VoIP Newsletter

MERCATOR CAPITAL

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Inside This Issue

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Investment in Vonage reaches $208 million

Voice-over-Broadband company Vonage has obtained an additional $105 million in funding, bringing the total investment in the company to $208 million. The majority of the new funding is to be utilized for global expansion and increased marketing.

Starting with the existing staff strength of about 480 employees and ownership of 25 PoPs in the US, Vonage plans to expand globally with the UK and Switzerland being the first countries for investment this year. That is to be followed by expanding into Asia Pacific and Latin America.

The company has completed over 400 million calls and over 1.6 billion minutes of traffic. It has installed over 250,000 lines. About 1,000 lines are being added a day, according to Vonage. The early adopters of Vonage services had mostly been the young technology enthusiasts who were the original broadband adopters a couple of years ago. However, that has changed. The education cycle for Vonage customers continues to get shorter. A year ago, according to the company, the sales cycle was several months. Now it is just a few days.

Voice-over-Broadband (VoB) has received significant consumer attention in nearly all countries that have a relatively mature broadband market. In this newly developed segment of VoIP, we are starting to see competition between three types of players: the incumbent operators, independent ASPs such as Vonage and facilities-based competitors like Fastweb in Italy, Free in France, and Softbank BB in Japan.

Facilities based providers in VoB are essentially offering a cable alternative to the incumbents or a triple play over DSL. They are taking a significant number of customers. Fastweb currently has about 380,000 subscribers, with 80 percent of those using voice. Free in France has about 640,000 subscribers. These providers typically charge a flat monthly fee for the package, which includes unlimited national long distance calls. Softbank BB, representing the largest VoB deployment, serves about 4 million customers all of whom are using voice service. These providers are delivering a simple phone service to customers who are attracted by price for a bundle of services. That creates a different kind of concern for incumbents since these new providers are attacking the mass market.

It seems that the strategy of incumbents considering (or already offering) VoB services is to delay the migration of their existing legacy infrastructure for a while. In the future, once they have significant penetration on the broadband side with voice on top of it, they can bridge the two networks through some multi-service access node technology. France Telecom recently announced a product to compete in VoB marketplace. BT announced a service called Communicator. Telia also has a broadband phone offering. Most major European players, except Telecom Italia to an extent, have either rolled out the offering or are

Vonage cont'd …

planning to do so. In the US, incumbents like Qwest and AT&T have also announced VoB service.

However, Vonage seems to be the one that has heated up the market from a publicity point of view. Vonage has done a tremendous job in heightening market awareness for consumer VoIP. Despite their relatively small number of customers compared to the incumbents they enjoy significant brand awareness.

Vonage history goes back to a small venture called Min-X that essentially provided a free web-based clearinghouse service to VoIP service providers. Although the Vonage service model today is far from what Min-X offered, the early Vonage management came from Min-X that was founded by Jeff Pulver of Pulver.com.

The origin of current Vonage model was the private brandable service it offered to cable companies and direct retail service to the owners of IP Phones. Having moved away from that model, the company decided that it was not going to restrict itself to PC and IP Phone as the end user calling platforms. It also decided to serve only those customers that had a broadband connection. The company started R&D in 2001. Year 2002 was mainly spent testing the service. The company's new broadband phone service, which makes use of an ordinary analog phone, was launched in 2003.

Vonage service makes use of a telephone adaptor, such as the Motorola VT1000v that has a QoS router in it and plugs directly into a cable or DSL modem enabling service over an ordinary analog phone at home. This particular device is used to transform calls from analog to packet. Voice from analog phones is transformed into data packets by the Motorola device, which sends these packets via the broadband modem on to the public Internet. Breakout from Internet to public telephone network is done via CLECs. Although most Vonage subscribers may have a PC and can make use of a Vonage soft client, unlike Skype users they do not need a PC to make phone calls.

Vonage is a pure play VoIP service and the company offers only VoIP calling plans. It has several calling plans suitable for various segments of the market: residential, SOHO and SMB. The cheapest package starts at $14.99 per month. Flat rate fees mostly apply to calls within North America. For calls outside North America, Vonage charges low international rates.

The longer-term strategy of Vonage is to offer unique features and functionalities that a PSTN residential subscriber does not get from the incumbents. The company is aware that it cannot market itself as merely offering lower priced services. All the current value added features are provided for free. Most of the telephone companies, including other nextgen VoB providers, charge for such features. In fact, the majority of incumbents do not have the new VoIP-enabled feature offerings such as the virtual phone numbers, online management of features, multiple phone numbers, searching lifetime call activity, and Outlook integration.

With regard to the infrastructure, Vonage does not use any switches although it does have some SIP proxy servers, feature servers, and Cisco equipment to do the IP-TDM conversions at the edge before handing calls off to CLECs. The company leases some IP backbone capacity from Level 3 and Global Crossing, but has a very low Capex model.

Vonage is able to roll out new features and functionalities within days thanks to the company's in-house R&D team with a strength of over 100 engineers, which is the second biggest team after its customer services group within the company. Vonage is now exploring Voice-over-Wi-Fi and video services. The company is manufacturing its own branded Voice-over-Wi-Fi handset. When the service becomes available, a Wi-Fi customer can use its Vonage assigned phone number anywhere in the world and make or receive phone calls through the locally available public Internet access points.

Vonage cont'd …

VoB is one of the fastest growing segments in VoIP, and Vonage has undoubtedly catalyzed the activity in this segment. However, there have been a few other cases, such as Dialpad that offered free PC-to-Phone service, where all the flurry of activity and investment resulted in insignificant gains in the end.

There is regulatory uncertainty surrounding the issue of access charges in the US that could have a major impact on VoIP service. Vonage in particular is vulnerable. If the FCC decides, at some point, to levy access charges on VoIP companies the whole flat rate service model could potentially fail. At the moment, the FCC is content with classifying VoIP as a value added data service. Although it has made emergency service 911 mandatory for all service providers (Vonage uses 911 enabling solution from company called Intrado), the FCC has waived access charges for VoIP service for the time being "in order to encourage the growth of enhanced services" with the help of VoIP technology. At present, regulation in countries such as the US, Canada, and the UK seems to favor companies like Vonage. Any further policy changes are unlikely until after the US election. If there is a change in administrations, one could envision a slight shift in policy. However, most VoIP companies think that the shift will not be so significant as to reverse the previous FCC ruling on the issue.

Cisco acquires P-Cube for $200 million

Cisco is to acquire P-Cube, developer of a service aware IP network controller, for $200 million in cash and options. Although Cisco did not comment on exactly what product line the P-Cube solution will be integrated with, it seems that the newly acquired solution will form part of Cisco's broadband aggregation router.

The P-Cube solution inspects packets in an IP network to determine the type of application being used. The information can be utilized in various ways. It can be used to implement priorities at both the application and the subscriber levels. Some of these functionalities can also be found in Session Border Controller (SBC) technology. Cisco already sells a SBC module alongside its IOS. The existing SBC module it has is limited in terms of the features it can support. Being subscriber and application aware is at the heart of current SBC development push.

The acquisition is expected to be completed by October this year. P-Cube was founded in 1999. Revenues are believed to be approximately $15 million. The company is not profitable yet. Main customers include SingTel, Telenor, and Interoute.

Neustar introduces clearinghouse solution

NeuStar has announced a clearinghouse solution for real-time routing and settlement among carriers using IP. The clearinghouse services include VoIP endpoint directory/discovery services, access to network routing data, including number portability, and provisioning interfaces to assure interoperability between IP and PSTN networks.

The clearinghouse solution is based on a real-time registry built on ENUM technology that contains over 100 million entries and supports over 20,000 updates/day. ENUM is the IETF Standard for converting a telephone number into an Internet domain name.

Based in Washington, DC, NeuStar operates the registry of all North American telephone numbers and administers the database services relied upon by all carriers in the United States and Canada to route billions of telephone calls daily. NeuStar also operates the US registry. Over 4,000 telecommunications and service providers currently rely upon NeuStar's services.

GIPS establishes strategic supplier relationship with Nortel Networks

Swedish company Global IP Sound (GIPS) has signed agreements with Nortel Networks whereby the voice processing technology of GIPS will be integrated into various VoIP products of Nortel including, soft phones, IP Phones and Nortel's flagship SIP based Application Server. Nortel has also been issued GIPS warrants, which the vendor can exercise after five years or after having generated a pre-set amount in license fees.

Nortel has been granted about 2.67 million warrants to purchase shares of GIPS common stock at an exercise price of SEK 3.10 per share. The warrant issue represents 5 percent of the fully diluted value of GIPS.

Nortel's SIP based application server MCS5200 is geared towards the IP Centrex market. The company has two ways of delivering IP Centrex solutions. The first is a product called Centrex IP which works off the Nortel softswitch CS2000 with some 300+ Centrex features available as a subset of the CS2000. The solution is targeted at large enterprise customers where service providers cannot get away with top 20 voice features. The other way to deliver IP Centrex is through the MCS5200 SIP application server that can work with the CS2000 to provide multimedia services to enhance the voice feature set delivered by the CS2000. Those two combined are also the solution for large corporations. The MCS5200 does pure play hosted multimedia services targeted at SME's where one does not necessarily need 300 Centrex services but merely the top 20 voice features. In that case one does not need the CS2000 and can use the MCS5200.

The actual features available on Nortel's MCS5200 is very limited. IP Centrex vendors are typically offering over 250 features, which one would associate with PBX capabilities. In the hosted environment, Nortel is involved in two or three trials in North America. For example, the vendor does not have the web portal or user control panel capability in its MCS application server offering. So they are missing functionalities like dial-from-the-directory, click to call, access to voicemail through web, setting up instant conferences, setting up find me follow me rules from web portal, etc.

The GIPS voice processing solution has been integrated into the MCS with the intention of improving the speech quality. GIPS develops enhanced voice codecs that are ideal for open Internet type applications. Companies such as Skype use the software to handle adverse network congestion. GIPS software allows Skype to compensate for things such as the packet loss.

Other GIPS customers include Pocket Presence, Longboard, and WebEx. The company has been campaigning with the IETF to standardize around its voice codec for VoIP based applications. It has recently had success with the Packetcable forum that sets standards for VoIP over Cable. Packetcable has selected GIPS' iLBC, a 15kbps voice codec, as the standard codec for Packetcable media gateways. However, GIPS is to provide the codec royalty-free.

Today, there is little happening in VoIP over Cable market largely due to the fact that industry wide standards have not been established yet. Once the market is established, GIPS hopes to sell its other enhanced voice processing modules such as echo cancellers, jitter buffers, voice activity detectors, conferencing engine and other similar elements that complement iLBC codec forming part of GIPS' overall voice processing solution.

The main advantage using GIPS at the component level is quality of voice over adverse network conditions. The solution can sustain high quality voice conversation with up to 20 to 30 percent packet loss. The other major advantage is in using the company's VoiceEngine portfolio which speeds time to market. With this solution, GIPS can help bring applications to market without the developer having to know the details of voice processing. Application developers generally pay little attention to voice processing.

Where is border controller technology headed?

One of the major contributions made by VoIP in telecommunications is that it made the distributed architecture a reality. It catalyzed the decoupling of the control layer from that of media processing. However, the traditional way of centralizing intelligence at the core of a carrier's network was maintained. SIP challenged that tradition a few years back and has the potential to redefine the role of network elements. The new breed of Session Border Controller (SBC) technology, although not as revolutionary as SIP, is re-opening the debate of the role of various VoIP network elements in its own way.

Some interesting possibilities arise, depending upon future directions of SBC technology. In particular, the role of softswitches and routers can potentially be re-defined. There are different perceived directions for SBCs. Among the start-up SBC vendors, Nextone and Kagoor seem to be comparatively more flexible with their architecture. These two entertain the possibility of having both a distributed SBC architecture - whereby some of the functionality might leak into other network elements - as well as a standalone piece of equipment dedicated for SBC functionalities. Acme and Netrake, on the other hand, seem to assert that SBC will remain a distinct standalone piece of equipment.

As always, the approach taken by incumbent vendors will have a major impact on the future evolution of SBC. Sonus, Nortel, and Alcatel have already integrated their in-house SBC technology into their VoIP product portfolio. Alcatel has a standalone SBC and will continue to provide it for the time being. However, the feedback it is getting from its customers is that the standalone solution is appropriate only for the short term. In the long term, carriers want to see SBC capability integrated into the edge IP environment. So Alcatel's longer-term direction is to look at migration down that path.

The control function, which basically issues the instructions, will be part of the softswitch. Alcatel strategy is to provide the SBC control functionality of the media processor -the brains in a SBC - within the softswitch and have the execution function at the IP edge. At the moment, Alcatel's SBC edge component is a discreet device providing security and QoS functions but longer term it will be an integral component of some other piece of Alcatel equipment at the edge of an IP network.

Nortel has also introduced a pure media processor and rather than moving some of the control functionality and service intelligence to the edge the vendor has retained that within the softswitch or SIP application server. Nortel uses a control protocol to control the media processor in the same manner as the media gateway is controlled. In terms of security features, such as NAT and firewall traversal, these capabilities are still retained (by Nortel) at the edge in this media processor. Topology hiding, for instance, is happening at both points. The Softswitch does it for signalling and the media proxy does it for media. Protocol interworking happens at the signalling level. With other functionalities like Call Admission Control the softswitch defines the policy and media proxy enforces that policy.

The market definition of SBC at present implies that it deals with both signalling/control and media. But it can do that in more than one way. It can do that in a single integrated box or in a distributed fashion. As design evolves, large networks may be designed to partition out the SBC functionalities to match up with location. It is possible that networks will include some media processing boxes at various locations and a single signalling/control box so long as tight control can be maintained.

If the distributed model catches on and the signalling/control function gets integrated with the softswitch, an interesting question arises as to which piece of equipment could the media processor part be integrated with. SBC has been designed with very specific functionalities, the type which media gateways and media servers were not designed to

Border Controller…. Cont'd

handle. Softswitches also can deal with a few of the signalling elements, but not everything that is asked of a SBC. So subsuming the entire SBC functionality into the softswitch from a technology standpoint seems difficult, unless for strategic reasons the vendors are architecting these solutions to integrate tightly with other pieces of network elements. If we look at softswitches, they started as protocol translation solutions translating TDM into IP. Certain carriers are known to be putting pressure on vendors to transfer some of the softswitch functionalities into SBCs. So the reverse is also feasible to an extent. Softswitches do not deal with media and they were not designed as high packet inspection solutions. They were designed as transaction databases. Some of the softswitches can do some protocol interworking and routing. However, the other problem is that to the extent that SBC functionality is pushed into the softswitch, the functionality may end up being a proprietary solution to a few vendors only. The bottom line is that the shifting functionality of either the softswitch or the SBC to the other comes with a series of technical obstacles and also limits the carrier's ability to achieve best of breed solutions.

Router makers, it seems, will also play a very important role in VoIP/SBC domain. There are at least a couple of router companies today who want to go into the firewall domain. In the short term they are putting the SIP based firewall at the edge thereby increasing firewall functionality. Longer term they could put server functionalities and then probably coupled with the SIP-SS7 gateway the whole network route will be established.

SBC features such as NAT functionality can easily be subsumed into an edge router or just a router. However, certain SBC signalling/control aspects are not easy to integrate into a softswitch. The softswitch is primarily about voice, geared towards TDM/IP interworking. Traffic management and routing capabilities in softswitches are not advanced. Carrier needs drive the creation of various combinations of network elements loosely referred to as softswitches. However, the lowest common denominator in softswitch architecture is the media gateway/controller. In addition, the media gateway/controller role will inevitably become diluted as IP-TDM conversions become less important in an IP world. As such, the softswitch companies are bound to look into developing SBC functionalities.

As the role of the media gateways/controllers wane, the intelligence of the network from the routing and traffic management standpoint could be the session controller. Perhaps softswitch companies are responding to the diminished role of the media gateway/controller by adding the SBC capability alongside their media gateway/controller. So the media gateway/controller is becoming the transitionary integration point from TDM to IP. It seems that over time these companies could be replacing their TDM blades with IP blades that provide network border switching. However, ultimately they are in a collision path with router companies the likes of Cisco and Juniper.

Consider a scenario where we have a session controller (signalling controller of the current SBC decoupled from the edge SBC equipment) acting within the signalling/control layer and the media channel being the MPLS router fabric. The difference with the current set up is that these components will not just offer voice as a service. It will be a multi service environment where any real-time service will be offered over IP, with application servers sitting on top of this platform. In that environment the role of the media gateway/softswitch will be the conversion between PSTN and IP clouds. Although the softswitch is a transition technology, it could easily be at least 10 to 15 years before the carrier community decommissions the last TDM switch. We are likely to have Class 5 TDM switches for the foreseeable future and first see the decommissioning of the tandem switches in the event the MPLS router technology takes over at the core. Over time the Class 5 lines will be replaced by broadband connections. Other types of access technologies will come into the market such as cable, DSL, and wireless, and will cannibalize some Class 5 lines. In the future, edge routers could become an

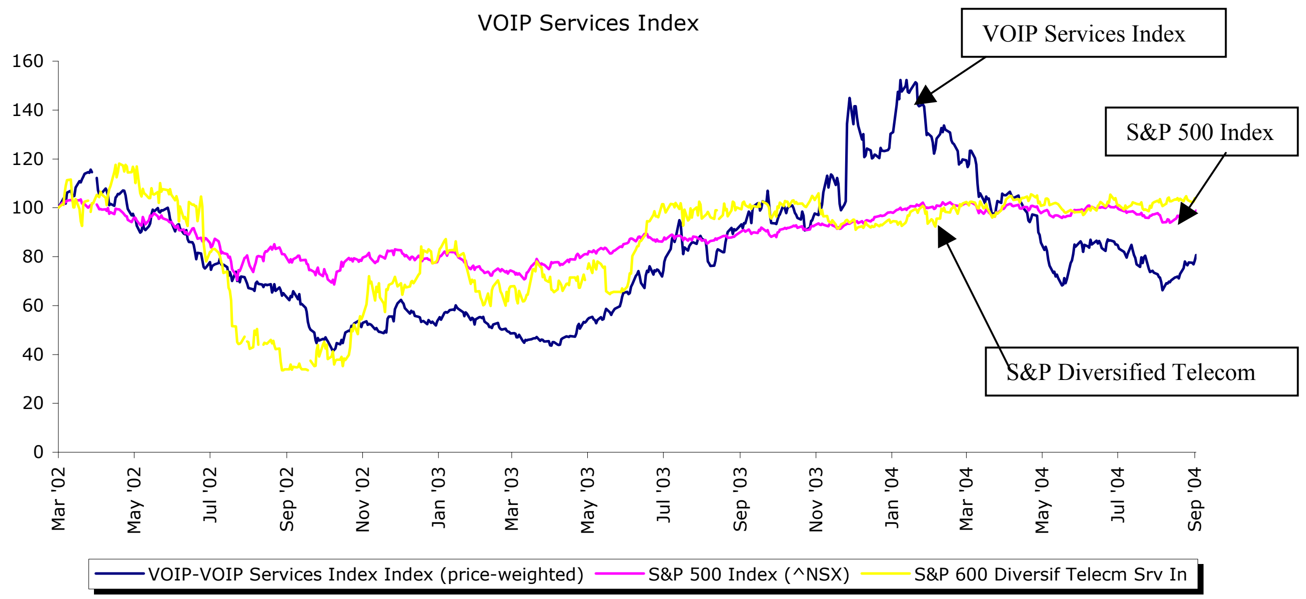
Border controller… Cont'd…

aggregation device, streamlining various access methods: broadband, 3G wireless, Wi-Fi, cable, etc.

Suffice it to say, both softswitch and router vendors are interested in SBC technology. There are some acquisitions on the horizon. There are just four major start-up SBC vendors in the market. It remains to be seen as to what happens post acquisitions, i.e. what route the development will take. Ultimately, the type of architecture carriers prefer will determine the evolution of SBC technology. One can see a variety of functionalities floating around in the network. Different vendors' packages are delivered in a variety of different forms. Some forms are more attractive to some carriers than others. In the long-term most of these functionalities will be available from all major vendor implementations. At the end of the day customers generally are more interested in what works, than they are in the architecture of the products. Most customers do not approach their decision making as an architectural question.

Financial developments July/August 2004

Company	Products / Services	Development	Details
Vonage	Voice over broadband	Funding	Raised a further $105 million in funding bringing the total investment in Vonage to $208 million
P-Cube	IP service control platform	Acquisition	Acquired by Cisco for $200 million in cash and options
AudioCodes	VoIP hardware	Filed Shelf Registration	Shelf registration statement will allow AudioCodes to sell from time to time up to $150 million of equity and/or debt securities
Steleus	QoS management solution	Acquisition	Acquired by Tekelec for $56 million, consisting of approximately $29 million of cash and $27 million of Tekelec's stock
Sentito	VoIP switches	Funding	Raised $28.5 million in funding led by Kodiak Venture Partners and Core Capital Partners
Sonus Networks	Softswitch	Quarterly results	Revenues $42.4 million, Net Income $4.9 million
Deltathree	VoIP retail service	Quarterly results	Revenues $4.7 million, Net Loss $886,000
Worldquest Networks	VoIP retails service	Quarterly results	Revenues $2.8 million, Net Loss $294,000



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S&P Diversified Telecom
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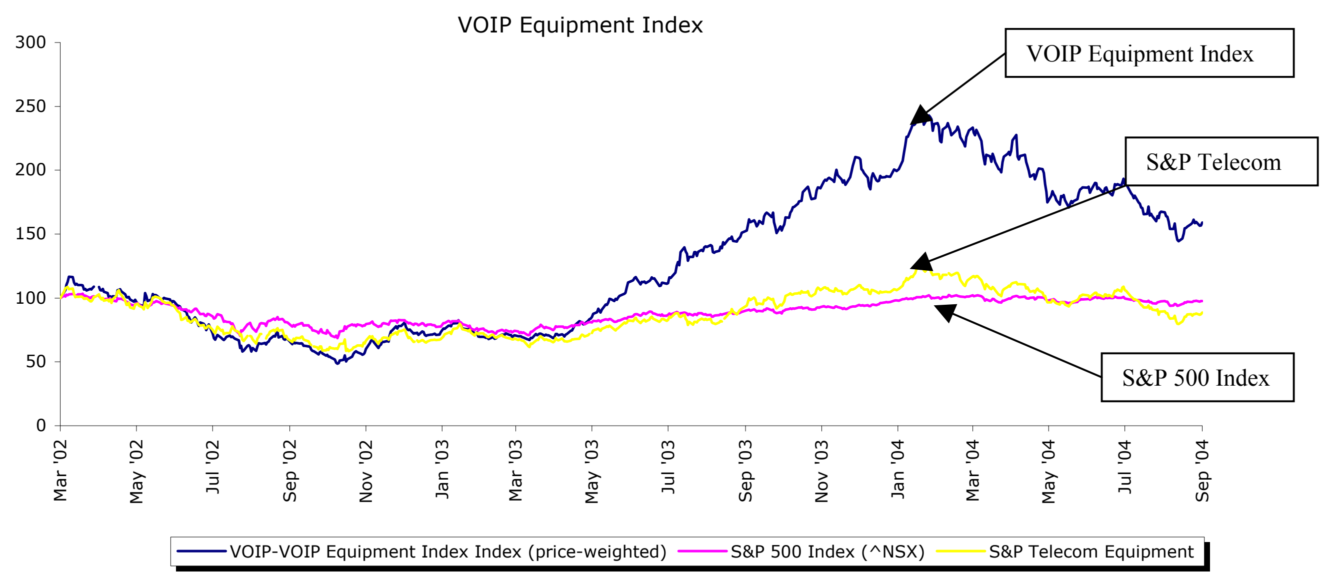

VOIP Equipment Index
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VOIP-VOIP Equipment Index Index (price-weighted)
S&P 500 Index (^NSX)
S&P Telecom Equipment

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