UPDATE

Solutions for Success

Consultant/Vendor Sales Group
February 2004

Douglas Ireland

SBC FreedomLink℠ Creating Special National Wi-Fi Hotspot Network

SBC Internet Services, Inc. is now creating one of the nation's largest wireless Internet access networks, commonly known as Wi-Fi hotspots, under the FreedomLink℠ marquee.

SBC FreedomLink service offers hotels and airports, as well as restaurants, convenience stores, retailers and other chains with more than 25 locations, the opportunity to become an integral part of this network with no capital expenditure, no installation

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Ron Fischer

VoIP Offer Set Expanded

The International Data Corporation recently projected that the US market for Hosted IP voice solutions will increase from $281M in 2003 to $6.7B in 2007. The Gartner Group just completed a review of our IP Solutions – they indicated that mid-size businesses should take a strong look. SBC IP Communications, Inc. plans to be, and is currently, a major player in this growing marketplace.

To that end, a complete set of services was launched that address this growing IP Marketspace.

Live News SBC Broadcast, Feb 18 — **Back Cover**

Inside

Robin MacGillivray, BCS President, SBC West

Message to Telecom Consultants

Let me start out by wishing each of you a very **Happy New Year**, with hopes that 2004 will be your most successful year ever! Through your recommendations you have influenced millions of dollars in revenue for the SBC family of companies and it's my commitment to you to do all we can to continue to earn your trust and confidence in 2004. That's what "Stand & Deliver" is all about. It's a theme we're using internally to constantly remind ourselves of our promise to you that we will always be the brand you can trust to deliver World-Class products and reliable service to your clients. It's my personal goal to Stand & Deliver beyond your expectations.

We believe the best competitive strategy we have for keeping customers is our ability to meet their needs, the first time, on time, everytime. There's probably nothing more critical to the success of our business. As we enter a new year, there are a lot of things going on that may directly impact you and your clients. Here are a few:

◆ We're now offering Long Distance at incredible prices in all 13 states SBC Long Distance serves.

◆ We're offering all sorts of spectacular packages and bundles to enable you and your customers to be more efficient and productive.

◆ We're changing the competitive landscape with EchoStar and are on track to launch SBC Dish Network early this year (2004).

◆ We're extremely excited about Wi-Fi and the partnership opportunities we're now offering through SBC FreedomLink℠.

As we strive to exceed your expectations, we continue to value your opinion and appreciate your comments. Please continue to keep your Liaison Managers informed about what works and doesn't work so we can take the appropriate action.

We know you're counting on us and you have my commitment that we'll continue to Stand & Deliver 110% for you and your clients in 2004.

Robin

Kari's Korner

Number Portability: Wireline or Wireless – Which is Best for You and Your Clients?

Most customers want the benefits of wireline service – such as reliability, security, high quality and access to broadband service through DSL – and the convenience of wireless. Working with Cingular® Wireless, we're well-positioned to combine the benefits of both:

◆ **SBC companies and Cingular® Wireless are integrating** their services, including a unified wireless-wireline mailbox and FastForward, a cradle that transfers wireless calls to a wireline phone while recharging the batteries on the wireless phone.

◆ **Demand for broadband** is soaring and best met over a wireline rather than wireless service.

◆ **Safety.** In blackouts, fires, floods, earthquakes and other disasters, it's essential to have a wireline phone connected directly through a wall jack to our very reliable network and not dependent on the external electrical power grid to operate. SBC companies have several layers of redundancy through battery and generator back-up systems to help customers receive service during power outages. If you use a cell phone, make sure you keep it charged up so it can serve as an alternate means of communication. You can't make or receive a call on a dead battery.

KARI'S KORNER

Business customers who are considering changing between wireless and wireline providers should consider the following before determining if switching service is right for them:

Service Options

- **Ensure your number can be switched.** Check with your new provider to ensure the number you want to keep can be transferred.
- **Do not disconnect your existing phone number.** Begin the process of transferring to a new provider before you disconnect with an existing provider. Disconnecting first may mean you will lose the phone number that you are trying to retain.
- **Be aware of what's not available with wireless.** Many business-class services are only available for wireline customers. These can include unlimited local, toll and long distance calling; 800 numbers; free White Pages and Yellow Pages listings; and the ability to bundle services like wireline and wireless phone, Internet access and Web hosting on one bill. Wireline phone service is needed for a reliable DSL or dedicated high-speed Internet connection. Cutting the cord completely may mean you could lose some of these valuable services.
- **Consider wireline/wireless features.** SBC companies are moving rapidly to integrate wireline and wireless features and functionality. This gives customers even greater control and flexibility over their communications, plus the convenience of wireless and the reliability of wireline. And for small businesses, SBC companies and Cingular® Wireless provide deep discounts and the convenience of one bill with the shared minutes for business plans.
- **Determine who services the line.** Ask the sales representative which company will repair your phone or telephone lines if there is a problem. If having a local company with its own repair personnel who will provide fast, professional service is important to you, be sure to ask before you switch.

Billing

- **One bill.** Check to see if the company will bill all of its services on one bill, including local, toll and long distance, wireless and business services, like Web hosting.
- **Electronic billing.** Determine if you can pay your bill electronically at no charge on the providers Web site (like SBC eBill).
- **Know the one-time and monthly costs of the services.** Be sure to ask if the prices quoted are part of a promotion or fixed for the long term.
- **The costs of switching.** Determine if the new or current provider charges a fee to switch providers.
- **The costs of cutting the cord.** Check to see if your new wireless company will allow you to use your existing wireless phones. Be sure to factor in the cost of buying new phones for all of your employees, if required. Keep in mind that incoming calls during regular business hours count against your minutes with many wireless plans. You could end up paying for large buckets of minutes or for overtime minutes to accommodate calls that would be free on your wireline bill.
- **Determine if a bundle is right for you.** Phone companies often offer businesses the flexibility to build a bundle of services for deep discounts (such as SBC Business Connections℠). Be sure to check other offers to determine if they are competitively priced and if you are able to customize a bundle to pick the services that meet your calling needs.
- **Be aware of apples-to-oranges price comparisons.** Be wary of companies that compare their bundle prices with their competitors' "a la carte" prices.
- **Know your contract.** If committed to a contract with your current provider (clauses could include wireless service, local wireline service or Internet service on your local line), ask if there will be a charge for early termination of the contract.
- **The benefits of a single telecom provider.** Be sure to check with various providers for discounts that you may receive for keeping all of your voice, data, wireless and Internet services with a single provider. Some companies will not allow you to keep the discount on certain services if disconnecting one service of a bundle.
- **The benefits of sticking.** Your current provider may want to do all it can to keep you as a customer. Ask what it would provide to retain your business, such as contract extension or an attractive bonus offer.

Quality and Reliability

- **Business Stability.** Some customers and partners might question the stability of a business with only a wireless number.
- **Quality.** Wireless phones occasionally drop calls. That sudden silence could mean a missed sales opportunity.
- **Reliability.** Quality and availability of wireless phone service is not always as reliable as wireline service, especially during situations where thousands of customers want to use the phone at once.

Please contact your Liaison Manager or Consultant Vendor Sales Group (1.800.552.5299) if you have any questions about Wireline or Wireless.

We're here for you. Your Success is our Mission.

Happy New Year to each of you!

Kari   **415.542.4516**
          kw6875@sbc.com

Microsoft Recommends SBC Yahoo! DSL Business Edition

SBC Communications Inc. announced that SBC Yahoo! DSL Business Edition has become a recommended high-speed Internet service for Microsoft Business Solutions small- and mid-market retail customers and industry partners. Under an agreement with SBC companies, Microsoft Business Solutions is offering SBC Yahoo! DSL Business Edition to independent retailers seeking faster, more efficient online access through broadband services and features designed specifically for the workplace.

Initially, Microsoft will offer SBC Yahoo! DSL Business Edition as an addition to its Microsoft Business Solutions Retail Management System 1.2, a complete store automation solution designed to assist single- and multi-store retailers in streamlining point of sale (POS), customer service and retail management. The solution empowers independent proprietors, store managers and cashiers through affordable and easy-to-use automation. SBC Yahoo! DSL Business Edition complements the Microsoft solution with a secure, always-available, high-speed broadband connection that improves credit and debit card-processing transaction speeds, enhancing the customer experience at the point of sale. And, as more retailers transfer their operations to the Web, the networking capabilities of SBC Yahoo! DSL Business Edition will make it easier and more cost efficient to integrate with supplier networks.

"Our relationship with Microsoft Business Solutions gives us an established sales channel to reach small- and mid-market retailers and significantly broadens the customer base for SBC services," said Chuck Rudnick, senior vice president, Business Marketing, SBC Communications.

fees, no management fees, and no need to hire and train engineers or technical support professionals. The only cost to the venue is dedicated internet access. This is an excellent business decision, attracting more loyal high-income customers by offering the convenience of Internet access, and collecting revenue every time an individual uses the service. SBC FreedomLink service helps venues:

◆ **Increase Traffic** with us promoting locations through our aggressive FreedomLink marketing campaigns, recommending our hotspots to almost 20 million business and 60 million residential customers. SBC SMART Yellow Pages® telephone directories are another resource that drives new business to hotspots.

◆ **Increase Revenue Per Visitor** by offering premium high-speed wireless Internet access in seating and parking areas – guests that stay longer buy more goods. We put the venue in control: venues can set their own access prices based on their market, and can even offer free access with a purchase or to VIPs.

◆ **Eliminate Risk** by allowing us to pay for all hardware, installation, maintenance, management, and technical support. Our 24x7 telephone help desk will also provide 5-star service to guests, leaving venue staff free to serve in other ways.

As consultants, you know your clients better than anyone. We are installing hotspots all over the country as quickly as our engineers can move, and we would love to help your clients join the FreedomLink network. You have an opportunity to help your clients join a powerful marketing effort, add value to their customer experience, modernize their property's infrastructure, and generate additional revenue with no financial outlay. If you would like to take the first step toward bringing these benefits to your clients, we can quickly prepare a site-specific action plan with you. Contact me at 415-537-8073 or Douglas.Ireland@sbc.com. Thank You.

Douglas Ireland, Senior Account Manager for SBC FreedomLink Venue Sales, recently joined the company after earning his Masters in Network Engineering in Barcelona, Spain.

Wi-Fi Takes Off

About 99 million people will have Wi-Fi capable computers by 2006, according to Gartner, Inc., a global research firm. Almost 31 million Wi-Fi users are expected in 2007.

Benefits of Being an SBC FreedomLink℠ Hotspot?

Co-Branded Marketing

SBC FreedomLink service will be launching an aggressive campaign in 2004 urging our 80 million existing customers to visit our hotspot partners. We will also provide on-site marketing support materials.

Direct Revenue Generation

Revenues generated by wireless Internet access fees will be split between the venue and SBC FreedomLink. In addition, venues will enjoy incremental sales improvements due to increased traffic and higher spend per visitor.

More Traffic

Providing wireless Internet access is an important differentiator, influencing customer's decisions of where to stay, eat, shop, or fill the gas tank. This effect will be enhanced by our aggressive marketing campaign highlighting participants.

Higher Spend Per Visitor

The average Wi-Fi user is an educated, mid to high income professional. Not only is wireless Internet access an opportunity to attract these customers, it also keeps them on the property longer, providing the opportunity to sell them more drinks, desserts, and other goods. The additional service will also create more loyalty among these users.

Added Value for Customers

SBC FreedomLink hotspots will provide users with a valuable communications link – a connection to the office, the family, and the world wide web.

Increased Customer Loyalty

When a venue's potential customers are making the decision which venue to choose, the availability of wireless Internet access will be an important factor in steering toward the SBC FreedomLink hotspot.

"What you don't say may be just as important as what you say." – F. MacDonald

Target Venues

General Criteria

If a client meets any of these criteria, they are a candidate for FreedomLink Wi-Fi service:

◆ Strong Brand
◆ High-profile Location
◆ Over 25 Locations
◆ Subscriber Appeal

Unique locations

Airports

Conference & Convention Centers

Municipal Facilities

Universities

Hospitals

Stadiums

Lodgings

Hotels

Resorts

Casinos

Timeshare Resorts

Chains with over 25 Locations

Gas Stations

Convenience Stores

Fast Food Restaurants

Family/Casual Restaurants

Supermarkets

Sports Clubs

For all of our Wi-Fi hotspots that meet the criteria, we'll pay the complete capital costs, network monitoring and maintenance, and 24x7 technical support for users. We also provide valuable aggressive co-branded marketing targeting our 80 million business and residential customers. Contact Douglas Ireland for more details.

"For retailers and other small businesses, SBC Yahoo! DSL Business Edition delivers a superior online experience that streamlines operations and boosts productivity."

Microsoft Business Solutions customers in the SBC 13-state region can take now advantage of valuable promotional pricing for SBC Yahoo! DSL Business Edition, starting as low as $26.95 a month for 12 months. Microsoft Retail Management System customers also will receive a free Office Gateway router – a $149 retail value.

"SBC Yahoo! DSL Business Edition and Microsoft Retail Management System 1.2 deliver an important competitive differentiator for independent retailers by combining the convenience of broadband with point of sale and retail management functionality that helps these smaller retailers to better strategically manage, control and plan the growth of their operations," said Brendan O'Meara, product unit manager, Microsoft Retail Management Systems, Microsoft Business Solutions.

UPDATE

These service categories include:

- **Hosted IP Communications Service** (HIPCS) – Network based VoIP
- **Network VPN solutions** – data networking
- **Internet Services** – DSL and Dedicated access at a variety of speeds
- **Managed IP Services** – Co-Location, Dedicated and Shared Hosting, Consulting and Management
- **VoIP Equipment** – Managed Services and Equipment from Cisco and Nortel

The newest in this line of IP products is Hosted IP Communications Service (HIPCS) – network based Voice over IP (VoIP). This service utilizes a network host IP Softswitch technology to provide all the feature functionality of a traditional PBX or Centrex. The key enhancement is that the line is IP and can handle converged voice and data – essentially your phone and PC are integrated and use each other to make calls or access data (LAN or Internet).

The primary benefits to your customers are:

- **Converged voice and data** (Internet access for all lines)
- **Reduced capital investment** (network based)
- **Productivity** (phone service integrated with PC and Outlook applications)
- **"Unlimited" Regional and National calling plans**
- **"Unlimited" On-net calling** to all other stations on HIPCS service

A HICS network configuration/arrangement consists of the following components:

- Dedicated Frame Relay Internet connection to the closest SBC Internet POP
- In general, each Regional Service Area (RSA) makes up a HIPCS network. All customer locations within the RSA are connected together via their Dedicated Internet Access to the same Softswitch and would be considered "on-net"
- Each network has access to a variety of advanced capabilities based on which of the 4 packages they select. Advanced features include: On-net calling, Web Portal access to features and administrative changes, Find me/Follow me call routing, calling from Remote locations looks like "on-net", Mobile Office, and Voice Mail/Universal Messaging
- All "on-net" calling and calls within the same Regional Service Area are included in the monthly recurring charge for each line/station
- Ability to call nationally or internationally – National calls can be made on a per minute charge (Standard Plan) or Unlimited (Premium Plan)

Hosted IP Communications Service is being deployed nationally. The approximate current schedule is: 15 RSA's by the end of 2003, 30+ RSA's by the end of 2Q04, and 70+ RSA's by the end of 2004. The deployment will include many RSA's outside the traditional SBC footprint and will be offered by SBC Telecom.

Continue to watch for information on this exciting IP product, as well as our many others, in press releases and from your customers' Account Teams. SBC plans to be very active and loud in the IP space in 2004.

Long Distance Products and Promotions

We do not plan to let-up on our push in to the Long Distance business. A number of exciting product enhancements and promotions are planned for the first half of 2004.

Products:

- International Toll Free Service is expected to launch in 2Q04 to over 40 countries
- Significant enhancements are being made to the billing platform throughout 2004 – both electronic and paper summary/format

Promotions:

- Dedicated Voice Access (DVA) NRC rebate ($250)
- Special International Rates to top called countries for High Volume Calling Plan (subject to change and extension of 1-31-04 expiration)
- Special "winback" packages and bonuses for HVCP opportunities
- "Risk Free" Toll Free – waive NRC, waive 3 months of NRC
- Connections Credit Promotion for Small Business plans – waive Monthly Minimum usage Commitment for 6 or 9 months based on calling plan selected
- Access Line Winback – rebate of access line NRC based on the Small Business calling plan selected
- LD Private Line (DS1) – $950 MRC for Intra-state DS1 is being continued
- Frame Relay – 20% discount on access, port, PVC for all locations/drops based on meeting certain minimum requirements. Also waives NRC.

(Your support of our LD products has been tremendous. Thank You and help keep us informed via your Liaison Manager of areas we need to continue to concentrate on to maximize our assistance to you.)

Ron

Ron Fischer, Director of Channel Delivery for SBC West, has been in the telecommunications industry for nearly 25 years.

Feeling Burned Out?

Tips On How To Get Recharged

An UPDATE reader recently contacted me complaining of burnout. No wonder. With busy work schedules, crowded freeways, a full load of family obligations plus many other factors in life, it's easy to see why so many people get burned out.

Everyone's busy. We all feel burned out now and then but life's a rollercoaster ride. Hang in there and chances are great that your coaster car will rise again. Here are some tips I've learned over the years on how to overcome burnout:

1. **Take a walk.** My dad always said walk around the block 10 times – it does wonders for clearing your mind.
2. **Listen to uplifting music.**
3. **Send a card or email** to someone you haven't communicated with in a long time.
4. **Take action** on any challenges you've been mulling over. My mom says, "Handle it, handle it, handle it." Beginning is half done.
5. **Read something** inspirational or see a "Rudy"-type movie (with a happy ending).
6. **Smile** – especially when looking in the mirror. People around you may like it and it may make you feel better.
7. **Help someone** – a neighbor, family member, stranger. It probably will make you feel good.
8. **Change your diet.** Try something totally off the wall. Change your routine.
9. **Walk out** in your yard, look up in the sky and watch the clouds. We rush around so much we forget the beauty of a cloud, sunset or sunrise.
10. **Look for the good** in every situation. You usually can find good in everything if you look long enough.

Remember, the **best is yet to come**. Learn to enjoy the journey. The journey is the reward. Happy Trails. UPDATE EDITOR

Note: The opinions expressed here are not necessarily those of the SBC companies but merely some tips that may help. Naturally there are many trained professional mental health practitioners in society who can be consulted for burnout and other such important matters.

"Life is like riding a bicycle. To keep your balance, you must keep moving."

– Albert Einstein

Nancy Grover

Wardriving and Warchalking

You've just installed your new wireless network. It was a relatively painless process, but now you've got a potential security problem on your hands, and you may not even be aware of it.

Too many wireless networks are gaping doors that allow hackers, using just a laptop, a wireless card and an antennae made from a soup can, to read your e-mail, steal your passwords, and view any personal information you may have stored on your computer.

Hackers could be using your wireless connection to send spam or viruses out to the Internet, with the only traceable route pointing back to you, your business or your home. They can detect and intercept your wireless signal by using a method called wardriving. Most wardrivers don't misuse the information they find, but there are still those who will.

What is Wardriving?

Wardriving has nothing to do with war, it is actually a play on the term wardialing. Wardialing is the practice of dialing random phone numbers trying to find a modem that will answer, thus allowing unauthorized access. Hackers often run programs that call large blocks of phone numbers in an attempt to find corporate, school or home computers they can connect to. The term wardialing, was coined from the 1983 hacker-cult movie *War Games*, where a teenage hacker created autodialer software that eventually helped him find his way into a Department of Defense computer.

This new, wireless age has introduced yet another form of network discovery – wardriving. Wardriving happens when someone drives around with wireless equipment looking for unsecured wireless networks, to gain illegal access, or to simply check on the RF (Radio Frequency) environment. Wardrivers gather statistics about wireless networks by listening for their publicly transmitted broadcast signals. Wireless access points announce their presence at set intervals by sending a packet containing their network identifier (SSID – Service Set Identifier) and other information. A wireless, network discovery utility running on a portable computer, such as a laptop or PDA (Personal Digital Assistant), listens for these public broadcasts and logs the data.

In densely populated cities like New York, San Francisco, London, or Paris, access points can be identified by walking around with a wireless equipped PDA. Wardriving can also be accomplished while riding a bicycle, flying an airplane (as long as you are not flying too high), or even from the backseat of a cab.

Wardriving can also assist in determining wireless technology market growth through direct inspection. Industry does not necessarily need to depend on a researcher's assessment as to how many wireless networks are out in the world. It's possible and easy-to-use wardriving data to see how connected or technically savvy a neighborhood or community is.

Once wireless network data is collected, it is often posted on the Internet using message boards, or posted to lists located on web sites specifically created for this purpose. There have even been contests where the goal is to find as many non-secure wireless access points as possible. For those using unprotected wireless networks, you may already be on one or more of these lists. Or perhaps, your home or business has been warchalked, identifying it as an open network.

Warchalking

Warchalking was inspired by a custom hobos used during the Great Depression where they used chalk marks to indicate which homes were friendly. Once a wireless access point is found, Wardrivers mark a series of symbols on sidewalks and walls to indicate nearby wireless access. That way, other computer users know where they can find free a Internet connection, and potential access into someone else's network.

KEY	SYMBOL
Open Node	ssid)(bandwidth
Closed Node	ssid ◯
WEP Node	ssid access contact Ⓦ

The most common symbol, see below, is used to represent freely accessible open nodes. If known, the warchalker will also indicate the SSID and other information about that network. The second symbol identifies a closed networks, or a network with an unknown access method, and the third indicates a node protected with WEP (Wired Equivalent Privacy, a security protocol).

Despite some initial hype and media attention, warchalking is now more of an Internet and wireless conversational topic rather than an actual practice. There are a few marks here and there in some of the larger cities, but lately, warchalking has been used by the network owners themselves.They use the marks to attract clientele, announcing they can have free and open Internet access – usually for the price of a cup of coffee or a meal.

In Conclusion

If there are so many free access points why should the rest of us worry about our own networks being hijacked? The answer goes back to the beginning of the hacker age. People break into networks because it's fun, challenging, gives them bragging rights, and satisfies their intellectual curiosity. But most of the time, they just want to see if they can do it.

You can make your wireless connection more difficult to crack by taking basic precautions with your network:
- **Use WEP and Encrypt**
- **Change your passwords** frequently
- When you leave or go to sleep, **shut your system down**
- When connecting to another network such as your office, **use VPN**.

And remember, it is illegal to connect to a non-public wireless access point without permission. Period.

Nancy Grover, Regional Manager – SBC Corporate Information Security, is responsible for the company's critical systems, including the core network and the Network Operating Centers. She is a Certified Information Systems Security Professional.

UPDATE

Paul Bedell

Fibre Channel Service Launched

Fibre Channel Technology

The information explosion and the need for high-performance communications for storage networking have been the focus of much attention during the 1990s. Performance improvements in data storage, processor speeds and capabilities, and workstations have spawned increasingly data-intensive and high-speed networking applications. The connectivity between these systems and their input/output (IO) devices demands a new level of performance in reliability, speed, and distance.

There are two basic types of data communications between processors and peripherals: channels and networks. A channel (as in "Fibre Channel") provides a direct or switched point-to-point connection between the communicating devices. A channel is typically hardware-intensive and transports data at high speed with low overhead. In contrast, a network is an aggregation of distributed nodes (like workstations/PCs; file servers and peripherals) with its own protocol that supports interaction among these nodes. A network has relatively high overhead since it is software-intensive, and consequently slower than a channel. Networks can handle a more extensive range of tasks than channels as they operate in an environment of unanticipated connections, while channels operate amongst only a few devices with predefined addresses. Fibre Channel attempts to combine the best of these two methods of communication into an I/O interface that meets the needs of channel users and also network users.

Fibre Channel is a highly reliable interconnection protocol which supports rapid transfer of data between workstations, mainframes, servers, data storage systems, and other peripherals using Small Computer System Interface (SCSI) and IP protocols. Although it is called "Fibre Channel", its architecture doesn't represent either a channel or a real network topology. It allows for an active intelligent interconnection scheme, called a "fabric", to connect devices. All a Fibre Channel port has to do is to manage a simple point-to-point connection between itself and the fabric.

Fibre Channel is specially suited for connecting computer servers to shared storage devices and for interconnecting storage controllers and drives. Fibre Channel standards are defined in American National Standards Institute (ANSI) document X3.230-1994, which is also International Organization for Standardization document 14165-1. The industry standard for the transmission media of Fibre Channel can include coaxial cable, as well as either single mode or multi mode fiber. SBC will provision FibreMAN on single mode fiber in the network core.

Fibre Channel is a high-speed transmission technology that can be used as a front-end communications network, a back-end storage network, or both at the same time. Fibre Channel is a driving force in the SAN arena for connecting multiple hosts to dedicated storage systems. It has become a popular host-to-storage interconnect technology for open systems.

SBC FibreMAN℠ Service

SBC has now launched a new Fibre Channel service known as "FibreMAN." The FibreMAN service offering targets the exploding Storage Area Networking (SAN) market. Major drivers of this service include the following:

◆ The compound annual growth rate (CAGR) for Fibre Channel (ports) is projected to be 58% from 2001-2005 per IDC.

◆ More than 10,000 government regulations affecting storage in the United States have been implemented since late 2001.

◆ IDC forecasts bandwidth consumption will grow by a factor of 100 to 200 into 2006.

However in the end, disaster recovery and business continuity are the two biggest drivers in the push for Storage Area Networking, and FibreMAN service is the ideal product to support these efforts.

FibreMAN will be offered in the metropolitan marketplace as a point-to-point private line service with various levels of route diversity, as well as an equipment protection option in March, 2004. FibreMAN will extend connectivity between customer sites to enable connectivity between storage devices. The FibreMAN service will be telco-owned, operated, and maintained in each of our regions. This service will be an intraLATA offering and will be offered out of the state exchange tariffs.

FibreMAN will be deployed with customers having the option to choose from either 1 Gbps or 2 Gbps transmission speeds. Both 850 nm (multi-mode fiber) and 1310 nm (single mode and multi-mode fiber) interface options will be available with both transmission speeds. The 1 Gbps and 2 Gbps interface offerings are industry standard transmission speeds supported through the IEEE (Institute of Electrical and Electronics Engineers) 802.2 standard.

The signaling characteristics of remote Storage Area Network (SAN) connectivity applications using the Fibre Channel protocol typically require very low latency in order for the devices on either end to communicate effectively. This latency can cause the devices not to work. The Fibre Channel protocol addresses this latency issue by having the CPE devices modify signaling to insert additional control bits known as "buffer credits". However, these control bits reduce the effective throughput that can be obtained on a Fibre Channel circuit. Hence, the actual throughput a customer can obtain on a Fibre Channel circuit is distance sensitive. Buffer credits are a function of the equipment used by the customer buying FibreMAN. FibreMAN will not be designed with buffer credits in mind since SBC does not have any control of how the customer uses buffer credits. FibreMAN's flow control delivers data only as fast as the destination buffer is able to receive it – which will be determined by the customer's equipment (CPE).

Fiber Channels switches are part of the customer's network. These switches have different settings per distance requirements. Fibre Channel switches have software-based options to extend distance requirements as well as adjust the buffer credits allocated between ports in addition to the use of cut-through.

Cut-through is a switching technique that allows a routing decision to be made as soon as the destination of the frame is received. Cut-through switching eliminates the use of conventional store and forward switching. Buffer credits are used to determine how many frames can be sent to the recipient without waiting for an acknowledgement for each frame. This allows the switches to "fill-up" a 100km fiber with frames, without technically sacrificing performance. Each SAN application could be a little different in the sense that buffer credits may or may not be effectively used. Some Fibre Channel switches are not using an extended fabric.

Given this distance sensitivity of the Fibre Channel protocol, special consideration and communication will be required to insure that customers are aware of the effective throughput they can expect on a FibreMAN circuit. Also, the SBC FibreMAN service will not be offered with guaranteed throughput thresholds since the CPE devices provided by the customer determine this. The SBC FibreMAN service will guarantee a specific line rate (e.g. 1 Gbps) to be delivered between the customer premises, but not throughput.

Benefits

FibreMAN is based on technology that provides reliability, scalability, high-throughput, and low-latency. Users would enjoy the following benefits:

◆ Use of an ANSI-standardized platform

◆ Optional transmission rates at 1 or 2 Gbps speeds

◆ Protocol flexibility – capability to transmit data in a number of formats such as SCSI; TCP/IP; IPI and HIPPI

Applications

Corporate information is a key competitive element, and FibreMAN will enhance an IT department's ability to access and protect this information more efficiently.

Fibre Channel is the number one application for all types of storage. Potential customer applications for FibreMAN include the following:

◆ Network-based storage
◆ Storage backup and recovery systems to support improved disaster-tolerance
◆ Connectivity within server clusters
◆ Connectivity within storage arrays
◆ Access to large databases and data warehouses
◆ Connectivity from Internet data centers and/or web hosting data centers to corporate data centers or other offices
◆ Storage transport for imaging applications
◆ Infrastructure for "serverless" backup and serverless buildings.

Symmetrix Remote Data Facility

For sites requiring a higher level of throughput and local real-time mirroring, EMC Enterprise Storage offers Symmetrix Remote Data Facility (SRDF) within a Fibre Channel architecture. SRDF is software that offers a host independent, mirrored data storage solution that duplicates data on a physically separate recovery or target site transparent to users, applications, databases and host processors.

When the primary source for the stored date is unavailable, SRDF enables fast switchover to the target or recovery site so that critical information is again available in minutes. Once the primary source is restored, SRDF can resynchronize the primary site with the target site, thereby ensuring information and database consistency.

Applications that particularly benefit from an SRDF over Fibre Channel implementation are those requiring locally connected synchronous, real-time mirroring. Information for financial transactions, such as for brokerage accounts, banking, and mortgage servicing, critical production data for telecommunications, databases, and manufacturing systems, are applications that would benefit from SRDF over Fibre Channel.

SRDF will not be an inherent part of the FibreMAN service offering. However, SRDF is an EMC Enterprise Storage offering that customers could use to interface with SBC FibreMAN℠ service.

Route Diversity Options

Three options for FibreMAN diversity will be made available to SBC customers with the launch of FibreMAN: Loop Diversity, Alternate Wire Center Diversity, and Inter-wire Center Diversity. Customers can achieve end-to-end diversity by coupling Alternate Wire Center Diversity and Inter-wire Center Diversity.

NOTE: Customers can achieve end-to-end diversity by coupling alternate wire center diversity and inter-wire center diversity, in those instances where alternate wire center diversity involves multiple central offices.

Customer Architecture Options

The following topologies are examples of Fibre Channel arrangements that customers can implement with SBC's FibreMAN service. These topologies will not be part of the FibreMAN service offering itself. SBC's FibreMAN service will be a point to point fiber interconnectivity product between customer Fibre Channel switches. The FibreMAN service will provide electronics at the customer premise enabling the interconnectivity between sites to take place. The electronics will be Network Termination Equipment (NTE) owned by SBC.

Fibre Channel allows for three different topologies: point-to-point, fabric switched or arbitrated loop.
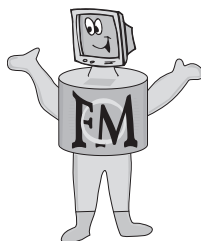
FibreMAN

Point-To-Point

A Point-to-point topology is the simplest and least expensive of the three topologies. It consists of two Fibre Channel devices connected to each other with a single, dedicated fibre cable. The transmit fibre of one device goes to the receive fibre of the other device, and vice versa. There is no sharing of the bandwidth, which allows the devices to enjoy the total bandwidth of the link.

Arbitrated Loop

Using the arbitration protocol, a single connection is established between a sender and a receiver, and a data frame is transferred around the loop. Loops can be configured with hubs to make connection management easier. A total of 127 nodes are supported within a single arbitrated loop with one slot reserved for fabric use. The FC-AL topology is an effective way of connecting multiple servers and storage devices, but a single break in the unidirectional loop stops all traffic. FC-AL is a subset of a Switched Fabric.

Switched Fabric

Switched Fabric is a networked-switched topology that allows thousands of ports to be connected to a fabric. Traffic between ports is routed through switches that can be interconnected and cascaded. The connection is completely managed by the Switched Fabric, remaining invisible to the nodes. The protocol allows systems to attach to the fabric, to obtain addresses, and to become known to other systems. Switched Fabric provides efficient sharing of available bandwidth.

We're ready to support our enterprise customers with this new service offering in any way we can!

Paul

Paul Bedell, SBC Associate Director of GigaMAN, can be reached at pb1321@sbc.com. He is an author of business books and teaches at DePaul University.

Spam Tips From SBC Internet Services

1. Protect Your E-mail Address

Whenever you provide your primary e-mail address for sweepstakes, website shopping etc., you're taking a chance that it can be picked up by spam software. SBC Yahoo! DSL and Dial members receive AddressGuard™, allowing them to create up to 500 substitute addresses to use for everyday activities, like shopping online. Members can color code the substitute addresses to better manage their inbox and use filters to automatically sort e-mails into specified folders. If a substitute address becomes overloaded with spam, the member can delete it without affecting their primary e-mail account.

2. Check Privacy Policies

Always check a company's online privacy policy to ensure it won't sell your e-mail address to third parties.

3. Use Anti-Spam Tools

SBC Yahoo! DSL and Dial members are armed with powerful anti-spam tools, like SpamGuard, an e-mail filtering tool which automatically sorts unsolicited bulk e-mail to the Bulk Mail folder. Additionally, members can block e-mails from up to 200 addresses or domains and block HTML-graphics from being downloaded until they are deemed safe by the user.

4. Report Spam

Report unsolicited and deceiving e-mails to the Federal Trade Commission or consumer protection agencies. SBC Yahoo! members can report unwanted e-mails to SBC Internet Services and Yahoo! quickly and easily by simply marking the message and clicking the "Spam" button in the inbox. This information will be used to improve the SpamGuard filter.

Increasing Productivity

IP Product Portfolio To Help Businesses Converge Voice and Data Networks

SBC Communications Inc. recently announced a new portfolio of managed IP products, furthering the company's efforts to help businesses benefit from the next generation of voice and data networking and perhaps the most substantial technological advance in telecommunications in 100 years.

Powerful new service options are being rolled out as part of the SBC IP portfolio, including an innovative new hosted VoIP product, SBC PremierSERV℠ Hosted IP Communication Service (HIPCS), which is available in select markets today. Also announced are new SBC PremierSERV IP-VPN options, including network-based services with planned availability in the first quarter of 2004. The customized IP-VPN network connections provide cost-effective, flexible IP connectivity options to support a broad spectrum of IP applications, including VoIP.

The new portfolio is the result of an ongoing SBC strategy to take a strong leadership position in the rapidly emerging IP communications market, including IP networking and Voice over IP (VoIP). With a full range of IP-based voice and data services, backed by full service management capabilities and years of expertise in delivering IP connectivity, the company is positioned to help businesses with every step in the process of adopting IP-powered communications capabilities. With regulatory approval to offer long distance services in all 50 states, the company is now able to deliver IP services nationwide, provide compelling and much-needed new choices for business customers.

IP products allow businesses to converge voice and data applications onto a single platform, resulting in cost efficiencies and powerful tools that can increase employee productivity, such as a single inbox for voice and e-mail messages, "click-to-call" functionality from PCs, and "find me, follow me" call routing options.

"Since the mid-90s, the SBC family of companies has pursued a multi-faceted strategy to evolve with our business customers, focusing on expansion of our geographic reach as well as our product portfolio," said Ray Wilkins, group president, SBC Marketing and Sales. "Today, with the regulatory freedom to offer long distance in all 50 states, we're able to serve the needs of our business customers beyond our traditional service area.

"At the same time, we're matching our national scope with innovative, in-demand products that address what is perhaps the hottest topic among CIOs today – voice-data convergence," said Wilkins. "We're not only enabling application integration and convergence with our IP portfolio, but we're also providing businesses of all sizes with a new competitive choice – one that has the services, expertise and commitment to help them embrace the next-generation communications network."

Both HIPCS and IP-VPN include fully managed options, enabling businesses to adopt IP capabilities without extensive up-front capital investments or in-house management expertise because SBC companies provide those services. The new offerings augment the existing SBC data and voice networking services to provide a comprehensive range of options for businesses of all sizes.

"The breadth of the SBC portfolio, our managed services capabilities, and our strong existing relationships with business customers are all key elements of our strategy – and key competitive differentiators for the SBC family of companies," Wilkins said. "Our mission is to help businesses determine the IP evolution strategy that meets their individual needs. That could mean a full switch to IP networking and VoIP, or it could mean the gradual adoption of IP products while continuing to use traditional voice or data services. SBC companies are prepared to help businesses identify the right strategy, and to help them with every stage of implementation and management."

SBC PremierSERV℠ Hosted IP Communication Service (HIPCS)

SBC PremierSERV HIPCS integrates customized applications as well as the traditional functionality of business voice-only systems, all through a Web browser-based interface – combining the customer benefits of VoIP with the ease-of-use of a network-hosted solution. And because VoIP uses the same basic language as common data communications services like e-mail, new levels of voice and data integration are possible, allowing employees to more effectively manage information and stay in touch with customers, suppliers and one another.

SBC PremierSERV HIPCS service features include:

- **Unified messaging.** Voice mail and e-mail can be consolidated in a single inbox, and voice mail can be forwarded like e-mail.
- **"Find me, Follow Me."** Enables employees to forward calls to a mobile phone, remote office, another extension, etc.
- **"Click-to-Call."** Enables one-click calling from a phone set or PC Web browser.

Users simply "click-to-call" from Call Logs or a Directory.

- **Conferencing.** From an Internet browser, users can schedule conference calls on demand.
- **"Plug and Play."** Users can plug in their IP devices, including IP-enabled phones, from anywhere within a corporate network, allowing them to use their regular "office" number even when traveling or working from the road.

In addition, by combining SBC PremierSERV HIPCS and IP-VPN customized services, businesses can realize new IT efficiencies by consolidating voice and data traffic onto a single business network. IT departments also benefit from plug-and-play functionality – moves, adds and changes can be managed instantly from any network connection, and businesses can scale up or down without calling vendors or ordering new cards. SBC PremierSERV HIPCS is available in select markets today, and will be available in cities nationwide by the end of 2004. The SBC IP portfolio also includes customer premises-based VoIP options that are available nationwide today.

"VoIP and other IP-based applications and products are by far the number one topic of discussion today between us and our business customers – making it a tremendous opportunity for us to expand our relationships with these customers now that we are able to deliver long distance services," Wilkins said. "Businesses recognize the advanced communications applications and efficiencies that can be realized with the IP platform, and how those new capabilities can translate into competitive advantages and a healthier bottom line. We have designed SBC PremierSERV HIPCS to enable our customers to realize these advantages while minimizing headaches and up-front capital expenditures."

SBC IP-VPN Services

SBC PremierSERV IP-VPN offerings provide a highly flexible and cost-effective way for businesses to establish or expand network capabilities, including Internet and data transport, and applications such as VoIP.

Unlike many competitive offerings, SBC PremierSERV IP-VPN services work seamlessly with existing data network connections, enabling businesses to add IP-based transport connectivity to supplement existing connections or add new business locations to a network. IP-VPN connectivity can be delivered through SBC PremierSERV Dedicated Internet access connections.

The straightforward package incorporates all elements needed to support IP

February 2004

Carlos Alas, Jr.

Selling Below Tariff Across State Lines With Master Service Agreements

As a telecommunications company serving business customers across a thirteen-state region, we're poised to help customers whose businesses are multi-regional optimize their service and the value they derive from it. One of the tools available to the Sales Account Teams to achieve this is the Master Service Agreement (MSA) and Master Discount Agreement (MDA). Both of these take into consideration a large customer's geographic footprint as well as service and billing. The benefits to a customer in entering one of these types of Agreements are not only Master Discounts across the SBC Regions but also Convergent Billing which aggregates all Core Products and Services across all regions and is presented in one bill for the customer, provided the customer requests and qualifies for Convergent Billing.

Coordinating an enterprise-wide contract for Core Products and Services across SBC's thirteen-state region requires a lot of resources. Not only does the pricing and product mix vary from region to region depending on a customer's individual circumstances, but the regulatory environment is complex and different from state to state and region to region as well. To address these and other parts of constructing such a complex deal, SBC has put in place an organization known as the Global Solutions Group. This organization takes on these large-scale projects from beginning to end. The Global Solutions Group puts the different departments from different regions together and manages the project through the qualification, pricing, contract development and implementation stages. The following is a brief outline of what is involved in putting together a multi-region agreement. The good news is that SBC has the resources and the mechanism to bring this type of agreement to any customer who qualifies and is interested in a multi-regional Master Discount Agreement.

In order to qualify for an MSA/MDA, a customer must be billing in the vicinity of $500,000.00 in Total Billed Revenue for Core Product and Services, such as usage and local access. Their geographic presence must span at least two states, each of which must be in a different region, such as SBC California and SBC Texas. The pre-approval of a Sales Vice-President is required before an Account Team can proceed with an MSA/MDA.

Once a Customer has been pre-qualified, a Site Directory based on the customer's Billed Telephone Numbers (BTNs) is developed using their current account information across the regions and for the services they wish to include in the contract. The Customer then reviews the Site Directory for accuracy and approves it. Once approved, SBC then sets about coordinating all the elements that will be required to put the contract together. That includes generating an Optimization Report which takes into account the customer's revenue, products and usage. A special "Kick-Off" call is held, headed up by the Global Solutions Group, with all the departments involved, such as Pricing, Contracts and Sales, in order to assign areas of responsibility and timelines. Next, a Rate Letter is generated for each of the affected Regions. The pricing is then presented to the customer. Once the pricing and the terms have been approved by the customer, the contract is then developed and presented to the customer for signature. SBC countersigns the contract at the Senior Sales Vice President level. The contract is then filed with all the respective Regulatory Agencies in the affected States and implemented. The process takes approximately two to three months barring any complicated negotiations in the process that may happen.

These types of contract opportunities are exciting both for the Global Solutions Group working on them as well as the rest of the teams collaborating and participating in the negotiations and contract development. You can find out more about multi-regional Master Discount Agreements by contacting your Consultant Liaison Manager listed in the back of this publication or by calling 1-800-552-5299.

Carlos R. Alas, Jr. is an Associate Director in Contract Development for SBC California. He has been with SBC for nine years and previously held positions as Account Manager and Executive Briefing Center Manager in San Francisco. He holds an MBA in International Management.

"Success is not the key to happiness. Happiness is the key to success. If you love what you're doing, you will be successful!"

– Albert Schweitzer

networking, including Dedicated Internet connections, needed equipment, remote access software, and service management and monitoring options. IP-VPN offerings, including software-based solutions and offerings delivered via customer premises-based equipment, are available nationwide today. SBC companies plan to make available full-featured network-based solutions in the first quarter of 2004, providing even greater levels of flexibility and scalability.

"In the coming years, businesses will continue to move from traditional data services to IP-based platforms to take advantage of applications and cost efficiencies," Wilkins said. "Over the course of time, these IP connections may be the only network connections that businesses need. In the meantime, with the SBC IP-VPN portfolio, we're taking a hybrid approach, delivering the flexibility to allow businesses to take steps toward IP without abandoning existing investments in other networking technologies."

Pacific Bell Park Becomes SBC Park in 2004

The San Francisco Giants and SBC Communications Inc. changed Pacific Bell Park to SBC Park on Jan. 1, 2004. The two have a 24-year agreement that gives SBC Communications the naming rights to the team's popular four-year-old waterfront ballpark. The new name reflects the company's move from a regional brand to a global identity that went into effect a year ago. "SBC played a critical role in the development of our ballpark and helped keep Major League Baseball in San Francisco," said Larry Baer, Giants executive vice president." The park has helped reinvigorate the south end of San Francisco's downtown waterfront and to transform it into one of the City's most vibrant and exciting new neighborhoods. Across the street from the park is the new Mission Bay community. SBC, working with Catellus Development Corporation, is deploying in the Mission Bay community, a next-generation fiber to the premises network capable of providing voice, data, and video services via a fiber network direct to the end-user. Recently, SBC California and SBC Internet Services, Inc. began offering residents of Mission Bay voice and Internet services over its fiber network, which enables applications ranging from streaming video and audio to interactive video games and video conferencing, as well as access to a community-based Intranet portal known as mbconnect.net.

UPDATE

OPT-E-MAN℠

The focus in the telecom industry is rapidly shifting from voice to data as carrier networks migrate from circuit switched to packet switched. As bandwidth requirements increase, customers continue to want more cost-effective and higher bandwidth services across a metropolitan area. Ethernet, the favorite protocol of Local Area Networking, is becoming the generally accepted protocol in Metropolitan Area Networks (MAN) providing transparent connections at continually higher speeds. A MAN is characterized as intracity in nature, about 75-80 miles in length with bursty traffic. Ethernet is an easy technology to manage, it's flexible, cost-effective and it provides scalability, which is a feature not easily provided by any other service available today.

As the power of applications, PCs and workstations increases, the need to connect them at higher speeds becomes greater. High-speed interconnection of LANs and Dedicated Internet Access are great applications that can take advantage of the benefits of Ethernet. Customers who have multiple locations within a metropolitan area, and users running bandwidth intensive applications such as large file transfers for database storage and retrieval, distance learning streaming technologies, medical imaging, CAD/CAM applications, disaster recovery/Storage Area Networks, Internet access or video would benefit from the Optical Ethernet Products at the native 10 Mbps – 1 Gbps rate.

Optical Ethernet Metropolitan Area Network (OPT-E-MAN℠)

We've introduced a new in-territory product, known as Optical Ethernet Metropolitan Area Network (OPT-E-MAN℠) to meet customers' MAN needs. It is an advanced, packet and fiber-based transport providing Layer 2 Ethernet service. OPT-E-MAN℠ acts as an Ethernet bridge to transparently interconnect multiple customer local area networks within the same LATA (intraLATA) and may also be used as an underlying Dedicated Internet Access transport. OPT-E-MAN℠ supports nearly any data transport configuration – point to point, point to multi-point, or multi-point to multi-point – using physical and virtual connections to meet specific business needs. Connections to the service range from 10 Mbps – 1 Gbps providing flexible bandwidth increments to support customer requirements. Customers can connect to OPT-E-MAN℠ using a switch, bridge or router.

Customers best suited for this new product have a need to connect multiple locations and include medium and large business customers, inclusive of Fortune 1000 companies, in all industries including the public and private sectors. Vertical markets include: government, education, health care, financial, retail, and high tech, as well as Internet Service Providers and Application Service Providers.

Benefits

Simplification and Convenience of Network Architecture

OPT-E-MAN℠ is provisioned over a fiber facility to the customer premise and provides an Ethernet interface that can increase bandwidth dramatically – e.g. 10/100 Base T interface can support from 10 Mbps to 100 Mbps without a new interface being installed.

By connecting via Ethernet, there is no requirement to incorporate a separate protocol or interface. A single handoff from the provider to the customer adds convenience and simplicity to the network architecture. OPT-E-MAN℠ allows IT managers to maintain connections without introducing new or additional protocols.

We will install and maintain all equipment needed to provide direct connectivity to the customer's existing equipment using standard connectors. As a result, for customers, it appears as if all equipment for their network is in the same building or campus – the transfer of data across the MAN becomes completely transparent. we'll also monitor the network 24 x 7 providing the customer a fully maintained and managed network solution simplifying network management and administration as well as cost.

Cost-Effective

OPT-E-MAN℠ provides the customer with a known protocol, reducing operational costs for training, employees, maintenance and administration, as well as capital costs for equipment. Additionally, OPT-E-MAN℠ is very price competitive when compared to Frame Relay and ATM services at equivalent bandwidth levels and contract terms.

Ethernet interfaces are less expensive because of the fewer physical interfaces, servers, and routers that are necessary. For most customers, this service will be "plug and play" on their existing equipment. By utilizing standard interfaces to provide direct compatibility to the customer's existing equipment, there is no need for up-front investment in expensive CPE. Further cost savings are derived from ports – 100 Mbps for instance on an Ethernet router, are 10-20 times less expensive than OC-3 ports on SONET equipment. In addition, most business IT managers are familiar with the Ethernet protocol while Telco services such as ATM and even dedicated services are less ubiquitous in the IT world, additional training costs are virtually eliminated.

Ethernet requires less equipment, service and operational costs. Because Ethernet is the dominant standard in the LAN arena, demand continues to drive the prices down for hardware. Many customers will eliminate the need to purchase expensive servers and internetworking equipment, such as a bridge or router, at remote LAN sites. Additionally, because most corporate networks are using Ethernet, companies will be able to save additional expenses in training, management, and administrative expenses.

OPT-E-MAN℠ allows customers to add bandwidth as their needs grow so in essence, customers only pay for what they use.

Here are four instances when scaling will prove beneficial to customers:

- **Changes in business patterns:** Change in the number of employees, applications, business conditions, mirroring, or database replication.
- **Seasonal/anticipated events:** sales, promotions, holiday credit validation, school registration, and sports events.
- **Unanticipated events:** data analysis, research, back-up service, disaster recovery, or software development.
- **High volume traffic:** during the school year/school day vs. during school holidays or summer vacation.

Network Flexibility

Greater network flexibility allows the customer to add new locations with ease. In addition, changing the capacity of bandwidth between existing locations is easier and faster. OPT-E-MAN℠ should be easier to administer than existing Frame Relay/ATM Private Line networks because it eliminates burdensome PVC management.

Reliability and Security

Higher reliability and security is made possible by the 24x7 monitoring that is offered to customers. The customers in traditional non-managed services incur the cost in dollars and man-hours in

purchasing, maintaining and managing their own networks. With one of these managed services, the customer has no costly software or equipment to own and/or grow obsolete, no engineers to hire, and no continuous training requirements.

Furthermore, the possibility that an intruder might penetrate the network architecture is immensely decreased because of the service monitoring as well as the assigned secure ports and Ethernet Virtual Connections (EVCs) that will be associated with each customer connection. EVCs provide logical point to point dedicated connections between two customer locations. Virtual LANs (VLAN) will be assigned to the EVCs to ensure security of customer traffic. The fear of intrusion into a customer's network is further diminished since the use of Multi-Protocol Label Switching (MPLS) in the core allows for configuration of a dedicated logical connection for each customer.

MPLS will be using within the core architecture. By using MPLS, SBC will be able to add a level of security to the customer traffic and will be able to offer enhanced Grade (Quality) of Service parameters and eventually offer interworking capabilities with existing SBC products such as Frame Relay, ATM, and GigaMAN. MPLS in the core is transparent to the customer. But by using it, it enables SBC to do a number of things such as making the product more robust, helping to segregate customer traffic by establishing a secure EVC over a shared infrastructure, and enables SBC to support many customers efficiently by allowing scaling to meet customer needs more effectively. Additionally, MPLS allows for support of Service Level Agreements (SLA) and provides redundancy in the core, traffic engineering and fast-reroute.

Superior Network Performance

The OPT-E-MAN℠ services provide guaranteed bandwidth through the MAN at the native speed of the customer application(s).
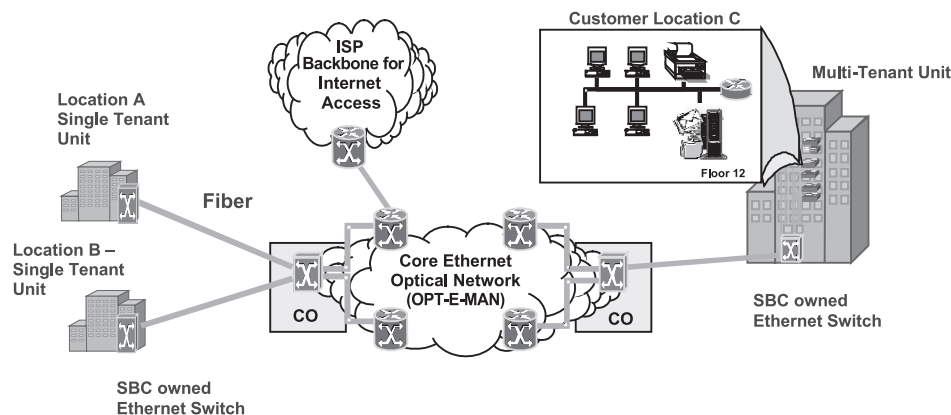
The service also offers the customer the ultimate solution for customers experiencing bottlenecks in the WAN. In addition to higher bandwidth options and scalability, the services are secure and reliable service.

Service Level Agreements

The SLAs that SBC will offer with the products will benefit the customer and will ensure top-notch service and reliability. Our SLAs will differentiate this product from other carrier offerings and provide the necessary data to allow the customer to justify their network expenditure and growth.

This diagram shows a high-level view of the SBC optical Ethernet environment. The Cisco 7600-based Ethernet Optical Core provides is surrounded by Cisco 3550 devices at the customer premises which are owned and operated by SBC. For enterprise location connectivity (Transparent LAN, or TLS*) such as that shown at the extreme left and right sides of the diagram, optical transport provides the physical layer connectivity between stand-alone customer locations and a location housed in an MTU. Similarly, ISP backbone connectivity (top) provides the basis for Dedicated Internet Access (E-DIA).

*TLS is simply a high-speed connection between two or more LAN segments across a metro or wide area that gives users the appearance of being connected to the same local area network. It provides an all-Ethernet model that simplifies the handoffs between the local and transport environments yet is perfectly capable of transporting Layer Three protocols such as IP.

Product Development

OPT-E-MAN℠ will eventually have three Layer 2 switched Metro Ethernet offerings when fully developed (Basic, Basic Plus and Premium) together with three grades of service (Bronze, Silver and Gold). The difference between these offerings is the robustness of the platform support:

- general data traffic (Bronze)
- delay sensitive VoIP traffic (Silver)
- delay sensitive video traffic (Gold)

Additional differentiations between the three offerings include:

- point to point, point to multi-point and multi-point configurations
- bandwidth options
- applications such as Layer 2 Ethernet Virtual Connections to enable TLS using VLANS; dedicated Internet access; Frame/ATM interworking and Layer 3 VPN service
- MPLS-enabled
- redundant core network
- the type of SLAs offered
- Cisco platform

The OPT-E-MAN℠ Basic service was the first offering delivered in 2003, with the other offerings scheduled in 2004 and 2005. Cities that launched it in 2003 include: San Francisco, Chicago, Dallas, Los Angeles and SNET territory. Cities planned for early 2004 include: Houston, Detroit, Sacramento, San Diego, Kansas City, St. Louis, Cleveland, Indianapolis, and Austin.

We offered our Bronze Level (general data traffic) in late 2003 and will complete Silver Level (supports VoIP and delay sensitive traffic) in the first half of 2004. Our Frame/ATM interworking will follow in the latter half of 2004 with our Gold Level (supports video over IP) in 2005.

Summary

Many customers today utilize transport and packet-based services as a means for interconnecting two or more locations. This interconnection is done via bridges and routers and can be quite expensive and does not provide a lot of flexibility. OPT-E-MAN℠ will provide the means for customers to migrate their current LAN topologies to a new, faster standard. SBC's new optical Ethernet solution is low cost, simple and flexible. It offers reliable and secure network architecture with an MPLS core, integrates seamlessly with pre-existing infrastructures, scales to LAN speeds, supports the most common enterprise applications and supports all topologies.

Tom David
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UPDATE

11

Jerry Hinek

What About Firewalls?

Introduction

If you ever read Charles Dickens's *A Tale of Two Cities* you will remember the first 12 words: "It was the best of times; it was the worst of times". That time is today for firewalls. As attacks on computer networks have gotten more sophisticated, firewalls have gotten stronger and more sophisticated. As businesses demand more and more from their networks, businesses punch holes in their own firewalls, taking on more risk.

This article will discuss how you can use a firewall to protect your personal or business computer network and information. My goal is to examine firewall security as serving both about the need for security and the need for risk. A well chosen firewall will help you to mitigate the risks.

A Brief History

The classic idea of a firewall is a mechanism that separates a small network such as a business network from the Internet. All communication in or out is directed through one point which can prevent undesirable access from outside the small network. That one point may be a single router or network server capable of filtering network traffic.

That was fine when the Internet had 5% of the traffic it has today and business networks mainly connected dumb terminals to mainframe computers. But the Internet has become very useful: We put network interface cards (NICs) into personal computers (PCs) and connect them over transmission control protocol/internet protocol (TCP/IP) based Ethernet local area networks (LANs). Businesses communicate with other businesses across network wires. Employees take their laptop computers home and need access from there to corporate networks.

The original firewall model could break many a business today. Firewalls have had to keep up with the demands of more network traffic and greater threats.

Big businesses can have tens or hundreds of gateway devices securing their network perimeter. These devices can be side by side or in different locations. One device manages the flow of E-mail, scanning for viruses and blocking SPAM. Another manages the Virtual Private Network (VPN) and yet another protects the website.

Don't forget about Instant Messaging, web meetings, Extranets and even dial-up access. All these devices need support staff to keep them updated and running.

Personal Firewalls

Did you know that many firewalls are free? Microsoft® Windows XP has a built-in firewall. There are highly rated software firewalls available to download for free from reputable web sites. Others are free to try for a month then cost less than $50.00 to keep. Personal use firewalls are reasonably priced.

Hardware

I recommend a home router for any broadband connection. Even if you have only one computer you should get the router, but the router will let you connect 4 to 8 computers simultaneously to the same high speed line. Read the box. Make sure it has a firewall built in. Look for a sale and you shouldn't have to pay more than $100.00. The two common firewall protocols on personal routers are Network Address Translation (NAT) and Stateful Packet Inspection (SPI). Some newer routers have both protocols built in. They work fine out of the box with minimal setup and no ongoing maintenance. You can easily configure them to meet your needs from your web browser or another graphic user interface (GUI) packaged with the router.

Software

Software firewalls can be just as effective as routers, but they place additional processing on the personal computer. They have to filter network traffic at the same time that they retrieve your E-mail or load your web page. The firewall built into the router filters the network traffic and allows only the things you want to get to your computer. Your computer will seem faster.

If you are not convinced that you need a personal router at home or even that you need a firewall, download free firewall software that will report what it blocks. Use it for a few days or a week; then look at all the attacks that were blocked. Some of what it blocks is perfectly innocent network garbage, but you will see Internet Worms and Trojan-Horse attempts listed in the report. Your personal computer could be commanded to attack other computers or spread hostile software. Some large "denial of service" attacks enlisted many infected computers to hit a target simultaneously.

Wireless

If you are on a wireless network you probably want to have a software firewall on your computer. On a wireless network you are more vulnerable to an opportunistic

attacker in proximity. Wireless routers, like their wired counterparts, usually have a built-in firewall, but if you use a wireless hotspot somewhere else you have no control over security.

Anti-virus Software

Many computer viruses ride on E-mail, and can sneak by most personal or inexpensive firewalls. Neither the software firewall nor the router will provide adequate anti-virus protection. You still need anti-virus software running on your computer to protect you from viruses carried by E-mail or instant messages.

Small Business Firewalls

A small business may be able to survive with the same type of firewall you would use for your home. That decision depends on the number of employees, and on how much the business relies on connecting to the Internet for its viability. If you work alone, go with the classic model.

Travel Agency

A small travel agency with 10 or 20 workstations in a single office might find the model to be a bottleneck. Travel agencies depend on their networks. They use the Internet to connect to the reservations systems of the travel and tourism industry. Travel agents have E-mail accounts for the business and may have to download video clips from destination hotels and resorts. The agency may have a web site. The accounting system is also online. The agency may employee contract agents who work from home, but who need access to the company's computer and networks. An inadequate firewall could hurt this type of business.

Bakery

A small bakery may have a network and computers, but the demands on the network are trivial. Most of the network communication would be inside the firewall. The bakery may do some online ordering, but that business can function over a phone line. A single point of access would offer the strongest and most cost effective security for the business. If business is good and the bakery grows into a chain of bakeries, then they might want to consider a firewall for each store or location. Locations can communicate over a VPN. The business will probably never be a network centered business, so a wide area network (WAN) would unnecessary.

Large Business Firewalls

Large complicated businesses need complex firewall systems that enable the business and mitigate risk. The firewalls they need must let a lot of traffic across

the network perimeter and block a lot more. Most large businesses would lose significant revenue if the network were unavailable and if employees, business partners and customers could not access parts of it from anywhere in the world. A single point of access is not only an unacceptable bottleneck; it's also a single point of failure.

Complex, Non-Business Organizations

Even school districts and government organizations have found that their needs won't tolerate the confinement of a classical firewall. For them, firewalls have become larger, far more complex and sometimes fairly porous. It's not unusual even to have internal firewalls, separating one department or school from another.

Many Devices on the Firewall

With a more complex model, the firewall is a collection of network routers and high speed servers performing specific tasks. Routers at the entry point or points of the firewall examine network traffic, and direct it to appropriate servers that perform the primary security functions for their own traffic. VPN goes to one server that authenticates users and negotiates encryption keys. E-mail goes to another server that scans the E-mail for viruses or hostile attachments before passing it along to departmental mail servers or directly to the addressee. Web page requests go to the web server. There may be specific firewall gateways for customers ordering goods or for employees checking their benefits from home. Instant messaging may have its own devices on the firewall. Voice over IP will certainly need even more devices.

Support

All these devices attached to the firewall serve the dual role of protecting the inside network and helping the business to communicate better with the outside network. The problem is that each of these devices has to be managed by people with the expertise and the budget to keep them functioning properly. System administrators have to update or patch software or operating system periodically. Security administrators have to enforce security policy by setting firewall rules that may prohibit access to certain websites or block all file transfer protocol (FTP) requests across the perimeter. Someone has to scan firewall logs for signs of aggressive attacks. This can be done with software.

Firewall Rules

Sometimes firewall rules can have unexpected and undesirable consequences. Suppose there has been a longstanding rule in the firewall to allow Company B

unlimited access to a particular database server on Company A's network. Someone believes that only the HR department from Company B should have that access. The rule to allow unlimited access is changed to block access and a rule to allow the HR department to have access is added. Those rules have to come in the correct order. If the rule to block access is first, then a request for access from HR will always be denied. Managing the hundreds or thousands of rules employed by large companies is a very complex job.

Poorly Configured Firewalls

If support people do not do their jobs well the business becomes vulnerable to several kinds of problems. Incorrectly configured firewalls could disrupt the businesses they should serve and expose the business to malicious activity.

Choosing a Firewall

By now you can tell that the firewall you choose has to match your needs. Malicious attacks over the Internet will only increase in volume and frequency and the need for security has never been greater. If you are a large company you are a large target for network threats. Your firewall has to handle your needs today and tomorrow and may need upgrades as your business grows or as attacks change. Think about the things you want to do, then think about the best ways to do them securely. That's the key to security: security should enable your business.

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

SBC Communications' Board Proposes All Directors Stand For Election Annually

The Board of Directors of SBC Communications Inc. voted to submit to shareowners a proposal requiring every director to stand for election annually. Currently, SBC has a classified board structure where each director is elected to a three-year term and a third of the board stands for election each year.

Shareowners will vote on the proposal at the company's annual meeting of shareowners on April 30, 2004.

"Our board believes the annual election of directors is consistent with SBC's commitment to good corporate governance and being accountable to shareowners," said Edward E. Whitacre Jr., SBC chairman and CEO. "We have a talented, diverse and independent board of directors today, and we expect shareowners will support the board's recommendation to strengthen its accountability."

SBC E-Services Certified

SBC E-Services, Inc., a subsidiary of SBC Communications Inc. has been awarded HP SP Signature Certified status through the HP Service Provider (SP) Certification program, establishing SBC E-Services as an industry-recognized Web hosting and server collocation services provider.

The HP SP Certification program is a comprehensive assessment of people, processes and technology, and provides recognition of a service provider's (SP's) capability to consistently deliver a reliable hosting service to a defined standard, based on industry best practices. From information technology infrastructure to management best practices, participation in the HP SP Certification program represents a commitment to high standards that increases customer confidence. HP SP Certification is concerned with only the SP's ability to deliver reliable services. SP Certification is global in scope, ensuring that a service provider is capable of meeting consistent quality standards in each of its data centers worldwide.

"The HP SP Certification program provides guidance and confidence to companies outsourcing their hosting requirements to service providers," said Ken Bloom, acting managing director of the HP SP Partners and Programs. "The program rigorously assesses a service provider's IT systems and services running on the full range of HP platforms and storage, across six domains of availability: IT Service Management, Networking, Applications and Database, System Software, Hardware, and Environment."

SBC E-Services focuses on full end-to-end support for customers, including access, networking, equipment, and services. SBC experts handle all elements of customer need, from design to delivery to ongoing management of hosting services. SBC PremierSERV℠ Hosting Solutions also include monitoring and reporting tools, which provide businesses with details required to proactively manage operations, system performance, resource availability and site usage.

The full SBC PremierSERV Hosting portfolio includes a wide spectrum of hosting solutions, from shared, managed and server collocation to enhanced services, such as storage and managed security, to meet customers' demanding hosting needs.

Additional information on SBC E-Services enhanced managed hosting portfolio and case studies on how SBC E-Services can help your business is available at www.sbc.com/premierserv.

Jagdish Kohli, Ph.D.

Teleradiology – The New Frontier

Teleradiology is a growing area in the medical industry where inner human body images can be interpreted by radiologists at a distance. Many technological developments in the field of high speed networks have contributed to the ongoing growth of the teleradiology business.

In this article we discuss the following aspects of teleradiology:

Teleradiology Overview
High Speed Networks
Future

Teleradiology Overview

MRI (Magnetic Resonance Imaging), CT (Computed Tomography), US (Ultra Sound) and Radiographs are some of the techniques by which inner body images are captured. These images assist radiologists to diagnose brain tumors, blocked heart arteries, blood clots in veins and many other microscopic diseases in the human body. Surgeons use inner body images to accurately operate on the right part and position in the human body.

Radiological images have been created on radiographic films for many decades. More recently with the developments in digital technology, these images are captured as soft computer files. There is a lot of information stored in each computer file as dots of varying intensity represent the inside details. Digital images have the following advantages as compared to film X-rays:

◆ Easy to transmit over a telecommunication network
◆ Ease of consultation by a group of specialists for simultaneous viewing
◆ Remote viewing by any radiologist independent of place and time.

Table 1 captures the amount of time required to transmit a single MRI image using a range of varying speed networks. The time to transmit an image also depends upon the amount of compression used before sending the image. As can be seen with T1 network speed, a MRI image can be sent from one place to another in split seconds.

A complete medical image exam for a single patient is a collection of many images/slices. The radiologist needs to study all these images together to diagnose the problem. Average number of images required for a Radiograph study, CT study and MRI study are shown in Table 2. Also shown here are the numbers of exams transferred in a

Table 1. Time to Transmit Single MRI Slice *(in seconds)*
Time vs. network speed for varying compression ratios (512 x 512 x 8 bit slices)

	28.8Kb Modem	56Kb	ISDN@64Kb	T-1 (1.5Mb)
3:1	75.0	13.0	11.0	0.5
8:1	10.0	5.0	4.0	0.2
20:1	4.0	2.0	2.0	0.1

28.8Kb modem already doing compression at 3:1. Compression ratios are estimates. 3:1 is lossless

Table 2. Exam Capacity for Primary Diagnosis for Various Networks *(Exams in 24 hours)*
Exam capacity for 24 hours vs. network speed (lossless compression)

	28.8Kb Modem	56Kb	ISDN@64Kb	T-1 (1.5Mb)
Radiograph	14	115	130	3,000
CT	8	55	65	1,500
MRI	10	90	105	2,400

Compression ratios estimated at 3:1. Network efficiency estimated at 66% for 28.8 modem, 80% for others.

24-hour period for reading at different network speeds. Again a high speed network is a must to manage the flow of a large volume of studies cost-effectively.

High Speed Networks

A customer's perspective of a telecommunication network speed is defined by the speed at which the information can be downloaded from a remote site or uploaded for transmittal to another user. This customer experience is best represented by a number of DSL technologies. The family of DSL technologies, typically denoted as xDSL, includes High bit rate Digital Subscriber Line (HDSL), Asymmetric Digital Subscriber Line (ADSL), Single line high speed Digital Subscriber Line (SDSL), and Very high speed Digital Subscriber Line (VDSL). xDSL modem technology permits ultra-fast, cost-effective, and constant access to the Internet over ordinary copper telephone lines.

xDSL provides speeds up to 8 Mbps (up to 52 Mbps with VDSL) downstream and up to 1 Mbps upstream (up to 2.3 Mbps for SDSL). High transmission speed is now considered crucial to Internet applications such as interactive multimedia including medical images. Representative examples of network speeds from a telephone network are shown in Table 3. The availability of a particular speed is also a function of the distance between customer location and telephone company remote terminal.

Table 3. xDSL Speeds

| Distance (feet)	Downstream (receive)	Upstream (send)
8,000	7.1 Mbps	90 Kbps
8,000	1.5 Mbps	1.5 Mbps
12,000	1.5 Mbps	90 Kbps
12,000	1 Mbps	1 Mbps
18,000	640 Kbps	90 Kbps
18,000	256 Kbps	256 Kbps
Unlimited	144 Kbps	144 Kbps

Wireless Networks

A number of advances have taken place in wireless technologies over the past two decades. The high speed wireless network can allow a radiologist to review medical images from anywhere by using a mobile laptop computer.

US wireless carriers are currently building the third generation (3G) wireless networks. These networks will provide speeds in the range of 384 Kbps to 2.4 Mbps. WCDMA and CDMA 1xEV-DO are the 3G technologies. Wireless data network speeds for a range of technologies are shown in Table 4.

Table 4. Public Wireless Network Speed Evolution

Technology	Peak Network Speed
GSM (Global System for Mobile Communications)	7.1 Mbps
GPRS (Global Packet Radio System)	1.5 Mbps
EDGE (Enhanced Data in GSM Environment)	1.5 Mbps
WCDMA(Wideband Code Division Multiple Access)	1 Mbps
CDMA (Wideband Code Division Multiple Access) 1xRTT	640 Kbps
CDMA (Wideband Code Division Multiple Access) 2000 1xEV-DO	256 Kbps

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Figure 1. Unified High Speed Public Network
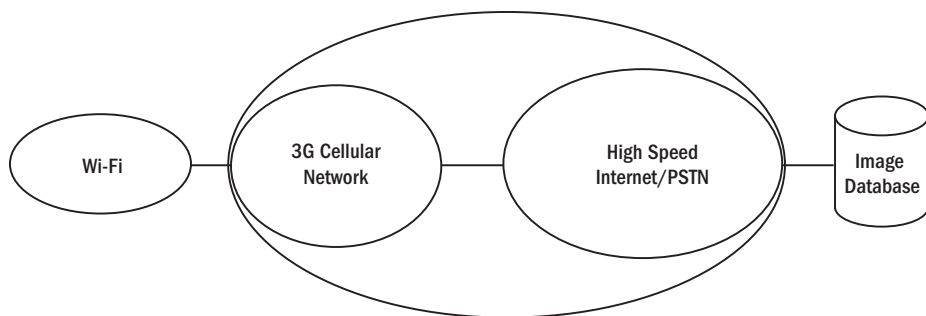
Wi-Fi hot spots are being created in all public places, such as cafes, airports, train stations and public parks. Wi-Fi is a standard for wireless local area networks (LANs). Wireless LANs allow users within their area of coverage to connect to fixed networks without the need for cables. They employ electromagnetic waves to transmit and receive data over the air from a network access point (base station).

Short for "Wireless Fidelity", Wi-Fi is actually the common term for the IEEE (Institute of Electrical and Electronic Engineers) 802.11b specifications, also referred to as "Wireless Ethernet" and "WLAN". It provides a range of approximately 100m (300 feet) and data transmission speeds of up to 11 Mbps over the 2.4 GHz band. To put it into context, the average wired Ethernet network provides speeds of 10 Mbps; traditional 56k modems offer up to 56 Kbps and 3G is expected to support 384 Kbps to 2.4 Mbps.

With a Wi-Fi card in the radiologist's mobile computer a high speed connection can be established from any publicly located hot spot. The issues of security need to be addressed appropriately before using this service.

Future

Figure 1 captures a vision of an evolving high speed public network. It's all coming together– the Wi-Fi high speed wireless access, 3G cellular network and the high speed Internet/Intranet with xDSL speeds. This network will be transparent to the user as he/she may establish a cost-effective high speed connection from a wire line access point or a wireless access point. Within the context of medical images, a radi-ologist can review images from a remote database independent of time and place.

It's all coming together – the Wi-Fi high speed wireless access, 3G cellular network and the high speed Internet/Intranet with xDSL speeds. This network will be transparent to the user as he/she may establish a cost-effective high speed connection from a wire line access point or a wireless access point. Within the context of medical images, a radiologist can review images from a remote database independent of time and place.

Developments in medical imaging technologies and high speed public networks are helping the medical industry to create many new business models to read medical images for the benefit of:

◆ On-call radiologists
◆ Referring physicians
◆ Specialists
◆ Off-site radiologists
◆ Clinicians
◆ Departments outside of radiology
◆ Patients

A promising future is unfolding in the delivery of new healthcare services using high speed telecommunication networks. A lot has been achieved and a lot more has yet to be realized for improving the quality-of-health for many.

Jagdish Kohli is an independent Healthcare and Information Technology consultant. He can be reached at jagdish_kohli@yahoo.com.

SBC E-Services Helps Bankers Integration Group Power OnLine Financing Database

Bankers Integration Group, a California-based application service provider to the finance and insurance industries, has a patent pending software engine, BIGFNI, which is a web-based risk analysis engine that provides automobile dealers with a powerful tool for pre-screening loan applications and matching them to lender programs, ensuring that consumers are offered the best financing available to them.

The data that the BIGFNI software compiles is sensitive, and Bankers Integration Group wanted to take extra precautions to ensure the data was stored, backed-up and available for restoration on demand through a secure environment. Further, the company wanted the data storage facility located away from the Bankers Integration Group main facility, in case of disaster at the main facility. Bankers Integration Group turned to SBC E-Services for a solution.

Solution

A team of SBC E-Services experts evaluated Banker's Integration Group's needs and recommended SBC PremierSERV℠ Data Center Hosting and Storage Area Network (SAN) services to enhance the company's operations as an application service provider in the finance and insurance industries.

First, Bankers Integration Group's primary data site was relocated to the SBC Internet Data Center in Irvine, California to provide additional reliability and stability to BIGFNI's users.

Next, a backup site was established at the SBC Internet Data Center in Dallas, Texas. SBC Internet Data Centers offer a wide range of transport capabilities connected directly to an OC-192 Internet backbone to provide fast access to hosted servers. These facilities are designed with redundant power supplies, fire protection, and environmental controls to provide a high level of reliability.

Finally, Bankers Integration Group was connected with SBC PremierSERV Storage Area Networking (SAN) capabilities so data could be accessed, backed-up and restored on-demand with guaranteed service levels. The SBC PremierSERV SAN infrastructure is fully fiber-based, providing for disk-on-demand services with high-scalability and availability, and tape-backup services that offer superior performance and reliability.

Result

As a result, Bankers Integration Group has been given new opportunities to augment or replace in-house data storage or establish off-site data repositories for disaster-recovery and business continuity purposes.

"After an exhaustive review, our technical team determined that SBC had the most advanced data centers in the country, providing the highest level of reliability, security and technical expertise in the industry," said Ted Cunningham, vice chairman of Bankers Integration Group. "As an application services provider in the finance industry, we are particularly concerned with security and reliability issues. SBC Internet Data Centers were designed from the ground up with these issues in mind."

UPDATE

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Progress Report On Major Growth Strategies

SBC Communications Inc. outlined a broad range of marketing, customer service and productivity initiatives designed to strengthen its competitive position and drive growth. The company reported that major growth initiatives – including its recent Midwest long distance launches, expansion in national data and enterprise markets, its plan to launch bundled SBC DISH TV video services in early 2004 and Cingular® Wireless' national GSM/GPRS network conversion – are all on or ahead of schedule.

SBC Communications is updating and standardizing systems at its call centers and network service centers over the next two years to further enhance customer service, simplify operations and increase productivity.

"We have come through a tough period for our company and the industry," SBC Chairman and CEO Edward E. Whitacre Jr. said during a company-sponsored conference. "We have many sizable opportunities ahead, and I am optimistic and confident about our ability to execute on behalf of our owners."

Gaining long distance freedom in the final five SBC states was a major milestone, Whitacre said, because it provides opportunities for new long distance revenues, helps drive access line retention and winback, and gives SBC companies much greater traction in the national data and enterprise business markets.

"Our initial entry into the Midwestern long distance market several weeks ago has been very successful, with early sales figures outpacing our initial growth rates in other states," Whitacre said. "Being able to offer long distance in a bundle with local, DSL, wireless and soon satellite TV – in all of our markets – gives us great sales momentum heading into 2004."

Business Markets

While SBC companies have strong existing local relationships with many businesses, long distance freedom, combined with the addition of new capabilities and infrastructure, has improved the company's competitive position in the national business market.

The SBC IP backbone and out-of-region networks – which reach more than 30 major metropolitan markets outside the company's traditional service area – are up and running. The company has built a national sales force focused on the large-business market. In addition, products and customer-care capabilities are being added to help drive new large-business growth opportunities. The company has already won several major contracts.

With strong customer relationships and nearly half of the Fortune 500 companies located within its core 13-state footprint, SBC companies are well positioned to compete for this business. Large businesses with more than 50 percent of their locations within the SBC 13-state area spend an estimated $34 billion a year on telecom services.

Cingular® Wireless

Cingular® Wireless has accelerated subscriber growth over the past three quarters and has made a number of moves to strengthen its competitive profile.

Its network conversion to the GSM/GPRS industry standard – now 92 percent complete across Cingular's existing geographic footprint – is ahead of schedule and should be completed in 2004. In addition, through roaming agreements, Cingular expects GSM coverage to reach 90 percent of the nation's population by the end of this year and 95 percent by the end of 2004. Currently, 40 percent of Cingular customers have GSM-enabled handsets.

The company will also further strengthen its competitive position through its pending NextWave Telecom spectrum acquisition, which covers 34 markets and a population of more than 83 million. This purchase, which is expected to close in the first half of 2004, will increase Cingular's average spectrum in its top 100 markets from 30.3 MHz to 34.5 MHz, increasing its network capacity.

In less than a year, Cingular has moved from a distant fifth in subscriber growth to a strong second, with a net subscriber gain of 745,000 in the third quarter. Today, Cingular's network serves 23.4 million cellular/PCS subscribers, with licenses reaching a population of 236 million across the United States.

Major drivers of Cingular's subscriber growth include its quality service, nationwide coverage and broad distribution. Cingular has 86,000 retail points of presence across the United States, complemented by the sales channels of its parent companies' wireline operations.

Productivity, Service and Cost Reductions

While they execute new marketing initiatives, SBC companies also are investing in technology and resources to enhance customer service, improve productivity, and reduce costs. The goal of these initiatives is to simplify operations by standardizing technology, migrating to national platforms and automating various functions.

Among the hundreds of initiatives under way, the company is reducing its number of call centers by about one-third by standardizing technologies and processes. And in the SBC network center operations, the company expects to substantially reduce its roughly 500 locations – down from 600 a year and a half ago – and create a more efficient, uniform system with a consistent national approach to service. Productivity improvement initiatives that are underway today are expected to save the company an additional $1.3 billion annually in expenses and capital costs by 2006.

Over the last two years, the company's total work force has declined by 28,000 employees. SBC companies expect the pace of companywide staffing reductions going forward to accelerate from recent quarters, mainly through attrition.

2004 Outlook

Whitacre said effective marketplace execution and disciplined cost management will be hallmarks for 2004. "We are confident that as we move forward we will see revenue trends stabilize, leading to positive growth in revenues, including proportionate results from Cingular, by the end of next year," he said.

For 2004, the company expects:
- Continued growth in DSL net adds.
- Consumer retail long distance penetration of more than 40 percent companywide by year end.
- Strong access-line performance in the Midwest – similar to trends in the Southwest and West following long distance launches.
- A capital spending program of approximately $5 billion.

Whitacre said SBC marketing initiatives will continue to impact margins in the near term. But with improving revenues and access-line retention trends – combined with ongoing cost reductions – the company expects margins to stabilize by the end of 2004, he said.

Cautionary Language Concerning Forward-Looking Statements

Information set forth in this news release contains financial estimates and other forward-looking statements that are subject to risks and uncertainties. A discussion of factors that may affect future results is contained in SBC's filings with the Securities and Exchange Commission. SBC disclaims any obligation to update or revise statements contained in this news release based on new information or otherwise.

SBC Long Distance Expands International Portfolio With India 60 Plus

SBC Long Distance added a new international calling plan to its growing portfolio that provides rock-bottom rates to specific regions of the world. For a flat monthly rate of $14.95, India 60 Plus allows callers more time to talk with faraway family and friends with per minute rates as low 25 cents when all minutes are used. Additional minutes are billed at just 26 cents per minute.

"Staying in touch with family and friends is more affordable than ever before," said Jeff Urbanek, executive director of consumer marketing for SBC Long Distance. "SBC Long Distance continues to develop exciting new products for individual countries and regions that help our customers get the most for their dollar."

This new international "block of time" plan covers direct-dialed calls from the U.S. to India and Pakistan and joins other plans such as Middle East 60 (for calls to Oman, Syria, Bahrain, Israel, Jordan, Kuwait, Lebanon, Palestinian Authority, Saudi Arabia, Turkey, United Arab Emirates, Iran, Qatar and Yemen); AsiaSaver 100 (for calls to Hong Kong, Singapore, South Korea, Taiwan, Japan, Malaysia, Indonesia and China); and EuroSaver 180 Plus (for calls to Austria, Monaco, Belgium, Netherlands, Denmark, Norway, Finland, Poland, France, Portugal, Germany, Spain, Ireland, Sweden, Italy, Switzerland, Liechtenstein, United Kingdom Luxembourg, Andora, Greece, San Marino & Hungary).

If you would like more information on SBC international plans, please contact your Liaison Manager at 1-800-552-5299.

Helping Businesses Protect Themselves From Internet Viruses, Worms & Hackers

As Internet viruses, worms and other security breaches threaten business networks with increasing frequency and severity, affiliates of SBC Companies are delivering a new consulting service to help potentially vulnerable small- and medium-sized businesses protect their communications services and critical data.

SBC companies have introduced the SBC PremierSERV℠ Security Architecture Evaluation (SAE) service, an offering designed specifically to help smaller companies identify and address a range of network security challenges. The service provides a cost-effective means to identify vulnerabilities to a business' network infrastructure and to develop corrective actions that fit a company's specific business requirements and security needs. The service includes a technical assessment of the company's network perimeter as well as staff interviews designed to evaluate the state of its information security program.

The small- and medium-sized business market traditionally has been underserved in terms of security consulting services. This, combined with the fact that many smaller companies lack in-house IT expertise, can result in higher levels of vulnerability to attacks by viruses, worms, and hackers.

"With the recent spate of viruses and worms like LoveSan, SoBig, and Blaster, many small businesses are in desperate need of professionals to help them protect themselves to ensure their operations are not disrupted from such attacks," said Chris Christiansen, IDC's Program Vice President for Security Products and Infrastructure Software.

"To date, this market – which can be especially vulnerable, due to their lack of resources and security expertise – has had little help, as most information security service providers focus on larger companies."

With SAE, SBC consultants scan up to 100 public Internet addresses for vulnerabilities, which are weaknesses in the business' IT systems that might allow unauthorized activity, such as hacking. SBC consultants also review one router and one firewall, looking for policy and configuration issues that might compromise the security of a business network.
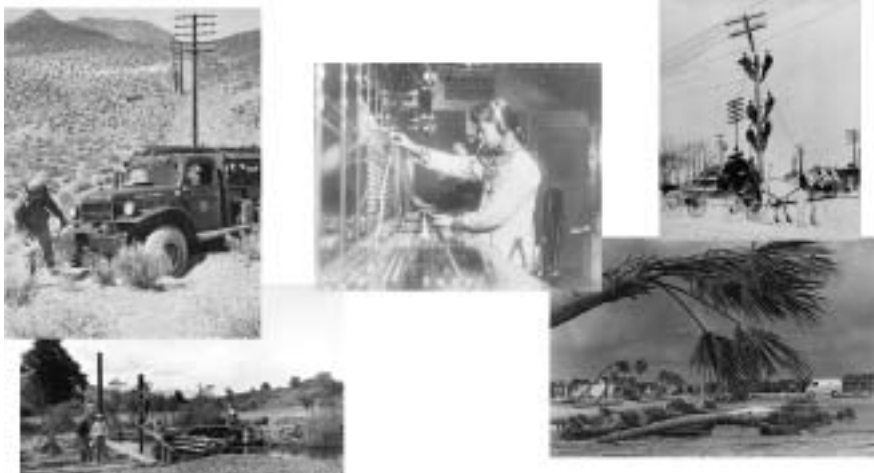
The SBC SAE service also helps to secure a small- or mid-sized business' intellectual property and business operations. It provides improved awareness of security threats and the current exposure of a business customer's information assets to those threats. The assessment yields information designed to allow a business to better protect its information assets and identifies existing information assets, security controls, and vulnerabilities.

In addition, SBC companies introduced the SBC Vulnerability Scanning Service (VSS), an affordable solution for businesses wanting to assess the security of their external-facing networks. The SBC VSS complements other current SBC Managed Security Service offerings, and provides the business customer with specific reports of any vulnerabilities that were found as well as recommendations on how to mitigate them.

*Opinions expressed in **UPDATE** are not necessarily those of the SBC companies.*

Webwatch

www.thefuturefaster.com
Check out this website, created by the U.S. Telecom Association, which represents more than 1,200 of the nation's telecom companies.

Travel Alternatives For Efficiency & Savings
Call 1-800-266-3373 for information on the 1-800-CONFERENCE® suite of conferencing and collaboration services that offer outstanding travel alternatives and savings for businesses.

Ringing The Bell
Several SBC employees joined Chairman and CEO Ed Whitacre in ringing the opening bell at the New York Stock Exchange Nov. 13th in observance of SBC's 20th Anniversary of being listed on the prestigious exchange.

SBC Companies – Celebrating 126 Years of Service

Photos courtesy of SBC Archives and History Center, San Antonio, Texas

Cassandra Jessie-Johnson

DSL Data News

Happy New Year!

2003 was a phenomenal year for us and telecom users. We introduced many enhancements to the DSL product portfolio and made a few changes to benefit your customers, including reducing the monthly rate of the SBC Yahoo! DSL Basic Package to $39.95/month, launching the SBC Yahoo! DSL Symmetric 384-S Package, the SBC Yahoo! DSL Basic – S Package (static) and the SBC Yahoo! DSL Expert Plus (dynamic) options, and adjusting the shipping and handling charge, just to name a few. There were some low points due to a continually weakening economy, however, you helped us bend the trend. Our DSL market share continued to increase month-over-month. In the second quarter of 2003, we grew 304,000 DSL lines. We also ended the year with SBC Long Distance available in all 13 states.

We said "Yahoo"…

At the close of 2002, all of our existing legacy SBC Internet Services' DSL customers were able to migrate to the SBC Yahoo! Portal via a download URL. At the end of 2003, the SBC Yahoo! Business Portal was launched! This enabled your customers to become more competitive and improve business productivity. The Business Portal included customized services for the business client.

Of all of the new features and enhancements, the most popular proved to be the expanded parental controls for residential customers, as well as and the email safety and security tools for residential and business customers. SBC Yahoo! DSL and Dial subscribers automatically received new anti-spam, e-mail protection services, Address-Guard™ and SpamGuard Plus as part of their current service. Your customers told us that safety, security, and privacy were important and we listened. Now your customers have more control in protecting their inboxes.

If customers would like to take a tour of the SBC Yahoo! product, you can refer them to: http://www02.sbc.com/DSL_new/content/1,,78,00.html

New Upstream Speeds

The availability of the new speeds is contingent upon the distance, called loop length, from the customers' location to the Central Office or Remote Terminal (RT). 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 customer's computer. For more information on either of these two new SBC Yahoo! DSL Packages, call your Unique Services Center South Consultant Queue today at 1-866-234-4DSL (4375).

Steeper Discounts and more…

On the horizon for the second quarter, we'll have another great way to sell SBC Yahoo! DSL – bundled with our Shared Web Hosting product. Together the two are called Web Advantage (formerly known as Online Office). Promote e-commerce, web-hosting by SBC to your business customers that would like an online presence as well as an opportunity to increase their online revenue. One-stop-shop all at SBC!

Best in Class

SBC Communications has exemplified industry leadership by expanding the availability of DSL Internet access service to more than 32 million customer locations across its footprint. To date, SBC has over 3 million DSL subscribers, with nearly 2,020 Remote Terminals (RTs) and over 11,960 Distribution Areas (DAs) ready for service, in ASI West and SBC California and 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 Jessie-Johnson is Associate Director, Business Processes Team, SBC Sales Operations-Central

Highlights Across The Regions

SBC Long Distance

Now that SBC Long Distance is available in the Midwest, it can provide Long Distance service in all 13 states. Sales have surpassed targets and the Midwest business group had the most successful long-distance launch in SBC's history!

1-800-CONFERENCE®– Just got Simpler!

Customers now will receive one great service for one simple rate. Effective late November 2003, 1-800-CONFERENCE® Bridging charges and Long Distance charges for customers were combined and billed into one single rate – making it simpler for customers to understand their charges.

Avaya IP Office available now in Southern New England Telephone territory

Avaya IP Office is a total communications solution for small and medium businesses. IP Office is designed for customers with 2 to 60 stations with expansion capability of up to 256 stations. Customers can set up IP Office as a traditional Key/PBX, or as an IP telephony server, or a combination of both. It is a business applications suite with a full contact center, a voice communication solution, and a data communications solution – "all in one". It offers full voice functionality with a comprehensive list of features and benefits that can help a small company succeed and grow. Avaya IP Office will also be available in the Southwest region soon.

Tidbits

Did you know that nearly 50 percent of Fortune 500 companies are headquartered in our 13-state footprint?

February 2004

Rates at-a-glance for SBC Yahoo! DSL Internet service with enhanced upstream speeds

Product Name	Speed (downstream x upstream)	Loop Length	Rack Rate
Yahoo! DSL Basic Package	Up to 384Kbps x 128 – 256Kbps	16K ft	$39.95/mo
Yahoo! DSL Basic – S Package	Up to 384Kbps x 128 – 256Kbps	16K ft	$54.95/mo
Yahoo! DSL Standard Plus Package	384Kbps – 1536Kbps x 128 – 256Kbps	12K ft	$49.95/mo
Yahoo! DSL Standard Plus – S Package	384Kbps – 1536Kbps x 128 – 256Kbps	12K ft	$64.95/mo
Yahoo! DSL Deluxe Package	768Kbps – 1536Kbps x 256 – 384 Kbps	9K ft	$59.95/mo
Yahoo! DSL Deluxe – S Package	768Kbps – 1536Kbps x 256 – 384 Kbps	9K ft	$79.95/mo
Yahoo! DSL Symmetric 384 – S Pkg	384 – 416 Kbps x 384 – 416Kbps	12.5K ft	$119.95/mo
Yahoo! DSL Expert Plus Package	1.5Mbps – 6016Kbps x 384 – 608Kbps	7.5K ft	$139.95/mo
Yahoo! DSL Expert Plus – S Package	1.5Mbps – 6016Kbps x 384 – 608Kbps	7.5K ft	$159.95/mo

SBC West Restores Network & Aids People After Devastating Southern California Fires

Over One Million Feet of Fiber and Copper and More Than 900 Telephone Poles Were Lost in Flames

The series of fires from San Diego to San Bernardino to Los Angeles last year damaged the outside telecom plant network like nothing in history. "In a matter of days, we were replacing a network that took many years to construct," said Chuck Smith, president and chief executive officer for SBC West. Smith said he is proud of the fact that despite the loss of commercial power at several central offices for a period of several days, "our switches continued to process calls, thanks to back-up power sources engineered into the network.

"Our back-up power systems operated flawlessly, just as they are designed to do. We never lost a central office but our biggest advantage was the 'can-do, get it done' attitude of our employees. As entire communities suffered from the shock, thousands of our Southern California employees came to work to serve our customers." (Some were even employees who had lost their homes in the fires.)

SBC West People Help The Community

Numerous employees, including the Telephone Pioneers, helped out fire victims in a variety of ways, from donating money to giving blood to collecting food and clothes. Even the SBC Consultant/Vendor Sale Group that produces this publication helped make a difference. Liaison Manager Lowayne Shieh was contacted by Michael Lakin, National Sales Manager of ADTRAN, who lives near the fire area in San Diego. He and his wife, Lesa, wanted to know what could be done to help folks in the Crest area of San Diego County. After Lowayne and other CVSG members assisted, Michael sent her the following email: "Lesa just arrived home with wonderful stories from her day at Crest Elementary. She cannot say enough great things about you, SBC and Cingular. You really made a difference for many families who lost everything in the Cedar Fire in Crest. She and her friends were able to post signs around the area regarding how to contact SBC for assistance. The school really appreciated the cell phones and support from Cingular® Wireless and SBC West. Please tell everyone that they really made a difference!"

Cingular® Donates Phones

Cingular® Wireless donated 1,100 phones – each including $500 of prepaid airtime – to the Southern California Evacuation Centers and the American Red Cross chapters in the regions of the fires.

Features Made Available Without Cost To Displaced Consumers & Businesses

SBC West made these features available free of charge for displaced consumers and businesses (for a certain length of time):

- **Call Forwarding**, which automatically forwards calls to any phone number fire victims choose.
- **Remote Access To Call Forwarding**, which allows fire victims to dial in and direct normal home phone calls to another number from any phone.
- **The Message Center** (for residential customers) or SBC Voice Mail (for business customers), which allows fire victims to retrieve messages left at their home phone from any location as well as leave a greeting telling callers their status.

Emergency Services That SBC Companies Can Provide:

SBC Intellicast Target Notification Service for Government Customers

SBC Intellicast Target Notification Service augments other emergency warning systems by quickly telephoning targeted areas with a specific warning message. IntelliCast combines a telephone number database (e.g. 9-1-1 database or other telephone number and address listing data.), x,y coordinate geographic routing database, and outbound calling.

IntelliCast utilizes the coordinate routing database to generate telephone number extracts for specified areas, which define an emergency event. Emergency event boundaries may be either pre-planned (as in the case of a flood zone) or "drawn" in real time (such as a chemical fire with toxic plume). The telephone numbers are then extracted and outbound calling begins with the dialing of the telephone numbers extracted from the event boundaries and delivering a voice message notification generated by the customer. Outbound calling will provide a maximum capacity of 1,132 simultaneous calls, initially.

This product is supported by your Region's E911 Teams.

SBC Crisis Alert Management System (CAMS)

SBC Crisis Alert Management System (CAMS) is an integrated, web-based solution that enables organizations to proactively notify individuals quickly with important information. SBC Crisis Alert Management System gives the capability of reaching people via a variety of channels, including the Internet, wireless devices, or conventional telephone equipment. CAMS is hosted out of a secure datacenter with redundant and dedicated servers. SBC Crisis Alert Management System provides the following features:

- **Variable notification methods** – Various notification methods of telephone, cellular phone, numeric pager, e-mail to RIM devices, e-mail to alpha pagers. Distribution methods provide notification to users wherever they may be located in the world by their individual methods of choice.
- **Highly reliable, trackable system** – CAMS allows notification to take place by several means. Dedicated, redundant servers further enhances reliability. Also, the ability to track who has and has not received notification allows organizations to then target select groups that need further effort to reach.

If you would like more information on these Emergency Services, please contact your Liaison Manager at 1-800-552-5299.

Lowayne Shieh
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Alcatel Selected For Fiber-to-the-Premises Initiative

Lab testing and field trials planned for 2004

SBC Communications Inc. has announced a four-year primary supplier agreement with Alcatel for the SBC Fiber-to-the-Premises (FTTP) initiative. The agreement will enable SBC Communications to move forward with further lab testing and field trials, which are the next steps in developing and finalizing potential use for this next-generation network technology.

Ultimately, FTTP deployment will depend on results of the final lab testing and field trials, as well as clarification of any regulatory guidelines that would apply to FTTP networks.

FTTP is a promising technology that could provide a foundation for next-generation broadband networks, capable of providing nearly limitless voice, video and data bandwidth for consumers and small businesses. The technology is capable of supporting a number of emerging and evolving applications, such as interactive gaming, photo sharing, PC backup and telecommuting, along with video conferencing, premises surveillance, and other novel video services, which could be delivered on demand and in high-definition.

Happy New Year from the CVSG!

SBC CVSG Resources For You

1. Website: sbc.com/cvsg
2. Bell Advantage (Password-Restricted)
3. CVSG Hotline – 1.800.552.5299

4. Breaking News on CVSG Listserver
5. SBC Streaming Media News Broadcasts over the Internet

(Call your Liaison Manager to get a Password to Bell Advantage or subscribe to Listserver or UPDATE and to attend Broadcasts in person or via the Internet.)

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
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