



Strategic Networks Group
Insight to Move Forward

SIP Trunk Services: The Cornerstone of Unified Communications

First in a Series on the Migration to Converged Networks

Lisa Pierce
lpierce@strategicnw.com

Doing More with Less

The Benefits of Unified Communications

In these challenging economic times, many organizations have reduced budgets and furloughed employees.ⁱ One of the important consequences of downsizing is that the remaining workforce must work both efficiently and cost-effectively. This is especially important to mid-sized companies.ⁱⁱ But organizations can't do more with less by doing business as usual. Thus it's especially important that available personnel have the tools on hand to maximize their productivity. These are precisely the benefits cited by early adopters of Unified Communications.

Unified Communications (UC) provide a flexible and feature-rich platform to support the integration of non real-time data and text-based applications with a variety of emerging real-time applications, such as location-based services, fixed/mobile convergence, multimedia collaboration, and applications that use presence engines, like click to call/chat (see Table 1). In fact, according to a recent poll, 32% of US businesses already use UC applications, and an additional 31% plan to begin deploying these within the next three years.ⁱⁱⁱ

Convergence: The Foundation of Unified Communications

To deploy UC, organizations must first deploy a single network infrastructure that supports both voice and data applications. Typically known as a converged infrastructure, at a high level this requires businesses to upgrade or acquire new LAN and IP Telephony hardware and software, and to connect these upgraded sites, Internet Protocol (IP)-based WAN access, services and features.^{iv} Many companies are laying the foundations for deploying UC at their sites by acquiring the necessary converged network infrastructure.^v For instance, according to the TIA, the number of IP PBXs in use in the U.S. exceeded that of legacy PBXs in 2007.^{vi}

Looking at the wide area, a number of IP-based services are available from service providers. The simplest, Internet services, typically are the least suited to provide a secure, reliable infrastructure capable of supporting both real time and non-real time applications. To support business-class convergence, organizations typically employ carrier services like MPLS and Ethernet. Businesses continue to migrate from legacy layer 2 services like Frame Relay and ATM to these WAN services, even in the current economic climate.^{vii} In fact, by the end of 2010, MPLS adoption will reach the tipping point - with installations exceeding that of legacy layer 2 data services.^{viii}

Table 1

Category	Description
<i>IP-Based Collaboration and Conferencing</i>	Point-point and multipoint videoconferencing (desktop, room/telepresence), web/data conferencing or whiteboarding augmented by audio
<i>Find Me/Follow Me</i>	Enabled by presence engines, often ties in Fixed Mobile Services like consecutive ring or single number service
<i>Unified Messaging</i>	Unified inbox/outbox (single message box that handles email, IM, fax, landline and mobile phone messages) often augmented by text-to speech and speech-to text capabilities
<i>Contact Center</i>	Presence is used to optimize call/session handling; other common UC applications used in contact center applications include click to chat, click to call and speech recognition

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Session Initiation Protocol (SIP) Trunks: The Cornerstone of Unified Communications

Although far from being a best practice, many companies implement convergence in a piecemeal fashion. Along with migrating from Frame Relay or ATM to MPLS and Ethernet services, they upgrade their LANs and implement IP PBXs on a select basis. But often they upgrade each of these without considering how they will interwork. Thus the connection between the new IP-based WAN and the new IP-based LAN often uses legacy access technology. This presents the following types of problems:

- By using legacy access, the IP-based WAN and LAN are islands unto themselves, incapable of supporting geographically dispersed UC applications.
- Although Ethernet and MPLS services have many of the necessary attributes, such as Class of Service, to support UC applications, they are fundamentally data services. As such, they are unable to perform session or call control functions, which are essential to UC.

The solution to both problems is SIP Trunks. SIP trunks perform some key call and session control and management functions, and serve in place of traditional access lines and trunks.^{ix} Typically provisioned by carriers over T1 trunks, carrier-based SIP trunk services interface between carriers' nodes and SIP-enabled customer premises equipment, such as a SIP gateway or IP PBX.^x SIP Trunks also interconnect customer sites with hosted VOIP/IP centrex services, cloud/software as a service (SaaS) applications, and facilitate customer connectivity with IMS-based applications, like single number service (see sidebar). At the carrier, SIP Trunks interconnect to IP-based WAN services, VOIP/multimedia-enabled network nodes and from these, to the public switched telephone network (PSTN).

By bridging IP-enabled local area networks and IP-based carrier networks, SIP Trunks provide the necessary all-IP foundation to enable UC collaboration between individuals who work in diverse locations.^{xi} As such, they act as the cornerstone of a converged infrastructure, and are essential to the functionality of Unified Communications. Not surprisingly, use of SIP Trunks is becoming very popular—one recent study places adoption in almost 40% of North American enterprises.^{xii} Since SIP enables UC, it works in concert with a number of other protocols including those necessary to support Presence and Instant Messaging (via SIMPLE) and multimedia applications like SDP, RTP, RTCP.^{xiii} In addition to facilitating the use of UC applications between diverse locations, SIP Trunks provide other benefits, including reducing some network-related expenses (see Table 2).

Spotlight on UC: Single Number Service

Typical fixed-mobile converged (FMC) services allow a caller to dial one number (for instance, someone's office phone), but to also ring the same called party's cellular and home office phones (enabled either via pre-provisioned consecutive or simultaneous ring services subscribed to by the called party). In many cases, calls are tromboned between the PBX and the phone the called party uses to answer the call. But with a network-based IP Multimedia Subsystem (IMS)-based Single Number Service, the called party may still use several types of phones, but only has one publicly-available phone number. By utilizing a SIP-based presence engine that monitors activities across a wide range of user devices, the IMS platform rings only the phone the called party is using at that time. In addition to saving money on phone numbers and voice trunks at the main company site (where the PBX is located), the company can decide what Caller ID is used for outbound calls. For instance, a physician who is calling a patient from her home or cellphone may prefer that the patient see her office's Caller ID.

Table 2

Major SIP Trunk Benefits for Business Customers	
Function	Example
<i>Support for UC Applications</i>	See Table 1 for some examples- can be especially important to cost-effectively extend UC to small/remote sites
<i>Decreased Telecommunications Expenses</i>	Reduce the number of service-specific access lines and trunks on either a local or long distance basis, frequently also decreasing the effective price of on-net calls. Some providers' SIP Trunk services also offer lower prices on local calls or blocks of DIDs.
<i>Simplified Architectures</i>	Companies that implement UC and SIP Trunks often make heavy use of strategically-placed data centers. This often results in drastically simplified IT/network architectures.
<i>Future Migration</i>	Paves the way for future migration to advanced WAN services like Ethernet VPLS, or cloud/SaaS-based solutions

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Migrating to SIP Trunk Services

Although not supported universally, customers can acquire SIP trunk services from a growing array of telecommunications service providers, including legacy PSTN providers, cable providers/MSOs, VOIP specialists and select managed service providers and value-added resellers (VARs). Like any communications-related technology that is emerging, expertise and competency varies significantly by both provider and vendor (such as SIP-enabled IP PBX, gateway or videoconferencing product). The best way to ensure that your company's equipment will interwork appropriately with your SIP Trunk services provider is to check with the provider directly—many conduct interoperability tests with popular vendors' products and software releases on an ongoing basis. There are other issues to consider, such as WAN architecture. It's certainly possible to simply replace T1s and analog lines with SIP trunks, but customers who implement IP Telephony and UC systems frequently use the data center as their communications hub. In these circumstances, they make substantial use of MPLS and Ethernet services to support intra-company voice and data communications, and may only elect to use SIP Trunks when connecting from the data center(s) to external networks (see Figures 1 and 2).

Staged Implementation of UC

We've discussed why companies that are interested in deploying UC applications across a variety of locations are implementing SIP Trunks now. However, some companies have found they can save money by just implementing SIP Trunks alone, without adopting UC. Their savings are derived from reducing access and local carrier-related expenses.^{xiv} These companies are studying and piloting UC, and plan to migrate as their businesses require.

Never Say 'Never'

However, not all organizations have yet taken the time to learn about UC; by default, they plan to continue using traditional PSTN services and legacy access indefinitely. They will find that voice and video equipment vendors are building their current-generation products on IP-based solutions, and will support legacy technology for a finite period of time.^{xv} Similarly, service providers are migrating their legacy local and long distance networks to converged platforms that support VOIP. Thus businesses which don't plan ahead will find they face fewer and fewer legacy supplier alternatives, likely with escalating prices, in the coming years. This means that virtually all organizations, including late adopters and the most practiced of procrastinators, will find that the clock is ticking and SIP is on their future roadmap. Even for these companies, it's not too soon to begin to prepare.

About Strategic Networks Group

7322 Manatee Avenue Web, Suite 191

Bradenton, Florida 34209-3441

Office: (941) 539-6670

www.strategicnw.com

Since businesses are becoming increasingly reliant on telecommunications and IT services, Strategic Networks Group works closely with business customers to optimize landline and wireless telecom lifecycle activities, including architecture, sourcing, negotiations, and performance management. And by providing telecom and IT service providers with unique insights gained from working with business customers on a daily basis for over 15 years, we help them maximize the effectiveness of the product, pricing, marketing and sales strategies targeted to business customers.

About Lisa Pierce

lpierce@strategicnw.com

Lisa Pierce is the founder of Strategic Networks Group. She is an expert on emerging business network class services, including UC/VOIP, MPLS, Ethernet, and 4G. A frequent speaker and media commentator, she has authored and published more than 800 reports. Her professional background includes 10 years as Vice President of Telecommunications Research at Forrester Research, four years in telecommunications protocol consulting and training at Telecommunications Research Associates, and nine years at AT&T in new business services product development, management, research and forecasting.

Notes, Links and Bibliography

ⁱ Nationally, in October 2009, the US Department of Labor estimates that the unemployment average is above 9.5%. According to a report summary on Webtorials' website, when compared to 2008, 45% of companies surveyed anticipated they would reduce network/IT staff in 2009, and 50% planned to reduce spending on IT and network-related capital equipment. The report, "State of the Market Report on Networking Plans and Priorities", was published in January 2009.

ⁱⁱ According to a July 2009 study commissioned by IBM titled "Inside the Midmarket: A 2009 Perspective", 90% of U.S. mid-sized business surveyed cited improving efficiency, reducing costs and increasing employee productivity as their top business priorities.

ⁱⁱⁱ In July 2009, CIO magazine conducted a poll of 413 CIOs, and published the results in the October 1, 2009 edition. See http://www.cio.com/article/503900/Exclusive_Unified_Communications_Survey_Results

^{iv} Depending on the vendor or carrier, 'convergence' may also imply the use of the same real time applications across both a fixed and mobile infrastructure.

^v As to IP telephony adoption, according to an October 28, 2009 press release/executive summary issued by Wainhouse Research, although the global UC products market declined by 5% between 2007 and 2009 (to \$14.8B), it will grow by 10% between 2010 and 2013 (to \$16.4B). Products with the greatest projected growth rates are highly collaborative in nature and include web conferencing and IM/presence servers, team workspaces and videoconferencing equipment. Projected growth rates of these products range between 24% and 100%.

^{vi} Information is derived from an excerpt of the TIA's 2009 ICT Market Review and Forecast, published on its website.

^{vii} For example, according to a presentation by Infonetix at a Metro Ethernet Forum workshop on September 21, 2009, global Ethernet services revenue will reach \$34B/year by 2013-a 5 year average annual growth rate of 55%.

^{viii} According to its June 26, 2009 press release, Vertical Systems anticipates that number of locations in the U.S. that use MPLS will exceed 1 million by 2011.

^{ix} The types of access lines and trunks usually replaced by SIP Trunks include individual analog/POTS lines, ISDN BRIs, T1 and T3 connections, and ISDN PRIs.

^x Many customers want to use a T1-enabled SIP Trunk for both UC (real time) and data (non real time) applications. To allow both types of traffic to reside on the same access line/trunk on a flexible basis, carriers often deploy Ethernet-based Virtual Private Line services (EVPL) at layer 2.

^{xi} As alluded to earlier, companies often want to deploy UC applications across both converged voice-data and fixed-mobile infrastructures. SIP Trunks are often an essential component in enabling the use of UC applications in concert with cellular services.

^{xii} According to an October 27, 2009 press release, a study by Infonetix places adoption of SIP Trunks at 39% of North American enterprises, and estimates they will become the second most commonly deployed type of trunk within a year.

^{xiii} In order of occurrence the protocols listed are SIP for Instant Messaging (IM) and Presence Leveraging Extensions, Session Description Protocol, Real-time Transport Protocol, and Real-time Transport Control Protocol.

^{xiv} For instance, Florida-based Riverside National Bank uses SIP-based trunks to support its inbound and outbound contact center today. The SIP trunks interface to a SIP gateway at the bank. Since many SIP Trunk services support select compression algorithms, Riverside estimates it saves 2 T1s/PRIs for every SIP trunk it installed. See http://www.nojitter.com/blog/archives/2009/03/keeping_tdm_pbx.html.

^{xv} As to PBXs, the TIA study referenced above estimates that by 2012, less than 20% of the PBXs installed in the U.S. will be legacy PBXs-over 80% of the installed base will be IP PBXs. By this time, we anticipate that the majority of vendors that had sold legacy models will no longer support them - customers will need to seek out specialists with both the expertise and spare equipment, typically on a local or regional basis. Indeed, many customers report this is already the case.