



November 2005

UPDATE

Solutions for Success

Consultant/Vendor Sales Group

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Kari's Korner



>Quality People, Companies & Products

SBC West Business Leader Robin MacGillivray was recently quoted in *Quality Times* on our company's commitment to Quality: "Quality hasn't gone away over the years – it's not a fad," she said. "It's a constant thread and tone in all we do. Anything less than Total Quality has direct bearing on our customers – whether the work of an individual, product, service or our image." How true! Having worked in a variety of departments over her 26-year career at SBC, Robin knows a lot about Quality and constantly shares it. No wonder she was recently

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An UPDATE Special Report

>Quality – You Know It When You See It!

UPDATE surveyed several successful businesses on the topic of "Quality." We found their responses to be very insightful.

What is Quality?

"Reaching for excellence – the highest standard in all that we do. It's the intricate details of doing something right the first time."

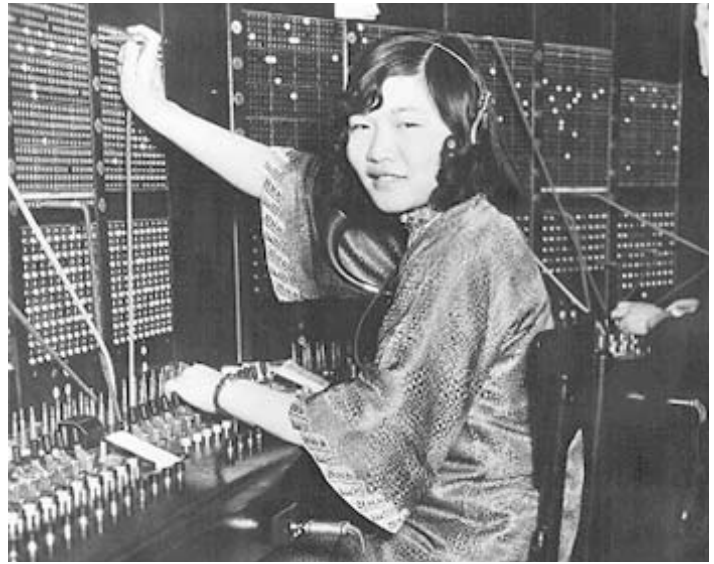
"Delivering the best possible service...providing an extra level of service that differentiates us from our competition."

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UPDATE Special Report On Executives

>What Former Job Really Helps You Today?

One sold encyclopedias door-to-door, another was a ski lodge waitress, a third pumped gas, yet another worked in a full-service grocery store, others did a multitude of things. One thing these enterprising men and women have in common is how they used their previous jobs to gain a knowledge & understanding that helped them succeed. UPDATE surveyed several telecom consultant executives on what former job really helps them today. We THANK all respondents for taking time out of their busy schedules to share their past with us. What we received in this enthusiastic response, amazed us. Many responses provide a rare insight – a glimpse into what made them develop into who they are today.

Helped Define My Values

"In college, I sold encyclopedias door-to-door during Summer to pay for school. Although I learned a lot about selling, it also taught me about people, particularly how they make decisions and raise their families. These experiences helped me define my own values which helped me raise my own children."

Peter T. Duncan, Associate Partner, Accenture
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>New Intrusion Prevention Services Offer

With corporate data networks at an ever-growing risk from disruptive and destructive network security threats, including worms and virus outbreaks, SBC Communications Inc. recently announced the addition of a powerful new intrusion prevention service to its portfolio of SBC PremierSERVSM Managed Security Services.

The new SBC PremierSERV Managed Intrusion Prevention Service (IPS) provides business customers with a cost-effective, professionally managed tool that can detect, contain and/or neutralize both known network threats as well as previously unidentified threats, also known as "zero day" threats. These malicious intrusions – in the form of viruses and worms on network clients such as servers, laptops, desktops or other endpoints – can sometimes bypass traditional network perimeter-based security solutions.

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“Creating a finished product that our clients accept to their standards.”

Why is it important?

“Because consciously or subconsciously we measure people and things by their Quality.”
“Without it, we’re out of business.”

How do you get it?

“You keep trying things to get your product and service better.”
“By being always on your toes – communicating with your customer; knowing their changing needs and what your competition’s doing; then taking it up a notch by finding ways to add even more value.”

How do you know you’ve got it?

“Your customers tell you.”
“You should know it when you feel it. If you don’t have it, you’ll feel it like a misfitting shoe.”

How do you keep it?

“Never taking anything for granted; never being satisfied – always wanting to do better.”
“Constantly upgrading your procedures. If we’re doing the same thing next year that we’re doing today, we’re falling behind.”
“Being in regular contact with your customers. Two-way Communication is the key with a capital ‘C’.”

What does it cost?

“It’s like a return on investment. It costs less than what you get back.”
“It costs you imagination, knowledge and endless effort.”
“You can’t put a dollar amount on it. It’s really whatever it takes since without it you’re dead!”

>New Contract with Hawthorne School District

SBC Communications Inc. recently announced a new contract with the Hawthorne (California) School District. The district serves 10,000 students at eight elementary schools, three middle schools and a charter high school.

Under the contract, SBC companies will provide GigaMAN® Service, a dedicated fiber-optic point-to-point gigabit Ethernet service, to each school to connect the various locations and improve communications throughout the district.

The solution will provide Hawthorne School District with a flexible, linked Metro Area Network (MAN) that can transmit data at extremely high speeds, minimize downtime and allow for increased productivity among teachers and faculty.

How much is it worth to you?

“We base all our purchases on it. If it does not meet our standards, we won’t buy it, regardless of cost. It doesn’t pay to use anything substandard.”
“We demand a consistency of Quality products and services from our vendors, just like our clients demand it from us.”
“If you focus on Quality, you may increase your profit by an amount equal to 10% of your sales.”
“With all the competition today, it can mean the difference of surviving or not.”

Priceless Quality Tips From Businesses

“Know your limits so you can go around them.”
“It’s a mortal sin if you pass along a problem.”
“People want to work for a company committed to Quality.”
“Employees should be empowered to resolve a problem & prevent its reoccurrence.”
“Do it right the first time!”
“The more we’re faced with High Tech, the more we need High Touch.”
“Quality is continuous improvement.”
“There is always a better way.”
“Deliver what customers expect.”
“Care, listen & deliver.”
“Quality begets quality.”
“Quality needs to improve.”
“There is no substitute for quality.”
“Quality is pro-active.”
“Quality means never having to say you’re sorry.”
“The difference between ordinary & extraordinary is that little extra.”
“Autograph your work with excellence.”
“Without Quality, Without Customers.”
“Nothing is good enough.”
“Quality is never final.”

“As our district continues to grow, we need to expand our services in order to support rising data traffic and improve our communications districtwide,” said Gil Mara, technology coordinator, Hawthorne School District. “SBC companies will help us meet those requirements by providing a solution that is flexible and dependable.”

“Hawthorne School District personnel are very forward-thinking in their telecommunications vision and goals,” said Robin MacGillivray, president – Business Communications Services, SBC West. “They demanded a system design that is reliable and cost effective, with the flexibility and capability to adapt to new technologies in the future. Our GigaMAN optical networking solution simplifies network operations and will allow Hawthorne to expand and upgrade its communications technology infrastructure while taking advantage of greater speed and bandwidth.”

selected as one of the Bay Area’s Most Influential Women by *The San Francisco Business Times*. Other SBC Leaders also place Quality as a Top Priority. That’s why SBC Companies recently won a major Quality Award from Ford Motor Company. This is the first time Ford has given its prestigious “Q1” status to a telecom company. The honor was for Consistency, Customer Satisfaction and a Drive To Do Better every year. Ford evaluated SBC companies’ performance in three areas: Regulated Services, Managed Services and De-Regulated Products. As part of the honor, a “Q1” flag is flying over SBC company facilities in Michigan...SBC Products also are known for their Quality. The September *Consumer Reports* says SBC Yahoo! DSL is ranked “Best Value in Broadband Service”...Speaking of Quality, one of our Quality Groups is SBC Knowledge Ventures who creates strategic value by developing and commercializing the corporation’s intellectual property assets. It broadens the use and deployment of SBC companies’ innovation in the marketplace through the sale and licensing of our assets, creates valuable business relationships with others interested in marketing intellectual properties and does a whole bunch more.



Robin MacGillivray

To learn more, you can check out: <http://www.sbc.com/gen/corporate-citizenship?pid=5882>. And we in the CVSG strive to provide each of you with Top Quality Service. That’s why our Liaison Managers work one-on-one with you and why we inform you of the latest on telecom, including SBC Products & Services, through UPDATE, our Streaming Broadcasts, Listserver, Bell Advantage, seminars, conferences and the website, [sbccom/cvsg](http://www.sbc.com/cvsg). Please see the back cover for more info about these efforts to help you succeed like never before. We’re here for you and because of you and we know it! Thanks very much.

Kari

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CVSG Leader

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New Contract With Forward Air

SBC Communications recently announced a new 5-year contract with Forward Air, Inc. for SBC PremierSERV™ Network-based Virtual Private Network utilizing MultiProtocol Label Switching technology to deliver highly differentiated services to 63 locations nationwide to help improve the company’s network capabilities for more efficient data transport.

Providing Service

"From 16-19, I worked at a Service Station. Most people think of gas stations but we ran a Service Station, with the emphasis on "Service." Our clients came to get gas, at which time we checked their air pressure, oil and fluid levels. We would then sell and install these basic needs." *In telecom, our clients come to us for their basic needs, POTS lines, local and long distance calling, Internet access... We then provision these services.* At another time, our clients would come for routine maintenance – oil changes, tuneups, new tires, brakes...things needed to keep the car running. *In telecom, this could be a routine update of software, review of cable plant, new local, LD or Internet access plans.* Later the time comes to look at better performance needs or desires...improving gas mileage or handling or the effect of weather conditions on the car. *In telecom this could mean a lot of things: phone system forklift upgrade, new call center application, remote offices, more local or LD calling, new bandwidth needs, cost controls... We help provide the basics, the maintenance, the growth, a consultative relationship – the only difference in how I treat the client is the product."*

Doug Kanner, President, RFM Group
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Negotiation

"When I was 16, I was hired by a ski lodge in my native Michigan. The deal was I'd be paid minimum wage and get free ski lessons on my day off. I was a waitress and short order cook in a lunch-only restaurant. People were in a hurry, very hungry and hollering at me all the time. After lunch, I was required to rent skis and boots and sell apparel to lodge guests. When the store closed, I had to collect tickets for the ski lift. Finally, at the end of my shift, I had to help the manager balance out the day's receipts. After my first week of witnessing three broken ankles, I asked for a raise in pay, in lieu of ski lessons. I thought the price they charged for a lesson was what I should see for a raise on my paycheck. I was shocked to learn that the selling price of the lesson was not the gauge, but the actual cost of the labor at the lodge was all I could receive...so I had to negotiate the value of the labor to translate into what I would receive by way of a pay raise."

Jacque Mercier, Principal, Eagles Soar Communications
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Managing Difficult People & Keeping Projects on Track

"When I was 21, I received a promotion to Assistant Store Manager of a Pantry Markets full-service grocery store. The Pantry Markets were similar to what we know today as

Gelsons or Bristol Farms in terms of product quality, selection and in my store's case, the customer base as well. As the youngest Assistant Manager in the company's history, I quickly learned to manage employees as well as customer expectations and handle those unexpected problems that occur when dealing with the public. Today, decades later, I find that I utilize those hard-earned skills to manage difficult people and keep projects on track."

John Lambert, Managing Principal,
Lambert & Associates
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Setting Standards

"When I was going to college, I worked summers and all breaks for an electrician who was a perfectionist. Being a junior electrician in a very upscale section of Long Island, New York, I was encouraged to include in my every day work clear communications with everyone, group discussions with co-workers, effective time management, effective materials handling, adjustable scheduling and doing every part of a job perfectly the first time. No job was ever done until the customer was totally satisfied. His constant counseling and encouragement set my work ethics to a height that has made every job since then a comparison to his standards. I have used the same approach with anyone that has worked for me, improving and adjusting it over time, to great success as well."

George Cisler, Principal, G Services
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Hands-On Background Came In Handy

"When I worked for AT&T, I ran the California operations group for a few years, right at the time AT&T was installing tons of fiber optic cabling. My OSP Operations folks had to maintain all of the fiber. When I visited my OSP groups around the state, they taught me all about fiber – how to calculate loss budgets for it; how to splice it; how to use an OTDR and test it...When I later started TEECOM Design Group, designing structured cabling systems for commercial clients, that hands-on background in fiber came in very handy!"

Cecilia Trost, Principal, TEECOM Design Group
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Managing Client Needs

"Being a director of Customer Services (at a health insurer) taught me the importance and value of managing client needs while trying to solve complex technical problems."

Roy Walker, President, Walker Consulting, LLC
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Developing Skills

"For about 7 years, I was the Telecom Manager for a large Northern California County Government. Prior to my involvement, the County had no formal central tele-

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communications management function. Each major County department managed their own telephone service requirements, dealing directly with Pacific Telephone. My task was to centralize and modernize the more than 70 individual PBXs (as many as 3 separate systems in a single building) into a cohesive network. It took 12 new tariff filings and 4 years to convert those 70-odd independent systems into 5 regional 'Telephone Service Centers.' When completed, all locations were connected via a rather sophisticated (at the time) tandem tie-line network permitting 4-digit dialing between all County telephone users. I believe that this experience allowed me to develop the basic knowledge and skills, which I continue to strive to improve in my work as an independent consultant."

Peter G. Bologna, President,
World Communications Group
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Caring

"The most important job I held was for three years during my doctoral program at Indian Institute of Technology (IIT), Roorkee, India. The first two years of this program involved extensive research and during the last year, I published the key findings of my investigations in several international journals. The skills of independent investigations that I learned during my research years continue to help me in my professional assignments. The topic of my research was new with minimal resources available in the institute's library. I started writing letters to many experts in Europe, Canada and the USA seeking help in getting published research material. I received help from a lot of these experts during my time of need. I feel my gratitude towards all these people who

assisted me in my growth. The only way I can pay back the people is to help everyone I come in contact with in my daily life. This attitude towards my fellow human beings is making my life's journey very enjoyable.

Jagdish Kohli, Ph.D.

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Concisely Summarize The Issues

"In 1990, while in a Corporate Strategy role at Illinois Bell, I also served in an Executive Assistant role to Dick Brown, President of Illinois Bell (later Vice Chairman of Ameritech). One responsibility was to prepare him for an Office of the Bell Group President meeting, which involved receiving the meeting agenda 3 days prior to the meeting, then preparing 6-8 position papers (one for each agenda item/discussion area) within 24 hours. This taught me to concisely summarize the issues, background and recommendations from a CXO perspective."

Phil Bierman, Client Solutions & Relationship Director, Deloitte Services, LP
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Letting Go

"I was an industry analyst for a large research firm. I had an unrelenting publication schedule, much as a journalist does. In each publication, I had to make insightful comments, supported by data, as to the direction of the industry and individual companies. This experience taught me to do the best I could within the allowed time and then, LET GO! The "letting go" part works for me since you can literally collapse from the stress of always wishing you had a bit more time or a bit more information before proceeding. This ability to "let go," has served me well, especially in executive positions where the pressure is great and you never have enough information but nonetheless must make decisions."

Eileen Healy, President & CEO, Healy & Company
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Trusting You To Do Your Best

"Perhaps my most challenging position was that of Director of Operations for a Shared Tenant Services Provider with sites in California, Texas, Florida and New York. It allowed me to focus my actions based on a well-rounded perspective melding strategic and tactical needs for a broad range of customers with the business and technical needs of my employer. Additionally, I was responsible for developing policies and procedures covering customer support as well as technical aspects of the business, both for day-to-day operations and on a special project basis. During this period, my boss was excellent at recognizing the skills of his employees, motivating them to contribute as best they can. His communications were frank but always encouraging. One ground rule of his was: 'As

long as I can trust you to do your best, I can afford to pay you; when I can no longer trust you, I can no longer afford to pay you.' As a consultant, this breadth of experience and my ex-boss' perspectives have guided me well."

Robert James, President, TechMoves

rjames@techmoves.com

Developing Skills

"I believe my telecom consulting experience with a 'Big 8' Accounting Firm has been the most beneficial for my practice. It taught me to develop:

- ◆ A structured approach to a consulting project
- ◆ Relationships with the clients and vendors
- ◆ Objectivity
- ◆ Independence

Ron Pellegrini, Principal, Pellegrini Associates
ron_pellegrini@hotmail.com

Walk the Talk

My telecommunications career has been lengthy – over 50 years. Been varied, started initially as an "installer" for Pacific Telephone. Last assignment was as National Account Manager in AT&T Long Lines. Took early retirement from AT&T in 1982 & been consulting since then. No one job had one specific accomplishment that is identifiable today. Over time learned that job/personal responsibility is critical. Over time learned that professionalism is important. Learned that one must do what he/she has committed to & do so in a manner that's consistent with your values and the values of others.

Ken DeLong, Partner, DeLong and Associates
ken.delong@verizon.net

Learning On The Job

"I was an Industrial and Plant Engineer with a small aerospace firm in Southern California. The company was awarded several large contracts with a major commercial/military aircraft manufacturer along with a subcontract for ordnance cases and they expanded to a new facility in the City of Industry. I was Project Manager for the construction of all manufacturing and office facilities for the new factory. This included machine shop and heat treating facilities, assembly, materials handling and metal plating operations. I also was responsible for the information service infrastructure, data cabling and telephones. As a degreed mechanical and industrial engineer with 15 years experience, the manufacturing facilities planning and construction was not new to me. However, the office layout, planning and infrastructure construction was quite new. The mainframe computer at the headquarters offices was some 300+ miles away, so I was at this time first exposed to Wide-Area-Networks and the mechanisms of dumb terminals and other onsite data peripherals. I also became well-acquainted with PBX and

Telco systems and facilities. This project just so happened to coincide with the deregulation of the telecommunications industry (which began in January, 1984). The new factory and offices were subsequently served by some of the charter long distance providers in the fledgling long distance industry. At the time, I was able to achieve a remarkable rate – \$.25 per minute for all company long distance services, bettering the headquarters offices by nearly \$.10 per minute. The experience intrigued me and I became a part-time, then a full-time (1986) telecom consultant."

Steven R Green, President, S. R. Green & Associates
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The opinions expressed in this column are those of the individual executives and not those of the SBC family of companies.

>SBC SMARTpages.com Launches Site Redesign

SBC SMARTpages.com, a leading Internet Yellow Pages (IYP) site, has launched a comprehensive site redesign that includes a new look, enhanced search features, in-depth consumer shopping content and more information provided in search results. These changes make it easier for online consumers to connect with local businesses.

The new look starts on the home page – located at www.smartpages.com – with a unique design for an IYP site. Consumers can easily search for local businesses by entering a category, name, product or service. Because consumers will have many options for viewing business content and sorting their results, they will receive the most relevant information from their search.

SMARTpages.com now features more than 100 revised City Guides nationwide with comprehensive, up-to-date local information, including local news, weather, sports, concerts, dining and local business information. SMART Guides have been designed specifically for consumers, with information in more than 20 of the most popular shopping categories, such as automotive, travel and entertainment.

SMARTpages.com advertisers receive more value than ever with a single ad purchase. Their ad also receives distribution on YellowPages.com and Switchboard.com and soon will also appear on AOL Yellow Pages. SBC has also introduced popular new advertising packages, such as Print Ads Online and SBC Search Engine Solutions. In addition, SMARTpages.com offers priority ranked business-listing ads, sponsored links and custom Web sites.

"The focus of network security is rapidly evolving from detection to eradication. With Managed IPS, we are not only able to identify interior threats, but can contain and respond to them in a real-time, automated fashion, which better protects the mission-critical data networks we plan, design, build, and operate for our business customers," said Mark P. Fishler, vice president, SBC product management. "The addition of an intrusion prevention service focused on the network interior complements our strong existing portfolio of managed security offerings and provides an additional layer of protection against potentially destructive zero day threats."

SBC PremierSERV Managed IPS utilizes a leading-edge network security solution from Mirage Networks that actively monitors and defends a network's interior, stopping network threats before they cause widespread damage. This device is installed on top of the corporate network (as opposed to an "in-line" design) and does not require expensive network re-architecture nor does it tax network bandwidth. No desktop software has to be purchased, installed or maintained.

Unlike previous generations of intrusion prevention technology, the security appliance used by Managed IPS provides heuristic-based (or discovery-based) zero day protection for business customers. The device responds to malicious activity based on its detection of suspicious network activity, rather than a signature-based approach that relies on a pre-determined database of signatures (or attributes) of known malicious threats.

SBC IPS differs from traditional firewall, intrusion detection services (IDS), and antivirus solutions in several ways. For example:

- ◆ SBC IPS monitors behavior of various computers and servers operating on the corporate network, as opposed to looking for known signatures of worms and viruses. This enables the service to identify malicious activity resulting from both known and unknown threats.
- ◆ SBC IPS monitors traffic between computers operating on a corporate network, serving as a complement to traditional firewall technology, which attempts to erect a barrier at the entry point to the corporate network. This enables detection of known and unknown threats resident on trusted computers inside the corporate network.

SBC IPS automatically isolates and stops the propagation of detected threats without the need for software agents to be installed on individual computers.

The SBC companies' new intrusion prevention service can assist in mitigating a variety of

network interior security threats. For example, a destructive worm or virus – such as MyDoom.BB – can infect a corporate network when an employee unknowingly downloads an infected file from a personal e-mail account to a corporate laptop on a home office network and then re-connects to the corporate network. The security appliance used by SBC PremierSERV Managed IPS is designed to detect the presence of the worm or virus on the re-connected laptop, test to verify if it is malicious, and, if determined to be malicious, quarantine the infected laptop to prevent the spread of the worm to other network hosts.

Managed IPS also includes device integration, configuration, 24x7 real-time monitoring by trained professionals at SBC security operations centers, security event notification, and response, trouble resolution, and reporting.

With the addition of the Managed IPS, SBC companies offer business customers access to a complete suite of SBC PremierSERV managed security service options administered by trained SBC personnel, including:

- ◆ Managed firewall services
- ◆ Managed virus scanning
- ◆ Managed content filtering
- ◆ Vulnerability scanning
- ◆ Managed intrusion detection

To meet the needs of organizations with limited IT staff or security expertise, the SBC companies offer several of these services as part of CompleteSecure, an "all-in-one" package of security services. The CompleteSecure package includes virtual private networking (VPN), firewall administration, intrusion prevention, content filtering, and anti-virus services.

SBC companies also offer a portfolio of leading security hardware devices and trained professionals to stage, install and configure the devices on the customer premises. In addition, SBC PremierSERV Consulting Services are available to offer expertise in designing IT infrastructure and networks to protect against security threats.

Additional information about SBC PremierSERV Managed Security Services, including the new Intrusion Prevention Service and the Complete-Secure service package, can be obtained from your Liaison Manager.

New SONET Service for CareTech Solutions

SBC Communications recently announced a new 5-year Data Services contract with CareTech Solutions, Inc., a technology and health information management outsourcing provider. SBC will be providing Synchronous Optical Network (SONET) service to support the organization's new Internet Data Center, Call Center and Network Operations Center with the highest levels of redundancy and survivability.

>New Contract With John Muir/Mt. Diablo Health System

Demonstrating its commitment to providing robust service upgrades to business customers, SBC Communications Inc. recently announced a new seven-year communications services contract with John Muir/Mt. Diablo Health System that will provide the Walnut Creek, Calif.-based health provider with expanded data capacity and network capabilities.

Building on an existing communications infrastructure, SBC companies will launch an upgrade in network integration through the deployment of a Multi-service Optical Network (MON) Ring – a single, redundant, secure managed network that will link John Muir/Mt. Diablo Health System's two hospitals and affiliate locations, and expand the capabilities of the network while supporting stringent business contingency plans, which include mandates for minimal down time and 24/7 real-time visibility for network users. The new MON Ring will be built upon dense wavelength division multiplexing (DWDM) technology, utilizing Nortel's Optical Metro 5200, the leading Metro Broadband Services delivery platform.

"The solution laid out by SBC companies clearly indicates a level of technology that improves patient safety by allowing instant and uncompromised access to patient information and records, thus enabling our health care professionals to make the best clinical decisions," said Eric Saff, chief information officer, John Muir/Mt. Diablo Health System.

SBC companies will upgrade the existing circuits to the MON Ring, resulting in an integrated, managed network that delivers robust benefits, including quadrupled bandwidth with capacity for additional projected growth over the next seven to ten years. For John Muir/Mt. Diablo Health System, the MON ring was designed to carry Fibre Channel, Gigabit Ethernet, and SONET (OCN) services in their native format, eliminating points of failure and costly protocol conversion equipment.

"John Muir/Mt. Diablo Health System has been a customer of ours for nearly 20 years, and we're very pleased they've chosen us to provide this dynamic network upgrade. The capacity of the MON Ring will allow each physician in the hospital simultaneous access to the network to view patient records and X-rays, or update and monitor patient data, without a single hitch in real-time visibility," said Robin MacGillivray, president, Business Communications Services-SBC West. "It essentially creates a virtual, feature-rich, on-demand environment with no wait time or downtime."



> It Happens: Surviving A Disaster

Executive Summary

This article provides an overview of steps you can take to help keep your business running after a disaster. You need to analyze your business, prioritize its needs and plan for what you would have to do to replace key components or people. Share your plans with your key employees. You also need to plan for the safety of your family before natural disasters so that you will have the time and focus to get the business running again.

Introduction

In previous articles, I have tried to help you protect yourselves from cyber attacks of one sort or another. I usually discuss the risks and the trade-offs so you can decide what suits you best. In this article I am going to assume the worst can and will happen no matter what we do. By the worst, I don't necessarily mean cyber attacks, but natural disasters and other catastrophic events that can occur no matter how much defensive action we may take.

Earthquakes happen when they happen. Tornadoes and hurricanes are not affected by your defenses. We saw Hurricane Katrina in real time on television and on the web. We saw the pictures of the tsunami in Asia at the end of 2004. You can't predict or stop these events, but how well you survive them can depend a great deal on what you do before they happen.

This article is about a topic sometimes called "Disaster Recovery" and other times called "Business Continuity". It will discuss things you can and should do now to give your business a better chance to keep functioning after a disaster. I won't define disaster for you; you'll know it if it happens.

Key Steps in Preparing for the Worst

What you should do depends on the size and complexity of your business and on where the most critical components, processes and people are. By critical I mean which ones would cause the most damage if they were lost to you for even a short time. For some people their business could not exist without a car, a cell phone and a personal digital assistant (PDA). Others need their design studio with all the tools and supplies. Others have one or more offices with computer systems, phone systems and key personnel doing fast paced order processing.

Analyze and Prioritize

The very first step is to analyze your business and prioritize which components or people you would need the fastest, and which ones you could do without if they were delayed for a day or a week in returning to service. Frequently one of the most important things is a communications channel. You might be able to delay payroll a day or two, but not too long. You can probably put off paying bills for a few days. Take some time to evaluate and document what's most important to keep your business running. You should identify what you could replace, such as office supplies, and what is irreplaceable, such as all the information that your business has on computer.

Family and Loved Ones

Although this article is about keeping your business running, you'll have a hard time doing that, especially after a natural disaster, if you're not sure that your family is well. They depend on you and the success of your business, so if you can plan for their well-being in advance you'll be able to give your business the attention it will need. As you go through the rest of this article keep your loved ones in mind and include them in your plans. The American Red Cross has an excellent web page for Family Disaster Planning: http://www.red-cross.org/services/disaster/0,1082,0_601_00.html

Plan

Once you have a handle on the critical components you should make a plan for how you will take care of those most urgent needs after a disaster. Which employees do you want to contact you as soon as possible after the event? You may need to arrange a new place of business quickly. Will you have to rely on cell phones temporarily? You may need to recover information from backups to your computer systems. Do you have backups now? How fast would you be able to obtain your backup data and restore it on a different computer? Who's help will you need right away? What kind of help will you need right away? After a disaster you will probably be running around frantically unable to hold a staff meeting to decide what has to be done. Take the time to decide before a disaster.

Prepare

By this point in the process you will have a good idea about what you have to do to stay in business. Now it's time to take steps that will make that plan a success.

At the very least, draw up a check list of things that you have to do after the worst happens. Prioritize those things. It won't be perfect, but it will save you time and will probably help you to avoid forgetting critical things when you need them. You can assign tasks or groups of tasks to key people on this list so that everyone will know who is

responsible for what and who needs what resources to accomplish the tasks.

You will need an emergency contact list so you and your employees can reach each other. Perhaps there is a friend or family member in a different state who would be willing to take a few calls and help you coordinate with people. Get that person's agreement in advance so you can inform your employees.

STEP ONE: If you haven't been backing up your computer files, now is the time to start doing that. It only takes the minor disaster of your drive crashing to ruin your day or week. Lost data can mean the loss of months of work to some professionals. STEP TWO: You have to keep the backups somewhere else other than near your computer. A backup does you no good if it's destroyed at the same time as your production database. Your Internet Services Providers (ISP) may give you disk space. If you have very large files you may have to contract with a data storage and recovery company.

You need a place to set up shop if your primary location is destroyed. See where you can rent office, shop or warehouse space. Establish relationships with the owners of these locations if that is possible. Negotiate terms before the disaster. It will be a lot less expensive if you can.

Some Things To Consider

Computer Systems

Computers are normally easy to obtain, their prices keep falling and their power keeps increasing, but the information we keep on our computers may be a lot more difficult to replace or recover.

Recovery Vs. Insurance Adjustment

Planning for disaster recovery may be less expensive than buying insurance that will pay you off after something happens. Earthquake insurance is very expensive, if you can get it, and comes with a high deductible. Scheduling regular data backups and sending the backups offsite can be trivial in cost by comparison. If you have a Virtual Private Network between your home and your office, can you send the backups securely over the Internet? Large capacity external hard drives are only a few hundred dollars. The storage capacity of little USB memory sticks is up to 2 gigabytes already. Are your electronic files small enough to keep copies in your car or your home? If you make the effort to protect yourself from disaster you reduce the risk for your insurance carrier and you may get more favorable rates in return.

Zotob Virus

The Zotob worm that struck many computers on August 16 was a small disaster. It dis-

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rupted a lot of businesses. Both ABC and CNN admitted being affected by it and having to use typewriters to write their stories. I'm sure that wasn't a well-documented and planned disaster response, but it worked for them. What do you have? It's easy to say they should have installed the operating system patches that Microsoft published the week before, but they have priorities and pressures just as you do. Certainly install the patches, but prepare for recovery from cyber disasters.

Conclusion

You can't prevent all possible disasters, and it would be very expensive to try. Planning for disaster recovery is a cost effective alternative. Give some thought to what you could do if the most important things to your business suddenly were not there. By planning in advance you can minimize the disruption to your business.

Phishing Update

The people who write phishing messages trying to trick you into revealing your personal financial information know that most

of us are becoming more aware of the tactic, so they have begun using new techniques to stay one step ahead of us.

One recent technique is for the crook to work an online Chat Rooms gaining the trust and confidence of potential victims. The crook can spend months talking to you and pretending to share your interests before asking you for a favor or for some information. Remember phishing is a form of social engineering. Be wary of revealing too much personal or financial information electronically, no matter how low-risk it may appear. The bad guys often are very persuasive, very creative and very adaptable.

Jerry

Jerry Hinek is a Senior Business Security Manager for SBC Services. He earned an MBA in Information Management and is a Certified Information Security Professional. The opinions expressed in UPDATE are not necessarily those of the SBC family of companies.

> SBC Companies Helping Hurricane Victims

The SBC Foundation is providing a dollar-for-dollar match of contributions – up to a total corporate contribution of \$2 million – by regular full-time employees and eligible retirees with funds directed to the American Red Cross. The money is aiding emergency relief efforts in the affected communities along the Gulf Coast in Louisiana, Mississippi, Alabama, and along the entire path of Katrina. This contribution is in addition to a five-year, \$1 million grant made earlier this year to the American Red Cross. According to the Red Cross, the initial contribution helped put Red Cross personnel in position prior to Katrina so they would be ready to provide immediate aid to hurricane victims seeking basic needs, such as shelter, food, drinking water and supplies.

SBC companies are deploying a wide range of free communications services valued at more than \$4 million per month for use by the tens of thousands of refugees in Houston and San Antonio. The company has made available to hurricane victims at the Houston Astrodome up to 1,000 telephones with free local and long distance calling, three months of free personal voice mailbox use, free wireless service in conjunction with Cingular® Wireless, and SBC Yahoo! DSL service and computers for high-speed Internet access. The companies have installed Wi-Fi hot spots for use by public service personnel and media for wireless Internet access. Also, SBC companies set up phone banks for refugees in Tyler, Texas

and Beaumont, Texas. SBC Pioneers have been staffing phone banks in shelters and assembling care packages for refugees.

SBC companies also are enabling free access to SBC FreedomLink Wi-Fi hot spots in areas heavily impacted by Katrina, including Louisiana, Mississippi, and Alabama, as well as the Houston, Texas, area and specific cities in Florida, where many hurricane evacuees are staying. Florida cities include: Pensacola, Panama City, Warrington, and Callaway. This free wireless broadband access at designated SBC FreedomLink locations assists hurricane victims and relief workers with critical communications as they work to recover from the disaster. The FreedomLink venues offering free service include Barnes & Noble bookstores, The UPS Store® and Mail Boxes Etc.® locations.

In response to requests from BellSouth, SBC companies were deploying up to 140 technicians to assist in Louisiana, Mississippi and Alabama. At the UPDATE deadline, additional technicians were to be provided on an as-needed basis. SBC companies responded to a request from BellSouth for generators and microwave trailers. SBC companies and other providers have a long history of providing "mutual aid" assistance after natural disasters or in other times of need, helping to ensure that critical communications services in impacted areas are restored as quickly as possible.

Information in the above story is subject to change.

"Be somebody for somebody."

Mother Teresa

> Helping Law Enforcement Stay Connected

Federal and local law enforcement agencies across the country are deploying a new wireless handheld information solution from Cingular Wireless and BIO-key International, Inc. that enables officers in the field to quickly access National Crime Information Center (NCIC) and other critical data.

The U.S. Capitol Police, Federal Protective Services and Oklahoma County Sheriff Office are among those public safety organizations that are using the Cingular/BIO-key solution. The solution gives law enforcement officers who are on foot, a bike, horseback, or on special detail the ability to query local, county, state and federal criminal databases using BlackBerry™ wireless handhelds and Pocket PC-based wireless PDAs that are equipped with BIO-key's PocketCOP software and operate on Cingular Wireless' nationwide GSM/GPRS wireless data network. Cingular Wireless operates the largest wireless digital voice and data network in the U.S.

PocketCOP enables real-time access to vehicle registration information, stolen vehicle information, weapon registrations and warrant information. Thanks to Cingular's wireless data network, officers using the wireless handhelds can also send text messages and e-mail for quiet, inconspicuous communications in the field.

Cingular provides law enforcement and public safety agencies with a variety of mobile device platforms including trunk-mounted wireless modems and laptops with EDGE-enabled PC modem cards in addition to the new PocketCOP solution for handhelds and wireless PDAs. The backbone of the system is Cingular's GSM/GPRS network, which provides wide area coverage for reliable data connectivity across the country in 13,000 cities and towns and along 40,000 miles of interstate highways. This helps ensure sufficient capacity for communication between law enforcement officers and the stationhouse – even during peak network usage. Deploying wireless handhelds from Cingular enabled with PocketCOP can reduce traffic on a law enforcement agency's private radio channels, keeping them open for critical communications.

BIO-key's PocketCOP features the most advanced data security that exceeds CJIS Governing Board standards. Security features include end-to-end AES encryption, user ID, password and device authentication at logon, plus audit trail via log server to monitor activity. Cingular adds an additional layer of security in its GPRS network with 64-bit A5 encryption with authentication protocols for added security and wireless data compression for enhanced speed.



>Removing Hidden Data

In the August 2004 issue of UPDATE, I wrote an article about Steganography, which is the intentional hiding of data

to keep others from seeing it. This month I will be telling you about data hidden in your Microsoft Word, Excel and PowerPoint documents that you may be sharing without your knowledge. This data is known as **metadata**.

What is Metadata?

When a Microsoft Office document is created, opened, or saved it can contain metadata that includes user information. The document author is not usually aware the document contains anything more than what he/she has written and can see on the computer screen. This could lead to the disclosure of sensitive or proprietary data when electronic versions of these documents are shared with others. Metadata is also stored in other word processing applications such as WordPerfect, OpenOffice and StarWriter. But as 90% of users use Microsoft products, I will concentrate on those.

On its Web site, Microsoft lists the following metadata that may be stored in documents created in all versions of Word, Excel and PowerPoint:

- ◆ Tracking Changes: Inserted or deleted text
- ◆ Comments
- ◆ Your name
- ◆ Your initials
- ◆ Your email address
- ◆ Your company or organization's name
- ◆ The name of your computer
- ◆ The name of the network server or hard disk on which you saved the document
- ◆ Other file properties and summary info
- ◆ The names of previous document authors
- ◆ Document revisions
- ◆ Document versions
- ◆ Template information
- ◆ Hidden text
- ◆ Macros
- ◆ Hyperlinks
- ◆ Routing information
- ◆ Non-visible portions of embedded Object Linking and Embedding (OLE) objects

Viewing Metadata in Word

Text you thought you had deleted, edits, comments and other information become viewable to anyone using a hex editor. However, as most people don't use hex editors in their day-to-day routines, the average Microsoft Office user can still view some of the stored metadata.

Open a Word document, and click on *File*, then *Properties*. This opens the Properties dialog box, which contains summary information about a file. Click on the *General* tab and you will see the directory path and hard drive the document is stored on, as well as the time and date it was created, last modified and viewed.

On the *Summary* tab, the name of the author or authors, your company's name, and name of the template used will be displayed.

The *Statistics* tab contains information about the size of the document, with the Total Editing Time displayed in minutes. The time displayed is actually the amount of time the document remained open on the computer and not the time actively spent editing it.

Why is Metadata a Problem?

Many times, people will reuse and adapt a document for a new client or project. As deleted text, tracking information, changes, versions, and comments on documents can become viewable, confidential and proprietary information can be leaked out

British Prime Minister Tony Blair was embarrassed last year, when documents pertaining to the conflict in Iraq contained metadata information that contradicted his official position.

Unmonitored content leaving a corporation introduces legal and competitive risk. Lack of content filtering and monitoring makes it difficult to discover potential breaches of policy, the sharing of confidential information and the ability to hold individuals accountable.

How to Remove Metadata

There are several ways to reduce or eliminate metadata from Microsoft documents. Word, PowerPoint and Excel users should turn off the Fast Saves feature. To do this click on *Tools*, then *Options*, then select the *Save* tab, and uncheck *Allow fast saves*. In older versions of Microsoft Office products, this feature is turned on by default.

The Allow fast saves feature lets a computer save a file more quickly by not removing deleted text. If you use features like tracked changes, document versions or comments, make sure you delete the information that is being kept within the document with these features before sharing it with someone outside your company.

Office XP, Word 2003 and Office 2003 include new features that help reduce accidental disclosure of metadata. By selecting *Tools*, then *Options*, and clicking on the *Security* tab, you can specify that some metadata not be saved in a document. Microsoft provides the ability to remove personal information from a file upon save and

to warn users before printing, saving, or sending a file that contains tracked changes or comments.

Converting files to a PDF format will strip out most metadata. Sending documents in a format that prevents a document from being changed can actually be helpful or even necessary in some cases. Ideally, you should clean out metadata such as tracked changes, versions and comments as it can end up being included in the PDF file after conversion.

While converting a file to a PDF format will strip out much of the metadata, PDF files can contain their own metadata. This is usually basic information like the name of the author, date of creation, file location etc. Select *File*, then *Document Properties* to view the summary metadata information within a PDF file. In this same dialog box, you can add further restrictions as to how the document can be accessed, used, copied or printed in the *Security Options* settings. If you want the recipient to have the ability to edit the document, it will need to be sent in its original format, but without metadata. There are several programs that can help identify and clean metadata from these documents.

A very simple way to view and remove some hidden data is to cut and paste an entire document into the Notepad application. Most text should now be visible. Save the document as a .txt file. Note that in doing this, you will lose most of the formatting. Now open the .txt file in Word, reformat it and save it again as a .doc file.

Remove Hidden Data Tools

Microsoft and other companies have recognized the dangers of metadata and have developed tools that can be used to find and eliminate some types of metadata. Keep in mind that for most legal purposes, it is important to retain the original document with the metadata intact. However, it is equally important not to share confidential data outside the company. When it is necessary to share documents, there are tools that can assist in removing much of the metadata.

Microsoft recently released the Remove Hidden Data Add-In, which permanently removes hidden and collaboration data, such as change tracking and comments, from Word 2003/XP, Excel 2003/XP, and PowerPoint 2003/XP files.

The Remove Hidden Data add-in can be used on individual files within an Office XP or Office 2003 application, or run on multiple files at once from the command line. In either case, to run the tool you must have the application installed in which the document was created.

The tool runs on Windows 2000 Service Pack 4, and Windows XP Service Pack 1. It has not been tested on Microsoft Windows 2000, and cannot be installed on Windows 98 or Windows Millennium Edition.

Microsoft's tool can be downloaded from www.microsoft.com/downloads/details.aspx?FamilyID=144e54ed-d43e-42ca-bc7b-5446d34e5360&displaylang=en and works with the following applications: Microsoft Office Excel 2003, Microsoft Office PowerPoint 2003, Microsoft Office Word 2003, Microsoft Excel 2002, Microsoft PowerPoint 2002, and Microsoft Word 2002.

A new and promising tool for removing metadata has been recently introduced by Workshare, called Trace. Trace works similarly to the Remove Hidden Data add-in, but with more options. Information about Trace can be found at <http://www.workshare.com>.

For additional information about manually removing metadata from your documents, view these articles from the Microsoft Knowledge Base:

Word 2003:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;825576>

Word 2002:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;290945>

Excel:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;223789>

Power Point 2002:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;314800>

Word 2000:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;237361>

Power Point 2000:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;314797>

Power Point 97:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;223793>

Nancy

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The opinions expressed in UPDATE are not necessarily those of the SBC family of companies.

"Speech is the index of the mind."

Seneca

>Cingular to Deliver Wireless E-mail and PIM Solution on Windows Mobile Handsets

Cingular Wireless recently became the first wireless company in North America to offer Good Technology's GoodLink™ wireless messaging and data access software and service on Windows Mobile-enabled Smartphones.

GoodLink from Cingular is now available on the Audiovox SMT 5600 and the Motorola MPx220 Smartphones. Both devices now support the latest version of GoodLink software, GoodLink 4.5 for Windows Mobile Smartphone, to give business customers continuous two-way wireless synchronization of their corporate Microsoft Outlook applications, including e-mail, calendar, contacts, notes and tasks, while on-the-go using a lightweight handset.

The Audiovox SMT5600 is a "candybar" style Smartphone recognized as one of the world's smallest Windows Mobile-based Smartphones, weighing just 3.6 ounces. The Motorola MPx220 is a quad-band flip-phone designed for busy professionals wanting style without compromising high-tech phone features.

"The availability of GoodLink from Cingular on Windows Mobile Smartphones gives our business customers who prefer the look and feel of a wireless handset a cost-effective way to access their corporate e-mail without having to purchase a PDA," said Michael Woodward, executive director, mobile professional solutions, for Cingular Wireless. "This underscores Cingular's commitment to provide our customers with the applications they need using the devices and operating platforms they prefer on the largest digital wireless data network in the U.S."

GoodLink from Cingular provides a two-way, wirelessly synchronized connection to Microsoft(R) Outlook functions and other features when customers are within Cingular coverage areas on multiple device platforms including Palm, Windows Mobile Pocket PC and now Windows Mobile Smartphone. GoodLink provides enterprise-class, FIPS-certified security including end-to-end AES data encryption, remote data wipe and remote password policy management. It also includes Secure Over-The-Air™ device provisioning and management featuring Zero-IT-Touch™ activations and upgrades of GoodLink and third-party applications for simplified IT administration.

Both the Audiovox SMT5600 and the Motorola MPx220 are compact yet rich with features, including Microsoft® Windows Mobile 2003 Second Edition for Smartphone, T9 predictive text, MSN Messenger, built-in Bluetooth, infrared port, mini SD card slot,

speakerphone, voice recorder, Camera and camcorder, and Windows Media Player.

"There is a growing class of business users that requires highly secure wireless access to email and PIM, but isn't willing to sacrifice portability and phone power," said Rick Osterloh, vice president, products, Good Technology. "Cingular and Good together are uniquely able to serve this user base with a cost-effective choice of Windows Mobile Smartphones powered by GoodLink on the largest digital wireless data network in the country."

Cingular offers GoodLink as an end-to-end service for a monthly fee of \$44.99 per month for unlimited data with a qualified voice plan. Customers must purchase a one-time \$1,500 Starter Pak per GoodLink server license, and a one-time \$99 per user GoodLink Client Access license. Cingular is offering both devices for as low as \$199.99 with a two-year voice and data service contract.

GoodLink from Cingular is available through Cingular's direct B2B sales organization. For more information or to arrange to speak with a B2B account manager, call 1.866.429.7222 or visit <http://www.cingular.com/goodlink>.

Cingular Wireless signs long-term distribution agreement with RadioShack

Cingular Wireless recently announced a 10-year distribution agreement with RadioShack Corporation, the nation's most trusted consumer electronics specialty retailer, that will give Cingular more than 5,000 new sales outlets across the United States. This agreement also will make RadioShack Cingular's single largest distribution outlet.

Cingular will sell its full line of post-paid products and GoPhone pre-paid products through RadioShack stores beginning in the first quarter of 2006.

"The agreement with RadioShack builds on Cingular's already-strong distribution system," said Cingular President and CEO Stan Sigman. "RadioShack brings a nationwide network of stores and a team of knowledgeable and helpful salespeople with an unparalleled understanding of wireless products. Cingular is looking forward to leveraging these new sales channels to grow our business and serve our customers."

Cingular has 2,300 company-owned stores and kiosks and sells its postpaid products in 5,100 other national retail stores. The company is also represented in 15,000 authorized agent locations. The two companies are also exploring other distribution opportunities in the future.



> Digital Surveillance

Our society is undergoing tremendous changes. Visible terrorism is on the increase in many parts of the world.

New technologies continue to evolve to identify people involved in illicit activities. These technologies also challenge the long-cherished privacy of law-abiding citizens. Leading democratic societies are debating this issue to find a new balance between personal privacy and security of the environment we live in. New technologies also afford an opportunity for citizens to participate more actively to create a more secure and sustainable social order.

Privacy in the Digital World

Several technology developments for gathering, sorting, mining, and distributing all kinds of information about people pose potential threats to privacy. Here are just a few of them:

- ◆ All sorts of records are now digitized. Everything from tax returns and legal settlements to sales receipts are now in digital format, which can be easily copied.
- ◆ Databases have proliferated. Since everyone from your bank to your local dry cleaner is storing customer information in a database, large data repositories are inviting targets for hackers. Databases also make it easier for people to look up information they have no business accessing.
- ◆ Databases are increasingly linked. New application integration technologies such as Web services are designed to tie databases together easily, allowing business intelligence software to pinpoint specific information in multiple databases.
- ◆ The Internet makes collecting, sharing, and sending information easy.
- ◆ Inexpensive digital cameras, particularly Webcams, let people capture images wherever they go. Digital video recorders are also becoming an integral part of mobile phones.

Table 2. Data Trails.

Old Trails	Recently New Trails
<ul style="list-style-type: none"> ◆ check payments drawn ◆ loans ◆ charge account transactions ◆ credit-card transactions ◆ taxation details ◆ welfare payments ◆ licensing details 	<ul style="list-style-type: none"> ◆ ATM withdrawals ◆ debit-card payments ◆ telephone call records ◆ building access ◆ video-surveillance ◆ email traffic ◆ web-traffic ◆ stored-value cards ◆ calling-number display ◆ personal telephone numbers ◆ intelligent transportation systems

Table 1. Dataveillance Techniques.

Front-End Verification	Computer Matching	Profiling
Cross-checking of data in an application form, against data from other personal data systems.	Expropriation of data maintained by two or more personal data systems, in order to merge previously separate data about large numbers of individuals.	A set of characteristics of a particular class of person is inferred from past experience. Data-holdings are then searched for individuals with a close fit to that set of characteristics.

These technologies are here to stay, and their potential for both good and evil is real. Over the past few years, the tug-of-war between privacy and security has reached a new level, and people are accepting a new reality. People are willing to give up some of their privacy in pursuit of security. They are willing to put up with inconveniences at airports and office buildings. They are getting accustomed to removing their shoes before going through airport metal detectors. They don't seem to mind having their photo taken many times before getting into elevators in office buildings. But they do have a problem with indiscriminate data gathering that invades people's privacy without really improving security.

The mass collection of personal information and subsequent mining of that data will not solve the security problem. Instead, the government ends up with far more information than any person or any computer can analyze. Data mining is problematic because it results in extensive watch lists of people who share "suspicious" traits, such as an ethnic surname or a fondness for movies about airplanes. But so many people end up on these lists that the lists become an inefficient way of finding the bad guys. Data mining is better for building a case after the fact than for preventing an attack. The massive data collection measures are more effective at trampling our privacy. Never the less we are moving towards a surveillance society. The following are the preconditions to establish a digital surveillance society:

1. A range of personal data systems, each processing data for specific purposes.
2. Personal data systems connected via one or more telecommunications networks.

3. Consistent identification of the data.

The first two conditions have been satisfied as a result of progress in information technologies during the last two decades. The third condition is the sole factor that is inhibiting the achievement of a surveillance society.

Dataveillance

Dataveillance is a subset of the digital surveillance system and is the systematic use of personal data systems in the monitoring or investigation of the actions or communications of one or more persons. It is significantly less expensive than physical and communications surveillance, because it can be automated and augmented by pattern recognition.

Front-End verification, computer matching and profiling are the key Dataveillance techniques and their definitions are listed in Table 1.

As we participate in life's daily activities we generate a lot of data. Multiple activities create "Data Trails" and define the identity of individuals. A succession of identified transactions, which reflect real-world events in which persons participate are listed in Table 2. Paper-based data trails have been around for a long time and some of the activities associated with them are listed under old trails in Table 2. Over the past couple of decades there has been an ever growing trend to use information technologies in our daily transactions. These technologies create a large amount of data about each individual. Technologies associated with these recently new trails are also listed in Table 2.

There is so much data out there about each one of us because of our regular electronic transactions that one could ask the question "Where is the real privacy?" We could also reconcile with the fact that we are becoming a part of an "open society". Dataveillance techniques discussed above are used to identify individuals by establishing correlations between different data trails.

Mobile Surveillance

Mobile Phones regularly check in with their nearest base stations in order to optimize signal strength. This can, of course be monitored and will pinpoint the phone to at least the nearest cell - approx. 1 sq. km in the country, as little as 250 meters in some heavy traffic city areas. It is technically possible for a certain phone to be sent "test signal" units so that it responds much more

frequently with its position more frequently than normal. All phones have radio frequency "fingerprints" i.e. characteristics of the individual antenna and electronics of a particular unit. These characteristics of mobile phones can be used to pinpoint the location of a crime scene. This is further illustrated in the following application of mobile technology for surveillance.

United Kingdom has 4 million cameras monitoring streets, parks and government buildings. London alone has 500,000 cameras watching for illicit activity. Mobile surveillance involves a number of citizens to video capture a crime scene at any time and any place. Thus this capability augments the video surveillance of stationary cameras.

Mobile Surveillance is a potential application that can be facilitated by personalized mobile devices and assist in capturing the identity of evil doers. Law enforcement agencies can create partnership with public and train volunteers to act as public agents to provide timely information about crime scenes. A number of citizens can volunteer

and participate in this endeavor. If a registered volunteer happens to be near a crime scene, he/she can record the scene and shoot it to the appropriate place for further investigation. The associated personalized device can also provide the location of the crime scene and put a date and time stamp on the video scene. Thus adding a few million "moving electronic eyes" can create a more secure environment.

Long Term Solution

In the final analysis technology alone can't provide a long term solution to the problem of a balanced and sustainable social order. Education plays an important part in unlocking the hidden human potential for change. Developments in wireless networks and handheld mobile devices will bring new learning resources to people any time, any place and in any media format. It's the education that reduces the "Knowledge Divide", "Economic Divide" and now the "Digital Divide" between privileged members and underprivileged members of the society. Too

much gap between "Have" and "Have Nots" creates social problems of poverty, drug abuse, alcoholism, terrorism etc. Taking care of the underprivileged members of the society by creating public private investment-based economic zones, bringing new employment opportunities and engaging people in addressing social issues is one of the ways to address the problem of seclusion, isolation, disengagement and resulting destructive behavior. These are some of the important steps towards creating a just, equitable and sustainable social order and of course the proliferation of the Mobile Internet will bring knowledge and awareness to create a better future for all people.

Jagdish

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>Motorola And Scientific-Atlanta Will Be Set-Top Box Suppliers For SBC U-Verse TV

SBC Communications Inc. announced recently that contracts have been awarded to both Scientific-Atlanta and Motorola to deliver next-generation Internet Protocol TV (IPTV) set-top boxes that will enable customers to access TV programming, video-on-demand, interactive applications and other advanced features that are part of the U-verse family of services.

Both vendors will develop and supply IPTV set-top boxes that will help SBC companies offer consumers more TV choice and a much-needed alternative to cable companies. The contracts, awarded by SBC Services Inc., give equal market opportunity to both vendors and continue through the end of 2008. Project Lightspeed is the SBC initiative to expand its fiber-optics network deeper into neighborhoods to deliver SBC U-verse TV, voice and high-speed Internet access services.

"This is a major technology milestone for IPTV," said Lea Ann Champion, senior executive vice president, SBC IP Operations and Services. "A number of different technology components have come together to ensure the set-top boxes can efficiently support the features and functionality we plan to deliver to our customers."

The planned IPTV set-top boxes are tunerless, which allows multiple video streams to be sent to one set-top box. Additionally, because the boxes will operate next-generation compression technology – either MPEG4

or VC1 – the Digital Video Recorders (DVRs) are expected to store content approximately twice as efficiently as DVRs provided by other video distributors' DVRs.

"We remain on track to give consumers more video entertainment choices through SBC U-verse TV," said Champion. "The planned set-top boxes will offer many outstanding capabilities and we can add even more features in the future by upgrading the software in the boxes remotely."

The set-top boxes will operate the new Microsoft® TV IPTV Edition software. SBC provided a common set of specifications to both vendors to build the set-top boxes.

"Motorola's IP set-top platform, built on our decades of experience as the global leader in digital set-top technologies, will establish SBC U-verse TV as an industry-leading IP video service," said Dan Moloney, president, Motorola Connected Home Solutions. "Our vision of seamless mobility begins with bringing high-quality, IP video into the connected home, and our role in the launch of SBC's entertainment service represents yet another step forward in making that vision a reality."

"The dynamics of interactive video systems and integrated services over an IP network will require set-tops with groundbreaking, innovative technology to deliver a wide range of advanced capabilities," said Jim McDonald, chairman, president and CEO at Scientific-Atlanta. "The combination of Scientific-Atlanta's expertise in digital set-tops and the unique insight we have acquired in helping SBC establish the infra-

structure for its one-of-a-kind video network will help our IP set-tops to provide SBC U-verse TV viewers with a seamless video entertainment experience."

In March 2005, SBC awarded a contract to Scientific-Atlanta to provide IP video network equipment that would enable SBC to acquire, process, encode, and distribute digital media content to subscribers. SBC is currently testing this video network equipment as part of an SBC technical trial. Instead of using a traditional broadcast video system, in which all content is continuously sent to every customer's home, SBC companies will use a switched IP-video distribution system. In the switched IP-video network, only the content the customer requests is provided to the customer, freeing up bandwidth to be used for other applications.

The SBC U-verse suite of services allows for increased programming choices and many new services that integrate video, broadband, voice and wireless products.

SBC is planning an initial controlled market entry in late 2005 or early 2006. The company plans to add more features and functionality, including whole-home DVR and high-definition functionality, to the SBC U-verse TV offering and enter more markets beginning in mid-2006. Both vendors continue to make progress in delivering the technology to SBC. At this time, SBC expects to use Motorola set-top boxes initially when it scales the service, with Scientific-Atlanta set-top boxes soon thereafter.



Ethernet is a widely used protocol among business customers for moving data across their local area networks (LAN). Over 90 percent of installed enterprise networks worldwide use Ethernet in their LANs. Customer applications have increasingly placed more demand on bandwidth, and as customers networks have grown, so too have their local and wide area networks (WAN). The drive for greater bandwidth is forcing companies to look at the make up of their networks, their ongoing operations, deployment costs and the manpower needed to support it.

Metropolitan area networks (MAN) are now commanding more attention as they connect LANs and WANs. Up until the past few years, LAN and WAN connections were either DS-1 or DS-3 private lines providing either too little or too much bandwidth. There is a paradigm shift in the MAN environment as new optical metro access and transport technologies become available to support the connections between LANs and WANs.

SBC Ethernet Solutions

The traditional view of Ethernet technology is changing as it moves out of the LAN environment and into the MAN and WAN networks. We are now seeing Ethernet used with legacy networks and protocols. SBC offers pure Ethernet connectivity for LAN extensions in our GigaMAN product to the hybrid Ethernet over SONET (EoS) service providing Ethernet with SONET qualities.

Our GigaMAN product is a dedicated point-to-point pure Ethernet solution for LAN extensions available in full 1 Gbps pipes. The service provides an excellent solution for LAN interconnection and business continuity applications. Our OPT-E-MAN service offers flexible, scalable switched Ethernet service enabling transparent LAN and dedicated Internet applications. SBC also offers Ethernet over SONET (EoS) service providing Ethernet ports on SBC SONET solutions enabling LAN interconnection in native protocol. It's this relatively new service that this article will review. EoS is a service designed to provide customers more bandwidth than our GigaMAN service (unprotected Ethernet) and less than our high end Multi-service Optical Network (MON) service (a Dense Wave Division Multiplexed network service).

What is SBC Ethernet over SONET?

Ethernet over SONET is our first next generation SONET offering. SONET is a transport-only, Layer 1 technology that relies on higher-level protocols and switching systems to

establish logical connections. SONET supports multiple services including Time Division Multiplexing (TDM) (for voice applications), Asynchronous Transfer Mode (ATM), frame relay, and Internet Protocol (IP) based traffic. Ethernet ports are added onto dedicated SONET enabling LAN interconnection in native protocol by directly mapping or encapsulating the Ethernet frames in the SONET payload. The Ethernet signal is transported inside a SONET frame from one network element (add/drop multiplexer) to another. Provisioning of EoS is handled just like a DS-1 or DS-3 circuit. Multiple Ethernet signals can be transported across the same network using different STS's (Synchronous Transport Signal – the electronic information transfer rate on mux's, equivalent to speeds known as Optical Carrier (OC) levels on fiber). EoS is delivered as a simple point-to-point private line solution with 100 Base T (100 Mbps) and 1 Gigabit Ethernet (1000 Base LX and SX [single mode fiber and multimode fiber]) ports integrated into the dedicated SONET Ring platform from OC-3 to OC-192. The EoS feature is only available on Next Generation SONET equipment; hence existing SONET customers may need equipment upgrades to utilize this new service.

The Value Proposition

Customers who already have invested in SONET fiber networks and require a native Ethernet interface, or new customers who require reliable, high quality, cost-effective SONET connectivity that offers Ethernet access without requiring a separate overlay network, are good candidates for this EoS service. As mentioned before, legacy SONET equipment does not support Ethernet cards and existing SONET customers may need intermediary devices or equipment upgrades to allow for encapsulation of the Ethernet into SONET frames. SBC DataComm can provide this equipment for these customers.

EoS offers value considerations for the customer. Here's why, it:

- ◆ Reduces the need and cost for protocol conversions when entering and leaving the SONET network
- ◆ Provides Ethernet with a SONET service level agreement
- ◆ Provides Ethernet channels with SONET qualities for reliability and survivability
- ◆ Allows TDM (voice) and Ethernet (data) to operate in parallel on one network

Applications for EoS include:

- ◆ Connecting LAN-to-LAN at native speed
- ◆ Transport of large files
- ◆ Sharing of key resources
- ◆ Support collaborative computing
- ◆ Internet access
- ◆ Headquarters to data center or branch office connectivity

Product Enhancements

As this product continues to evolve, SBC is planning enhanced Layer 1 functionality in late 2005 or in 2006. These technological enhancements will provide our customers with improved performance, flexibility, efficiency, and manageability. Here are several of the enhancements under development.

Virtual Concatenation (VCAT)

SONET channels are inherently the wrong size for carrying Ethernet traffic. For example, putting a single GigE data stream (1 Gbps) into an OC-48c (2.5 Gbps) channel wastes 58 percent of the bandwidth of the SONET channel. A more efficient way of packing Ethernet traffic into a SONET/SDH transport network utilizes virtual concatenation. It's an encapsulation technique for the transport of payloads that do not efficiently fit within the "standard set" of synchronous payload envelopes (STS-1 and STS-Nc). It provides the ability and the flexibility to size the customer's bandwidth based on their traffic requirements by creating a payload of finer granularity compared to the contiguous concatenation offered today. This planned enhancement adds flexibility to the legacy infrastructure, allowing it to be used more effectively.

Autoconcatenation

Autoconcatenation is a software feature on CPE that allows a customer to automatically reconfigure the point-to-point circuit STS's based on demand without having to wait for SBC to reconfigure the network, as the network automatically adapts to the change the customer made.

Generic Framing Procedure (GFP)

Another planned enhancement is Generic Framing Procedure (GFP). When customers use CPE from different vendors to terminate Ethernet circuits, each vendor's interpretation and implementation of the standards may differ. GFP is used mainly for packet-oriented client signals such as IP and Ethernet, and provides a standardized method for mapping onto SONET or other optical transport networks (DWDM) with dissimilar hand-offs, e.g., Ethernet or storage area network protocols.

Customers that require reliable, cost effective transport of data at very high speeds will like these EoS enhancements on enabled SONET circuits. They provide flexible and dynamic bandwidth allocation suited to customer needs and budget. Customers can allocate bandwidth based on need rather than bandwidth defined by the SONET service. High throughput and low-latency combined with the physical layer security offered by SONET provide for excellent business continuance applications.

Resilient Packet Ring (RPR)

RPR is a relatively new Layer 2 MAC (Medium Access Control) protocol that combines features of SONET, ATM (statistical multiplexing), and GigE (simplicity and popularity). As the name indicates, RPR is designed to work in ring topologies and will have less than 50 ms restoration for time critical, delay sensitive (voice) traffic. Approved by the IEEE in 2004, 802.17 is a standard designed for the optimized transport of data traffic over fiber rings. It's designed to provide the resilience found in SONET networks, but instead of setting up circuit oriented connections, it provides a packet based transmission without being encapsulated into SONET payloads to increase the efficiency of Ethernet and IP services. As with the previously discussed enhancements, RPR is under review and development as a lifecycle enhancement for our EoS service.

Summary

Ethernet is by far the most successful networking technology used worldwide. When compared to other transport technologies it is less complex to manage and it is cost effective. Ethernet over SONET architecture combines Ethernet economics, packet switching flexibility, and SONET resilience to effectively transform a portion of the SONET network into an invisible tunnel between LANs to provide transparent LAN service. Future enhancements will provide even better functionality for this service. EoS may not be the answer to every customer's transport application, but for SONET customers it provides the ease of network management with the resiliency of SONET service at a very competitive price.

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*"Knowledge comes but wisdom lingers."
Alfred Lord Tennyson*

Removing Language Barriers

SBC California and SBC Nevada have partnered with Language Line (over-the-phone interpreter service) to offer support to residential customers in more than 150 languages at no additional charge to the public. This effort enables the companies to expand language capabilities beyond English, Spanish, Mandarin, Cantonese, Korean, Vietnamese, Tagalog and Japanese. As a result, more than 12,000 customers have done business with SBC California alone. With this special service, the most frequently requested language by far is Russian, followed by Armenian, Hmong, Farsi and Punjabi.

Webwatch

Ever wonder what states require E9-1-1?

There's a sensational website that answers that: www.nena.org/9-1-1techstandards/state.htm

The National Emergency Number Association has a wealth of info that should be very useful to you on: www.nena.org

We thought their history of E9-1-1 would be of interest to you:

The Development of 9-1-1

The three-digit telephone number "9-1-1" has been designated as the "Universal Emergency Number," for citizens throughout the United States to request emergency assistance. It is intended as a nationwide telephone number and gives the public fast and easy access to a Public Safety Answering Point (PSAP).

In the United States, the first catalyst for a nationwide emergency telephone number was in 1957, when the National Association of Fire Chiefs recommended use of a single number for reporting fires.

In 1967, the President's Commission on Law Enforcement and Administration of Justice recommended that a "single number should be established" nationwide for reporting emergency situations. The use of different telephone numbers for each type of emergency was determined to be contrary to the purpose of a single, universal number. Other Federal Government Agencies and various governmental officials also supported and encouraged the recommendation. As a result of the immense interest in this issue, the President's Commission on Civil Disorders turned to the Federal Communications Commission (FCC) for a solution.

In November 1967, the FCC met with the American Telephone and Telegraph Company (AT&T) to find a means of establishing a universal emergency number that could be implemented quickly. In 1968, AT&T announced that it would establish the digits 9-1-1 (nine-one-one) as the emergency code throughout the United States.

The code 9-1-1 was chosen because it best fit the needs of all parties involved. First, and most important, it meets public requirements because it is brief, easily remembered, and can be dialed quickly. Second, because it is a unique number, never having been authorized as an office code, area code, or service code, it best meets the long range numbering plans and switching configurations of the telephone industry.

Congress backed AT&T's proposal and passed legislation allowing use of only the numbers 9-1-1 when creating a single emer-

gency calling service, thereby making 9-1-1 a standard emergency number nationwide. A Bell System policy was established to absorb the cost of central office modifications and any additions necessary to accommodate the 9-1-1 code as part of the general rate base. The Enhanced 9-1-1, or E9-1-1, subscriber is responsible for paying network trunking costs according to tariffed rates, and for purchasing answering equipment from the vendor of their choice.

On February 16, 1968, Senator Rankin Fite completed the first 9-1-1 call made in the United States in Haleyville, Alabama. The serving telephone company was then Alabama Telephone Company. This Haleyville 9-1-1 system is still in operation today. On February 22, 1968, Nome, Alaska implemented 9-1-1 service.

In March 1973, the White House's Office of Telecommunications issued a national policy statement which recognized the benefits of 9-1-1, and provided for the establishment of a Federal Information Center to assist units of government in planning and implementation. The intense interest in the concept of 9-1-1 can be attributed primarily to the recognition of characteristics of modern society, i.e., increased incidences of crimes, accidents, and medical emergencies, inadequacy of existing emergency reporting methods, and the continued growth and mobility of the population.

In the early 1970s, AT&T began the development of sophisticated features for the 9-1-1 with a pilot program in Alameda County, California. The feature was "selective call routing." This pilot program supported the theory behind the Executive Office of Telecommunication's Policy. By the end of 1976, 9-1-1 was serving about 17% of the population of the United States. In 1979, approximately 26% of the population of the United States had 9-1-1 service, and nine states had enacted 9-1-1 legislation. At this time, 9-1-1 service was growing at the rate of 70 new systems per year. By 1987, those figures had grown to indicate that 50% of the US population had access to 9-1-1 emergency service numbers.

In addition, Canada recognized the advantages of a single emergency number and chose to adopt 9-1-1 rather than use a different means of emergency reporting service, thus unifying the concept and giving 9-1-1 international stature.

At the end of the 20th century, nearly 93% of the population of the United States was covered by some type of 9-1-1 service. Ninety-five percent of that coverage was Enhanced 9-1-1. Approximately 96% of the geographic US is covered by some type of 9-1-1.



> Emerging Wireless Applications

Let's be clear about one thing: voice is still the "killer app" in the wireless industry, at least in the United States. The U.S. has always been slow to appreciate and adopt data-based wireless services such short message service, for example. Where people in Finland use their mobile phones (via e-wallet applications) to pay for items at a vending machine, this type of vending machine doesn't even exist in the U.S. as of early 2005.

The nature of today's wireless service requires several basic attributes in order to spur widespread adoption of new applications, especially those that are 3G-enabled. These are all prerequisites to being able to offer "advanced" and "value-added" services:

1. First among them is mobility, pure and simple, is mobility: the ability to maintain error free, constant voice and data communications while on the move. In other words, no dropped calls.
2. "Immediacy", which allows subscribers to obtain connectivity when they need it, regardless of location and without a lengthy login session. In other words, a service similar to the "always on" nature of DSL or cable modems.

3. Finally, "localization" will allow subscribers to obtain information relevant to their current location (think locator technology).

The combination of these characteristics provides a wide choice of possible applications that can be offered to mobile subscribers.

In general, applications can be separated into two high-level categories: business segment and consumer segment. These include:

- ◆ Communications: E-mail; fax; unified messaging; intranet/Internet access (business)
- ◆ Value-added services (VAS): Information services; games (consumer)
- ◆ E-commerce: Retail; ticket purchasing; banking; financial trading (business and consumer)
- ◆ Location-based applications: Navigation; traffic conditions; airline/rail schedules; location finder (consumer)
- ◆ Vertical applications: Freight delivery; fleet management; sales-force automation
- ◆ Advertising (consumer) (Source: ARC Group)

Applications can be broken down into two high-level categories:

1. Those where it appears to end users that they are using the mobile communications

network purely as a pipe to access messages or information, and

2. Those applications where users believe that they are accessing a service provided or forwarded by (through) the network operator, such as video streaming.

E-Mail and Internet Access

E-mail on mobile networks may take one of two forms. It is possible for e-mail to be sent to a mobile user directly, or users can have an e-mail account maintained by their network operator or their Internet service provider (ISP). In the latter case, a notification will be forwarded to their mobile terminal; the notification will include the first few lines of the e-mail as well as details of the sender, the date/time, and the subject. This is how the Blackberry service works. Fax attachments can also accompany e-mails.

Corporate E-Mail

With up to half of employees typically away from their desks at any one time, it is important for them to keep in touch with the office by extending the use of corporate e-mail systems beyond an employee's desktop. GPRS-capable devices will be more widespread in corporations than amongst the general mobile subscribers, so there are likely to be many corporate e-mail applications using GPRS versus Internet e-mail applications whose target market is more generalized.

Internet E-Mail

Internet e-mail services will be available through a gateway service where the messages are not stored, or mailbox services in which messages are stored. In the case of gateway services, the wireless e-mail platform simply translates the message from SMTP, the Internet e-mail protocol, into SMS form and sends the message to the SMS Center for processing. In the case of mailbox e-mail services, the e-mails are actually stored and the user gets a notification on their mobile phone and can then retrieve the full e-mail by dialing in to collect it, forward it and so on. And by linking Internet e-mail with an alerting mechanism such as SMS or GPRS, users can be notified when a new e-mail is received.

Internet Access

As a critical mass of users is approached, applications aimed at general consumers are increasingly being placed on the Internet. The Internet is becoming an invaluable tool for accessing corporate data as well as for the provision of product and service information.

Intranet Access

The first stage of enabling users to maintain contact with their office is through access to

e-mail, fax, and voice mail using unified messaging systems. Increasingly, files and data on corporate networks are becoming accessible through corporate intranets that can be protected through firewalls, by enabling secure tunnels via virtual private networks [VPNs]).

Unified Messaging

Unified messaging (UM) is an application that's getting its toehold through today's VoIP networks. UM uses a single mailbox for all messages, to include voice mail, faxes, e-mail, and short message service (SMS) messages. With the various mailboxes accessible from one place – one "portal" – unified messaging systems then allow for a variety of access methods to recover messages of different types. Some will use text-to-voice systems to read e-mail and, less commonly, faxes over a normal phone line. Most will allow for inquiries of the contents of the various mailboxes through data access, such as the Internet. Others may be configured to alert the user on the terminal type of their choice when messages are received.

Value-Added Services

Value-added services refer strictly to content provided by network operators to increase the value of their service to their subscribers. Two terms that are frequently used with respect to the delivery of value-added data applications are "push" and "pull", as defined below.

- ◆ "Push" refers to the transmission of data at a predetermined time, or under predetermined conditions. It could also apply to the unsolicited supply of advertising such as delivery of news as it occurs, or stock values when they fall below a preset value.
- ◆ "Pull" refers to the demanding of data in real time by the user (for example, requesting stock quotes or daily news headlines). Video streaming could fall into either of these two categories.

To be valuable to subscribers, push/pull content must possess several characteristics:

- ◆ "Personalized information" tailored to user-specific needs with relevant information. A stock ticker, focusing on key quotes and news, or an e-commerce application that knows a user's profile are two examples of personalized information.
- ◆ Content based on a user's current location; which can include maps, hotel finders, or restaurant reviews. (This content is locator-based).
- ◆ Convenience means that the user interface and menu screens are intuitive and easy to navigate.
- ◆ Trust pertains primarily to e-commerce sites where the exchange of financial or other personal information is required.

Some value-added services are outlined in the following sections.

E-Commerce

E-commerce is defined as conducting business transactions over the Internet, or through a type of data service. This would only include those applications where a contract is established over the data connection, such as for the purchase of goods or services. This also includes on-line banking applications because of the similar requirements of user authentication and secure transmission of sensitive data such as account numbers.

Banking

The incentive among banks to encourage electronic banking stems from the comparable costs of making transactions in person in a bank to making them electronically. Specific banking functions that can be accomplished over a wireless connection include: balance checking, moving money between accounts, bill payment, and overdraft alert. The Federal Reserve reported that in 2004, for the first time in U.S. history, electronic payment-by-check exceeded standard check payments to the tune of \$7.8 B. Wireless banking transactions grew 4.7% in the from 2002 to 2005. Mobility enhancements will only take this evolution farther.

Financial Trading

The immediacy with which transactions can be made using the Internet and the requirement for up-to-the-minute information has made the purchasing of stocks a popular application. By providing push services and coupling these with the ability to make secure transactions from a mobile terminal, a valuable service unique to the mobile environment can be provided.

Video Streaming

Video streaming is now entering the mobile realm. Some view the ultimate application of the "unwired age" as live TV delivered to millions of handsets via streaming media. Customers are still mulling over their commitments to live TV over mobile phones. They're still evaluating the need for audio and video streaming. In other words, this type of application could be a technology in search of a market, instead of the other way around. The results of a survey in Wireless Review magazine in the December 2004 issue stated the following regarding "Consumer Interest in watching TV or video on portable devices".

- 26% – Not at all interested
- 27% – Not very interested
- 32% – Somewhat Interested
- 9% – Very interested
- 5% – Extremely interested

Could it be that we've simply had enough TV in our lives, and we don't really need or want it available to us 24 hours a day, even if the capability exists to deliver it to us? When looking at the survey results, maybe TV-to-the-handset falls under the same category of all the people who are buying that gadget that can remotely turn TVs off in public places (covertly, of course).

Nevertheless, analysts are still pumped up about the future of mobile video, even if they're still uncertain how the business model will play out. Strategy Analytics predicts that the global market for mobile video content will reach \$4.6B by 2008, with mobile music sales reading \$2.2B. But these numbers include both streamed and downloaded content, with streaming representing a small fraction of the total. Wireless carriers' thinking about mobile multimedia of all types should be similarly cautious. On a worldwide basis, one of the biggest multimedia applications on phones is music. But this isn't to say that streaming has no place in music. Using streaming or progressive downloading ("pseudo streaming") to the handset can create a radio-like service. This approach is becoming very popular in Europe. But streaming songs to the mobile handset remains the exception today, not the rule.

Two basic types of services send video data to wireless handsets. The first is one-way service, delivering commercial video content from service providers to users. The second type is two-way, sending video from user to user. Either type may or may not use streaming.

Mobile television, such as the appropriately named "MobiTV" service available to customers of Sprint and AT&T Wireless (now Cingular), is the highest-profile example of one-way video. MobiTV uses streaming technology to deliver commercial television programming, such as news, sports, and weather – live, to users. MobiTV essentially just re-packages broadcast and cable programming. In-Stat/MDR expects the number of mobile video subscribers to reach 273,000 (out of 175 million wireless subscribers) by January, 2005; to exceed 1,000,000 by end of 2005, and to level off at around 22 million by 2009.

As with music, there's a non-streaming counterpart to mobile TV. Cinema Electric creates original video and other content that users can download the way they do ringtones and wallpaper. It distributes 8 channels with names like Electric Catwalk, Movie Messages, and Sports Action. The video clips and animation usually amount to no more than 90 Kb. RealNetworks offers news, sports, movie trailers and weather via a wireless company.

Two-way video between users may or may not require streaming. Video messaging can run over existing non-streaming technology such as multimedia messaging service (MMS). This lets users create, send and receive messages that include text, audio, graphics and video. But other services will happen in real time, such as mobile video-conferencing. This is referred to as "look where I am"-type application, where users will wave the camera around to show friend what the user is seeing at any given moment (great, more goofs at the ballpark).

Carriers need to clearly separate the technology from the service in the eyes of the consumer. Some issues have less to do with the technology that its commercial implications, such as pricing. For example, there might be a small price/fee to stream content to the handset only once. But if you want to keep it and view it more, you may have to pay 4 times the cost (i.e. \$2 versus 50 cents).

Content "aggregators" may not find the mobile business model very appealing, one reason being that people who receive streaming content won't be able to keep it, so they won't be prepared to pay a premium for it. And the people who own the content are asking for a significant share of the revenue, and carriers want their share (30% retail margin?), so that leaves very little or the guy in the middle that's providing the solution – the aggregator.

Many industry analysts expect two-way video to be slow in coming. As with other mobile technologies, the U.S. lags the rest of the world, because what Americans really like to do today, still, is call people and talk. That's about it. As with everything else in wireless, only time – and the fickle consumer – will determine how streaming media plays out.

Location-Based Services and Telematics

Location-based services provide the ability to link push or pull information services with a user's location. Examples include hotel and restaurant finders, roadside assistance, and city-specific news and information. This technology also supports vertical applications such as workforce management and vehicle tracking.

Vertical Applications For Business

In the mobile environment, vertical applications apply to systems utilizing mobile network architectures to support the implementation of specific tasks within the value chain of a company. Examples of vertical applications include the following:

- ◆ Sales support – Provision of stock and product information for sales staff, as well as integration of their use of appoint-

ment details and the remote placement of orders. "Appointment details" could include information on product availability based on customer meeting agendas.

- ◆ Dispatching – Communication of job details such as location and scheduling; allowing inquiry of information to support job function. For example, this type of application could be used by a landscaping firm or a construction firm.
- ◆ Fleet management – Control of a fleet of delivery or service staff, monitoring their locations and scheduling work based on location.
- ◆ Parcel delivery – Tracking the locations of packages for feedback to customers and performance monitoring

Advertising

Advertising services will be offered as a push type information service. Advertising may be offered to customers to subsidize the cost of voice or other information services. For example it could be location sensitive where a user entering a mall would receive advertising specific to the stores in that mall.

Paul

Paul Bedell is Associate Director of Product Management for the PremierServ Hosted IP Service. Paul is also an Adjunct Faculty member at Chicago's DePaul University and a published author. This article is an excerpt from his new book, "Wireless Crash course – SECOND EDITION", published by McGraw-Hill in June, 2005. The opinions expressed in this article are those of Mr. Bedell and not those of the SBC family of companies.

New Voice and Data Services Contract with HUB Distributing, Inc.

SBC Communications Inc. recently announced a new five-year contract with California-based HUB Distributing, Inc., an affiliate of Sun Capital Partners Inc. HUB Distributing, which owns the Anchor Blue, Miller's Outpost and Levi's Outlet by MOST chains, has a retail presence in more than 240 locations throughout the United States.

Under the terms of the contract, SBC companies will provide SBC PremierSERVSM Internet Protocol Virtual Private Network (IP-VPN) service to connect HUB's corporate data center with each of its 244 locations. The IP-VPN service will enable HUB to use its Wide Area Network (WAN) more effectively while helping improve employee efficiency in processing sales and tracking inventory. The service will also give employees new productivity tools, such as wireless access within the store and Internet Protocol (IP) telephony applications. It will also support rapid growth.

> Sterling Commerce Delivers Applications To Accelerate Revenue Growth

Sterling Commerce, the multi-enterprise collaboration company, recently announced the immediate availability of Sterling Customer Order Management and Sterling nWMS-Distribution solutions, the industry's first packaged composite applications (PCAs) designed to accelerate revenue growth for enterprises along the retail value chain.

Facilitating rapid implementation and time-to-value, the process-centric PCAs deliver pre-configured capabilities to optimize the complex processes associated with multi-channel order management and multi-facility distribution environments, yet ensure flexibility to adapt to varied customer-specific business rules.

"We are facilitating Multi-Enterprise Collaboration by enabling participants across the retail value chain to effectively synchronize processes, information and systems across multiple facilities, channels, fulfillment and service partners," said Sam Starr, CEO of Sterling Commerce. "Our announcement of these applications demonstrates Sterling's rapid progress in leveraging and integrating the combined Sterling and Yantra (fulfillment) strengths and technology offerings as they exist today, moving toward a unified platform for multi-enterprise computing in the future."

Sterling's first version of its Customer Order Management PCA allows enterprises to capture, manage and coordinate the fulfillment of customer orders across a multi-channel (Web, call center, store, etc.), multi-enterprise supply chain environment. It provides a single point of visibility, and a single solution to enable an "order from anywhere, fulfill from anywhere" strategy for multi-channel customer management. Sterling's nWMS – Distribution PCA helps manufacturers, distributors and other enterprises intelligently and efficiently sell and distribute finished goods to the retail market by improving inventory management, compliance and process coordination across multiple facilities.

"The PCAs are unique in that they leverage both component-based application services and a service-oriented business-process platform to deliver readily deployable solutions for revenue-accelerating initiatives that retailers are pursuing," said Scott Pulsipher, vice president of product management, applications for Sterling Commerce. "They provide an "off-the-shelf" solution to ensure rapid time-to-value for the customer, while not sacrificing the desired configurability and flexibility for seizing future growth opportunities." Pulsipher was formerly vice president of product management for Yantra Corporation.

"Sterling's strategy is well founded, setting the bar for future needs of managing dynamic trading communities by combining infrastructure and applications (a.k.a. applistructure) to improve the traditional forms of intercompany collaboration," said Eric Austvold and Jeff Hojlo in the May 2005 AMR Research report, "Applistructure for the Trading Community – Sterling Commerce's MESA Strategy."

Accelerating Retail Growth Initiatives

The Sterling Customer Order Management PCA is targeted at major retailers or distributors that are selling direct to consumers utilizing channels such as call centers, the Web or kiosks. It offers such enterprises a pre-configured solution for managing the various fulfillment processes associated with revenue-generating strategies, such as bundled products and services, in-store pick-up, vendor drop-ship and multi-stage fulfillment. The solution enables greater customer satisfaction with on-time, accurate fulfillment, while improving operational efficiency, increasing order accuracy and on-time performance, and allowing more effective inventory sourcing and management. As the first pre-configured packaged composite application, it is simple to use and set up, requiring less time to "go live." As a result, it reduces the investment required to implement and integrate with legacy applications reducing cost and providing more immediate value to customers.

Pioneering Next-Gen Network-centric Warehouse Management Approach

Sterling's first version of its nWMS-Distribution PCA is geared toward manufacturers and distributors that sell finished goods to the retail market. With its unique network-centric warehouse management approach, the nWMS-Distribution PCA offers these enterprises a highly configurable and flexible solution to improve inventory management and distribution operations across multiple, varying facilities in demand-driven supply chain initiatives.

Based on a business-user context instead of a technology context, networked facilities allow distributors to introduce new functionality and technology to its business ecosystem faster and more cost effectively. Organizations with large-scale distribution centers can use the Sterling nWMS-Distribution PCA as a single solution to configure all of their facilities into a single environment but have the flexibility to only use the capabilities and components necessary for the specific operation of each facility. This differs from most warehouse management solutions that require significant implementation each time a new warehouse is added making changes costly and time intensive.

>New Area Code Coming To Southern California; No Phone Number Changes Required

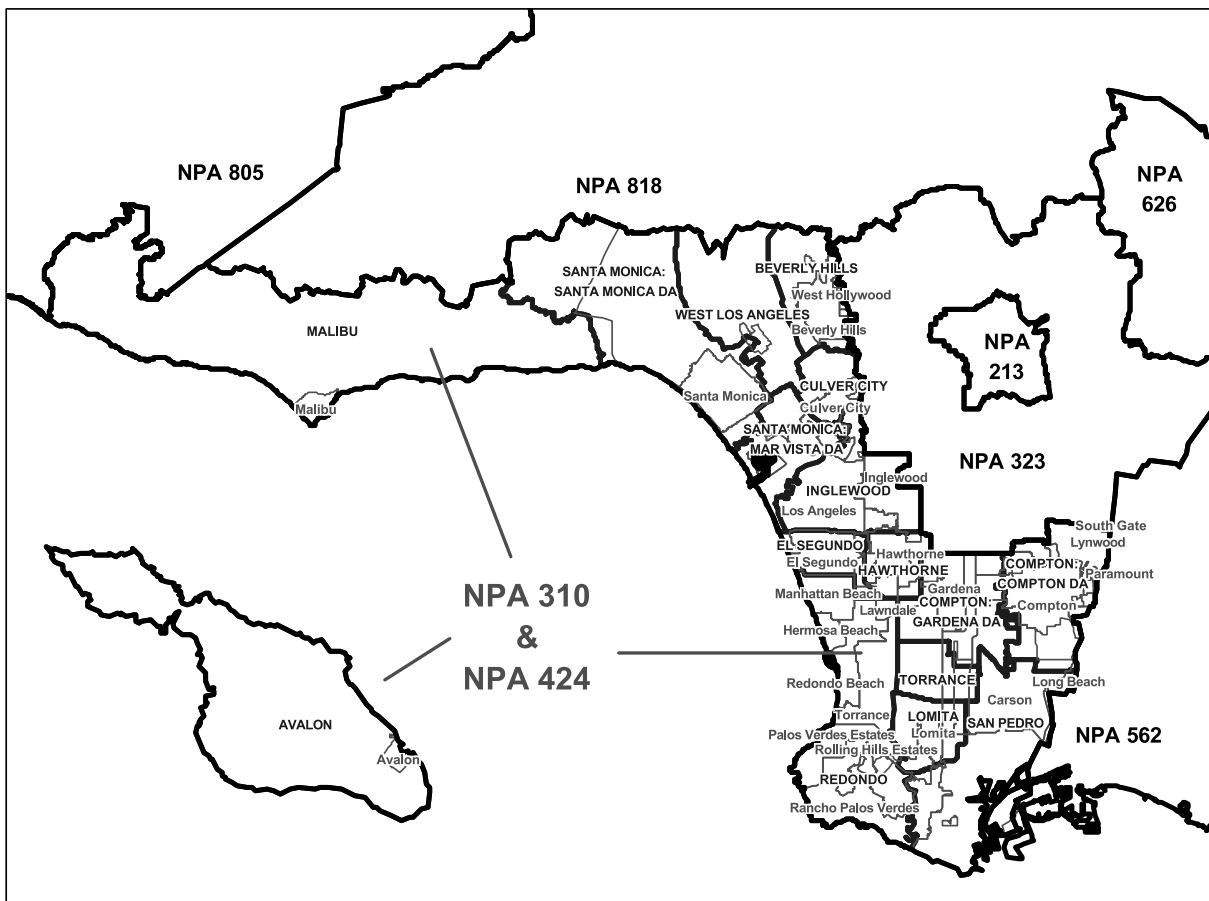
The Joint Telecommunications Carriers (JTC), a consortium of landline and wireless telecom providers, recently announced details about the California Public Utility Commission's decision to introduce the 424 area code as an "overlay" on the 310 area code in Southern California. The JTC said the most important things consumers and businesses need to know about the new area code are:

- ♦ All customers who currently have a phone number with a 310 area code will keep the 310 area code;

- ♦ Phone numbers with the new 424 area code could only be issued after August 26, 2006;
- ♦ To prepare for mandatory 1+10-digit dialing on July 26, 2006, all customers should begin the habit of dialing 1+10-digits beginning December 31, 2005.
- ♦ Beginning July 26, 2006, 1 +10-digit dialing will be required to complete calls. All customers with 310 and 424 area codes must dial 1+10-digits on all calls, including those within and between the 310 or 424 area codes.

The carriers serving the state will launch a public education plan in conjunction with the CPUC to ensure that area customers understand the change and that inconveniences are minimized. The plan will focus on how the area code overlay works; what changes will and will not take place; and, when those changes will occur. Over the past ten years, telecommunications carriers successfully implemented 50 area code overlays throughout the U.S. to make telephone numbers available to meet growing demand.

For more information please contact your Liaison Manager.



>SBC Partner Continues Rapid Latin American Expansion

Say "wireless" and most SBC employees think "Cingular." That's as it should be, given SBC Communications' 60 percent ownership stake and Cingular's huge presence all across the U.S.

But Cingular is not the only, or even the largest, wireless company owned in part by SBC. South of the border, SBC owns about eight percent of an even larger one – América Móvil – which serves over 70 million customers in 13 countries.

América Móvil was created in 2000 as a spin-off of Telmex, Mexico's largest telecom-

munications carrier. Since that time it's become one of Latin America's leading wireless companies by pioneering prepaid phone cards, subsidized handsets and other innovations targeted at a region where demand is strong but incomes are limited. América Móvil also grew significantly by buying assets at low prices from early players in Latin American markets who later decided to shift their attention elsewhere. In 2004, revenues were up 49 percent – to \$11.9 billion, from \$2.9 billion at the end of 2000.

SBC has played a key role in making that growth possible, according to Rick Resnick, president-SBC Mexico. "Since its creation,

we've helped América Móvil maintain excellent service and keep pace with tremendous growth in demand for wireless service," he said.

Today América Móvil has customers in every major Latin American country — including Argentina, Brazil, Mexico, Uruguay and Columbia – and recently announced acquisitions in Chile, Peru and Paraguay. América Móvil is huge but still has enormous potential, given the fact that the Latin American market is home to 674 million people.

"If the world seems cold to you, kindle fires to warm it up."

Lucy Larcom

UPDATE



>SBC California Out-of-Franchise Update

In previous UPDATES, I focused on the expansion of our Out-of-Franchise footprint in California and on some of the great promotions that are available to make it easy for businesses outside of SBC franchised territory to switch to SBC. In this issue, I would like to focus on our capability to serve Out-of-Franchise customers that have complex, high-bandwidth needs.

SBC California Out-of-Franchise has the capability to develop large, customized solutions. We will build fiber facilities directly to a customer's location if it makes financial sense. As of August 2005, we have over 100 fiber-lit buildings and over 150 route-miles of fiber serving customer locations outside of SBC California's traditional franchised territory, delivering DS3s, OC-N circuits, GigaMANs, OPT-E-MANs, and SONET services to SBC's Out-of-Franchise customers.

We recently completed three large Out-of-Franchise projects, each of which demonstrates our ability to successfully design and implement solutions, regardless of the complexity or difficulty.

The first project was a large Centrex application for the Port Hueneme Division, Naval Surface Warfare Center, a.k.a. "Port Hueneme". Port Hueneme issued a request for quotation in 2004 to various competitors as the expiration of their contract with the incumbent carrier was imminent. SBC California responded with a solution to install Centrex via Digital Loop Carrier equipment on the customer's premises, and performed a coordinated cutover to transition Port Hueneme's 3400 lines, which includes Primary Rate ISDN (PRI), Basic Rate ISDN (BRI), Voice Mail and other services. Because Port Hueneme is relatively remote from the SBC network, a leased OC-12 circuit was used in lieu of our own fiber facilities to provide connectivity between the remote DLC unit and the SBC host office at SIMICA11.

The project involved months of planning, construction, and coordination between many SBC departments to orchestrate a seamless weekend cutover. This was a very demanding project, and SBC California's talented and dedicated sales and support personnel successfully executed the cutover to the customer's satisfaction.

Another successful project recently completed was for the American Red Cross in Pomona.

In the August 2005 issue of UPDATE, a five-year contract was announced for SBC to manage voice and data services for American Red Cross, where available. The American Red Cross had started construction on a brand-new regional blood center in Pomona and required mission-critical diverse and redundant facilities. Our initial engineering assessment suggested that there were too many challenges to overcome to deliver proper facilities to this location, given our lack of infrastructure in the area. Upon relook, we found a creative solution which involved the acquisition of infrastructure and rights-of-way from another carrier, enabling an end-to-end fully diverse SONET solution, all on SBC fiber and electronics. While construction of facilities was proceeding, SBC first installed temporary services, enabling the Red Cross to turn up the new blood center on schedule. SBC then seamlessly cut over to the permanent facilities once they were completed. Again, the SBC team rose to the occasion and delivered to meet the customer's needs.

The third project recently completed was for Sutter Health in Roseville. Sutter Health is implementing innovative ways to store and display medical images and records remotely and needed to tie several Northern California locations together with a diverse and redundant WAN. The SBC GigaMAN product met their needs, with the exception of whether or not SBC could extend GigaMAN circuits to the Out-of-Franchise Roseville location. Leasing circuits from the incumbent carrier was not an option because of the proprietary nature of gigabit Ethernet products such as GigaMAN. SBC recently completed a Right-of-Way agreement with the incumbent carrier, enabling SBC to lease conduit capacity so that we could deliver fiber cable directly to Sutter Health's building.

These are just a few examples of what we can do to deliver high-bandwidth products and services outside of SBC California's traditional service area. We are anxious to do more, and look forward to working with you!

John

SBC California Out-of-Franchise Leadership:
Howard A. Lenox, Jr., Sales Vice President
John X. McCarthy, Sales Director
John Capoccia, Director, OOF Business Operations

John Capoccia, a Director in the SBC California Out of Franchise Organization, has been with SBC California since 1983. He can be reached on jc1468@sbccom.

"If you don't take care of your customers, someone else will."

William Greenwood

>New Hosted VoIP Contract with NCE Computer Group

SBC Communications Inc. recently announced a new contract to deliver a hosted Voice over IP (VoIP) network to San Diego, Calif.-based NCE Computer Group, a data-storage service and provider of integrated storage solutions.

Under the terms of the five-year contract, SBC companies will provide NCE with SBC PremierSERVSM Hosted IP (Internet Protocol) Communication Service (HIPCS), a Voice over IP (VoIP) service that combines voice and data communications on a single network and allows personalized control to support and manage the company's business communications.

SBC PremierSERV HIPCS will provide additional flexibility to the company's call-management system and will enable increased productivity among its call staff by allowing NCE employees to use the hosted-VoIP service from any Internet connection, either on location or remotely.

"Our need for an improved call-management system was growing every day, and we needed a provider who could help us meet these increased demands," said John Cappello, customer service manager, NCE Computer Group. "We're confident that this SBC company hosted-VoIP solution will provide us with the tools we need to build upon our integrated solution and to improve our overall business efficiencies."

>Data Services Contract with PETCO Animal Supplies, Inc.

SBC Communications Inc. recently announced a new contract with San Diego, Calif.-based PETCO Animal Supplies, Inc., one of the nation's fastest-growing and largest animal-supply retailers.

SBC companies will deliver SBC PremierSERVSM Network-Based Virtual Private Network (NVPN) service for secure, reliable MPLS-based IP network connections to more than 700 PETCO locations.

Additionally, to help augment PETCO's IT staff, SBC companies will provide SBC PremierSERV Data CPE Support Services and SBC PremierSERV Network Management services to assist with the day-to-day monitoring and maintenance of the PETCO network.

"SBC NVPN allows us to provide customers of all sizes with the highest levels of network security and service reliability at a cost-effective price," said Bob Ferguson, group president and CEO of SBC Enterprise Business Services.



> Highlights Across The Regions

SimpleLink Enhanced Discount Plan vs. Complete-Link Usage Plan

SBC West (California) has two great plans available and your customers have often asked why both are necessary in the marketplace.

1) SimpleLink Enhanced is an optional total volume discount package plan that provides discounts based on customer minimum monthly revenue commitment level and term length. SimpleLink Enhanced is aimed at small business customers with 1-10 basic access lines. SimpleLink Enhanced is also available in SBC Midwest and SBC Southwest.

2) CompleteLink combines core services, allows Northern and Southern California account aggregation, and provides discounts on specific eligible services based on customer commitment level and term length. CompleteLink is termed as a usage plan in that it rates calls at a flat per minute rate, regardless of time of day on the following:

- ◆ Local (Zones 1 & 2)
- ◆ Zone 3
- ◆ Local Toll
- ◆ Custom 8 (Does not include Basic 800 or Easy 8)
- ◆ Calling Card Calls

CompleteLink is aimed at business customers whose total billed revenue for contributory products averages between \$700 and \$200,000 annually. There are 12 MARC (minimum annual revenue commitment) levels to choose from to tailor the plan to best fit the customer's telecommunication spending. Customers can have up to 250 billing telephone numbers on agreement, one agreement per customer. Customers can upgrade to CompleteLink from most optional calling plans without incurring early termination fees. CompleteLink is also available in SBC Midwest, SBC East, and SBC Southwest.

Both plans are used as competitive tools to acquire, retain/save and winback your customers. There may be slight differences in the services. Please contact your Liaison Managers to determine eligibility and functionality for your customers.

SBC PremierSERV Dedicated Internet Access

Dedicated Internet Access customers in all regions now have access to a business-quality e-mail service. The DIA Business E-Mail Service offers 300 Mb of storage space available to them at no charge. Customers may also purchase other

options, including e-mail spooling, and additional domain names.

Upon request, SBC will provide the 300 Mb free account and access to other features to existing DIA customers who do not currently have e-mail. SBC will not solicit these customers to institute the 300 Mb free account. Existing customers simply call the Dedicated Enhanced Service Center (DESC) at 866-WERE ON IT to establish their free account.

Additionally, SBC has many incredible discounts available on DIA and CPE. Contact your Liaison Managers to obtain additional information on DIA for your customers.

Packages and Promotions

SBC is committed to your business growth. We have promotions and discounted packages comprised of Local, Long Distance services with SBC, as well as, SBC Yahoo! DSL, Cingular® Wireless, Voice & Data, and SBC Messaging. Ask about special offers. Prices vary depending on exact configuration of the packages. If you have questions about any of the SBC offers, please contact your Liaison Managers to determine eligibility for your customers.



Cassandra Jessie-Johnson is Associate Director of the Business Processes Team, SBC Sales Operations Support.

>New Three-Year Contract with MedAssets, Inc.

SBC Communications Inc. recently announced a new voice and data services contract with Georgia-based MedAssets, Inc.

In addition to long distance voice services, SBC companies will provide SBC PremierSERVSM Network-Based Virtual Private Network (NVPN) utilizing MPLS (Multi-Protocol Label Switching) technology, SBC PremierSERVSM Frame Relay, SBC PremierSERVSM Asynchronous Transfer Mode (ATM), and SBC PremierSERVSM Dedicated Internet Access (DIA) to support Voice over Internet Protocol (VoIP) communications between MedAssets' various locations, including Los Angeles, CA, St. Louis, MO, Cape Girardeau, MO and Atlanta, GA.

SBC companies will also provide Cisco Systems® Architecture for Voice, Video and Integrated Data (AVVID) services to replace MedAsset's PBX switches.

Together, the services will help improve customer service capabilities by providing speedy and flexible IP-based network connections while lowering the company's long distance costs.

>1.800.CONFERENCE®

Audio Conferencing

1-800-CONFERENCE offers a full range of services to meet your audio conferencing needs. Tailored options and flexible enhancements for managing participation maximize your conference experience from planning – to meeting – to post-conference follow up.

Video Conferencing

Personalize your distance meetings and increase participation by hosting face-to-face videoconferences across multiple locations. Our 1-800-CONFERENCE consultants work with you to find the option that best suits your needs.

Web Conferencing

Simplify your presentations and web-based collaboration with 1-800-CONFERENCE.

Enhanced and Reporting Services

1-800-CONFERENCE helps you plan, confirm attendance, record and archive your conference, and even extend your conference to the Internet. You get the who-what-when-where – in a format you can use.

To order or for further information, call 1-800-CONFERENCE (1-800-266-3373)

"We were looking for a reliable provider that would allow us to centralize our applications while helping us create a universal dialing plan and phone system," said Steve Wiggs, director of information technology, MedAssets Supply Chain Systems. "We're confident SBC companies will meet our needs and help us improve customer service capabilities while reducing our long distance costs."

"From NVPN services to VoIP capabilities, we look forward to delivering our full range of complete, managed communications services to MedAssets, Inc.," said Chuck Rudnick, President – Business Communications Services, SBC Southwest. "Together, our services will help MedAssets centralize their applications and improve overall customer service throughout the company."

A man named Pablo once said his mother told him, "If you become a soldier, you'll be a General; if you become a monk, you'll end up the Pope." Instead, he became a painter and ended up a Picasso.



What's All The Talk?

Thanks to Jake Bailey for catching these two Thailand entrepreneurs enjoying our latest UPDATE on the streets of Bangkok. If you come across a unique UPDATE reader(s), please send a digital shot to our Editor.

UPDATE Telecom Trivia Quiz

1. Western Electric mass-produced color telephones for the first time in:

- A. 1950
- B. 1954
- C. 1959

2. Who coined the word "Hello?"

- A. Alexander Graham Bell
- B. Mr. Watson
- C. Enrique Garcia
- D. Thomas Edison

3. Where did the word "Hello" come from?

- A. The word "Holler."
- B. A formal version of the greeting "Howdy"
- C. It just popped into the inventor's mind

4. According to Etiquette Consultants, how many times should a caller allow a phone to ring before hanging up?

- A. 3
- B. 4
- C. 6

Answers: 1-B; 2-D; 3-A; 4-C
Thanks For Trying.

New Data Services Contract with Baker Robbins & Company

SBC Communications Inc. recently announced a new contract with Baker Robbins & Company, an independent technology-consulting firm with more than 100 employees located in the firm's Chicago, Houston, Los Angeles, New York, San Francisco, and London locations.

Under the terms of the three-year contract, SBC companies will deliver SBC PremierSERVSM Network-based Virtual Private Network (NVPN) service, utilizing Multi-Protocol Label Switching (MPLS) technology, SBC PremierSERV Internet Protocol – Virtual Private Network (IP-VPN), and SBC PremierSERV Dedicated Internet Access (DIA) for secure and reliable network connections to support the firm's online applications.

In addition, SBC companies will provide Baker Robbins & Company with SBC PremierSERV Installation and SBC PremierSERV Network Management services to assist with the day-to-day monitoring and maintenance of its network.

"As a technology consulting firm, it is important for us to have an enhanced network with multiple capabilities," said Robin North, IT director, Baker Robbins & Company. "SBC companies will provide us with the expertise to manage our applications while meeting our data-networking needs."

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 Listserv
- 5. SBC News Broadcasts

(Call your Liaison Manager to get a Password to Bell Advantage, subscribe to Listserv or UPDATE, and to participate in Broadcasts)



SBC Consultant/Vendor Sales Group

Toll-Free Hotline 1.800.552.5299 (for any other number, toll charges may apply.)

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