Ascend

COMPETITIVE ANALYSIS

MultiVoice for MAX

Ascend Competitive Marketing Group

ASCEND

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1. Introduction/Product Positioning

Ascend Communications' MultiVoice™ for the MAX™ is an integrated solution designed to maximize capital expenditures for Network Service Providers and corporations. The MultiVoice product consists of hardware and software to transport voice services over existing IP backbone networks. A typical MultiVoice configuration is illustrated in the following figure:

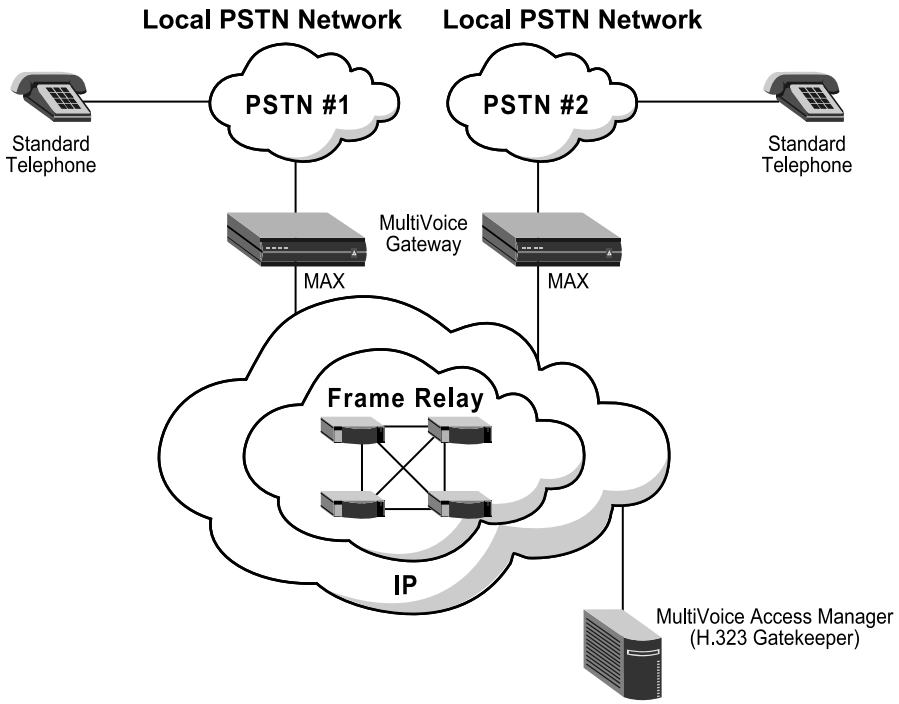

Figure 1 – Long-haul VoIP network

MultiVoice for the MAX is strategically important to businesses for the following reasons:

- **Long Distance Cost Savings**
  By integrating voice and fax communications over an IP data network, a company can greatly reduce costs by eliminating long distance charges for intracompany calls. Company employees, regardless of location, can call each other toll free, no matter how long conversations last.

- **Reduced Equipment Investment**
  Many companies lease or purchase separate equipment (dedicated circuits, routers, etc.) for their voice and data traffic. With voice over IP, the cost of procuring and servicing equipment is greatly reduced, since all intracompany communications traffic, both voice and data are transmitted over the same network.

- **Alternate Routing**
  With voice over IP, a call can "hop-on" a data connection at one point in the public switched network and "hop off" at another. And because there are so many alternate routes between start and end points, it's virtually impossible to lose a voice connection. If a core switch determines that a particular segment of the managed IP network is busy or down, another segment can be used to transport the voice stream.

2. Key Competitors/Competitive Environment

There are five principal solution providers offering “integrated” VoIP: Ascend, Cisco, 3COM, Bay Networks, and Lucent. Each competitor’s product has the basic functionality of Voice over IP, but there is a vast difference in scalability, management and interface between the various solutions. Another category of vendors produce PC-based solutions or software that specialize in only Voice over IP. Those vendors include VocalTec, NetSpeak, Vienna Systems and Clarent.

Cisco 3600

Cisco recently added voice over IP capabilities to its 3600 series router. The Cisco 3640 has four network modules slots, while the 3620 only has two available slots for Ethernet or WAN connectivity. In order to use routing, dial-up access, or multi-service plug-in module, the 3600 requires at least one port be used for WAN services. H.323 support is bundled with Cisco IOS. This means the software will require a hefty amount of overhead. IP Multicast is not currently supported in the 3600 router. Cisco IOS does support TCP/IP, Real-Time Transport Protocol (RTP), and PPP. However, there is an extra cost for additional protocol support.

Because the Cisco 3600 is targeted at small to medium sites, it does not scale up for large IP networks. A solution comparable to Ascend’s MultiVoice for the MAX 96-port version is 80% more expensive.

The Cisco 3600 does not support multi-point VoIP configurations like MultiVoice. Only point-to-point static configuration is available. This means call routing is less efficient on an IP network.

Bay Networks/NetSpeak WebPhone

Bay Networks has entered into an agreement with NetSpeak Corporation to purchase 9% of the company, and to bundle Netspeak’s Business WebPhone System with BayStack. Two versions of WebPhone will be available on the BayStack router product line: WebPhone client software, and the Business Webphone System.

WebPhone is for client point-to-point voice over IP, while Business WebPhone System provides additional features such as statistics gathering, firewall support, and remote supervision. Bay Networks has not slated a release date for Business WebPhone System.

3COM Total Control

3COM licensed DataBeam Corp.’s T.120 and H.323 protocol stack for integration with Total Control access switch. Little information has been released about which features will be supported, however the T.120 and H.323 protocols will integrate with the HiPer card and programmable DSP engines. No ship date has been announced, but product is expected to be available in Q2 98.

Lucent Internet Telephony Server

The Internet Telephony Server SP is based on common Internet software and interface standards including H.323, elemedia coders, and other standard coders. The base configuration has 24/30 channel support. Quality of service monitoring is available on the Internet Telephony Server, however, only ReSerVation Protocol is supported. Internet Telephony Server is targeted at the low-end business or ISP.

PC-Based Solutions

Most of these solutions are software only, which run on a PC. Micom V/IP is an ISA card solution that requires a voice over IP card and a T1 card in the PC. Customers do not like PC-based solutions because they require an extra monitor, cable and hard drives, which create more troubleshooting and setup problems. Another reason users do not like a PC-based solution is that it is inherently more expensive to operate because it generally takes a dedicated PC—a cost that is usually equivalent or more than an integrated solution.

3. Ascend MultiVoice Key Competitive Advantages

- **Scalable Architecture**
  The MultiVoice Gateway uses DSP add-in MAX slot cards to implement Voice over IP. Each DSP card can have up to 16 individual CPUs. Each DSP CPU is dedicated to a single voice call. The majority of the voice and protocol processing to handle a VoIP call occurs on the adjunct DSP cards freeing the central CPU in the MAX for other functions. This results in a scalable architecture that allows additional ports to be added to the MAX with little affect on the shared system processor.

- **MultiVoice Gateway for the MAX**
  MultiVoice is the only product to offer multi-point VoIP configurations and dynamic call routing between gateways via the MultiVoice Access Manager[1]. This allows network service providers to build intelligent network with call routing capabilities. MultiVoice Gateway provides a "proxy" H.323 terminal for every PSTN connection established via the Gateway.

- **Extensive QoS Support**
  MultiVoice for the MAX integrates best effort, relative QoS, and Absolute QoS Is set by the MAX and provided end-to-end by IP Navigator and Ascend's Frame and ATM core switches. Used in conjunction with IP Navigator and an Ascend Frame Relay or ATM coreswitching network, the MultiVoice product can provide guaranteed bandwidth and delay characteristics required for transmission of real time data such as voice. No other competitor can currently offer this end-to-end guarantee which is essential for implementing packet voice networks that provide toll-quality voice calling. MultiVoice QoS integration with IP Navigator will be provided in an IP Navigator release later this year.

- **Telephony WAN Interfaces**
  The MultiVoice Gateway for the MAX provides multiple, high-density interfaces for connecting to the PSTN. Support for T1, T1/PRI, E1, E1/PRI and BRI is available on Release 1.0 of the MultiVoice Gateway software.

- **Packet Networks Interfaces**
  The MultiVoice Gateway offers support for both standard Ethernet LAN and Frame Relay connections to the IP packet network.

- **Voice Codec Support**
  The MultiVoice Gateway for the MAX supports H.323 voice codecs G.711 and G.729(A) for transmitting toll-quality digitized voice at 64 Kbps and 8 Kbps plus the RTP/IP header overhead.

- **Voice VPN support**
  MultiVoice Gateway supports a voice Virtual Private Network mode where user authentication is bypassed. Users trying to access a MAX Voice network will not be prompted for a PIN. Instead, they will be allowed to direct dial the number making private networking easier to implement.

- **Hybrid line Echo Cancellation Support**
  In PSTN networks where echo cancellation is required, the MultiVoice Gateway will perform this function and deliver end-to-end echo cancelled voice calls.

- **Web based Administration Interface**
  The MultiVoice Access Manager supports local and remote system management using Microsoft's Internet Explorer V 3.X or NetScape Navigator V.3.X.

[1] The MultiVoice Access Manager is known as a "gatekeeper" in the H.323 standard.

- **Call Accounting Records**
  The MultiVoice Access Manager generates files containing start and stop Call Detail Record (CDR) on all calls that are established via a MultiVoice network.

- **Third Party Billing System**
  Separate billing applications can interface with MultiVoice Access Manager. This results in a single user database that is under the control of the billing application.

- **Leverages Proven MAX Platform**
  MultiVoice leverages the solid and widely installed MAX access concentrator platform. Using a simple DSP card and software upgrade, customers can add voice service without adding a new infrastructure. Over four million MAX concentrator ports are in use today. A majority of network service providers have standardized on Ascend's MAX platform.

- **Cost Effective Solution**
  Existing MAX 4000, 4002 and 4004 customers can leverage their investment by simply adding a DSP card to the MAX hardware platform. No extra equipment or costly hardware chassis is required to receive Voice over IP.

4. Competitive Analysis

Feature	Ascend MultiVoice	Cisco 3620/ 3640	3COM Total Control	Lucent Internet Tele-phony 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

5. Selling Against the Competition

Vendor Competitive Disadvantage	Result
Cisco 3620/3640 • Designed for low-end business sites • Poor scalability—12 port maximum configuration. • No multi-point VoIP support • QoS supports ReSerVation Protocol (RSVP) only. • No support for T1, E1, BRI network interfaces. • High priced, low value • More expensive than MultiVoice for the MAX	• Expensive to upgrade • Poor solution for large scale Enterprise or NSP • Poor Quality of Service-no Absolute QoS
Bay Networks BayStack • Shoe-horned into BayStack product line • No multi-point VoIP support. • Limited PSTN connection support • Limited QoS support	• Technology is not tailored to hardware. • Not designed for large-scale IP networks. • Poor Quality of Service-no Absolute QoS
3COM Total Control • Not available until 2H' 98. • T.120 and H.323 protocol stack support only • No multi-point VoIP support • Little management capabilities • More expensive than MultiVoice for the MAX	• Higher administrative costs • Poor software and hardware support • Low Quality of Service • Not a complete solution.
Lucent Internet Telephony Server • No BRI support • No multi-point VoIP support • Poor line monitoring capabilities • Poor scalability • High price, low value	• Poor quality of service • More costly to operate • Not designed for large IP networks

6. Bottom Line

Ascend's MultiVoice for the MAX is the only product specifically designed and targeted for large NSP and large corporate Voice over IP applications. In addition, MultiVoice for the MAX is the only product to offer an H.323 "Gatekeeper" as specified in the ITU-T H.323 standard. Using the MultiVoice Access Manager, a channel can be used to register gateways within a network, or perform Call Admission which includes user authorization with Personal Identification Numbers (PINs) and address translation. No other competitor product has this feature.

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