Systems and Network Analysis Center
Information Assurance Directorate

Unified Communications Technical Primer

Introduction

The purpose of this fact sheet is to provide IT managers with a brief introduction to Unified Communications (UC) and the technologies that make up UC. This fact sheet should be used as a starting point for IT managers who are researching whether to upgrade their current infrastructure to incorporate a UC solution. Once they make the decision to implement UC, they should follow recommendations from NSA's IA Guidance for UC Deployments document.

What is Unified Communications?

UC is the move to bring together all the ways a user communicates, and to make communications among users more efficient. UC is the move, seamless to the user, to bring together all the ways a user communicates—VoIP, email, voice-mail, fax, instant messaging, and video conferencing—and to make communications among users more efficient.

Technologies or Components of UC

Voice over Internet Protocol

VoIP is not a single protocol, but a conglomerate of several individual protocols that become the backbone of UC. The Session Initiation Protocol (SIP) is quickly becoming the standard signaling protocol for VoIP, especially for interoperability with other vendors. It is possible to use other open source protocols or vendor proprietary protocols for an organization's internal VoIP communications. However, industry trends show more and more vendors moving to SIP for all of their VoIP communications, spurred on by the desire to use SIP for interoperability.

Working in conjunction with SIP is the Real-time Transport Protocol (RTP). While SIP handles setting up and tearing down a communication, RTP carries the media. Media can be the audio, video, or both audio and video associated with the phones, video phones, voice mail, audio conferencing, and Video Tele-Conferencing (VTC).

Presence

Presence makes up the second foundation of UC and is what makes communications among users more efficient. In UC, presence is more than indicators in software clients of available, busy, or away. Presence gathers information from various sources to provide real-time availability information about a user. Presence information also includes a user's communication capabilities (phone, video phone, email, and Instant Messaging (IM)) and the user's preferred means of communication.

The gathering of presence information relies on many technologies such as XML, SOAP, and third-party APIs to pull information from enterprise calendar applications such as Outlook, and personal calendar applications like Google Calendar. Usually, a single server functions as the hub of presence information for an organization, using these technologies to gather, store, and report presence information.

The reporting of presence information to users is done with SIP for IM and Presence Leveraging Extension (SIMPLE) or the Extensible Messaging and Presence Protocol (XMPP). These protocols are also used by users to manually set their presence information and

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for IM. On the enterprise level an organization may want to share their user's presence information with another organization. This is known as federation. SIMPLE or XMPP is used between two organization's presence servers to make federation work.

Unified Messaging

Unified Messaging (UM) is a collection of technologies to bring new communication features to users. UM brings together messages from diverse mediums, fax, email, and voice mail to a single application. It is from this one application that users can not only retrieve their messages, but have their messages converted to different media. Examples include retrieving a fax as an email or voice mail, listening to an email, and so on.

To perform these media conversions, UM employs technologies such as text-to-speech, and voice recognition for speech-to-text. Since voice recognition is already being used by UM, many vendors include the feature to allow users to use voice commands. Among other things, these voice commands allow users to control devices, and retrieve and create appointments.

Web Conferencing

In combination with audio conferencing and VTC, UC also contains technologies for web conferencing. Web conferencing allows users to share documents, display slides, and do white boarding during an audio conference or VTC. Providing web conferencing to users requires heavy use of Web 2.0 technologies. Web 2.0 and the many diverse technologies that make up Web 2.0 require their own documentation and are out of the scope of this brief fact sheet.

One Application

The current UC experience for a user requires a desk phone, email client, web browser, web camera, and one application for presence, IM, and a soft phone. While this has reduced the number of items a user needs at his/her workstation by incorporating new ways of communicating into existing items, it still does not provide users with that one seamless experience. Vendors are moving closer to one ubiquitous application; but, for now many vendors offer applications that come close. In a single application, users have their presence, IM, email, chat, phone, video phone, voice mail, and even the ability to schedule conferences. This application can be used on a workstation, laptop, PDA, or a smart phone. Mobility is the major advantage of having all these features in a single application with the ability to run on multiple platforms. Now, with a mobile device and a connection to the Internet, a user can work from anywhere. The goal of a single application is the true essence of UC—providing a more efficient work environment.

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