SBC

UPDATE

Consultant/Vendor Sales Group
January 2003

SBC Total Connections Offers Value, Convenience & Choice

• Bundle Now Available with Initial Annual Savings Ranging from $276 to $575 & One Bill

• Combines Discounts and SBC Yahoo! DSL or Dial, CingularWireless, Long Distance or Local Toll, Unlimited Local Calling, Call Management Services, DISH Network Digital Satellite

SBC Communications Inc. recently announced an evolution in its packaging strategy designed to retain and attract new customers in today's competitive marketplace by rewarding those who consolidate their communications services with SBC with significant discounts, extensive customization options and unparalleled convenience.

Called SBC Total Connections, the new marketing initiative will deliver to consumers integrated bundles that combine the simplicity of one bill and one call, expanded choice from a broad array of communications services, and the company's best available pricing.

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SBC National Data Transport Portfolio Enhanced

SBC has introduced an enhanced, standardized portfolio of national data transport solutions furthering its ongoing strategy to deliver to business customers a new class of integrated data and IP networking services on a national basis. These enhanced national data services, including new SBC Frame Relay, ATM and Private Line offerings along with the company's supporting data backbone networks, are critical in providing fully integrated communications services for

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Craig Tanikawa & Michelle Walker-Martin

Frustrated or Satisfied - How Does Your Call Routing System Affect Your Customers?

Wouldn't you like to know what your customers really think of your company? Well, there's an easy way to find out. Try this experiment. Call your company's direct line and listen. What do you hear? Is it a recorded voice that sends you down a black hole of confusing menu options? Or is it a professionally

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SBC Moves to a Single National Brand (p.18)

Inside

SBC Long Distance Streaming Media Broadcast

Feb. 19th (see back cover)

Vice President's Corner

Kari Watanabe
CVSG Vice President

Your Success Is Our Mission, We'll Always Be Here Sharing Your Vision

"HAPPY NEW YEAR"
To our readers, I want to personally wish each and every one of you a very Happy New Year and hope that you & your family and clients have the most successful and joyful year ever in 2003. We're here to help you maximize that success. Please call our Liaison Managers (1-800-552-5299) to assist you in your projects; to subscribe to our Listserver for Breaking Telecom News and to get you a Password for special access to CV Web Connect, where you can get the latest SBC & industry news, pricing, promotions, product news plus much more (even this UPDATE). Also, be sure and participate in our Streaming Media Broadcasts (the next one features SBC Long Distance on Feb. 19th from 9-11:30am PST; call your Liaison Manager for the URL or 1-888-889-6010 for additional details).

ALWAYS HERE FOR YOU

At your service in 1915

We've been helping business and residential customers for 125 years. The SBC heritage as a local operating company dates back to Jan. 28, 1878, when the world's first commercial switchboard was launched in New Haven, Conn.

From February through August of 1878, exchanges were established in San Francisco, St. Louis, Chicago and Detroit. These small local exchanges were the proud predecessors of SBC today. SBC Communications (www.sbc.com) has grown to be one of the World's leading data, voice and Internet services providers.

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SBC TOTAL CONNECTIONS

As of third quarter 2002, more than 7 million, or 22 percent, of SBC's customer base subscribed to a distinct package or bundle from SBC, creating significant potential for the company to incent customers to aggregate their services with SBC or opt for bundles instead of buying services on an "a la carte" basis. According to independent research, approximately 60 percent of consumers are interested in purchasing packages or bundles.

SBC Total Connections, the first bundle in the new SBC Connections family of bundles, combines SBC Yahoo! DSL or Dial, Cingular wireless, a low cents-per-minute long distance or local toll rate, unlimited local service and home phone calling features, where these services are available, starting at about $85 a month - for initial annual savings starting at $276. Depending on the state and the products and enhancements customers select, initial annual savings potentially can be as high as $575.

With SBC Total Connections, customers are able to personalize it to meet their needs; for example, they can add calling features like voicemail, or select from multiple wireless and long distance calling plans. Additional services and enhancements will be offered at the company's best available pricing at the time. The bundle is available via a single call and is all on one bill. Customers also can choose to add satellite TV entertainment through DISH Network; charges for that service will appear on a separate bill.

"SBC Total Connections is the best deal of its kind on the market - a deal no other provider in our service area can surpass," said Ray Wilkins, president, SBC Marketing and Sales. "But in the spirit of choice, we also offer a variety of other bundles, which also feature great values, convenience and customization options. Our goal is find the 'rightsized' plan for each customer."

SBC Total Connections is now available to new and existing customers. It currently is available in all regions the company serves except Connecticut, where it will be available in the future, and in markets where services are available. The bundle includes term agreements for certain products, including SBC Yahoo! DSL and Cingular Wireless service.

Today, a significant number of consumers in SBC's regions obtain their local service from one company, their wireless services from another, and their long-distance services from yet another provider. The ability to aggregate some or all of these services and receive significant discounts, a single bill and a single point of contact represents a new choice, savings and convenience for consumers. In fact, the broad range of communications services that will be made available makes the SBC Connections family of bundles unique in its marketplace - whether compared with direct competitors such as cable companies, long distance companies or competitive local exchange companies.

"There's significant upside opportunity for the provider that can crack the code on bundles and offer something other than a 'one-size- fits-all' package or bundle, and we believe SBC Total Connections and the new SBC Connections family of bundles will deliver what consumers really want," said Wilkins.

The company expects to offer additional enhancements to SBC Total Connections and new bundles under the SBC Connections family in the near future, including new long distance calling plans (where long distance is available) allowing for unlimited night and weekend calling and bundles that blur the lines between wireless and wireline.

For further details on SBC Total Connections' availability and requirements, contact your SBC Consultant Liaison Manager (1-800-552-5299.)

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VICE PRESIDENT'S CORNER

Through our World Class network, SBC companies now provide a full range of voice, data, networking and e-business services, as well as directory advertising and publishing. A Fortune 27 Company, America's leading provider of high-speed DSL Internet Access services and one of the country's leading Internet Service Providers, SBC companies currently serve nearly 60 million access lines nationwide. In addition, SBC owns 60 percent of Cingular Wireless, which serves more than 21 million wireless customers. Internationally, SBC has telecom investments in 28 countries. Amazing how our company grew, thanks to the foresight of a few creative and courageous individuals who had a dream. And all of you and your predecessors made this happen in our continuous effort to enable our customers to be all that they can be. For this, we say:

"Thank You."

Kari

(415) 542-4516
e-mail: kw6875@sbc.com

Cassandra Jessie-Johnson, SBC

DSL DATA REPORT

"HAPPY NEW YEAR"

2002 was a turbulent year for SBC. We had many successes and some lows across the market. It was no different in the DSL environment, however we ended the year on a high note. Between April and September we grew over 400,000 DSL lines. Our market share has increased month over month since the SBC Yahoo! Alliance. We also ended the year with the announcement that SBC would start this year off in the Long Distance market. One bill, one call, countless choices.

SBC Yahoo! Migration...

Now, all SBC Internet customers can benefit from SBC Yahoo! DSL or SBC Yahoo! Dial service. Effective November 18, 2002, all existing legacy SBC Internet Services DSL customers were able to migrate to the SBC Yahoo! portal via a download URL. Customers were notified by email and postcards. The web-based download version is simple to use, quick to complete and gives each customer the choice of components to download for their SBC Yahoo! DSL experience. Below are the minimum system requirements for basic download. Other software components have different minimum system requirements that are listed online during the download process.

Minimum System Requirements For Basic Download

Windows or Mac with Internet Explorer 5.0 and above 256 Color adapter with 800 x 600 resolution.

A CD option for upgrading will be coming sometime this month. Look for information in your mailbox.

If customers would like to take a tour of the SBC Yahoo! product, you can refer them to http://yahoo.sbc.com/.

Introducing Symmetrical 384 X 384...

Mid-month, SBC will introduce a new

SBC Yahoo! Highlights

- 110 MB on-line storage
- Parental Controls+Virus Software
- 3 premium listings in both SBC Y! Classifieds & SBC Y! Auctions
- 2 select premium services like Bill Pay, Games Membership and additional on-line storage
- 20% discount on additional Premium Services

product, SBC Yahoo! DSL Symmetric 384 - S Package, which is a Static IP offering for customers up to 12.5 K ft. Yahoo! It will be comfortably priced between the Deluxe - S Package and the Expert Plus - S Package. This will be a viable solution for your customers who need the increased upstream but at a lower cost for video conferencing, file transferring, and other business sensitive applications.

We're No. #1...

Since the leading three Internet Service Providers all launched new versions of their services in 2002, comparisons were plastered all over the media. Forrester Research was one of the first technology analyzers to report out. What did they report? On a scale of 1 to 5, SBC Yahoo! came in at 4.3, compared to 3.8 for one competitor and 2.9 for another. Forrester's report cited SBC Yahoo! DSL and Dial as leading Internet services with strong current offerings and go to market strategy.

Rack Rates for SBC Yahoo! DSL Internet Service:

The availability of the new speeds is contingent upon the distance the customer's premise is from the Central Office (loop length). If the SBC Yahoo! DSL service is served by a Remote Terminal (RT), the loop length limitation does not apply. The guaranteed speed is the minimum speed in the speed range selected. Actual throughput speeds will vary due to Internet congestion and other factors associated with the Network or the customers' computer.

Product Name Speed (downstream x upstream) Loop Length Rack Rate: **SBC Yahoo! DSL Basic Package** up to 384Kbps x 128Kbps 16K ft $42.95/mo **SBC Yahoo! DSL Standard Plus Package** 384Kbps - 1.5Mbps x 128Kbps 12K ft $49.95/mo **SBC Yahoo! DSL Standard Plus – S Package** 384Kbps – 1.5Mbps x 128Kbps 12K ft $64.95/mo **SBC Yahoo! DSL Deluxe Package** 768Kbps – 1.5Mbps x 256Kbps 9K ft $59.95/mo **SBC Yahoo! DSL Deluxe – S Package** 768Kbps – 1.5Mbps x 256Kbps 9K ft $79.95/mo **SBC Yahoo! DSL Expert Plus – S Package** 1.5Mbps – 6Mbps x 384Kbps 7.5K ft $159.95/mo

More Promotions

Our incredible promotional rates will continue this year, affording your customers a generous opportunity to experience SBC Yahoo! DSL at discounted prices. Customers can enjoy discounts on CPE, monthly rates as low as $39.95/month and waivers of processing fees. Bundled customers can enjoy even steeper discounts. Mail drops are coming your way soon. Listen for radio ads announcing an offer in your neighborhood!

Poised For Take Off

SBC continues to demonstrate industry leadership by expanding the availability of DSL Internet access service. To date, the service is available to more than 28 million customer locations. In October 2002, SBC held the honor of being the first provider to reach 2 million DSL Internet subscribers, even in the face of a weak economy. At the end of the month, we had nearly 1,780 Remote Terminals (RTs) with over 10,760 Distribution Areas (DAs) ready for service, in ASI West and SBC (California) and SBC (Nevada). For more information, to qualify your customers for SBC Yahoo! DSL Internet Service, as well as to order the service for your clients, contact the Unique Services Center South Consultant Queue at 1-866-234-4DSL (4375).

Cassandra is Associate Director—Voice & Data Solutions, SBC

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SBC NATIONAL DATA TRANSPORT PORTFOLIO ENHANCED

businesses of all sizes, especially larger companies, businesses with multiple locations or those with complex needs. The standardized national data services (replacing previous regional offerings) add new levels of convenience for SBC's customers, providing identical pricing and service features throughout the company's regions and nationwide. The offerings are available today in all SBC regions. The company's new, standardized service offerings deliver greater convenience and flexibility for customers.

SBC's new standardized Frame Relay, ATM and Private Line services provide customers with the following benefits and options:

· The same features, terms and pricing across all of SBC's regions and a single point of contact for customers with transport needs ranging throughout SBC's territories.
· New service capabilities, such as alternate routing, disaster recovery and permanent virtual circuits with quality of service.
· A new bundled offering for locations outside of SBC's local service territory, allowing more cost-effective and efficient connection to the SBC data networks.
· Enhanced Service Level Agreements providing industry-leading performance and reliability guarantees for customers.
· Seemless international Frame Relay and IP services covering 48 countries, as well as dedicated international Private Line service to Mexico. These new services are available as standalone offering or as the transport foundation for SBC's PremierSERV (SM) Network Management offerings.

To find out where these networks and related services are available today, please contact your SBC Liaison Manager (1-800-552-5299).

Jerry Hinek, SBC

The Perils of E-mail

I imagine we all have a bit of a love/hate relationship with E-mail. I can contribute this article to Update by sending it in as an E-mail attachment. I can coordinate meetings and communicate with friends or colleagues in different Time Zones. But all that junk mail and all those viruses... This article will discuss many of the real problems that come our way through our E-mail systems.

Viruses

A computer virus is an executable code written deliberately to cause a computer to do something that the owner does not want. The damage can vary from trivial annoyances such as ridiculous pop-up reminders to go to lunch to catastrophic destruction of the contents of disk drives. Virus techniques have developed and evolved as our technology has. The writers make use of the most common technologies to infect the most people in the shortest time. There's always a foot race between those who write the viruses and the companies that develop the antidotes. The virus writers are always in the lead.

Pre-E-mail Viruses

There were two early types of computer virus: ones written to attach themselves to executable files on a PC or Macintosh and those that infected the boot sector on a PC. Computers were not normally networked as they are now and viruses could be spread only on diskettes exchanged among people or by means of bulletin boards that people could dial into using a slow analog modem. Both of these types of virus spread slowly because the technology of the day would not allow for anything fast.

File-Infecting viruses could only spread or do any damage when a user ran the executable file. File-Infecting viruses spread slowly.

Boot sector viruses could only spread when someone turned on or re-booted a PC while an infected diskette was in the boot drive (usually the A:\ drive).

Macro Viruses

Macro viruses were written to take advantage of the newer technology of powerful macro languages. They weren't written specifically to spread rapidly but the rapid growth of the Internet and of

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THE PERILS OF EMAIL

E-mail usage turned macro viruses into a very large and worldwide problem. People merely had to open a document or spreadsheet sent by someone known and trusted and they were infected.

Microsoft® wanted to make its software very useful to people and to businesses, so it developed robust macro languages for its products. MS Word® documents could have hidden code that might fetch the current date or edit a form as a person filled it in.

Business recognized the benefit of E-mail; E-mail became more powerful. No longer was E-mail only for sending plain text messages, people could attach other files, including MS Word® documents, to their message.

The first MS Word® macro virus was called the "Concept" virus. It spread far faster than any previous virus and it took the Anti-virus vendors several months to develop the tools to detect and clean the Concept virus. In fact Microsoft, which had never been in the anti-virus business, had to publish the first cure for the Concept virus. The cure was an MS Word® macro. Fortunately Microsoft® gave it away for free.

E-mail Viruses

The development of powerful macro languages did not stop with word processing and spreadsheets; they are used in E-mail software as well. E-mail programs have become more useful, allowing messages to have graphics, hyperlinks to web pages and embedded code to do useful things. The Melissa virus took advantage of the power of E-mail by sending itself to people in your E-mail address books. The virus hopped from computer to computer as people opened what appeared to be an ordinary E-mail from a known sender. It took the Melissa virus less than a day to spread around the world to millions of computers. We learned that day to be suspicious of E-mail, even from people we know and trust.

Fighting Computer Viruses

Combating computer viruses requires a combination of technology and awareness. If you control your own E-mail servers you should deploy anti-virus software on the server to scan all incoming E-mail attachments for virus infected attachments and for hostile code. You should also deploy anti-virus software on all user workstations. You have to keep this software up to date. Finally you must constantly be suspicious of E-mail that looks odd. Tell your staffs to check with the sender or just delete suspicious E-mail.

Hoaxes

Hoaxes are insidious, Social Engineering messages that can cause real harm to people, systems and institutions. They cause harm not because they are executable code but because they ask lots of people to do things that wind up causing the damage. There are several categories of E-mail hoax that make different claims and cause different kinds of problems.

Virus Alerts

It's bad enough that some technically savvy people use E-mail to spread computer viruses, but other people see E-mail as an opportunity to make up fictitious computer virus alerts that create a completely different set of problems. Some people describe these virus alert hoaxes as Social Engineering viruses. A message arrives in your E-mail with a subject line and text that imply a lot of urgency. A typical virus hoax states that some company announced a new and evil virus "yesterday" that the anti-virus software can't detect. The hoax then asks you to warn everyone you know by E-mail so that the virus won't hurt you or the people whom you warn.

Some recent viruses also instruct the user to delete certain files on your computer that the message claims are part of the virus. The files that the user deletes are actual MS Windows® files. They should not be deleted.

Charitable Chain Letters

Some hoaxes go out in E-mail with messages that say that for every E-mail going to a particular E-mail account a certain amount of money will be contributed to the care of some individual dying of cancer. Usually the person named does not exist and no one will actually donate money to anyone or anything as a result of sending the message. But people can be so nice that they comply and the owner of the E-mail account can no longer use it. Sometimes entire E-mail systems have had to be scrapped because of a charitable chain letter hoax like this one.

Public Health Hoaxes

Public health hoaxes warn people that certain bad things have happened to innocent victims; they ask you to spread the word as widely as possible to prevent other victims. Usually they attribute the warning to a government or public health agency. There will often be the name of a legitimate person at the victim agency. People don't stop and think that legitimate agencies would use the mass media to alert people. E-mail is fast, but it can't hold a candle to radio and TV.

Cash Payment Hoaxes

One recent hoax claimed that Microsoft® was testing a new E-mail tracking system and that it would pay people to send on the message to others. The author

claimed to have gotten thousands of dollars already despite having felt doubtful to begin with. The message was playing upon your own feelings that the message was dubious so that you would buy into sending it around. Really greedy people sent the hoax to thousands of people all at once. This caused enormous strain on E-mail servers.

Financial Fraud

Several years ago, the CBS TV Show 60 Minutes did a story on a type of fraud that comes from Nigeria. The perpetrators send letters to people promising millions of dollars in reward if the recipient could help the sender in getting money out of Nigeria. This was all an elaborate ruse to get the recipient either to send money to the sender or to send personal bank and financial information to the sender. People who fall for the scam wind up poorer. This scam now spreads in E-mail. There are many variations of the text, but the message is fairly similar: "This is all legitimate and you will get rich." Don't trust it.

It's Bad Enough

that some technically savvy people use E-mail to spread computer viruses, but other people see E-mail as an opportunity to make up fictitious computer virus alerts that create a completely different set of problems.

The Problems with Hoaxes

We all know that hoaxes are bad. Some hoaxes are against the law. You can be arrested and prosecuted for calling in a phony bomb threat. A real bomb threat is also a crime, but not a hoax. What makes E-mail hoaxes special is that they spread very quickly and cause problems by their volume. The primary problems with E-mail hoaxes are:

- Denial of service
- Loss of productivity
- Loss of credibility for legitimate sources of emergency information
- Loss of your own credibility
- Financial harm

Denial of Service

Hoaxes that spread to hundreds or thousands of readers may ask recipients to contact a certain phone number or E-mail account. That is normally sufficient to overwhelm systems or personnel not prepared to handle so many messages. Universities, police departments, hospitals and businesses have been harmed by hoaxes. And people trying to reach the organization with legitimate business are harmed by not being able to get through.

Loss of Productivity

When hoaxes spread through organizations people are distracted from their real work and motivated to pass along the hoax to others further disrupting their days. In a large business a hoax can be sent to thousands of people in a few hours. Once they are out of the bag, hoaxes usually have to just die out on their own. Sending thousands of E-mails to an entire company to tell everyone that there is a hoax creates its own problems. In the meantime, several thousand people have each lost a few minutes of productivity.

Loss of Credibility

When computer viruses spread, anti-virus companies and legitimate computer security organizations analyze the threat and react professionally. Many computer virus hoaxes claim that the anti-virus companies can not combat the fictitious threat. People feel that their own security support people are not on the job and keeping them safe from threats. And when these legitimate organizations do send out messages to people, the messages receive less attention than they should. This same is true for the public health agencies and police department who are also harmed by some hoaxes.

Hoax Characteristics

Hoaxes have different content depending on who or what the author wants to harm. The one thing most hoaxes have in common is that they try to get you to do something. The most common characteristic is that hoaxes ask you to send copies of the message to everyone you know or everyone in your E-mail address book as quickly as possible to spread the word. Any message that asks you to do this should be suspect, even if it comes from your mother. The people who send the hoax to you are just as fooled as the people who sent the hoax to them.

Hoaxes use your emotions rather than appeal to your reason. Most hoaxes try to scare you to do something before a bad thing happens. Others appeal to different emotions including greed and human kindness. They will usually attribute the message to some reputable person or business. Sometimes they just try to affect a trustworthy tone. All of them ask you to spread the word.

Combating Hoaxes

The three most important things in combating hoaxes are Awareness, Awareness and Awareness. You have to stay informed, stay alert and inform other people. The more people who can send back a message to their well meaning friend and tell them that the message is a hoax, the fewer hoaxes we will all see.

Hoaxbusters

The US Department of Energy maintains a great list of known E-mail hoaxes broken down into several categories. It's a great place to check first whether that message you got is real or not. http://hoaxbusters.ciac.org/HBHoaxIndex.html.

SPAM

We all see the SPAM every day in our Inboxes. From business propositions to Internet drugs to invites to visit porn websites. We've all gotten a lot of humor because anyone who laughs at a joke on the web wants to pass it along. After a while we don't accept mail from some friends. People hate all the unwanted mail and are pressuring the government to help stop it. It's virtually impossible to stop someone who is determined to send you E-mail. No E-mail filter can help you get rid of all SPAM unless you just delete everything. Filter what you can, delete the rest.

No E-mail Filter

can help you get rid of all SPAM unless you just delete everything.

Filter what you can, delete the rest.

What's Coming Next?

Cell phones and PDA's can accept E-mail. It won't be long before people exploit these devices, perhaps scrambling your appointments or ringing when no one is calling. Perhaps calling someone else randomly while your phone is on the dresser at night. New technology is great for all the convenience it brings us. The benefits outweigh these problems, but to minimize the problems you have to keep yourself informed. Don't be an easy target.

Jerry is a Senior Business Security Manager for SBC Services. He earned an MBA in Information Management & is a Certified Information Systems Security Professional.

Paul Bedell, SBC

Ethernet Passive Optical Networks (EPON) - The Simple PON

Ethernet passive optical networks (EPON) are an emerging access network technology that provide a low-cost method of deploying optical access lines between a carrier's central office (CO) and a customer site. EPONs build on the International Telecommunications Union (ITU) standard G.983 for asynchronous transfer mode PONs (APON) and seek to achieve the dream of a full-services access network ("FSAN") that delivers converged data, video, and voice over a single optical access system.

PON can support transmission up to 12 miles, depending on the number of customers on the network and the capabilities of the laser signal regeneration, which is why it's only targeted for short metro links. Carriers are just beginning to deploy PON, with players like Quantum Bridge, Paceon, and Optical Solutions offering systems today.

Evolution of Passive Optical Networks

Passive optical networks (PONs) address the last mile of the communications infrastructure between the service provider's CO, head end, point of presence (POP); and business or residential customer locations. Usually , only large enterprises can afford to pay the $3,200 – $4,300 per month it costs to lease a DS-3 circuit (45 Mbps) or optical carrier (OC–n) SONET connection. T1s that cost $375 per month (average) are an option for some medium-size businesses, but most small and medium-size enterprises and residential customers are left with few options beyond plain old telephone service (POTS) and dial-up Internet access at 56Kbps. Where available, digital subscriber line (DSL) and cable modems offer a more affordable interim solution, but these services are difficult and time-consuming to provision. DSL availability is also constrained based on whether or not the required electronics are in serving central offices.

In EPON systems, bandwidth is limited by distance and by the quality of existing wiring (similar to xDSL services); and voice services aren't widely implemented over these technologies. The result is a growing gulf between the capacity of metro networks on one side and end-user needs on the other side, with the last-mile bottleneck in between. PONs aim to break the last-mile bandwidth bottleneck by targeting the "sweet spot" of bandwidth between T1s and OC–3s that other access network technologies do not adequately address. This bandwidth area also includes a sweet spot that will provide a variety of cost-effective speeds and feeds that don't exist today.

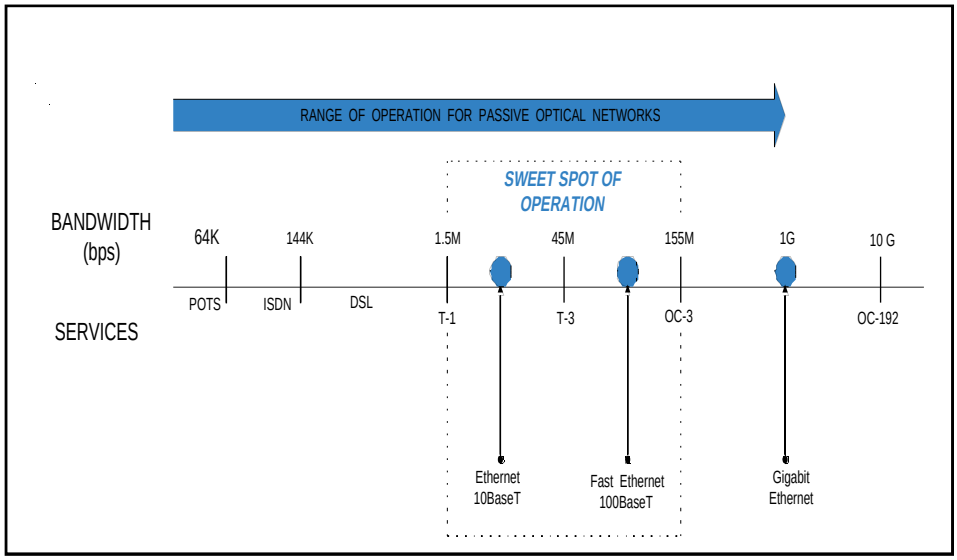


Figure 1: Ideal Frequency Range for Passive Optical Networks

EPONS Versus APONs

The key difference between EPONs and APONs is that in EPONs, data is transmitted in variable-length packets of up to 1,518 bytes (maximum) according to the IEEE 802.3 standard for Ethernet. Conversely, in APONs data is transmitted in fixed-length 53-byte cells (with 48-byte payload and five-byte overhead), as specified by the ATM protocol. This format means it's difficult and inefficient for APONs to carry traffic formatted according to the Internet Protocol (IP). IP calls for data to be segmented into variable-length packets of up to 65,535 bytes maximum. For an APON to carry IP traffic, the packets must be broken into 48-byte segments with a 5-byte header attached to each one. This process is time consuming and complicated. It adds protocol overhead in the form of the notorious ATM "cell tax", which adds additional cost to the OLT and ONUs. When using ATM in any architecture, 5 bytes of bandwidth are wasted for every 48-byte segment, creating an onerous overhead. By contrast, Ethernet happens to be tailor-made for carrying IP traffic and dramatically reduces overhead compared to ATM.

EPON Fundamentals And Benefits

Unlike point-to-point fiber-optic technology which is optimized for metro and long-haul applications, EPONs are specifically designed to address the unique demands of the access network. Because EPONs are simpler, more efficient, and less expensive than alternative access solutions, EPONs finally make it cost-effective for service providers to extend fiber into the last mile. This allows them to reap all the rewards of a very efficient, highly scalable, low-maintenance, end-to-end fiber-optic network.

The key advantage of an EPON is that it allows carriers to eliminate complex and expensive asynchronous transfer mode (ATM) and SONET network elements and to dramatically simplify their networks. Traditional telecom networks use a complex, multi-layered hierarchical architecture which overlays IP onto ATM, SONET, and WDM. This architecture requires a router network to carry IP traffic, ATM switches to create virtual circuits, add/drop multiplexers (ADM) and digital cross-connects (DCS) to manage SONET rings, and point-to-point DWDM optical links.

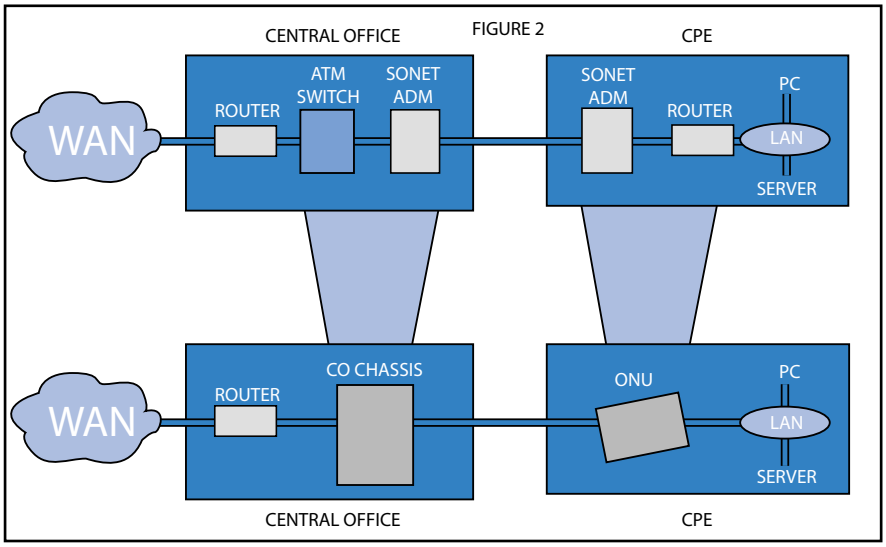
There are a number of limitations inherent to this legacy architecture:

- It is intensely difficult to provision because each network element (NE) in an ATM path must be provisioned for each different service
- It's optimized for time division multiplex (TDM) voice—not data—so its fixed bandwidth channels are ultimately inefficient and have difficulty handling bursty data traffic
- Legacy TDM-based architectures require inefficient and expensive optical-to-electrical-to-optical (O–E–O) conversion at each network node
- They also require installation of all nodes up front (because each node is a regenerator), and older architectures do not scale well because of their connection-oriented virtual circuits.

In the example of a streamlined EPON architecture in Figure 2, an optical network unit (ONU) replaces the SONET ADM and the router at the customer premise, and an optical line terminal

"See an individual in every customer."

Figure 2



Source: www.iec.org

Figure 2: How EPON Simplifies Carrier Network Architectures: "Before" (top) and "After" (bottom)

(OLT) replaces the SONET ADM and the ATM switch at the CO. Figure 2 below illustrates how EPON streamlines service provider architectures when compared to legacy designs and operations.

To summarize, an EPON architecture offers carriers a number of benefits. First, it lowers up front capital equipment and ongoing operational costs relative to SONET and ATM costs. Second, an EPON is easier to deploy than SONET/ATM because it uses simpler hardware and no outside plant electronics, which reduces the need for experienced technicians. Third, it enables flexible provisioning and rapid service reconfiguration. Fourth, it offers multi-layered security, such as virtual LAN (VLAN) closed user groups and support for virtual private networks (VPNs), IP security (IPSec), and tunneling. Finally, carriers can increase revenues by exploiting the broad range and flexibility of service offerings available over an EPON architecture. Profit margins will be higher due to lower infrastructure costs. This includes delivering bandwidth in scalable increments from 1 Mbps to 1 Gbps and value-added services such as managed firewalls, voice traffic support, VPNs, and Internet access.

The development of EPONs has been spearheaded by several visionary start-up companies that feel the APON (ATM-based PON) standard is an inappropriate solution for the local loop because of its lack of video capabilities, its insufficient bandwidth, its complexity, and its higher expense. And as the migration to Fast Ethernet, gigabit Ethernet, and now 10 gigabit Ethernet gathers steam, these start-ups believe that EPONs will eliminate the need for conversion in the wide-area network LAN / WAN connection between IP and ATM protocols.

EPON vendors are focusing initially on developing fiber-to-the-business (FTTB) and fiber-to-the-curb (FTTC) solutions, with the long-term objective being the realization of a full-service fiber-to-the-home (FTTH) solution for delivering data, video, and voice over a single platform. While EPONs offer higher bandwidth, lower costs, and broader service capabilities than APON, the architecture is broadly similar and adheres to many G.983 recommendations.

In November 2000, a group of Ethernet equipment vendors kicked off their own standardization effort under the auspices of the Institute of Electrical and Electronics Engineers (IEEE), via the formation of the Ethernet in the First Mile (EFM) study group. Sixty-nine companies have indicated they'll participate in the group, including 3Com, Cisco Networks, Alloptic and World Wide Packets.

Passive Optical Network Architecture

The passive elements of an EPON are located in the optical distribution network (also known as the outside plant). They include single-mode fiber-optic cable, passive optical splitters/couplers, connectors, and splices. Active network elements (NEs), such as the OLT and multiple ONUs, are located at the end points of the PON. Optical signals traveling across the PON are either split onto multiple fibers or combined onto a single fiber by optical splitters/couplers, depending on whether the light is traveling up or down the PON.

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KEY: The PON is typically deployed in a single-fiber, point-to-multipoint, tree-and-branch configuration for residential applications.

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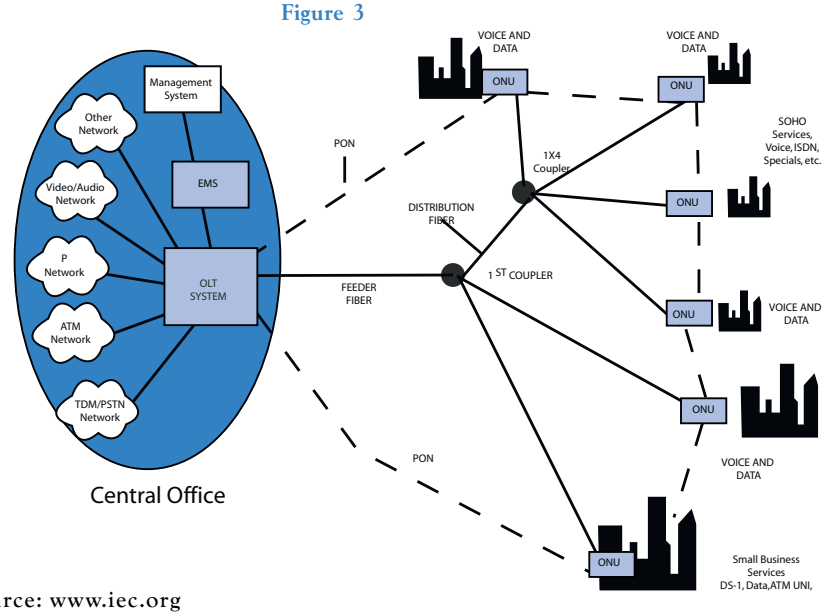
continued on page 8

Figure 3



Source: www.iec.org

Figure 3: Passive and Active Network Elements of a PON

continued from page 7

EPON THE SIMPLE

The PON may also be deployed in a protected ring architecture for business applications, or in a bus architecture for campus environments and multiple-tenant units (MTU).

See Figure 3 for an illustration of a PON architecture.

Economic Justification For Ethernet PONs

Cost-Reduction Opportunities

EPONs offer service providers unparalleled opportunities to reduce the cost of installing, managing, and delivering existing service offerings. For example, EPONs can :

• Replace active electronic components with less expensive passive optical couplers that are simpler, easier to maintain, and longer lived

• Conserve fiber and port space in the CO Share the cost of expensive active electronic components and lasers over many more subscribers

• Deliver more services per fiber and thereby slash the cost per megabit

•Enable long-term cost-reduction opportunities based on the high volume and steep price/performance curve of Ethernet components

• Save the cost of truck rolls because bandwidth allocation can be done remotely. It's estimated that each truck roll costs service providers around $750

• Use standard Ethernet interfaces which eliminates the need for additional DSL or cable modems

• Prevent the need for electronics in outside plant, which reduces the need for costly powering and right-of-way space

• Free network planners from trying to forecast the customer's future bandwidth requirement because the system can scale up very easily

continued on page 18

Point-to-Point Fiber Access	EPON
Point-to-Point Architecture	Point-to-Multipoint Architecture
Active electronic components are required at the end of each fiber and in the outside plant.	Eliminates active electronic components such as regenerators and amplifiers from the outside plant, and replaces them with less-expensive passive optical couplers that have simpler designs, are easier to maintain, and have longer lives than active components
Each subscriber requires a separate fiber port in the CO.	Conserve fiber and port space in the CO by passively coupling traffic from up to 64 optical network units (ONU) onto a single fiber that runs from a neighborhood demarcation point (splice box or manhole) back to the service providerês CO, head end, or POP
Expensive active electronic components are dedicated to each subscriber	The cost of expensive active electronic components and lasers in the optical line terminal (OLT) is shared over many subscribers

Table 1: Comparison of Point-to-Point Fiber Access vs. EPON

The economic case for EPONs is simple: fiber is the most effective medium for simultaneously transporting data, video, and voice traffic, and it offers virtually unlimited bandwidth. But the cost of running fiber point-to-point from every customer location all the way to the CO, installing active electronics at both ends of each fiber, and managing all of the fiber connections at the CO is obviously prohibitive.

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KEY: EPONs address the shortcomings of point-to-point fiber solutions by using a point-to-multipoint architecture in the outside plant portion of the network instead, by eliminating costly active electronic components such as regenerators, amplifiers, and lasers, from the outside plant. Active components will always cost much more than passive components. In the PON scenario, the passive component is a type of optical splitter, a prism of sorts. This prism re-directs optical signals (lambdas) down different routes in the "last miles".

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Mark Fei

Grid Computing: An Example of the Confluence of Telecom and Computing

What is grid computing? And why do we, in telecommunications, care? We'll answer the first question in this article. We care about grid computing because it is one of the things that are going to help restore strength in the telecommunications industry.

Background

There has been a lot of discussion in the last couple of years about bandwidth gluts. We have heard that the dismal condition of the telecom market is partially a consequence of excessive deployment of fiber optic capacity. There is some truth to this but the problem is more one of timing than of any real excess in capacity. Networks have been built in anticipation of demand that hasn't materialized—yet.

Sometimes Interesting Technology

ideas float around for a while

before they get

enough traction to be widely noticed.

In a now-famous speech several years ago, Bob Metcalfe (co-inventor of Ethernet and founder of 3Com) made the prediction that the volume of traffic in private networks (he was specifically talking about LANs) was growing at such a rate that it would cause the collapse of the Internet. Well, as we can now see, the Internet has scaled nicely to accommodate the growth of traffic. The question now is: has "the Internet" (i.e., backbone links and switches) scaled too far? Do we really have a glut of capacity somewhere? Anywhere? I'll dodge this one for now and say, "maybe", but even if so, this is a temporary condition. As is often the case, so often that it's become a hackneyed cliché, what's really needed to restore the economic balance is a killer application. There is no question that all of the capacity currently in place will get exhausted; there is only the question of when. We can't answer that with any precision but we can understand what some of the applications are which will utilize this capacity and that will give us some insight into the future.

We're going to look at one such application for the remainder of this article.

A Little Push

Sometimes interesting technology ideas float around for a while before they get enough traction to be widely noticed. There are many things that can help spur this traction, but one would be bold statements about $10 billion dollar investments by IBM. That's exactly what happened at the end of October when Sam Palmisano, IBM's new CEO, announced their commitment to the "on demand" future which has grid computing as a principal enabler.

A Very Brief History of Computing

Business computing is a little more than 40 years old. A timeline of computing could be broken down into three overlapping phases, with their start times roughly as shown:

Stand-alone (began in 1960s)
Distributed, aka Client/Server (began in 1980s)
Networked (began in 1990s)

Each new phase does not replace, but rather adds to, the methods of earlier phases.

In the stand-alone era, computers worked autonomously—they were fed programs and data and they returned results. In the distributed, or client/server era, computers are connected together so that computational workloads can be shared to a certain degree. However, such sharing was rigidly and narrowly defined. An example would be mainframe computers (servers) performing complex database operations while desktop PCs (clients) handle functions like user interface, information display, etc. The third era, in which we find ourselves today, is largely driven by the Internet and the open protocols that have evolved with it. Users are able to access a great variety of information resident on vast numbers of computers located, potentially, anywhere on Earth. The client/server model is also a crucial element in this era, i.e., your PC is the client and you are requesting information from servers located elsewhere. An important thing to note here is that while information is widely distributed and accessible from nearly anywhere, actual computational horsepower is still very statically located.

Let's look at an example to better understand what this means. Imagine a scenario in which you run standard productivity applications on your PC (e.g., word processing, spreadsheet, email, browser, etc.) Hopefully, your PC is equipped with sufficient processing power, memory, and other resources to run those applications satisfactorily. Now let's further imagine that you have a new requirement to run a video editing application on your PC, but you're only going to need to do this kind of work occasionally. What you quickly discover is that your PC is woefully inadequate to this new chore and you wind up spending countless hours waiting for tasks to be completed. In order for this video editing to be accomplished in a reasonable amount of time you need more computer horsepower than you currently have sitting on your desk. But, if you were to go buy that horsepower, it would sit, unused, for most of the time. What would be ideal would be the ability to somehow grab (borrow, buy or rent) computational horsepower across a network from other computers, available when you need it.

Enter Grid Computing

Grid computing is the solution to the problem just described. Grid computing is sometimes described as making computing power available the way that electric power is—just plug in and use (and presumably pay for) what you need, when you need it. This is not a radically new idea but rather a very reasonable next step in the evolution of computing. We move from the notion of clients and servers to one of peer-to-peer computing, but we extend this model in dramatic and, more importantly, dynamic new ways by allowing applications to automatically find not only distributed sources of information, but distributed sources of raw computational power.

> **For Most of the 40 Years**
>
> of computer history, computers have been capable of manipulating and moving data internally far faster than the data could be moved between computers.

Accomplishing what I've just described is not trivial technically, and will require significant work in the areas of open standard protocols and methods. There is a tremendous amount of work that has already been done and there are exciting trials already underway which provide proof of concept. Let's take a few more minutes to explore what the implications are in our bailiwick—the network.

Impact on the Network

For most of the 40+ years of computer history computers have been capable of manipulating and moving data internally far faster than the data could be moved between computers. Simply put, computers were very fast but networks were slow. Furthermore, any networks that were fast enough to keep up with the computers (high speed LANs, data center technologies like ESCON, FICON, Fibre Channel, etc.) all had serious distance limitations so their application was limited to use within a building or campus. Advances in network technology in the last few years have produced an interesting leap-frog effect. We now find that networks can be faster than the computers. In essence, the computers, not the network, are sometimes the bottleneck in information processing.

This improvement in networking capability is what makes grid computing possible and economically viable. If sufficient throughput can be obtained economically, then distributed computing nodes can be tied together to share their horsepower. However, in order for this to function on a significant scale, the throughput needed will be measured in gigabits per second, at a minimum. In other words, there has to be enough bandwidth, with low enough latency, that the computers don't waste time waiting for data.

Conclusion

There are a few people left in the world (and I'm one of them) who are still very optimistic about the future of telecommunications. This bright future will materialize because there will be applications that consume huge amounts of bandwidth, but that bandwidth has to be available very inexpensively. The solution to the current economic woes facing many carriers is not to attempt to recapture higher prices for services, but to help enable massive consumption of services, which can only happen if the services become cheap.

For a look at grid computing today and an interesting example that you can participate in from your own PC, see http://www.fightaidsathome.org. This particular example does not consume vast amounts of bandwidth because most of the participants don't yet have the bandwidth available, but it does illustrate the grid computing model.

Mark, founder of Fei Communications Group, LLC, has been training CEOs and other leaders in the Telecom World for nearly 20 years. He can be reached at www.fei-comm-group.com.

Opinions expressed are not necessarily those of SBC.

"A Kind Word Is Like A Spring Day."

Russian Proverb

Jagdish Kohli, Ph.D.

Health-Oriented Technologies (HOT)

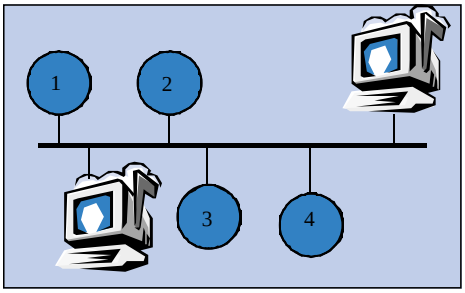
The 20th century was about electronics and micro-miniaturization, making things smaller, faster and cheaper. The 21st century will be the century of quality of life and health, application of technologies to improve health. Here we explore the following two areas where new health oriented technologies (HOT) will continue to provide better quality of health for the masses. These include:

- Healthcare Enterprise Technologies
- Home Healthcare Technologies

Healthcare Enterprise Technologies

Today's health delivery centers are full of telecommunication and computer technologies. A representative example of a wired healthcare enterprise is shown

Healthcare Enterprise Network



1= patient scheduling system; 2=billing system
3=digital medical imaging ; 4= operating room

Figure 1

in Figure 1. Various departments in a medical center are all interconnected via a high speed Intranet.

Technologies prevalent in various health delivery sites include:

- Video and audio conferencing for consultation and remote diagnostics
- Object oriented technologies for billing and appointment scheduling
- Digital Imaging systems for x-rays
- Internet access for medical research and training
- Highly sophisticated Operating Rooms (ORs) for surgical procedures

Surgery is a very respectable branch of the medical system and this continues to deploy newer technologies to improve the quality of healthcare. Laparoscopic surgery is a recent development in the evolution of operating room technology. This system deploys telecommunications, computers and robotics technologies as shown in Figure 2.

Emerging Health Oriented Technologies

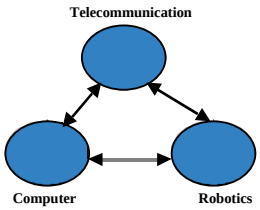


Figure 2

Laparoscopic surgery uses miniature scopes and instruments that are inserted through tiny incisions in the abdomen. The surgeons don't see the area, but view the procedure on a monitor that receives images from a small camera or scope inserted into the body. Laparoscopic surgery is used for a number of situations. It's a minimally invasive gall bladder surgery. A comparison of newer technology based surgery with the traditional method follows:

This procedure had previously required a large incision, a week's hospital stay and eight weeks of recovery.
Today, Laparoscopic surgery produces almost invisible scars. The hospital stay has been reduced to overnight, with a return to daily activities in about a week. Thus this newer medical enterprise technology has resulted in economic benefits along with improving the quality of life for the patients.

OR-1—The Future in Surgical Technology:

ValleyCare Medical Center in Pleasanton, California has the operating room of the future. In 2000, ValleyCare opened the first PC-based, fully integrated operating room in the United States. "OR-1" is equipped with robotic assistance, ergonomic features to make longer surgeries less fatiguing and touch screen computers that enable surgeons and nurses to control virtually every aspect of the operating room. The use of robotic arm gives surgeons the use of both hands (instead of holding the camera with one), and provides a more steady and consistent view. Since the robot is programmed to each surgeon's voice, making minute adjustments to the camera position is simple, efficient and less fatiguing. This level of technology permits the surgical team to tackle more complicated cases and provides ValleyCare physicians almost unlimited access to information and communication during a surgical procedure.

Source: ValleyCare Health System

Home Healthcare Technologies

A number of health related technologies are used by many people in the comfort of their own homes. These include:

- Blood pressure (BP) meters for checking BP as and when needed
- Digital thermometers for checking body's temperature
- Digital weighing scales for monitoring body's weight
- Digital meters for measuring blood sugar levels specially for patients with diabetes
- Medical alert systems for patients' with serious medical problems and needing urgent help at a short notice

Integrated Health Services Network

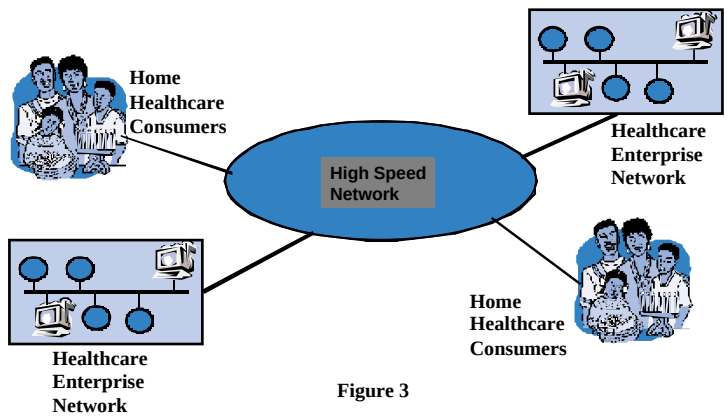


Figure 3

The Future

An integrated view of an evolving healthcare network is shown in Figure 3. Home healthcare users including elderly members and young and adult families would always be connected with the

healthcare enterprises.

Health oriented technologies are very promising with a number of system-wide benefits including:

• A convenient and non-threatening environment within the home to manage health
• Periodic consultations with the primary healthcare provider via audio or video conferencing
• Periodic health check monitoring by using simple-to-use health oriented technologies
• Monitoring resulting in an early detection of any malfunctioning within the body and thus recovery at much lower costs
• Overall improvement in the delivery of quality healthcare

In order to fully benefit from newer health oriented technologies, various members of the society must be exposed to the power of these technologies. The best and cheapest way to care for people is to help them not get sick. A heightened level of self-awareness is extremely important to recognize and take charge of one's own state of health.

Health-Oriented Technologies will help alleviate human suffering by preventing the onslaught of disease. Most of us will agree that a planned dose of prevention is much better than a painful cure.

Jagdish has worked on a number of information technology projects during the past 20 years. His work in medical communications is widely known. He can be reached at jagdish_kohli@yahoo.com

Sterling Commerce Launches Global Partner Program

Sterling Commerce has introduced the Sterling Commerce Global Partner Program, a comprehensive initiative that streamlines sales processes, information flow and resources between the company and its channel partners. The wide-ranging program provides distributors, resellers, affinity partners and referral partners access to a variety of sales, marketing and customer support tools designed to address their unique needs and add value to their sales processes. Key elements of the sterling Global Partners Program include PartnerNet, Support on Demand and the Partner Advisory Council. PartnerNet, a password-protected website, includes current Sterling Commerce product information and downloadable marketing collateral, training materials and success stories. Contact your Liaison Manager or 1-800 873-7945 (code, m29901nr) for further details.

SBC Technology Resources, Inc. Provides Solutions

For SBC to maintain its leadership position, it must continually pursue technology research and development. That's the driving force behind SBC Technology Resources, Inc. (TRI), the research and development division of SBC Communications. Founded in 1988, TRI provides technology consulting and expertise to the SBC Communications family of companies, exploring new ways to turn leading-edge technologies into real-life solutions for businesses and consumers.

SBC's business units rely on TRI to provide creative technology solutions that are necessary to gain a competitive advantage in the marketplace. With labs in two of the country's leading high-tech centers – Austin, Texas, and Pleasanton, Calif. – TRI collaborates with other technology industry leaders and premier universities and assists with internal and customer field trials.

TRI focuses its research and development efforts on the following key areas:

Broadband Internet
Studying new technologies that support Internet transport and delivery systems and widespread data connectivity to help businesses and consumers communicate smarter and faster.

Network Services
Transforming telecommunications network services to increase user convenience, productivity and effectiveness, as well as researching new convergence network architectures and products and services.

Enterprise Information
Technology. Researching new products and services for network management, operational support systems, customer care, information infrastructure security, and information technology to support businesses as they enter new markets, develop new products and services and improve operations.

Wireless Systems
Developing technology to improve and expand SBC's cellular, PCS and other wireless communications services.

"Lead With Integrity."

Thom Matson

SBC R&D to develop new layers of Internet security

SBC Communications has announced the formation of an Internet security test bed designed to uncover new and innovative ways to expand the scope and effectiveness of cyber-security technology.

The project, known as the Internet Assurance and Security Center (IASC), will be designed and managed by SBC Technology Resources Inc., SBC's research and development center based in Austin. TX

SBC is launching the IASC in response to the rising tide of Internet security violations, such as viruses, worms and denial-of-service attacks. The Computer Emergency Response Team, Coordination Center, an organization that documents security vulnerabilities, says Internet security violations more than double each year. According to cyber-security experts, the recent Bugbear virus is the most severe widespread attack to occur in 2002. Less than one week after it first appeared, the virus had grown exponentially, affecting millions of users around the world.

Howard Schmidt, Vice Chairman of President Bush's Critical Infrastructure Protection Board, met with SBC officials last month to review plans for the IASC and other security efforts being implemented by the company. "SBC is showing just the sort of initiative that is needed in the private sector to help advance cyberspace security," Schmidt said.

The IASC will focus on development of security technologies and standards that can be applied throughout large telecommunications networks, such as SBC's, that handle Internet, voice and data traffic for millions of individual users and businesses. While the majority of current security efforts, such as firewalls, place the primary burden of security on end users, IASC research will support a holistic approach that encompasses all elements of the network: telecommunications providers, enterprise networks, customer networks, and hardware and software vendors.

"Internet and network security violations are at an all-time high, and the problem demands our immediate attention," said Fred Chang, president and CEO, SBC Technology Resources. "SBC recognizes this threat, and we also understand that addressing it will take a cooperative, collaborative effort among the public and private sectors, including network providers and equipment vendors. We have chartered the IASC to help facilitate this effort and begin the process of enhancing overall security for the Internet, carrier and corporate networks."

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In addition to the original research to be conducted by TRI, the IASC also will act as a point of collaboration with existing security research efforts in government, academia and industry. Telcordia Technologies is the first company to partner with SBC on the IASC project. TRI also has a research alliance with the Center for Infrastructure Assurance and Security (CIAS) at the University of Texas-San Antonio. Additional partners and collaborators will be announced in the future. The IASC will evaluate several methods to detect and neutralize attacks and unwanted content from carrier networks. In addition to investigation of security technologies and systems in general, the IASC will focus on approaches for embedding security components in the network.

Network-based security brings the potential for significant advances:

* Security functions could be shared among multiple subscribers on a network, relieving some of the burdens placed on individual users to take security precautions, and ensuring that all subscribers are protected by the latest technology.
* Attacks and unwanted content could be stopped in the carrier network, preventing congestion of subscriber links.
* Security technology components in different parts of the network could correlate information and collaborate to thwart attacks.

As an example, security components in several parts of SBC's network could be designed to detect unusual flows of traffic converging on a particular customer. Once it is determined that this behavior is a distributed denial-of-service attack, the network could automatically filter the offending traffic from multiple locations.
Another area of focus for the IASC will be the development of new security specifications for telecommunications equipment providers. Large telecommunications networks are built using products from several different vendors. The IASC will work with these vendors to encourage widespread adoption of security standards for their components, creating a "designed-in" element of security that will protect networks from the ground up.

The IASC is only one component of SBC's efforts to provide comprehensive security offerings for three distinct segments of the communications infrastructure: individual users, enterprise networks and large service providers, such as SBC. Currently, the majority of Internet security products and services are developed for individual customers and business networks; these products include firewall and anti-virus software.

The IASC's focus on carrier security will round out SBC's complementary Internet security offerings. The company's DataComm division offers enterprise customers a full network security portfolio to integrate the design, delivery and management of security packages. Residential users who sign up for the new SBC Yahoo! DSL service will receive security software at no extra charge. The Internet and data networks in general have become a critical infrastructure for business, communications and entertainment.

Rick Tonielli, SBC

SELLING SOLUTIONS

Winning customers in a competitive marketplace is always a challenge. This is especially true in today's telecommunications market, where customers increasingly have the opportunity to choose not only between multiple providers, but also between multiple technologies to address their needs. This gives customers considerable flexibility in purchasing, and drives service providers to create differentiation strategies for their products.

Here's an example.

The Neptune Printing Co. needs to transmit information between its locations. Up until fairly recently, its choices primarily consisted of purchasing TDM-based connectivity from the ILEC or not. Then, competitive long-distance providers such as MCI and Sprint, and new technologies like frame relay and ATM appeared on the market, but options remained fairly limited.

Today's situation is likely quite different. Neptune probably has a wide variety of providers to choose from, including the big IXCs (AT&T, MCI/Worldcom, and Sprint), its local exchange carrier, such as SBC, and any number of competitive providers. This is especially true in metropolitan areas.

Equally important is the menu of technologies that are now available to meet the connectivity needs of Neptune Printing. The standard list of options is still there: DS-1, DS-3, frame relay, and SONET or ATM if bandwidth needs are very high. However, this list is expanding in many areas to include other types of transport, notably Ethernet and IP-based services.

Services above and beyond basic connectivity are also becoming commonplace, as service providers seek to create differentiation for their products. These services include things like guaranteed levels of throughput, various security options, and the ability to monitor the performance of one's own network via the Internet.

Providers are also beginning to offer bundles of services for increased convenience and favorable prices. Case in point-- what if Neptune would like to have most or all of its communications needs met by one company, consolidated onto one bill, and priced at a discount?

As intimidating as this long list of options may be for Neptune, it's great news for them and for all buyers of telecommunications services. The ability to pick and choose between providers and between technologies allows them to balance their performance needs and purchase price much more effectively than ever before.

Obviously, this has implications on the sales side of the equation. Since in many cases there is more than one product, and more than one provider, that could do the job, a successful salesperson needs to be able to explain to the customer why the benefits of what he or she is selling, at the price being quoted, provide a better overall value than other competitive offers.

Let's use Neptune Printing as an example. Assume that what the company needs is a way to transport imaging data between its locations. In order to answer even the basic question of which transport technology is appropriate, further analysis of the company's needs must be done.

Defining customer needs

Finding out how much traffic needs to be moved from one place to another is only the first step in understanding what solution would be the best fit for Neptune.

Is the amount of traffic more or less constant over time or does it "spike" frequently?

continued on page 13

Winning Customers

In A Competitive Marketplace

is always a challenge.

This is especially true in today's telecommunications market, where customers increasingly have the opportunity to choose not only between multiple providers, but also between multiple technologies to address their needs.

SBC Executive News

John Atterbury, Group President-Strategic Processes, has been named SBC Group President-Operations. He assumes Stan Sigman's responsibilities for SBC's Wireline Operations & reports to Ed Whitacre, Chairman and CEO.

Stephen Carter, President & CEO of Cingular Wireless, has been named Vice President of SBC & reports to Whitacre.

Stan Sigman, SBC Group President & Chief Operating Officer, has been named President & Chief Executive Officer of Cingular Wireless.

Forrest Miller, Group President of Corporate Planning, also will oversee Sterling Commerce.

To more effectively focus on High-Speed Data Services and offer Worldclass Customer Service for Data and Long Distance Products, SBC is changing the reporting structure for its Data and Long Distance Companies to report to SBC Enterprises, a division of SBC Operations, Inc. As of Dec. 1st, the following organizations report to Rich Dietz, President-SBC Enterprises:

- SBC Internet Services companies (SBIS, PBI, AIMS, SNET Internet & Prodigy)
- SBC Advanced Solutions companies (ASI & AADS)
- SBC DataComm
- SBC Long Distance
- SBC E-Services
- SBC Telecom (on a dotted line basis)

Rich Dietz will report to John Atterbury, Group President-Operations. Among those reporting to Dietz will be:

Zeke Robertson, Senior Vice President-SBC Advanced Solutions

Fred Taylor, Vice President-SBC Advanced Solutions

Bob Casali, Vice President-SBC Advanced Solutions

Cliff Agee, Senior Vice President-SBC DataComm

Yno Gonzalez, Vice President-Network Operations-SBC Long Distance

Tim Harden, President of SBC Telecom (on a dotted-line basis). As part of this reorganization, **J. Michael Turner,** President of SBC DataComm & SBC Internet Services, has announced his intention to retire (Dec. 30, 2002).

SBC & Yahoo!

SBC and Yahoo! had an idea: Build an Internet experience specifically for broadband. It would be something totally new. Your homepages would be personalized for you. They would get you things you like and keep out the things you don't. They follow your favorite football team or help you pay your phone bill. Internet built for broadband would even look different. Pages would play streaming videos or connect you to Internet radio stations. Homepages would update themselves right before your eyes. Internet built for broadband would be able to do things pages programmed for slower speeds wouldn't. And it's here. Welcome to SBC Yahoo! DSL. It's smarter. It's faster. It's Internet that logs onto you. See it yourself at sbc.com/sbcyahoo.

A Closer Look

With SBC Yahoo! DSL you get the Internet at warp speed--along with exciting, personalized features and perks that take advantage of your fast new connection. Some of the features include:

- Personalized Homepage: Customize your homepage and do everything--from email, Webcam, instant messenger, calendar--without leaving.
- Customized SBC Yahoo! DSL Browser: Enjoy a new browser designed to take full advantage of your fast new connection.
- Email: Set up 10 personalized sub accounts and access your mailbox online from anywhere.
- Messenger: Send instant text and voice messages and see your friends bigger and clearer than ever.

Contact your Liaison Manager for further details.

continued from page 12

SELLING SOLUTIONS

Are the characteristics of the traffic expected to change over time? For example, does the company expect to carry voice traffic on the network at some point in the future?
Are delays in transmission important, or can data just be resent if it gets lost? How mission-critical is data transmission? What sort of network downtime is permissible?
Does the company need to be able to monitor the performance of its network?
How quickly must the company be able to add bandwidth? Does Neptune want the capability to do so itself, without having to rely on the service provider?
What level of security is needed? Does it matter if Neptune's data is mixed with data from other sources during transport, as long as it gets there?
What kinds of access are needed to the transport network?
What types of legacy equipment are in place? Must they work with any new solution?

The proliferation of transport services means that, even for a straightforward application such as Neptune Printing's, choosing one is more complex than it may seem; it's necessary to consider the types of questions listed above before recommending a solution. Each type of transport has its own strengths and weaknesses from a customer perspective when compared to the other, as highlighted below. For the purposes of this example, we will assume that Neptune has significant bandwidth needs, as might be required to transmit detailed photographic images. Two typical solutions that could perform this level of transport are SONET and Ethernet.

Comparing suitable technologies

First, let's consider SONET. It offers many benefits; it's a mature technology that is extremely (over 99.999%) reliable. In addition, a SONET network can automatically recover from a fiber cut in less than 50 milliseconds, and offers performance and alarm monitoring.

Sounds great? There are also downsides to choosing SONET. Installation and configuration of a SONET network requires a lengthy interval measured in weeks or months. Further, it can be scaled only in large increments. If Neptune had an OC-3 network (155 Mbps), its only options for increasing bandwidth would be to add another OC-3 circuit or to upgrade to an OC-12 (622 Mbps). Either of these choices would require another lengthy installation interval. Plus, users pay for all the features that SONET offers. Maybe Neptune could get by just fine without 50-millisecond automatic restoration of its network.

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SELLING SOULTIONS

So what about Ethernet? It doesn't offer the same level of recoverability and reliability as SONET. It is a relatively new technology outside of the LAN environment, and it doesn't come with the kind of performance monitoring offered by SONET.

What Ethernet does do is provide bandwidth, and lots of it. Further, it's cheap; next-generation technologies like Gigabit Ethernet are 30% - 70% more cost-efficient than legacy networks (Lehman Brothers / McKinsey, Aug. 2001). These cost savings can be passed through to customers.

Ethernet's long history within corporate LANs means that a company's IT personnel are likely already familiar with its use and will easily be able to connect it to existing internal networks.

Further, its simplicity means that it is more easily scalable and can often be installed mor quickly than SONET.

The strengths and weaknesses of both SONET and Ethernet must be evaluated against the needs of Neptune Printing. In this very basic example, it seems likely that Ethernet would be the best choice for Neptune. Imaging data probably doesn't need to be transmitted in real-time; it's not like sending voice or video signals, where any delays hamper the usefulness of the connection. Any data that doesn't come through flawlessly can simply be resent.

Further, Neptune probably doesn't need to have near-instant network restoration in the case of a network problem. Its business depends on providing printing services, where a few seconds or even minutes of downtime is unlikely to severely hamper operations. Perhaps a backup T-1 circuit would provide a level of protection without having to pay for SONET. All in all, Neptune could probably save money while still getting the job done by using Ethernet.

This is clearly a very simplistic example. Neptune undoubtedly has other telecommunications needs besides transmission of its imaging data. Perhaps the company has an internal telephony system like a PBX, a need for offsite backup storage of important information, or a large number of cell phones and laptops with remote access for its sales force.

Creating solutions

One way that a service provider can differentiate itself from its peers is to sell "solutions" to its customers, rather than products. As a full-service provider, SBC could very well be able to meet all of the telecommunications needs Neptune Printing faces. For example, one way that SBC could make its Ethernet product more attractive would be to bundle it with other services that Neptune may need, such as wireline or wireless voice services, or data storage capabilities. Such a strategy would have the added benefit of lessening SBC's need to compete strictly on price for the Ethernet business.

What Ethernet Does Do is Provide Bandwidth, and lots of it.

Further, it's cheap; next-generation technologies like Gigabit Ethernet are 30% - 70% more cost-efficient than legacy networks.

These cost savings can be passed through to customers.

The example of Neptune Printing can be applied to all competitive situations. In today's market, simply selling a stand-alone product at a competitive price is not seeing the whole picture. A successful salesperson will help their customer evaluate the various available options, and recommend solutions that in some cases may go above and beyond the specific need the original contact was based on. Service providers that can provide this type of additional benefit will be greatly enhancing their efforts to retain their existing customer base and gain new customers.

Rick is Associate Director-Strategy, SBC. He earned a Master's Degree at the University of Illinois-Urbana-Champaign and an MBA from Northwestern University's Kellogg School of Management. He previously worked for the U.S. Environmental Protection Agency.

Broadband A Hit In Sports

SBC now has more than 2 million DSL Internet access customers. That strong growth is driven in part by people who are using the product in new and innovative ways. Take the world of sports, where fans now take for granted services none of us dreamed of just a few years ago:

- **Enhanced** coverage of games available from sports networks.
- Instant Polls that allow viewers to pretend they're managing a team or making decision in the World Series or Super Bowl.
- **Streaming Radio** Play-by-Play and Video Highlights and Photos—perfect when there's no TV coverage or when teams want to supplement what's available.
- **Fantasy Leagues** where fans create play on teams they've dreamed about.
- **Online Virtual Tours** of stadiums, previews of seating options, online ticketing and ticket printing at home.
- **Customized home pages** that feature your team's scores, schedules and news. Customers with SBC Yahoo! can do even more—set up their browsers to add buttons from virtually any sport, so they can jump from their home page right to the latest sports news. They can select a personalized scoreboard, so scores are visible as soon as you open the browser. And they can use SBC Yahoo! to set up a calendar for their favorite team.

Paying Bills Online

The total number of online billing customers in SBC jumped 266% in 2001 from the previous year. In about two years of offering its eBill service, SBC has nearly 700,000 customers paying bills online.

"The growth rates SBC has seen, show there is a demand for this service," said Jason Briggs, senior analyst at the Yankee Group. "Large telecom carriers will play a significant role in driving mainstream adoption of Electronic Bill Presentment and Payment (EBPP). Telcos have the most penetrated service in the U.S. home—local phone service—and an audience of broadband DSL subscribers (as well as dial-up) with which to promote eBilling. Our research shows that a broadband-enabled household is almost two times more likely to pay bills online than a dial-up household."

A Yankee Group Study shows 8.9 million households pay online and this number is expected to double by 2004.

Saving money is one of several factors spurring more people to sign up for online billing. People use online billing to eliminate writing checks every month, to save time, to view bills online and keep a record of their bill.

"Customers are quickly realizing that online billing is a convenient and secure way to pay bills and a great way to simplify life," said Yoland Martinez, Director of Online Billing at SBC.

To find out more about how you and your clients can use eBill to save time and money, contact your Liaison Manager (1-800-552-5299).

Tom David, SBC

Data with David

"Integrated Access" is a term heard in the industry today that denotes the consolidation of voice and data services on one pipe with enhanced customer service, including outsourced network management, consolidated billing and single points of contact. It provides small and medium business customers with a consolidated access to a full suite of high-speed telecom services.

Customers have desired a single integrated T1 solution that provides cost savings with a bundled price and simplified network management by consolidating CPE from multiple devices to just one. They want reliability from their network provider and flexibility to change service options as their business needs change. They also want convenience and the ability to buy packages of local voice and data services, high speed Internet access, long distance voice and data services, web hosting, voice mail, calling features in a single package at a competitive price from a single point of contact.

T1 Integrated Access

SBC has introduced an in-territory T1 Integrated Access porduct that provides a business service solution combining local voice, long distance (available in certain SBC areas), Internet, frame relay and CPE into a menu of services that can be customized to fit each customers needs. Customers who have business locations with between 8 and 22 lines and combined telecom expenditures between $1,000 and $2,000 per month are good candidates for this service.

The new T1 Integrated Access product provides:

Transport – a channelized (1.5Mbps) that delivers up to 24 channels of DS0 level data and/or exchange voice service to the nearest DCS (Digital Cross Connect) equipped central office.
Local Exchange Services – includes individual and multi-line business service, PBX trunking, Direct Inward Dialing (DID) and Centrex service.
Frame Relay Service for Data Networking – SBC's Advanced Services Inc. (ASI) Interstate UNI Port will be offered for permanent virtual circuits at specified rates lower than the UNI port speeds shown under Dedicated Internet Access below.
Dedicated Internet Access – DIA will be offered in conjunction with ASI's frame relay service with speeds of 128Kbps, 384Kbps, 512Kbps and 768Kbps.
Dedicated Voice Access – SBC Long Distance will provide customers with long distance options. In addition to the traditional DS1 point-to-point service, Dedicated Voice Access will be offered in two new serving arrangements for T1 Integrated Access. Customers may have DVA 6–pack and DVA 12-pack offerings that are point-to-point connections between the SBC Long Distance Point of Presence and the customer specificed DCS equipped central office.

And last, the customer requires an Integrated Access Device (IAD)or CPE that takes the channelized T1 signal and splits it between several different interfaces so that the single T1 can be shared by multiple services. SBC DataComm will sell the customer the Adtran TA 850 and TA 612 to provide this interface. In addition to providing a platform for analog and digital voice support, Total Access 850 has a built-in IP router, management, and a migration path to next generation ATM services (through a flash-upgrade). SBC can use remote inband management of the TA 850 to turn features, functions, and access ports on or off based on customer requirements. (The TA 850 may be viewed at: http://www.adtran.com/Common/_Adtran/images/ta850.htm)

Customers Have Desired
a single integrated T1 solution that provides cost savings with a bundled price and simplified network management by consolidating CPE from multiple devices to just one.

SBC also provides the Adtran TA-612 that has exactly the same functionality as the TA-850. The benefit to the customer is that the fixed port is less expensive than the TA 850 which retains full modularity. The "fixed-port" refers to the number of analog POTS lines supported in the IAD, via the amphenol connector to the 66 block. The TA-612 can support 12 analog POTS lines. The TA 612 does not support DSX-1; and this is a main differentiator. Any customer requiring digital connection for voice (to PBX) will need to purchase the TA 850.

Qualifying Customers

Customers best suited for Integrated Access service have:
Between
- 8 and 22 analog lines
- Average greater than $500 per month in long distance expense
- Utilize Internet access for e-mail and browsing (the direct Internet access @ 768Kbps is the highest speed offered with Integrated Access and it will support up to 30 users)
- Data networking services like frame relay. The Integrated Access solution often provides the most efficient way to eliminate unneccesary access costs as well as equipment costs since a router is included in the IAD.

Single Point-of-Contact

SBC DataComm is the single point-of-contact when trouble shooting problems on Integrated Access. When reporting trouble to SBC DataComm they will help isolate the trouble and coordinate repairs with SBC, SBC Internet Services, SBC ASI or SBC Long Distance. Similarly, billing support and inquiries are directed to SBC DataComm for processing.

Billing

Integrated Access has many variations of product mix that prevent billing of services at one bundled rate. Instead, customers will select from a menu of services and be invoiced for the services individually. The billing for local services will appear on SBC's bill together with separate affiliate pages for SBC ASI and SBC Internet Services. SBC Long Distance charges (except for switched long distance service not covered by a high volume calling plan) and SBC DataComm (Adtran TA 850 and TA 612) will bill direct.

Pricing

Pricing for this service may be obtained through the account team, authorized sales representative or your consultant liaison manager.

Summary

T1-Integrated Access Services is a complete solution that allows your clients to combine, over a T1 access line, their local and long distance service, Internet access and data services utilizing a single integrated access device. It offers business customers savings, convenience, reliability and flexibility. Customers may now select a menu of services tailored to fit their communication needs.

Tom David
Liaison Manager
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"A leader is a merchant of Hope."

Napoleon

SBC & 3com Deliver Solutions To Small & Medium-Sized Businesses

SBC & 3com are now offering exciting new solutions for small and medium-sized businesses. These solutions are based on SBC's network infrastructure, services and skilled resources and 3com's range of LAN (Local Area Network) wired, wireless and security products. They are delivering innovative, high value, converged data and voice networks to business customers. Here are some examples of how these products and services can help you and your clients (additional product/service details are available at sbc.com and 3com.com):

A Small Office/Home Office Deployment (2 to 20 user office) less with minimal Internet access needs (Email only, no web hosting):

- WAN connectivity is via SBC ISDN Internet Service (BRI, two B channels, 128K).
- A 3Com ISDN LAN Modem Terminates the BRI connection (A 56K LAN Modem will be substituted if ISDN is not available and POTS access must be used).
- A 3Com OfficeConnect Cable/DSL Secure Gateway provides DHCP; NAT, 4 10/100 Switch ports and ICSA certified Firewall protection.
- For secure Access through the Internet, the Secure Gateway supports VPN tunnel origination and termination.
- 3Com Network Supervisor will be used for local LAN Management.

Other 3Com/SBC solutions address the needs of small/medium companies (20 to 200 user office) requiring simple, robust network connectivity and remote/Internet access. These solutions scale well across the potential user range. The customer's bandwidth requirements and the SBC Transport Service being used will determine WAN interfaces.

SMB Local Area Network (LAN) Services Matrix

Service	Bandwidth	Customer Premise Equipment (CPE)	Applicable SBC Services
Ethernet LAN for up to 24 users/workstations	Switched 10/100Mb/s	3Com OfficeConnect Switch 5, 8 & 16 series (10/100Mb/s) 3Com 1100 3300, 4400, Baseline 10/100 Switch (10/100Mb/s) *note 1*	SBC Installation & Maintenance
Ethernet LAN for up to 24 users/workstations	Switched 10/100/1000 Mb/s	3Com 4900, 4900-SX, 4924, 4950, Baseline 10/100/1000 Switch	SBC Installation & Maintenance
Ethernet LAN for 25 to 48 users/workstations	Switched 10 & 100 Mb/s	3Com 4400 and Baseline Switches Multiple 1100, 3300 Switches	SBC Installation & Maintenance
Ethernet LAN for more than 48 users and/or workstations	Switched 10/100Mb/s and 1Gb/s	Multiple 3300, 4400, 4900, 4900-SX, 4924, 4950	SBC Installation & Maintenance
Wireless Ethernet LAN, 802.11B *note 2*	11Mb/s	3Com Access Points 2000, 6000, 8000 with wireless NIC cards and wireless workgroup bridge	SBC Installation & Maintenance
DC power for NBX phones and Wireless Access Points on Ethernet switch for up to 24 devices	10/100 Mb/s	3Com Ethernet Power Source (12 or 24 port), NBX Power Adapter (single device)	SBC Installation & Maintenance

1. 1100, 3300, 4300 and 4400 switches all support one or multiple 1Gb/s expansion modules.
2. NICs and Wireless Client Bridge are available and listed in the 3Com Buyers Guide.

continued from page 1

FRUSTRATED OR SATISFIED

designed automated information system that effortlessly takes you exactly where you want to go? The answer will tell you whether customers who call your company come away feeling frustrated or satisfied. Automated information systems (commonly referred to as call routing applications) are as essential to companies today as the banks of operators were to the companies of yesteryear. Whether your company is large or small, you will need a call-routing application that efficiently and cost-effectively serves the needs of your customers. In fact, successful businesses do not view these applications as a replacement for a human attendant, but as a tool to help savvy customers get where they want to go as quickly and efficiently as possible.

Even the most basic phone and messaging systems can allow users to quickly reach their party by keying in their extension, also known as "auto attendant" or using a simple menu to route directly to information such as phone numbers, addresses, or instructions for obtaining forms. Designed correctly, call routing applications can enhance productivity and give your company a more professional image. Designed incorrectly, they can drive your customers away.

In order to ensure your customers' acceptance of your call routing system, it is critical that you take the time to plan, design and implement a caller-friendly application. Below we've included a few tips to help you design a simple, direct diagram (or call flow) and write a clear, concise script.

Design the Diagram

Your first step is to diagram your call routing application. If you don't have flowcharting software, a pencil and paper will do. Draw a box, also referred to as a "cell," to represent a transfer point or audio message. Connect these cells with lines to form the structure, which may resemble a pyramid or tree. This drawing will help you craft your script.

Most people cannot remember past three or four choices so anticipate what your customers are calling for and design your menus accordingly. The most frequently chosen menu option should always be first.

Give the caller the option to repeat the menu or spoken information by pressing a key. Use the same key throughout the application for consistency. You may also want to dedicate a key to returning the caller to the previous menu in case they've made a mistake.

Consider how the caller will exit the call routing application. Some systems allow a "goodbye" message to be played prior to being disconnected.

Finally, always provide the caller with the option of pressing "0" to speak with a knowledgeable person during business hours.

Write the Script

The way you convey information through speech is different than in writing. Your call routing application will be heard, not read so try to keep the script in a conversational tone. Do not read your company's brochure word for word!

Use contractions as you would in everyday speech (i.e., "you'll" instead of "you will").

* If you have a complicated menu, speak the menu titles to keep callers from getting confused.
* Avoid acronyms and technical jargon.

Implement the Technology

Finally, take the time to properly implement your call routing application. Before recording the application, conduct staff auditions to find the best voice to reflect your company. Use the same, professional quality voice talent throughout the application. Typically, a female voice is preferred when giving instructions; a male voice for information. You may also consider hiring professional voice talent.

Thoroughly test your application for any programming or recording errors. Often this can be done before cutover. Choose a low traffic day for implementation to minimize any problems due to programming errors.

If your company has a web site with similar information, be sure the content of the web and call routing application match. You can also maximize both systems by referring callers to the web site and web site visitors to the call routing system. Don't forget to include a diagram of the call routing application on the web site.

Advertise your new application to your customers through a mailer or other means. Include a copy of the diagram when appropriate so callers have an idea what to expect. Anything you can do to increase the caller's acceptance will reduce the number of complaints about "talking to a machine" and improve customer service.

You may also consider hiring a consultant to conduct an analysis of both the call flow and script. It's important to make sure your call routing application complies with today's industry standards. A consultant can also audit an existing application for accuracy, errors, and sense. Don't simply install your application and forget about it. Make a point to call it from time-to-time to check it for errors and changes. Perhaps a phone number associated with it was disconnected. Don't rely on your customers to point out these errors to you!

Craig Tanikawa and Michelle Walker - Martin are Project Managers for Pinnacle Bay Resource Group, Inc., a vendor-independent telecommunications project management and consulting firm. Web site: www.pbrg.com, Email: info@pbrg.com

Opinions expressed are not necessarily those of SBC.

SBC Wins State Endorsement For Long Distance In Nevada

As we were going to press, the Public Utilities Commission of Nevada (PUCN) endorsed SBC's application to provide Long Distance service in Nevada. SBC expects to file its Nevada application with the FCC in early January.
Federal regulators will have 90 days to consider and vote on the application. "This support of our Long Distance application means we are a giant step closer to bringing Nevadans more choice and value as well as the convenience of one-stop shopping for all their communication needs," said Sylvia Samano, president of SBC for Nevada. The PUCN held several hearings, gathered input from the industry, public and their staff as well as the Bureau of Consumer Protection in order to make their decision.

Unsung Heroes Help Their Communities

The SBC Pioneers, a volunteer organization of nearly 200,000 employees and retirees, contributed nearly 8 million hours of community service last year to enhance the communities where they live and work.

The Pioneers, the largest company-sponsored volunteer organization in the United States, help their communities by providing disaster assistance, literacy training, beach cleanups, food distribution for the needy and special athletic competitions for the physically challenged. At SBC, our connection with our customers goes beyond communications services, we want to make a positive difference through the Pioneers.

How To Avoid Wasting Time

From **"Leadership When The Heat's On"** by Danny Cox
1. Don't do an employee's job for him or her. This can cost one-third of a manager's efficiency.
2. Don't do tasks that can be handled by someone with less responsibility.
3. Don't spend time on a "pet" project at the expense of items more valuable to the organization as a whole.
4. Don't keep repeating instructions. Some employees learn they don't have to take action until the boss tells them for a third time.

SBC Inks Agreement to Sell Interest in Cegetel

SBC has entered into an agreement to sell its 15% interest in Cegetel to Vodafone for approximately $2.27 billion in cash. Cegetel is a joint venture which owns 80% of SFR, the second-largest wireless provider in France with narly 12.5 million subscribers. Other Cegetel owners include Vivendi, Vodafone and British Telecom.

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EPON THE SIMPLE

• For service providers, all these benefits add up to lower capital costs, reduced capital expenditures, and higher profit margins

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KEY: Although the focus here is on cost reductions and related benefits for service providers (carriers), the standards of competition do indeed come into play in this context. If a service providers costs are reduced, those cost savings will ultimately be passed on to consumers in the form of lower service fees and charges.

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In addition to POTS, T1, 10/100BASE-T, and DS−3; EPONs support advanced features like Layer 2 / 3 switching, routing, voice over IP (VoIP), IP multicast, VPN 802.1Q, bandwidth shaping, and billing. Revenue opportunities from EPONs include:

• Support for legacy TDM, ATM, and SONET services

• Delivery of new gigabit Ethernet, Fast Ethernet, IP multicast, and dedicated wavelength services

• Tailoring of services to customer needs with guaranteed SLAs

• Quick response to customer needs with flexible provisioning and rapid service reconfiguration

Paul is a Product Manager, Business Marketing, Optical Data Networks, SBC. He also teaches at DePaul University and can be contacted at paul.a.bedell@msg.ameritech.com.
This article is an excerpt from his new book, "Gigabit Ethernet For Metro Area Networks", published by McGraw-Hill in December, 2002. It is available at major bookstores.

It's all about "we"

Award Given for Innovative e-Commerce Strategies

Pfizer Inc. and Astra Zeneca have been named winners of the fifth annual Sterling Commerce and the Healthcare Distribution Management Association (HDMA) Service Corporation award for Best Practices in Electronic Commerce for their innovation and implementation of the HEALTHCOM catalog for supply chain efficiency. The award is designed to recognize the most successful applications of e-business technologies in the pharmaceuticals manufacturing and distribution industries.

Formerly called the Sterling Commerce/HEALTHCOM award, recognition of this year's winners was made at the recent annual meeting of HDMA at the Biltmore Resort in Phoenix.

Through the HEALTHCOM Catalog Services from HDMA and Sterling Commerce, drug manufacturers are able to upload detailed product pricing, promotion and logistical information for easy access by distributors and other trading partners. During the last five and a half years, the HEALTHCOM Catalog (www.healthcom.com) has been successful in making more accurate and up-to-date information available while improving efficiencies and reducing costs.

Both Pfizer and Astra Zeneca, pharmaceutical manufacturers, were honored for their innovative use and implementation of the HEALTHCOM catalog as a primary supply chain management tool for distributors and other trading partners. Pfizer and Astra Zeneca were pioneer users of the catalog, which today is widely used among pharmaceutical wholesalers and manufacturers alike. Barry Sommerville, Pfizer director of information technology revenue cycle systems, created the original catalog and, until recently, was responsible for maintaining it for the industry.

With consolidation an ongoing force in the pharmaceutical industry, both Pfizer and Astra Zeneca have succeeded in utilizing the HEALTHCOM catalog to increase operational efficiency during a period when the size of their enterprises and trading partner networks were undergoing rapid growth. Having already experienced e-commerce success with the HEALTHCOM catalog before their businesses expanded, both companies made it a priority to integrate the catalog into their operations as they increased in size and complexity.

"As Pfizer and Astra Zeneca demonstrate, e-commerce solutions continue to help the pharmaceutical industry improve operational efficiencies," said Ronald J. Streck, president and CEO of HDMA. "Together with Sterling Commerce we continue to offer HDMA members new opportunities to lower costs and better serve customers by increasing supply chain efficiency."

"Sterling Commerce is proud of what we've accomplished with HDMA and are especially excited by the results of member companies like Pfizer and Astra Zeneca in using the HEALTHCOM catalog," said Sam Starr, chief operating officer, Sterling Commerce.

Through the alliance between Sterling Commerce and HEALTHCOM, Sterling Commerce provides business integration expertise and e-commerce solutions to HEALTHCOM members.

"Who Looks Outside, Dreams;
Who Looks Inside, Awakes."

Carl Jung

SBC Moves to a Single National Brand

To further establish itself as a national telecommunications leader, SBC Communications Inc. (NYSE:SBC) has announced it will move to a single national brand - SBC. Use of the SBC brand will provide a more unified presence in the marketplace, making it easier for customers to find and do business with SBC companies across geographic boundaries and product lines.

The move to a single national brand will unify offerings previously marketed through regional brands such as SBC Southwestern Bell, SBC Pacific Bell, SBC Nevada Bell and SBC Ameritech. SBC companies will continue to offer wireless service nationwide through Cingular Wireless, SBC's joint venture with BellSouth.

SBC & Cisco Announce Strategic Relationship

To Deliver New Class of Managed Communications Services

SBC & Cisco have announced a new strategic marketing and sales relationship focused on accelerating the delivery of a new class of managed business services, combining Cisco's leading edge equipment and SBC's state-of-the-art transport and networking services. SBC also plans to use select Cisco technology in its core network infrastructure to deliver emerging services.

The agreement is designed to address one of the most pressing dilemmas faced by businesses today—the need to expand and upgrade communications technology to stay competitive, while at the same time, conserving scarce financial resources.

Demand for Mobile Services Strong Internationally

China is adding about 4 million mobile subscribers a month.

India is expected to add 8 million subscribers in the next 5 years.

In the United States, mobile minutes have grown 45% over the last year.

Source: Healy & Co.

SBC Positioned in Mexico

SBC owns an approximate 8 percent equity share in Mexico's nationwide telecommunications company, Telmex, which operates nearly 12.7 million access lines. SBC has worked with Telmex to develop its network into one of the most advanced in the world, and has helped the company achieve its goal of enhanced telephone service throughout Mexico. Within the first five years of privatization, more than 5.5 million access lines were added, providing phone service to thousands of villages where it had never before been available.

"Enjoy the journey.
The journey is the reward."

SBC Telecom Glossary

Access Charges:
Fees paid by long distance carriers to local telephone companies for use of local facilities to originate or terminate calls.

Access Lines:
Local loop telephone lines providing telephone service to individual residences and businesses.

Access Minutes of Use:
The units of time used as the basis for determining the billing for the interconnection between the long distance network and the local loops in interstate and intrastate long distance calls.

Access Reform:
The process by which access charges will be restructured to better reflect the cost of providing access to local network facilities. This process will involve removing implicit subsidies and restructuring cost recovery mechanisms.

Additional Lines:
Access lines in addition to a primary line sold to homes to meet increased demand for voice, data and video products and services.

Asymmetrical Digital Subscriber Line (DSL):
Allows Internet users to surf the World Wide Web at high speeds over existing copper phone lines. DSL enables downstream connection speeds of up to 1.5 Mbps and upstream connection speeds of 128 Kbps.

Asynchronous Transfer Mode (ATM):
High-bandwidth, low-delay packet switching and multiplexing technique used to deliver traffic at varying rates, permitting a mix of voice, data and video.

CAGR:
Compound annual growth rate.

Caller ID:
A flagship product that allows customers to see a caller's name and number before answering a call.

Cash Operating Expenses:
Operating expenses that exclude depreciation and amortization.

Channel Terminations:
The number of end points of a data circuit.

Churn:
The percentage of customers discontinuing service during a month compared to the average base during the period.

Cost of Capital:
SBC's weighted cost of its respective debt and equity capital. Each SBC subsidiary has a unique and identifiable cost of capital appropriate for its business and financial risks.

DS-1:
A 1.544 Mbps digital signal carried on a T-1 transmission facility.

DS-3:
A 44.7 Mbps digital signal - the equivalent of 28 DS-1s.

EBITDA:
Earnings before interest, taxes, depreciation and amortization.

EBITDA Interest Coverage:
EBITDA divided by total interest expense.

Frame Relay:
A connection-oriented high-speed data transport service that facilitates the exchange of data through predefined paths.

Free Cash Flow:
The excess cash that is generated from a business. Cash from operations less construction and capital expenditures.

Internet Access:
A service that provides a gateway to the Internet for the user.

InterLATA:
InterLATA calls are long distance calls that originate in one LATA and terminate in another. With the Telecommunications Act of 1996, RBOCs must satisfy certain criteria to be able to provide interLATA long distance service.

Internet Protocol (IP):
Part of a family of protocols that tracks the Internet address of nodes, routes outgoing messages and recognizes incoming messages.

Interstate Access:
Interconnection of local networks with long distance networks to originate and terminate state-to-state long distance calls. Local exchange carriers charge long distance carriers for originating and terminating access to the local networks.

ISDN:
Integrated Services Digital Network, a high-speed network that enables simultaneous transmission of data, graphics, video and voice over a single telephone line. ISDN comes in 144,000 BPS for the desktop or 1.544 Kbps for telephone switches, computer and voice processing systems.

LATA:
Local Access Transport Areas are geographic sectors established in 1984 by the FCC for the administration of long distance telephone service provided by the RBOCs and the interexchange carriers.

SBC Long Distance Streaming Media Broadcast

Wed. Feb. 19, 2003
9-11:30am PST

Featuring Ron Fischer, Director, Business Long Distance, SBC & Others.
Streamers: To get the URL, please contact your Liaison Manager on 1-800-552-5299 or leave your name & email address on our Reservation Line: 1-888-889-6010 and you'll be contacted.

To Participate in the Broadcast at SBC Locations in Sacramento, San Francisco, San Ramon, Pasadena, Los Angeles or Anaheim, please call your Liaison Manager or our Broadcast Line. Thank You. We Look forward to your participation in this important event, sponsored by

1-800-CONFERENCE®.

1-800-CONFERENCE® Announces Streaming Services Powered by Yahoo!

The 1-800 CONFERENCE® product portfolio is pleased to announce its new Webcasting service powered by Yahoo! Webcasting (also known as streaming) is an emerging technology that has shown increased demand among customers looking to send video or audio messaging to large audiences. The service is backed by Yahoo's Webcast Studio Professional tool and a team of event coordinators who take clients through the process of presenting a live or pre-recorded event.

The most popular applications for this new technology include capturing video from any video conferencing system and streaming directly to a viewer's desktop. Unlike switched telephone and ISDN charges, the larger the audience involved the bigger the savings over traditional forms of communication. A traditional audio conference may also be streamed. This allows participants to listen to an audio conference by simply clicking on a link from the desktop. Webcasting is a natural extension to the 1-800-CONFERENCE® current suite of services and helps organizations extend their communication savings, reach and impact. For more information contact 1-800-CONFERENCE®, at 1-800-266-3373 and select option 1.

WHOSE NETWORK ARE YOU USING?

If you ever get a phone call to change your telecom service from SBC, you might want to ask:
- **Whose Network Are You Using?**
- **Who Maintains That Network?**
- **Whose Repair People Go Out To Fix It In An Emergency?**
- **Does Your Company Serve Everyone Or Just The Most Profitable Areas?**

Consultant/Vendor Web Address To Change

As we were going to press, SBC Communications Inc. went to a single brand--SBC--that unifies offerings previously marketed through regional brands like SBC Pacific Bell. As a result, our Web Address (www.pacbell.com/Products_Services/CSG) will be changing sometime in the future. If you're unable to get through, please contact our team at 1-800-552-5299. We'll be publicizing the new address once we have it.

Thanks.

"Optimism Is The Father That Leads To Achievement."
Helen Keller

"Light Tomorrow With Today."
Elizabeth Barrett Browning

SBC Consultant/Vendor Sales Group

Toll-Free Hotline 1(800) 552-5299 (for any other number, toll charges may apply.)
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Thank You for reading Update