

# Unified Communications Solutions and Interoperability

A Look Beyond the Rhetoric



**AVAYA**

The Power of We™

# TABLE OF CONTENTS

## PART I: THE AVAYA APPROACH

Standards	3
Architecture	3
Ecosystem	4

## PART II: INTEROPERABILITY HIERARCHY OF NEEDS

Infrastructure	4
Access	5
Unified Experiences	5
Communication-enabled Business Processes (CEBP)	7

## EVOLUTION

## CONCLUSION

## LEARN MORE

The term unified communications encompasses a wide variety of definitions. Almost everyone has his or her own interpretation of what unified communications really means. This is understandable given that unified communications is not a technology but rather a concept or a vision. Common to all definitions is the idea of integrating multiple communication modalities and applications to increase employee productivity and collaboration, and improve business processes. Unified communications achieves its value by embedding communications into business processes, and by empowering people to focus on the purpose of interactions rather than the technologies that facilitate those encounters.

To achieve its potential, the “unification” of communications is highly dependent on interoperability. While an enterprise may be working with fewer vendors in the future, no single vendor may be able to provide a complete unified communications solution.

The depth and breadth of interoperability defines the reach and extensibility of a unified communications system. Interoperability is necessary to allow

previously disparate applications and services – some from a mix of vendors – to work together as a single cohesive business solution. Protocols and APIs facilitate interoperability; some of which may be industry standards while others may be proprietary.

Standards specifically define what something must or must not do. However, standards sometimes also define what something should, shouldn’t, or could do. To gain an appreciation of the variability that can exist within a standard, refer to *RFC 2219 Key words for use in RFCs to Indicate Requirement Levels*<sup>1</sup>.

Because standards are subject to interpretation, two components based on the same standard may not actually work together. As a result, standards alone are not sufficient for interoperability. To help alleviate this issue, many vendors also provide APIs that allow other applications and products in the software ecosystem to work with theirs.

For viability, a vendor solution must both support industry standards and have available APIs. To truly set itself apart from others, a vendor’s solutions must also be designed and architected for multi-vendor

environments, and include a software ecosystem that supports solution level interoperability.

The purpose of this paper is to define the many dimensions in which Avaya addresses interoperability. First, the paper will outline the key elements of Avaya’s interoperability strategy:

- Going beyond standards support to involvement in the standards bodies
- The establishment of a SIP/SOA architecture that is based on IMS principles and designed to accommodate multi-vendor solutions
- The availability of open APIs and the management of the ecosystem all within the Avaya DevConnect Program

Avaya takes a structured and holistic approach to unified communications. Much like Maslow’s hierarchy of human needs<sup>2</sup>, interoperability within unified communications requires each layer be built upon the next. The second part of this paper will discuss how Avaya addresses interoperability in the areas of:

<sup>1</sup> <http://tools.ietf.org/html/bcp14>

<sup>2</sup> Maslow, A. H. (1943). A Theory of Human Motivation, Psychological Review 50, 370-96.

- Infrastructure
- Access
- Unified experiences
- Communication-enabled business processes

## PART I: THE AVAYA APPROACH

### Standards

Avaya’s heritage of active participation in industry standardization activities reflects its position as an innovator. Avaya participates in standards activities around the world. Not only does this participation help ensure products meet enterprise needs and applicable government requirements, it also enables Avaya to base its innovations in emerging technologies on industry standards. The activities in which Avaya participates include leadership and contributions in voluntary and mandatory standards creation, as well as the activities of various consortiums, forums, and trade associations. Experts from Avaya Labs and other Avaya organizations are involved in standards activities for existing and emerging technologies addressing telecommunications, data networking, e-business, application programming interfaces, safety, environmental, and regulatory standards.

Over the years, many Avaya experts have served in leadership positions for various standards definition organizations. Hundreds of R&D professionals in Avaya Labs and other Avaya organizations help support the Avaya participants with their role in these organizations. Avaya plans to continue the active participation in external standards activities and is always aiming to

provide the world’s best communications solutions that enable businesses to excel. Avaya views these activities as important opportunities to interact with other industry participants, and in particular, with enterprise customers. The goal is to satisfy an enterprise’s near and long-term needs for interoperability, multi-system compatibility, and safe and efficient operation.

Avaya is also proud of its technical leadership in standards activities that have defined new industry directions and opportunities. For example, in the IETF and SIP Forum, Avaya has participated in defining SIP and associated applications. Avaya is active in the Web Services and business applications standardization within the OASIS and JCP, and has made leading contributions within VoIP standardization. Avaya experts hold leadership positions in the IETF, SIP Forum, OASIS, VXML Forum, and the W3C.

Table 1 lists a number of the standards organizations in which Avaya directly participates.

### Architecture

Figure 1 illustrates the evolution of communications architectures. It shows that in the past, conventional communications systems were a single integrated stack. With a tendency to be highly proprietary, it was necessary for these systems to come from a single vendor.

Communications architectures then evolved to include the IP PBX. By separating access from the rest of the system, it allowed the needs of branch and remote users to be serviced remotely. However, users were still bound to a particular system, and applications were tightly coupled to the connection layer. Consequently, it required that all applications come from the same vendor that provided the connection capabilities.

Table 1: Avaya Participation in Standards Organizations
<b>International Standards</b> <ul style="list-style-type: none"> <li>• IETF – Internet Engineering Task Force</li> <li>• ITU-T – International Telecommunication Union, Telecommunication Standardization Sector</li> <li>• IEEE – Institute of Electrical and Electronics Engineers</li> </ul>
<b>American Regulatory Agencies</b> <ul style="list-style-type: none"> <li>• FCC – Federal Communications Commission</li> <li>• NENA – National Emergency Number Association</li> </ul>
<b>European Standards</b> <ul style="list-style-type: none"> <li>• Ecma International – European Computer Manufacturers Association</li> </ul>
<b>Consortia and Fora</b> <ul style="list-style-type: none"> <li>• SIP Forum</li> <li>• W3C – Worldwide Web Consortium</li> <li>• IMTC – International Multimedia Teleconferencing Consortium</li> <li>• Voice XML Forum</li> <li>• JCP – Java Community Program</li> <li>• FIPA – Foundation for Intelligent Physical Agent</li> </ul>
<b>Standards-Related Trade Associations</b> <ul style="list-style-type: none"> <li>• TechAmerica Europe</li> </ul>

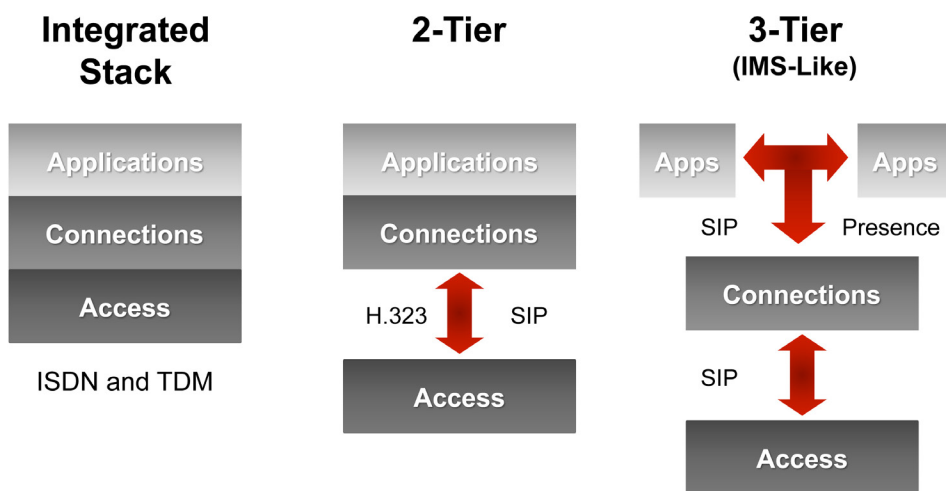


Figure 1: Architectural Evolution

The current evolution shows the Avaya Aura® architecture, which is based on a three-tier model. This is similar to the IMS architectures that service providers currently use. The application layer centralizes applications such as UC shared applications – including messaging, conferencing, self service, telephony feature servers, and social networking – and Web 2.0 applications. Unlike the restrictions in the other models, these applications may come from different vendors. The connection layer serves as a modular strong core providing management, routing and integration among all devices and platforms, multi-vendor environments and service provider clouds. The SIP protocol facilitates interoperability.

Although most vendors will note support for SIP in their spec sheets, the Avaya Aura® architecture is different. Avaya Aura® Session Manager works independently from the applications that use it, allowing Avaya's SIP core to bring multiple applications together through SIP and manage the associated sessions. Finally, the access layer enables all distributed branches, remote systems and PBXs to connect directly with the core. In this way, business users can access the right

application, regardless of device location or platform. This three-tier approach provides maximum flexibility and helps avoid vendor lock in.

## Ecosystem

The Avaya DevConnect Program currently has over 14,000 registered companies, including more than 400 technology partners. These partners create vertical, horizontal, and value-added applications for Avaya's standards based-solutions. Any interested ISV, IHV, SI, SP or corporate IT developer can participate in the program.

The DevConnect Program provides a wide range of developer-oriented resources including access to APIs and SDKs, developer tools, technical support and training materials. In contrast to vendors with invitation-only programs, Avaya DevConnect is open to all customers, channel partners, and technology partners, even if they develop solutions that overlap with elements of Avaya's own portfolio.

DevConnect compliance tests provide enterprises with a high level of comfort in the interoperability between DevConnect member solutions and Avaya products.

Through a jointly developed test plan, Enhanced level DevConnect members work with DevConnect engineers to assess the interoperability of both member and Avaya products. During DevConnect testing, Avaya endeavors to test not only at the protocol level, but also at the solution level. This type of testing allows Avaya to look at the complete solution experience instead of the expected input and outputs. In addition, Avaya goes beyond a mere "checkmark" acknowledgement of interoperability by publishing configuration information in the form of Application Notes. These documents help enterprises and channel partners deploy joint solutions that match actual tested configurations.

More detailed information on the Avaya DevConnect Program, including available SDKs, APIs, testing and application notes, can be found on the DevConnect website at [www.avaya.com/devconnect](http://www.avaya.com/devconnect).

## PART II: INTEROPERABILITY HIERARCHY OF NEEDS

### Infrastructure

Infrastructure is defined as the networks, servers, and gateways that establish the foundation on which a unified communications (UC) solution runs. The software that makes up Avaya's UC solutions is designed to work with IP networks. Additionally, Avaya applications run on commercial off-the-shelf hardware, typically using the Linux operating system. Avaya also provides the integration services to harden the operating system, optimizing it to provide the security and performance necessary for real-time enterprise communications.



Avaya servers and gateways can connect via standards-based networking equipment from vendors such as Cisco, Juniper, and Extreme. In addition, Avaya UC integrates with Avaya's fit for purpose data networking solutions to provide high levels of resiliency and performance.

Avaya data networking solutions provide integrated management for all aspects of network and UC applications.

## Access

### User Devices

Access defines the way in which clients and devices connect to services and servers, and the way networks connect to each other. Without access, there is no utility because there is no connectivity. Further, access must be provided based on how users want to connect. Avaya provides unified communications experiences across the widest array of operating environments.

On the desktop, Avaya provides solutions for users working on Microsoft Windows, Apple Mac OS, Linux, and Android personal computers, laptops, and appliances. Avaya one-X® Portal provides access to unified communication applications through browsers including Internet Explorer, Safari, or Firefox.

There is an increasing trend toward the Virtual Desktop (VDI) - where a user's desktop software resides on a data center server, such as a Citrix server, and is accessed via a remote client - like a Citrix client - or desktop. Avaya clients such as Avaya one-X® Communicator and Avaya one-X® Agent are designed to operate in such environments. While today's solutions support controlling the software remotely, the ability of VDI architectures to deliver real-time voice and video to the desktop is limited for now.

Mobility is a key requirement for unified communications. Its importance will only increase as mobile computing surpasses desktop computing in terms of the number of devices being shipped. Extending enterprise applications, rich communications and collaboration to mobile devices will further add to the importance. While IT once commanded the devices available to users, with increasing frequency, users now have the flexibility to select from a range of devices. Recognizing these trends, Avaya extends enterprise communication services to a wide variety of mobile platforms, including RIM BlackBerry, Apple iOS, Android, Nokia Symbian, Windows Mobile, and J2ME based devices.



Figure 2: Avaya support for mobile operating environments

### Carrier Connectivity

The last area of access is connectivity to the service provider networks. Traditional connectivity has been delivered via well defined T1 or E1 interfaces. These provided a clean point of demarcation between the service providers and the enterprise. It was a simple case of establishing a T1/E1 connection between the carrier Class 5 switch and the enterprise PBX.

SIP offers the promise of lower cost connectivity and support delivering richer collaborative experiences. The interface is controlled by a Session Border Controller available from either Avaya or a third-party vendor, including Acme Packet, Sipera, Ingate, and Audio Codes. Unlike the older T1/E1 interfaces, the SIP infrastructure implemented by the service providers can vary from one provider to the next. Hence, Avaya has established the Global Service Provider SIP Compliance Program (GSSCP). With the program, Avaya has expanded the scale of the DevConnect test facilities to conduct and document SIP interoperability testing with service providers using different scenarios. Avaya has defined several reference architectures for the deployment of Avaya Aura® solutions, and continues to test interoperability with service providers worldwide.



Figure 3: Avaya support for desktop operating environments

## Unified Experiences

By bringing multiple forms of communication together into unified experiences, unified communications helps employees be more productive, customers be better served, and business processes be more efficient.

### Desktop

At their desk, users typically make use of a PC and a deskphone, and in some cases specialized devices such as an executive video appliance. Mobile devices, such as smart phones and tablets, also need to seamlessly interoperate with desktop applications. With that in mind, Avaya created the Avaya Flare® Experience, which aggregates access to a variety of communication services.

Initially introduced on the Avaya Desktop Video Device, the Avaya Flare Experience will soon be available for other operating environments such as Windows and iOS. Currently, it can access Avaya services such as telephony, high definition video, conferencing, instant messaging, and audio conferencing. A video call can be established with users who are on a Polycom or Tandberg endpoint either via SIP or H.323. Instant messaging can be federated with Microsoft OCS or IBM Sametime users. Access to email and calendar from a variety of sources provide important communications context. Contacts from a variety of directories can be aggregated together to create a simplified experience. Access to social networking applications such as Facebook promotes greater collaboration outside the enterprise.

In terms of desktop experiences, enterprises using Microsoft or IBM software suites can enjoy those branded experiences with the reliability of a single real-time

communications infrastructure powered by Avaya Aura® solutions. This extends click-to-call and telephony presence into Microsoft Office Communicator, Outlook, and SharePoint; or IBM Sametime, and Lotus Notes, Connections, and Quickr.

### Mobility

While the Avaya Flare Experience is delivered by way of client software running on a device, Avaya one-X® Speech provides an integrated and unified experience for hands-free needs critical to highly mobile users. Avaya one-X Speech aggregates access to Avaya Modular Messaging for voice messages; to Microsoft Exchange or IBM Lotus Domino for email calendar and contacts; to a corporate directory via LDAP; and to Avaya Communication Manager or CS 1000 for voice calling and conferencing.

As noted earlier, a variety of smartphone devices support Avaya one-X Mobile. A key part of a fixed mobile convergence solution is single number access. This means that calls to a user's enterprise number will be bridged with the user's preferred device. Although many vendors provide this service today, most use a variety of call redirection techniques instead of the bridged technique Avaya uses. Avaya's bridging technique helps ensure voice messages don't get stranded in a mobile device or home phone mailbox. Users can also move calls seamlessly from desk phone to mobile without disrupting the current conversation. Finally, Avaya one-X Mobile routes outbound calls through the Avaya Aura system, sending the user's enterprise number, not their mobile number, to the called party.

## Unified Messaging

Unified Messaging was perhaps the first "unified" application. This brings email, voicemail, and fax together into a single cohesive solution. Avaya addresses interoperability for unified messaging using several topologies. Some enterprises wish to store all messages (email, voicemail and fax) in the email message store. To meet this requirement, Avaya unified messaging solutions can store messages in Microsoft Exchange or IBM Lotus Domino. In other cases enterprises need to deliberately store voice messages separate from email. In such cases, Avaya provides the message store, but leverages the IMAP4 standard as the means to provide access to the voice messages through the email client.

Avaya's messaging solutions are integrated with a range of communication servers and support important features such as message waiting indication and contextual greetings. Avaya Message Networking acts as a protocol converter to allow multiple voicemail systems to co-exist within the same voicemail network using Avaya legacy INTUITY® and OCTEL® system protocols, as well as industry standards such as AMIS, VPIM, and SMTP.

### Conferencing

Avaya Aura® Conferencing can be integrated with Avaya Web Conferencing or third-party web conferencing solutions such as Microsoft Live Meeting, IBM Sametime, or Adobe Acrobat Connect Professional. The integration enables these web conferencing products to leverage the audio conferencing controls from within the web experience. It allows users to see the audio and web participants in a single roster, and will unify the presence for participants using both media. It allows participants to identify who is

speaking, and for conference hosts to mute noisy lines. To assist with creating and joining meetings, Avaya Aura Conferencing integrates with Microsoft Outlook and IBM Lotus Notes calendar applications.

## Video

Avaya Aura is a single architecture built on SIP standards, which processes video and voice calls over the same communications infrastructure. The Avaya Aura architecture provides a single network for all enterprise communication needs. It is a communication services platform based on SIP standards, allowing multi-modal multi-session communications. This includes very efficient high definition video for Avaya and third-party endpoint support - SIP and legacy - and interoperability.

The Avaya Aura® architecture allows for direct SIP endpoint support in the core. This is accomplished three ways. Using SIP as the integration protocol, Avaya provides a number of SIP UC endpoints to provide voice and video services. Since SIP is the underlying standard in Avaya Aura solutions, it allows for native third-party endpoint support and interoperability. Avaya Aura supports the latest standards for high definition (HD) video. In addition to H.263, Avaya supports H.264 Advanced Video Codec (AVC) and will soon support Scalable Video Codec (SVC).

Avaya Aura solutions allow users to make very efficient HD video point-to-point and multipoint calls between Avaya and third-party users. Finally, the testing of third-party endpoints is performed via the Avaya interoperability lab. These labs perform testing of third-party solutions to help ensure interoperability. There are a number of third-party vendors that have

completed or are in the process of completing Avaya testing, including Polycom, LifeSize, Tandberg and Cisco. The compliance testing between Avaya Aura® SIP systems and endpoints helps ensure enterprises can collaborate using voice and video between Avaya and third-party solutions.

The Avaya Aura architecture can extend this interoperability to non-SIP based systems including H.323. Enterprises may be planning to migrate existing H.323 systems into a SIP-based architecture such as the Avaya Aura solution. This requires interoperability between the H.323 and SIP systems. The Avaya Aura architecture natively supports such interoperability through the Communication Manager Evolution Server. Enterprises with H.323 based video can use the Avaya Aura Communication Manager Evolution Server as the H.323-to-SIP gateway. This will allow video calls to occur between the Avaya Aura system and third-party systems. This integration also provides core routing functions for voice and video consolidating dial plans, and routing entities for voice and video

## Presence

Presence is at the heart of a unified communications experience. Presence service allows a user to indicate his or her availability and share it with others. Users can provide their status in addition to status indications that automatically leverage device and calendar usage to indicate availability. The more sources of presence that can be aggregated, the more a presence state will accurately represent true user availability.

Avaya Aura® Presence Services has been designed for this very purpose. It natively supports both the SIP/SIMPLE and XMPP protocols to facilitate the collection of presence

information from various systems. While it can act as the single presence engine for the enterprise, it can co-exist with other presence engines such as Microsoft Office Communications Server or Lync, or IBM Sametime. This means that Microsoft or IBM users can see Avaya presence within their respective experiences, and Microsoft or IBM presence can be provided within the Avaya Flare Experience and Avaya one-X solutions.

Because presence information is aggregated from multiple sources, it is possible that conflicting information may need to be resolved. For example, a user may have no meetings scheduled on the calendar, but may be using his or her desk phone. Or a user's PC may be shut down, but he or she is on a business call using a mobile device. Avaya Aura Presence Services allows enterprises to define rules as to how a presence state is ultimately derived.

## Management and Administration

Avaya's applications support Simple Network Management Protocol (SNMP) with associated Management Information Bases (MIBs), allowing easy incorporation into existing management tools. For example, Avaya applications requiring user authentication can utilize Microsoft Active Directory. In addition, Avaya Aura System Manager will use LDAP to synchronize its directory information based on Active Directory.

## Communication-enabled Business Processes (CEBP)

Communications-enabling business applications and processes provide significant opportunity to improve worker productivity, speed responses to critical situations,

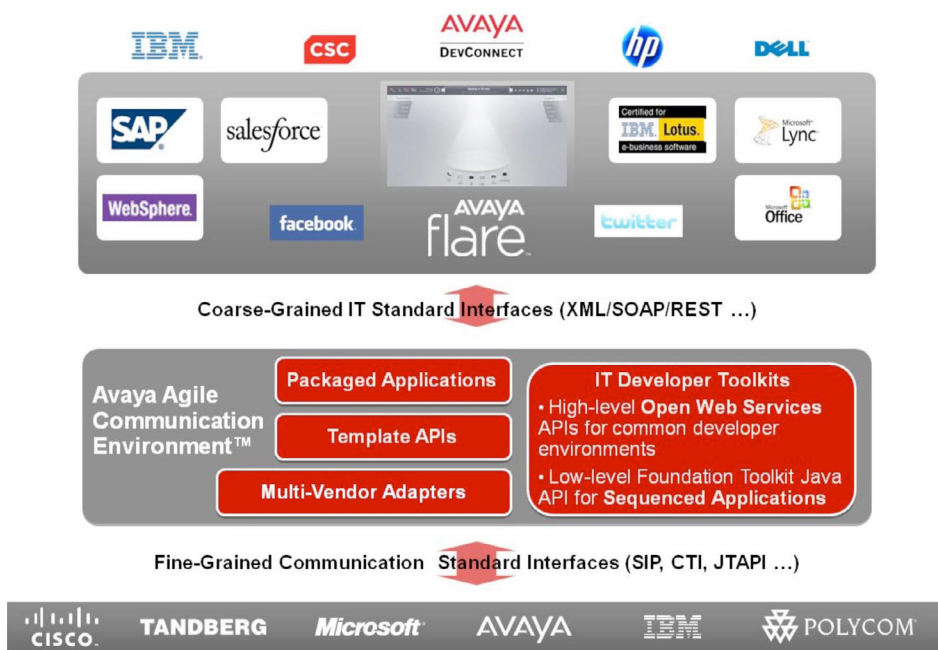


Figure 4: CEBP Architecture based on Avaya ACE™

accelerate key processes, and significantly enhance customer satisfaction. In Avaya's experience, enterprises require a broad approach to CEBP to successfully gain initial business value and then build growing momentum for further initiatives.

Avaya Agile Communication Environment (ACE™) allows business applications and processes to quickly and easily be communications-enabled through a set of packaged applications and developer toolkits. CEBP applications that would have taken weeks or months to create by specialist telecommunications developers can now be easily achieved by web services IT developers in a matter of days — often up to 80% faster than traditional methods.<sup>3</sup>

Figure 4 shows how Avaya ACE™ is designed to address multi-vendor interoperability. Its higher level web services APIs allow developers to easily extend communications into business applications without requiring extensive knowledge into the intricacies of communications. At

the same time, the lower level communication APIs allow fine control of the communications applications themselves. This allows for a heterogeneous communications infrastructure to be integrated with the business applications. For instance, the Avaya ACE integration for Microsoft Office Communicator can be used to provide a Microsoft-centric user experience for Avaya Communication Manager, Avaya Communication Server 1000, and Cisco Unified Communication Manager.

The Avaya ACE toolkit is open to IT and business application developers through the Avaya DevConnect Program, providing SOA-style Web Services (SOAP and RESTful APIs) with Web Services Description Language (WSDL) definitions. It can be easily incorporated into a developer's preferred integrated software development environment (IDE), such as Microsoft Visual Studio or open source Eclipse Java-based tools. Avaya ACE Web Services expand on open standards, including Parlay X, with multi-vendor support for voice, video, presence

and other media over time. This allows IT developers to create cross-platform applications without having to contend with the various telephony protocols of the network infrastructure.

Interfaces to Avaya Aura® solutions and multi-vendor communications systems are enabled through Avaya ACE software adapters that use both open and proprietary protocols as required. Available protocols include SIP, TR-87, JTAPI, IBM Virtual Places, Microsoft Unified Communications Management API (UCMA), Avaya CS 1000 Meridian Link Services (MLS), and Avaya Application Enablement Services.

The Avaya ACE toolkits can be used to create sequenced applications that are managed through Avaya Aura® Session Manager. A sequenced application is a communications workflow that follows a pre-determined path. Each application in a sequence sees all requests and can deny, modify, or forward initial SIP requests. It is invoked in a predefined sequence during communication set-up and may be one of a number of applications sequenced. A sequence is defined independently for both the originating and terminating sides of the communication. Session Manager routes incoming communications to each application sequenced in the communication — first on the originating side, then on the terminating side — before finally routing to the actual endpoint.

For example, a sequenced application could be written to help participants join conference calls. A call to a conference bridge is diverted to a conference helper application, which is connected to Microsoft Exchange. The application reads out the name of the meeting, and enters any passcodes required to join the call. Hence, sequenced applications can be used to alter how services are provided for specific

<sup>3</sup>Based on Avaya internal research.



users given a specific context, and can be used to leverage services across a variety of applications.

## EVOLUTION

There are very few “green field” implementations of unified communications. An enterprise typically evolves towards unified communications. Enterprise environments often have established PBXs with associated deskphones and voice messaging systems, along with existing email systems. These systems are at various stages of depreciation, and a move towards unified communications usually requires interoperability between the old and the new. The Avaya approach is to “wrap and embrace” instead of “rip and replace” – even for third-party systems – to help maximize investment protection.

Avaya Aura® solutions support the simultaneous use of older analog, digital and IP (H.323) terminals along with newer SIP endpoints. This includes both endpoints provided by Avaya as well as third parties. Avaya stands out from other UC vendors because it provides simultaneous native support for these devices without requiring third-party gateways. This allows enterprises to maintain their investments in devices and user experiences without the complexity and cost of third-party gateways. Further, as enterprises migrate to a SIP architecture, it protects their investments in Avaya IP phones. The SIP software can be loaded into existing Avaya IP phones, transforming the phones into direct endpoints within the SIP architecture.

Often enterprises have a heterogeneous mix of communication vendors, perhaps because of mergers and acquisitions or decentralized decision making. For example a company may use Avaya Communication Manager in the Americas, Nortel CS 1000 in Europe, and Cisco Unified Communication

Manager in Asia-Pacific. Each support SIP. However because SIP standards vary across vendors, interoperability remains a challenge.

The Avaya Aura architecture is designed for interoperability. It contains software-based adaptation modules that can normalize the signaling to allow multiple communication servers to exist within a single enterprise network. Avaya currently supports connectivity with Avaya, former Nortel, Cisco, Siemens, Alcatel-Lucent, and Microsoft-branded communication servers. This interoperability allows enterprises to:

- Maintain a single enterprise-wide dial plan
- Centralize a consistent set of services, such as unified messaging and conferencing, in the Avaya Aura enterprise cloud and extend them to all employees
- Consolidate and reduce trunking
- Leverage tail end hop off that can effectively transform an international call into a local call by using a multi-vendor enterprise communications network. For example, a user may initiate a call to a customer from an Avaya system on one continent, which will then route through an enterprise network across continents utilizing other vendors' systems, before finally connecting to the customer as a local call

Thus far, the discussion has focused on the evolution of communications from past to present. However, current trends are pointing to a new generation of solutions. Trends include:

- Users' desire to select their own devices and applications
- Adoption of tablet computers
- The need for mobility
- The use of social networking

- The drive toward virtualization – both in the data center and on the desktop
- Cloud computing – private, public, and hybrid solutions
- Ever expanding applications of SIP

Enterprises require a platform that has the flexibility to evolve to incorporate these trends and Avaya provides exactly that platform. The Avaya Aura architecture has the flexibility to allow enterprises to evolve from current day to next generation solutions.

## CONCLUSION

Interoperability is a key requirement for any unified communications solution. It is what allows the old to work with the new. It allows the new to work with the next. Interoperability is the engine that will allow the definition of unified communications to evolve and bring more applications and technologies under its umbrella. Support for standards is table stakes. Avaya goes beyond by participating in the standards bodies that are setting those standards, not just following what others develop. APIs provide access to a vendor's unique capabilities. Avaya's robust APIs and SDKs are supported by the Avaya DevConnect Program to focus interoperability at the solution level instead of the protocol or API level.

Perhaps the most significant factor that distinguishes Avaya's interoperability from others is the Avaya architecture that has been designed to address interoperability. The Avaya Aura architecture three-tier approach allows session management to work independently from any one application. It also uses SIP in a robust manner, allowing various applications to work with each other. Likewise, Avaya ACE provides a middleware layer that allows communication services to be embedded into an array of business

## About Avaya

Avaya is a global provider of business collaboration and communications solutions, providing unified communications, contact centers, data solutions and related services to companies of all sizes around the world. For more information please visit [www.avaya.com](http://www.avaya.com).

applications. Avaya bases its unified communications strategy on a multi-vendor solution premise, helping meet the needs of enterprises and their users. It may be the most extensible solution available, offering the greatest reach into various operating environments, devices, and applications that an enterprise may use today – and will use in the future.

## LEARN MORE

To learn more about unified communications and interoperability, contact your Avaya Account Manager or Avaya Authorized Partner. Or, visit us online at [avaya.com](http://www.avaya.com).