

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
TW Telecom Inc.)	WC Docket No. 11-119
Petition for Declaratory Ruling Regarding)	
Direct IP-to-IP Interconnection Pursuant to)	
Section 251(c)(2) of the Communications Act)	

OPPOSITION OF AT&T INC.

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I. INTRODUCTION AND SUMMARY

AT&T Inc. and its affiliated companies oppose the above-referenced petition by tw telecom inc. (TWTC) for a declaratory ruling that TWTC’s facilities-based Voice Over Internet Protocol (“VoIP”) services are telecommunications services as well as telephone exchange services and/or exchange access, and, accordingly, TWTC is entitled to establish direct IP-to-IP interconnection with incumbent LECs for the transmission and routing of such services under Section 251(c)(2) of the Communications Act.¹ 47 U.S.C. § 251(c)(2) (the “Act”). TWTC

¹ TW Telecom Inc. Petition for Declaratory Ruling Regarding Direct IP-to-IP Interconnection Pursuant to Section 251(c)(2) of the Communications Act at 2 (filed June 30, 2011) (Petition). TWTC also asks the Commission to declare that services that originate and terminate in Time Division Multiplexing (TDM) format but are converted to IP format for transport (*i.e.*, IP-in-the-middle services) are telecommunications services, and thus that it should be allowed to demand direct IP-to-IP interconnection for such services. It asserts that, because the Commission already has held that IP-in-the-middle services are telecommunications services, its petition “does not further address the classification of these services and instead focuses on the classification of TWTC’s facilities-based VoIP services.” *Id.* at 3, 8. TWTC thus does not explain how such services are provided (for example, who converts the IP-in-the-middle traffic from TDM to IP and back to TDM, where such conversions take place, *etc.*), making it impossible to analyze the merits of its petition with respect to such services. Because TWTC has failed to provide this basic information, the Commission should deny TWTC’s request regarding those services. Accordingly, AT&T does not further address this aspect of TWTC’s petition and focuses instead on the classification of TWTC’s facilities-based VoIP services.

claims that this declaratory ruling is critical to facilitate the transition from TDM to IP technology, and thus to promote deployment of next-generation broadband networks.² In reality, TWTC's petition plainly is a self-serving attempt to shift to ILECs the cost of converting the transmission protocol of its VoIP traffic to TDM for transport and termination on the PSTN. TWTC's request is not only unlawful but also contrary to sound public policy.

As AT&T previously has explained, the VoIP services at issue are information (not telecommunications) services, and TWTC thus has no right to demand interconnection for the transmission and routing of such services pursuant to section 251(c)(2). Even if those services were telecommunications services (which they are not), the Commission could not mandate that ILECs accept IP-to-IP interconnection because that would require ILECs to provide access to an "unbuilt, superior network," which, as the Eighth Circuit has ruled, exceeds the Commission's authority under section 251(c)(2).

Nor is there any merit to TWTC's claim that grant of its petition is necessary to facilitate the transition from TDM to IP technology, and thus to promote deployment of next-generation broadband networks. To the contrary, grant of its petition would have precisely the opposite effect, forcing ILECs to divert scarce investment capital from further deployment of broadband facilities and services to deployment of facilities and equipment to enable competing VoIP providers to reach the rapidly dwindling number of POTs subscribers. Granting TWTC's petition thus would undermine the Commission's ambitious objectives of encouraging deployment of broadband facilities and services to all Americans.

Moreover, TWTC's petition is wholly unnecessary. IP-based interconnection already is occurring, and indeed flourishing, today. And that is so not *despite* the lack of regulation but

² See *id.* at 5.

because federal and state regulators wisely have refrained from imposing the heavy hand of regulation on IP-based services and interconnection. As we have explained elsewhere, interconnection among IP-based service providers currently is governed by freely negotiated agreements, and that market-based regime for exchanging IP traffic has functioned well for decades.³ There is no reason to believe it will fail to do so in future. In addition, interconnected VoIP providers have a variety of market-based options for converting their traffic into TDM format before handing it off to TDM-based carriers – including services offered by Neutral Tandem, HyperCube and others. TWTC’s petition would supplant these market-based solutions with regulatory mandates and below-market pricing, and thus undermine this competition and the public interest benefits it brings.⁴

For all these reasons, TWTC’s petition must be denied.

II. DISCUSSION

A. TWTC’s VoIP Services are Information Services

In its petition, TWTC simplistically claims that its facilities-based VoIP services (*i.e.*, its Direct SIP Trunk service and Converged Voice Services) offer end users some functionalities that are “strikingly similar” to the “transmission of voice signals to and from locations of the customer’s choosing without any fundamental alteration of the voice signals” provided by traditional, TDM-based telephone services, and thus that its “telephone service provided via facilities-based VoIP network technology remains the quintessential telecommunications service.”⁵ It further claims that the services at issue are “‘comparable’ to traditional local phone

³ AT&T Reply Comments, WC Docket Nos. 10-90 *et al.*, at 2; 8-16 (filed May 23, 2011).

⁴ *Id.* at 17-18.

⁵ TWTC Petition at 8-9. *See also id.* at 11-12 (noting that the core functionality of the VoIP services at issue is the ability to make and receive telephone calls, which is the same as that of TDM-based telephone service, and that it offers such services to the public for a fee, and

services” because they “provide essentially the same functionalities as traditional, TDM-based telephone services,” and consequently meet the statutory definition of a telephone exchange service.”⁶ Accordingly, TWTC asserts, it has the right to interconnection for such services under section 251(c)(2) of the Act at any technically feasible point.”⁷

TWTC’s analysis is fundamentally flawed on every level. As TWTC recognizes, ILECs are obligated to provide interconnection with their local exchange carrier networks only to a telecommunications carrier (*i.e.*, a provider of “telecommunications services”),⁸ and only for the transmission and routing of “telephone exchange service and exchange access,”⁹ which is why TWTC struggles so desperately to convince the Commission that its VoIP services fall within the definitions of a “telecommunications service” and “telephone exchange service” or “exchange access.”

claiming that, consequently, such services fall “precisely within the statutory definition of ‘telecommunications services.’”).

⁶ *Id.* at 17. TWTC asserts that, because the services at issue are telephone exchange services, the Commission need not decide whether they meet the definition of exchange access. *Id.* at 18. But, it claims, those services also provide “exchange access” because TWTC offers to terminate calls transmitted by stand-alone long distance providers to its VoIP subscribers. Of course, if, as discussed below, TWTC’s VoIP services are not telephone exchange services, then its offer to terminate long distance calls to such customers also cannot meet the definition of “exchange access.” 47 U.S.C. § 153(16).

⁷ TWTC Petition at 20. TWTC also argues that the Commission should require ILECs to provide IP-to-IP interconnection because “converting all of the information required to transmit a call in IP to a different protocol creates a significant risk that some of the information will be lost in translation, and result “in a serious degradation of service.” TWTC Petition at 7. But the traffic at issue must be converted from IP to TDM format for termination on the PSTN regardless of which party performs the conversion. Indeed, millions of minutes of VoIP traffic are already being converted for termination on the PSTN today without any degradation of service. Moreover, if TWTC really was concerned that conversion of its VoIP traffic to TDM for termination on the PSTN might result in a loss of information and service degradation, one would think it would want to perform the conversion itself to ensure that it is done properly rather than trying to foist that task onto ILECs.

⁸ 47 U.S.C. § 153(44).

⁹ 47 U.S.C. § 251(c)(2).

TWTC's "quacks like a duck" argument is wholly unavailing. The mere fact that TWTC's VoIP services provide "the ability to make and receive telephone calls" does not mean those services are "telecommunications services," and "telephone exchange service" or exchange access, as TWTC claims.¹⁰ Rather, those services are "information services" because: (1) they require a net protocol conversion to allow intercommunication with end users attached to the PSTN; and (2) they integrate voice calling with a variety of other functionalities that allow end users to "generat[e], acquir[e], stor[e], transform[], process[], retriev[e], utilize[e], or mak[e] available information via telecommunications."¹¹

As the Commission has long recognized, a service that "enables an end-user to send information into a network in one protocol and have it exit the network in a different protocol clearly 'transforms' user information" and thus entails a net protocol conversion between end-users, which constitutes an "enhanced" or "information" service.¹² Insofar as TWTC's VoIP services allow its subscribers to originate communications in IP format and terminate them on the circuit-switched PSTN in TDM format (and vice versa), those services entail a net protocol conversion and therefore are properly classified as information services.

TWTC itself concedes, as it must, that its VoIP customers' calls that terminate on the PSTN undergo a net protocol conversion, and that the Commission has concluded such services

¹⁰ TWTC Petition at 11.

¹¹ 47 U.S.C. § 153(20).

¹² *Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as Amended*, CC Docket No. 96-149, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 21905, 21956 ¶¶ 103-66 (1996) (*Non-Accounting Safeguards Order*) (holding that "all of the services that the Commission has previously considered to be 'enhanced services' [which include those offering a net protocol conversion] are 'information services'").

“are generally information services.”¹³ But, it claims this fact does not render those services “information services” because such protocol conversions are occurring “in connection with the introduction of a new basic network technology’ (*i.e.*, a new technology for providing ‘telecommunications’).”¹⁴ But the “new technology” exception on which TWTC relies was intended to address situations “involving no change in an existing service, but merely a change in electrical interface characteristics to facilitate transitional introduction of a new technology.”¹⁵ Here, TWTC’s services do not merely change the underlying technology used to provide an existing basic telecommunications service, but rather (as discussed below) are entirely new services that offer functionalities and characteristics that are distinct from legacy, TDM-based telephone services. Consequently, TWTC’s services do not fall within the “new technology”

¹³ TWTC Petition at 12.

¹⁴ *Id.* at 13 (citations omitted). TWTC also asserts that, “while the Commission has concluded that services involving a net protocol conversion are generally information services, this rule has never been used as the basis for treating telephone service as an unregulated service.” *Id.* at 12-13. It claims further that the Commission treated net protocol conversions as enhanced out of concern that ILECs might provide transmission services to their affiliated providers of protocol conversion services on more favorable terms than to unaffiliated providers of such services. And because, it maintains, there are few independent providers of protocol conversion services (which is not true, insofar as companies like Neutral Tandem, HyperCube and others offer IP-to-TDM conversion services), there is no protocol conversion market to protect and thus no reason to retain the rule that services involving a protocol conversion are information services. *Id.* at 14-15. However, neither of these arguments falls within any recognized exception to the Commission’s long-standing rule that a service providing a net protocol conversion is an information service, and thus provides no basis for classifying TWTC’s VoIP services as telecommunications services. [Even if TWTC’s arguments merited a reexamination of the Commission’s rules relating to net protocol conversions, which they do not, the Commission could adopt the exceptions to those rules that TWTC advocates only through a rulemaking – not a declaratory ruling – insofar as those rules were adopted long ago through a rulemaking in the *Computer Inquiry Proceeding*.]

¹⁵ *Communication Protocols under Section 64.702 of the Commission’s Rules and Regulations*, GN Docket No. 80-756, Memorandum Opinion, Order, and Statement of Principles, 95 FCC 2d 584, ¶ 16 (1983).

exception to the rule that a service involving a net protocol conversion between end-users is an enhanced, and thus an information, service – not a telecommunications service.

In any event, the services at issue here (*i.e.*, TWTC’s Direct SIP Trunk service and Converged Voice Services) provide voice calling as an application integrated with a variety of other applications/functionalities that allow end users to “generat[e], acquir[e], stor[e], transform[], process[], retriev[e], utiliz[e], or mak[e] available information via telecommunications.”¹⁶ TWTC itself acknowledges as much, noting that its services “enable end users to increase their productivity with applications such as click-to-call conferencing (which permits end users to initiate an instant conference call by clicking on the names of the desired participants) and ‘find me/follow me’ (which permits end users to be reached at any of several telephone numbers).”¹⁷ While TWTC attempts to downplay the significance of these additional functionalities by likening them to speed dial and call-forwarding,¹⁸ those applications plainly constitute information services insofar as they combine computer processing, information provision and computer interactivity with data transport.¹⁹ Moreover, the services at issue combine a host of other functions as well, including Internet access and IP VPN, as part of a “single fully managed solution.”²⁰ As TWTC’s own literature describes its Converged Services:

¹⁶ 47 U.S.C. § 153(20)

¹⁷ TWTC Petition at 11, citing McNamara Decl. at ¶ 5.

¹⁸ *Id.* (“The click-to-call conferencing and find me/follow me applications are similar to speed dial and call forwarding features, respectively, that have been offered by providers of TDM-based telephone services for years.”).

¹⁹ *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, et al.*, GN Docket No. 00-185, *et al.*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798, 4821 (2002) (*Cable Modem Order*), citations omitted.

²⁰ *See*

http://www.twtelecom.com/Documents/Resources/PDF/MarketingCollateral/twProdSl_4804ConvServ_0410.1.pdf (last visited Aug. 11, 2011) (“tw telecom’s Converged Services combines voice (local and long distance), secure Internet access, and IP VPN into a single fully-managed

Much more than a simple bundled service, Converged Services delivers overall flexibility in network design, the ability to change configuration based on location needs, greater control over bandwidth allocation and prioritization, and built-in security, giving your business a much more robust solution to maximize your network and your resources.²¹

The services at issue thus “combine[] computer processing, information provision, and computer interactivity, enabling end users to run a variety of applications” as a “single, integrated service,” which accordingly “constitute[s] an information service, as defined in the Act.”²²

Section 251(c)(2) applies only where the party requesting interconnection is a “telecommunications carrier” (*i.e.*, a “provider of telecommunications services”).²³ Because, as discussed above, the traffic TWTC seeks to exchange via IP-to-IP interconnection is an information service (and thus not a telecommunications service), TWTC is not entitled to interconnection pursuant to section 251(c)(2).²⁴

solution.”). *See also*

http://www.twtelecom.com/Documents/Resources/PDF/cs/CaseStudy_BoiseState3.pdf (last visited Aug. 11, 2011) (describing a Direct SIP trunk solution provided by TWTC to Boise State as a “converged voice and data network” provided over a “single connection.”). *Id.* (“When you change to SIP trunking everything becomes software controllable. . . . [It allows the user to] compress channels, alter data streams and do a lot of other things.”). *Id.* (“We just dropped the SIP line onto our main university routers and were good to go.”).

²¹ Converged Services, tw telecom, available at

http://www.twtelecom.com/Documents/Resources/PDF/MarketingCollateral/twProdSl_4804ConvServ_0410.1.pdf (attached).

²² *Cable Modem Order* at 4821-22.

²³ 47 U.S.C. § 153(44).

²⁴ In order to qualify for interconnection under section 251(c)(2), a provider not only must be a telecommunications carrier (which TWTC is not for the services at issue) but also be providing “telephone exchange service” or “exchange access” – that is, local PSTN services. 47 U.S.C. § 251(c)(2)(A). However, the services TWTC is providing are overwhelmingly and inseparably interstate. And, as the Commission made clear in the *Local Competition Order* over a decade ago, a carrier providing only interexchange or interstate services cannot demand interconnection pursuant to section 251(c)(2). *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Interconnection Between Local Exchange Carriers and*

B. The Interconnection TWTC Demands Would Require Access to an As-Yet Unbuilt Network.

Even if the Commission were to conclude (wrongly) that the services at issue here are “telecommunications services,” as well as “telephone exchange services” or “exchange access,” as it must to require interconnection pursuant to section 251(c)(2), it could not mandate ILECs to accept IP-to-IP interconnection. Over a decade ago, in vacating the Commission’s superior quality interconnection rules, the U.S. Court of Appeals for the Eighth Circuit held that section 251(c)(2) requires access “only to an incumbent LEC’s *existing* network – not to a yet unbuilt superior one.”²⁵ It further held that the Act “does not mandate that incumbent LECs cater to every desire of every requesting carrier.”²⁶ Thus, the Commission cannot require ILECs to deploy a new network using new technology simply to suit an interconnecting carrier.

But, that is precisely what the Commission would have to do if it were to grant TWTC’s petition. That is because mandating IP-to-IP interconnection would require ILECs to create new functionalities or capabilities that do not currently exist in their networks, simply to accommodate TWTC’s preference for delivering its traffic in IP format. While the industry is in the midst of a migration to IP technology, that transition is by no means complete. In any event, in many (if not most) cases, ILECs are not themselves offering IP-based services and have not deployed media gateways and other IP technology in the PSTN to exchange traffic in native IP-format, and to convert that traffic to TDM for termination on the PSTN. Rather, it is the ILECs’ affiliates (such as their long distance affiliates) that have deployed IP networks and are offering IP-based services (including VoIP services), and that are converting IP traffic to TDM for

Commercial Mobile Radio Service Providers, CC Docket No. 96-98, 11 FCC Rcd 15499, 15598-99 (1996) (*Local Competition Order*).

²⁵ *Iowa Utils. Bd. v. FCC*, 120 F.3d 753, 813 (8th Cir. 1997), subsequent history omitted.

²⁶ *Id.*

transmission and routing on the PSTN where necessary. As a consequence, the ILECs cannot provide IP-to-IP interconnection to route and terminate IP traffic on the PSTN without a massive overhaul of the network, which cannot be required under section 251(c)(2).²⁷

C. There is No Legitimate Policy Basis to Require IP-to-IP Interconnection.

Nor is there any legitimate policy basis for interpreting section 251(c)(2) to require IP-to-IP interconnection. The exchange of IP-based and other packet-switched communications on the Internet has, since its inception, been governed by market forces rather than prescriptive regulatory mandates. That regime has functioned well for the past two decades, adapting to astonishing changes in technology and massive increases in traffic, all without government intervention. As of June 2010, the number of interconnected VoIP subscriptions (the vast majority of which are to services provided by non-ILECs) had reached 29 million, an increase of 21 percent, even as the number of switched access lines declined by 8 percent, from 133 million to 122 million.²⁸ The minimally regulated, market-oriented framework that has governed the exchange of VoIP traffic on the Internet and with the PSTN has efficiently facilitated the transmission and exchange of millions of VoIP calls, and there is no reason to believe it will not continue to do so. Indeed, the surest way to constrain the ability of this framework to continue evolving and expanding to meet the needs of consumers and the nation's economy would be to subject it to the hornet's nest of intractable regulatory controversies that have roiled the PSTN for the past thirty years.

²⁷ Even if ILECs are incrementally deploying IP facilities and equipment as part of an evolution in the network, requiring them to accelerate the pace of such deployment and to disrupt their deployment plans to accommodate the interconnection demands of VoIP providers like TWTC would not constitute a routine modification of the network that can be required under section 251(c)(2).

²⁸ Local Telephone Competition: Status as of June 30, 2010, Industry Analysis and Technology Division, Wireline Competition Bureau at 5-6 (rel. Mar. 2010), available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db0321/DOC-305297A1.pdf.

Moreover, interconnected VoIP providers have a variety of market-based solutions for converting their traffic into TDM format before handing it off to TDM-based carriers. Neutral Tandem, HyperCube and others have made providing such IP-to-TDM conversions a cornerstone of their business strategies. TWTC's petition would supplant these market-based solutions with regulatory mandates and below-market pricing, and thus undermine this competition and the public interest benefits it brings.²⁹ Such a result would be contrary to the very purposes of the 1996 Act, which was enacted to promote competition and innovation.³⁰

Granting TWTC's petition also would threaten the nation's goal of encouraging deployment of broadband facilities and services to all Americans. That objective can only be achieved through private investment to further expand deployment of broadband facilities and equipment. Requiring ILECs instead to invest (or accelerate their investment) in the media gateways and other equipment that would be necessary to enable them to accept competing providers' VoIP traffic in native IP-format, and to convert that traffic to TDM for termination to the declining number of POTs subscribers, would force ILECs to divert scarce investment capital from development of their own broadband networks. It also would spawn years of costly litigation, like that which followed adoption of the Commission's rules governing interconnection for legacy, TDM-based services. Such a requirement thus would create a

²⁹ *Id.* at 17-18.

³⁰ *See, e.g., Global NAPs, Inc. v. Verizon New England, Inc.*, 454 F.3d 91, 94 (2nd Cir. 2006) (“Two prevalent themes of the 1996 Act are emphasis on competition for the benefit of consumers and to further innovation, and a predilection to leave the Internet largely unregulated.”).

significant barrier to ILECs' investment in broadband infrastructure in direct contravention of section 706 of the Act³¹ and goals of the National Broadband Plan.

III. CONCLUSION

For the foregoing reasons, the Commission should reject TWTC's petition.

Respectfully submitted,

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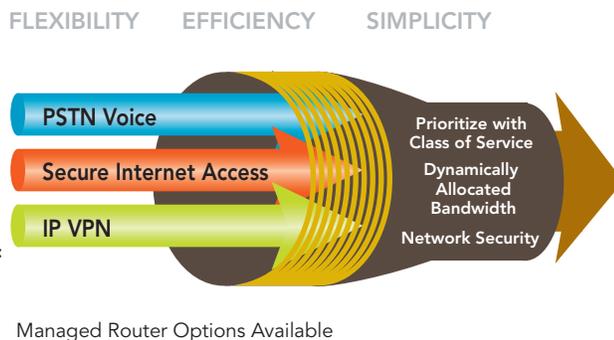
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³¹ 47 U.S.C. § 1302(a) (“The Commission ... shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans ... by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.”).

Converged Services



Building a business network does not have to be complicated. Converged Services from tw telecom provides everything you need for your voice, data, and Internet communications—all in one easy, customized solution, and managed by a provider known for superior customer service and network reliability. Experience the ultimate in flexibility, simplicity, and efficiency with Converged Services from tw telecom.



One Network. All the Options.

tw telecom's Converged Services combines voice (local and long distance), secure Internet access, and IP VPN into a single, fully-managed solution.

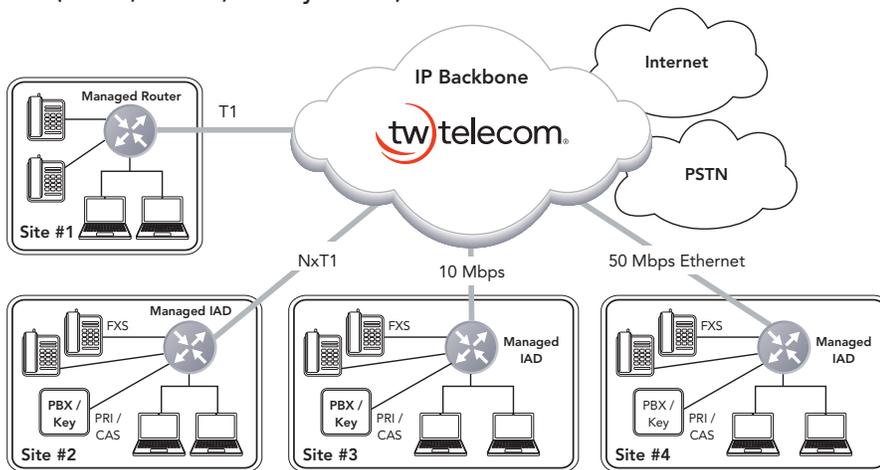
Much more than a simple bundled service, Converged Services delivers overall flexibility in network design, the ability to change configuration based on location needs, greater control over bandwidth allocation and prioritization, and built-in security, giving your business a much more robust solution to maximize your network and your resources. Whether you have a single location, or hundreds of sites of all different sizes, Converged Services has flexible connection options to meet your needs starting at a single T-1 and scaling up to Gigabit Ethernet.

Delivering multiple services over a single fully-managed connection not only simplifies your network, it also saves your business time and money. Everything you need is included with no expensive hardware to buy, configure, maintain or manage.

Feature-Rich Capabilities

- Select the appropriate mix of full featured lines, and digital trunks or PRI for your voice service. Our voice service is designed to seamlessly support either traditional or IP phone systems.
- With tw telecom's fully-managed secure Internet access, you do not have to equip each site with its own Internet connection and firewall, maximizing your bandwidth and IT resources, and minimizing cost.
- Dynamic bandwidth allocation enables Converged Services to more efficiently use bandwidth. Voice and data can more efficiently use the available bandwidth so there is never idle capacity.
- Class of Service (CoS) options allow you to further manage bandwidth by prioritizing time-sensitive applications to ensure peak performance.

CONVERGED SERVICES
(IP VPN, Internet, Security & Voice)



Advantages of Converged Services

Simplicity: Simplify your network by integrating voice, data and Internet into a single, flexible, efficient solution.

Any-to-Any Connectivity: A fully meshed network allows you to reduce latency by avoiding hub and spoke traffic patterns. It also makes adding a location quick and easy.

Internet Security: All Internet traffic flows through **tw telecom**'s redundant network firewalls, which are managed by our team of security experts.

Free Long Distance and In-Network calling: All lines, trunks and PRI come with free long distance minutes of use (based on bandwidth purchased) and free calling to any other **tw telecom** customer nation-wide.

Proactive Management: Fully-managed security and hardware frees your IT resources up for other initiatives. Your network connections are also monitored 24x7.

Control & Visibility: MyPortal provides self-service access to account information, bandwidth utilization, on-line billing, trouble ticket creation and tracking, and much more.

SLA: Your services are backed by **tw telecom**'s industry leading Service Level Agreements.

Superior Customer Experience: Our people listen carefully, respond quickly and make things happen.

About tw telecom

tw telecom delivers the most advanced telecommunications solutions on the market to a wide spectrum of business and organizations across the United States. Since 1993, we have built a legacy of success through exceptional customer care, remarkable product and powerful networks. These strengths enable us to deliver scalable solutions that help customers improve their business metrics. For more information please visit www.twtelecom.com.

Boise State University Graduates to Largest National Education VoIP Deployment with tw telecom IP-based Solution



THE COMPANY

Boise State University

INDUSTRY

Education

EMPLOYEES

2,200

BUSINESS RESULTS

- **VoIP-enabled solution cut call expenses by 50 percent**
- **Eliminated six gateway devices via direct-connect SIP trunk**
- **Simplified network to significantly reduce administration effort**
- **Metro Ethernet upgraded remote campus user status to real time application access**

COMMUNICATIONS APPLICATIONS

- **Voice over IP implementation**
- **Economical long distance calling**
- **Inter-facility voice/data/video connectivity**



The Challenge

Several years ago, Boise State University IT managers looked to the future of communications technology. They reviewed their expenditures. They talked about their dealings with their communications vendor. And in the end, they decided to convert their copper-wire based voice network to a fiber-based, voice over Internet protocol (VoIP) network.

It wasn't an easy journey. At the time, their vendor was a monopolistic-minded incumbent local exchange carrier (ILEC). According to Brian McDevitt, manager of telephone network services, for the University, "It was always frustrating because it was such a chore to get any customer service out of them."

So motivated by poor service, the desire to deploy productivity-enhancing technology and trim expenses and effectively connect the school's three main campuses, Boise State managers issued an RFP. In the end, **tw telecom** won the bid to implement a plan to replace 1,000 copper lines with a fiber solution.

"**tw telecom** helped us achieve our goal of bringing all service on campus onto fiber," explained McDevitt. We saw a need to be on metro fiber to reduce prices and scale circuits effectively to pace our fast growth."

Later, Boise State managers decided to simplify their network further by taking the next evolutionary VoIP step. They issued an RFP for a Session Initiation Protocol (SIP) trunk that would connect directly to their VoIP PBX. Again **tw telecom** won the competitive bid.

Fueled by the new services, Boise State's VoIP deployment had grown to 14,000 DID's and 4,000 handsets, making it the largest nationwide among Universities, 65th overall nationwide and 145th worldwide.

About tw telecom

tw telecom delivers the most advanced telecommunications solutions on the market to a wide spectrum of businesses and organizations across the United States. Since 1993, we have built a legacy of success through exceptional customer care, remarkable products and powerful networks. These strengths enable us to deliver scalable solutions that help customers improve their business metrics. For more information, please visit www.twtelecom.com.

RELATED SOLUTIONS/ TECHNOLOGIES

- Cisco CallManager IP PBX server-based application

TW TELECOM SOLUTIONS

- SIP Trunk (SIP IP Trunking)
- Metro Ethernet Service (Native LAN Service)

The Solution

Services: Boise State initially deployed tw telecom's Metro Ethernet service (Native LAN). The two 100 Mbps pipes linked the University's main and two remote Canyon County and Boise West campuses. These moved the network from divergent voice/data communications to converged Ethernet circuits which carry data, video and voice traffic.

Later, Boise State network engineers worked with **tw telecom** experts to replace eight T1s with a single 20 Mbps Quality-of-Service-enabled SIP trunk at the main campus. The SIP service connects directly to the University's Cisco CallManager VoIP PBX system and provides PSTN termination for unlimited local calls. To meet business continuity objectives, McDevitt runs CallManager on three clustered servers across campus.

The Value to the Business

Financial Benefits

Boise State managers leveraged the new technology to good effect. "We figure the new solution will be about half the cost of what we paid previously," explained McDevitt. "That's possible in part because the SIP trunk allows us to access on-net long-distance **tw telecom** nodes for free. Those are important considerations for a state-funded university."

By connecting directly to Boise State's network, the SIP trunk enabled the retirement of six gateways formerly used to connect to T1 digital service.

"Not only did that simplify our network, it gave us savings in administration and maintenance costs," said McDevitt.

The easier-to-administrate VoIP phone system contributed to McDevitt's ability to hold the line on headcounts too. That's in spite of significant growth in recent years that has doubled the size of the University's phone network.

Business Benefits

The metro Ethernet solution allowed McDevitt's team to economically and efficiently connect the school's Main, West and Canyon County campuses. This eliminated the need to use costly tie lines or the related hardware and maintenance that would have been required with an alternative solution.

Shortly after moving to a VoIP implementation, Boise State technicians began running a single line to desktops versus the two-wire harnesses they ran before. "Being able to lay one data cable to the desktop and split it for phone service really reduces our overhead costs," stated McDevitt. "We can turn up new stations quicker and more efficiently."

In referring to the University's deployment of **tw telecom**'s metro Ethernet service, McDevitt said, "Our remote locations are about 15 miles apart. By replacing T1s with the 100 Mbps service we were able to upgrade users at remote sites to real time status."

"The **tw telecom** SIP Trunk is a key element of our VoIP implementation. It is highly scalable, interoperates with our Cisco CallManager application, and will substantially cut our costs. We believe SIP technology will revolutionize business communications the way VoIP has changed the residential landscape."

Brian McDevitt

Manager of Telephone

Network Services

Boise State University

From an employee/student productivity perspective, McDevitt is bullish on VoIP's future potential. "We're looking forward to the next generation of applications. For example, students, faculty and administrators will eventually be able to click a link on a website to be connected automatically. When you multiply the seconds of time savings that gives you by the thousands of times it would be used daily, it adds up."

Another VoIP benefit has been easing the burden on the school's help desk. The new phones use intuitive web-based interfaces that replace arcane phone customization button sequences of old.

Technology Benefits

The new solution enabled the IT team to converge their voice and Internet traffic. This eliminated the need to manage, maintain and update separate voice and data networks and their related infrastructure.

According to McDevitt, the SIP implementation simplified the administration of his networks. "The converged voice and data network means we only need to worry about a single connection. From a personnel skill-set perspective, that means I can run voice and data services with people experienced with data networks."

Additionally, by providing an IP handoff, the Boise State IT staff was able to fully utilize their IP PBX LAN infrastructure to support local calling and inter-office calling for faculty, staff and students.

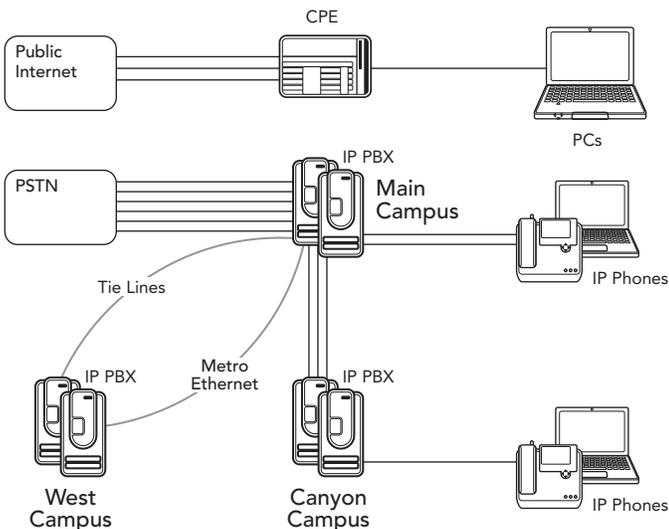
Since migrating to **tw telecom's** fiber, Boise State has upgraded to greater bandwidth, scalability and business-class service. Specifically, the SIP trunk service scales from two to hundreds of Mbps capacity. And McDevitt describes the service as "clearer with less static than the old solution."

Another service advantage has been reduced downtime. Before, if a T1 had a bad channel it had to be configured out of the CO. "When you change to SIP trunking everything becomes software controllable," stated McDevitt. "We can compress channels, alter data streams and do a lot of other things. It's much more configurable by us. We could do almost nothing with the old T1s."

From a network topology standpoint, the SIP trunk deployment eliminated potential points of failure. "We retired six T1 gateway devices we no longer needed," explained McDevitt. "We just dropped the SIP line onto our main university routers and were good to go."

Before

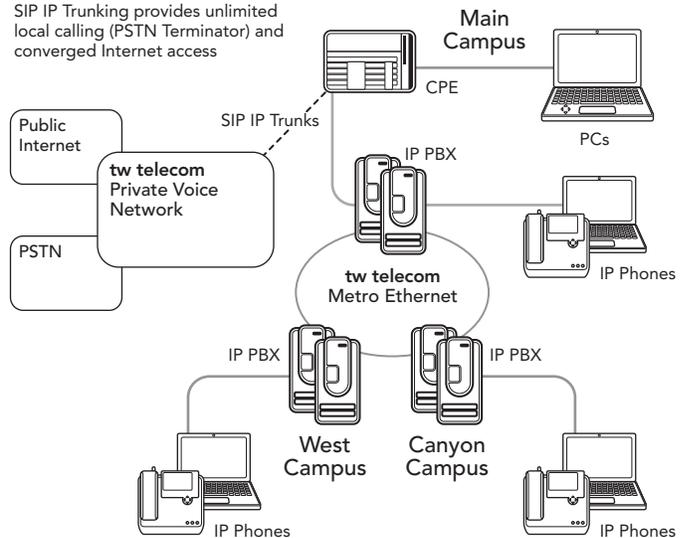
Legacy Voice Deployment with
PRIs and Separate IP access for Internet



After

SIP IP Trunks Deployment with Converged VoIP
and Internet across Metro Ethernet.

SIP IP Trunking provides unlimited
local calling (PSTN Terminator) and
converged Internet access



The tw telecom Experience

tw telecom put to rest customer service issues for Boise State managers. "It's been very refreshing to have a sales person continue to follow up with me after the sale," explained McDevitt. "There was no drop off in responsiveness to our needs or to any issues. Unlike our former provider, I talk to people at the CO down the street if there's a problem instead of some guy in Denver."

As for the SIP deployment, "The process as been great so far. tw telecom brought in industry experts to make sure this new technology goes in perfectly the first time. The project schedule was well planned and it's been pleasant dealing with their management, technicians and experts."

Boise State University

Boise State University is the largest institution of higher education in Idaho with about 18,600 students and 2,200 faculty and staff. More than 190 undergraduate, graduate, doctoral and technical degrees are offered within eight colleges. A metropolitan university located in the capital city, Boise State is committed to life-enhancing research, teaching excellence and public service.
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