



BEA White Paper

BEA WebLogic Communications Platform™ and IP Multimedia Subsystem (IMS)

Next-Generation Converged Services



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CWP1234E0505-1A

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Introduction

As widespread deployment of the IP Multimedia Subsystem (IMS) begins to solve the fundamental challenge of connectivity across network domains and lays the groundwork for value added services, application and service infrastructure will face new challenges. The convergence of legacy telecommunications networks with all-IP infrastructure offering data, voice and multimedia services requires a flexible and robust, execution environment for network applications. Cost-effective value-added network services require application server platforms provide a high degree of availability, seamless interoperability with legacy and next-generation systems, high performance, and a development environment that drives rapid service creation, testing and deployment. The IMS promise of lowering capital and operational costs for service providers while providing an exhaustively expanded range of value added services can not be realized unless the service and application infrastructure accurately reflect the requirements of a real, operational network. The role of the IMS SIP application server in this resulting hybrid architecture is more central, and critical to service provider success, than ever before.

IMS is an industry standard specification defined by the 3rd Generation Partnership Project (3GPP) in Release 5 & 6, originally for 3G UMTS mobile networks. Because of its general applicability outside the wireless access domain, other standards bodies that have subsequently adopted the majority of the 3GPP IMS specifications as the underpinning of their own architectural standards. These forums include the 3rd Generation Partnership Project 2 (3GPP2) under the Multi-Media Domain (MMD) specifications, the Open Mobile Alliance (OMA), and the European Telecommunications Standard Institute (ETSI). Because the IMS is primarily concerned with IP and application layer issues, non-mobile network operators, such as fixed-line operators and cable operators, are also beginning to adopt IMS as part of their broader move to all-IP networks. Despite the long-term potential for a truly access independent application services layer, however, real-world deployments of new services must be optimally architected to address not only IMS, but also non-IMS networks. Failure to continue to derive maximum value from existing network capabilities negatively impacts Return on Investment (ROI) in not only the IMS core systems and services infrastructure, but in the capital investment in customer acquisition, support and other back-office functions related to expansion of service portfolios as well.

The IMS standard is based upon the widely adopted Internet standard technology called Session Initiation Protocol (SIP). SIP is at the heart of the IMS network architecture, providing the real-time, peer-to-peer, multi-party and multi-media capabilities of IMS. The application services layer of IMS networks must support SIP interfaces and IMS SIP application servers, so as to reduce the complexity of IMS applications as well as pave the way for enhanced, feature rich network services. Because of the wide-scale proliferation of end-devices and applications adopting SIP, the market is ripe for CSPs to take advantage of this market landscape by deploying IMS core networks, along with the compelling end-user applications to drive volume adoption of IMS network services.

This white paper describes the market need for IMS, how it works, how it can be used, and how the BEA WebLogic Communications Platform suite helps CSPs deliver new IMS network services. The strength of IMS is realized when existing network assets are leveraged into new services. The service issues facing CSPs are building, integrating, deploying, extending, managing, and maintaining applications across the entire spectrum

of disparate access networks. These challenges are addressed by BEA Systems through its product offerings. BEA helps CSPs realize IMS revenue growth by consistently and effectively aligning with CSP business goals and requirements, and delivering value added products and services to meet those needs.

Market dynamics

Under increasing market pressure, CSPs are facing a multitude of challenges forcing changes in how they conduct business. CSPs have to rethink how they manage their network infrastructure and how they interface with 3rd party partners, as well as increase average revenue per user (ARPU) and loyalty from their existing subscriber base by adding new, value-added services. The communications industry as a whole is undergoing an evolutionary transformation, whereby the line between fixed-mobilebroadband service providers are blurring, and where in the past subscribers have historically had multiple service provider relationships, are now able to get most of their communications services provided by a single provider. The traditional issues of network infrastructure—connecting the pipes to boxes, is giving way to new issues of service delivery and execution infrastructure, which requires running industry standards based services across multiple platforms, networks, and applications.

Worldwide, the communications industry is seeing consolidation of CSPs through mergers and acquisitions, and strategic partnerships. Fixed-line service providers are acquiring mobile and broadband networks, and conversely, mobile and broadband operators are acquiring fixed-line networks. Service providers are increasingly launching new data services in response to the declining ARPU on voice-only services, and likewise, broadband service providers are launching telephony services over their IP networks.

In addition to the convergence of network infrastructures, there is also a convergence of telecommunications and Internet technologies, which facilitates the creation and delivery of new services on top of these converging networks. Because of the increasing need for flexibility, the traditional approach to “network architecture,” in which functional decomposition of the network is facilitated by the standardization of protocols, is giving way to a new “software architecture” for service delivery and execution infrastructure. The relationship between functional elements of the service architecture is increasingly defined in terms of Application Programming Interfaces (APIs), greatly increasing the importance of open, standard platforms and proven service implementation technologies, such as those provided by BEA WebLogic Communications Platform. This trend represents a new frontier of “convergence” and underscores the similarities between the historic evolution of information technology and the future of communications systems.

Standards organizations such as ETSI/TISPAN, 3GPP, 3GPP2, OMA, Parlay Group, Java Community Process (JCP) and Internet Engineering Task Force (IETF) are all cooperating to deliver mature open, industry-standard architectural specifications, which spell out what protocols and APIs are needed by CSPs and application developers to facilitate the deployment of next-generation networks, applications and services. Some of the key technologies which have been standardized include SIP, Parlay/OSA, Parlay X Web Services, JAIN SLEE and SIP Servlets, among others.

Finally, the market demand for richer, interactive, multiparty communication services by end-users is accelerated by the proliferation, and widespread market adoption of cutting-edge, multimedia-capable, multi-purpose mobile, and fixed devices. Today's communication devices are fast becoming the infotainment devices of the near-future, with many mobile devices capable of voice, video, data, file-sharing, and presence. And owners of these devices are demanding rich-media, interactive services which can take greater advantage of the technical capabilities of their devices. The users of these devices represent an existing install base for rich-media, interactive services that can immediately be used to validate mass-market service concepts and generate significant revenue for service providers in the near term.

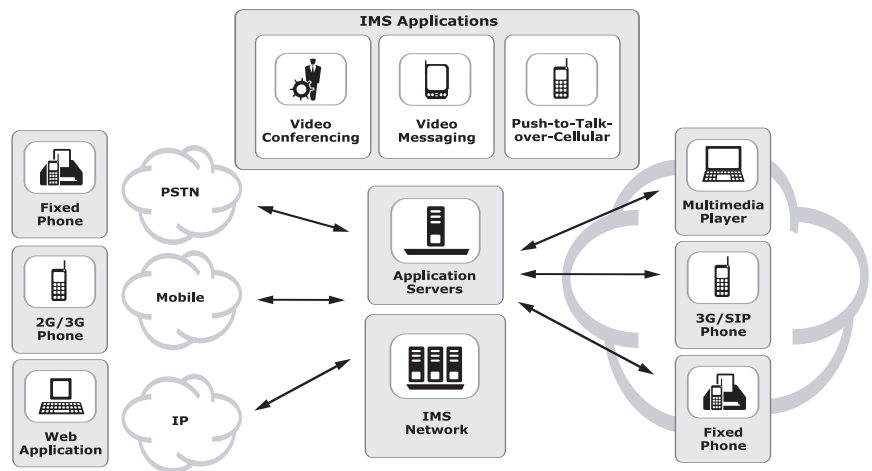
The combination of these network, end-user, and business factors are forcing network operators and service providers to become more agile at the service delivery platform layer of their network infrastructure. In order to meet the demands of this fast changing business climate, CSPs need a horizontal network infrastructure which will allow them to rapidly develop, deploy, and deliver a large number of new services, which in many cases will have been developed by a 3rd party content and service provider.

IMS overview

IMS is a network architecture, based on telecommunications and Internet technologies, which has been standardized by 3GPP in its Release 5 (finalized March 2002) specifications, and updated in Release 6 (finalized 2004). IMS is not new in that its underlying technologies and concepts have been discussed by standards and technology groups for some time. But what is new is that the IMS specifications have gone through two 3GPP releases, with increasing adoption by CSPs, as well as vendors and Network Equipment Providers (NEPs) supplying the associated network equipment, applications and devices. IMS delivers a reusable platform for new service experimentation, deployment, and integration, resulting in the expansion of the types of communications services available to consumer and enterprise end-users.

Figure 1

Overview of IP Multimedia Subsystem



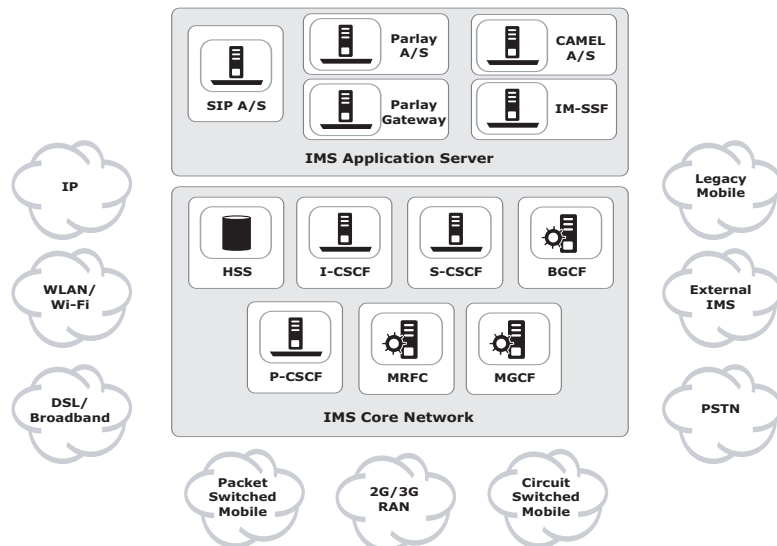
IMS specifies a core set of network functional entities, which support access to the SIP-based communication services provided by CSPs. Instead of inventing new protocols, IMS builds upon existing Internet protocols, as specified by IETF, such as SIP, Session Description Protocol (SDP), and Diameter, which enables the creation of a complete and robust real-time, peer-to-peer, multimedia network architecture. IMS provides for network elements, such as CSCF, HSS, MRF, and others, whose functionality and external and intra-IMS interfaces have been standardized.

IMS was originally developed by 3GPP, and later adopted by 3GPP2 as the basis for their Multi-Media Domain (MMD), to support the creation of multimedia applications capable of supporting any type of media content, such as voice, video, messaging and data, and the convergence of cellular and WiFi/broadband networks. But because IMS supports convergence of wireline, wireless and IP/broadband networks, it has been adopted by ETSI TISPAN, a fixed network ETSI committee. Based on SIP, IMS enables the delivery of any type of media content over any type of access network, to any type of SIP end-point device.

IMS architecture

In traditional network architectures, regardless of whether it's a fixed, mobile or broadband network, services are deployed and delivered by a set of specialized network elements specific to that service, and access network. In addition to proprietary hardware, operating system, communications interfaces, and supporting applications, each service requires its own “silo” of service and network-specific elements. The “silo” of service elements includes unique functionality for charging, presence, group list management, routing and provisioning. It is very costly and expensive to build and maintain this network structure.

Figure 2
IMS network architecture



IMS offers a network architecture where software infrastructure, through the use of standards, enable network elements to look and feel like general purpose servers. With the 3GPP Release 5 and Release 6 specifications, IMS enables many network functionalities to be reused and shared across multiple access networks, allowing for rapid service creation and delivery. This opens the network for off-the-shelf application servers and IDE tools. The architecture consists of:

- Application services
- Session control
- Network connectivity.

Application services

Ideal for standard application servers such as J2EE, the application services layer is where the business or session logic is hosted. IMS specifies a SIP-based common interface, IMS Service Control (ISC) by which applications hosted on SIP, Parlay/OSA and CAMEL application servers interact with the IMS core network. The main integration point between IMS application servers and the IMS core network is through the Serving Call Session Control Function (S-CSCF) network element. 3GPP IMS defines a set of generic service enablers, such as presence and group list management, to be implemented as services in a SIP application server.

Session control

Session control is where the network signaling is performed for setting up sessions (formerly known as ‘calls’ or ‘call control’). The session control layer consists of several core network elements which control and manage session set-up and maintain subscriber user data. Session control also provides interworking between IMS and PSTN/PLMN networks through media servers and gateways. Additionally, IMS specifies network elements which specify breakouts to PSTN and other peer IMS networks (BGCF: Breakout Gateway Control Function), and perform signaling protocol translations between SIP and PSTN/SS7 networks (MGCF: Media Gateway Control Function).

The main network elements of IMS are the Call Session Control Function (CSCF). The CSCF is a SIP proxy and registrar server which manage the registration of IMS User Equipment (UE, also known as terminals, handsets, or SIP phones), and routing of SIP signaling messages to the appropriate IMS application server, or to the appropriate IMS or non-IMS network. Key to optimal SIP message processing by CSCF nodes, and service logic execution by IMS SIP application servers, such as BEA WebLogic SIP Server™, are high-performance, high-availability features.

IMS specifies 3 different types of CSCFs:

- Proxy-CSCF (P-CSCF): SIP proxy server which routes SIP request and response messages of the UE to the appropriate Interrogating-CSCF(I-CSCF), and is the single point of entry for all traffic from the UE into the IMS network. P-CSCFs are typically located in the user’s home network, but are often located in visited networks, and provides the following functionalities:
 - Billing information generation
 - SIP message compression for latency reduction

- IPSec integrity protection for trusted messages
- SIP message verification.
- Interrogating-CSCF (I-CSCF): SIP proxy server which queries the Home Subscriber Server (HSS) to obtain the address of the appropriate S-CSCF where the request must be forwarded, and is the first point of contact within the user's home network.
- Serving-CSCF (S-CSCF): SIP registrar server which enables the requesting user to access the network services provided by the network operator, and handles all of the SIP signaling between endpoints. S-CSCFs are always located in the user's home network, and provides the following functionalities:
 - Session control
 - Service usage authentication & authorization
 - Session context
 - SIP message routing.

The Home Subscriber Server (HSS) element provides a central database which stores each subscriber's unique service preferences and information, including current registration information (IP address), roaming information, call forwarding information, buddy list/instant messaging information, voicemail options, etc. IMS centralizes the subscriber information to enable multiple applications across multiple access networks to share and leverage any given subscriber's status and preference information. HSS also enables operators to better manage and administer subscriber data and provisioning across multiple services across multiple networks. And the HSS provides IMS service authentication and authorization support, as well as maintain information about the currently assigned S-CSCF for any given user request.

The MRFC (Media Resource Function Controller) and MGCF (Media Gateway Control Function) elements of the IMS session control layer provide the necessary interworking between SIP signaling and media gateway signaling (H.248), by managing session distribution across multiple media gateways and media servers.

The BGCF interacts primarily with the S-CSCF, MGCF, and peer BGCFs in external IMS networks, and performs the function of selecting the IMS network in which a breakout to the PSTN network, via the MGCF and Media Gateway (MGW), is to occur. BGCF selects the appropriate local MGCF, or peer BGCF in another IMS network, and in the latter case, provides authorization services into other IMS networks.

Network connectivity

The network connectivity layer consists of routers, switches, media servers and media gateways for converting VoIP bearer streams to the PSTN TDM format. This layer provides a common pool of media servers which can be shared across multiple applications and services. The IMS network architecture supports connectivity with all types of access networks, whether it's IP, broadband/DSL/cable, Wi-Fi, circuit-switched mobile, packet-switched mobile, legacy mobile, or external IMS networks.

IMS features and capabilities

The IMS architecture specifies a number of common functions and service enablers which can be reused across multiple access networks to enable multimedia services. Some of the key features offered by the IMS architecture are:

- Multimedia session management
- Quality of Service (QoS)
- Mobility management
- Service control
- Standard interfaces.

Multimedia session management

Multimedia session control and management in IMS is made possible through the use of SIP as the standard session control protocol. A SIP/IMS session is a connection between two communication endpoints, such as a mobile phone, PDA, softphone, or a fixed phone. Once a communication session has been established, IMS enables the media session between to end-points to consist of any type of media content, and IMS also enables a session to be dynamically modified at run-time. This means media types can be added/dropped dynamically, depending on the nature of the application. The ability to manage multimedia communication sessions in real-time will enable new kinds of interactive, multiparty, and converged media applications to be developed, such as video telephony/chatting, push-to-talk, multimedia telephony/conferencing, among others.

Quality of Service

With traditional mobile and IP networks, bandwidth availability fluctuations and network congestion have limited a CSP's ability to offer guaranteed Quality of Service (QoS) to subscribers and to 3rd party partners, and low quality "real-time" mobile IP services, resulting in poor voice and video transmissions. Network QoS implies the ability for CSPs to measure, adjust, and deliver a certain level of transmission rates, gateway delays, and error rates. By having the ability to manage these QoS variables, CSPs are able to increase customer satisfaction, as well as monetize different levels of QoS, such that subscribers are able to request different QoS levels for different types of services. IMS provides CSPs with a standardized network element, the Policy Decision Function (PDF), which controls and monitors the packet network traffic into an IMS network from a GPRS and UMTS network. Through the PDF, IMS enables CSPs to deliver real-time IP network services at specified QoS levels.

Mobility management

As end-users roam between their home networks and other visited networks, while using peer-to-peer, real-time, multimedia services, it becomes critical for the service provider to enable end-users to be able to find each other as they roam between networks, as well as to have their home network services be available in visited networks. IMS provides the HSS and CSCF elements to enable mobility management. The HSS is the data store for subscriber registration and location information, which is supplied to the CSCFs for session set-up and management, and message forwarding to IMS and non-IMS networks.

Service control

As CSPs increase the number of new applications and services deployed and delivered through their networks, with a large number being supplied by 3rd party service and content providers, CSPs will be challenged to effectively control and manage the invocation of services within their network, as well as manage the interactions between the disparate service components. IMS networks address this need through the HSS and CSCF elements. As an end-user registers into the IMS network, the CSCF downloads the Subscriber Service Profile (SSP) from the HSS, which contains each individual's services provisioning information. For each subscriber, the SSP enables CSCFs to know which services need to be executed, in which order, address of the appropriate IMS application server(s), and the order in which the application server needs to execute the specified services. IMS enables CSPs to implement a common service control, execution and interaction platform for all services and subscribers accessing their networks.

Standard interfaces

With IMS, 3GPP has delivered a standardized architecture and interfaces for deploying multimedia IP services across multiple access networks. This facilitates the development of new and innovative SIP/IMS services by 3rd party developers and service providers, independent of the IMS network deployments by CSPs, thereby fostering cross-network service integration, interoperability, and roaming.

IMS application examples

As the communications industry transitions from a predominantly voice and text centric business model to an IP-based, multimedia, multiuser and converged network services based on open industry standards such as IMS, the key to success for this new architecture will be the creation, proliferation and adoption of new converged communication services. Example of new IMS services include:

Push to talk over cellular (POC)

Push-to-talk-over-cellular, or PoC, is a service which enables traditional walkie-talkie services to be possible over mobile networks using mobile handsets. Unlike traditional phone calls, PoC calls are initiated when one user pushes down the call button, speaks into their mobile device, and releases the call button when finished speaking. The listening user can respond by pressing their call button. Whereas traditional mobile phone calls are full-duplex, meaning both parties can hear and speak to each other at the same time, PoC calls are half-duplex, which means only one party can speak at a time, while the other party, or parties, must listen. PoC is a sticky application due to immediacy factor of PoC communications. Instead of being conversational, PoC calls tend to be instructional, directional, with immediacy of connection without the delays of call set-up and dialing.

IMS enables PoC services through presence, instant messaging, billing, single sign-on, and central OA&M processes. Operators with existing IMS/SIP networks can readily roll-out PoC services by deploying the PoC application on top of a IMS SIP application server, such as BEA WebLogic SIP Server, and Over-the-Air (OTA) download of a PoC client to end-user devices. Unlike a normal phone call where the calling party listens while the network attempts to 'ring' the called party, a PoC call session does not work well when delays are introduced. The user of a PoC device expects instant connection to another PoC user, or otherwise the service will fail.

There have been several real-world PoC trial services which have failed due to long latency on session set-up. The SIP session establishment must be streamlined with very low latency, and the SIP application servers executing the PoC service logic must have high performance with high availability.

Multimedia conferencing

Many business users are familiar with voice teleconferencing services, as well as web-based multimedia conferencing services, such as Webex. With the increasing proliferation of mobile devices with large color displays, faster processors, speakerphones and Bluetooth, and coupled with increasing deployments of IMS networks which combine interactive multiparty communications with Quality of Service features, multimedia conferencing is a service that many end-users will now be able to enjoy. Typically, a dedicated, SIP-enabled conferencing server, which can be implemented on top of a SIP application server, provides conference reservation and scheduling services. This includes the ability to have the conference be initiated via a dial-in bridge, or be auto-initiated by a presence-enabled conferencing server, whereby the presence status of the key conference participants is used to automatically set-up the conference call at the appointed time once the key participants are detected to be online. IMS supports multimedia conferencing services through its QoS feature, which enables a higher quality user experience, and through multimedia session management features, which enables the session set-up for each individual participant to be managed separately, thereby matching voice and video quality to each participant's device capabilities.

Voice-video messaging

This service is a form of instant messaging, but instead of sending just text, the end-user has the ability to send audio and video files, and instead of just 1-1, these voice-video messages can be sent 1-many. This will require an application on the UE to record the audio and video files. Voice-video messaging facilitates faster and spontaneous communications, since recording an audio/video message will be easier than typing in short messages using a small mobile phone keypad. IMS enables voice-video messaging with its standardization on SIP, and via the CSCF and MRF elements.

Click to dial

This service allows end-users to initiate a multimedia communication session with one or more parties, by clicking on a SIP-enabled link on a web browser, web-enabled desktop or enterprise applications, or an on-screen link on a mobile device. This will trigger the IMS network to automatically negotiate the necessary communication sessions with the designated parties, and establish the requested single-media or multi-media call session. Service providers can use click-to-dial services and capabilities to offer their end-users premium value-added services, whether they are consumers or business users. Combined with SIP/SIMPLE-based presence data, click-to-dial-enabled applications can allow end-users to know in advance whether their intended calling party is available for a conversation. This could be friends calling friend upon receiving an e-mail, or customers calling customer support call centers, or enterprise users calling fellow employees, customers, or business partners upon receiving a document from them. CSPs have the potential to realize new revenue streams by offering click-to-dial-enabled services, thereby increasing customer loyalty and satisfaction, and thus reducing churn. IMS networks enable click-to-dial services by leveraging the SIP protocol and the 3PCC (3rd Party Call Control) B2BUA (Back-to-Back User Agent) network element, which can establish, manage, and terminate communication sessions on-behalf of two or more SIP user agents.

IMS benefits

As IMS network and application deployments proliferate, the benefits derived by network operators, service providers, and their end-user customers are considerable. The benefits for network operators include faster time-to-market, lower capital and operating expenses, availability of best-of-breed solutions, secure network access control, and reusable services.

Service providers

The key benefits derived by service providers from deploying IMS networks is new and increased revenue streams, and reduction in capital and operating expenses. By consolidating application interfaces into the application server, the creation of new multimedia services can be developed and delivered in a very short time-to-market cycle while dramatically reducing the support cost of the applications. IMS enables the creation of new services which were not possible previously, or might have been too costly and complex to implement, such as PoC or video sharing. Because IMS supports roaming between different networks, new services developed to a single platform can be made available across multiple access networks. This will enable CSPs to increase customer loyalty, increase ARPU from their installed base, and reduce churn. IMS also enables CSPs to monetize the fast pace of multimedia-enabled mobile device development, and end-user's changing needs. This requires the ability for CSPs to mix-and-match, and integrate different services to come up with new services. IMS enables CSPs to take an existing voice-based application, and integrate with multimedia sharing and video-enabled services. Or Web-based applications can be mobile/real-time/multimedia-enabled.

By deploying an IMS network architecture, CSPs can reduce the need to build-out multiple silos of network elements each time they add a new service. By deploying a horizontal, IP-based, converged service delivery architecture based on the IMS standard, CSPs can implement new services on existing network infrastructure, reducing the costs associated with new equipment purchases. And in the longer term, IMS supports CSPs need to reduce the costs and complexities of managing multiple, parallel network elements, reducing their overall operating expenses.

End users

With IMS, end-users will be opened up to a new world of communication services which they might have associated mainly with the PC/Internet world, such as instant messaging and presence. In addition, there are new features in IMS services which end-users might never have thought about. For end-users, the benefits include richer, multimedia user experiences, roaming, new IP-based services, simplified identity management, personalization, ease-of-use, security and mobile-fixed-Internet integration. With the proliferation of rich-media capable mobile devices, both consumer and enterprise end-users have become very savvy about the personalized, interactive, and near real-time demands they have about their day-to-day communication services.

BEA WebLogic Communications Platform in IMS

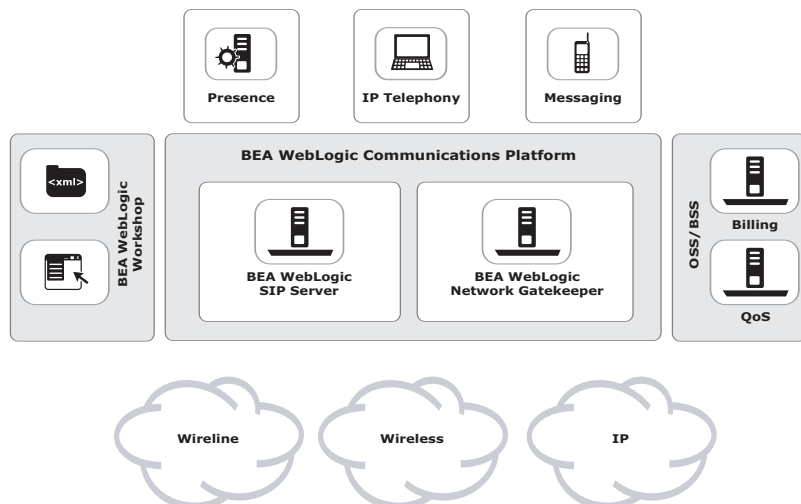
As the market leader of J2EE-based application infrastructure platform software to enterprises and service providers, BEA is situated at the nexus of the convergence of IT and telecommunications technologies, and the convergence of fixed, mobile, and IP networks. CSPs are realizing this two dimensional convergence of technologies and networks by implementing the IMS standard architecture for next-generation, IP multimedia communication services. BEA is leveraging its already dominant position as the leading application server and transaction processing platform in the CSP's OSS/BSS layer, to become the leading IMS application infrastructure vendor with the recent launch of the BEA WebLogic Communications Platform product suite, the service delivery platform product line within the overall BEA telecommunications industry solution, BEA WebLogic Service Delivery™.

BEA WebLogic Communications Platform consists of the IMS SIP application server, BEA WebLogic SIP Server, and the powerful policy enforcement, 3rd party partner management, and Telecom Web Services platform™, BEA WebLogic Network Gatekeeper™. By combining a high performance SIP application server with a platform for policy enforcement, partner management and Telecom Web Services, BEA WebLogic Communications Platform offers CSPs a unique IMS service creation, delivery and control platform.

3GPP release 5 (IMS) SIP application server

The power and value of the 3GPP IMS network is its ability to offer CSPs a path to increasing revenue and lowering costs of delivery IP multimedia communication services in a converged network environment. At the core of enabling the IMS value proposition is the SIP application server, such as the BEA WebLogic SIP Server.

Figure 3
BEA WebLogic
Communications Platform



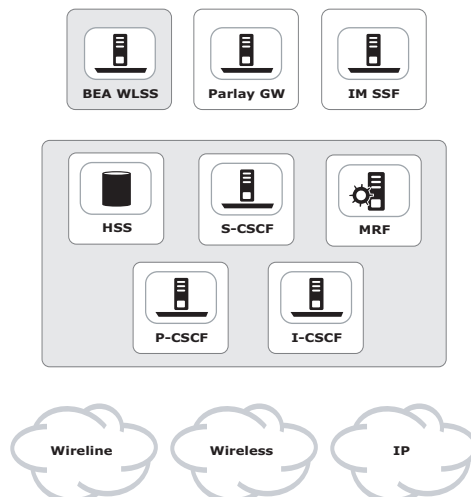
3GPP Release 5 specifies a SIP application server element in the application services layer of IMS, defining it as an entity that hosts and executes IMS services logic, and which supports a set of IMS services and capabilities. The session control layer elements specified in IMS, such as the CSCF and MRF are SIP network servers, do not host and execute applications or services. Because 3GPP IMS explicitly specifies a core set of interfaces, functions, and roles that a 3GPP SIP application server must support, just implementing a SIP protocol stack on a J2EE application server, or implementing a SIP network server element in the IMS core network, such as a SIP proxy, does not qualify those elements to become a 3GPP SIP application server.

The key interface required for a 3GPP IMS SIP application server is the IMS Service Control (ISC) reference point. ISC is a SIP-based interface, and it allows SIP application servers in the application services layer to interface with the S-CSCF node in the IMS Core Network. ISC enables a SIP application server to receive SIP messages from IMS UEs, and other SIP application servers, as well as initiate SIP messages to UEs and other SIP application servers. Non-SIP application servers, such as Parlay and CAMEL application servers, can also receive and initiate SIP messages to/from the IMS Core Network via ISC support in the Parlay/OSA gateway and IM-SSF, respectively.

3GPP also specifies a set of SIP network server roles to be supported by a SIP application server as part of SIP dialogues and transactions. These roles include SIP User Agent (originating/terminating), SIP Registrar, SIP Proxy, SIP Redirect, and 3PCC/B2BUA. To support these roles, a SIP application server needs to implement the relevant and corresponding IETF SIP RFCs. 3GPP also specifies extensions to the core IETF SIP RFCs to support sending and receiving of SIP messages by SIP applications server over the ISC interface. This is specified in RFC 3455, which provides extensions for private header support in SIP messages.

Figure 4

BEA WebLogic SIP Server in IMS



BEA IMS application server—BEA WebLogic SIP Server

The BEA WebLogic Communications Platform suite delivers an IMS SIP application server, BEA WebLogic SIP Server. BEA WebLogic SIP Server provides a 3GPP IMS SIP application server based on the SIP Servlet API (JSR-116), and is the industry's only SIP application server which delivers an integrated J2EE-SIP servlet container. BEA WebLogic SIP Server fully supports the 3GPP Release 5 specified IMS Service Control (ISC) interface, the IETF SIP RFCs required to enable BEA WebLogic SIP Server to fulfill the roles of SIP network servers, and the 3GPP RFC extensions for ISC support.

Conclusion

IMS is the next-generation network architectural standard which is becoming the industry standard for the creation and delivery of real-time, multimedia, multiparty communication services. CSPs worldwide are in different stages of evaluating, and deploying IMS networks. As CSPs evolve their fixed, wireless and IP networks to a converged network architecture, the optimal SIP application execution environment becomes a major consideration for rapid IMS service creation and deployment.

An IP-based network architecture based on IMS will be the core element of future, next-generation networks. 3GPP and 3GPP2 have adopted SIP as the standard session protocol, enabling IMS networks to deliver SIP-enabled realtime, multimedia communication applications. A key factor for CSPs with IMS networks to realize maximum revenue potential from their investments is the strategic decision on which IMS application services platform to deploy, with an IMS-compliant SIP application server at its core. This critical decision will determine how rapidly CSPs can begin to monetize their IMS network investments through the delivery of a new generation of SIP-based services, as well as how securely CSPs can open up their IMS networks to a portfolio of strategic 3rd party partners and developers.

With BEA WebLogic SIP Server and BEA WebLogic Network Gatekeeper, which are part of the BEA WebLogic Communications Platform product suite, CSPs can rapidly monetize their IMS networks, while securely controlling 3rd party access. Together with the BEA WebLogic Platform™ suite of industry-leading J2EE application infrastructure products, and its ecosystem of Java and Web Services developers and ISV partners, BEA delivers a complete IMS application services platform and ecosystem for CSPs to leverage with their gradual migration to a converged network infrastructure.

Glossary

1xEV-DO	1x Evolution—Data Only
1xEV-DV	1x Evolution—Data and Voice
3GPP	Third Generation Partnership Project
3GPP2	Third Generation Partnership Project 2
3PCC	3rd Party Call Control
ARPU	Average Revenue Per User
B2BUA	Back-to-Back User Agent
BGCF	Breakout Gateway Control Function
BSS	Business Support System
CAMEL	Customized Applications for Mobile Networks Enhanced Logic
CDMA	Code Division Multiple Access
CSCF	Call Session Control Function
CSP	Communications Service Provider
DSL	Digital Subscriber Line
EDGE	Enhanced Data Rates for Global Evolution
ETSI	European Telecommunications Standards Institute
GPRS	General Packet Radio Services
GSM	Global System for Mobile communications
HSS	Home Subscriber Server
I-CSCF	Interrogating-CSCF
IDE	Integrated Development Environment
IETF	Internet Engineering Task Force
IM-SSF IP	Multimedia Service Switching Function
IMS IP	Multimedia Subsystem
INAP	Intelligent Network Application Part
IP	Internet Protocol
ISC	IMS Service Control
J2EE	Java 2 Platform, Enterprise Edition
JAIN	Java APIs for Advanced Intelligent Networks
JCP	Java Community Process
MGCF	Media Gateway Control Function

MMD	Multi-Media Domain
MRF	Media Resource Function
MRFC	Media Resource Function Controller
NEP	Network Equipment Provider
OA&M	Operation, Administration & Management
OMA	Open Mobile Alliance
OSA	Open Service Access
OSS	Operation Support System
OTA	Over-The-Air
P-CSCF	Proxy-CSCF
PDF	Policy Decision Function
PLMN	Public Land Mobile Network
PoC	Push-to-Talk-over-Cellular
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RAN	Radio Access Network
RFC	Request For Comment
S-CSCF	Serving-CSCF
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SIMPLE	SIP for Instant Messaging and Presence Leveraging Extensions
SLEE	Service Logic Execution Environment
SS7	Signaling System No. 7
SSP	Subscriber Services Profile
TCAP	Transaction Capabilities Application Part
TDM	Time-Division Multiplexing
TISPAN	Telecoms & Internet converged Services & Protocols for Advanced Networks
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
VoIP	Voice over IP
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless Local Area Network



About BEA

BEA Systems, Inc. (NASDAQ: BEAS) is a world leader in enterprise infrastructure software, providing standards-based platforms to accelerate the secure flow of information and services. BEA product lines—WebLogic®, Tuxedo®, JRockit®, and the new AquaLogic™ family of Service Infrastructure—help customers reduce IT complexity and successfully deploy Service-Oriented Architectures to improve business agility and efficiency. For more information please visit bea.com.

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CWP1234E0505-1A