

The ABCs of SIP

Many businesses today are talking about Voice over Internet Protocol (VoIP) and Session Initiation Protocol (SIP), but in order to be a part of the conversation you need to know: A) What is SIP? B) What are the benefits of VoIP and SIP? C) How do I get started?

A. What is SIP?

In the roughly 140 years since Bell first called Watson to say "I want you," there have been three major changes in the way telephone calls are transmitted.

1. For the first 100 years, conversations went via analog wave forms. The current in the line varied with the sound of your voice.
2. During the next 40 years we went digital. Here, your voice is sampled and converted into digital format—a string of 1s and 0s.
3. Today, we see widespread adoption of VoIP—the digital signal is packetized and sent over a data network.

Let's take a brief look at each of these:

Analog Plain Old Telephone Service (POTS)	Digital Primary Rate Interface (PRI)	VoIP
One conversation per circuit	23/24 conversations per circuit	Number of conversations only limited by bandwidth or licensing
2 wire interface (copper)	2 or 4 wire interface (typically copper)	Copper, fiber, Ethernet, coax, cellular
48 Volt "signaling"	"D" channel signaling	SIP
Either voice or data (modem)	Fixed allocation of channels between voice and data at 64 KBPS each	Dynamic allocation of voice, data, video and other applications with Quality of Service (QoS)
	23 bearer + 1 signaling (23 B + D) PCM/TDM. Call information carried on D channel	TCP/IP - packet signaling. Call information carried along with the voice packet
	1.544 MBPS, 64K per conversation plus 64K reserved for signaling	512 KB thru multi-gigabit. About 90K per conversation uncompressed

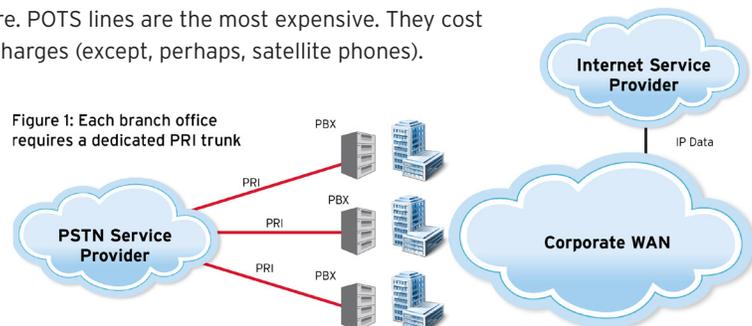
Each new technology allowed us to pack more information into a single communication line. At the same time, each also offered a much richer experience in terms of features, functionality and benefits.

B. What are the benefits of VoIP/SIP?

Cost

Communication lines are expensive resources. Like any other expensive resource, the more efficiently a company uses these facilities the more profitable they are. POTS lines are the most expensive. They cost about \$30 per month each and have the highest usage charges (except, perhaps, satellite phones).

While \$30 may not seem like much, the limited functionality of these POTS lines often requires you to buy more than you really need. For example, you may want some lines for inbound calls (say to provide individual phone numbers), with others dedicated to outbound calls and still others going both ways. A PRI provides much more efficient utilization of that pair of wires, serving the same needs with fewer channels. The "D" channel signaling allows each of the "B" channels



to be allocated to inbound or outbound services on a per call basis. PRI also allows for more efficient call handling by the local and long-distance carriers, which they reward with lower per minute costs. In the end, however, both POTS and PRI are still dedicated voice systems. When they are not being used for calls, they sit idle. VoIP/SIP, on the other hand, dynamically allocates bandwidth, with voice (and video) traffic being prioritized over text-based data traffic. This allows much more effective use of your facilities, allowing more information to be carried over a smaller "pipe."

There is a range of billing options available. Since VoIP is a packet-based technology, there really is no requirement for "channels." They are simply a billing construct. You can buy services by the "talk path" (or channel) that include unlimited domestic long-distance (LD) usage. At the other end of the spectrum, talk paths may be free and you pay per minute for usage. This allows you to tailor your billing to match your calling patterns.

Finally, since internal voice traffic is carried on your data network, intercompany call costs are eliminated, and POTS lines at your branch offices can be significantly reduced. These savings alone will often cover your cost to upgrade to VoIP within one or two years.

Capabilities

SIP has a very robust feature set, but the most significant advancement is severing the link between phone lines and physical locations. Until now, your numbers were tied to your address: If you were in Los Angeles, you had a Los Angeles number. There were ways to extend your "reach," but these were very expensive. With SIP, phone numbers and location become independent. You can still be in Los Angeles, and making and receiving calls on a New York City local number. This provides both cost savings and operational enhancements. POTS lines in small branch offices can be reduced without losing your local presence. Calls are delivered to your SIP gateways and routed to the appropriate office over your data network. Likewise, remote sales representatives are given company phone numbers in their local markets, and you retain control of your customers when field personnel change. Additionally, SIP lays the groundwork to move from just voice to other forms of communication. For example, it gives you the ability to use video in a point-to-point or point-to-multiple point session.

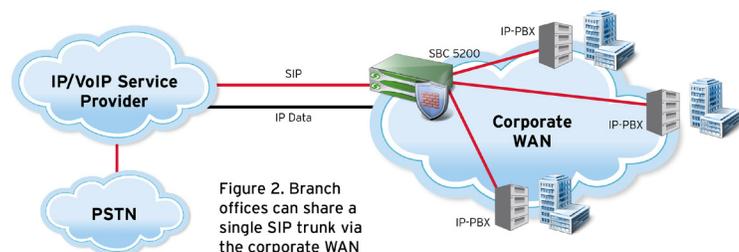
Continuity

Location independence has a huge impact on business continuity. A properly designed network will have multiple SIP gateways in diverse geographic locations. Traffic is automatically allocated among these gateways. Should a local or regional event take one offline, calls automatically flow through the other(s) with no service interruption. This also allows branch offices to back each other up during busy hours or weather emergencies. With SIP you can locate your phone systems in hardened data centers, providing levels of redundancy and security that would otherwise be impossible for all but the largest enterprises to afford.

C. How do I get started?

Remember, SIP is just a signaling protocol. In order to get the full benefits of SIP in your network, you'll need three things: a SIP connection—available from many service providers, a Session Border Controller (SBC)—to terminate the SIP connection, and a VoIP infrastructure to carry the calls internally. An SBC provides the security, interoperability and some of the intelligence (e.g., where to route SIP calls) needed to safely connect SIP trunks with your network. You can think of an SBC as a SIP super-firewall that includes a host of value-added services such as load balancing, least-cost routing, signaling interworking between different network devices, and media transcoding. Enterprises should pay especially close attention when selecting an SBC and look for features that can add real value to their SIP solution, such as:

- Centralized subscriber and routing databases for simplified provisioning of moves, adds and changes across the enterprise
- Compliance with SIP industry standards like SIPconnect 1.1
- Demonstrated interoperability with IP-PBXs
- Superior session capacity/performance under high traffic/load conditions
- Ability to migrate from traditional PRI service to SIP at a metered pace
- A redundant, high-availability (99.999%) architecture
- Built-in media transcoding for wireless and wireline codecs, video and HD voice
- Protection against Denial of Service (DoS) attacks, eavesdropping and other security threats



You'll find these features (and many more) in Sonus' family of SBC solutions, including the SBC 1000, SBC 2000, SBC 5110, SBC 5210, SBC 7000 and SBC SWe (Software edition) Session Border Controllers. Today, Sonus SBCs protect many of the world's leading service provider and enterprise networks—ask your SIP provider, or your peers, if they're using Sonus SBCs.

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About Sonus Networks

Sonus Networks, Inc. is a leader in IP networking with proven expertise in delivering secure, reliable and scalable next-generation infrastructure and subscriber solutions. Sonus products include session border controllers, policy/routing servers, and media and signaling gateways. In 2012, Sonus launched its Partner Assure program to provide turnkey sales support and training to authorized resellers around the world. To date, more than 100 companies have joined the Partner Assure program. For more information, visit www.sonus.net.

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