



Adding Value to a SIP Trunk

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Abstract

Voice over Internet Protocol (VoIP) has come a long way from its origins that allowed cheap phone calls over the Internet. With appropriate QoS mechanisms in place and support for rich signaling, the packet based data network can now be relied upon for supporting commercial grade voice telephony.

What is a SIP Trunk?

Session Initiation Protocol (SIP) refers to is the common signaling standard for real-time communications using Voice over Internet Protocol (VoIP). SIP is an open-standard which allows network carrier voice equipment to interoperate seamlessly with customer premise equipment (CPE). The voice channel established between the two is what is referred to as a SIP Trunk - a virtual phone line that utilizes a Broadband connection for access.

SIP is a rich signaling protocol capable of supporting not only voice, but can also be used to set up multi-media connections involving data and video streams.

Who sells SIP Trunks?

There are several Internet Telephony Service Providers (ITSP) that offer SIP trunks. An ITSP typically deploys a Soft-switch based architecture. The Soft-switch serves as a gateway between the SIP based packet network and the TDM based Public Switched Telephone Network (PSTN). The larger the foot print of an ITSP, the longer the distance a call can be carried in packetized form on its network. And the longer a call stays on the packet network, cheaper it is due to inherent bandwidth efficiencies of the packet network. This in turn results in lower per minute price for the end user.

ITSPs offer several different pricing models for SIP trunks. The most prevalent model is 'pay as you use'. In other words there is no fixed monthly recurring charge. An enterprise only pays for the calls that it makes. The local intra-lata calls are free. The long distance calls are billed 40-70% cheaper compared with the traditional service providers.

TDM trunks are usually sold in increments of T1's (or PRIs) or for smaller enterprises as fractional T1s with a minimum number of voice channels. On the other hand SIP trunks can be added in increments of one. Hence an enterprise can order exactly what it needs.

Therefore by switching to a SIP trunk based network, an enterprise can save a considerable amount of money on its voice telephony related operational expenses.

Deploying Value Added Services

Figure 1 shows a typical legacy PBX environment.

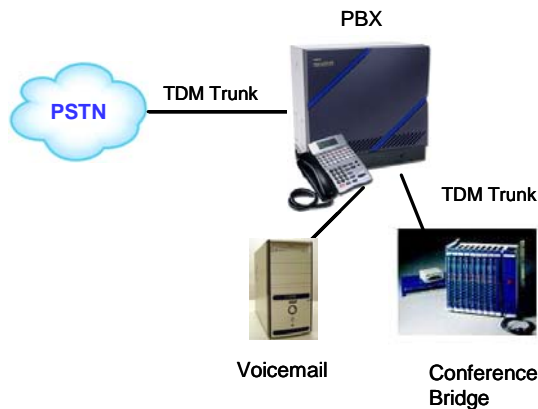


Figure 1: Enterprise Legacy PBX Deployment

As shown, the PBX is connected via TDM based trunks (CAS T1 or ISDN PRI) to the PSTN. The enterprise has also deployed its in-house Voicemail and Audio Conference Bridge. The interface between the legacy PBX and the in-house Voicemail system and Audio Conference Bridge is also based on a TDM based trunk.

The enterprise uses outsourced web conferencing and video conferencing services as needed.

The TDM trunk connected to the PSTN has a block of 100 Direct Inward Dialed (DID) numbers associated with it. The PBX routes the calls to individual employees based on the incoming DID number. If an employee is busy or does not answer the incoming call, the PBX routes that call over to the Voicemail system.

One specific DID number is set up as a lead number for the Audio Conference Bridge. When multiple people call the same number for joining a conference, the PBX routes those callers based on the lead number to the PRI connecting to the Audio Conference Bridge.

The TDM based trunks connected to the PSTN incur a monthly recurring charge. These charges can range from \$500-\$1000 /Month per T1 depending on the carrier and the geographical location. In addition,

the enterprise pays long distance charges in the range of 5-8 cents per minute.

The scenario described above is typical of the telephony environment in a medium to large size enterprise today.

Adding a SIP Trunk

In order to leverage the advantages of SIP trunking, an enterprise needs to upgrade its telephony equipment to support SIP. This involves; a) replacing the TDM PBX with an IP PBX or b) augmenting the existing TDM PBX with a packet module so that it can support a SIP trunk.

If the enterprise uses in-house value added sub-systems such as an external Voicemail system and Audio Conference Bridge, then newer SIP based alternatives that are now available should be explored.

SIP Trunk based Network

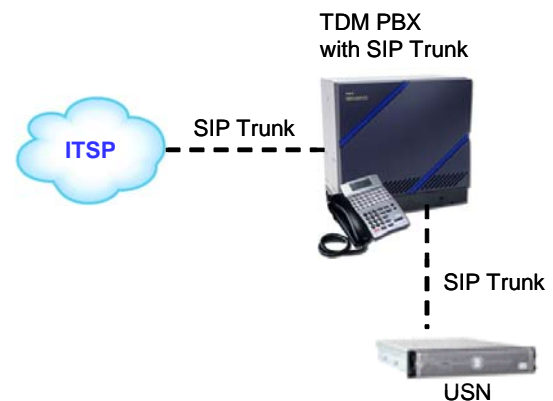


Figure 2: Enterprise IP PBX Deployment

Figure 2 shows the same enterprise network as before with two changes.

1) A packet based module has been added to introduce the SIP trunk on the PBX. This SIP trunk is then connected to the ITSP via the enterprise's data network.

2) A SIP based value added service platform has been added. The platform also interfaces with the PBX via the same SIP trunk. The particular platform shown in Figure 2 is XOP Network's **Universal Service Node**. Along with providing Meet-me conferencing, the platform also provides Web conferencing, Voicemail and Group Alerting applications. Therefore, between the PBX and the USN, the Enterprise can not only use IP telephony for regular phone calls, but also use it for providing all previously available value added services.

Benefits of a SIP Trunk

- Easier management – one data connection for both voice and Internet.
- Same ITSP for both local and long distance service.
- Ease of switching between ITSPs. Enterprise can get best rates for the services as they switch easily between service providers just by pointing to a different IP address.
- Hard Dollar savings. Significant reduction in monthly telephony related expense due to 'pay for what you use' model.
- Reduction in the cost of service platforms due to availability of SIP based appliances that can provide multiple services in one platform.
- Retain the same phone numbers as ITSPs support local number portability.
- Location Independence. In the event the office needs to relocate across the city or across the country, the pain of the move will be minimal as the same SIP trunk will be available at the new location as long as Internet service is available.
- Enables converged services such as multi-media collaboration and video conferencing. Also sets the stage for further enhancements such as presence and location based services.

Summary

VoIP and SIP technology have come a long way from the early days of making cheap phone calls over the Internet. The true benefits of packet based networking are now in reach of most Enterprises. This paper describes how an enterprise can use SIP trunking to lower its monthly telephone bill and also introduce value added services via a SIP based applications platform.

About XOP Networks

XOP Networks is a leading supplier of TDM and IP based value added services platforms for Enterprises and Independent Telephone Companies. Its unique product architecture allows smooth migration of value added services from legacy circuit switched TDM networks to VoIP based packet networks. Its products support Audio Conferencing, Web Conferencing, Group Alerting, Enhanced Firebar, Voicemail and a few other services. XOP Networks is headquartered in Plano, Texas. Additional information on XOP Networks is available at

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