Integrating VoIP and Presence into your Enterprise Applications

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INTRODUCTION

As IP networks proliferate and Voice over IP (VoIP) becomes a reality, enterprises are increasingly looking to better integrate their communications infrastructure with existing and future computing infrastructure. A simple scenario is when a web-based, self-service application (e.g., IT helpdesk) becomes much more usable if live human interaction (e.g., by telephone) becomes possible during the use of the self-service application. Historically such integration has required complex and proprietary integration to enterprise PBX systems and telephony networks through Computer Telephony Integration (CTI) interfaces. However, with the ubiquitous availability of IP networks, the emergence of Session Initiation Protocol (SIP) as a signaling protocol for IP networks, and the availability of SIP Servlets as a programming model for SIP-based applications, it is now possible to significantly simplify this integration challenge.

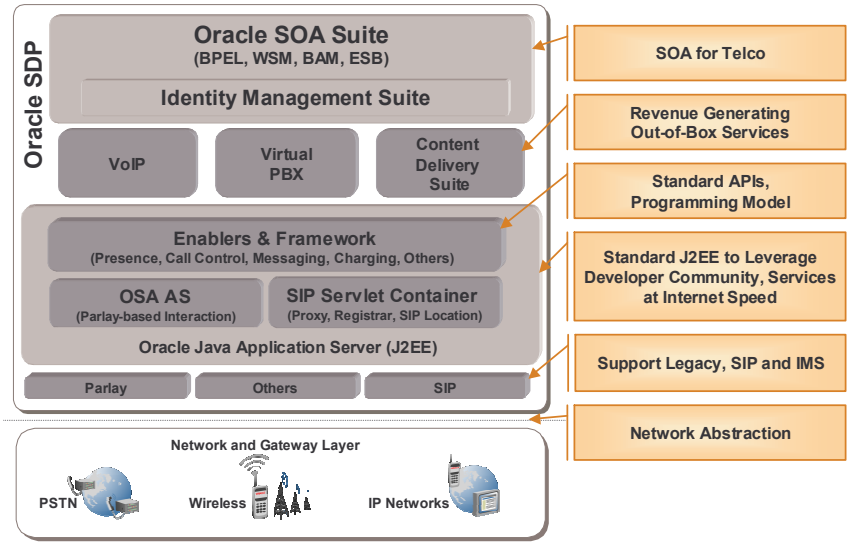

Figure1: Oracle Service Delivery Platform Approach

The Oracle Service Delivery Platform (SDP) provides a compelling set of capabilities in this regard. The Oracle Communication and Mobility Server (OCMS), a component of the Oracle SDP, provides extensive support for the core SIP protocol as well as its many widely used extensions (e.g. RFC 2543, 3261, 3262, 3263, 3264, and 3265). In addition, OCMS supports the SIP Servlet programming standard as defined in the JSR 116 standard by the Java Community Process. Using OCMS and the Oracle SDP, enterprise customers can easily integrate new capabilities such as VoIP into their enterprise applications and enhance employee productivity. In addition, OCMS enables employee presence information to be integrated into enterprise business processes for efficient routing decisions for specific scenarios (e.g. route email outage related questions to an available helpdesk representative with the right skill).

EVOLVING REQUIREMENTS: A CUSTOMER SCENARIO

Imagine that you are responsible for the management of the IT infrastructure at a mid-sized company. In addition to the IT infrastructure, you also own the helpdesk that employees call when they run into IT issues. When an employee runs into an IT issue, they can either call the helpdesk or fill out a form on the IT helpdesk web page. In either scenario, they receive an email with a trouble ticket number they can use to check on the status of their request.

Imagine still, in a recent survey you conducted with your employees on the effectiveness of this system, you discovered two significant pain points. The first one is that about half the time, employees find the details required by the web-based form too complex to answer on their own. Therefore, they start filling out the form, but abandon the form half way through due to encountering a difficult question, and simply pick up the phone and call the helpdesk number. If they pick up the phone, they are placed on hold till a representative is available at which time they have to provide their outage information to the representative all over again.

The second pain point is that quite often, employees are routed to generalists or experts that are not appropriate for their specific issue. In large part, this is because users tend to bypass the IVR system that is in place to try to identify the outage area for a given incident. You have tried multiple approaches to fix this problem. But given the wide variety of IT issues, there has been no noticeable improvement in this regard.

Your director of innovations has just come to you with a proposal for addressing both these issues. His key insight is that there should be a way to initiate a phone conversation from the web page an employee uses to

submit a trouble ticket. That integration should be simple (i.e., easy to develop and easy to maintain), easy to use (i.e., no complex configuration required by the employees), and enable the information an employee has already entered to be available to the helpdesk representative. In addition, the call should be routed to a helpdesk representative who is best suited to address the issues on the web page based on the information already submitted by an employee.

Given your significant experience with the complexity of traditional CTI approaches, you are hesitant to attempt this solution. You know that the helpdesk representatives are globally distributed. Different locations use different telephony systems from different vendors with different proprietary integration APIs. You also know that your company has an overall mandate to move towards IP telephony – your hope is that there is an effective way to implement the suggestion made by your director of innovation that is future-proof for IP telephony and can avoid the integration challenges with traditional CTI.

STANDARDS

Fortunately, SIP provides an elegant solution to your conundrum. SIP is a control protocol that can be used in a variety of different scenarios to perform signaling. Like HTTP, SIP is a text-based, chatty protocol that is human comprehensible. SIP is also extensible thereby providing a framework for adding capabilities to the core SIP protocol over time.

SIP is particularly compelling when used in a VoIP context. SIP can be used as the control protocol to set up and tear down calls and also to negotiate the codecs and capabilities of the end points that are involved in a VoIP call. Vinton Cerf, a noted founding father of Internet technologies, has called SIP as the third great protocol of the Internet with good reason. After IP and HTTP, SIP adoption has reached an inflection point and SIP is the de facto signaling and control protocol of choice today.

SIP Servlets, a programming standard defined by the Java Community Process in the JSR 116 standard, provides a programming model on top of vanilla SIP as a protocol. Just as HTTP Servlets enabled any web developer to build exciting Internet applications in a Java/J2EE environment without understanding all the complexities of the HTTP protocol, the SIP Servlets specification seeks to abstract the details of the SIP protocol from an application development perspective. As a result, any web developer can integrate SIP and SIP-based communication into an existing J2EE-based web application quite easily.

Finally, extensions to the core SIP protocols such as the SUBSCRIBE and NOTIFY methods as well as the SIP event notification package make it possible to build a system that can aggregate presence information from a variety of different end points and publish that information on demand.

Using such a system, it is possible to determine when a given helpdesk representative is on the phone with another employee solving their problem or is simply unavailable. Such a system is able to aggregate and publish presence information in near real-time, thereby providing relevant, up-to-date information about which helpdesk representatives are actually available.

From our previous scenario, it is now clear how the innovation director's vision for integrating Telephony into the self-service web application can be realized. From an implementation viewpoint, his proposal calls for two sets of changes: (a) integrating VoIP (or web-based click-to-dial) implemented on SIP Servlets into the helpdesk web application and making use of the converged container functionality defined in JSR 116 to share information between across the SIP and J2EE components, and (b) providing a system for aggregating presence information of all the helpdesk representatives and making that information available to any client on a near real-time basis. By implementing these sets of changes, it is possible to address both sets of frustrations expressed by employees with the current helpdesk system, by phone or on the web.

ORACLE PRODUCT STRATEGY

The Oracle Service Delivery Platform provides a set of products that are uniquely able to solve the scenario outlined above. Based on the Oracle Fusion Middleware Suite, the Oracle SDP is a SOA-based Java Execution Environment (EE) platform that implements a general purpose, standards-based programming model optimized for communication-centric applications. In addition, the Oracle SDP is highly scalable, available and provides a guaranteed-latency execution environment for operations such as call control.

In the Oracle SDP, the Oracle Communication and Mobility Server (OCMS) implements connectivity and a programming model specialized for SIP. In addition to supporting the core SIP RFC (3261), OCMS also

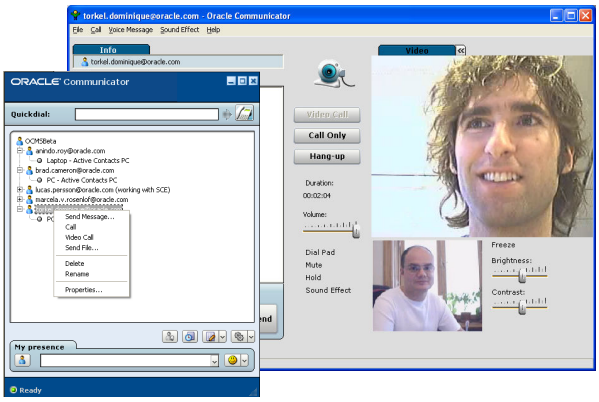

Figure2: Oracle Presence, Instant Messaging, Voice, and Video Soft Client

implements JSR 116, the SIP Servlet specification. OCMS also supports a comprehensive set of SIP extensions such as the SUBSCRIBE/NOTIFY methods (RFC 3265), the SIP INFO method (RFC 2976), PRACK reliability (RFC 3262), and SIP location (RFC 3263). In addition, OCMS provides an OMA-compliant presence and XDMS server that can aggregate presence information from a variety of publishers and make that information available through Java and Web Service APIs to applications in near real-time. Finally, the Oracle SDP in general and OCMS in particular are hot-pluggable, making the capabilities above available on multiple Java EE applications servers (e.g., JBoss) in addition to Oracle products. The breadth of features, out-of-the-box support for VoIP or simple click-to-dial and presence and support for multiple Java EE servers make OCMS the industry-leading offering for integrating VoIP and Presence into enterprise web applications.

CONCLUSION

The convergence of communications and computing is proceeding at a rapid pace within enterprises. Properly harnessed, such convergence can result in dramatically improved employee productivity and better utilization and user experience of enterprise applications. By integrating standards and technologies such as SIP, SIP Servlet, Presence and VoIP into a standards-based Java EE platform, Oracle is leading the way towards enabling such convergence. The Oracle Service Delivery Platform (SDP) and its Oracle Communication and Mobility Server (OCMS) component provide everything an enterprise needs to head down the path of implementing such convergence and realizing the resulting benefits.

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