SIP Trunking Guide:
Get More For Your Money
07/17/2014

fusion

Overview

SIP trunking is the most affordable and flexible way to connect an IP PBX to the Public Switched Telephone Network (PSTN). SIP trunks can also provide dial-tone service to a traditional PBX or other legacy phone system via an Integrated Access Device (IAD).

Gartner estimates that 14% of all U.S. business exchange lines are now SIP-based, and this figure is expected to increase to 50% by 2015.[1] The skyrocketing popularity of SIP trunking makes perfect sense when one considers its many cost and feature advantages compared to legacy ISDN Primary Rate Interfaces (PRIs), Basic Rate Interface (BRIs), or analog lines.

This white paper will detail these advantages, as well as providing an overview of SIP trunking technology, guidelines for choosing a qualified SIP trunking provider, and advice for a successful installation.

[1] Gartner, Inc., How to Use SIP to Rethink Voice Trunk Topology, 2012, Neil Rickard and Robert F. Mason, August 16, 2012.
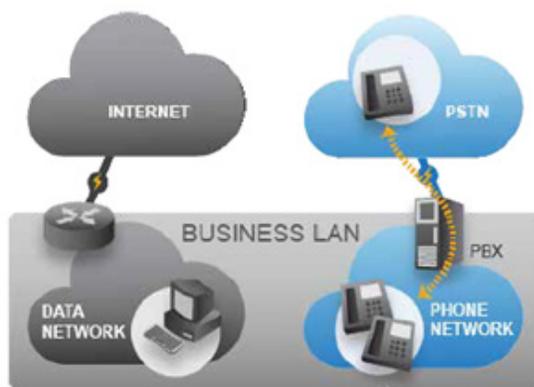
How SIP Trunking Works

SIP trunking is a proven and widely available technology. It uses the Session Initiation Protocol (SIP) signaling method to provide local and long distance dial-tone service to a business phone system via the Internet. Instead of traveling over traditional phone lines, calls utilize the IP network and are sent over a broadband connection and through the Internet to the PSTN.

The diagrams below illustrate how SIP trunking works at a basic level. The yellow lines indicate the path of a voice call via a traditional PRI or analog line connection versus a SIP trunk.
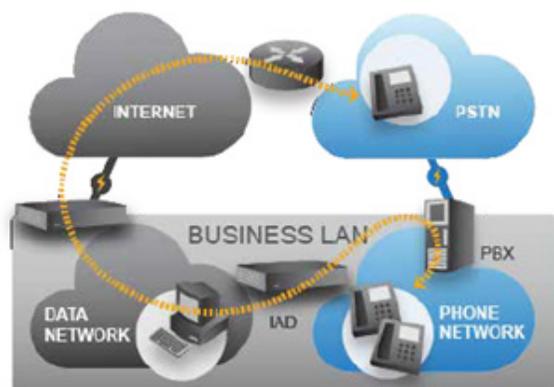
Traditional Phone Service   **SIP Trunking Solution**

SIP trunking enables the convergence of voice and data over a single broadband connection. Older converged technologies, such as integrated T1 or PRI lines, work by dedicating specific channels to voice and others to data. SIP trunking is far more flexible. It enables dynamic allocation of bandwidth to either voice or data. When there are no voice calls, all the bandwidth remains available for data.

To deploy SIP trunking across your organization, you will need to install a SIP trunk at each location where you have a PBX or IP PBX. If you have separate equipment at each of your locations, you will require multiple SIP trunks. Each IP PBX will connect to the existing data network on each Local Area Network (LAN), which will in turn connect to your SIP trunking provider network via a broadband connection. The connection between your provider and your LAN will be mediated by a multi-functional router, which also acts as a security firewall and provides outbound Quality of Service (see page 8).

If you have a single IP PBX with adequate capacity, you can leverage the functionality of that IP PBX to support remote locations. In this type of deployment, you will only need to connect one SIP trunk to that central IP PBX and ensure that you have enough concurrent call sessions on that SIP Trunk to support the peak call volume of your entire organization. Remote locations can register to the IP PBX, which will then be able to terminate and send out calls to individual handsets at all company sites. The SIP trunk simply completes each call's connection to the PSTN.

Advantages of SIP Trunking

According to a recent independent report, SIP Trunking enables companies to reduce their telephony costs by an average of 33%.[2] These savings are derived from various combinations of the benefits listed below, depending on the specific situation. Additional benefits include improvements in management efficiency and business continuity.

No Phone Company Costs

SIP Trunking removes the requirement to pay for an expensive local connection to the PSTN, such as a PRI or analog lines.

Right-Sized Calling Capacity

With PRIs, companies are forced to buy voice channels in increments of 23. If your peak call volume is 26 concurrent calls, you have to purchase two full PRIs, so you end up paying for 20 more voice channels than your business will ever actually utilize. With SIP trunking, you can buy exactly what you need to support anticipated call volume. If your needs change, scaling up or down is quick and easy.

Converged Voice and Data

Instead of paying for separate data circuits and voice trunks, you can combine all your voice and data traffic over a single broadband connection. As explained in the previous section, bandwidth is dynamically allocated to voice calls as needed and remains available for data when it is not. This allows you to optimize bandwidth utilization and maximize the value of your circuit.

Voice/data convergence also simplifies network management and allows for economies of scale, especially because many of today's broadband options are significantly less expensive on a per-megabit basis than voice PRI/T1s. For example, a business that was previously using separate voice PRI/T1 and data T1 connections may be able to upgrade to a single, higher-bandwidth Ethernet connection for half the cost or less.

[2] 2012 SIP Trunking State-of-the-Market Report, commissioned by Sonus Networks, Inc. and produced by Webtorials Editorial and Analyst Division, July 2012.

No Intra-Company Long Distance Costs

If your business has multiple geographically dispersed locations that utilize SIP trunking, you can make pure VoIP calls between locations without ever touching the PSTN or incurring long distance charges. For many companies, calls between locations account for a large percentage of overall long distance costs, so month-to-month savings can be profound.

Lower Long Distance Rates

Because of VoIP peering, SIP Trunking providers can usually offer much lower rates for domestic and/or international long distance than the phone company, as well as the option of unlimited long distance calling for smaller companies. Discounted minute bundles may also be available.

Business Continuity

When a natural disaster strikes, we are all reminded of the need for contingency plans for data as well as voice communications. However, interrupted service can be caused by unexpected call spikes, power outages, PBX failures, loss of connectivity, as well as a natural disaster. When evaluating what procedures to implement in a failover/recovery plan for your business, keep in mind that the number of options is as varied. The technical sophistication of failover options is likely to correlate with the expertise of the service provider. Failover options from most Internet telephony service providers (ITSPs) are either Call Forwarding or IP Address Forwarding.

Call Forwarding

This is the most popular choice for small to medium-sized businesses, as it does not require a backup PBX in a different physical location.

When phone service at your business location goes down for any reason—such as a power outage, PBX failure, broadband connectivity loss, or natural disaster—your SIP Trunking provider can automatically redirect your calls to any telephone number, including a VoIP, PSTN, mobile, or international number. You can choose to have all calls to any DID (direct inward dial phone number) on the trunk redirect to a prioritized list of numbers, or you can create a specific list for each DID.

There are two types of Call Forwarding solutions – Trunk-Based and DID-Based.

1) Trunk-Based Call Forwarding – Your service provider sends calls to an alternative number (perhaps to a cell phone or to a line at a different business location). Trunk-Based Call Forwarding allows any number of DIDs with a prioritized list of numbers, in effect creating a type of centralized answering service.

2) DID-Based Call Forwarding – Offers more granular, detailed 1-to-1 solution. In this scenario, call forwarding can be set so that each DID will forward to a specific number. For example, most calls could go to an administrative hub, whereas all sales calls could go to the sales manager, and customer service queries could be directly linked to the phone numbers of all available representatives.

IP Address Forwarding

This solution generally appeals to larger companies with disaster recovery plans who choose to implement services from more than one carrier, or who have multiple locations.

There are two types of IP Address Forwarding solutions – Single Trunk Failover and Multiple Trunk Failover

1) Single Trunk Failover – If you have a single SIP trunk and your broadband circuit or equipment fails, you can enable automatic failover of that trunk to a different IP address connected to the same IP PBX (such as an alternative broadband circuit), another IP PBX, or a voicemail server. In other words, calls continue to be routed down the same trunk, but the registration simply switches to another device or IP address.

2) Multiple Trunk Failover – If you have multiple SIP trunks and one goes down for any reason, your provider can automatically redirect the calls to another trunk and concurrent call sessions (CCSs) can be shared among the remaining trunks. For example, if you have two trunks with eight CCSs each and one trunk goes down, all your calls go to the other trunk and your CCS limit is temporarily increased to 16.

Choosing a Provider

SIP trunking providers vary widely in expertise, network coverage, and customer service. The following are some key factors to consider as you make your choice.

IP PBX Interoperability

Every IP PBX manufacturer implements the SIP standard in a different way, creating a host of potential challenges for SIP trunk deployment. These challenges can be avoided if your SIP trunking provider and IT personnel have the necessary knowledge, but many SIP trunking providers can only support equipment from a limited number of vendors.

Therefore, it is critical to find out whether a provider has conducted interoperability testing and certified their service on the specific IP PBX, IAD, and/or router equipment you will be utilizing in your deployment. An experienced, SIP-focused provider will maintain ongoing communication with a large number of vendors and test continuously to stay current with product updates and software revisions.

Calling Plan Flexibility

The most cost-effective calling plan for your business depends on your size, number of locations, and usage habits. Most SIP trunking providers charge a monthly fee based on the number of concurrent call sessions you require, along with a choice of unlimited local or unlimited long distance calling plans. In most cases, unlimited long distance plans only make sense for very small businesses that prefer a predictable bill. Larger companies get a better value by paying only for unlimited local calling and selecting a bundled minute or metered option for long distance.

Multi-location enterprises with high call volumes and businesses that manage busy call centers can often save even more with a fully metered calling plan option. This type of calling plan is not widely available, but offers maximum savings and flexibility for companies that can aggregate a large number of minutes. Concurrent call sessions charges are reduced, and all calls are metered, including local, long distance, inbound and outbound.

Although domestic and international long distance rates with SIP trunking are almost always lower than what the phone company can provide, some providers offer much lower metered rates than others or low-cost minute bundles. Evaluate these options closely as you make your decision.

Business Continuity Options

As discussed in the Advantages section, SIP trunking can significantly improve the continuity of your business with a variety of failover, disaster recovery, and load balancing options that traditional phone lines cannot support. However, not all providers have the necessary expertise to deliver these benefits. Ask any potential provider about what services they offer to help you avoid potential business disruptions, such as unexpected call spikes, power outages, PBX failures, broadband connectivity loss, and natural disasters.

Speed of Installation

The time it takes to install a SIP trunk can range from days to weeks or even months. Your SIP trunking provider can only control one piece of this timeline—configuring the SIP trunk on their network and sending you the necessary SIP credentials to enable dial-tone service. The rest depends on your situation. You may need to acquire new equipment, install a broadband circuit, or upgrade an internal network, in addition to configuring the PBX or IP PBX connection for the SIP trunk.

An experienced SIP trunking provider should be able to provide you with SIP credentials in a matter of days and support your IT team with implementation coordination and set-up guides to make the rest of the process as efficient as possible.

Quality of Service

Quality of Service (QoS) is the ability to recognize and prioritize voice calls over other types of data as they travel over a network. If there is network congestion, jitter, latency, or any other issue, bandwidth is maintained for voice to ensure that call quality does not suffer.

Outbound QoS is typically maintained by the customer router. In most cases, inbound QoS is not critical as long as you have plenty of bandwidth for all your voice and data applications. It becomes more important if you need to maximize your bandwidth efficiency. For example, if you are pushing the limits of your broadband connection during peak call times, QoS management on your provider network will prioritize bandwidth for voice to eliminate the risk of poor call quality or dropped calls.

You can only get QoS from your SIP trunking provider if you also purchase your broadband connection from them. This is a significant benefit of choosing a provider that also offers broadband.

Ensuring a Successful Deployment

Configuring the IP PBX or IAD is the most complex part of the SIP trunking deployment process. Only a seasoned IT professional can ensure success. This professional should have proven experience with SIP trunking and certifications for the device(s) you are looking to deploy.

- A reputable SIP trunking provider will contribute to your success in the following ways:
- Verifying device interoperability and providing set-up and/or certification guides for your equipment.
- Configuring the SIP trunk on their network platform.
- Providing SIP credentials in a timely fashion (days, not weeks or months).
- Assisting the IT professional with the configuration (call testing, validation, etc.).

With the guidance of a qualified IT professional and an experienced provider, SIP trunking is a relatively straightforward process that will enable you to begin recouping your investment rapidly.

About Fusion

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