment.

To maintain the availability of the directory server, Oracle Communications Instant Messaging Server supports LDAP failover, which works on a multi-master replication (MMR) setup of LDAP servers. In this configuration, all the LDAP servers are master servers and have permission to read and write data. The IM server uses only one server at a time and will fail over to the surviving LDAP server if the current LDAP server becomes unavailable.

Oracle Communications Instant Messaging Server also leverages other Oracle software such as a monitoring framework to actively monitor and manage IM processes. It also uses log4j, the open source, extensible logging mechanism developed by Apache for creating log files that record various events, system errors, or other aspects of interest. In addition, with log4j you can define your own logging configuration according to the log4j syntax, including the ability to configure Oracle Communications Instant Messaging Server to generate a separate log file for XMPP traffic only. Furthermore, an IM watchdog process detects potential problems and helps maintain the availability of the IM service.

Secure Access, Secure Communication

Security plays a critical role in the day-to-day operations of today’s enterprise. Corporations need to maintain at least the same level of security for IM communication as they do for other forms of communication within the enterprise. A compromise in security can result in downtime and increased operational costs. Common use cases for secure IM include businesses that require secure transmission of communications and secure data archiving.

Oracle Communications Instant Messaging Server provides secure communication on multiple levels—from policy enforcement to encrypted communication. The basic level of security is through LDAP namespace ownership, which means that IM communication can be limited to users provisioned in a given corporation’s LDAP directory. This level of security is employed in isolated LDAP-based IM networks. The IM server communicates with an LDAP directory server for both authentication—in the case of an LDAP-based nonidentity deployment—and user search. For chat to occur, the users must be in LDAP. The IM server cannot communicate with a user outside its LDAP namespace unless the server has been configured to communicate with another server that owns a separate namespace. The
IM server’s ownership of the namespace ensures that enterprise users’ communications will remain within a contained environment.

With traditional consumer IM solutions such as AIM or Yahoo! Messenger, IM communication is not secured against the corporate directory and is not contained within the enterprise and, as such, may be subject to eavesdropping or virus attack. This is an obvious consideration if the customer decides to connect the IM server to a public IM network through an XMPP gateway. Only the traffic that enters the public IM network is insecure. Communications contained within the Oracle Communications Instant Messaging Server domain remain secure.

Oracle Communications Instant Messaging Server can be used to provide communication with the extended enterprise beyond the corporate employees by enabling the administrator to define the access policy for users and groups. For example, an administrator could define an access policy for customers that is different from the access policy for partners or employees. Here are some of the policies that can be enforced:

» Conference room access
» Conference room management
» Conference room moderation
» Contact list management
» User settings access
» Presence change notifications

Access controls may be stored in LDAP or can be implemented through a set of text-based files stored on the IM server and accessed by the server when required. Access controls are used for administration, users and conference rooms.

Pluggable authentication, and Custom single-sign-on support in Oracle Communications Instant Messaging Server enables use of a variety of authentication methods such as LDAP, SecurID, Radius, and Membership.

Oracle Communications Instant Messaging Server also provides security through encryption. Users can deploy Oracle Communications Instant Messaging Server in conjunction with the TLS protocol to provide client-to-server and server-to-server encrypted communications as well as certificate-based authentication between servers.

Furthermore, Oracle Communications Instant Messaging Server provides privacy profiles and contact list authorization mechanisms to ensure further security. Privacy profiles are user-defined lists that apply traffic and presence blocking or enabling rules to individuals or groups of users. Users can create profiles that specify who may or may not communicate with them or who may or may not view their presence or status. Contact list authorization provides a mechanism that enables end users to control who has access to see a given user’s status. When users attempt to add a contact to their contact list, an authorization request is sent to the target contact for approval. If the target contact approves the request, status or presence updates will be viewable by the initiating users. Contact list authorization is enabled by default, but end users can specify that all status requests be automatically approved.

Secure Document Archiving

Although some view IM communications as transient and not worth archiving, many enterprises seeking to use IM as a business tool regard archiving as an essential requirement. For example, in cases in which IM is used as the primary tool for providing customer service, the ability to archive the communications between the customer and the customer service representative is paramount. Solutions to customer problems can be archived for later retrieval by other customer service representatives solving similar problems. Furthermore, certain businesses must adhere to government or industry regulations and may require that all communications be archived.
Oracle Communications Instant Messaging Server provides a flexible archiving solution that consists of out-of-the-box archive providers such as the e-mail archive provider as well as a programmatic interface that enables developers to create custom archive providers.

Oracle Communications Instant Messaging Server provides an e-mail archive provider that leverages the existing store and archive capabilities of traditional messaging systems as well as the search capabilities of existing e-mail clients. With the e-mail archive provider enabled, IM communications of participants will be issued as e-mail messages to each user participating in the conversation. With this technique, each participant can retain a transcript of the IM conversation and virtually any e-mail client can be used to search and manage instant messages. When used in conjunction with Oracle Communications Messaging Server, the e-mail archive provider can take advantage of the wide range of features offered by the Oracle Communications Messaging Server message store, such as flexible rules for aging and expiring messages as well as quota enforcement.

Finally, Oracle Communications Instant Messaging Server provides the APIs for creating a custom archive provider. The Archive Provider API is useful for creating an archive provider that can be invoked for the following server processes:

» When an instant message—such as a chat or conference message—is sent
» During an authentication event, such as a login or a logout
» When there is a change in the presence status
» During a subscription event, such as when someone joins or leaves a conference

Intuitive, Easy-to-Use, Feature-Rich Clients
Oracle Communications Instant Messaging Server, apart from many XMPP standards-compliant clients, also supports the integrated Ajax Web 2.0 client, Convergence.

Convergence
A standalone instant messenger client works well for customers who need a versatile IM application that needs to exist as an individual component on their desktop, but other users may want a more integrated client that combines presence and chat with other communications services such as e-mail, calendar, and address book. Convergence provides a fully integrated fat client experience inside a browser. Drag-and-drop, drag-and-resize, auto completion of addresses, context-sensitive actions, customizable themes, and more are woven into the fabric of Convergence, making it a compelling alternative to standalone communications applications. Convergence is deployed as a Web application within Oracle Glassfish Server. Consequently, it can be deployed on a machine that is physically separate from the machine running Oracle Communications Instant Messaging Server or it can be deployed on the same machine. Convergence supports e-mail, calendar, address book, chat, presence, and integration of third-party functionality to provide new integrated services (mashups). In terms of IM functionality, Convergence does the following:

» Provides real-time presence management that indicates who is online, offline, away, or is idle, thus enabling users to describe their availability or location. Presence status can automatically be changed to “Busy” based on a user’s calendar availability. Convergence can display additional availability information beyond what is provided by presence, such as “on the phone” or “out to lunch.”
» Provides integrated presence throughout the user interface. If an e-mail sender or recipient is an authorized contact in the user's buddy list, the user can instantly view the presence of the e-mail sender or recipient in the e-mail header. Calendar users can instantly see the presence of intended invitees.

» Provides a robust contact list for creating dynamic contact groups—as many as are needed for collaborating with different users and groups. Contact groups might represent project teams, working groups, or accounts. Users can initiate chat with individuals in the contact list or group and can also upload avatars or images so that buddies can immediately see the user's avatar when the user comes online or during a chat.

» Supports multi-format messages including text, rich text, and URLs. Users can control the message font size and color or can send a variety of emoticons to vary the mood of the chat.

» Supports presence authorization so that contacts can see a user's presence only if the user has given approval. Approvals can be given automatically or manually, depending on the user's preference.

» Supports chat transcripts. Users can print chat transcripts or e-mail chat transcripts to themselves or others. The date and time of the transcript is automatically inserted into the e-mail subject line.

» Provides presence enhanced audio and video calling (click-to-call) without any browser plugin using WebRTC technologies. This capability is available in a deployment when Convergence is integrated with the Oracle Communications WebRTC Session Controller product.

Presence-Enabled Applications

First and foremost in IM is the concept of Presence. It is Presence, after all, that enables individuals to know who is available right now and their willingness to engage in an IM conversation. However, IM is not the only application that can take advantage of presence. Consider the utilization of presence in certain services such as Web services. Processes can be engineered to use presence as an indicator to automatically use these services when they become available. Oracle Communications Instant Messaging Server provides visual presence indicators and enables individuals to modify their presence, provided that they have the proper access controls. Individuals can even limit the ability of others to see their status. Perhaps more importantly, Oracle Communications Instant Messaging Server provides a simple HTTP based Presence API for accessing the internal presence service for use in other applications.

Open, Extensible Platform

Public Java APIs

In addition to providing a modular, highly flexible architecture, Oracle Communications Instant Messaging Server provides the following APIs to extend the functionality of the product:
Instant Messaging Server Service API

The Instant Messaging Server Service API is a developer API used by applications to access internal IM services such as presence and conferences. With the Instant Messaging Service API, developers can integrate IM services into Java- or Web-based clients. Other uses may include the development of bridges or gateways that enable another class of clients or the integration of IM and presence into existing applications.

Web Presence API

The Web Presence API is used to retrieve presence information about users connected to the Instant Messaging Server. An example of an application that might use the API would be an enterprise application that provides a presence widget that allows employees to see the presence status of other employees, independent of whether those employees are contacts.

Archive Provider API

The Archive Provider API is used to provide IM message archiving. An archive provider is a software module that provides integration with some type of archive or auditing system. Each configured archive provider is invoked whenever the server processes a message, an authentication event (login or logout), a presence status change, or a subscription event (when someone joins or leaves a conference).

Message Conversion API

The Message Conversion API is used to perform virus checking and removal, translation engine integration, or message content filtering. This API invokes a message converter for every message or each message part going through the server. The message converter can leave the message part intact or can modify or remove the message part. Messages can include text as well as attachments. The text parts are processed as Java string objects. The message converter processes any attachment as a stream of bytes and returns a potentially different stream of bytes—or nothing at all if the attachment is to be removed.

Authentication Provider API

The Authentication Provider API can be used to integrate Oracle Communications Instant Messaging Server with other authentication systems.

Here are a few examples of how additional applications benefit from using these APIs:

- Portal channels can display contact lists and enable real-time communication.
- Presence status can be displayed and conferences initiated from other Web-based collaboration applications such as Web-based e-mail, calendars, or address books.
- Desktop-based IM clients and mobile IM clients can deploy Oracle Communications Instant Messaging Server.
- Server applications can display presence status to notify end users optimally.
- External applications can use the IM server as a real-time communications platform for sending/receiving messages, files to other applications, devices.

Conclusion

Oracle Communications Instant Messaging Server is a compelling solution for any business seeking to provide IM services to its employees, partners, or customers or a business seeking a robust real-time communication/messaging platform to build their applications on. It has several key features that make it an exciting component of Oracle Communications Unified Communications Suite.
High-Performance Server

Oracle Communications Instant Messaging Server is built on an extensible, distributed, modular architecture. This underlying architecture employs connection multiplexers, which are used to provide a certain level of horizontal scalability to the environment. The multiplexers scale vertically with the introduction of additional CPUs, and the IM server component scales with the introduction of additional memory. The distributed nature of the architecture enhances the overall scalability of the IM solution, because various IM components and services can be distributed throughout the network and run on dedicated hardware if necessary. Furthermore, to provide vast scalability, IM servers can be pooled to support an ever-growing number of end users.

Security, Flexibility, and Extensibility

Oracle Communications Instant Messaging Server supports secure transactions over TLS and SSL and provides a robust and flexible authentication framework for developing pluggable authentication modules (PAMs). It can be deployed with Oracle Communications Messaging Server to utilize its built-in archive capabilities. It can also be deployed on multiple operating system platforms. Oracle Communications Instant Messaging Server also supports the use of Convergence. The individual components can be run on the same physical hardware, or they can be distributed throughout the network.

Oracle Communications Instant Messaging Server provides support for multiple clients through a Java developer API that enables additional IM clients to access core IM services. Additional clients can also access IM services through XMPP interoperability and built-in gateways.

Standards and Proven Technology Underpinnings

Oracle Communications Instant Messaging Server is built on standards such as Java, XMPP, HTTP, LDAP, WebSocket, TCP/IP, TLS, and SSL. As a result, it can be easily integrated into environments that employ these standards. Oracle Communications Instant Messaging Server integrates seamlessly with the proven, industry-leading, highly scalable Oracle Directory Server, Oracle Communications Messaging Server, and Oracle Communications Calendar Server. The integration with other products produces an overall communications solution that is greater than the sum of its parts.

Integration with Oracle Communications Calendar Server leverages the alert capability of IM to provide notifications for calendar appointments, automatically changing user’s presence status based on calendar availability. Integration with Oracle Communications Messaging Server produces a flexible archiving solution that can be integrated with third-party message archiving systems.

In summary, when Oracle Communications Instant Messaging Server is used as a standalone product, it is an effective IM application. However, Oracle Communications Instant Messaging Server is much more than that. Its extensibility and integratability with other components of Oracle Communications Unified Communications Suite identify it as a platform that can solve complex problems introduced by an ever-changing communications landscape.
Appendix: Abbreviation/Acronym List

» AIM: AOL Instant Messaging
» AJAX: Asynchronous JavaScript and XML
» GUI: Graphical User Interface
» HTML: HyperText Markup Language
» HTTP: HyperText Transport Protocol
» ICAL: Internet Calendaring (also iCalendar)
» IETF: Internet Engineering Task Force
» IM: Instant Messaging
» IMAP: Internet Messaging Access Protocol
» IMPS: Instant Messaging and Presence Service
» IP: Internet Protocol
» JRE: Java Runtime Environment
» JVM: Java Virtual Machine
» LDAP: Lightweight Directory Access Protocol
» OMA: Open Mobile Alliance
» PAB: Personal Address Book
» PDA: Personal Digital Assistant
» PDU: Protocol Data Unit
» SIP: Session Initiation Protocol
» SIMPLE: SIP for Instant Messaging and Presence Leveraging Extensions
» SMPP: Short Message Peer-to-Peer
» SMS: Short Message Service
» SMSC: Short Message Service Center
» SMTP: Simple Mail Transfer Protocol
» SOAP: Simple Object Access Protocol
» SSL: Secure Sockets Layer
» STUN: Session Traversal Utilities for NAT
» TCP: Transmission Control Protocol
» TLS: Transport Layer Security
» TURN: Traversal Using Relays around NAT
» UDP: User Datagram Protocol
» WAP: Wireless Application Protocol
» WCAP: Web Calendar Access Protocol
» WebRTC: Web Real-time Communications
» WML: Wireless Markup Language
» XEP: XMPP Extension Protocols
» XML: eXtensible Markup Language
» XMPP: eXtensible Messaging and Presence Protocol