These are questions worth serious thought. Especially if you or your customers have been through any downsizing. *Business Week* recently featured the need for Security Consulting Services in "Revenge of the Downsized Nerds." Experts estimated as many as 30% of a company's approved users are no longer around. Executives make the mistake of assuming firewalls will protect them but a third of companies using firewalls say they’re still hacked into, according to the Computer Security Institute.

Fortunately, SBC Consulting Services has the offerings designed to meet you and your customers' security needs, in specific areas such as Security Policy Development and Penetration Testing. Here's a brief overview of both:

**Security Policy Development**
1. This provides customers with the means to understand their organization's technological security posture and the ability to take the correct steps to improve and reinforce that posture by:
   - Providing an inventory and logical description of the secure technology infrastructure.
   - Delivering a comprehensive issue report for the policies and procedures, ranked in order of criticality.
   - Providing recommendations for remediation of the issues identified.
   - Recommending what can be done to improve the policy infrastructure.

(continued on page 2)
DATA WITH DAVID

PROMISES OF IP TELEPHONY

Users of traditional Centrex service, PBXs, and Key Systems are currently faced with the challenge of deciding whether they should grow or replace their current service or system. The convergence of voice and data has added new complexities for telecom and IT managers to consider in designing their networks. One of the technology triggers driving network convergence is the pervasive and widening growth of Internet Protocol as a common element in both Local Area Networks (LAN) and Wide Area Networks (WAN). In the past three years, IP telephony has become the major focus of many technology vendors and service providers as users have sought to receive:

- Enhanced features at equal or lower costs than traditional voice
- Cost savings associated with simplified moves, adds and changes
- Increased productivity from new applications including remote office arrangements
- Increased use of data networks for all applications

Pacific Bell plans to introduce IP Centrex Fourth Quarter 2001 as customers look to this new technology and seek ways to find less expensive communications solutions. IP Centrex, which is a replacement for traditional circuit switched technology, is an IP telephony application offered over a managed IP network and not the Internet, although IP Centrex will interconnect to the Internet.

VICE PRESIDENTS CORNER (continued)

2. Develop best practice, documented up-to-date and clear organization Information Security Policies by:
   - Employing industry best practices and methodologies to assess and document the organization's current security policies from the individual component level to entire systems and networks.
   - Ensuring that all relevant policy documents have been specified.
   - Make sure the policy analysis focuses on the correct policy infrastructure.
   - Provides organizations with an unbiased assessment of their current information systems and telecommunications security policies.

3. Ensures the validity of the Secure Technology Policy by:
   - Analyzing the relevant information systems and telecommunications security policies.
   - Identifying and documenting the existing and potential issues in the secure technology policy infrastructure.
   - Assessing the criticality of identified policy issues.
   - Evaluating and suggesting possible remediation techniques, tools and methodologies.

Penetration Testing
This demonstrates the need for customers to protect the integrity and confidentiality of the organization’s information, computing and telecommunication assets from attacks either outside or inside the organization by:

- Establishing how hackers and crackers can gain unauthorized access to the technology and information resources.
- Employing a variety of automated and manual network scanning and war dialing tools and methodologies to accurately simulate a potential hacker/cracker attack.
- Identifying and documenting potential and existing vulnerabilities in the network perimeter infrastructure.
- Assessing the criticality of identified vulnerabilities.
- Analyzing the relevant information systems and telecommunications security policies.
- Evaluating and suggesting remediation techniques, tools and methodologies.

Additional SBC Security News
1. SBC Internet Services recently launched an Online Security Center where DSL and Dial-Up Customers can download and install anti-virus, privacy and firewall software onto their personal computers. SBCIS customers receive a 30-day free trial of this service that features McAfee.com products. After the trial period, customers will be charged an annual subscription of $48, if they choose to continue using the McAfee software.

2. Sterling Commerce Banking System’s Division has announced the licensing of its Vector Kite Anti-Fraud Software by a multi-billion bankholding company. The company will use Sterling’s application to more easily identify potential fraud and reduce losses from Check Kiting—a sophisticated scam involving repeated deposits of bad checks through multiple accounts. By using Sterling’s software, one bank reduced annual Kiting losses from $12 million to $10,000.

For more information on how SBC can help you and your customers with Security, please contact your Pacific Bell Consultant/Vendor Liaison Manager (see back cover for their e-mail addresses & phone numbers). And watch our next Pacific Bell CVSG TV Broadcast on Wed., Dec. 12 from 9-11:30am PST. You can either view the broadcast at one of our sites or be a Streamer. Call 1-888-889-6010 to reserve a spot or see Back Cover for Streaming information.

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By contrast, an alternative to Pacific Bell's first IP telephony service offering is Voice over IP (VoIP). VoIP is voice-packetized traffic that is transmitted over the Internet. This capability is usually deployed for toll bypass, and because the Internet is not a managed network and was specifically designed for data, the quality is inconsistent and often extremely poor.

Packet + Centrex = IP Centrex
In IP telephony, voice conversations can be digitized and packetized for transmission across the network. IP Centrex consists of Centrex stations that work off a network and was specifically designed for data, the Internet. This capability is usually deployed for toll bypass, and because the Internet is not a managed network (PSTN). Consequently, an extensive set of features is immediately available to IP Centrex users without needing to upgrade the Class 5 switch. The central office is equipped with an IP gateway, which allows for interconnection to both the Internet and the PSTN. (See diagram top of next column)

Benefits
IP Centrex provides business customers with some key benefits:

Increased Productivity
IP Centrex lays the framework for multimedia communications such as desktop video conferencing, unified messaging, multimedia conferencing, file sharing, and white boarding. The timeframe for introduction of these supplemental services is expected to be in late 2002 or 2003.

One of the primary groups that will benefit from these IP enhancements will be the remote office or "road warrior" workers. With IP Centrex, geographic location is not a factor when defining a Centrex group. Branch offices, telecommuters, and even business travelers can be combined into a single Centrex group with the main office, even if they are all served by different wire centers. This is possible because packet transport is so inexpensive and is not mileage sensitive. Multolocation Centrex provides the following advantages to the customer:

- Easier for the corporate telecom manager to administer one large Centrex group rather than several separate Centrex groups.
- Uniform services and features for all users, regardless of where their office is.
- Extend advanced business features to telecommuters' homes without any Foreign Exchange costs.
- Uniform dialing plan across the company. Abbreviated dialing can be used to call the office next door or the office across the state.

Operational Efficiency
Provides toll-grade quality of service implemented on managed IP networks which are scalable and provide secure, reliable and integrated IP telephony.

Cost Savings
For many of our customers, the real value of IP Centrex will be obtained through lower cost benefits of managing and delivering voice and data together on a converged network—both within the enterprise and on the access connection to the network. Converged networks also improve utilization of premise wiring. Toll charges will also be eliminated for calls between two or more locations part of the same Centrex group.
**Enhanced Feature Set**
IP Centrex provides complete feature menus that are currently offered today. It provides enhanced customer control over moves, adds and changes. In the future, IP Centrex will promote Computer Telephony Integration (CTI) solutions where telephone functions can be controlled by the user’s PC, and where telephone information (e.g., caller ID information) can be integrated with other software applications. The ultimate form of CTI is the softphone, where the PC actually replaces the telephone.

**Deployment**
Introduction of IP Centrex is expected to begin in the Fourth Quarter of 2001 in Sacramento and Los Angeles, CA; Chicago, IL and Houston, TX. A limited number of Centrex Offices will be deployed in these market areas at that time. A final deployment schedule is still under development.

**Conclusion**
IP Centrex also holds out the promise of true convergence. Customers are actively pursuing IP technology as a means to converge their separate voice, video, and data networks into single unified networks that can handle all their communication needs. Benefits of this convergence mean network efficiencies and enhanced features. Since voice will be packetized, it means end users can write their own applications to a server that sits on the network. Moves and changes become simple: you simply unplug the phone and move it to another jack resulting in less documentation and cable plant to track. And if the voice traffic is carried on a managed IP network, it runs for free. For work-at-home applications, the employee only needs a DSL line with voice-over capabilities and access to an Internet account. IP Centrex is the natural evolution of migrating from today’s circuit switched narrow-band network into the future broad-band networks which offer next generation services without disrupting customer operations, or sacrificing the productivity features that Centrex users have come to rely on.

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e-mail: tfdavid@pacbell.com

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"A good thing about telling the truth is you don't have to remember what you say."

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**CENTREX IS HERE FOR YOU**

With its many energy driven (and high bandwidth hungry) industries, such as high tech and entertainment, California businesses must be uniquely innovative and resourceful, especially during the current energy crisis. It is critical that businesses and consumers have a power back-up plan in case of rolling blackouts or power outages. At Pacific Bell, our primary goal is to keep businesses’ and consumers’ telecommunications systems running with reliable services and products that won’t be interrupted by power outages. Our Centrex product is the most reliable telecommunications system during any disaster (fire, earthquake and floods) and in particular, during power outages.

During our last CVSG TV Live Broadcast, Donna Marie Simmons, Regional Product Manager for Centrex and VOIP (Voice over IP) Products, provided excellent information to help businesses with a Power Back-Up plan that can alleviate your worries and concerns during rolling blackouts. Here are a few key points that Donna Marie noted:

**Centrex Staying Power**
- Powered by the Pacific Bell Central Office
- Five 9’s of reliability (999.99 reliable)
- Redundancy
- 24 x 7 - Service Availability

**Centrex: Telecommunications Back-Up**
- Customers are concerned about telecommunications back-up alternatives
- Centrex plays well as a back-up or primary telecommunication solution
- Complements existing telecommunication systems.
  - PBX w/Combination Trunk–Customers who have an existing PBX that does not have Enhanced Alternate Routing, should order RACF (Remote Access to Call Forwarding). This will allow the customer to Call Forward their PBX trunk side line to their Centrex Back-Up System.
  - PBX w/PRI–Customers who have an existing PBX trunked with PRI with Enhanced Alternate Routing should be advised to have their Enhanced Alternate Route flow to their Centrex Back-Up System.
- Excellent primary telecommunication system
  - Powered by the SBC Central Office
  - Eliminates the expense associated with maintaining a switch on the premise

To address the current energy situation and save money and energy, Pacific Bell has a telecommunications Back-Up Plan that is described in the following Centrex Promotion:

**Current Centrex Power Up Promotion** (Now through Dec. 31, 2001)
Between 50-100% off of installation charges depending upon line size and term
- $50 off select telephones
• $4.00 off monthly voicemail box charge
• $15.00 off jacks 2-5

Minimum requirements for this promotion:
• 2 Centrex Lines
• Classic Feature Package on each line
• 1 voicemail box
• 1 Telematrix (two line phone) 2105 or 2 Telematrix (one line phones) 1105's
• Pacific Bell Usage Plan

*Note all Centrex tariff requirements must be met for this offer. Power Up with Centrex is a bundle.

Other products that can help in the PBX environment:

• Customer with PBX trunked with PRI with Enhanced Alternate Routing
  – Enhanced Alternate Route: $47.50 MRC and $142.49 NRC

• Customer with PBX with Combo trunks
  – Remote Access to Call Forwarding (RACF): $2.90 MRC and $9.00 NRC

How to View the Archived CVSG TV Broadcast
To view the presentation about “Centrex: More Than Just Power...Staying Power” (also “SBC CPE & Support” & “Video Monitoring of Schools” as well as “Pacific Bell/ SBC News”), type in the following URL. If you encounter problems, call Technical Support at 1-800-266-3373; Press 3; then Press 2.

http://209.247.74.138/servlet/IPConfServ?ORG_ID=22 &CONFERENCE_ID=47415

If you need more ideas and information about how to design a power back-up plan for your customers, please call your Liaison Managers at 1-800-552-5299.

– Lowayne Shieh

WEATHER.COM & CINGULAR WIRELESS

Weather.com, the world’s leading source of weather on the Web and the official site of The Weather Channel, is the premier weather provider for Cingular Wireless. Cingular customers with Internet capable phones can now view customized weather forecasts from up to three cities—anytime, anywhere. To use this service, users simply sign up by visiting Weather.com’s Cingular section located at weather.com/services/phone.html

“The Strategic Shift of Call Centers
(continued)

2. **Retention of customers.** In this scenario, call centers focus on maintaining customer relationships and customer satisfaction to ensure that the investments made in acquiring customers are not lost. Both inbound and outbound technologies and processes are used to support this objective.

3. **Increased investment by customers.** This objective aims to increase the revenue per customer, and expand the range and/or frequency of products purchased by customers.

A Call Center may focus exclusively on one of these objectives, but more typically they address two or even all three objectives. After all, most businesses do not produce just one product or service, and will have different sales, marketing, and support strategies based on multiple factors such as positioning of product, volume of sales, or revenue to company.

The strategic objectives of the Call Center must be reflected in the call handling strategies. (Note: in this article the Call Center includes phone, e-mail, and web-based contacts.) For acquisition of customers, the most important facet of a handling strategy may be speed of answer. When an established customer calls and your strategic objective is retention of that customer, caller identification for personalized service or self-service options may come into play. And when looking to increase the value of a customer, CRM applications and contact options such as web-based self-service are valuable tools.

Call Centers should periodically audit their call handling strategies to ensure that these are aligned with corporate objectives. These audits often identify opportunities for consulting services to revamp call handling strategies and accompanying purchases of technologies or applications to support these changes.

Pacific Bell Call Center Solutions offer a complete array of products that help Call Centers meet their strategic objectives. From ACDs to quality monitoring and workforce management, our Call Center Solutions sales consultants can work with you to select the appropriate products and configurations for your clients.

– Christine Hertzog

For more information about Pacific Bell Call Center Solutions, contact your liaison manager or Christine Hertzog, Regional Sales Director at ch7912@msg.pacbell.com. Hertzog has over 15 years experience in Call Centers and Computer Telephone Integration Technologies. She has worked in sales, marketing, product management, and most recently as a consultant.
An Update Special Report

THE HOSTING MARKET DOWNTURN & SBC’S POSITION

By Nalesh Chandra, Associate Director - Managed and Dedicated Hosting and Bill Tang, Associate Director - Data Center Hosting (Co-location)

A Profitable Business Proposition

Many industry experts touted the profit potential of the web hosting business since 1996 – when more and more households were getting Internet services, surfing the web and increasingly purchasing products online. Research analysts began declaring billion dollar revenue streams for companies engaged in providing an outsourced hosting solution for companies on the web.

In 1999 analysts affirmed the US hosting services market as one of the most rapidly growing segments of the IT industry and the Internet economy in general. IDC Research forecasted the hosting services total market revenue to increase by a factor of more than 13 between year-end 1999 and year-end 2004. The overall expected compound annual growth rate (CAGR) for the period 1999-2004 was 67.1%, with year over year growth rates starting at 108.2% and ending at 39.1% as the market matured.

Given the enormous revenue potential of the hosting business, thousands of companies jumped on the Internet bandwagon and set up data centers, hosting environments and strategic partnerships to deliver the outsourced hosting solutions businesses were looking for. Many of these companies were pure-play hosters, often backed only by venture capital funding with an eye on gaining market share in the space. These pure play hosting service providers took on enormous debt to finance their data centers in hopes of becoming a market leader in the web hosting market.

For many, taking on that enormous debt led to landing the top spots in market share – profitability is another story. The top 20 Hosting Services Providers represented a mixed bag with regard to business focus and customer base. HSPs (Hosting Service Providers) such as IBM Global Services, Exodus, Digex and Genuity focused on the enterprise and dot-com segments and emphasized complex, multiserver hosting implementations, managed data center utility service and increasingly platform-based managed hosting services.

Providers such as Verio, XO and Data Return derived the bulk of their revenue from Shared hosting and small and medium-sized business customers, but began moving into the dedicated/managed hosting space and pursued larger enterprise accounts.

Finally, telco-oriented HSPs such as AT&T, Sprint, and Cable & Wireless operated in all market segments and targeted business of all sizes.

The table (page 7) shows competitor marketshare based on revenue (not profit). Some of these competitors have consolidated as a consolidation and merging trend gained momentum during the second half of 2000. Please note that this is a revenue/market share table and that although many of these companies show strong revenue, their net income may be negative.

The term "Internet Data Center" was on the lips of every industry expert. If your company did not have an Internet Data Center, it was light years behind the Internet generation. Venture capitalists became caught up in the dot-com firestorm and pumped billions of dollars into e-commerce startups and those companies developed a sudden need for a place to outsource their servers and bandwidth. Exodus Communications, which had been a struggling ISP in the early 1990’s, jumped onto this bandwagon, and others like Equinix, Globix, and Navisite quickly followed suit. Hosting revenue boomed from $941 million in 1999 to $3.5 billion in 2000. The future was looking bright for hosting service providers.

With the enormous revenue potential and the possibility of becoming one of the top 20 in the hosting market, it all sounded like a great business proposition. Everyone was supposed to win.

What Happened?

Fast forward to the year 2001. The hosting business is still a good business to be in and many of the companies in the top 20 will continue to provide outsourced hosting, but profitability is now more important than being the revenue leader. The problem began with the 1990’s being a decade of technology oversupply. As prices for computers and technology screamed downward at a meteoric pace, services such as web hosting quickly became commodities and easily available for a fraction of their original cost. This was good news for business customers, but not so good news for hosting service providers, who had to now compete on a technologically even playing field. Competition meant lower prices and lowering prices was the last thing companies with millions of dollars invested in hosting infrastructures wanted to see.
<table>
<thead>
<tr>
<th>E0Y 2000 Rank</th>
<th>Competition</th>
<th>Acquired by</th>
<th>Merged</th>
<th>Operates as</th>
<th>E0Y 2000 Share %</th>
<th>E0Y 2000 Revenue</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
<td>IBM Global Services</td>
<td>N/A</td>
<td>IBM Global Services</td>
<td>Exodus</td>
<td>15.1</td>
<td>$696 M</td>
<td>Focus is on Co-location</td>
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<td>Exodus</td>
<td>N/A</td>
<td>Exodus</td>
<td>Exodus</td>
<td>15.1</td>
<td>$696 M</td>
<td>Acquired by NTT in 2000</td>
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<td>3</td>
<td>Verio</td>
<td>NTT</td>
<td>Verio</td>
<td>Verio</td>
<td>4.2</td>
<td>$194.5 M</td>
<td></td>
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<td>4</td>
<td>UUNET / WorldCom</td>
<td>Merged with</td>
<td>Intermedia</td>
<td>UUNET / WorldCom</td>
<td>3.8</td>
<td>$176 M</td>
<td>Merger with Intermedia gives them controlling interest in iDigex</td>
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<tr>
<td>5</td>
<td>iDigex</td>
<td>Controlled interest held by UUNET / WorldCom</td>
<td>iDigex</td>
<td>iDigex</td>
<td>3.7</td>
<td>$168.1 M</td>
<td>UUNET/WorldCom with Intermedia gives them controlling interest in iDigex</td>
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<td>iGlobal Center</td>
<td>Exodus</td>
<td>Exodus</td>
<td>Exodus</td>
<td>3.1</td>
<td>$142 M</td>
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<td>Qwest</td>
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<td>$124.2 M</td>
<td>Currently in Chapter 11 bankruptcy</td>
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<td>Genuity</td>
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<td>2.3</td>
<td>$108 M</td>
<td>Black Rocket is the brand for e-Business strategy</td>
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<td>Navisite</td>
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<td>1.9</td>
<td>$88.4 M</td>
<td>Dedicated and Managed Hosting</td>
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<td>Digital Island</td>
<td>Pending merger with Cable and Wireless</td>
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<td>Digital Island</td>
<td>1.9</td>
<td>$87.6 M</td>
<td>Mainly high end Managed Hosting</td>
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<td>AT&amp;T</td>
<td>1.8</td>
<td>$86.9 M</td>
<td>Provides both Dedicated and Co-location Hosting</td>
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<td>13</td>
<td>Earththink</td>
<td>N/A</td>
<td>Earththink</td>
<td>Earththink</td>
<td>1.4</td>
<td>$65.8 M</td>
<td>Offers shared Hosting only</td>
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<td>Concentric XO</td>
<td>XO</td>
<td>XO Comm</td>
<td>XO Comm</td>
<td>1.3</td>
<td>$62.2 M</td>
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<td>Cable &amp; Wireless</td>
<td>Pending merger with Digital Island</td>
<td>Cable &amp; Wireless</td>
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<td>0.9</td>
<td>$41.1M</td>
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<td>$41.1 M</td>
<td>Managed &amp; Dedicated Hosting</td>
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<td>Interland</td>
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<td>$29.4 M</td>
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<td>Interland</td>
<td>0.5</td>
<td>$26.1 M</td>
<td></td>
</tr>
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<td>19</td>
<td>Sprint</td>
<td>N/A</td>
<td>Sprint</td>
<td>Sprint</td>
<td>0.6</td>
<td>$22.4 M</td>
<td>Offers Shared, Dedicated and Co-location Hosting</td>
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<td>20</td>
<td>Above Net</td>
<td>Owned by Metromedia Fiber</td>
<td>Above Net</td>
<td>Above Net</td>
<td>0.5</td>
<td>$24.1 M</td>
<td>Co-location Hosting</td>
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<tr>
<td>Top 20 subtotal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65.6%</td>
<td>$3,020.3 M</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34.4%</td>
<td>$1,583.3 M</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>$4,603.6 M</td>
<td></td>
</tr>
</tbody>
</table>

Source: Company reports, Goldman Sachs Research estimates

As the industry faces a slowing economy and the demise of free-spending dot-com ventures, belts are tightening around the globe. The recent entry of large telecommunications companies, like SBC Communications, into this market is making the hosting business a game that only the financially secure can play.

Hosting companies have increased their capacity: by the end of 2003, their worldwide gross square footage will jump nearly ten times, to 83.6 million, and the number of data centers will grow tenfold. The problem is that the most of that growth has been funded by debt, and companies now are watching their cash reserves dry up and their debt liability increase – a losing proposition for pure play hosting service providers.

**Trouble with the Leaders**

At the peak of the Internet's growth, the data center expansion boom extended beyond the virtual world into millions of square feet of actual real estate, as companies like Exodus Communications built high-tech hosting facilities around the world trying to keep up with demand for Web server space. For a few years it appeared that hosting companies couldn’t overbuild. Even with a rush into the market by telecommunications companies, start-ups and giants such as Intel, companies were selling space as fast as they could build it.

But that phenomenon has come to a deafening halt, forcing many hosting companies into crisis mode. "What you're seeing is an about-face in supply and demand," said Carrie Lewis, an analyst with The Yankee Group. "All these data center plans were made (last year) and at that point everyone saw demand going up. Then demand fell off a cliff."

The San Francisco brokerage, WR Hambrecht, estimates that Exodus will have to pay $365 million, or 20 percent of estimated revenue, in interest expense on its $2.8 billion in long-term debt. In 2002 that number is expected to hit $400 million, which means Exodus may have to raise more funds from the capital markets. The problem is that the capacity bought by that debt might go unused. According to Tier 1 Research, dot-coms represented a third of hosting revenue in 2000, and as startups go under, hosting service provider business is drying up; Exodus, for example, recently lost two premier tenants, eToys and Pets.com. The company also laid off hundreds of employees.

In the meantime, the hosting business is becoming increasingly attractive to communication giants, such as SBC Communications, that are bent on taking market share away from existing pure play hosting service providers. Because companies like SBC own networks, they can afford to sell services at lower prices to attract customers – a luxury that pure play hosting companies cannot afford. Besides, corporations are more likely to choose big players, not small companies, for their outsourcing, says Tier 1 founder Andrew Schroeper. While the outsourcing business retains its long-term appeal, at the moment corporations looking to cut IT spending are delaying plans to outsource infrastructure.
"This is a challenging time to be in the hosting business, because the new players are Telco's who have deep pockets," says Greg Gore, an analyst at WR Hambrecht. "It is turning into a volume game, and the players with the deepest pockets will win." Tier 1's Mr. Schroepfer predicts a shakeout among the first-generation companies, followed by a period of consolidation. "Telco's were the fools a few years ago," he says, "and now they have all the cash." SBC was one of those companies that waited to see how profitable the hosting market would be before diving into the space. SBC is now positioned to make profit on its hosting suite of products, whereas competitors are still looking for ways to cover their debt expense.

What's Next for Hosting Service Providers?
It is clear that the hosting companies are quickly rethinking their expansion plans as they realize that growth is not necessarily the key to profitability. SBC Communications is also thinking along those lines. Sure, SBC is not in a bad position as Exodus, since it didn't build as many multi-million dollar Internet Data Centers, but the company still will focus on the bottom line when it comes to its hosting suite of products. Analysts say demand will pick up again as the economic pendulum swings back, perhaps following the classic boom-and-bust cycle of real estate prices, but for now the results show that the building spree of recent years wasn't financially sound. Analysts also say they are confident that the strongest companies will emerge on the other end of the bust in fairly good positions, however. The overall demand for Web hosting services will not go away, but analysts say demand will eventually catch up with last year's building boom. "It's not all gloom and doom," The Yankee Group's Lewis said. "The Web hosting marketplace is viable. Companies just have to reassess and refocus. That's a good thing."

SBC's Position
Will SBC Communications follow in the negative financial footsteps of companies like Exodus Communications? The answer is a resounding: No. How can SBC be so sure? SBC Communications will survive the dot-com and web hosting shakeout because it (1) is not a pure play competitor, (2) is not funded by venture capital (3) is not overly burdened by debt and (4) has what it takes to be successful at hosting.

SBC's does more than just web hosting. SBC Communications has been in business for over 110 years and offers a wide variety of products and services to business customers around the globe. With its breadth of offerings and multi-billion dollar revenue and profit stream, SBC will not face the challenges a traditional pure play hosting service provider will face. This means that SBC is committed to its hosting business and will continue to ensure that that the hosting portfolio of products is properly funded for success. If a pure play hosting service provider is not profitable, its core business suffers and customers suffer due to staffing cutbacks. SBC does not face this problem.

SBC Communications is a Fortune 15 corporation and is not funded by venture capital like many pure play hosters. Being self-sufficient affords SBC the ability to make decisions about its hosting platform in the best interest of its customers. The teams at SBC focus on making the businesses we host a success rather than wondering if we will be in business next year.

Unlike Exodus Communications, SBC is not burdened by an enormous debt liability when it comes to its hosting portfolio. SBC makes sound financial decisions and uses its money wisely when taking on new technologies such as hosting. Sure, SBC spent money on building two new Platinum Internet Data Centers, but building those data centers will not put us out of business.

SBC plans to be successful in the hosting market because we have what it takes to provide World-Class service. Just look at these facts:

- **SBC Knows Data.** SBC has experience operating over 1,000 secure, fault-tolerant Central Offices nationwide, in addition to owning and operating over 100 internal company data centers
- **SBC Leverages IT Support.** We have 15,000 Data Specialists, 1,000 Sales Specialists with Advanced Industry Certifications, over 700 Cisco Gold-certified Specialists and 513 System and Design Engineers
- **SBC’s Internet Presence is Widespread.** We have access to over 30 SuperPOPs and 420+ Dedicated Access POPs covering 70% of the U.S. as well as 2,800 Dial Access areas in 82 countries worldwide. We also operate two of the seven Internet NAPs.
- **SBC Deploys the Most Advanced Data Network in the World.** Our broadband network backbone maintains an average uptime of 99.99%. SBC backs up its IP technology with over 100,000 fiber miles, 50,000 remote access servers, 13,000 SONET rings, 1,300 Frame Relay and ATM switches and 500+ Cisco 7500 routers
- **SBC Delivers “World Class” Customer Service.** "SBC has been one of the top-performing Tier 1 telecommunications companies over the past 10 years." – Stratecast Partners, U.S. Data Communications Strategies, March 2000

The Internet world moves at light speed and the constant change makes it difficult for many companies to keep up. In just a few short years, the hosting market has gone from a revenue haven where a few technotypes could use a loan from their grandmother to start a hosting company in their garage to a multibillion dollar industry where only the financially sound hosting service providers will survive. The ones you once thought were unbreakable, like Exodus, seem to be cracking at their foundations, and the ones you never heard of before in the hosting space, like SBC Communications, are starting to make big moves. Keep an eye on SBC Communications. Here yesterday, today and tomorrow—you can count on it.

For further information contact: nalesh.chandra@pacbell.com

"Impossible is just an opinion."
Caprice de Lorm  
Senior Project Manager  
Data Solutions, Pacific Bell

**DSL DATA**

**Pronto Sales Readiness Information**
Over 150 Central Offices are sales ready for Pronto DSL Internet Service in the West region. Approximately 1,163 Remote Terminals and 5,895 Distribution Areas were deployed in these Central Offices at the end of July. This represents 1.5M households that are Pronto DSL Internet sales opportunities for customers that were previously ineligible for service due to distance limitations.

To qualify your customers for DSL Internet Service, as well as to order DSL Internet Service for your clients, call 1-877-722-3755.

**PBI DSL Internet Partnering with Prodigy**
SBC and Prodigy have partnered to offer DSL Internet Service with Prodigy content and SBC Internet Services' DSL-Internet retail offerings. As a result, customers who sign up for DSL Internet Service with Pacific Bell will have their network access provided by SBC Internet Services and their portal provided by Prodigy. DSL transport continues to be provided by ASI.

With this alliance, customers receive a more robust package with PBI Basic and Enhanced DSL Internet Services. The new offering includes:
- PB/Prodigy Co-Branded Home Page
- 11 mailboxes (1 Primary and 10 Additional)
- 15MB web space for Personal Web Page
- Customizable and User-Friendly Personal Home Page
- Direct links to some of the most popular Internet sites
- Instant Messaging
- Message Boards
- Newsgroups
- Stock Market/Portfolios
- Ability to check e-mail messages from any computer that has Internet access

The implementation of PBI DSL Internet partnering with Prodigy began on 7/28/2001. As of 7/28, all newly registering PBI DSL Internet customers receive the full Prodigy feature and content set. The domain name *sbcglobal.net* is used for new customers. Customers upgrading from PB Dial-Up service (with domain name of *pacbell.net*) will register for new PBI DSL Internet service as an existing PBI customer and will not receive the full Prodigy feature and content set until migration.

- Current SBCIS Dial-Up subscribers within the SWBT, PB and NB territories
- Current SBCIS Basic, Enhanced and Business (29 Static IP) DSL Internet customers within the SWBT, PB and NB territories
- Current SBCIS customers = customers with *pacbell.net* or *nvbell.net* or *swbell.net* as the domain for their dial-up or DSL Internet Service as of the migration date

Customers will be notified at least 30 days before their service is migrated to the Prodigy content. When their service is migrated, customers will see a new home page (portal) with more functionality than the current interim portal. If a customer has his/her home page set to a site other than the default SBCIS home page, then the home page settings will not change and customer will continue to see that home page. They will keep their current e-mail address and domain names and not lose any bookmarks that are saved in the web browser software. They also will be able to sign up for additional e-mail boxes and utilize the additional functionalities provided with the alliance.

Additional enhancements will be made to the program in 2002. Included in this are additional ordering flexibility for customers with DSL Internet or Dial-Up (upgrades, downgrades, moves, etc.) as well as being able to purchase more features, such as mailboxes and additional IP addresses. Pricing will remain the same as it is today, until otherwise notified. However, please note pricing is subject to change. Customer Notification will occur in one of two ways: For existing customers on the *pacbell.net*, *nvbell.net* & *swbell.net* domains, notification will be handled via e-mail. For all new customers, information will be given at the time of order placement.

For more information regarding PBI DSL Internet partnering with Prodigy, contact your Liaison Manager.

**US & Mexico: One Stop Shopping**

For International Frame Relay & Private Line Services

SBC, through its Southwestern Bell Long Distance affiliate, is making it faster and easier for businesses to connect offices in authorized locations in the US and Mexico by providing one-stop shopping for International Frame Relay and Private Line Services. SBC's cross border services allow businesses to transmit data traffic at greater speeds for a lower cost. Through its partnership with Telmex, SBC offers a comprehensive and competitive data network solution for the customer, including data CPE hardware and network design consulting. SBC, which maintains the largest data network throughout Texas, functions as a single point-of-contact for customers. SBC offers International Frame Relay and Private Line Services using a range of bandwidths with transmission rates up to 1.54 Mbps

For further information, e-mail Henry Peluffo at: *hpeluffo@msi.com.mx*
E-LEARNING: HOW TO SUCCEED AND FAIL

E-learning engenders a fear of failure. Why else do brows furrow when the term e-learning comes up? Implementing e-learning is not for the faint of heart. Cisco Systems, one of the shining examples, took five years and many false starts. Research a few years ago revealed that some 80 percent of IT projects come in late or over budget. What do missed IT implementation targets have to do with e-learning? Maybe more than you realize. After all, some e-learning courses have an 80 percent dropout rate. A good migration and implementation strategy of Unicast vs. Multicasting or ISDN vs. IP or real time vs. archive – all need careful consideration.

With this backdrop, it is not surprising that e-learning actors are strutting carefully across the e-learning stage. They are trying to get the audience on their side. New training technology has not delivered the goods in the past. Let’s face it, audiocassettes never had a great future. Their libraries are now at our fingertips. Peer-to-peer communication possibilities are enormous. And huge amounts of bits and bytes can be moved around the world instantaneously. Napster proved that. But can people still fail with e-learning? It’s not hard to do. For HR managers, training directors and consultants who are intent on failing here are a few tips. Of course, if you want to succeed …

Think Training Not Business
The lack of a clear business focus can help you fail. When the business reason is not clear then you will not have clear targets to shoot for when you develop materials. An example of a clear business objective could be to help new sales reps become fully operational and make their first sale in four weeks not six, as it is now.

Promise The Moon
This is a good way to help e-learning fail. E-learning is not a walk in the park. It requires people to learn in a new way (1% taste, 1.5% touch, 3.5% smell, 11% hearing, 83% sight, from: TechLearn 2000), to teach in a new way (remotely, interactive distance learning, Internet), even to develop training in a new way (from a production studio). Making all these changes is complex, so there will be challenges. Setting very high expectation, for example: that you will cut training costs by 50 percent while maintaining training effectiveness, is a good way to undermine implementation.

Outsource Everything
Hiring consultants or some sort of service provider to handle all of your e-learning needs is a splendid way to foster failure. Outsiders can provide substantial help and chances are you will need help from outsiders. But you need to remain closely involved at every turn in the road. You need to look critically at what consultants and service providers offer.

Let People Sort It Out For Themselves
You might be tempted to “give e-learning a try.” Let’s make it available and see if employees use it. Not a good idea. Chances are folks won’t use it. You need a change management strategy to implement e-learning successfully. (It’s true, you can’t really “manage” change, but you can smooth transitions). You need to select your target groups, identify what they should be told about e-learning, figure out the most effective way to communicate with them and break the news.

Force E-learning On Resisters
People who don’t support e-learning will complicate your existence. You might be tempted to press on. Steam roll the bumps out of the road. It might work at first, but a better, long-term strategy is to find out why people could resist e-learning before it is implemented. Seek ways to accommodate them. Help them adjust to e-learning. It might be as simple as paring up resisters with champions.

Don’t’ Evaluate
Evaluation is never fun. First you have to plan it. And to plan an evaluation you need to know up front what you are trying to accomplish. More rigorous thinking! It’s much easier to let it go … people will tell you if e-learning has failed. Sure thing. Maybe they will say it failed, when the truth is that it succeeded. The point here is that if you do a serious evaluation you will know whether you succeeded. You will be able to proclaim your success. Better yet, a good evaluation will give you hints for improving your e-learning program.

I hope I haven’t given you e-learning stage fright. E-learning does not need to be a negative experience. But you have to manage expectations — yours and those of the people you work with and serve. Successful HR managers, training directors and consultants who guide e-learning know where they are going and how to get there. After all, “all the world’s a stage…” You may want to consult with 1-800-PACIFIC for more information about Visual Communications offered by Pacific Bell Advanced Enterprise Solutions, on (949) 838-8244. Brennan began his telecommunications career in 1974. He was a fiber optic engineer in the 80’s; a technologist in the 90’s and now frequently speaks as a subject matter expert on Visual Communications, Voice/Video over IP and Streaming Media.
S P O T L I G H T  . . .

MISSION BAY: BUILDING A BROADBAND COMMUNITY FROM THE GROUND UP

As the Internet and advanced telecommunications services play an increasingly important role in how we live, it’s only logical that prospective home and business owners will look for the latest technology where they live. Already one step ahead of this trend is the Mission Bay real estate development near Pacific Bell Park, San Francisco where access to advanced technology will be built into homes and offices, just like electricity and water service.

SBC Communications Inc. and Catellus Development Corporation have teamed up to create the broadband-enabled community at Mission Bay, a massive 300-acre redevelopment effort. The development will consist of nearly five million square feet of commercial space and 6,000 residential units, all built from the ground up with direct access to the highest speeds of broadband communications and the most advanced telecommunications applications of today and tomorrow. Initial commercial and residential tenants will occupy the project in 2002.

Pacific Bell will offer voice, data and video services to Mission Bay residents and businesses over an advanced fiber network, allowing them to take advantage of applications ranging from videoconferencing to interactive video games to community-based intranet.

“Mission Bay embodies SBC’s vision of digital convergence, enabling delivery of voice, data and broadcast-quality video over one high-speed, broadband network to the home and business,” said Ray Wilkins, president and CEO of Pacific Bell. “We are excited to be working with Catellus to provide a broadband pipeline to all Mission Bay properties that will take us light-years ahead in offering the latest telecommunications applications.”

Always-On
The Mission Bay project is in line with SBC’s overall strategy to assemble the complete set of services and infrastructure needed in today’s always-on world. SBC offers a full range of broadband access technologies, networking, Web hosting services, and advanced e-business applications – offerings the company combines and customizes to meet the needs of individual business and residential customers.

For people living and working in Mission Bay, these capabilities mean instant and continual access to the latest broadband services available. The community will initially be served by a digital subscriber line (DSL)-based platform, but ultimately will transition to next-generation transmission technologies through a continuously expanding broadband pipeline.

Upon occupancy, the development will serve as the first test site for new network technology that depends on fiber connections directly to the home or business. This technology will dramatically increase the bandwidth between customers and the communications network, given upstream and downstream broadband speeds that start at five megabits per second. Such speed will enable access to services such as remote education and video-on-demand.

“This project is unique in entrepreneurial spirit and innovation and demonstrates both companies’ commitment to providing the highest speeds and advanced applications,” says Nelson Rising, chairman and chief executive officer of Catellus. “The broadband capacity provided by Pacific Bell will enable greater community interaction by establishing links to neighbors, local businesses, services, and civic information, while maintaining choice and flexibility for Mission Bay users.”

While the Mission Bay project provides a template for future broadband empowered commercial and residential developments, SBC also is delivering high-speed Internet and data services to millions of existing customers throughout its 13-state service territory. SBC is the nation’s largest provider of high-speed DSL connections, which provide Internet and data access at speeds up to 100 times faster than dial-up modems. What’s more, through its Project Pronto initiative, SBC is driving fiber-optics deep into its network to deliver DSL access to nearly all of its wireline customers by 2003, bringing the broadband into the reach of 78 million Americans.

For further information contact your liaison manager or Dianne Giacovelli, Project Director - Fiber Service at dmgiac1@msg.pacbell.com

MISSION BAY’S WALLED GARDEN

Pacific Bell is working with the developer to provide every unit with the highest speeds of broadband communications – starting at 5 Mbps for residential customers and ranging far higher for business customers.

For residential customers, the fiber will deliver applications ranging from voice, data and satellite-quality video to videoconferencing, interactive video-gaming and a community-based intranet known as the “Walled Garden.”

Residents will be able to:

- Post ads (Need a babysitter? Seen my lost cat? Want to buy a used car?)
- Download games and movies
- Participate in distance-learning
- Attend virtual community council meetings and that’s just for starters.

“Live every day!”
It's 2001.

5 years have passed since the passage of the Telecom Act of 1996.

A year has passed since the "dot bomb" collapse.

Most of the DLECs have failed or merged with other entities.

Many other CLECs have failed or are struggling.

At the risk of sounding cliché, I'll say it anyway: the $700 billion telecom industry and its related technology are evolving at a staggering pace.

Are we at a critical juncture in the evolution of the telecommunications world? You're darn right we are. Even though our industry has experienced turbulent times in the last year, this is still a great time to be working in the hottest field on the planet, telecommunications. Of course given today's environment, the definition of telecommunications includes not only the traditional meaning of telecommunications (i.e. circuits and switches), but data communications, software development and computer programming (JAVA, C++, HTML, Visual Basic), project management, product marketing and business analysis.

There is a major evolution taking place right now that promises to somehow, at some point in the near future, turn our world on its side, presumably for the better. This "world" includes those of us who work in the telecommunications industry, as well as the consumers and businesses that purchase services from SBC.

Listed below are just a few topics that are written about extensively today in the trade magazines, and sometimes even in the traditional media. What's clear is this: the telecom industry is in the midst of a revolution.

Fiber Glut Or Not?

Much has been written recently about a supposed "fiber glut" that's been brought about by the massive plowed-in-the-ground and wholesaler-to-retailer buildouts of huge optical fiber networks across the United States over the last few years. As usual, there are several perspectives on this assessment. Hundreds of thousands of route miles of fiber have been laid by an assortment of carriers (SBC included), though not all of that fiber is lit. But it's there. Waiting to be lit. Waiting to be used when needed.

A recent article in the July 15th edition of America's Network Magazine discusses a report by TeleChoice which states there's "no bandwidth glut in the U.S., and only a few routes are currently overbuilt". The San Francisco-to-Los Angeles route has three times more capacity than it needs right now, and New York-to-Chicago also has too much capacity. "But within three years, there will be more demand than supply on all of these routes", notes Russ McGuire, Chief Strategist at TeleChoice. He adds that on four routes there is already more demand than supply. The imbalance is addressed through traffic re-routing.

The optimistic take on the "fiber glut", per Forbes Magazine, is that it's not a glut at all – all that dark fiber will be lit in due course, when the "last mile" bandwidth bottleneck problem is resolved. And that bottleneck is being eliminated right now. Companies such as Looking Glass Networks, based in Oak Brook, Illinois are busy laying fiber in major cities to help bridge the capacity gap between the long-haul data networks and the metro area networks to satisfy local businesses that are crying for access to cheaper bandwidth.

A new breed of carriers known as "ELECs" (Ethernet LECs) are also focused on using gigabit ethernet technology to bring low-cost bandwidth to metro business customers. The most prominent players in this space include companies such as Telseon, Cogent and Yipes. Level 3 has been involved in this activity as well, having recently announced that (wholesale) demand for its metro dark fiber has been boosted by the growth of GigE as the "interface of choice in end-user network systems". SBC is keeping pace with this competition in the GigE marketplace, having launched the GigaMAN product earlier this year in Pacific Bell and Southwestern Bell. SBC was one of the founding members of the Metro Ethernet Forum last month, to push for faster adoption of Ethernet technology in metro networks.

On a related note, a June news release reported that scientists from Lucent Technologies' Bell Labs have calculated the maximum amount of information that can be transmitted over optical fiber, proving that fiber optics technology will result in robust, long-term and scalable communications networks. The Bell Labs team, whose results appeared in the June 29th edition of the British journal Nature, determined that it is theoretically possible to send approximately 100 terabits (Tb) of information or roughly 20 billion one-page e-mails, simultaneously per strand of fiber. Now that makes one fiber a powerful pipe, and that's without the additional capacity boost provided by DWDM technology!!

This Bell Labs development is important for several reasons:

1. It tells us the current theoretical limit of optical fiber. This information could serve as a useful benchmark for capacity planners in the carrier industry.
2. It gives scientists and manufacturers an inevitable new goal: to try to obtain 200Tb of information from each optical fiber. To reach the next level.

With the thoughtful, strategic placement of termination (muxing) equipment that's available today, and whatever is developed and made available "tomorrow", the fiber that's in the ground should hopefully last 10-15 years, based on the Bell Labs assessment above.
Developmental technologies being applied to the concept of Dense Wavelength Division Multiplexing (DWDM) are mind boggling. Microscopic mirrors, bubbles, holographic "gates", the list goes on. We’ve probably just begun to tap the potential of optical fiber’s capacity. As optical fiber and its inherent capacity potential get closer to the consumer and the small businessman, an economic and technological revolution will certainly ensue. "Broadband" will begin to reach its real potential. Wait and watch.

The Next Generation of E-commerce
Well, it’s been about a year now since many of the dot coms went bust. A lot of theories abound for why it happened. Here’s one person’s perspective on why it happened, and where the world of e-commerce may still take us.

Recent reports suggest that one of the reasons for the dot-com bust is that consumers didn’t flock to sign up for new broadband technologies as anticipated. Another theory states that the reason so many dot coms failed last year is that they lacked any reasonable semblance of decent customer service. (This is somewhat ironic given that more and more companies are seeking ways to use the Internet to improve their customer service). Also, do any of you ever remember seeing a pronounced, effective marketing and advertising campaign over the last few years for a dot-com that didn’t already have an established brick-and-mortar presence? I’m referring to billboards, electronic media and print media. I remember seeing just a handful of billboards for the non brick-and-mortar dot-coms between late 1999 and 2000. That’s it. Could it also be that a sizable portion of the general public is still skittish about posting their credit-card number on-line, regardless of the level of security that "XYZ" site insists they maintain? Who’s to say that an expert hacker couldn’t eventually break through even the best security system?

There are now approximately 30-40 million Americans on-line in the United States, but industry estimates predict that only 8% of American homes have high-speed Internet services. Some 20-25% of the population lives in areas that are too difficult to reach for most providers to supply broadband access services. We should care about this because widespread availability of speedy Net connections is good for the economy. I believe that eventually, the rural U.S. will be served by broadband providers because, if nothing else, a broadband "Universal Service" mandate may eventually be a reality, imposed by the FCC. MMDS radio technology would be a perfect medium to deploy in rural areas to meet this need. The main requirement would be huge towers possibly reaching heights of 1000 feet.

Eastern Management Group estimates that letting people work and/or shop from home, boosts productivity, and they estimate that broadband could add 3.7 billion work-hours to the economy each year as people commute less and drive less to stores. A new study by the Brookings Institution released on July 16th states that widespread use of high-speed Internet service by Americans could contribute as much as $500 billion annually to the U.S. economy. Consumers would benefit from on-line home shopping, entertainment, traditional telephone and health care services, as well as reduced commuting. $200 billion could be added to the economy if half the country has high-speed Internet service; or $400 billion if almost all Americans have it. The higher consumer demand will also provide a boost to manufacturers of computers, software and entertainment products, which would add another $50 billion to $100 billion to the economy.

There will undoubtedly be a reshaping of the e-commerce industry. A different business model may be a part of this new phase, where companies have to put a solid line in the sand regarding timeline to profitability (what a concept!!). A large part of the next phase of e-commerce will likely be brick-and-mortars using it as a supplemental source of revenue and marketing. In any case, any company – whether virtual or brick and mortar – seeking to do business on the Internet in the coming years will have to have several key elements in their plan if they intend to be successful:

1. A solid business plan that has a concrete deadline for turning "black" (profitable). This also applies to newly-created e-commerce divisions within established brick-and-mortar institutions.
2. A clearly defined plan to support its customers in as many ways as possible
3. A plan to market their web presence intelligently, beginning with a focus on areas where broadband deployments are more a matter of course rather than anomalies. Unfortunately, for the time being this means that the urban markets will be the primary focus.

Dot coms are on shaky ground on Wall Street, but the concept of selling over the Internet is on solid footing, according to industry experts who predict strong growth in online retailing for years to come. Retailers sold $45 billion worth of goods online last year, and Forrester Research Inc, a Cambridge, Mass research firm, is projecting the number will grow to more than $269 billion in 2005!!!

"People have been putting way too much emphasis on the meltdown in the financial markets", said Peter Fader, a professor of Marketing at the University of Pennsylvania’s Wharton School of Business. "That’s not a good indicator of the health of a business. The Internet, as a distribution channel and contend medium, is here to stay".

Wireless 3G
Recent reports on the new "3G" wireless technology suggest that building massive, multi-billion dollar overlaywireless networks to handle multi-media wireless transmissions may be a technology in search of a market. To paraphrase one article, do we really need to have the capability to watch a live CNN broadcast while on a streetcorner corner? Nevertheless, HP has hired a contractor to research and develop a 3G-type network, with one of the key goals being to develop and plan a network with so much capacity that it "doesn’t even need to be measured". Now there’s a concept!!! But some experts are asking, is a true 3G, "multimedia" wireless network really even needed? Are the billions it would cost overkill? Is the current push for 3G wireless similar
similar to the overexuberance (thank you, Alan Greenspan) experienced from 1999-2000 with dot.com mania?

One industry analyst believes the best thing to do is to develop a system where two parallel networks function, one being the existing voice-based network (all digital, of course); and another a parallel data network where eventually nanocells will be developed to provide saturation coverage of metro areas.

Another exciting development to watch is the creation and launch of locator technologies by the wireless carriers. The FCC has mandated that wireless carriers must deploy E-911 technologies, where persons dialing 911 from a wireless phone can be located to within 150 meters. To do this, they will have to deploy a locator system onto their existing networks. The wireless carriers determined, rightfully so, that they could use this "forced" network upgrade as a revenue source. One of the key things they'll be deploying is "billing zones", where consumers would receive special wireless calling rates depending on their exact physical (geographic) location when making calls. This will be interesting to watch. It won't be too far fetched to see consumers rely on the network to determine where they can find a gas station if they're lost and low on gas by dialing [* G-A-S*] on their wireless phones. The address of the nearest gas station would then pop up on their LCD display, with directions to the station. Your phone could also ring or vibrate when you're near your cleaners, reminding you to pick up your dry cleaning. The same thing could happen if you're outside the mall, where The Gap could advertise the daily sale special.

No matter what, a lot of spectrum is going to need to be moved in the U.S. to accommodate any deployment of advanced wireless services. The world (the ITU) has chosen the 1700 Mhz spectrum for assignment of wireless next gen services. Clearing that spectrum in the U.S. will be daunting task, especially since the Dept of Defense holds many of the frequencies in that band.

For now, the wireless industry is still growing like gangbusters. Capacity will become an issue within the next few years, given the rate at which people sign up for service (46,000 per day, according to the Cellular Telecom Industry Association). This alone may force the industry to make some hard choices about technology and system buildouts.

Mergers and Acquisitions

There are bound to be some major mergers and acquisitions over the next one to two years that will have a massive impact on the telecom climate. Jag Sheth, a professor of marketing at Emory University, predicted in the July 15th edition of *America's Network* that "long distance carriers will begin merging with the Baby Bells within 12 to 18 months, and three AT&Ts will be created. Rumors reflecting his prediction have been floating around for months. It's very possible that some of these mergers are already underway in boardrooms. What the FCC will have to say about these mergers will be interesting, since it will bring down many regulatory walls that have existed for decades in the local carrier marketplace.

The prediction above, coupled with the massive shakeout in the independent carrier industry, will make for an interesting time in the next year-and-a-half. Many of the "greenfield" carriers have either gone bankrupt, been bought, sold major divisions or are teetering on the brink of bankruptcy. Some examples:

- Winstar, a major facilities-based CLEC with major wireless license holdings, declared Chapter 11 in April. They are also in the midst of a nasty, bitter lawsuit with Lucent.
- Covad Communications, a major DLEC, filed Chapter 11 in early August.
- Broadband Office declared Chapter 11 recently and its building rights were purchased by aggressive ELEC upstart Yipes Communications.
- Teligent, a major wireless-based CLEC, has declared Chapter 11
- Telocity, a spunky DLEC, has merged with DirecTV DSL
- MFN, a wholesale and retail fiber provider, is poised to be purchased by Verizon, according to recent news perspectives.
- Intermedia has recently been purchased by Worldcom.
- PSINet, an ISP and long-haul fiber wholesaler, filed for Chapter 11 bankruptcy on June 1st.
- Lucent, the once-swaggering tech giant, will never be the same company it was 2 years ago after all its been through in the last year.
- Motorola recently sold its microelectronics division.

Competition is brutal these days. SBC is encountering fierce competition – right now – by such unlikely players as local municipalities, who have become dark fiber providers; local and national cable (TV) companies; and some savvy, gutsy customers who purchase dark fiber and turnkey their own networks.

The health of the telecom industry is crucial to the U.S., and actually the world economy. Not only do telecom companies purchase enormous amounts of high-tech products and services themselves, but their networks provide the foundation for entirely new industries, for example Web hosting and on-line video. The Internet in general spawned the growth of many related industries. Telecom is critical to getting the tech sector moving again, and telecom is critical for the U.S. economy as a whole.

Yes indeed, the telecom world has certainly changed immensely in the last 5 years. What the industry will really look like in 2006 is anyone's guess. But it's still fun to be a part of this industry, there's never a dull moment, is there? And one thing is certain: no matter what the future holds, SBC will definitely be a big part of it somehow.

(SBC’s Paul Bedell also teaches at DePaul University. His latest book, *Wireless Crash Course*, was recently published by McGraw-Hill. You can reach Paul at paul.a.bedell@msg.ameritech.com The opinions expressed in this and other columns in "Update," are the authors and not necessarily those of Pacific Bell or SBC.)
PART 2 - MOBILE INFOTAINMENT SERVICES DIRECTION

(CONCLUSION FROM THE LAST ISSUE OF UPDATE)

5. Motorola’s Accompli 009, built from its two-way messaging device platform, essentially looks like a miniature laptop with a minikeyboard and a 1.5-by-2-inch color screen, along with GSM phone capability.

6. Sony recently announced its second-generation Clie device, the PEG N710C. The device will be able to play digital audio and video files and will have a 320-by-320-pixel color screen. The Clie will use version 3.5.2S of the Palm OS, which supports USB. The device will also use a 33MHz Motorola Dragonball VZ processor and will come with 8MB of memory. A lithium-ion polymer battery will power the Clie. The handheld will weigh 5.7 ounces and measure 2.88 inches wide, 4.75 inches tall and 0.69 inch thick. The device is being positioned by Sony as an entertainment gadget.

Software defined architecture for a mobile terminal is another area of research advancing forward. With the success of this approach, mobile users can download the latest version of their terminal software when available. This approach will extend the life of the user access device and make the replacement of the device unnecessary every couple of years.

Future Direction

New user needs are uncovered with new development in technology. 3D image technology areas of digital photography, 3D-image conversion and compact image rendering have seen a lot of progress during the past few years. Intel recently released is Pentium-4 processor chip with enhanced 3D functionality to accommodate complex Web graphics. These new capabilities will provide new dimensions for infotainment presentation and personalization of the mobile access device.

From a business and consumer standpoint, Web-enabled mobile 3D information is empowering. It puts the learning control in the hands of the user and creates an immersive experience like no other. With the right 3D technology, online consumers can, in effect, pick a product up off the “shelf”, look at it closely, turn it over, measure its dimensions and, if desired, engage moving parts to view the product’s full functionality.

The next generation, 3G, networks are on the horizon. A number of high-speed data rates will be available over 3G in order to offer high quality multimedia experience to the user. While 3G network build-out is in progress, research has been intensified on a more capability-rich 4G network. Continuous improvements in microprocessor chips, memory chips and over-the-air interface technology will result in more cost-effective network designs.

Mobile network service providers have to pay attention to the following business issues for making their services attractive to more subscribers:

- End-to-end security
- End-to-end security
- Privacy of user information and transactions
- Quality of service
- Service charging options
- Service offerings based on user needs
- Personalization services

Mobile infotainment is a very young segment of the wireless industry. We have just seen the beginning of a much larger emerging market. As the mobile Internet applications continue to evolve, the ways it can change our lives continue to grow.

Acronyms

3D – Three dimensional imaging
2G – Second generation wireless network
3G – Third generation wireless network
4G – Fourth generation wireless network
GPS – Global Positioning System
GSM – Global System for Mobile
HTML – Hyper Text Mark Up Language
PDA – Personal Digital Assistant
PIM – Personal Information Management
SMS – Short Message Service
UMTS – Universal Mobile Telephone System
UMTSF – UMTS Forum
WAP – Wireless Application Protocol

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"Choose to look for the positive. In everything you can find it. Eventually.”
SHARP DISPLAYS FOR MOBILES

A tiny screen on your cell phone or personal digital assistant (PDA) displays a message or a picture that is captured by the eyes and transmitted to the brain. The quality of this human-machine interface defines the usability experience of seeking multimedia information and entertainment via a mobile device.

Currently there are a number of cell phones on the market with low quality, backlit and monochrome screens. More recently, a number of PDA manufacturers have shipped devices with sharp color displays. The cost of the display screen is an important factor in the total price of a mobile device. A comparison of three different display screen costs is provided in Figure 1.

![Figure 1. A Comparison of Display Screen Costs](source: DisplaySearch)

Screen technology is an active area of research and investigation and following two technological developments will influence the design of new mobile and other screen-based devices:

- Organic Light Emitting Diodes (OLED)
- Electronic Ink

Organic Liquid Crystal Display (OLED)

Unlike power-hungry liquid crystal displays (LCDs), OLED displays are brighter, sharper, power-friendly, and offer viewing angles of up to 170 degrees. An OLED display is built from a stack of ultra thin diodes. The resulting display is dramatically sharper, brighter, and more vivid than anything possible with conventional LCD phone screens. OLED screens are also self-illuminating, eliminating the need for a backlight. This feature reduces the power requirement for an OLED screen substantially below those of a LCD screen.

The following points summarize the current status of OLED technology development and future direction:

- Working with different standards, Kodak, Cambridge Display Technology, and Universal Display Corp. are leading the OLED charge.
- Tohoku Pioneer was the first company to use an OLED display, in its car radio. Motorola followed with a passive matrix OLED in its Timeport mobile phone, a CDMA phone supported by Verizon.
- A number of consumer electronic manufacturers such as Philips, DuPont, Sanyo, Toshiba and others have now signed on to make products with OLED displays.
- Commercial products are due on the market by the end of 2002. The users can expect first-generation OLED products to hit the market at premium prices.
- OLED displays will find applications in digital cameras, small televisions and other small form factor devices.

Electronic Ink

Electronic Ink is another promising technology for screens on mobile devices. It is many times brighter than a LCD screen and draws an order of magnitude less power. The concept of Electronic Ink follows the logic that displays should look very much like print on paper and behave like print on paper. That means the display should be flexible like paper.

Electronic Ink is made up of millions of tiny capsules containing white particles suspended in a dark dye. An electric field causes the particles to move to one side of the capsule or the other, creating either a dark spot or a white spot. An Electronic Ink screen does not require a backlight and it is persistent. The persistent feature means that it does not require a constant supply of electric current to maintain a picture and is thus power-friendly.

The following points summarize the current status of Electronic Ink technology development and future direction:

- E Ink, a US based company, has developed the Electronic Ink technology.
- E Ink has made an agreement with Philips. According to this agreement, E Ink will supply the ink-coated laminate and Philips will integrate the laminate into electronics and sell the display modules to device manufacturers.
- Current prototype versions of Electronic Ink technology are strictly monochrome. Commercial products are expected to be available by 2003. Color displays are under investigation.
- Quality yield and performance under mass production of these displays are not known as yet.
- The success of this technology can result in higher readability on thinner and lighter devices such as PDAs, Pocket PCs and Electronic Books.

A display is an important but only one part of a mobile device design. A number of other advances are taking place in the processor, memory, battery, operating system, and browser technology. Collectively these advances will create a new family of harmonized and user-friendly mobile devices.
**DEDICATED INTERNET ACCESS PACKAGES & MUX PACKS**

By Wendy Riemer,  
Associate Director-Integrated Solutions

**Dedicated Internet Access Packages**  
Everything you need for high-performance Internet access from industry leaders - SBC and Cisco. Complete, high-performance, reliable solutions with simple monthly prices starting at just $999.

The Dedicated Internet Access packages bundle SBC’s point-to-point, frame relay and/or ATM Internet access with Cisco’s industry-leading routers. The service is designed to meet low, medium and high bandwidth needs and is tailored to fit a range of e-business applications, such as joint intranets, enterprise resources planning and e-commerce capabilities. The network is setup to meet the most stringent requirements for reliability, availability and security for businesses with mission-critical applications.

SBC offers a solution that reduces downtime, minimizes over-subscription, maximizes network throughput, and ensures network integrity for your customers’ business applications

- **Network Reliability, Capacity and Performance** – SBC owns and operates the transport network. SBC also offers a dedicated connection that is “always on” for greater performance and reliability
- **Proactive network monitoring and fault resolution** – SBC’s Network Operations Centers (NOCs) provide proactive network monitoring and fault resolution 24 hours a day, 7 days a week
- **Installation Coordination** – SBC provides installation and project coordination to ensure a seamless, successful installation. SBC ensures everything works with a quality control setup before the package even arrives at your customer’s doorstep
- **Technical Assistance** – SBC offers 24/7 technical and maintenance assistance for all components of the packages, Internet connectivity, network and firewall monitoring, and management and domain registration

The packages are optimized to meet your customers’ individual needs. For more information about these bundled solutions, such as the T1 Frame Relay package for $999, please contact your Liaison Manager.

**MUX Packs**  
Streamline your customer networks with the new SBC Mux Packs.  

The Mux Pack combines the most requested equipment features into a single package with installation and maintenance.

SBC Mux Packs provide the customer’s network with the equipment, installation and maintenance services they need to take advantage of bandwidth resources. The components include:

- Equipment
- Project Coordination
- Installation
- 24 X 7 X 4 Maintenance
- Monthly leasing options

The Mux Pack Solution offers:

- **Simplicity**: The process of connecting to the SBC network is extremely simplified with a single point of contact to complete the customer’s Data Networking transport needs.
- **Single Point of Contact**: An increasing number of companies are understanding the value of having a single supplier take care of their data and voice networks as well as their communications needs to the outside world. With the SBC Mux Pack solution, there is a responsible party who can quickly act to address any configuration or maintenance issue that may arise.
- **Reliability**: High-quality, reliable products from SBC to help eliminate network problems. The Mux Pack is available with redundant features to ensure back-up capabilities.
- **Competitive**: The Mux Pack is competitively priced, offering your customer a simple package price and the option of monthly leasing. Pricing starts at $5,400.

For more information, contact your Liaison Manager.

**US ARMY SELECTS SBC TO IMPLEMENT GIGABIT ETHERNET DATA NETWORK**  

The US Army has selected SBC’s Federal Solutions Group, with support from Southwestern Bell, to implement a Gigabit Ethernet data network at Ft. Eustis, Va. The $7.3 million project will be completed in 24 months and is part of a modernization effort to deliver the high-speed network connectivity necessary to support the Army’s growing arsenal of high performance applications.

"When SBC’s work is complete, the Army at Ft. Eustis will have a fault-tolerant, state-of-the-art, high-speed Gigabit Ethnet network based on a technical solution that meets the Army’s highest performance standards," said Doug Dangremond, executive director, SBC Federal Solutions. Last year, SBC completed an upgrade at Ft. Polk, La.
WEB WATCH

There’s a handy web site that you all should know about: www.iec.org

This is the web site of the International Engineering Consortium (IEC). Their name is a bit misleading, as they’re not a generic engineering group. This is the same IEC that takes part in promoting telecom industry trade shows. It deals only with telecommunications and network-related topics and issues. This site has several features, but the very best aspect is the on-line tutorials that are housed there. The web page was just redesigned. When you go there, click on "On-Line Education". You can then browse for "New Tutorials" or go to "All". If you select "All", you’ll be shown as list of dozens of on-line tutorials on a mind boggling array of topics that deal with telecom, networking and computing. Each tutorial is written by a vendor, but the good part is they don’t hype their own product (hard to believe, eh?). The best part of the tutorials is that they’re compact--usually not over 15 pages long. Most, if not all of them, also speak to the reader in plain English. You can even do a search for a specific topic to see what they have on hand. Adobe Acrobat Reader is required to peruse the tutorials. The best thing to do is print out the tutorials and read them in your spare time (i.e. riding the train to/from work; during lunch; before bed). That way you increase the flexibility of when you expand your knowledge base, and you save your eyes some wear and tear at the same time. Surf and enjoy!!

– Paul Bedell

CIO MAGAZINE HONORS SBC TECH OF FUTURE PROGRAM

CIO Magazine recently recognized SBC’s Technician of the Future Program as one of the World’s most innovative business initiatives for its efforts to equip technicians with state-of-the-art technology and providing access to increased training and resources. The program is transforming every aspect of installation and repair, allowing SBC to provide improved Customer Service. “It equips our techs with superior technology tools, allowing our customers to enjoy the benefits of increased productivity and service quality,” said Stan Sigman, group president and chief operating officer of SBC.

Technicians throughout SBC receive Intelligent Field Devices--wireless laptops that integrate detailed and localized software-based cable maps, diagnostics/line testing, access to service call info and detailed product information. It allows techs to run 15 tests in 15 seconds, replacing at least six pieces of equipment. They have access to electronic reference materials and SBC’s new craft access system, which simplifies admin work.

“In order to survive in the competitive business world, companies rely on innovative ideas and development of those ideas into sound business practices,” said Abbie Lundberg, editor-in-chief of CIO Magazine. “SBC has done just that and is being recognized for its ingenuity and success.”

FLEX YOUR POWER

Here’s the CPUC’s website for Energy Conservation and Helpful Tips:
http://www.flexyourpower.ca.gov/state/fyp/fyp_home.page.jsp

Flex your Power! It only takes a little energy to save a lot!

California is facing a serious energy challenge. Working together, we can meet this challenge. Please spend a little time reviewing the information on this site, and join the millions of other Californians conserving energy.

The Features are:
• Energy Saving Tips
  Get energy saving tips for all sectors (Commercial, Industrial, Governmental, Agricultural, and Residential).
• Financial Incentives
  Obtain information on rebates, the 20/20 Rebate Program, and other financial incentives for energy conservation in your home or office.
• People and organizations across the state are making a commitment to save energy.... join them!
• California’s Energy Challenge
  California Energy Information Website - See Governor Davis’ orders, press releases, and actions on electricity stabilization, conservation and generation.
• Consumer Energy Center
  Click here to obtain the information you need to make the right choices for meeting the energy challenge.

– Spotted by Lowayne Shieh

(If you come across a particularly helpful Web site, please let us know about it so we may consider it for an upcoming issue of Update. Thanks.)

MOVING YOUR CINGULAR WIRELESS SERVICE? ONE CALL CAN DO IT ALL

The Cingular Relocation Team is now removing the hassle of transferring your wireless service. If you’re a Cingular customer moving from one Cingular service area to another, this team will assist you in the selection of an appropriate calling plan, features and when necessary, new wireless phones or accessories. For further details, call 1-866-999-1166 on Monday through Friday between 8am to 8pm EST.
This book has many positive aspects. First, it's condensed. The author doesn't try to take on too many topics all in one book. Second, he writes at a basic level, leaving most (if not all) of the industry jargon out of the book. If he does spew an acronym or two, he takes the time to not only define it, but to explain it as well. Third, this author's explanation of switching and routing is one of the best I've ever read, and I've read a lot of them.

The Book Has Four Parts

The First Part addresses the optical networking marketplace and how more and more network intelligence is being moved from the core to the edge. Shepard then discusses how local providers are dealing with this shift. The author then delves into a review of optical networking applications, which begins with an overview of SONET and SDH. Switching and routing are covered next in Part One, then ring architectures in the optical domain. Part One then wraps it all together by defining amplification and regeneration, and the difference(s) between their functions.

Part Two covers the migration from copper to glass, and the basics of optical transmission. Fiber manufacturing is covered, along with the different ways that the fiber itself changes the signals as they are transported down the glass. The different types of optical fiber are then discussed, and the attendant capabilities of all of them (i.e. single mode versus multi-mode).

Part Three reviews corollary technologies such as inside versus outside installations; cable installation options; submarine cables; and a small section on free-space optics. Shepard then moves into a well-written definition of dense wavelength division multiplexing (DWDM) technology. This section is concluded by summarizing the differences between optical switching and optical routing.

Part Four brings it all together by discussing "Solutions and Applications". It starts by listing the "players in the network game". There are some fascinating items in this section that detail what different manufacturers are doing with the technology available to them, including routing of optical signals using bubbles and holograms. The author then speaks to the new network paradigm and how the PSTN is being reinvented, and how Internet Protocol (v6) will play a key role in future optical networks.

A 15-page glossary is inserted at the end of the book, providing a great reference tool. There is also a "Common Industry Acronym" section following the glossary.
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• Optical Networking
• Security
• E-learning: How to Succeed & Fail
• Long Distance
• Area Code Update
• Pacific Bell/SBC News

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Here’s what you’ll need to experience the event remotely:
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• Internet Connection of at least 28,8 kbps or higher
• Internet Explorer or Netscape Navigator 4.0 or higher

You’ll be able to type in questions for the speakers.
Thanks, in advance, for becoming a “Streamer.”

– CVSG TV

A Special Thank You Very Much

The Pacific Bell Consultant/Vendor Sales Group would like to Thank all of you readers who participate in our Live Broadcasts. We’re reaching record numbers of viewers thanks to the incredible efforts of our CVSG TV Team. We’re the First at Pacific Bell/SBC to introduce Streaming Media to an External Audience. It wouldn’t be possible without the outstanding creativity and dedication of many. We’d particularly like to Thank SBC Distance Learning, SBC’s 1-800-CONFERENCE, Pacific Bell’s Advanced Enterprise Solutions and Akamai (webcasting co.). More specifically, Thanks to Mary Grim, James Eldredge, Dan Summa, Heidi Dold, Bill Pivrotto, Evelyn Lee, Ellen Schurecht, Kristin Wuest, Toni Warbla, Sharon Cohn, Michael Brennan, Sibyl Clark and the #1 Rated Consultant Liaison Program in the United States* – Kari, Tom, Lowayne, Bree & Eric. You all act as if what you do makes a difference. It does and you do!

– Craig

*According to The Brookside Group’s Survey of more than 4,600 telecommunications consultants throughout the country

CALIFORNIA SMALL BUSINESS ROUNDTABLE HONORS PACIFIC BELL

The California Small Business Roundtable selected Pacific Bell to receive the program’s first “Small Business Friendly” certification. The program features a detailed review process and “Seal of Approval” for large businesses and vendors that offer exemplary service to the small business community. Pacific Bell was granted the prestigious award for its advocacy, practices, services and commitment to small business. “One of our top priorities is to ensure our relationship with small business customers is collaborative in nature,” said Thom Matson, vice president of business services at Pacific Bell.

Thank you for reading Update.