

The US Telecommunications Industry Profile
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Index

	<u>Page</u>
Index	2
Executive Summary	3
Overview	4
Local Exchange Market	
Special Subsectors	
Wireless	
Fiber optics	
Recent Changes in the market	6
Telecommunications Act of 1996	
Growth of the internet	
Convergence of voice and data	
Market Forecast / Predictions	7
Sector forecast	
Rise of the all in one communications company	
Technologies to Watch	9
Optic Technologies	
Voice over Internet Protocol	
Developing markets for telecom equipment	11
Distribution Channels	12
Appendices	
Major IT Distributors	13
Telecom VARS – Western US	14
Trade and Industry Magazines /Websites	15
National Telecommunications Associations	17
Major Telecommunications Conferences & Expositions	20
Other resources for information	24
Glossary	25
Bibliography	28

For purposes of this report the telecommunications industry is defined as the movement of voice, video and data over distances long or short. It is comprised of local exchange, wireless service of all types, satellite broadcast, fiber optics, copper wire, undersea and coaxial cable, the internet, microwave, private networks, long distance service and video conferencing. Although the sector of telecommunications services is addressed in this report the emphasis in analysis and data is on the telecommunications industry as a market for equipment, software and services.

Executive Summary

The telecommunications industry in the past two years has led the U.S. economy in growth with a rate of twice the national average. Profound changes underway in both the structure of the market and the technologies used to provide communications services will challenge the ability of telecommunications providers to maintain this level of growth.

- Purchases of telecommunications equipment and services totaled \$517.6 billion in 1999 up 11.4 percent over 1998.
- Future spending on fiber optics equipment is projected to rise to more than \$28 billion by 2003.
- In 1999 spending on wireless communications equipment and services had already risen 17.4% over the previous year to \$57.7 billion and by 2003 total spending on wireless communications is projected to reach \$86.3 billion.
- Also, due to the increasing use of fax, internet and data networks, more than 30 million new phone lines were added in the five years between 1995 and 2000.
- By 2005, data and internet traffic are expected to make up 90% of all telecom network traffic.

The Telecommunications Act of 1996 has added competition to the local exchange carrier market, opening the door for new entrants (CLECs) to the market. CLECs have become the driving force for innovation in the industry.

By the end of 1999, over 200 million people were on-line worldwide; 118 million of them in the US. Worldwide users are expected reach 500 million in the next few years. With increasing use of new technologies that digitally transmit packets of data rather than analog signals, it no longer matters whether the information being transmitted is voice or data. Because of this convergence of voice and data traffic, telephony can be provided by any company including ISPs, ASPs and cable providers. Thereby increasing the competition for customers.

Major trends:

- A continued growth in wireless communications
- A convergence of wireless phones and the internet – creation of internet appliances
- Continued merger and acquisitions: Bundling of cable TV, telephone, internet and wireless services; and changing of pricing models
- Introduction of the all in one communications company or “commco”
- An expansion of broadband access options and fiber optic technologies
- An expansion of internet based telephony

Although telecommunications providers themselves offer a growing market for equipment and services, even larger markets are offered if equipment vendors look to corporate markets. The key to success for telecom equipment manufacturers targeting this market will be the development of distribution channels and the subsequent integration of equipment and software at the end user site.

Overview of current market

The telecommunications industry in the U.S. is in a period of profound transformation. Changes in customer expectations, infrastructure upgrades, increased competition from newcomers, traditional rivals and consolidation has led to innovation in technology, business models and service offerings. The market for equipment and services is larger than it has ever been, not just because of the phenomenal growth of investments in traditional infrastructure such as cabling and LEC (local exchange carrier) networks but because the very definition of the industry is changing as traditional voice telephone services expand to include broadband, wireless and internet applications. As data and voice communications merge, new opportunities for equipment and technology will develop.

In 1999 there were approximately 1,500 companies in the US providing local telephone services. These companies, often referred to as local exchange carriers (LEC), range in size from rural cooperatives serving fewer than 100 customers to large holding companies serving millions of telephone lines. Of these carriers 52 reported revenues that account for more than 90% of the nation's telephone services. To reach the international markets for telecommunications there are an additional 700 firms who buy access from local telephone companies in order to provide long distance service. In the newer telecom sectors, there exist data network service providers, wireless service providers and a new category of broadband service providers. All of which make up the telecommunications industry and the market for telecommunications equipment in the United States.

Purchases of telecommunications equipment and services totaled \$517.6 billion in 1999 up 11.4 percent over 1998. The industry has grown more than twice as fast as the rest of the economy overall in recent years and represents a healthy 5.6 % of U.S. domestic product. Spending on telecom equipment alone (including enterprise voice and data communications equipment, CTI software and hardware) in 1999 was approximately \$135 billion. Large capital investments in telecommunications infrastructure and the proliferation of e-commerce and internet based communications systems have fueled continuous growth in the industry, a trend expected to continue through the next 5 years.

With such leading international equipment vendors as Cisco Systems, Lucent Technologies and Dialogic based in the U.S., the United States is both an importer and exporter of telecommunications equipment. Main exports emphasize telephonic apparatus and parts, whereas net imports include more consumer oriented telecommunications products, such as cellular phones. U.S. exports of telecommunications equipment in 1999 totaled more than \$22.5 billion as the growth in overseas telecom markets (especially Asia) outpaced that of the US. The largest sources of imported telecom equipment into the U.S. are Canada (\$4.7 billion) and Mexico (\$4.2 billion) and in 1999 imports from both countries increased more than 40% overall. Of the imports from Canada, 59% (\$2.77 billion \$US) of the total originated in the province of Quebec.

The telecommunications services industry (which includes local and long distance calling, wireless and data communications services) reported \$269 billion in revenues for 1999 – an increase of 9% over 1998. Specific areas of note:

- wireless revenues jumped more than 30%, from \$37 billion to \$48 billion.
- competitive local telephone companies continued to grow rapidly, with revenues increasing to more than \$5 billion, up over 60% over 1998 and accounting for almost 5% of the \$112 billion of local service revenues.
- toll service revenues increased only slightly – from \$105 billion to \$108 billion – reflecting sharp reductions in the price of international calling as the average price per minute for international calls fell from \$0.68 to \$0.56. due to the use of voice over Internet Protocol technology.
- due to the increasing use of fax, internet and data networks, more than 30 million new phone lines were added in the five years between 1995 and 2000 at a cost of over \$55 billion.

One of the highest growth sub-sectors within the telecommunications industry has been in the demand for broadband services. In order to respond to this demand, investment in fiber optics technology tripled from \$4.1 billion in 1990 to \$14.6 billion in 1999. **Future spending on fiber optics equipment is projected to rise to more than \$28 billion by 2003.** However, despite investments in extensive fiber optic networks by broadband traders such as Williams Communications, Enron, Qwest and Global Crossing, copper wire still linked 82% of customers to the first point of switching in 1998. Thus the problem of bringing broadband access the “last mile” to the consumer continues to be an issue in the short term.

Fiber Optic Networks (miles of fiber optic cable)

Global Crossing	70,000 (for overseas access)
Williams Communications	33,000 (by 2001)
Qwest Communications	24,000
Enron	20,000

Another sub-sector that has experienced tremendous growth has been that of wireless communications. As cellular providers move toward 3rd Generation standards, internet enabled devices, and new business models, this market is set to explode. In 1999 spending on wireless communications equipment and services had already risen 17.4% over the previous year to \$57.7 billion. By 2003 total spending on wireless communications is projected to reach \$86.3 billion. Wireless communications services are growing apace and totaled \$45.2 billion in 1999, an increase of \$7.7 billion over 1998.

Recent Changes in the Market

Some of the recent challenges for the telecommunications industry in the US have come about as a result of regulatory changes decreed in the Telecommunications Act of 1996. Previous to this legislation, access to local telephone networks and services had been controlled in the major metropolitan areas by the Regional Bell Operating Companies (RBOC), and in less populous rural areas by smaller local exchange carriers. A structure formed after the mandated breakup of the AT&T / Ma Bell monopoly that occurred in 1984.

The Telecommunications Act of 1996 mandated that in order to have access to long distance markets for telephone services, local access providers must allow competition in their local markets. In order to actively promote this competition, a new type of carrier was created called a competitive local exchange carrier (CLEC). All carriers existing before this act were dubbed incumbent local exchange carriers (ILEC.)

Despite their limited market share (less than 5% of all local telephone services), the importance of this new type carrier should not be underestimated. **CLECs have become the driving force for innovation in the industry.** Local service competitors are deploying fiber in their networks at a faster rate than ILECs. New competitors increased their amount of fiber in place almost 5 fold from the end of 1995 to the end of 1998 and now have at least 16% of the total fiber optic system capacity that is potentially available to carry calls within local markets. They are offering new technologies such as DSL and voice over internet to end users and adapting technology to specific applications needed by businesses. Their entrance into the market has put pressure on the ILECs to implement similar technologies and services in order to remain competitive.

One of the greatest driving forces behind the rapid expansion of the telecommunications industry and the sales of telecommunications equipment and services has been the explosive growth of data and internet traffic. In mid 1998, the volume of data and internet traffic combined surpassed that of voice traffic for the very first time. **By 2005, data and internet traffic are expected to make up 90% of all network traffic.** As traditional telcos have been slow to respond to the needs of this explosive market, opportunities for new competitors have developed.

With new technologies using digital packets of data rather than analog signals, it no longer matters whether the packets being transmitted are voice or data. **Because of this convergence of voice and data, telephony can be provided by any company;** giving an incentive to data carriers (ISPs, cable providers, etc.) to move into markets traditionally controlled by RBOCs. In fact almost half of the 500 CLECs emerging in the past 3 years started out as ISPs (internet service providers.) Vendors of telecom equipment actively promote this type of crossover, as they stand to make millions selling equipment to ISPs that go into facilities based telecom. By becoming CLECs, ISPs can cut costs, benefit from regulatory anomalies and fully develop broadband opportunities to grow revenue.

With the potential of the Internet, VPNs (virtual private networks) and intranets only beginning to be exploited, the market for telecom equipment to handle digital traffic has

only just begun. By the end of 1999, over 200 million people were on-line worldwide; 118 million of them in the US. Worldwide users are expected to reach 500 million in the next few years. Competition for market share in this expanding global marketplace has made mergers, consolidation, aggressive marketing, re-positioning, and new business models necessary in today's internet access and service market.

In recent years, the merger of LECs, cable providers, long distance companies, data networks and ISPs have made headlines over and over; MCI Worldcom, Sprint Mindspring/ Earthlink, AT&T / MediaOne. There were 625 telecommunications mergers and acquisitions worldwide in 1998, up 19 percent from 1997. And the total value of those deals increased by \$169.4 billion, up 197% from the previous year. Where outright mergers have been avoided, there have been partnerships that effectively blur the lines between industries. The reasons for these partnerships can be stated simply as access to capital and competition for customers.

In this increasingly competitive telecom market, product cycles will shrink and early to market products will have the advantage. The pressure to be first to market, along with the accelerating convergence of voice and data traffic, will continue to drive telecom equipment merger and acquisition activity, as large companies find that their in-house product development can't match the breakneck pace of the sector. As long as this pressure remains, vendors with strong (or promising) technology will have opportunities in the market.

Market forecast / Predictions

Major trends to watch:

- A continued growth in wireless communications
- A convergence of wireless phones and the internet – creation of internet appliances
- Pricing models for internet services and connections will change
- Continued mergers and acquisitions: Bundling of cable TV, telephone, internet and wireless services
- An expansion of broadband access options and fiber optic networks
- An expansion of internet based telephony

Spending on wireless communications services – including cellular, broadband personal, communications services (PCS), specialized mobile radio (SMR), paging, Mobile satellite, mobile data and local multipoint distribution systems (LMDS) – at \$45.2 billion in 1999, is expected to reach \$75.6 billion annually by 2003. The PCS market alone doubled in 1999 – reaching 13.5 million subscribers and revenues of \$7.4 billion. An amount expected to triple within 4 years to \$21.3 billion. The market for mobile data services (such as cellular digital packet data CDPD) continued to have double digit growth in 1999.

Worldwide mobile satellite service revenues rose 87.5 percent to \$4.5 billion in 1999. By 2003, this segment will reach \$19 billion. The US market has lagged worldwide growth in the use of wireless communications due to incompatible standards and infrastructure

and billing differences. However, as these issues are addressed wireless service revenues should rise quickly. Third generation technology (3G), which provides high-speed connectivity (offering speeds of up to 6 ½ times faster than a standard telephone connection), will further bolster demand for mobile data in the next decade.

Developments in wireless technology, such as videoconference capable 3G broadband wireless technology and high speed data transmission could dramatically accelerate the use of wireless communications in the corporate environment and considerably enhance the potential of this market.

The market for wireless telephone service is converging more and more with the market for internet services and appliances. As worldwide users of the internet approach 500 million, more and more people will be constantly connected to the internet and businesses will be forced to focus on their web presence in order to remain competitive. New markets will develop for personal and location specific content and within 5 years one half of all e-commerce transactions by consumers are expected to be made via wireless methods using cell phones, pagers, wireless-modem-equipped portable computers and Palm Pilot-style devices. In 2001 alone more than 18.5 million of these internet appliances are expected to be sold.

The market for internet access and service will be characterized by mergers, consolidation, aggressive marketing, re-positioning, and new business models. As prices fall due to competition and open standards, just as they did in the personal computer market, connectivity alone will no longer be a competitive advantage. Companies are already offering free or heavily discounted PCs with the purchase of multi-year internet connection contracts. Net Zero, an ISP with the third largest customer base in the U.S., offers free internet access funded by revenues from advertising. New models that take advantage of the PC as a tool for delivery of advertising, entertainment and merchandising will continue to develop and content or added value services will be the only justification for end user fees.

All in one communications companies

As distinctions between service offerings, service providers, and their underlying networks become less important due to the development of new technologies and market deregulation, telecommunications providers are battling for growth in their customer bases. In order to acquire more customers and grow overall revenues, they must offer more services at a lower price to remain competitive. A trend that has developed to accomplish this is telecom “bundling”; the practice of offering a bundle of services for one price. A customer may get an internet connection, local and long distance service as well as cable TV all from the same company. (AOL – Time Warner, MCI Worldcom.) These integrated communications services that grow out of new multi-purpose high-bandwidth networks mark the birth of the all-in-one communications service company or commco.

Commcos share three traits:

- a revenue stream that emphasizes bundled services (simple connectivity is not where the money is)

- the goal of a wholly owned end to end network, that will eliminate the access fees companies must pay to other carriers and facilitate a high quality service across every segment
- investment in high bandwidth technologies for the backbones

The ILECs and CLECs that are able to become commcos and develop these traits through acquisitions or partnerships will be the ones to succeed in the new marketplace and **equipment vendors who are able to facilitate new services for these commcos will succeed along with them.** Technologies that facilitate this model will flourish. As an example within the market for wireless services, carriers could use voice recognition and text-to-speech technologies to provide consumers with messaging applications that make voice mail and email indistinguishable.

“It’s clear that unless a carrier by the end of the decade gets more than 50% of its revenue from nontraditional revenue streams, it won’t have a financially viable business model to take into the next decade.”

Ken McGee, VP of The Gartner Group.

In the latter half of 2000, the US stock market has experienced a major slow down which has had a significant affect on technology markets. Newly public companies and ones in the process of launching IPOs in order to raise investment financing have been hit hard. Many newly formed and expanding CLECs have become vistims of this economic downturn and seen their company’s valuations fall rapidly. Some companies will find opportunities to merge or sell out, others will fail. Except for those allied with large, well financed partners, this will lead to a credit crisis. Already major telecommunications equipment makers such as Nortel and Lucent have extended larger than normal amounts of credit in order to fuel the continued purchase of equipment. If these companies succeed in their endeavors to grow past this market slowdown, this will be viewed as a good investment by the large equipment companies. If, however, the market continues its slowdown and these companies begin to fail, it could have serious repercussions for the entire industry.

Technologies to watch

As the technologies that operate voice based systems converge with those of data, the immigration from circuit switched networks to Internet Protocol networks will continue. **IDC (consulting firm) predicts that by 2002, 20 – 25% of voice traffic will be carried on IP (VoIP) networks** rather than traditional telephone networks. In order to deliver high bandwidth to enterprise class customers, Metro area service providers are deploying optical technologies previously used primarily in long distance domestic and international networks.

Next generation telecommunications systems networks will transparently manage an increasing amount of traffic as data packets using IP across fiber optic wires equipped

with DWDM (dense wavelength division multiplexing) which will split fiber optics into 40 channels instead of four and across traditional copper wires, which these days can carry almost 20 times more traffic thanks to technologies like asymmetric digital subscriber lines (ADSL). Advanced regeneration systems will be able to send a message thousands of miles along the network instead of only 125 miles on each leg, causing the cost of enabling a single long distance call to drop to a fraction of a cent.

Communications Industry Researchers of Charlottesville, NC, finds that CLECs (who are upgrading faster than ILECs) and other metropolitan service providers will spend nearly \$1 billion on optical networking systems designed specifically to upgrade and extend their metro area networks this year. That figure is expected to jump to \$2.8 billion by 2004. Dell'Oro Group (a research group from Portola Valley, CA) shows DWDM orders alone from metropolitan area service providers grew 40% during the second quarter to \$80.9 million. Another technology that presents potential is managed wavelength services, which allow for on-demand capacity allocation by subdividing bandwidth according to the particular wavelength of signals transmitted along a fiber optic network. This technology will allow carriers to sell bandwidth associated with specific colors of light along their network. Many experts believe that optical wavelengths will be the building blocks of next generational service provider networks

Optics companies to watch:

Alidian Networks (CA)	Appian Communications (MA)
Astral Point Communications (MA)	Atmosphere Networks (CA)
Centerpoint Broadband Tech. (CA)	Chromatis Networks (MD)
Corvis (MD)	Cyras Systems (CA)
Kestrel Solutions (CA)	LuxN (CA)
Optical Networks (CA)	New Access Communications (CA)
Qeyton Systems (Sweden)	Quantum Bridge Comm (MA)
Qtera (FL)	Siara Systems (CA)
SilkRoad (CA)	Tellium (NJ)
Tenor Networks (MA)	

Just as digitized voice signals are carried across the public network by telecom providers, so soon will internet consumers be able to make regular phone calls from their computers and send them via internet based telephony. The cost savings will be substantial. It will be possible for end users to dial long distance phone calls at little or no charge; to arrange face to face video conferences with little effort. Current technologies to enable this are not yet at the quality level of existing telephony systems but as phone lines and technology improve this market will grow.

Voice over Internet companies to watch:

Net2Phone (NJ)	AOL/ Time Warner (VA)
PhoneFree.com (NY)	Dialpad.com (CA)
Zeroplus.com (IN)	DeltaThree.com (NY)
ibasis, Inc. (MA)	ITXC Corp. (NJ)

Visitalk.com (AZ)

New developments in web enabled appliances also offer tremendous market potential. The collaborative creation of Bluetooth (a radio chip with specialized software that enables devices to communicate with each other over a short range radio link,) by some of information technology's leading companies including 3Com, Ericsson, IBM, Intel, Lucent, Microsoft, Motorola, Nokia and Toshiba may be the first commercially viable system for mobile communication without wires and a truly wireless office. Low earth orbiting satellites (LEO) and geosynchronous satellites are being developed to address limitations set by current wired infrastructure and wireless standards; such as "last mile" telecom services for hard to reach areas; worldwide paging and single number cellular, and vehicle tracking. As technologies are used to solve current problems and offer new services, the market for telecommunications equipment will continue to expand.

Developing Markets for telecom equipment

Although telecommunications providers themselves offer a growing market for equipment and services, even larger markets are offered if one looks to the corporate markets. Companies are anxious to implement cost and labor saving devices and in the current economy many of them have funding available. Market applications where telecom and data communications converge offer opportunities including: all areas of e-commerce, document sharing within an intranet or WAN, and VPNs linking suppliers, manufacturers, distribution channels and end users.

The key to success for telecom equipment manufacturers targeting any of these markets will be the development of distribution channels and the subsequent integration of equipment and software at the end user site. The e-services market, which provides much of these integration services, is predicted to reach \$64.8 billion by 2003 (now at \$19.6 billion.) Originally thought of as web site developers and IT consultants, they have become providers of e-business services, a market for that matured and now demands more diverse knowledge and skills, including the ability to link back-end business processes with front end web applications.

ISDN, cable modem and DSL technologies, although not new technologies, have been repurposed in order to address new corporate markets. They can be used to increase the speeds of transmission over traditional copper telephone wire allowing for high resolution video conferencing, video on demand, games, educational services and recorded music. Because RBOCs have been slow to implement new technologies that might compete with their existing high priced T1 and T3 lines, CLECs offering DSL services have developed a market for broadband data delivery to businesses. Many cable companies are joining the ranks of CLECs to offer these services and in some markets cable is considered more reliable and lower in cost than the local phone company. Insight (a consulting firm) predicts that by 2005 the US will have an installed base of 32 million cable modems, generating \$11.5 billion per year in revenue.

Even telephone services are becoming increasingly available via cable. Worldwide subscribers to voice over cable service will go from less than a million in 1999 to more

than 20 million in 2004; revenues will jump from \$293 million to more than \$7 billion. Where cable companies have sufficiently expanded their services, they can already offer unified telecommunications – video, data, voice – at a lower cost than a company would have to pay separately.

Distribution

Equipment vendors will not be the only ones to benefit from the growth of the various telecommunications sectors. Spending on services in support of voice and data equipment is projected to grow at a compound annual rate of 19.5% through 2003 to reach \$237.1 billion (more than double the projected \$112.6 billion equipment market) in 2003. Already, for enterprise end users, spending on this type of support equaled \$116.5 billion in 1999. With an increasing number of equipment choices available to consumers, ASPs, systems integrators, IT consultants and other E-services companies will be the ones to reap the benefits as end users do not want to have to be their own hardware and software integrators. Network service providers (NSP) and manufacturers will increasingly need to rely on distribution channels that offer professional integration and consultation capabilities.

Although most manufacturers of telecommunications equipment, software or services, maintain a direct sales force, they often reserve their own salespeople for working with major accounts or distribution partners. In order to fully address the market, they will use a combination of tactics, including: partnering with other equipment or software companies with established market shares; forming alliances with major consulting, e-services and systems integrators; establishing a value-added-reseller (VAR) network; and selling to distributors and through them to resellers.

A well thought out market plan should be organized before approaching any distributors, resellers or other partners. The plan should, at the very least, denote an understanding of the current technologies and competitors in the marketplace and address how the new product or technology compares with them. When presenting this information to potential partners, an emphasis should be made on the specific market potential for this product and the ways in which it, as well as your company's market development plans, can be used to increase market share and revenues for the partner as well as for your company. Price is not the major selling point.

Good resources for e-business consultants and value added reseller references include:

Industry Trade Associations (see appendix)

Industry or market specific events: conferences, exhibitions, etc.(see appendix)

Industry or market specific trade publications (a few examples) (see appendix)

Major Information Technology Distributors in the US

Anixter International Inc	Skokie, IL	*
Arrow N.A. Computer Products	Greenville, SC	*
D & H Distributing	Harrisburg, PA	
GE Access	Boulder, CO	
GTE Supply	Irving, TX	*
Hall-Mark Computer Products	Tempe, AZ	
Ingram Micro Inc.	Santa Ana, CA	*
Merisel	El Segundo, CA 90245	
Mini-Micro Supply	Santa Clara, CA 95054	
Pinacor	Tempe, AZ 85282	*
Savoir Technology Group	Campbell, CA 95008	
Sprint North Supply	New Century, KS 66031	*
Synnex Info. Technologies	Fremont, CA 94538	
Tech Data, Inc.	Clearwater, FL 34620	*
Westcon Group	Tarrytown, NY 10591	*
Wyle Electronics	Irvine, CA 92618	*

*special emphasis on telecom / networking products

E-Service Value Added Resellers for Telecom

(Top 12 per VARBusiness Magazine – VARBusiness 500)

Anderson Consulting (now Accenture Inc.)
 Compaq Services (TX)
 Hewlett Packard Consulting (CA)
 Science Applications International Corp. (SAIC) (CA)
 CompuCom Systems (TX)
 TRW Systems & Information Technology Group (CA)
 AT&T Solutions (GA)
 Integris (MA)
 Modis, Inc. (FL)
 Sun's Enterprise Services Group (CA)
 Alltel Information Services (AR)
 American Management Systems (VA)

Telecom Value Added Resellers (VARs) – Western USA

<u>Company</u>	<u>City</u>	<u>State</u>
Access Telecom	Culver City	CA
Accurate Telecom	Van Nuys	CA
ACI Communications	Calabasas	CA
Alert Communications Services	Los Angeles	CA
Alliance Systems	Plano	TX
Ameritel Inc.	Van Nuys	CA
Applied Voice Technology	Kirkland	WA
Arcom	Milpitas	CA
Bar Tech Telecom, Inc.	Irvine	CA
Calence	Tempe	AZ
Central Telecom	Mission Hills	CA
Com-Aid	Valencia	CA
CommWorld	Fort Collins	CO
Dencom Systems, Inc.	Santa Monica	CA
Digital Telecommunications Corp.	Sunland	CA
Extenda Communications Corp.	Van Nuys	CA
GBH, Inc.	Irvine	CA
ICF Communications Systems	Concord	CA
Integrated Data Concepts	Los Angeles	CA
L.A.-Tel Corp.	Los Angeles	CA
NEC Business Communications Systems	Culver City	CA
Netvoice Technologies, Corp.	Irving	TX
Nortel Communications Systems	San Ramon	CA
Pacific Bell Network Integration	Dublin	CA
Pacific Blue Micro	Newport Beach	CA
Pacific InfoSystems	Portland	OR
Phone Masters	Los Angeles	CA
Phoneby	Costa Mesa	CA
Phonezone.com	San Francisco	CA
Planetary Networks	Sunnyvale	CA
PTC Telecommunications Co., Inc.	San Dimas	CA
REAL Applications	Woodland Hills	CA
SBC Communications Inc	San Antonio	TX
Semaphore Corporation	Seattle	WA
Siemens Rolm Communications, Inc.	Santa Clara	CA
SJI Corporation	Seattle	WA
So-Cal Telco, Inc.	Los Angeles	CA
Standard Tel	Long Beach	CA
The Sygma Network	Lakewood	CO
Verity, Inc.	Sunnyvale	CA
Voice Information Systems	Santa Monica	CA
Voice International	Anaheim	CA

Trade and Industry Magazines

VARBusiness Magazine

CMP Media, Inc.

1 Jericho Plaza, Wing A

Jericho, NY 11753

Tel: (516) 533-6700

<http://www.varbusiness.com>

Sm@rtPartner Magazine

100 Quentin Roosevelt Blvd., Suite 400

Garden City, NY 11530

Tel: (516) 229-3723

<http://www.smartpartnermag.com>

InformationWeek Magazine

600 Community Drive

Manhasset, NY 11030

Tel: (516) 562-5898

<http://www.informationweek.com>

Computer Telephony Magazine

12 West 21 Street

New York, NY 10010

Tel: (212) 691-8215

<http://www.computertelephony.com>

CLEC World

Phone: 303-235-9510

Fax: 303-235-9502

<http://www.clecworld.com>

Boardwatch – ISP World

Phone: 303-235-9510

Toll-Free: 1-800-933-6038

Fax: 303-235-9502

<http://www.ispworld.com>

Telecommunications Magazine

685 Canton Street

Norwood, MA 02062

Tel (781) 769-9750

Fax (781) 762-9071

<http://www.telecommagazine.com>

Telephony

Intertec Publishing Corp. – A Primedia Company

One IBM Plaza, Suite 2300

Chicago, IL 60611

Tel: (312) 595-1080

<http://www.intenettelephony.com>

Communications Solutions

One Technology Plaza

Norwalk, CT 06854

Tel: (203) 852-6800

<http://www.tmcnet.com/comsol/>

CLEC Planet published by internet.com

<http://www.clec-planet.com/>

National Telecommunications Associations

Cellular Telecommunications Industry Association

Headquarters: 1250 Connecticut Ave., NW, Suite 800

Washington D.C. 20036

Tel: (202) 785-0081

Website: <http://www.wow-com.com>

Description: CTIA is a national trade organization for the wireless telecommunications industry. Their membership is composed of manufacturers of wireless technology and associated industries. They sponsor an annual tradeshow highlighting developments in wireless technology.

Communications Managers Association (CMA)

Headquarters: 1201 Mt. Kemble Ave.

Morristown, NJ 07960-6628

Tel: (973) 425-1700

Fax: (973) 425-0777

Website: <http://www.cma.org>

Description: The CMA was established to benefit member companies by encouraging excellence in telecommunications management; providing a forum for the evaluation of emerging technologies and their business applications; stimulating peer-to-peer relationships and the sharing of information; providing on-going insight into regulatory and tariff issues; and fostering constructive relationships between telecommunication suppliers and end users.

Information Technology Association of America

Headquarters : 1401 Wilson Boulevard, Suite 1100

Arlington, VA 22209

Tel: (703) 522-5055

Fax: (703) 525-2279

Website: <http://www.itaa.org>

Description: ITAA today is the only trade association representing the broad spectrum of the world-leading U.S. information technology industry. It encompasses over 26,000 direct and affiliate members, from America's largest corporations to the entrepreneurs building the blockbuster IT companies of the future. ITAA includes computers, software, telecommunications products and services, Internet and online services, systems integration, and professional services companies.

Multimedia Telecommunications Association

Headquarters: 2500 Wilson Blvd., Suite 300

Arlington, VA 22201-3834

Tel : (703) 907-7472

Fax : (703) 907-7478

Website : <http://www.mmta.org>

Description: A subsidiary of the TIA, the MMTA is driving the convergence of communications and computing business applications that has opened up a wealth of new opportunities for distributors, value added resellers, manufacturers, software developers, carriers and corporate users. MMTA strives to ensure a high level of competency and creativity in the delivery of new technology based solutions to the business community.

NECA – National Exchange Carrier’s Association

Headquarters: 80 South Jefferson Road

Whippany, NJ 07981

Tel: 800-228-8597

Fax: 973-884-8508

Website: <http://www.neca.org>

Description: Formed in 1983 by the Federal Communications Commission (FCC) as a not-for-profit membership corporation, NECA plays an important role in administering the FCC's access charge plan -- a plan that helps ensure that telephone service remains available and affordable in all parts of the country. Directly and through its subsidiaries, NECA also administers a number of other significant federal and state programs, each designed to keep the United States telecommunications system the most widely used in the world.

Telecommunications Industry Association (TIA)

Headquarters: 2500 Wilson Blvd., Suite 300

Arlington, VA 22201

Tel: (703) 907-7700

Fax: (703) 907-7727

Website: <http://www.tiaonline.org>

Description: TIA is a full service national trade organization with membership of more than 1,000 large and small companies that provide communications and information technology products, systems, distribution services and professional services in the US and around the world.

United States Telecom Association

Headquarters: 1401 H Street, N.W., Suite 600

Washington, DC 20005-2164

Tel: (202) 326-7300

Fax: (202) 326-7333

Website: <http://www.usta.org>

Description: USTA is the premier trade association representing the nation's local exchange carrier industry. For more than 100 years, USTA has been providing a common ground where local phone companies of all sizes can unite to advance the industry's concerns. The association represents more than 1,200 small, mid-size and large companies worldwide.

Major Telecommunications Conferences and Expositions

There are many more expositions and conferences for the telecommunications industry and market than are listed here. These are merely some of the largest. For more information on specific vertical markets for telecommunications equipment and services or regional markets, contact the Ministry of Industry and Commerce or the Quebec Delegation or Trade Office in the region of interest.

CLECexpo

Location: New York, NY

Date: February 21 – 23, 2001

Description: CLECexpo provides three days of intensive workshops, educational sessions, exhibit hall showcase and networking opportunities second to none in the industry. You'll hear from the experts and meet the contacts you need to build a profitable business in this competitive marketplace. The conference and trade show will focus on the convergence of the Internet and telecommunications industries. CLECexpo serves CLECs, ISPs, ITSPs, IXCs, ASPs, ICPs, cable operators, next-gen telcos, telecom resellers, satellite/wireless companies and Web-hosting companies that are breaking new ground in the industry.

Attendance: 3000

Exhibitors: 250

Contact: Penton Media
1100 Superior Avenue
Cleveland, Ohio 44114
Phone: 303-374-9507
<http://www.clecexpo.com>

Communications Solutions (was CTI Expo)

Location: Las Vegas, Nevada & Washington DC

Date: December 5 – 7, 2000 & May 23 – 25, 2001

Description: Communications Solutions Expo features industrial computers, CTI software, development tools, call center products, and services, telecommunications products and services, internet telephony, fax and video, voice and data integration, unified messaging, conferencing directory services.

Attendance: 16,000

Exhibitors: 400

Contact: Technology Marketing Corporation
One Technology Plaza
Norwalk, CT 06854
Tel: 203-852-6800
800-243-6002
Fax: 203-853-2845
Online: <http://www.ctiexpo.com>

ComNet

Location: Washington D.C

Date: January 29 – February 1, 2001

Description: ComNet is dedicated to global networking utilizing wide area telecommunications, data telecommunications, networking and internet technologies. It draws buyers, information seekers and network professionals responsible for designing, building, facilitating, and managing global networks.

Attendance: 49,000

Exhibitors: 435

Contact: IDG Expo Management

Tel: (800) 545-3976

Online: <http://www.comnetexpo.com>

Computer Telephony Conference & Exposition

Location: Los Angeles, California

Date: March 6 – 8, 2001

Description: Computer Telephony profiles the industries of computer manufacturing, internet and online services, telecommunications and telephony. One of the industry's largest expositions of telephony equipment and software.

Attendance: 30,000

Exhibitors: 630

Contact: Computer Telephony Expo
Miller Freeman Expositions

12 West 21 Street

New York, NY 10010

Tel: 212-691-8215

Online:

International Wireless Communications Expo

Location: Las Vegas, Nevada

Date: March 28 – 30

Description: The IWCE 2001 delivers the information you need to survive in today's wireless communications marketplace. IWCE attendees include dealers, resellers, community repeater operators, private and cellular WCC base station operators, commercial end users, SMR paging cellular and PCS base station operators, engineering / consulting firms, mobile communications managers for all markets.

Attendance: 10100

Exhibitors: 355

Contact: International Wireless Communications Expo
Intertec Exhibitions

5680 Greenwood Plaza Blvd., Suite 100

Englewood, CO 80111

Tel: 720-389-3137

800-288-8606

Fax: 720-489-3101

Online: [http:// www.iwceconexpo.com](http://www.iwceconexpo.com)

Internet Telecom Expo 2000 (formerly CT Expo Fall)

"Where Telecommunications and the Internet Meet"

Location: New York, New York

Date: September 19 - 21, 2000

Description: Internet Telecom Expo brings together buyers and sellers of Internet-based telecommunications products and services. These products and services include IP telephony, computer telephony, PSTN/IP convergence products, telecommunications and network infrastructure hardware, unified messaging, web-enabled call centers, CRM applications, wireless Internet services, and server/LAN-based telecommunications platforms..

Attendance: 13,000

Contact: CMP Media

Manhasset, NY

Phone: 917-305-3330

Website: <http://www.I-TelecomExpo.com>

Internet World Fall

Location: New York, New York

Date: October 3 – 5, 2001

Description: Internet World offers direct access to the very best tools, talent and technology. Targeted conference program and vertical technology showcases. It attracts webmasters, ISPs and IT professionals. Internet World rivals the best stand-alone, vertical conferences in the industry for both content and emerging leadership. From advanced technology workshops to introductory sessions, covering every aspect of conducting business on the Internet.

Attendance: 50,000

Exhibitors: 630

Contact: Mecklermedia Corporation

20 Ketchum Street

Westport, CT 06880

Tel: 203-341-2972

Online:

National Association of Broadcasters (NAB)

Location: Las Vegas, Nevada

Date: April 21 – 26, 2001

Description: NAB is an event where the worlds of broadcasting, production, computing, telecommunication, multimedia, internet and corporate communications converge. Conferences include New Media Professionals, Internet Technologies & Applications, HollyWEB, Uplink99 Satellite Users and Operators, Electronic Distribution and Delivery, NAB Broadcast Engineering, NAB TV and Radio Management, TVB & RAB Sales & Marketing, and Business, Law and Regulation Conferences.

Attendance: 63,000

Exhibitors: 440

Contact: National Association of Broadcasters

11711 N Street, N.W.
Washington DC 20036-2891
Tel: 202-429-5300
Online: <http://www.nab.org>

Networld + Interop

Location: Las Vegas, Nevada

Date: May 6 – 11, 2001

Description: Networld+Interop provides networking, internet and telecommunications professionals with a comprehensive forum for educational and hands-on evaluation of products and services in order to make critical purchasing decisions. It affords buyers from enterprises, service providers, and resellers/ integrators the opportunity to experience live technology demonstrations first-hand. It's this focus on advanced, multivendor, multiprotocol, multiservice interoperability technologies and solutions that make Networld+Interop the definitive networking event.

Attendance: 55,000

Exhibitors: 766

Contact: Networld / Interop
P.O. Box 5955
San Mateo, CA 94402-0855
Tel: 415-578-6900
Fax: 415-525-0194
Online: <http://www.interop.com>

Supercomm

Location: Atlanta, Georgia

Date: June 3 – 7, 2001

Description: The premier annual communications and information technology exhibition and conference in the US is jointly sponsored by the USTA and the TIA.

Attendance: 53,000

Exhibitors: 800

Contact: Supercomm 2001
549 W. Randolph
Chicago, Illinois 60661
Tel: 703-907-7480
Online: <http://www.supercomm2001.com>

SUPERnet

Location: Santa Clara, CA

Date : January 14 – 17, 2001

Description : Sponsored by TIA and the International Engineering Consortium (IEC), 2001 will inaugurate the first SUPERnet Exposition. Located in Silicon Valley it will provide an unparalleled opportunity to focus on the core technology advancements that will drive the pervasive broadband communications environment. Conference tracks

focus on key challenges and growth areas for unleashing the future network: Optical Technologies & Architectures; Broadband Access Alternatives and Strategies; IP-Based Applications & Communications.

Attendance: N/A

Exhibitors: N/A

Contact: SUPERnet
549 West Randolph St., Suite 600
Chicago, IL 60661-2208
Tel: (312) 559-3866
Fax: (312) 559-4111
Online: www.supernet2001.com

The Western Show (sponsored by the Western Cable Association)

Location: Los Angeles, CA

Date: November 28 – December 1, 2000

Description: Sponsored by the California Cable Television Association, the Western Show is an international cable telecommunications convention and exhibition which draws attendees from the cable, convergence, telephony, satellite and internet industries.

Attendance: 30,000

Exhibitors: 410

Contact: The Western Show 200 Exposition Management
c/o Dobson & Associates Ltd.
1225 19th Street NW, Suite 310
Washington D.C 20036
Tel: (202) 463- 7905
Online: www.calcable.org/westernshow/

Other Resources:

U.S. Federal Communications Commission (FCC)

445 12th St. S.W.

Washington DC 20554

Tel: (202) 418-0190

Website: <http://www.fcc.gov>

Glossary

The telecommunications industry of the US is overrun with acronyms. Every new technology and service provider has their name abbreviated. In order to assist readers of this report in understanding these acronyms, I have assembled a few definitions:

ASP

Applications Service Provider; a company that provides remote access to applications, usually over the internet. ASPs are used when an organization finds it more cost effective to have someone else host their application than to install, implement and maintain the application at their own facility.

Broadband

High-speed voice, data and video networked services that are: 1.) digital; 2.) 384 Kbps (minimum for full-frame-rate digital video) or higher; 3.) interactive; and 4.) packet-based.

CLEC

Competitive local exchange carrier; created by the Telecommunications Act of 1996 to increase competition and customer offerings in the local telephone market.

DSL

Digital Subscriber Line; a technology that allows a provider the use of excess bandwidth found in a copper line for the provision of data services. Developed to take advantage of copper infrastructure until fiber was fully deployed but has become an industry unto itself.

ILEC

Incumbent local exchange carrier; providers of local telephone service in place before the Telecommunications Act of 1996; includes all of the RBOCs.

Interconnection Agreement

The broad agreement that determines how a CLEC will connect to the ILEC's network. Negotiated or arbitrated agreements typically must receive state public utility commission approval.

IP Gateway

Most commonly, a network device that converts voice and fax calls, in real time, between the public switched telephone network (PSTN) and an IP network. Primary gateway functions include voice/fax compression/ decompression, packetization, call routing, and control signaling. Additional features may include interfaces to external controllers, such as gatekeepers or soft-switches, billing systems and network management systems.

ISP

Internet service provider

IVR

Interactive Voice Response; this technology (along with automatic speech recognition) allows callers, when linked to a computer database, to speak in their natural voice to complete automated transactions over the telephone.

IP Telephony

Technology that allows voice calls to be transmitted as data packets in an IP (internet protocol) format; voice transmitted as data over the public internet, LAN, WAN or a private data network.

Internet Telephony

Voice transmitted as data over the public internet.

Media Server

A device that processes multimedia applications such as call distribution, fax-on-demand, and automated e-mail response programs.

PBX

Private branch exchange; a small, privately owned version of the phone company's larger central switching office.

POTS

Plain Old Telephone Service: the basic, traditional mode of copper-wire circuit switched telephone services.

RBOC

Regional Bell Operating Company; one of the regional local telephone companies formed from the breakup of AT&T (Ma Bell..) The RBOCs are the highest visibility ILECs

VOIP (or VIP)

Voice over Internet protocol allows telecommunications carriers to transfer calls from the public switched telephone network to the Internet Protocol network. VoIP also allows carriers to carry both voice and data over one line.

VPN

Virtual Private Network: a secure method of transmitting data over private and public networks.

T1 or T3 Connections

The T-carrier system, introduced by the Bell System in the U.S. in the 1960s, was the first successful system that supported digitized voice transmission. The original transmission rate (1.544 Mbsp) in the T-1 line is in common use today in Internet service provider connections to the Internet. Another level, the T-3 line, providing 44.736 Mbps, is also commonly used by Internet service providers.

WAP

Wireless Application Protocol; a protocol that enables wireless phones and other wireless devices to access data over the Internet and/ or Intranets and to display that data on WAP enabled devices.

Bibliography

- The Red Herring Magazine; May 1999,
'The Birth Of The Commco'"; pg. 80 – 81; Zerega, Blaize
'The CLEC Grows Up'"; pg. 92; Taptich, Brian E.
- The Red Herring Magazine; July 1999
'The Shrinking Telecom Food Chain'"; Myers, Cheryl J.
- The Red Herring Magazine; June 7, 2000
'Carriers encouraged to connect consumers with wireless services'"; Harvey, Phil
www.redherring.com
- Telecommunications Industry Association Publications
 Press Release: February 1, 2000 – *"Fiber Optics Spending Triples in Decade"*
 Press Release: February 22, 2000 – *"Broadband Connectivity Spurs Wireless Market Growth"*
 Press Release: March 29, 2000 – *"US Exports of Telecom Equipment Top \$22 Billion in 1999"*
 Press Release: March 3, 2000 – *"Growth of Profession and Technical Services Market Is Expected to Outstrip Double Digit Growth Of Convergence Technologies Market"*
 1999 Telecommunications Industry Report
- US Federal Communications Commission; September 25, 2000, *"Telecommunications Industry Revenues 1999"*
- Plunkett, Jack; Plunkett's Telecommunications Industry Almanac, pub. 2000, Plunkett Research,
- Federal Communications Commission, Washington DC
 Publication: *Telecommunications Industry Revenues 1999*
 Publication: *Statistics of Communications Common Carriers 1999*
- InformationWeek Magazine; September 11, 2000, *E-Services Evolve*, pgs. 22-24;
 Greenemeier, Larry and Maselli, Jennifer
- Information Week Magazine, September 11, 2000, *Telcos Aim To Offer More*, pgs. 367 – 372; Goodridge, Elizabeth
- Information Week Magazine; VPNs: August 28, 2000, *Changing Technology, Same Purpose*, pg. 60; Turek, Norman
- CLEC World, March 27, 2000; *"CLECs As ISPs – Value Added Service Opportunities"*, Maloff, Joel
- ZD Net; May 17, 2000, *"Cable Telephony to Skyrocket"*, Strother, Neil;
www.zdnet.com/anchordesk/

ZD Net; September 26, 2000, “*Web Phones are Ready – Are You?*”, Berst, Jesse;
www.zdnet.com/anchordesk/

ZD Net; October 4, 2000, “*Bulk Up Your Handheld*”, Berst, Jesse;
www.zdnet.com/anchordesk/

VARBusiness; “VARBusiness 500” October 2000
www.varbusiness.com