Ascend

OVERVIEW SUMMARY

MultiVoice for the MAX

Release 1.0

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Product Positioning

The MultiVoice™ product for the MAX™ is an excellent solution for VoIP deployment because it is highly scalable, integrated and based on international standards. Although the MultiVoice product can be used to support VoIP services over an unmanaged IP network such as the Internet, in order to provide end-users with reliable and high-quality voice it is recommended that the MultiVoice product be deployed on managed IP-networks. Since there is currently no Quality of Service (QoS) guarantees on unmanaged IP networks like the Internet, voice quality can suffer from delays or congestion on the network. This may result in inconsistent voice quality between calls or even within a call.

A managed public or private IP-network based on Ascend's Core Switching products can provide QoS that can improve the overall reliability and quality of packet voice calls as compared to today's Internet Telephony products. In this case, end-to-end QoS can be maintained resulting in higher quality packet voice calls. The QoS features of Ascend's IP Navigator product will provide guaranteed bandwidth and delay characteristics across a backbone Frame Relay and/or ATM network. This guaranteed QoS is know as "Absolute QoS" and results in an ideal packet channel for transmitting real-time information such as voice.

The MultiVoice for the MAX platform provides a much more compact, integrated, and scalable design than other VoIP gateways from vendors such as VocalTec, NetSpeak, Vienna Systems, and Cisco. The current VocalTec, NetSpeak, and Vienna gateways are based on a standard PC architecture with add-in PSTN interface cards (T1 cards) and DSP cards. The PC-based solutions are:

- Typically more expensive because they are not well integrated and required components from multiple vendors (e.g. PSTN/DSP cards from Dialogic or Natural Microsystems)
- Much less desirable for large-scale deployment by Network Service Providers

The Cisco 3600 VoIP access routers provides better integration than the PC-based gateway products, but it only supports PBX analog Foreign Exchange (FX) and trunk lines. The MultiVoice Gateway for the MAX supports higher density PSTN interfaces and a larger number of voice ports per chassis. Although advertised as H.323 compliant, the Cisco solution does not currently support an H.323 Gatekeeper for routing VoIP calls across large networks and providing user authentication.

Product Overview

In today's communications networks, real time voice information is transmitted via the Public Switched Telephone Network (PSTN). Voice is transmitted on the PSTN using circuit switched technology where each call is provided with dedicated bandwidth, usually 64 Kbps. In most public and private enterprises, computer generated information is transmitted over a separately maintained packet data network. In data networks bandwidth is usually shared between different computing endpoints.

Recently new technology and international standards have been introduced which allow enterprise customers and network service providers to introduce real time communications (voice) to traditional packet networks that utilize the Internet Protocol (IP). For example, Voice-over-IP (VoIP) technology and the ITU-T H.323 standards define a framework for the transmission of real time voice over IP-based packet networks such as the public Internet, private intranets, and Extranets. The implementations of these standards allow for products from different vendors to interoperate on the same network.

The Ascend MultiVoice™ for the MAX™ consists of a set of hardware and software components that allow Network Service Providers (NSPs) or Enterprise customers to add real-time voice transport services to their existing IP backbone network. The components of the Ascend MultiVoice solution for the MAX product family is illustrated in the following figure:

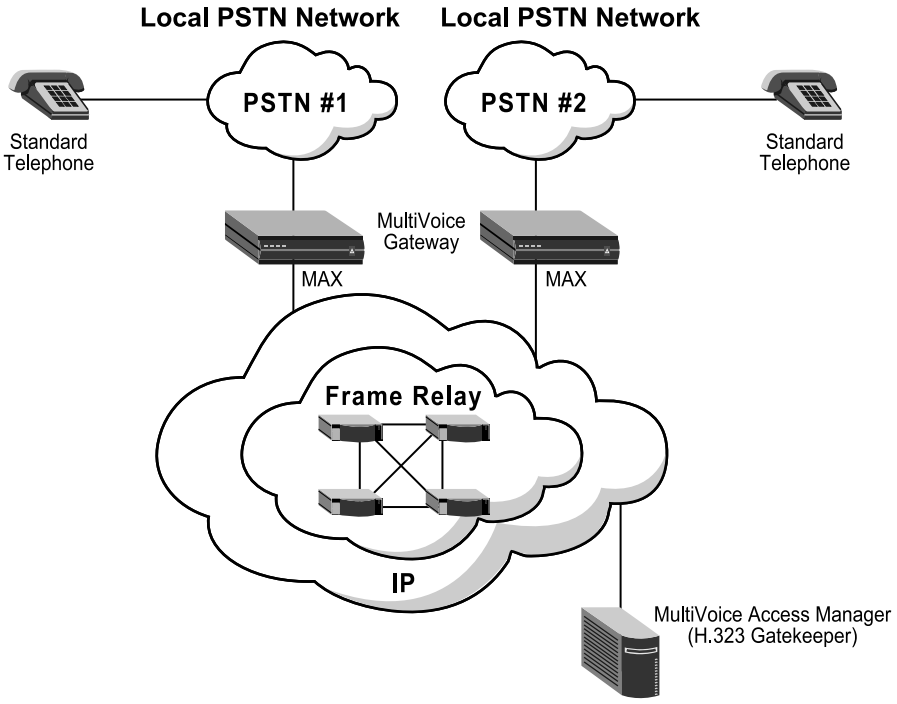

Figure 1 – Long-haul VoIP Network

Target Applications

A MAX-based MultiVoice network can be implemented to support many different applications in both public networks and in the private enterprise. The following are MultiVoice applications:

- Basic Public Long Distance Service: This application is intended for ISPs or CLECs that have an extensive domestic or international packet backbone network. It is assumed that the backbone network is a managed IP network where a QoS can be maintained for voice calls that are routed on the IP network. In this network configuration, the Network Service Provider only builds a single network that can carry both voice and data traffic. The NSP utilizes interfaces to a local, public PSTN network to deliver the last "leg" of a voice call to an end-user.
- Local "800" Service for Customer Service Applications: The Local "800" Service application allows ISPs or other network service providers to lower the cost of operation for customer service for their own operations or as a service to other enterprise customers. Since ISPs already have Point-of-Presence (POP) locations for their existing internet services, adding MultiVoice Gateways at those POP locations allow the ISP to publish a local customer service telephone number associated with each POP. This circumvents the long distance calling costs associated with traditional 800-based customer service operation.
- Point-to-Point PBX Trunk Extension: Enterprise customers, who want to use their existing packet data network to carry voice traffic between their PBXs, can use the MultiVoice Gateway for the MAX to interconnect different locations. In this network configuration, the MultiVoice Gateways are used in a point-to-point configuration between two PBXs at different locations.
- PBX Trunk Intraflow over Routed IP Networks: An enterprise customer with multiple PBX locations and a managed IP network can use the MultiVoice for the MAX platform to provide alternate routes for voice calls across their private network.

Software Features

MultiVoice Gateway R1.0 for the MAX

The MultiVoice Gateway for the MAX provides the interface between the PSTN and the IP-based packet network. It is the point at which traditional, circuit switched telephone calls "*hop-on*" and "*hop-off*" the MultiVoice packet telephone network. The following provides a listing of the major features supported by the MultiVoice Gateway Release 1.0:

- Phone-to-Phone H.323 Operations
- Telephony WAN Interfaces
- Packet Network Interfaces
- Voice Codec Support
- Voice VPN Support
- Hybrid-Line Echo Cancellation Support
- DTMF Detection and Generation

MultiVoice Access Manager R1.0 for the MAX

The MultiVoice Access Manager provides network call routing functions for connecting voice calls over an IP network, user authentication, alias translation, and call accounting features. The following are the major features supported by MVAM Release 1.0:

- Microsoft Windows NT v4.0 Support
- ITU-T H.323 Compliant Gatekeeper Implementation
- Phone-to-IP Address Translation
- Web-based Administration Interface
- PIN-based User Authentication
- Voice VPN Support
- Telephone Number Aliases
- Call Accounting Records (CDR)
- Gateway and User Database Support
- Third-Party Billing System Support

Hardware Features

The R1.0 MultiVoice platform will support the following hardware features:

- MAX 6000 Platform Support
- MAX 400X Platform Support (Upgrade Only)
- MultiVoice DSP16 Slot Card for the MAX 400X and 6000
- MultiVoice DSP12 Slot Card for the MAX 400X and 6000
- MultiVoice DSP8 Slot Card for the MAX 400X and 6000
- ISDN BRI Slot Cards
- WinTel Platform Support for the MultiVoice Access Manager

Frequently Asked Questions

1. What is Ascend is MultiVoice for the MAX Product?

The MultiVoice™ for the MAX™ product allows ordinary telephones to connect to other telephones using a public or private packet network. This is accomplished using a standard Voice-over-IP (VoIP) gateway that allows ordinary telephone calls to be transmitted across a packet network. The Ascend's VoIP gateway is known as the MultiVoice Gateway for the MAX. The gateway supports the ITU-T H.323 standard for transmitting voice over an IP network. When a voice call is received at a near-end MultiVoice Gateway, the voice signal is packetized, compressed, and transmitted over the packet network using standard protocols and voice compression technologies. At the far-end gateway the process is reversed and the call is delivered over the remote PSTN to its intended destination.

2. What are the components of the MultiVoice for the MAX Product?

The MultiVoice for the MAX product components include:

- MultiVoice Gateway for the MAX
- MultiVoice Access Manager (also know as the H.323 Gatekeeper).

3. What product hardware platforms will the MultiVoice for the MAX Product reside on?

The initial product platform for the MultiVoice Gateway will be the Ascend MAX 6000 platform with add-on DSP cards and the MultiVoice software. Existing MAX 4000 customers can also upgrade their MAX 400x chassis to support VoIP. In either case, the MAX platform must be dedicated to the MultiVoice Release 1.0 VoIP application. This restriction will be removed in a future release of the MultiVoice Gateway. The MultiVoice Access Manager (gatekeeper) will reside initially on a standard Intel PC server running the Windows NT v4.0 platform.

4. How does a MultiVoice call sound compared to a standard telephone call?

On a managed IP-network with multiservice Quality of Service (QoS) support, a call placed using the MultiVoice Gateway sounds just like a standard telephone call. This is possible because the MultiVoice Gateway supports the G.711 and G.729(A) toll-quality voice codecs and Ascend's network switching products can support end-to-end QoS. The G.711 codec is the same codec that is used by the standard PSTN network.

5. Who is the potential customer and target market for the MultiVoice for the MAX product?

The MultiVoice product is targeted at domestic and international ISPs, CLECs/Telcos, and corporate enterprise customers. Each market segment can realize the following benefits from the MultiVoice product:

ISP benefits:

- New service offering and revenue from existing customer base
- Obtain a higher return on an ISPs network by using existing network infrastructure to provide new service
- Cost justify increased internet access "pipes" to carry additional voice traffic on top of standard data traffic
- Transaction-based billing which scales with network usage

CLEC/Telcos benefits:

- Backbone provider revenues
- Revenues from leased lines
- Revenues from local calls (call completion by delivering telephone calls via a standard Internet connection)
- Two-tier pricing structure (Circuit Switched Service/Packet Switched Service) to address competitive threat from other service providers

Enterprise benefits:

- Backup for existing voice trunks (tie lines)
- Support the voice and data needs of small or branch office locations over a single private packet network
- Can deploy a MultiVoice Gateway on the premise (local gateway) on a private basis or as part of a service offering from a Network Service Provider
- Use spare capacity in internal packet network (intranet) to carry voice between PBXs in private networks (intraflow)
- Use same hardware for both data and voice remote access to enterprise network

6. What are the competitive advantages of the MultiVoice for the MAX product?

- Small footprint (MAX platform)
- Integrated platform
- ITU-T H.323 standard implementation
- Toll-quality 8 Kbps voice compression - G.729(A)
- High-density PSTN interfaces (T1/PRI/E1, BRI)
- Supported H.323 gatekeeper functionality for building large networks
- Integrated CSU/DSU - Frame Relay, Ethernet 10/100-Base-T
- Plug-In DSP16, DSP12, or DSP8 cards
- Scaleable platform
- 48/96 MultiVoice port bundles on the MAX 6000 (for T1-based systems)
- 30/90 MultiVoice port bundles on the MAX 6000 (for E1-based systems)

Competitive Analysis

Feature	Ascend MultiVoice	Cisco 3620/ 3640	3COM Total Control	Lucent Internet Telephony Server	Bay Networks BayStack w/ Netspeak
Integrated PSTN, LAN/WAN Routing, VoIP Gateway	Yes	Yes	Yes	Yes	Yes
H.323 Standards Based	Yes	Yes	Yes	Yes	Yes
QoS support					
Best Effort	Yes	Yes	Yes	Yes	Yes
Relative QoS	Yes	Yes	No	No	No
Absolute QoS	Yes	No	No	No	No
Real-Time FAX	Yes (R2.0)	Yes	Yes	Yes	Yes
Multipoint H.323	Yes	No	No	No	No
Point to Point H.323	Yes	Yes	Yes	Yes	Yes
PC-Client Support	Yes (R2.0)	Yes	Yes	No	Yes
Port Density	96	12	168	12	2
PSTN Interfaces:					
T1/PRI	Yes	No	Yes	Yes	No
E1/PRI	Yes	No	Yes	Yes	No
BRI	No	No	Yes	No	Yes
WAN/LAN Support					
Ethernet	Yes	Yes	Yes	Yes	Yes
Frame Relay	Yes	No	Yes	Yes	Yes
ITU Protocol Support					
G.711	Yes	Yes	Yes	Yes	Yes
G.729	Yes	Yes	Yes	Yes	Yes
Silence/voice Activity Detection	Yes (R2.0)	Yes	No	Yes	No
Price per Port	$677	$1277	N/A	$977	N/A
Availability	Q2 '98	Q2 '98	Q3 '98	Q2 '98	Q1 '98

Ordering Guidelines

Model Number	Product Description	US List Price	International Price List
MultiVoice Gateway for MAX 6000			
MXV-GWT-48	**48-port T1 System Bundle** which includes: MAX 6000 Chassis with four (4) T1/PRI interfaces, Three (3) MultiVoice DSP16 Slot Cards, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	$36,000	$36,000
MXV-GWT-96	**96-Port T1 System Bundle** which includes: MAX 6000 with four (4) T1/PRI interfaces, Six (6) MultiVoice DSP16 Slot Cards, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface, RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	$65,000	$65,000
MXV-GWE-60	**60-Port E1 System Bundle** which includes: MAX 6000 with four (4) E1/PRI, Four (4) MultiVoice DSP16 Slot Cards, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	N/A	$45,000
MXV-GWE-90	**90-Port E1 System Bundle** which includes: MAX 6000 with four (4) E1/PRI, Six (6) MultiVoice DSP16 Slot Cards, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	N/A	$65,000
MXV-GWQT-16	**16-Port T1 QuickStart Bundle** which includes: MAX 6000 with four (4) T1/PRI, One (1) MultiVoice DSP16 Slot Card, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface, RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	$19,500	$19,500
MXV-GWQE-16	**16-Port E1 QuickStart Bundle** which includes: MAX 6000 with four (4) E1/PRI, One (1) MultiVoice DSP16 Slot Card, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface, RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	N/A	$19,500
MXV-GWQEB-16	**16-Port E1/BRI QuickStart Bundle** which includes: MAX 6000 with four (4) E1/PRI, One (1) BRI Port Slot Card for connection to network services, One (1) MultiVoice DSP16 Slot Card, One (1) Autosensing Ethernet port (10/100Base-T), One (1) Serial V.35 Interface, RS-232 Console Port (DB-9), One (1) AC Power Supply, MultiVoice Gateway software	N/A	$22,500
MultiVoice Gateway for MAX (Upgrade Only)			
MXV-SO-GW	**MultiVoice Gateway Software Conversion for MAX.** This software only supports a dedicated MultiVoice Gateway and cannot be used to support other MAX applications, e.g. remote access.	$3,000	$3,000
MultiVoice DSP Slot Cards			
MXV-SL-DSP16	**MultiVoice DSP16 Slot Card** – provides support for up to sixteen (16) channels of VoIP communications.	$10,000	$10,000
MXV-SL-DSP12	**MultiVoice DSP12 Slot Card** – provides support for up to twelve (12) channels of VoIP communications.	$8,250	$8,250
MXV-SL-DSP8	**MultiVoice DSP8 Slot Card for the MAX 400X and 6000** – provides support for up to eight (8) channels of VoIP communications.	$5,950	$5,950

MultiVoice Access Manager Software for Windows NT v4.0			
MV-AMNT-4	**MultiVoice Access Manager – 4 Gateways** Windows NT v4.0 Application Software Only on CD-ROM, supports administration for up to four (4) GWs	$3,000	$3,000
MV-AMNT-32	**MultiVoice Access Manager – 32 Gateways** Windows NT v4.0 Application Software Only on CD-ROM, supports administration for up to 32 GWs	$15,000	$15,000
MV-AMNT-128	**MultiVoice Access Manager – 128 Gateways** Windows NT v4.0 Application Software Only on CD-ROM, supports administration for up to 128 GWs	$30,000	$30,000
MV-SU-AM432	**MultiVoice Access Manager – Upgrade 4 to 32 GWs** Windows NT v4.0 Application Software Only supports upgrade from a 4 GW system to a 32 GW system.	$13,000	$13,000
MV-SU-AM4128	**MultiVoice Access Manager – Upgrade 4 to 128 GWs** Windows NT v4.0 Application Software Only supports upgrade from a 4 GW system to a 128 GW system.	$28,000	$28,000
MV-SU-AM32128	**MultiVoice Access Manager – Upgrade 32 to 128 GWs** Windows NT v4.0 Application Software Only supports upgrade from a 32 GW system to a 128 GW system.	$16,000	$16,000
Other MultiVoice for the MAX Options			
MX-SL-8BRIN	**Eight (8) Port ISDN BRI** "S/T" interface card for connections to a network service.	$4,500	$4,500

***Note**: All configurations listed above that are not fully populated, can be separately upgraded with additional 16, 12, or 8 port DSP slot cards up to a system maximum of six cards per chassis. All MultiVoice network configurations with one or more MultiVoice Gateways will require a MultiVoice Access Managers in order to establish calls across the IP network.*

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