DOW, LOHNES & ALBERTSON, PLLC
ATTORNEYS AT LAW

RUTH E. HOLDER
TELECOMMUNICATIONS SPECIALIST
DIRECT DIAL 202·776·2465
rholder@dlalaw.com

WASHINGTON, D.C.
1200 NEW HAMPSHIRE AVENUE, N.W. · SUITE 800 · WASHINGTON, D.C. 20036-6802
TELEPHONE 202·776·2000 · FACSIMILE 202·776·2222

ONE RAVINIA DRIVE · SUITE 1600
ATLANTA, GEORGIA 30346-2108
TELEPHONE 770·901·8800
FACSIMILE 770·901·8874

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May 14, 1998

RECEIVED
MAY 14 1998
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

RE: Errata to Reply Comments of Cisco Systems, Inc. in the matters of: Petition of Bell Atlantic Corporation for Relief from Barriers to Deployment of Advanced Telecommunications Services, CC Docket No. 98-11; Petition of U S WEST Communications, Inc. for Relief from Barriers to Deployment of Advanced Telecommunications Services, CC Docket No. 98-26; and Petition of Ameritech Corporation to Remove Barriers to Investment in Advanced Telecommunications Capability, CC Docket No. 98-32

Dear Ms. Salas:

On May 6, 1998, Cisco Systems, Inc. filed Reply Comments in the above three proceedings. Filed herewith is a corrected copy of said Reply Comments. No substantive changes have been made. The attached corrected copy differs from the original in that duplicative text which appeared on page 13 of the original Reply Comments has been deleted.

Thank you for your consideration. Kindly associate this letter and the attachment with each of the above three dockets.

Sincerely yours,

Ruth E. Holder

Ruth E. Holder

REH/pamk

Enclosure

No. of Copies rec'd 0+12
List A B C D E

ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Petition of Bell Atlantic Corporation for Relief from Barriers to Deployment of Advanced Telecommunications Services	))))	CC Docket No. 98-11 ✓
Petition of U S West Communications, Inc. for Relief from Barriers to Deployment of Advanced Telecommunications Services	))))	CC Docket No. 98-26
Petition of Ameritech Corporation. to Remove Barriers to Investment in Advanced Telecommunications Capability	)))	CC Docket No. 98-32

REPLY COMMENTS OF CISCO SYSTEMS, INC.

I. CISCO'S INTEREST IN THIS PROCEEDING

Cisco Systems, headquartered in San Jose, CA, is the worldwide leader in networking for the Internet. Cisco's networking solutions connect people, computing devices and computer networks, allowing people to access or transfer information without regard to differences in time, place or type of computer system. Cisco provides end-to-end networking solutions that organizations, individuals and service providers use to build unified information infrastructures of their own, or to connect to other networks. An end-to-end networking solution is one that provides a common architecture that delivers consistent network services to all users. The broader the range of network services, the more capabilities a network can provide to users connected to it.

Cisco offers the industry's broadest range of hardware products used to form information networks or provide access to those networks; Cisco IOS™ software, which provides network

services and enables networked applications; expertise in network design and implementation, and technical support and professional services to maintain and optimize network operations. Cisco is unique in its ability to provide all these elements, either by itself or together with partners.

In contrast to many technology companies, Cisco does not take a rigid approach that favors one technology over the alternatives and imposes it on customers. Cisco's philosophy is to listen to customer requests while tracking all technological alternatives, and provide customers with a range of options from which to choose. Cisco develops its products and solutions around widely accepted industry standards. In some instances, technologies developed by Cisco have become industry standards.

Since shipping its first product in 1986, the company has grown into a global market leader. Since becoming a public company in 1990, Cisco's annual revenues have increased from $69 million in that year to $6.44 billion in fiscal 1997 – nearly one hundredfold in seven years. Cisco is today the world's largest Internet commerce site, selling more than $10 million in products every business day. As measured by market capitalization, Cisco is the third largest company on NASDAQ and among the top 40 in the world.

II. STATEMENT OF THE PROBLEM AND THE OPPORTUNITY

Few events have changed mankind as much as the introduction of machines to people during the Industrial Revolution. It created new products, drove innovation, and spurred a skilled workforce that ultimately changed our lives forever. The same is likely to be said for the Internet. Today, the Internet is changing the way we work, live, play and learn. As we draw closer to the end of the twentieth century, we, too, are in the midst of a revolution. The Internet and the use

of IP networks are bringing enormous production gains in business and enabling tens of millions of users to gain access to resources previously unattainable. A new "Internet Generation" is learning how to make increasingly effective use of the technology —and while none of us can yet predict its full implications, the benefits will be enormous and long lasting, permanently affecting people, business and nations.

Cisco welcomes the prospect of new participants and investors in the rapidly growing market for data communications services, including Bell Atlantic, Ameritech, and U S West. In framing the context in which that participation will occur, however, the Commission must be guided by a full understanding of the Internet marketplace as it is evolving today, lest the policies that it adopts do more harm than good. Cisco sees the Internet as a fundamentally healthy, indeed, spectacularly successful sector of our economy. Like any successful market, it could benefit from increased investment, but the Commission should neither require nor permit heavyhanded regulation.

The most notable feature of the Internet marketplace is rapid growth, accompanied by stresses and strains that typically accompany rapid growth. With the number of Internet users in the U.S. already at 56 million,[1/] private user demand for Internet services is growing by 85 percent per year.[2/] Eighty percent of business computers are networked,[3/] and 40 percent are

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[1/] Intelliquest Press Release, *Latest Intelliquest Survey Reports 56 Million American Adults Access the Internet/Online Services*, Nov. 18, 1997, http://www.intelliquest.com/about/release37.htm.

[2/] D. Molone, *The Big Squeeze*, COMMUNICATIONS WEEK INT'L, Feb. 3, 1997.

[3/] U.S. Department of Commerce, U.S. INDUSTRY & TRADE OUTLOOK '98, at 27-14 (1997).

connected to the Internet.[4] Some companies have experienced faster growth than they or others may have anticipated. America Online's subscriber base increased from 303,000 in 1993 to 11 million by the end of 1997.[5] U S West launched digital subscriber line (DSL) service in October 1997 and signed up seventeen hundred customers the first week, twice the expected number.[6] Market observers expect rapid growth to continue or accelerate, even without improvements in the regulatory climate. Bell Communications Research predicts that demand for bandwidth will increase at least 20-fold in the next five to ten years.[7] John Sidgmore, the Chairman of WorldCom, recently stated that demand for bandwidth on his company's backbone increased 1,000 percent in 1997 and that it is doubling every three-and-a-half months.[8]

The minimally regulated data communications sector is rapidly out pacing the heavily regulated voice communications sector. Vint Cerf predicts that by the year 2010, 90 percent of all communications could be data and only 10 percent will be voice.[9] Market research indicates that while voice traffic will continue to increase at moderate levels, IP traffic volumes are

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[4] *New York and the Future of Office Technology*, WESTCHESTER COUNTY BUSINESS JOURNAL, May 5, 1997, at 16.

[5] 1996 and 1997 AMERICAN ONLINE ANNUAL REPORTS; J. Kornblum, *AOL Reaches 11 Million Market*, CNET NEWS.COM, Jan. 20, 1998, http://www.news.com/News/Item/ 0,4,18294,00. html.

[6] T. Hanrahan, *The Bandwidth Oasis*, WALL ST. J. INTERACTIVE EDITION, Dec. 15, 1997, http://interactive.wsj.com/edition/resources/documents/net97Cover.htm.

[7] *See* M. Janah and M. Thyfault, *Networks: Telecommuters Find Data-moving a Snap*, INFORMATION WEEK, Apr. 7, 1997.

[8] L. Bowman, *WorldCom Sounds the Bandwidth Alarm*, PC WEEK ONLINE, Jan. 29, 1998, http://www.zdnet.com/pcweek/news/0126/29aworld.html.

[9] S. Murray, *Quieter Future Forecast*, BALTIMORE SUN, Jan. 23, 1998, at 1C.

increasing much faster and will soon become the dominant traffic type carried by the world's networks (see Figure 1).

Building the infrastructure to meet that demand will require massive investments of capital and expertise, much of it requiring swift responses to rapidly changing technology and market developments. The FCC should remove artificial impediments to such investments, if it can do so without jeopardizing the vigorously competitive character of the data communications market.

III. NEED FOR COMPETITION IN THE INFRASTRUCTURE

As the leading networking company for the Internet, Cisco believes that continued rapid growth of the Internet and a robustly competitive market for advanced information services are key to continued U.S. economic growth and prosperity. These goals can best be achieved by promoting competition in the infrastructure, by encouraging investment in advanced technologies, and reaffirming hands-off deregulatory policies for the Internet and all "information services."[10/]

The Telecommunications Act of 1996 codified national policy favoring the growth and development of computer and information services free from state or federal regulation.[11/] The '96 Act states that it is the policy of the United States "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services,

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[10/] "Information service" is defined as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications."

[11/] Pub. L. No. 104-104, 110 Stat. 56 (1996) (codified in 47 U.S.C.) (hereinafter cited as "the '96 Act").

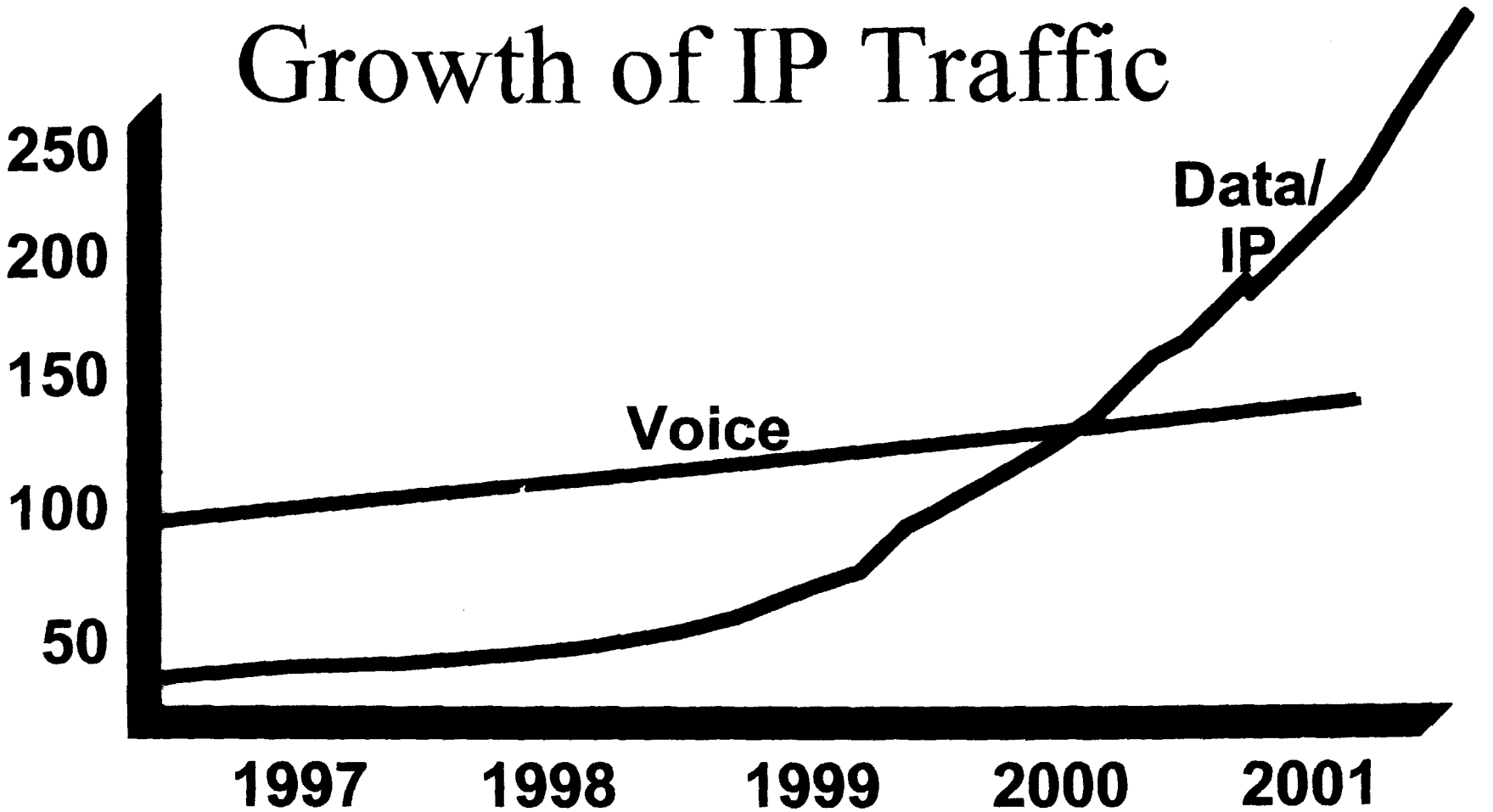

Figure 1 ***Yankee Group, 12/97***

unfettered by Federal or State regulation."[12] The need to keep the Internet free of regulation was echoed by the Clinton Administration in July 1997 with the announcement of *A Framework for Global Electronic Commerce*. The first principle enumerated in the paper reads: "The private sector should lead. The Internet should develop as a market driven arena not a regulated industry."

Cisco supports a pro-competitive and de-regulatory framework for the information services marketplace and the competition in the provision of network infrastructure that is necessary to achieve the former. We believe that any efforts to apply traditional telco regulation to this dynamic industry will slow innovation and dampen overall growth of the Internet. To ensure the successful rapid deployment of new, innovative technologies, Cisco asks the FCC to reaffirm its deregulatory position and the administration's hands-off Internet policy by: (1) refraining from regulating any router-based, packet-switched and cell-switched data networks,[13] and (2) affirming that router-based, packet-switched services will continue to be treated as unregulated information services under the '96 Act.[14]

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[12] 47 U.S.C. §230(b).

[13] Routers provide connectivity between the various individual networks making up an internet, i.e., any set of networks that are interconnected via the TCP/IP protocol suite. James Martin and Joe Leben, TCP/IP NETWORKING (1994) at 4 and 5. An Internet protocol packet, sometimes referred to as an "IP datagram," contains the internet address of the source host and the internet address of the destination host, among other things. *Id.* at 107. A cell is a form of fixed-length packet typically associated with very fast packet switching systems. *Id.* at 258.

[14] The '96 Act defines "information service" as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications. . . ." 47 U.S.C. §153(20). The Commission has interpreted the '96 Act as implying that "telecommunications" and "information services" are mutually exclusive categories, and that, for that reason, information service providers are not subject to regulations applicable to telecommunications providers. In the Matter of Federal-State Joint Board on Universal Service, *Report and Order* (FCC 97-157, released May 8, 1997) ("Universal Service First Report") at ¶788.

A powerful and growing marketplace demand for high-bandwidth packet and cell-switched communications services already exists and continues to grow. There are now more than 4,000 Internet service providers.[15] There are several new network operators whose strategy is to focus their efforts on this market. Companies like Qwest and Level 3 have raised billions of dollars on capital markets for the construction of networks designed specifically to support Internet protocol transmissions. Allowing new competitors to address that demand is not just a good idea that the Commission should examine at its leisure. The '96 Act provides that the Commission "shall take immediate action" to remove barriers to infrastructure investment that will accelerate deployment of advanced telecommunications capabilities to all Americans.[16] Government policies can help ensure that consumer demand will be met by allowing competitors to drive increased facilities deployments and service upgrades in the marketplace, but these policies must be implemented carefully to ensure that they do not restrict investment in these facilities by all willing service providers, whether they be ILECs, competitive local exchange carriers (CLECs), cable operators, interexchange service providers, or information service providers.

Experience has shown that competition not only helps to ensure reasonable prices, but also drives innovation.[17] In the late 1980s, competitive pressures from other long distance carriers forced AT&T to accelerate its deployment of digital services. CLECs managed to gain market share not only by offering lower prices, but also by offering quality innovations such as

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[15] J. Richard, BOARDWATCH DIRECTORY OF INTERNET SERVICE PROVIDERS (Fall 1997), http://www.boardwatch.com/isp/fall97/intro1.html.

[16] Section 706 of the '96 Act, codified at 47 U.S.C. §157 note.

[17] Policy and Rules Concerning Rates for Dominant Carriers, *Public Notice*, 4 FCC Rcd 6814 (1989), *citing* AT&T Press Release, December 1, 1988 (announcing acceleration of network digitization).

self-healing fiber rings that ensure alternate transmission paths, and local access circuit networks with non-blocking switches that are tailored to Internet access or unique business needs for data and voice.

Competition in customer premises equipment has led to a host of innovations, from personal fax machines to telecommunicating desktop computers, most of which were not foreseen when the Commission adopted its pioneering Carterfone decision in 1968.[18] In fact, the FCC engendered rapid growth of the networks referred to today as the Internet by creating a framework for competitive provision of enhanced services in the Computer II and III proceedings.[19]

Increased competition also promotes improved services. As Internet service providers look for differentiation, service models will change. A number of service providers focus on

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[18] Use of the Carterfone Device in Message Toll Telephone Service, Docket No. 16942, Decision, 13 FCC 2d 420 (1968), *reconsideration denied by Memorandum Opinion and Order*, 14 FCC 2d 571 (1968).

[19] See *CCIA v. FCC,* 693 F.2d 198, 213 (D.C. Cir. 1982) (upholding Computer II rules); Amendment of Section 64.702 of the Commission's Rules and Regulations, CC Docket No. 85-229, Phase I, 104 FCC 2d 958 (1986) (Phase I Order), recon., 2 FCC Rcd 3035 (1987) (Phase I Reconsideration Order), further recon., 3 FCC Rcd 1135 (1988) (Phase I Further Reconsideration Order), second further recon., 4 FCC Rcd 5927 (1989) (Phase I Second Further Reconsideration), Phase I Order and Phase I Reconsideration Order vacated, California v. FCC, 905 F.2d 1217 (9th Cir. 1990) (California I); Phase II, 2 FCC Rcd 3072 (1987) (Phase II Order), recon., 3 FCC Rcd 1150 (1988) (Phase II Reconsideration Order), further recon., 4 FCC Rcd 5927 (1989) (Phase II Further Reconsideration Order), Phase II Order vacated, California I, 905 F.2d 1217 (9th Cir. 1990); Computer III Remand Proceedings, 5 FCC Rcd 7719 (1990) (ONA Remand Order), recon., 7 FCC Rcd 909 (1992), pets. for review denied, California v. FCC, 4 F.3d 1505 (9th Cir. 1993) (California II); Computer III Remand Proceeding: Bell Operating Company Safeguards and Tier 1 Local Exchange Company Safeguards, 6 FCC Rcd 7571 (1991) (BOC Safeguards Order), recon. dismissed in part, Order, CC Docket Nos. 90-623 & 92-256, FCC 96-222 (rel. May 17, 1996); BOC Safeguards Order vacated in part and remanded, California v. FCC, 39 F.3d 919 (9th Cir. 1994) (California III), cert. denied, 115 S.Ct. 1427 (1995) (referred to collectively as the Computer III proceeding).

quality, security and policy control in virtual private networks. Examples are MCI, UUnet, Pilot Networks and many more. A wide range of offerings is already available in the market place. Cisco is working with many service providers to deploy still broader capabilities. It is probable that differentiated services will continue to emerge in mass market services with higher speed interfaces, because data communication services are judged by price-performance (i.e., a user buys "just enough" bandwidth for the application required). (The countervailing trend is that market studies show a strong unwillingness to pay more for Internet services, implying that advertisers and content providers will foot the bill.)

Innovation and improved responsiveness to customer needs by information service providers have occurred because government has stepped out of the way and prevented others from restraining competition. Today, nearly all of the innovations described above are widely available at reasonable prices to ordinary consumers in every part of the country, because market forces generated the incentives and technology provided the means to make them happen.

IV. INCREASED INVESTMENT AND INDUSTRY COOPERATION, RATHER THAN REGULATION, ARE NECESSARY FOR GROWTH IN NETWORK CAPACITY

The Internet has experienced explosive growth. With that growth there have been periods of congestion. Through capital investment, network engineering and the application of innovative technologies such as caching, the performance hot spots of one year ago have been eliminated. One of the best examples is the rapid expansion of dialed access by America Online (AOL). The capital markets have responded to that growth, and service providers have rapidly augmented their networks. The addition of experienced service providers with the ability to

invest rapidly in new infrastructure will help the industry overcome future hot spots more quickly.

The single biggest investment challenge ahead on the Internet is the availability of high speed access facilities. Higher speed access is an essential step in the proliferation and realization of the Internet's benefits. More aggressive investment in the Internet by exchange access providers like Bell Atlantic, U S West, and Ameritech will be a positive step for the industry.

To deliver efficient network manageability and scalability, today's data networks are based on a hierarchical architecture that includes high-data-rate backbone networks as well as service node layers that are closer to end users. The major function of a router in the backbone is to provide performance and scalability, to switch millions of packets per second, and to scale to higher rates. Edge routers at service nodes, which are collectively referred to as the distribution layer, provide features such as security, access control, and support for differentiated services through class-of-service offerings.

Fewer than ten companies can properly be characterized as providers of national backbone services, but more than 4,000 ISPs specialize in local service. Cable television operators are further augmenting the distribution layer with wide bandwidth services. While major investments are required to create a national backbone service, the barriers to entry are extremely low at any level of the network hierarchy.

To the extent that any congestion may have occurred on Internet backbones, it has been a temporary phenomenon resulting from explosive growth in demand for bandwidth. The market has shown formidable self-correcting tendencies and is market-demand-driven to address any congestion by deploying new technologies and investing necessary capital to build data networks.

Attachment A shows the performance characteristics of recently deployed and planned routers on the Internet, with substantial increases in capacity on the way.

Cisco is intimately aware of these developments because it is a major participant in the deployment of technologies that will enable the widespread deployment of next generation network services to businesses and consumers nationwide. Cisco's backbone service customers demand continued performance increases from routers and asynchronous transfer mode (ATM) switches to meet the market need. Cisco focuses its resources on listening to service provider requirements and then delivering the networking solutions that meet or exceed customer requirements. Cisco's 12000 series routers provide backbone performance levels – with 60 Gbps backplanes and OC-48 (2.5 Gbps) interfaces. Cisco provides equipment to ILECs as well as independent ISPs – last January, U S West announced that it would install Cisco BPX(tm) wide-area network ATM switches in more than 80 points of presence (POPs) around the United States by the end of 1998. This will enable U S WEST to offer ATM and Internet access services to large business customers nationwide.

Equipment suppliers and service providers have responded rapidly and effectively to rising demand at multiple layers of the network: dial environments are no longer chronically busy, and industry continues to deploy caching, gigabit switch routers (GSRs), more fiber, quality of service features, more interconnection points, etc.

Naturally, the highest capacity nodes are being installed first in major population centers, and high-speed services have typically been provided to business customers before being priced at levels that are affordable for residential services. Most disinterested observers view this as part of a natural and rational progression. Bell Atlantic expresses concern about this situation

even though, so far, there has been no indication that construction will stop before the needs of all Americans are addressed.

Bell Atlantic is proud of its accomplishments as a high quality data service provider, but the ILECs' deployment of ISDN should not serve as a model for the future. Burdening the provision of Internet services with the kind of regulation that applies to telecommunications carriers will deter market-responsive investments in the infrastructure, not promote them. Growth in data communications users and services is so rapid that any centralized plan for controlling the industry's path would be outdated by the time it was adopted and before the affected service providers could implement it. By contrast, incentives for capital investment in a competitive environment will hasten the rapid deployment of information services to all Americans.

V. THE MARKET FOR INFORMATION SERVICES IS DEREGULATED AND SHOULD REMAIN SO

The '96 Act states that it is the policy of the United States "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation."[20/] The term "Internet" in this context is defined as "the international computer network of both Federal and non-Federal inter-operable packet switched data networks."[21/] "Interactive computer service" is defined as "*any* information service, system, or access software provider that provides or enables computer access by multiple users to a computer server, including specifically a service or system that provides access to the Internet. . ."[22/] Illuminated by these definitions, Congress's deregulatory policy encompasses all

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[20/] 47 U.S.C. §230(b)(2).

[21/] *Id.* at §230(e)(1).

[22/] *Id.* at §230(e)(2) (emphasis added).

packet-switched data communications services, including all services based on Cisco's principal product: Internet routers and inter-networking operating systems software.[23]

The plain language of the statute and the legislative history demonstrate that Congress intended regulators to follow a hands-off policy toward packet-switched communications services. Router-based, packet-switched services fall within the '96 Act's definition of information service, not the Act's definition of telecommunications.[24] In language explaining the Senate bill that was combined with House legislation to produce the '96 Act, a Senate report states, "The definition of telecommunications service specifically excludes the offering of information services . . . precisely to avoid imposing common carrier obligations on information service providers."[25] The report goes on to explain that "[i]nformation services providers do not 'provide' telecommunications services; they are users of telecommunications services."[26] The Commission has likewise concluded that "telecommunications" and "information services" are

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[23] In this context, a routing function is a function of the Internet protocol that is responsible for moving IP data packets from a source host to a destination host, usually through multiple intermediate routers. The routing function in a host or router must decide the next hop each received data packet should take in traveling to its final destination. *See* James Martin and Joe Leben, TCP/IP NETWORKING (1994) at 315.

[24] Information service is defined as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications." 47 U.S.C. §153(20).

[25] S. Rep. No. 230, 104th Cong., 1st Sess. ("Senate Report") at 28 (1996). The conference report explained that the House acceded to the Senate's proposed universal service section with modifications. The modifications reflected in the bill as adopted do not alter this analysis. *See* H.R. Rep. No. 458, 104th Cong., 1st Sess., at 130-134.

[26] Senate Report at 28. Both the Commission and the court with jurisdiction over the AT&T Consent Decree had expressed the view that the two definitions were functionally equivalent. *See, e.g., U.S. v. Western Electric Co.,* 673 F.Supp. 525, 575 (D.D.C. 1987) (". . . enhanced services, *i.e.*, generally speaking, information services . . ."); Filing and Review of Open Network Architecture Plans, *Memorandum Opinion and Order,* 4 FCC Rcd 1 (1988), ¶29 n. 60 ("'information services' [are] a class of services that apparently is similar to enhanced services").

mutually exclusive categories.[27] It follows that information service providers, including providers of router-based packet communication services, are not subject to the duties applied to telecommunications service providers by the '96 Act.[28]

The Commission should reaffirm and clarify the hands-off position that it has historically taken concerning information and computer services by avoiding any future regulation. That should include a specific pronouncement that all router-based packet-switched services are unregulated.

The *Computer II* and *Computer III* proceedings were part of a broader effort by the Commission to deregulate services that could readily be provided by multiple competitors, subject to safeguards to prevent telephone companies from using their dominant positions in monopoly markets to restrain trade in competitive markets. The regulatory boundary line that was drawn between basic and enhanced services in *Computer II* was ambiguous in some ways, even though it was a major advance over the even more ambiguous boundary that had applied under the *Computer I* regime. Because manufacturers cannot control how their equipment will be deployed by service providers, the same product may be used by one customer as part of an "enhanced" service while another customer uses it as part of a "basic" service.

The petitions for waiver of Bell Atlantic, Ameritech, and U S West implicate fundamental issues that can be addressed in this limited context. Routers are readily available from Cisco and other vendors on the open market, and can be purchased by ILECs' competitors

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[27] After noting that 47 U.S.C. §254(h)(2) requires the Commission to enhance access to advanced telecommunications *and* information services, the Commission concluded that, if information services were a subset of advanced telecommunications, it would be repetitive to list information services. *Id.*

[28] The Senate Report specifically states, for example, that the legislation "does not require providers of information services to contribute to universal service." Senate Report at 28.

as easily as ILECs can obtain them. The Commission should respond to these petitions by recognizing that all packet-switched, router-based services meet the statutory definition of information services, and treating them as if they were enhanced services. In other words, the Commission should align its regulations with the statutory boundary between information services and telecommunications.[29] Concurrently, the Commission should issue a definitive interpretation recognizing that all packet-switched, router-based services meet the statutory definition of information services, whether or not they meet the definition of enhanced services in the Commission's rules.

Today, the Internet is society's best shot at developing an environment that is driven fully by market forces – one that levels the playing field for all businesses and provides opportunities for all Americans. Regulation of information services would severely limit the future prospects for the Internet. The services that use telecommunications infrastructure today are highly competitive. Instead of looking to regulation to harness its growth of the Internet, the Commission should embrace competitive principles, forbear from regulation and let the market

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[29] *See* Amendment of Section 64.702 of the Commission's Rules and Regulations, CC Docket No. 85-229, Phase I, 104 FCC 2d 958 (1986) (Phase I Order), recon., 2 FCC Rcd 3035 (1987) (Phase I Reconsideration Order), further recon., 3 FCC Rcd 1135 (1988) (Phase I Further Reconsideration Order), second further recon., 4 FCC Rcd 5927 (1989) (Phase I Second Further Reconsideration), Phase I Order and Phase I Reconsideration Order vacated, California v. FCC, 905 F.2d 1217 (9th Cir. 1990) (California I); Phase II, 2 FCC Rcd 3072 (1987) (Phase II Order), recon., 3 FCC Rcd 1150 (1988) (Phase II Reconsideration Order), further recon., 4 FCC Rcd 5927 (1989) (Phase II Further Reconsideration Order), Phase II Order vacated, California I, 905 F.2d 1217 (9th Cir. 1990); Computer III Remand Proceedings, 5 FCC Rcd 7719 (1990) (ONA Remand Order), recon., 7 FCC Rcd 909 (1992), pets. for review denied, California v. FCC, 4 F.3d 1505 (9th Cir. 1993) (California II); Computer III Remand Proceeding: Bell Operating Company Safeguards and Tier 1 Local Exchange Company Safeguards, 6 FCC Rcd 7571 (1991) (BOC Safeguards Order), recon. dismissed in part, Order, CC Docket Nos. 90-623 & 92-256, FCC 96-222 (rel. May 17, 1996); BOC Safeguards Order vacated in part and remanded, California v. FCC, 39 F.3d 919 (9th Cir. 1994) (California III), cert. denied, 115 S.Ct. 1427 (1995) (referred to collectively as the Computer III proceeding)

lead. The Commission's ability to move swiftly and act on this request will impact rapid deployment of Cisco's advanced technologies by its customers in several areas, including voice-data integration, frame relay services, ATM backbone switching architectures, network publishing, and IP telephony.

VI. CONCLUSION

The Commission should forbear from regulating any router-based, packet-switched communications services offered by Bell Atlantic, Ameritech, or U S West. For purposes of these proceedings, and recognizing that the Commission is reevaluating its *Computer II* and *Computer III* rules in a different proceeding, the Commission should apply existing *Computer II* and *Computer III* safeguards to the statutory boundary between the information services provided by those ILECs and their telecommunications services, not to the regulatory boundary between basic and enhanced services. As part of its decision, the Commission should interpret the Telecommunications Act of 1996 as requiring that all router-based, packet-switched services be treated as unregulated information services.

Respectfully submitted,

Of counsel:

Leonard J. Kennedy
Charles M. Oliver
Dow Lohnes & Albertson, P.L.L.C.

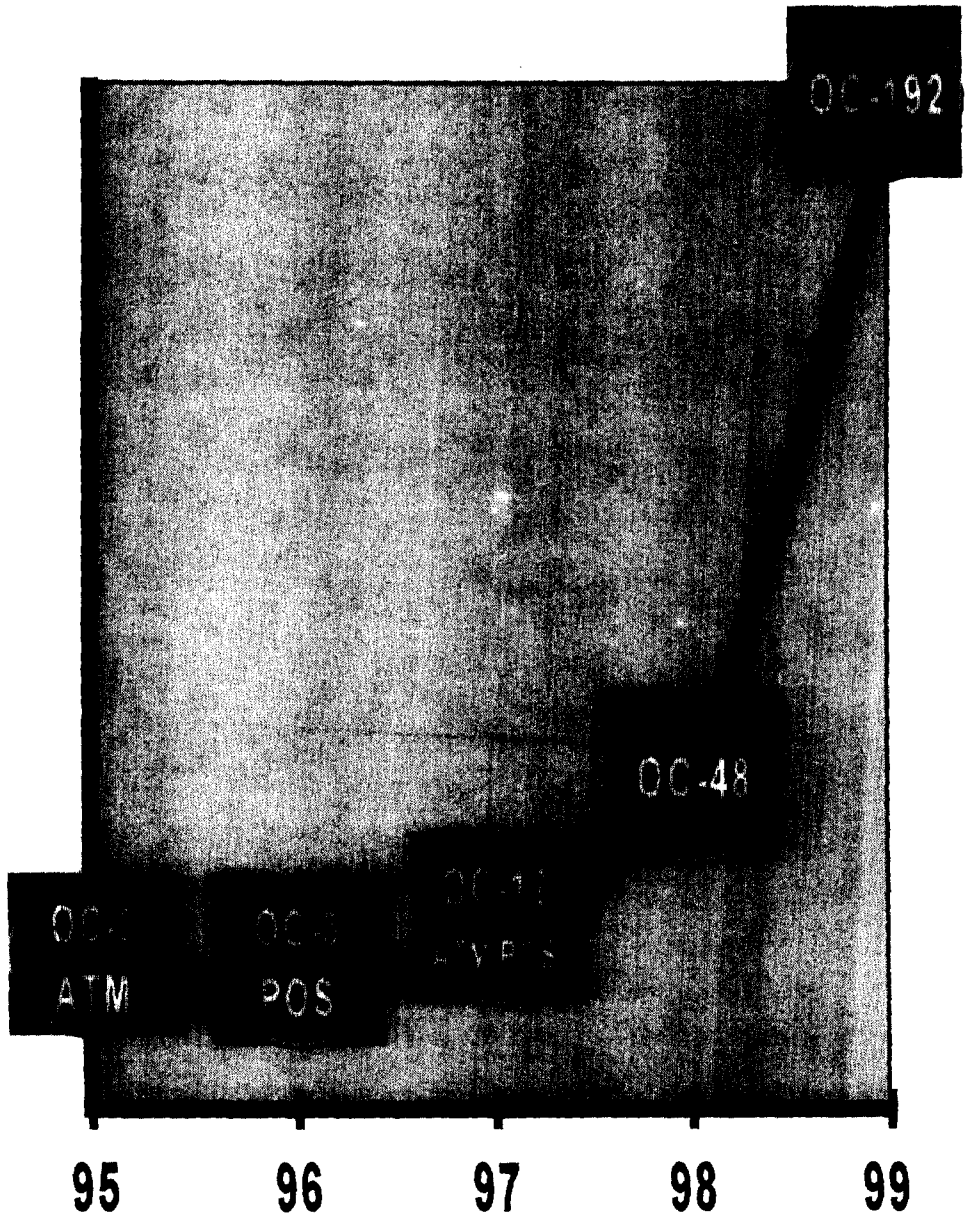
Dan Scheinman /G

A. Daniel Scheinman
Laura K. Ipsen
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
408/526-6650

May 6, 1998

Attachment A

Routing Performance Chart



Note: OC-192 interfaces are the next step on the performance curve. In addition, Cisco is collaborating on terabit switch research to achieve routing with 320 Gbps switching fabrics in 1999.

CERTIFICATE OF SERVICE FOR ERRATA TO REPLY COMMENTS OF CISCO SYSTEMS, INC.

I HEREBY CERTIFY that on this 14th day of May, 1998, I caused a copy of the Errata to Reply Comments of Cisco Systems, Inc., together with a copy of the corrected Reply Comments and this Certificate of Service, to be mailed, postage prepaid, by U.S. first class mail and hand delivered* to:

Chairman William E. Kennard*
Commissioner
Federal Communications
Commission
1919 M Street, N.W., Room 814
Washington, D.C. 20554

Commissioner Michael K. Powell*
Federal Communications
Commission
1919 M Street, N.W., Room 844
Washington, D.C. 20554

Commissioner Susan Ness*
Federal Communications
Commission
1919 M Street, N.W., Room 832
Washington, D.C. 20554

Commissioner Gloria Tristani*
Federal Communications
Commission
1919 M Street, N.W., Room 826
Washington, D.C. 20554

Comissioner Harold Furchtgott-Roth*
Federal Communications
Commission
1919 M Street, N.W., Room 802
Washington, D.C. 20554

Janice M. Myles*
Common Carrier Bureau
Federal Communications
Commission
1919 M Street, N.W., Room 544
Washington, D.C. 20554

International Transcription
Services, Inc.*
1231 20th Street, N.W.
Washington, DC 20036

John T. Lenahan
Christopher Heimann
Frank Michael Panek
Gary Phillips
Attorneys for Ameritech
Room 4H84
2000 West Ameritech Center Drive
Hoffman Estates, IL 60196-1025

John Thorne
Robert Griffen
Bell Atlantic
1320 North Court House Road
8th Floor
Arlington, VA 22201

Riley M. Murphy
James C. Falvey
American Communications
Services, Inc.
131 National Business Parkway
Suite 100
Annapolis Junction, MD 20701

Richard Taranto
Farr & Taranto
2445 M Street, N.W., Suite 225
Washington, D.C. 20037

Brad E. Mutschelknaus
Edward A. Yorkgitis, Jr.
John J. Heitmann
Kelley Drye & Warren LLP
1200 19th Street, N.W., Suite 500
Washington, D.C. 20036

William T. Lake
John H. Harwood, II
Jonathan J. Frankel
Wilmer, Cutler & Pickering
2445 M Street, N.W.
Washington, D.C. 20037

Maureen A. Lewis
Henry Geller
Alliance for Public Technology
901 15th Street, N.W., Suite 230
Washington, D.C. 20005-2327

Robert B. McKenna
Jeffry A. Brueggeman
US West, Inc.
1020 19th Street, N.W.
Washington, D.C. 20036

George Vradenburg, III
William W. Burrington
Jill A. Lesser
Steven N. Teplitz
America Online, Inc.
1101 Connecticut Avenue, N.W.
Suite 400
Washington, D.C. 20036

Christopher W. Savage
James F. Ireland
Cole, Raywid & Braverman, LLP
1919 Pennsylvania Avenue, N.W.
Suite 200
Washington, D.C. 20006

Thomas M. Koutsky
Assistant General Counsel
Covad Communications Company
3560 Bassett Street
Santa Clara, CA 95054

M. Robert Sutherland
Stephen M. Klimacek
BellSouth Corporation
1155 Peachtree Street, N.E.
Atlanta, GA 30309-3610

Jeffrey Blumenfeld
Christy Kunin
Frank V. Paganelli
Blumenfeld & Cohen
1615 M Street, N.W., Suite 700
Washington, D.C. 20036

Chérie R. Kiser
Michael B. Bressman
Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, PC
701 Pennsylvania Avenue, N.W.
Suite 900
Washington, D.C. 20004

Russell M. Blau
Richard M. Rindler
Tamar E. Finn
Swidler & Berlin, Chtd.
3000 K Street, N.W, Suite 300
Washington, D.C. 20007

Robert J. Aamoth
Steven A. Augustino
Kelley Drye & Warren LLP
1200 19th Street, N.W., Suite 500
Washington, D.C. 20036

John F. Raposa
GTE Service Corporation
600 Hidden Ridge, HQE03J27
P.O. Box 152092
Irving, TX 75015-2092

Richard D. Marks
Vinson & Elkins, LLP
1455 Pennsylvania Avenue, N.W.
Suite 700
Washington, D.C. 20004-1008

Gail L. Polivy
GTE Service Corporation
1850 M Street, N.W.
Suite 1200
Washington, D.C. 20036

Jonathan E. Canis
Kelley Drye & Warren LLP
1200 19th Street, N.W., Suite 500
Washington, D.C. 20036

Thomas R. Eames
President
Next Level Communications
6085 State Farm Drive
Rohnert Park, CA 94928

Colleen Boothby
Levine, Blaszak, Block
and Boothby, LLP
2001 L Street, N.W., Suite 900
Washington, D.C. 20036

Charles Eldering, Ph.D.
Telecom Partners Ltd.
900 Town Center
New Britain, PA 18901

Peter A. Rohrback
Linda L. Oliver
David L. Sieradzki
Hogan & Hartson, LLP
Columbia Square
555 13th Street, N.W.
Washington, D.C. 20004

Mark J. Tauber
Teresa S. Werner
Piper & Marbury, LLP
1200 19th Street, N.W.
7th Floor
Washington, D.C. 20036

Terrence J. Ferguson
Senior Vice President &
General Counsel
Level 3 Communications, Inc.
3555 Farnam Street
Omaha, NE 68131

James D. Ellis
Robert M. Lynch
Durward D. Dupre
Darryl W. Howard
SBC Communications, Inc.
One Bell Plaza, Room 3703
Dallas, TX 75202

Joel Bernstein
Halprin, Temple, Goodman
& Sugrue
1100 New York Avenue, N.W.
Suite 650 East
Washington, D.C. 20005

Leon M. Kestenbaum
Jay C. Keithley
H. Richard Juhnke
Sprint Corporation
1850 M Street, N.W.
Washington, D.C. 20036

Charles C. Hunter
Catherine M. Hannan
Hunter Communications Law Group
1620 I Street, N.W., Suite 701
Washington, D.C. 20006

G. Richard Klein
Commissioner for the
Indiana Utility Regulatory
Commission
302 W. Washington, Sutie E-306
Indianapolis, IN 46204

J. Manning Lee
Vice President, Regulatory Affairs
Teresa Marrero
Sr. Regulatory Counsel - Federal
Teleport Communications Group
Two Teleport Drive
Staten Island, NY 10311

Catherine R. Sloan
Richard L. Fruchtermann, III
Richard S. Whitt
David N. Porter
1120 Connecticut Avenue, N.W.
Suite 400
Washington, D.C. 20036

Randall B. Lowe
J. Todd Metcalf
Piper & Marbury, LLP
1200 19th Street, N.W.
7th Floor
Washington, D.C. 20036

Mark C. Rosenblum
Ava B. Kleinman
Dina Mack
AT&T Corporation
295 North Maple Avenue
Room 3252J1
Basking Ridge, NJ 07920

Mary McDermott
Linda Kent
Keith Townsend
Lawrence E. Sarjeant
United States Telephone Association
1401 H Street, N.W., Suite 600
Washington, D.C. 20005

Ronald L. Plesser
Mark J. O'Connor
Stuart P. Ingis
Piper & Marbury, LLP
1200 19th Street, N.W.
7th Floor
Washington, D.C. 20036

Cheryl L. Parrino
Chairman
Public Service Commission
of Wisconsin
P.O. Box 7854
Madison, WI 53707-7854

Jonathan Jacob Nadler
Brian J. McHugh
Squire, Sanders & Dempsey
1200 Pennsylvania Avenue, N.W.
Box 407
Washington, D.C. 20044

Jordan Clark, President
United Homeowners Association
655 15th Street, N.W., Suite 640
Washington, D.C. 20005

Richard J. Metzger
Vice President & General Counsel
Association for Local Telecom
Services
888 17th Street, N.W., Suite 900
Washington, D.C. 20009

Bartlett L. Thomas
James J. Valentino
Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, PC
701 Pennsylvania Avenue, N.W.
Suite 900
Washington, D.C. 20004

Jeffrey A. Campbell
Stacy Stern Albert
Compaq Computer Corporation
1300 I Street, N.W., Suite 490 East
Washington, D.C. 20005

Kecia Boney
Dale Dixon
Larry Blosser
Lisa B. Smith
MCI Telecomunications Corporation
1801 Pennsylvania Avenue, N.W.
Washington, D.C. 20006

John Windhausen, Jr.
General Counsel
Competition Policy Institute
1156 15th Street, N.W., Suite 310
Washington, D.C. 20005

J. Jeffery Oxley
Assistant Attorney General
1200 NCL Tower
445 Minnesota Street
St. Paul, MN 55101-2130

Genevieve Morelli
Executive Vice President &
General Counsel
The Competitive Telecommunications
Association
1900 M Street, N.W., Suite 800
Washington, D.C. 20036

Albert H. Kramer
Michael Carowitz
Valeria M. Furman
Dickstein Shapiro Morin
& Oshinsky LLP
2101 L Street, N.W.
Washington, D.C. 20037

Charles D. Gray
James Bradford Ramsay
National Association of Regulatory
Utility Commissioners
1100 Pennsylvania Avenue, N.W.
Suite 608
P.O. Box 684
Washington, D.C. 20044