



SIP Trunking: A Pain-Free Way to Cut Contact Center Costs

But Can Your Quality Management System Handle It?

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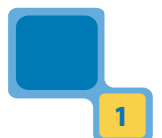
The Emergence of SIP in the Contact Center

In an industry that suffers no lack for acronyms, we are pleased to present another one - "ITSP," for Internet Telephony Service Provider. An ITSP allows enterprises and contact centers to achieve greater value from their investments in IP-based call servers by routing inbound and outbound calls over the Internet. IP-call servers have been around for well over a decade. They now account for more than half of new call servers sold. One of the top sales drivers is the promise of reducing network service costs. However, for most companies the savings in carrier fees have been negligible or non-existent. That's because most of their long distance traffic is originated over the PSTN (public switched telephone network).

Calls to points on the corporate LAN or WAN are basically "free," as they ride atop the data network at no additional cost. However, with contact centers, calls may originate from - or be directed to - virtually anywhere. If the contact center has an IP call server, the inbound and outbound traffic to points outside the corporate network must meet at gateways where the IP packets are converted to TDM (Time Division Multiplex) signals. From there, the calls travel over the legacy carrier's network and incur normal carrier toll charges. The contact center, which is typically the highest consumer of network service charges in the enterprise, accrues no financial benefit from its IP call server.

With ITSPs, the picture changes dramatically. VoIP "trunks" are terminated on SIP (Session Initiation Protocol)-compliant connection points on IP call servers and from there are routed as IP packets over edge hardware to a VoIP network owned or managed by the ITSP. The cost of transmitting IP packets over a controlled network is substantially lower than the per-minute charges of legacy carriers. If the ITSP does not have point-to-point connections, the call is routed over the local exchange from the closest point between the ITSP's local gateway and the point of destination. The ITSP absorbs this cost, then charges a premium to its customers to cover the cost of the local call and its own operating costs and profit margin.

Besides the savings in toll traffic, the contact center no longer has to pay for T1 or PRI trunks and related hardware and enjoys much greater flexibility in purchasing the precise number of connections it requires. There are many other benefits as well, which we will address in this paper. One very important requirement that applies to contact centers more than the general enterprise is signaling data (like caller phone number, caller name, and called number) must be delivered to the call server just like TDM calls over legacy carrier networks. Of particular importance is the ability to associate specific calls with specific extensions. This is essential for quality management and compliance monitoring. This can be a problem with SIP trunks. One company, Tempe, Arizona-based OAISYS®, has solved that riddle.





A No-Pain Way to Sharply Cut Operating Costs

With foreign outsourcers looming as a lower-cost alternative, contact center management is driven to bend their cost curves as much as possible while still maintaining acceptable service levels. This inevitably means looking at ways to reduce labor costs, as labor is the largest component of the contact center budget. Management of the larger contact centers has been very effective at implementing labor-saving technologies such as self-service and workforce management software. However, there are practical limits to how far enterprises can go with automation and sophisticated scheduling tools. Customers prefer dealing with human agents, particularly when the nature of the call is complex. Increasing agent workloads can result in higher attrition, with its attendant cost penalties of recruiting and training replacement staff and the increased risk of reduced customer satisfaction as new agents learn their jobs.

There is another option for lowering costs without adverse impacts on customer delight and staff morale. That is by attacking the second largest component of contact center costs — voice and data communication charges. There is a tendency to assume these charges are less controllable than labor costs. You think you have chosen the most competitive of the legacy carriers and implemented the most sophisticated least-cost routing scheme. After that, there is not much that can be done because traffic levels are largely out of the contact center's control. And, like airplanes and hotels, you need to engineer your capacity to handle peak conditions rather than "typical" traffic loads. The contact center inevitably pays dearly for underutilized capacity.

However, with ITSPs the model changes. An all-IP network is in your grasp and you do not need to reengineer the network. In this paper we will explain the role of the ITSP and the benefits you may expect from an all VoIP network. We will introduce the notion of SIP trunking, and address the sticky issue of quality monitoring in such an environment.

The Role of the ITSP

The advent of independent ITSP carriers is a rather new phenomenon. Most have been in business for less than ten years and have tended to concentrate their sales and marketing efforts on the general enterprise rather than the contact center. You may be unfamiliar with them or have only a cursory knowledge of their services, pricing, and network topology. There are over two dozen such companies operating in the United States. Examples include BandTel, Broadvox, PAETEC, CBeyond, Excel Telecommunications, Level 3, XO, Quest, as well as many others.

ITSPs can be roughly categorized into two groups — those that own their networks and those that purchase capacity from wholesalers, including legacy carriers. In this sense, they operate much like Internet Service Providers, with the big difference being they provide both voice and data services. Product offerings vary between carriers but generally provide the same services as legacy carriers, such as local and long distance



service, toll-free lines, DID numbers, MPLS VPN (Multi-protocol Label Switching Virtual Private Network), local number portability, caller ID, caller name, calling cards, 9-1-1 emergency access and dedicated Internet access. The simple business model for an ITSP is “buy wholesale, sell retail.”

SIP trunking service providers aggregate traffic from many enterprise customers. The traffic passed to the PSTN is of much larger volume than the traffic from any individual enterprise. This means the SIP trunking service provider can acquire the call minutes from the PSTN service providers at a lower rate than the individual enterprise. The network charge for the IP part of the call, which is the segment from the IP-PBX to the ITSP Network Operations Center (NOC) closest to the ultimate call destination, is typically not traffic-dependent; so there are significant cost savings that can accrue on this longest part of the leg. From the NOC to the final call destination the call may travel over legacy long distance and local loop Telcos.

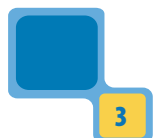
In general, ITSPs offer pretty much the same services but at a lower cost and with greater buyer flexibility. Service quality is comparable to legacy carriers. Contact center management does need to understand how security is handled as Internet telephony is inherently more vulnerable than TDM networks. This should be discussed with individual ITSPs, as they all have solutions.

ITSPs typically market their services either directly or through third parties. Direct sales may be initiated by authorized agents. Third party resellers may include IP-PBX makers that OEM the ITSPs services or Value Added Resellers that are trained and certified to sell and support both the hardware required (SIP-enabled IP call server and user agents as well as certain edge devices) and the VoIP service. A few ITSPs offer a complete turnkey hosted service, where the IP call server and edge hardware are folded in with the monthly service fee for local and long distance service. In this case, the ITSP assumes the network management responsibilities. The contact center administrator need only contact the ITSP of service changes; such as if additional trunks, load balancing or additional blocks of DID numbers are required. The contact center network can be separate from the enterprise network.

Understanding SIP

None of this would be possible without SIP (Session Initiation Protocol). SIP is a standards-based communication protocol capable of supporting voice, video, instant messaging and other multi-media communications. SIP was devised in the mid-1990s. The original intent was to define a standard for Multiparty Multimedia Session Control. The IETF (Internet Engineering Task Force) issued its SIP specification in 2001.

According to the SIP Forum (www.sipforum.org), *Session Initiation Protocol (SIP) is a text-based protocol designed to initiate, modify, and terminate interactive communications sessions among users, including voice, video, chat, and other types of multimedia communications.*



SIP is an application layer protocol that operates independently of the network transport protocol and is media-agnostic. SIP does not define the type of session being established, only how it will be managed. SIP has many applications, including the ability to manage multimedia sessions, video, web conferencing, and even video gaming. Within an enterprise, SIP can provide a “presence” status that alerts users of SIP endpoints (hard and soft phones) of the availability of others on the network and their preferred means of communication.

For ITSPs, SIP unifies a number of protocols associated with VoIP and enables direct packet peering from a compliant IP call server to a compliant VoIP service provider. In the example where VoIP calls are contained within the enterprise LAN and WAN, and the enterprise deploys SIP-compliant IP call servers at all sites, there are no Telco charges and no intervening gateways are required. In the contact center environment, where calls may originate from or be directed to virtually anywhere, the calls are intercepted at an ITSP gateway where they are converted from TDM to VoIP or vice versa.

What is a “SIP Trunk?”

Historically, voice signals traveled over physical wires, but SIP trunking makes a logical connection from one point to another through the Internet, making it possible to treat voice communication as just another application and deliver it as packets of data. Using SIP protocol makes the form of communication and physical location of the contacts irrelevant because the communication, whether voice or otherwise, is simply data traversing the public Internet to reach its destination.

A SIP trunk is the rather awkward name given to the telephony connection of an ITSP. A SIP trunk is not a “trunk” in traditional telephony jargon. A trunk is generally defined as a dedicated channel for a single 2-way conversation. A single T-1 span provides 23 voice channels and an additional channel for signaling information. This means a limit of 23 concurrent conversations before a trunk busy signal is returned to the caller. A SIP trunk, which physically is a single cable terminating on a SIP card in the IP-PBX, is the mechanism for bridging voice packets from an IP-PBX to the ITSPs network.

Unlike T-1 or BRI, the number of concurrent conversations is generally limited only by the contracted requirements of the enterprise, not any physical limitations of the circuit. The exception is if the contact center is running data over the same medium, then the VoIP call throughput may be limited. ITSPs recommend dedicated channels for voice and provide these as part of their service. If the enterprise prefers the ITSP use an existing WAN, then the ITSP can prioritize voice over data.

A SIP trunk is more akin to a water faucet than a two-lane highway. When you turn on your faucet, water will continue to run at the maximum rate until the reservoir runs dry. And, like water and electricity, you pay for just the amount consumed. Another option is to estimate your maximum number of concurrent



conversations, then contract for a SIP trunk with just that capacity. This may reduce your cost versus metered service since you are buying a smaller pipe with a smaller faucet.

There are about as many pricing models as there are ITSPs. As with legacy carriers, you can order toll-free and DID numbers. Costs are invariably substantially lower and you will have more choices. For example, you can assign local DID numbers to major geographic markets. To the caller, it looks like they are calling a local office, although the call may actually terminate at a site hundreds or thousands of miles away.

If you have legacy ACDs and are not ready to swap them out for IP, you can still benefit from the lower costs and greater flexibility of VoIP by front-ending your sites with gateways. The gateway handles the translation from IP address to telephone number and also provides firewall protection. Gateways may be purchased by the end user or leased from the ITSP channel partner. The use of gateways with legacy call servers significantly limits potential cost savings and can introduce call quality issues

Advantages to Contact Centers

SIP trunks provided by ITSPs and their partners provide numerous advantages to contact centers. Of course, the most tangible advantage is significant cost savings. But, beyond a less stressful budget, there are also advantages in flexibility and ease of administration.

Cost Savings Advantages

- *Lower long distance rates* - ITSPs can buy minutes from legacy carriers in bulk at much better prices than most businesses. Broadvox, for example, buys 800 million minutes from a mix of carriers. After adding back operating costs and profit margin, ITSPs can still sell long distance service for a very attractive rate, sometimes for as little as a penny a minute. Long distance cost savings will be even greater for intra-state calls, where local public utility commissions tend to keep rates high. Actual savings depends on many factors, but should range from 40 to 70 percent.
- *Pay for what you need or what you use* - With legacy carriers, contact centers have to provision for peak conditions. For businesses with sharp seasonal variations, they may be using only 30 to 50 percent of contracted trunk capacity for most of the year. Even if no traffic is running over these trunks, the contact center will still be billed for these hard-wired circuits. With SIP trunks, there are no T1 spans or BRI/PRI subscriptions. Under the various ITSP billing plans, you pay for what you use (metered service) or the capacity you need most of the time (number of concurrent conversations). If you need more to handle spikes, the ITSP can readily provide it. You do not have to purchase in large chunks (23 concurrent sessions with T1 and 30 for E1). You dimension capacity to your needs—not the Telco's.



- *No PSTN charges for intra-company calls* - Organizations that invest in IP-PBXs at multiple locations can eliminate toll charges for traffic between sites. There is no need for costly gateways to convert the IP call to TDM. The call will travel via VoIP end-to-end. The switches may be from different vendors.
- *Fold in the cost of an IP-PBX* - Don't have a SIP-compliant IP-PBX? No problem. Some ITSPs and their channel partners will install the switch with the SIP trunking service and fold the cost into your payment plan.

Flexibility Advantages

- *Load balancing* - Imagine you are the contact center manager for a major consumer electronics company. It is three weeks before Christmas and your agents are swamped with orders for the season's latest electronic gadgets. You walk into your office to find three people waiting with bad news. Three of your ten regional contact centers are down for a variety of weather-related issues and technical glitches. What to do? Three of the fully functioning operations are already at 90 percent of agent capacity. Four have plenty of agent capacity but not enough trunks to handle overflow from the sites that are not operating. Also, some of their people are not trained on the hot new "*I-Tomato*" that downloads movies and doubles as an electric shaver. It will take at least eight-hours of anguished calls to the telecom director, site managers, and five service providers to straighten this out and in the meantime your company will lose \$500K in sales. If you are working with an ITSP you do—*nothing!* You have already worked out a load balancing scheme to get more capacity where you need it and to route calls to the most qualified agents, based on subject matter (in this case, the *I-Tomato*).
- *Get the DID numbers you want, not just the ones the Telco is willing to provide* - Some businesses prefer to list local numbers for consumer contact in addition to (or perhaps in place of) 8XX numbers. Callers think they are calling a local business, even though the call may be handled in a different state or even a different country. Your local Telco will be happy to provide numbers of their choosing, but only for the community where the calls are terminated. Your contact centers are in South Dakota and Nova Scotia. Your customers are not. This is another example of the limitations of physical connections versus virtual connections. An ITSP may be able to give you local numbers wherever you like. Calls to that number will route from the ITSP's NOC to which ever contact center sites you specify.

Administrative Advantages

- *Fewer carriers to manage* - A large or even medium-sized contact center may have contracts for a half-dozen or more carriers. The aim is to deal with companies that have the best prices for specific geographies and specific services. Managing multiple carriers is a big job. It may be a function of the IT department rather than the contact center but either way it is time and money diverted from the core missions of the enterprise. Your ITSP is in the business of managing carriers. Let their people do the work for you.

Implications for Quality Management

The economic benefit from investing in a SIP-compliant IP call server that terminates SIP trunks are substantial, typically delivering 40 to 70 percent savings depending on a host of variables. This is serious money that can be diverted to training, compensation, retention and staff expansion. Voice quality can be as good as or better than traditional analog or digital circuits.

However, contact centers need to be aware of limitations in the ability to perform quality management. Call recorders and other devices that rely on the signaling data transmitted by dedicated trunks via T-1 and other common business communications connections may not adequately read the signaling data sent through the SIP trunks. The voice and screen actions will be recorded, but it may not be possible to index the calls to facilitate quality monitoring. For example, the recorder may not be able to associate specific calls with specific agent extensions or search for calls of specific durations. The core problem is CTI connections for traditional circuits are well developed and widely deployed by switch and recording vendors. However, this is not the case for IP calls terminated on SIP trunks. The phenomenon is so recent and growing so quickly that many switch and recording vendors have yet to develop integration solutions.

The OAISYS Solution

While several recording vendors claim vaguely to support SIP trunking, in many cases the support is limited to station-side only recording. There is no way to record system announcements, automated attendant interactions, IVR interactions, calls in an ACD queue, or calls on hold. There is also no way to record calls forwarded back out to the PSTN via a trunk-to-trunk transfer, which is a common method of sending calls to a user's mobile telephone.

Arizona-based OAISYS believes they are the only company that has developed proprietary technology that goes beyond station-side recording and integrates directly with SIP trunks to capture essential call identifiers.

This latest feature, called OAISYS SMDR Matching Logic, allows their two brands; Talkument® and Tracer, to associate extension information and account codes to a call once it is completed. Previously, businesses needing to record entire calls using SIP trunks had no available solution to limit recording to select telephones or calls or control access rights for recordings based on the telephone user or user input.

Examples of the data that can be associated with each call when SIP trunks are directly terminated on a call server include:

- Start date and time
- Call duration
- Call direction
- ANI/DNIS (if provided by the service provider)

Supervisors select calls for evaluation just as they would if the calls arrived via TDM circuits.

Pulling it All Together

By combining cutting edge technologies, there is now an advanced SIP contact center solution available without previously required tradeoffs. Contact centers that will benefit from the flexibility of SIP trunks for traffic bursting, precise provisioning, geographic transparency or trunk fault tolerance can still enjoy the full featured capabilities of a QA system. Here are just a couple examples of business cases for this combined solution:

- A retail catalog sales contact center that experiences traffic bursts the two months preceding the holidays will benefit from the flexibility of provisioning available with SIP trunks. Furthermore, the ability to diversify between two data service providers for redundant connections to the public network gives assurances business won't be halted during the busy season due to a service outage. Of course, connecting calls alone does not drive the business; professional call handling by qualified sales agents does. SMDR Matching Logic gives contact center management the tools needed to systematically evaluate agent conversations, report upon performance and drive results.
- A multi-site customer service contact center wants to use SIP trunks to share a single toll-free number across all sites without tying up its private network. SMDR Matching Logic ensures that in doing so, the contact center supervisors will still be restricted to only review their personal agent teams while giving upper management tools to search across the entire database of recordings using customer account information as well as agent details.

Executive Summary

Pelorus Associates has long stressed that contact centers have four basic missions;

1. To delight customers
2. To increase revenue
3. To minimize operating costs
4. To provide valuable business insights

We would also contend that for the majority of contact centers that is the current order of priority. However, weak global economic conditions for the past three years have meant increased emphasis on cutting operating costs. With personnel comprising 50 to 70 percent of the typical contact center budget, cost-cutting actions may include freezing salaries, replacing full-time agents with part-timers, cutting the training budget, forcing customers to communicate via the Web or IVR, or outsourcing the entire operation to low-wage nations. Several airlines even charge a premium for making reservations by phone. All of these maneuvers may produce some short-term benefits, but often the cost savings are not nearly as great as anticipated and the ill-will generated among customers and damaged agent morale are problems they may persist even after the economy rebounds.



In this paper, we have highlighted the option of cutting communications costs. These costs are substantial, typically comprising over 7 percent of the contact center operating budget. Reducing this number by 40 to 70 percent can help you reach your savings goals without having to make painful cuts in personnel. SIP trunking provided by ITSPs is a viable option that can not only save your company money, but also provide the flexibility to better manage peaks and valleys in call traffic. Moreover, SIP was devised for managing multimedia communications. Investments now in SIP hardware and software will help prepare your organization for the long-projected shift from voice to data communications.

While the economics and added flexibility are compelling arguments for exploring the SIP trunking option, contact center management must be sure downstream applications like call recording will function just as it had before. The combination of SIP trunking and an OAISYS recording solution helps assure contact centers can achieve the substantial economic and flexibility benefits of SIP trunking without compromising call quality.

About the Author

Dick Bucci is Principal of Pelorus Associates where he specializes in contact center technologies. He has authored ten in-depth reports on workforce optimization applications and over 30 white papers. As one of the industry's foremost thought leaders, his articles and observations have appeared in trade and business publications around the world. Dick has over 30 years of experience in the telecommunications industry.

About OAISYS

OAISYS® (www.oaisys.com) is a leading developer of call recording and contact center management solutions for a wide range of organizations, from small- to medium-sized businesses to multi-site large enterprises. The OAISYS voice documentation and interaction management solutions help companies within a variety of industries—including healthcare, automotive dealerships, financial services, and the public sector—attract and retain customers by digitally capturing phone-based interactions for simple retrieval, playback and management. Compatible with leading business communications system providers, including Avaya, Mitel, ShoreTel and Toshiba, OAISYS Tracer and Talkument applications help companies improve risk management, quality assurance, customer retention, dispute resolution, regulatory compliance requirements and other critical business concerns. OAISYS is headquartered in Tempe, Ariz. OAISYS Limited is located in Cambridge, England.

To find out more about Tracer, Talkument and OAISYS, please contact us at **888.496.9040** or visit us on the web at **www.oaisys.com**.

To find a reseller near you, go to www.oaisys.com, click "Support," then "Reseller Locator."

References

SIP trunking is a complex subject. Detailed technical and economic analyses are beyond the scope of this paper. Please refer to the list of resources for more detailed information. We want to extend special thanks to BandTel and Broadvox for their help with this paper.

Readers that wish to explore SIP trunking in more depth are encouraged to consult the following sources, which were very helpful in the development of this paper.

“The SIPconnect Technical Recommendation,” SIP Forum (www.sipforum.org)

“Understanding SIP- Today’s Hottest Communications Protocol Comes of Age,” white paper by Ubiquity (www.ubiquitynet.com)

“SIP Trunking Benefits and Best Practices,” white paper by Ingate Systems (www.ingate.com)

“VoIP Advantages for the Contact Center,” white paper by BandTel (www.bandtel.com)

“The Many Flavors of SIP Trunking,” white paper by BandTel (www.bandtel.com)

“Multi-state Company Cuts Telecom Costs Almost 50% with Broadvox SIP Trunking,” case study, by Broadvox (www.broadvox.com)