

Increasing Customer Loyalty with Enhanced Video Services

OmniVox3D® Application Server and Dialogic®
Host Media Processing Software Deliver Solid
Execution That Is Open to the Future



Executive Summary

To win in today's volatile wireless services market, service providers need to design, develop, and deploy new enhanced video services and be prepared to ramp them quickly when they become popular. The OmniVox3D® Application Server from APEX Voice Communications represents a unique and successful approach to this business challenge, seamlessly combining a powerful, open application server with a flexible application creation environment and a robust management interface. OmniVox3D benefits by using Dialogic® Host Media Processing Software to deliver media processing on standard servers rather than specialized hardware.



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APEX Voice Communications is a member in the Dialogic® Partner Program.

Strengthening Loyalty with New Services

Today's wireless users are increasingly demanding, as they continue to expect more new services at a lower cost, and they have little tolerance for missing out on the latest applications. At the same time, emerging technologies, together with new regulatory and business models, which include number portability, low-cost roaming, and open handsets, are giving consumers more flexibility than ever in choosing a service provider.

Customer fickleness and a hunger for innovation have become service provider focus areas. In a recently published study of mobile operators, Infonetics Research, a leading international market research and consulting firm specializing in data networking and telecommunications, asked service providers to identify their biggest business challenge. The survey participants rated customer retention and competition as their major concerns while a focus on profitability alone rated only seventh [Infonetics].

The technology that service providers seem most excited about, as they seek to maximize the spending of current customers and strengthen the loyalty of free-spending, cutting-edge users, is video.

From Still Photos to Interactive Video

The excitement generated by video technology began with the advent of camera-equipped handsets capable of capturing digital images and sharing them over the network. This service became extremely popular, and video clips soon followed. Today, the trend is interactive multimedia.

Video IVR is an interesting example. Conceptually Video IVR is similar to traditional IVR but with video added to enhance the experience. The user interacts with a real-time video stream by pressing DTMF buttons at the endpoint (typically a mobile handset), or by speaking when speech recognition is in use. Typically Video IVR is delivered over 3G video calls but could be delivered over any medium able to carry voice, video, and DTMF signals between the endpoint and the Video IVR server.

One of the advantages of Video IVR is that it places all the application logic on the server, which requires that the endpoint act only as a thin client. From a compatibility standpoint, a Video IVR application needs to be developed

only once for it to run on all 3G handsets. Delivering applications as Java applets, in contrast, can require hundreds of different builds to cater to the different 3G handsets available today.

Many popular voice applications can move naturally to video:

- Voice mail to video mail
- Voice conferencing to video conferencing
- IVR with a video response
- Chat to video chat
- Ring tones to video ring tones
- Call center to video-enhanced call center

Flexibility Is Key

After witnessing the explosive popularity of enhanced services such as color ring back tones, service providers have learned that they must be nimble in providing new enhanced services. They must be able to react more quickly than their competition to monetize emerging opportunities by moving from concept to deployment quickly.

A successful tactic that is rapidly gaining popularity is the deployment of multi-service application servers with integrated service-creation environments, based on industry standards. Such an application server increases productivity while simultaneously reducing time-to-market, at an affordable cost. A practical, proven model for this type of approach to rapid service creation and delivery is the SIP-based OmniVox3D® Application Server from APEX Voice Communications, which uses Dialogic® Host Media Processing Software for delivering media.

The OmniVox3D® Application Server Solution

The APEX OmniVox3D Application Server provides the power to design, develop, and deploy customized enhanced services and value-added IP multimedia services on a flexible, open architecture. Applications developed in OmniVox3D can run on both IP and TDM/SS7 networks, making it an excellent choice for today's hybrid environments that include both existing and next-generation services.

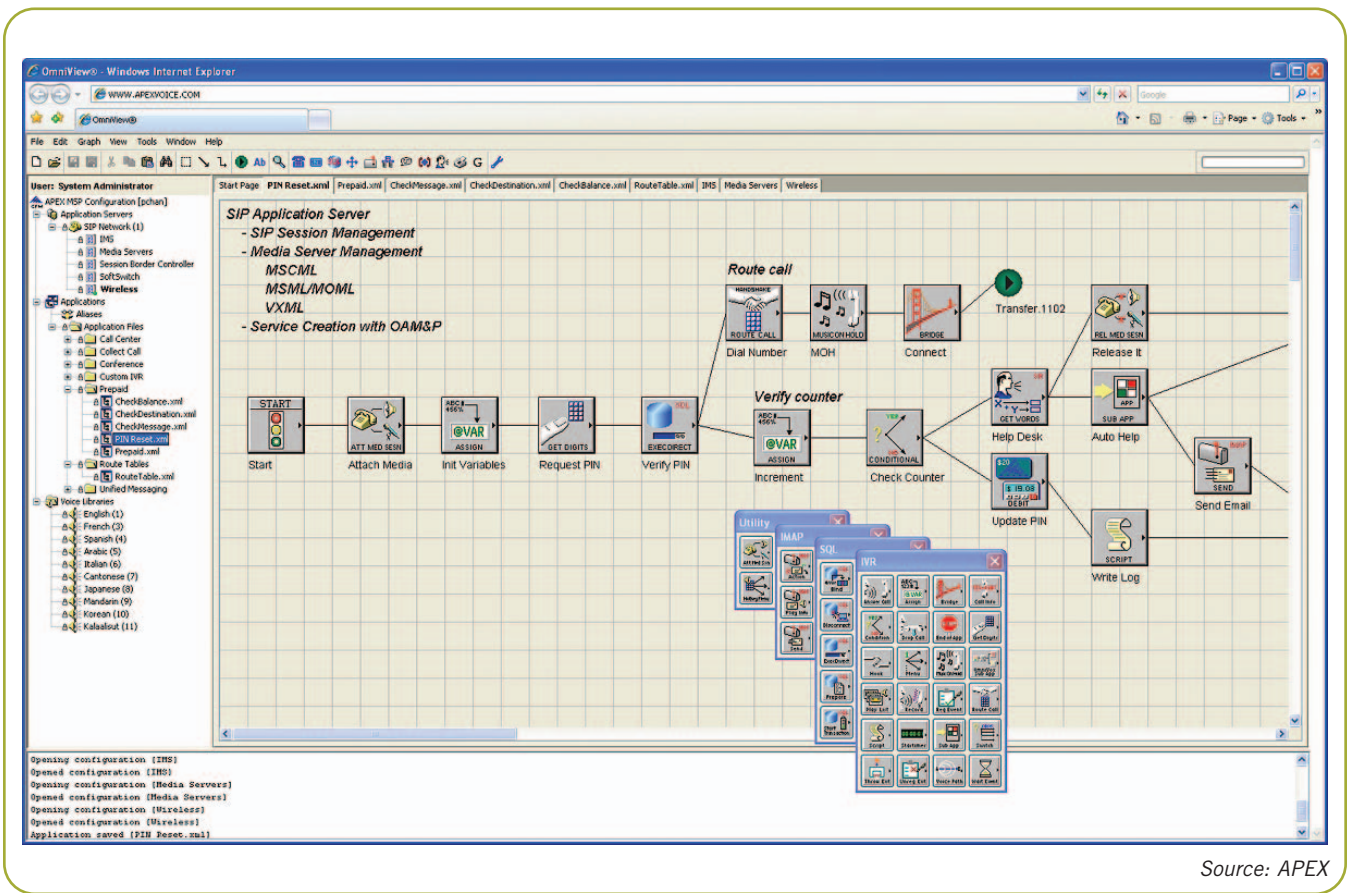
Because its design is modular, OmniVox3D can provide outstanding results on today's networks, including those running VXML gateways or IMS softswitches. Its architecture makes the underlying network interfaces and protocols transparent to the application, providing the ability to create or import an application once and run it in a variety of environments, including wireline and wireless intelligent networks.

Seamless Environment for Speedy Service Delivery

The OmniVox3D Application Server provides a strong and flexible execution environment. It delivers scalability and reliability to deployed applications, allowing a service provider to increase resources for service delivery easily without compromising quality. At the same time, the

OmniVox3D Application Server provides flexibility in creating new applications as a result of a tightly integrated OmniView® Service Creation/OAM&P Environment. This seamless environment allows applications to be designed, developed and deployed in days, rather than months, decreasing both time-to-market and time-to-ROI.

See Figure 1 for a sample of OmniView's browser-based interface, which can be used locally or remotely. Its rich command set for service development includes ASR, TTS, LDAP/IMAP, ODBC, SNMP, C-Sharp, VBScript, JScript, and others. In a SIP-based network, OmniVox3D offloads media processing functions and supports a variety of SIP-compliant components.



Source: APEX

Figure 1. OmniView's Browser-Based Interface

Modular Design for Varied Network Deployment

Designed with attention to openness and versatility, OmniVox3D can be deployed as a standalone IP-based application server solution or in conjunction with the OmniVoXML® media gateway, as part of the APEX Multi-Service Platform, (APEX MSP™) to serve applications such as Messaging, Prepaid, Conferencing and IVR.

To ensure that it works equally well in either deployment scenario, OmniVox3D has been designed to integrate as a core network element in any standards-based network, including those that must comply with IMS and other standards. An important benefit of OmniVox3D's modular design is the ability for customers to use varied network configurations to match unique network requirements. Such a design strategy also gives service providers the power to deliver new, state-of-the-art services to subscribers without compromising carrier-grade performance.

Because of its field-proven combined OAM&P and service creation capabilities, OmniVox3D continues to grow in popularity with over 15,000 installations in 95 countries at more than 250 service providers, processing hundreds of millions of calls each day.

The Quest for Interoperability

Dialogic Host Media Processing Software (Dialogic HMP Software) is an important component of OmniVox3D. Used as a media server, it allows both timely voice and video service creation and successful service delivery. Both products are designed to support the latest open standards to allow easy integration with advanced voice and video technologies.

Dialogic HMP Software performs media processing tasks on general-purpose servers based on standard server architecture without requiring specialized DSP-based hardware. It supports the initiation and termination of multimedia calls, which include SIP-based call control and H.263 video format. The software synchronizes voice and video streams for playback on IP video phones and IP-enabled soft clients and allows connection to a 3G network. Dialogic HMP Software can also deliver only the audio portion of a video call to an audio-only endpoint for 3G/2G gateway functionality.

Because it understands the value of open standards to service creation and delivery in the OmniVox3D environment, Dialogic strives to provide the highest level of interoperability by developing products such as

Dialogic HMP Software using SIP, H.323, and 3GPP standards as well as MSML. Dialogic engineers continually perform interoperability testing between Dialogic HMP Software and third-party components, and they focus on adding new standards-based functionality (such as video using 3G-324M) as early as possible. Dialogic's goal is to help enable APEX developers to accelerate the work and allow them to focus on enhancing OmniVox3D for their customers without interoperability concerns.

Benefits of Dialogic® Host Media Processing Software

Dialogic HMP Software also provides OmniVox3D developers and customers with the advantages of a software-based solution, which does not require specialized hardware for media processing:

- **Ease of use** — Installing and updating software is easier than installing and updating hardware because these activities are electronic and not physical.
- **Flexible licensing** — Software resources are purchased separately as needed as part of a software license instead of in fixed bundles of resources on various hardware media board models.
- **Easy maintenance** — When more processing resources are needed, resources can be added through software licensing rather than media boards, which must be ordered and shipped. In the case of hardware failure, a license can be moved to another server, which is easier than swapping specialized hardware boards that are generally stored as spare parts.

Because OmniVox3D uses Dialogic HMP Software, selling OmniVox3D is easier and more cost-effective since media servers can be downloaded as software, eliminating the need to transport and install hardware media boards. This software-based flexibility reduces costs and increases APEX's ability to deliver demonstration units and roll out product trials, which, in turn, can accelerate the sales cycle.

Long-Term Relationship Adds Value

Because APEX has worked with Dialogic and its products for more than 18 years (since 1989), APEX is able to use the full range of Dialogic IP and TDM products to provide solutions to its customers in virtually any deployment scenario. For example, APEX engineers are adept at using Dialogic HMP Software in either a Linux or Windows

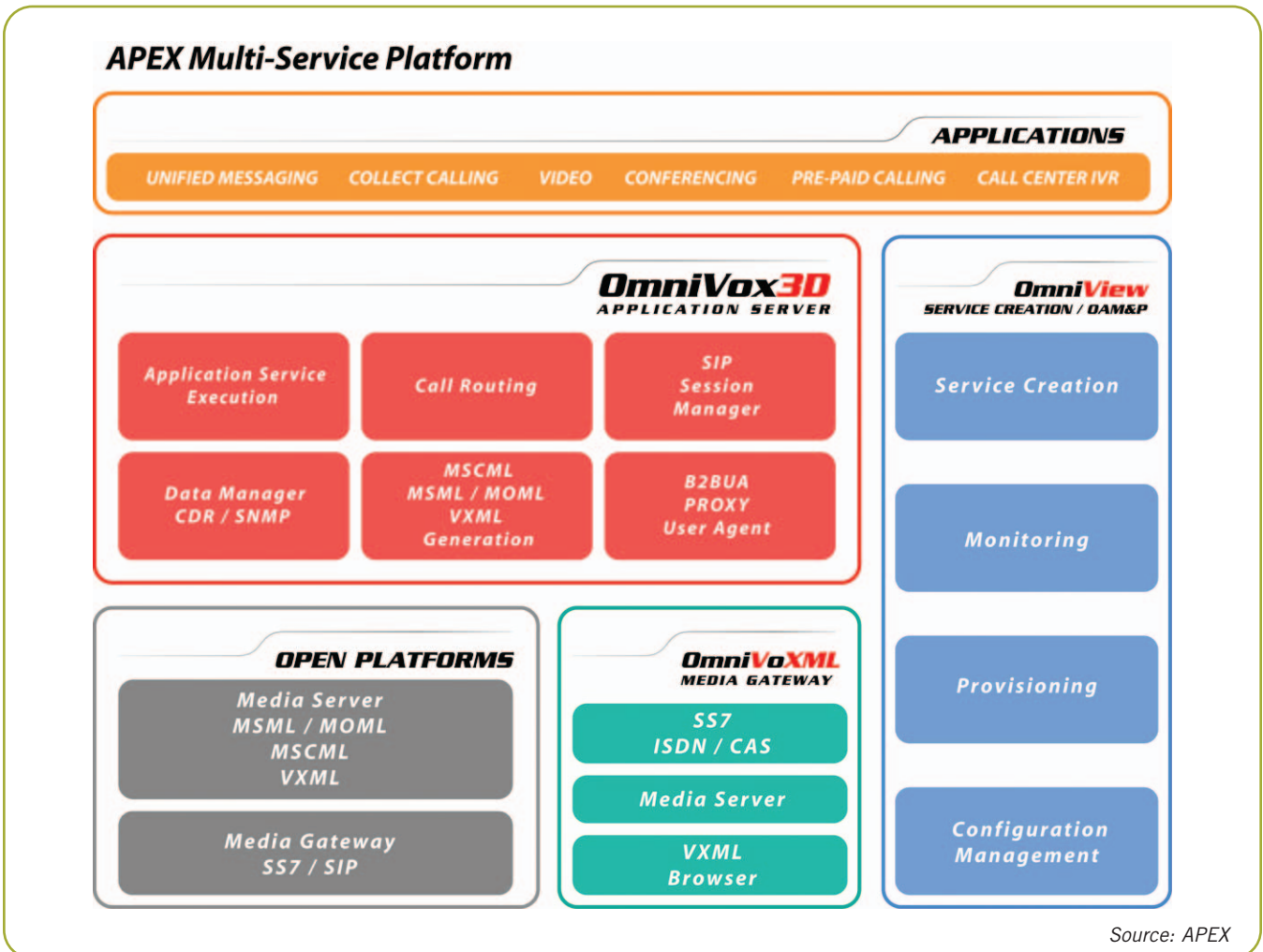
environment, which is a result of APEX’s development philosophy of interfacing to media servers and gateways using open standards such as MSML/MOML and VXML.

APEX engineers are also skilled in using Dialogic HMP Interface Boards, which allow host-based resources and IP transcoding to be accessible from a PSTN interface, and the Dialogic 1000 Media Gateway Series for seamless IP-PBX connectivity. APEX can also deploy the powerful Dialogic Multimedia Platform for AdvancedTCA (MMP for ATCA) for its customers who are ready to move to AdvancedTCA. MMP for ATCA can deliver applications such as voice and video mail, video portal, color ring back tones, unified messaging, and audio conferencing over IP and PSTN interfaces in wireless and wireline environments using standard protocols for session and media control.

Design Delivers Service Reliability and Performance

Because of their excellent initial design and wisely engineered enhancements, the OmniVox3D Application Server and OmniView Service Creation Environment have continued to be a leading system for designing, developing, and deploying services since their introduction in 1989. With its integrated OAM&P environment, OmniView can also manage applications from a single point once they have been deployed, whether on a single server or a network of servers for service provider and enterprise customers worldwide.

The OmniVox3D Application Server, OmniView Service Creation/OAM&P Environment and SIP Session Manager are the core elements of the APEX Multi-Service Platform. See Figure 2 for a detailed illustration.



Source: APEX

Figure 2. APEX Multi-Service Platform

Distributed Architecture and Web Technologies

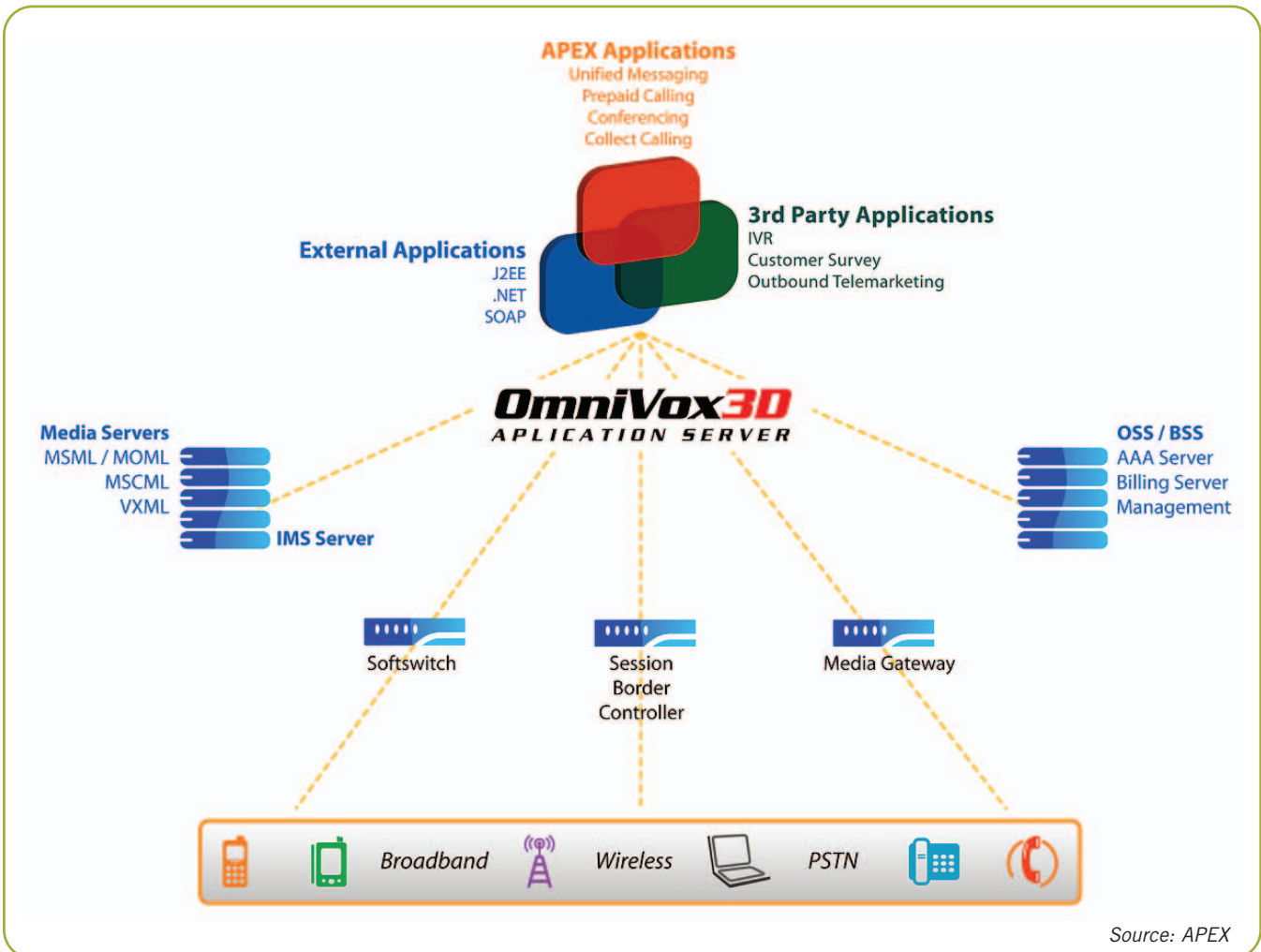
The OmniVox3D Application Server is built around web technologies, making it an excellent fit for high-volume services that require superior performance and reliability. OmniVox3D's distributed architecture and scalable design provides the ability to create voice and video applications once and run them in multiple environments including Next Generation Networks (NGN) and Advanced Intelligent Networks (AIN/IN). OmniVox3D's unique design also allows its users to grow, without forklift upgrades, while continuing to take advantage of changing computing and network environments.

The OmniView Service Creation Environment handles the arduous task of designing, developing, and deploying services with an easy, open-standards-based application development environment. OmniView's browser-based development tool also simplifies and accelerates testing

and, equally important, test management. This integration gives application developers the power to decrease prototyping and implementation time while still ensuring applications are robust, which is critical in today's extremely competitive services market.

OmniVox3D's open architecture also offers load balancing and fault tolerant configurations, providing an environment with no single point of failure. Thus, OmniVox3D enables the continuous operation of hosted services. The flexibility of distributed systems also gives growth paths to an Application Server that may be configured to meet most network configuration and service requirements.

OmniVox3D works in a wide variety of network environments, from Wireless and IMS Networks, to the enterprise back office that needs to add voice, as shown in Figure 3.



Source: APEX

Figure 3. OmniVox3D Application Server Architecture

The OmniVox3D architecture is designed to interoperate with standards-based IMS network elements including SIP MSML Voice and Video Media Servers, powered by Dialogic HMP Software.

The basic design allows applications to run regardless of the underlying hardware so long as the hardware supports the latest standards.

SIP Session Management

The OmniVox3D Application Server includes a powerful SIP Session Manager. This manager is a SIP Back-To-Back User Agent (B2BUA), a type of SIP Proxy Server that provides the front-end interface to OmniVox3D for incoming SIP calls. The SIP Session Manager has the following functionalities that are important for creating SIP-based telephony services:

- **Program control** — Answers calls, performs call dialogs, transfers, and ends calls under the program control of the OmniVox3D Application Server, and handles call dialog programs provisioned using the OmniView Service Creation Environment.
- **Interface to media servers** — Interfaces to standards-based voice and video media servers powered by Dialogic HMP Software via SIP with MSML or VXML markup languages. These media servers are used for playing voice and video messages, message recording, and the collection of DTMF digits and speech recognition data from/by the caller under program control of the OmniVox3D Application Server.
- **Call control** — Bridges SIP call signaling to a destination user agent or gateway, and can be used for prepaid billing and call center applications. Under program control of the Application Server, it is able to control the length of destination calls, interrupt and play warning messages (with media servers using Dialogic HMP Software) and perform "follow-on" calls. Because the SIP Session Manager integrates the SIP signaling, media servers and gateways can be freed efficiently from pure SIP calls once a call is routed.

- **Real-time billing controls** — Controls the length of destination calls, interrupts and plays warning messages (with media servers using Dialogic HMP Software), and performs "follow-on" calls under the program control of the Application Server.
- **Interface to Session Border Controllers** — Interfaces to third-party Session Border Controllers for routing and application services.

Working Together to Benefit Customers

Dialogic and APEX Voice Communications share a vision of standards-based voice and video solutions. They both focus on providing the market with proven technically sophisticated products that reduce the time, cost, and complexity of delivering services in today's highly competitive communications environment.

Both Dialogic and APEX are also dedicated to providing their customers with the highest-quality technical support, educational, and professional services, designed to reduce their customers' time-to-market, but increase time-in-market.

Together, Dialogic and APEX dedicate themselves to placing open-standards-based advanced voice and video technologies in the hands of their customers quickly and cost effectively.

References

[Infonetics] *Service Provider Plans for Next Gen Mobile and Wireless Broadband*, 2007.

Acronyms

2G	2nd Generation
3G	3rd Generation
AIN/IN	Advanced Intelligent Network/Intelligent Network
ASR	Automatic Speech Response
B2BUA	Back-To-Back User Agent
DSP	Digital Signal Processor
DTMF	Dual-Tone MultiFrequency
HMP	Host Media Processing
IMAP	Internet Message Access Protocol
IMS	IP Multimedia Subsystem
IP	Internet Protocol
IVR	Interactive Voice Response
MSML	Media Server Markup Language
MSP	Multi-Service Platform
NGN	Next Generation Networks
OAM&P	Operation, Administration, Management, & Provisioning
ODBC	Open DataBase Connectivity
SIP	Session Initiation Protocol
SNMP	Simple Network Management Protocol
TTS	Text-To-Speech
VXML	Voice eXtended Markup Language

About APEX Voice Communications

APEX Voice Communications, Inc. is a leading global supplier of multi-service SIP Application Servers to service providers and enterprises, as well as TEMs, systems integrators, VARs, and developers. The standards-based OmniVox3D Application Server enables innovative, revenue-generating voice and video services to reach the market quickly, easily, and cost-effectively.

Headquartered in Woodland Hills, California, USA, APEX was founded in 1989 and has over 15,000 installations across 95 countries. APEX has delivered OmniVox3D solutions and platforms for small organizations running single services, to service providers running thousands of simultaneous ports with hundreds of enhanced multi-media services.

About Dialogic Corporation

Dialogic Corporation is a leading provider of open systems platforms to both the enterprise and service provider markets. The platforms enable converged communications, allowing service providers, developers, and system integrators to deliver services, content, and applications using multimedia processing and signaling technologies.

Headquartered in Montreal, Canada, Dialogic and its subsidiaries have over twenty offices worldwide, providing local presence, knowledge, and support to serve its customers around the globe. Dialogic's research and development centers are located in Parsippany, New Jersey; Buffalo, New York; London, England; Dublin, Ireland; and Stuttgart, Germany as well as Montreal.

Learn More about this Innovative Solution

For general information, proof points, and case studies about the products described in this white paper, visit <http://www.apexvoice.com> and <http://www.dialogic.com>.

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