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For more information contact:

Rod Hackman
Partner
rhackman@mercatorcapital.com

www.mercatorcapital.com

Virginia Office:

One Fountain Square
11911 Freedom Drive
Suite 1080
Reston, Virginia 20190



Juniper initiates first major SBC acquisition

Juniper's acquisition of **Kagoor Networks** represents the first major session border controller (SBC) acquisition in the market. **Juniper** will pay \$67.5 million in cash, plus options and equity compensation. **Kagoor** had previously raised about \$40 million in venture funding.

Though **Kagoor's** 2004 revenues were less than \$5 million, the \$67.5 million price represents a technology acquisition, not necessarily a valuation of the viability of **Kagoor's** products or business, say industry experts. The valuation at about 15X trailing sales is very aggressive by most traditional measures; one of last year's major acquisitions in the VoIP sector occurred when **Lucent** acquired **Telica** for \$295 million, representing a multiple of about 12X revenue. **Cisco's** \$200 million acquisition of **P-Cube** in September 2004 was approximately 13X sales.

For **Juniper**, the acquisition makes sense for several reasons. Like many of the major network equipment manufacturers, **Juniper** sees VoIP as one of the significant revenue growth areas over the next five years. Most of the carriers are using SBC technology to deliver hosted VoIP services to business and residential customers. As a result, both softswitch and router companies are interested in acquiring SBC technology.

More than 100 carriers worldwide, most of who reportedly also use **Juniper** routers, have installed **Kagoor's** SBC products. It is not entirely clear at this stage whether

Juniper will utilize **Kagoor** technology as a standalone box or integrate it with its own platforms. If **Juniper** chooses the latter option, its edge router and **Netscreen** solution are strong contenders for subsuming **Kagoor** technology.

There is huge opportunity to replace every existing data firewall as enterprises move to VoIP. By VoIP-enabling **Netscreen** CPE firewalls, for instance, **Juniper** can combat **Cisco** in the enterprise market. **Cisco** IOS has a bundled SBC capability (called IP-IP gateway) that offers some of the basic security features. We believe the **Juniper-Kagoor** deal has lit the match and could drive companies such as **Cisco** to react quickly.

Though the SBC segment has seen several startups entering the market over the last several years, only a few of them (including **Kagoor**) garner significant market share. **Kagoor's** strengths include protocol support features and functions (including SIP, H.323, and MGCP), and having an efficient NAT traversal capability. **Kagoor** has three distinct platforms with varying sizes targeted at tier 1 carrier, mid-range carrier, and an enterprise deployment.

Kagoor has developed its own protocol stacks, which allows it to be more flexible to provide additional features and functionalities. We believe **Kagoor's** solution is also more flexible than other SBC vendors since it can offer both centralized and distributed border control. **Kagoor** delivers either a

Juniper – continued

unified box or a solution that splits media and signalling. With the advances of IMS architecture, the market is seeing increasing separation of the media and signalling as SBC technology continues to evolve. While a standalone SBC iteration continues to be seen in deployments, separation of its functionality from other network equipment such as softswitches, firewalls, routers, and gateways is a grey one. It is widely believed that SBC functionality will eventually be integrated into each of those product categories. There are several different directions for the future of SBCs, which is proving to be one of major drivers for market consolidation. It will be difficult to scale a standalone SBC business with pressures from softswitch, router and other types of companies to integrate such functionality in their solutions. Carriers are also averse to spending extra to address peering issues.

The first application that generated meaningful revenues for SBC vendors was carrier peering (a carrier-to-carrier application). While NAT traversal features for carrier-to-enterprise application might have helped SBC vendors in generating some limited revenue four years ago, subscriber-side security has been overlooked until recently. For instance, the proliferation of consumer Voice-over-Broadband (a carrier-to-consumer application) has caught several vendors off-guard. There are just too many security issues in consumer Voice-over-Broadband which the SBC vendors need to address. Those who have taken the lead in solving them include **Acme Packet**, **Jasomi**, and **NexTone**.

Security issues on the subscriber side include eavesdropping, unauthorized call diversion, voice spam, fake caller ID, and complex Denial-of-Service (DoS) attacks. **Jasomi's** solution overcomes eavesdropping with encryption and authentication. With security transcoding, over-the-Internet portions of a call can be secured. **Jasomi** believes that over-the-LAN portions do need not to be secured. However, many security experts warn that the internal trusted domain is just as vulnerable to abuse. **Acme Packet's** solution secures over-the-LAN portion of a call as well. For problems such as unauthorized call diversion,

Acme Packet performs deep packet inspection and enforces the destination specifications (as contained in the packet headers) to be followed. The **NexTone** solution can detect mid-call IP address changes. Some of these diversions are actually legitimate (as in an IP-PBX). Thus, the **NexTone** solution has policy that allows such diversions only from authorized endpoints (such as IP-PBXs) that must be explicitly provisioned in the system. **NexTone** also has "call gaping functionality" which imposes call volume limits on a per-endpoint basis as well as on a per-platform basis. The result is a simple and straightforward method to stop malicious calling and voice spam.

Fake caller ID and Distributed Denial of Service (DDoS) attacks are some of the more difficult issues to handle. **Jasomi** and **Acme Packet** claim to have solutions that at least partially solve them. As voice traffic migrates from PSTN and cellular networks to IP, more and more problems will come to surface. SBC vendors will need to solve these technical challenges while balancing potential merger and acquisition temptations. Conversely, those SBC vendors who develop solid solutions to handle the increasingly complex security aspects of VoIP may be able to fetch a price premium. We believe that the session border control sector will continue to see consolidation with many of the larger public companies strengthening their position in this market through acquisition.

Verizon to launch cellular VoIP

Verizon has announced the launch of mobile VoIP on the carrier's EVDO (Evolution Data Optimized) network. The company is expecting to roll out services sometime in 2008. **Verizon** has committed to spending \$1 billion on EVDO, a network originally pitched as wireless broadband. The upgrade is expected to take peak burst rates up to 3.1 Mbps on the downlink and up to 1.8 Mbps on the uplink. **Lucent** and **Nortel** are the primary equipment suppliers for the upgrade.

Although the bundling of voice is an added incentive for potential users, as an always-on broadband type connection, subscribers can easily use services of VoIP ASPs, instead of subscribing to the planned voice package by **Verizon**.

Presence integration with public wireline / wireless networks

Instant Messaging (IM), which evolved from the widespread use of Internet Relay Chat (IRC), created the concept of “presence”, whereby a user would know the availability of his contacts before trying to communicate with them. Today, presence information may include various statuses to indicate willingness, availability, or a present state, such as being in meeting, out to lunch, etc. Presence signifies certain valuable parameters in terms of user ability, competence, willingness and conditions for effectual and meaningful communication.

During its formative years, presence information was useful in sending IM for social and entertainment purposes but the communications industry quickly realized that it was applicable to many applications and forms of communications. Presence information can be relevant in communicating across:

- Devices such as IP phones, PDAs, PCs and mobile phones
- Different media types like text, audio, video
- Various applications such as IM, telephony, conferencing, online interactive games

There are two sources of information available on a user’s availability: (1) user’s self-published presence and, (2) the presence information sourced from network. When combined, both can help make presence information more accurate and meaningful.

As such, it is ideal to compute and gather the availability of a user by using as many data sources as possible in addition to the user’s published or announced presence information. To determine availability, a lot of information can be used from the network that can measure and predict presence information. In the case of public telephone networks – both wired and wireless – some important information contained within these networks can be retrieved with statistical and analytical methods. Information like whether or not a user is on a phone call, whether or not the communicating device (such as a cell phone) is on, whether or not the user is roaming, how long it has

been since a user made or received a last call – all can be used to compute availability and presence.

The concept underlying presence is truly worthwhile. Presence will help build more managed and satisfying communication in addition to saving time and money. However, its integration into existing public networks – whether wireline or wireless – is a big challenge. There are several technical hurdles to developing a presence system which incorporates hybrid networks to work together using the multiple devices and communication end-points. It is also a challenge for presence solutions to deal with traditional and legacy devices.

Technically speaking, presence is a client-server model where a client, generally a presence user-agent or an edge device, requests services offered by the presence application server. The server maintains and updates the user presence information in addition to pooling presence information whenever the subscriber logs in or out. Generally, presence servers have APIs for different clients or edge devices such as PCs, PDAs, IP-based wireless devices, IP Phones and SIP Phones.

To practically facilitate access to presence services from within the PSTN, a SS7 solution serves as an interface connecting to an IP network, hence giving access to the presence server. The presence server can be attached to a softswitch (using the relevant APIs) to make the two media (PSTN and IP) communicate. Thus, the presence information is translated in a language that the PSTN can understand.

For fixed PSTN lines where a POTS phone is usually the device, integration of presence is a bigger challenge. POTS devices are not intelligent endpoints like mobile handsets or PDAs. Their primary function is to send and receive audio information in the form of dialling information, human speech or other audible tones over a connection to a telephone switch. POTS phones by definition cannot create a presence document and communicate it to the switching infrastructure. The telephone switch or a gateway, to which a POTS phone connects, could create a presence document or virtual status. It is also possible

Presence – continued

to add some intelligence by adding some text to speech (TTS) functionality or some audible tones, which can further be used to declare or publish the status and program or append the information in the presence server. For some tangible presence information, the phones and edge devices must use some interface that is understood by the presence server. An IVR could be used in case of POTS, which can guide a subscriber to somehow publish or fetch the user's presence information.

There are several vendors who have made an effort to integrate presence with public networks. They include **dynamicsoft** (now part of **Cisco**), **Ubiquity**, **Indigo Software**, **Hotsip**, and **Longboard** among several others. The presence server from **Longboard** is an integrated application of their multiple application server platform. A PSTN endpoint such as a POTS phone or a cellular phone would be accessible to the platform, and hence to the integrated presence application server, through a PSTN gateway. In the mobile environment, presence is accessible over a GPRS network or through a Mobile Switching Center (MSC). IP-based endpoints such as an IP phone, a PC or even an analog phone (through an IAD) can integrate with the presence service. In terms of integration with diverse media, **Longboard's** presence solution is one of the most comprehensive we have seen in the market.

Having been unable to successfully integrate presence with PSTN, several VoIP vendors rebuilt their presence server exclusively for wireless networks. This includes **dynamicsoft** (now **Cisco**) and **Ubiquity**. The presence solutions from these vendors target applications accessible from 3G mobile handsets, such as push to talk (PTT) and dynamic directory, which let mobile IM applications offer presence information to users and initiate conferencing.

Most of the presence server solutions on the market can support a minimum of 50,000 simultaneously subscribers. Scalability is critical if presence is to be integrated with the public networks. These solutions should be able to provide service to millions of

simultaneous users, but the current solutions are not near that capability. One solution could be using multiple nodes of application servers that can be configured to work together and managed centrally, scaling to millions of subscribers. Japan's **Tokyo Gas and Electric**, a customer of **Fusion Communications**, which uses a presence server from **Longboard**, has multiple servers that are deployed in parallel and managed centrally. This configuration scales up to 550,000 transactions during a busy hour, according to **LongBoard**.

The integration of presence with public networks will require operators to obtain PSTN/wireless presence state of a subscriber. For example in mobile networks, the home location register (HLR) is the principal device that currently contains state-related information. However, most HLRs do not support trigger-based features. To obtain presence information, network elements would need to poll for the data. This can be expensive if not managed properly. Furthermore, the HLR does not always know all current information. In some cases, notifications that the phone is powered off are delayed or not sent when the subscriber is roaming.

As with any new technology, there are challenges in deploying presence into a telephony network. These are the standard challenges – scale, availability, back end systems integration, operations and management – as well as developing an economic solution with a positive ROI. Unfortunately, presence on its own generates no revenue for operators, yet it empowers other applications and reduces churn, which is its best economic argument today.

Presence will likely be offered to consumers as a feature of some other application, such as push-to-talk, conferencing, UMS, IM, dynamic directory, or IP Centrex. In some cases, presence may even be invisible to the customer. Since presence will add features and will make other applications more useful and meaningful, ROI measurements may only use presence as a contributing factor. As a result, presence as a stand-alone application will be priced accordingly.

Presence – continued

Vendor	Standards	Integration	Applications
Cisco	SIP / SIMPLE SOAP	Mobile, PDA	Mobile IM, push to talk, missed call summary, dynamic directory conferencing
Alcatel	SIP / SIMPLE	PC, PDA, Mobile, PSTN	IM, conferencing, collaboration
Hotsip	SIP / SIMPLE Wireless Village Protocol	SIP clients for windows Wireless Village clients, Pocket PC, EPOC, PDA, and mobile phones	Messaging, voice and video, notification,
Indigo Software	SIP / SIMPLE	IP Based, PCs Web Portals, SIP Clients	Call center, find-me/follow-me, IM & conferencing, web portal NAT/firewall
Jabber	XCP (XMPP implementation) SOAP	Mobile, Desktops like IP phones, PC, PDA	Conferencing, IM, application sharing, gaming, NAT/firewall traversal
LongBoard	SIP / SIMPLE	PC, Mobile Phone SIP Phone, PBX, PSTN Phone, PDA	Voice chat, conferencing, mobile application (OnePhone)

Telstra goes global with enterprise VoIP

Telstra has launched T-VoIP, a global VoIP offering that builds upon the regional VoIP service of the company in the Asia-Pacific. The service runs on a private MPLS backbone so that the delay-sensitive voice can be treated differently from data traffic.

T-VoIP allows companies to make unlimited calls between their offices for a flat monthly charge per virtual voice channel. For off-net calls outside the enterprise, there is a flat rate per destination country regardless of where the call is originated. For example,

an off-net call to Japan would cost the same whether it was made from Los Angeles or London.

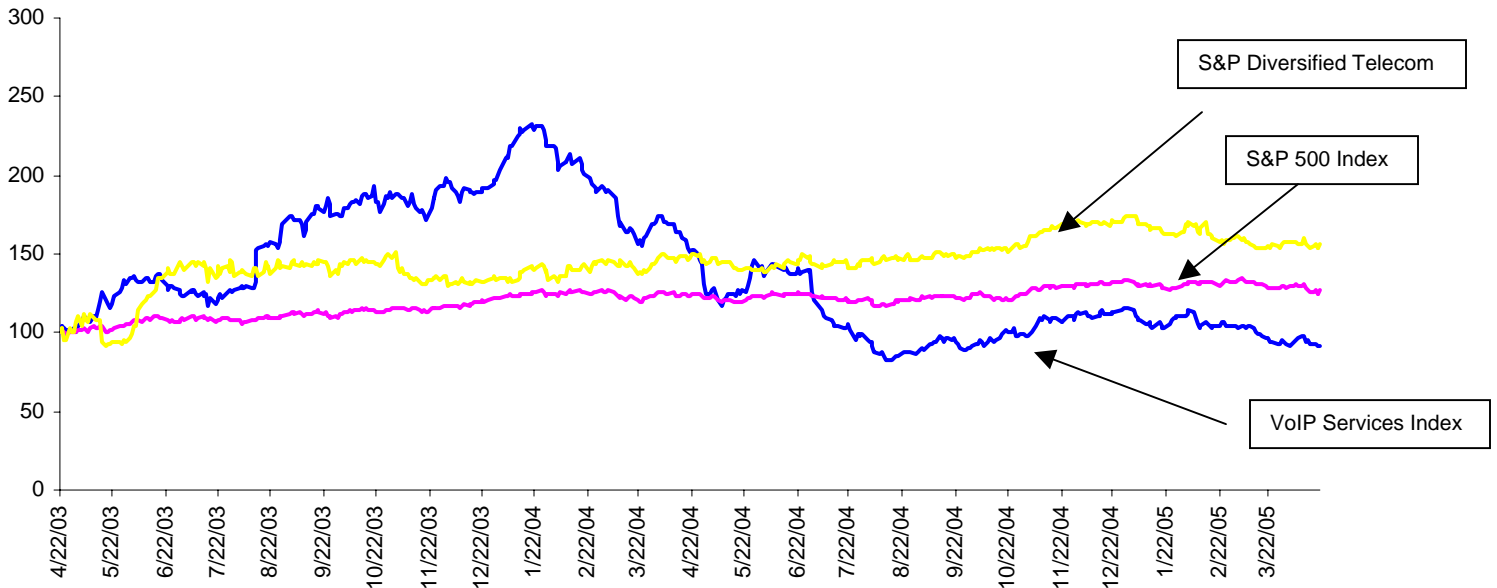
Telstra lets customers keep their traditional PBX platforms connecting them to Cisco routers equipped as VoIP gateways. Customers can buy virtual voice channels dedicated to VoIP calls or combine voice and data traffic on the same network. There is also a PSTN backup available.

The carrier is offering Service Level Agreements (SLAs) to customers, which is still rare in VoIP industry.

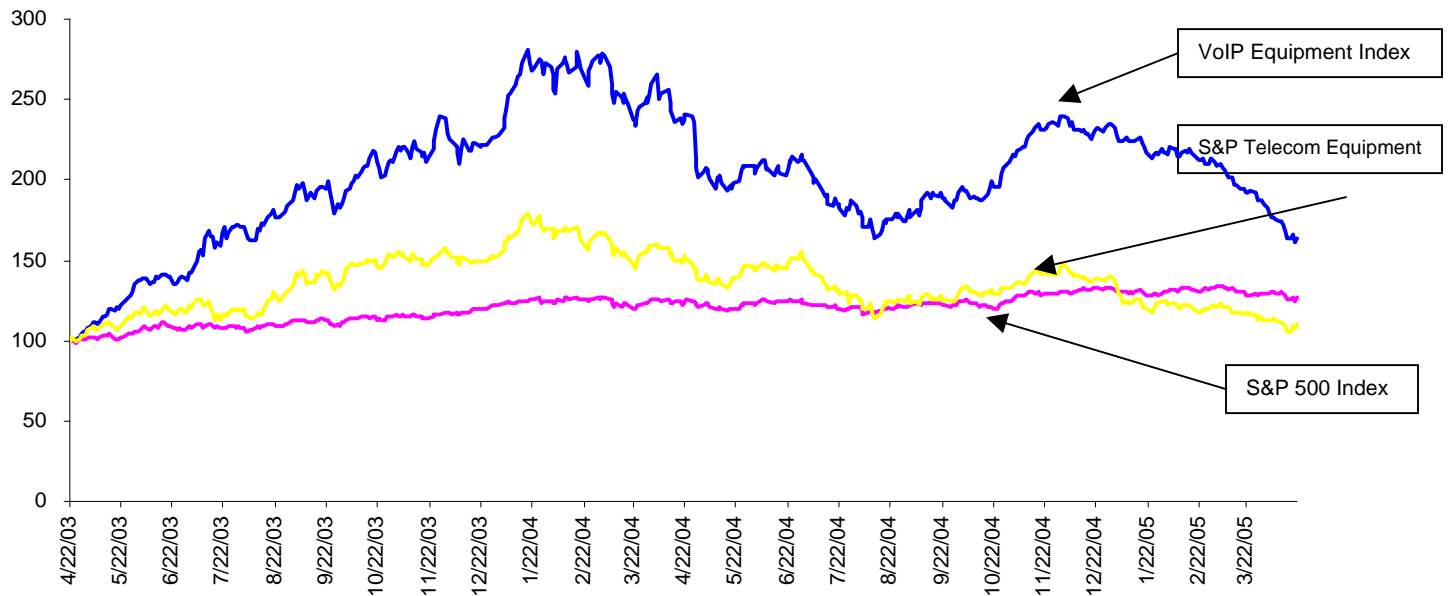
Financial developments March 2005

Company	Products/Services	Development	Details
VoIP, Inc	VoIP hosted service	Quarterly Results	Revenues \$2.0 million Net loss \$988,000
Fusion	Service provider	Quarterly Results	Revenues \$10.2 million. Net loss \$2.8 million
Kagoor Networks	Session border controller	Acquisition	Acquired by Juniper for \$67.5 million
Efonica	Retail VoIP services	Acquisition	Acquired by Fusion
ArelNet	VoIP gateways and software	Acquisition	Acquired by Airspan Networks for \$8.7 million.
Brix Networks	Test and monitoring solutions	Funding	Raised \$5 million in the latest round of funding.
MASERGY	VoIP Services	Funding	Raised \$45 million in funding

VoIP Services Index



VoIP Equipment Index



	Average Returns				
	<u>VOIP Services Index</u>	<u>VOIP Equipment Index</u>	<u>S&P 500</u>	<u>S&P 600 Diversified</u>	<u>S&P Telecom Index</u>
Annualized LTM	(39.09%)	(28.85%)	2.75%	6.14%	(25.20%)
30-Day Return	(10.55%)	(20.29%)	(3.81%)	(1.18%)	(9.23%)

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Virginia Office:

One Fountain Square
1911 Freedom Drive Suite 1080
Reston, Virginia 20190

Rod Hackman
David Ballarini
Lior Samuelson

rhackman@mercatorcapital.com
dballarini@mercatorcapital.com
lsamuelson@mercatorcapital.com

Israel Office:

Zvi Tower Building, 10th Floor
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel

(703) 995-5524
(703) 995-5521
(703) 995-5525

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