

SIP network consolidation solutions

application note

Leveraging SIP to reduce telecommunications cost and complexity

Forward-looking businesses are turning to SIP (the Session Initiation Protocol) to reduce CAPEX and OPEX and improve communications. By replacing legacy TDM-based telephony infrastructure with SIP-based solutions and converging interactive voice, video and unified communications (UC) onto a common IP backbone, enterprises can consolidate equipment and trunks, streamline operations, and improve collaboration and worker productivity. Many enterprises have reduced their telecommunications expenses by 30-70% by migrating to SIP. Most have recovered their initial investments in just months.

An open, standards-based protocol, SIP allows organizations to avoid vendor lock-in and choose from a broad selection of communications solutions and suppliers. In addition, many telecommunications service providers now offer SIP trunking services – flexible, cost-effective alternatives to traditional TDM trunks for PSTN origination/termination – as well as other SIP-based services like hosted conferencing and contact center solutions.

Like any new technology deployment, transitioning to a SIP-based network requires careful design and planning. Businesses often encounter vendor incompatibilities and service interoperability issues as well as security and QoS challenges that are beyond the scope of conventional IP firewalls, routers and gateways. Acme Packet Enterprise Session Border Controllers (E-SBCs) are specifically designed to overcome these SIP deployment challenges. The solutions deliver:

- Strong security by safeguarding user confidentiality and privacy, and protecting enterprise IT assets
- Easy interoperability by resolving multi-vendor compatibility issues and enabling multi-protocol interworking
- Assured reliability by enforcing service quality and enabling high availability services

Acme Packet E-SBCs let businesses enjoy all the benefits of an end-to-end SIP network without sacrificing reliability or service integrity.

Acme Packet E-SBC Key Benefits

For SIP trunking applications

- Protect and control enterprise infrastructure, services and applications
- Prevent fraud and service theft, and guard against malicious attacks
- Accelerate service deployment by mitigating service interoperability issues
- Ensure high availability by rerouting sessions around equipment or facility failures
- Optimize performance by balancing loads across trunks
- Save money by implementing least cost routing across service providers
- Ensure high availability by protecting against denial of service attacks and system overloads

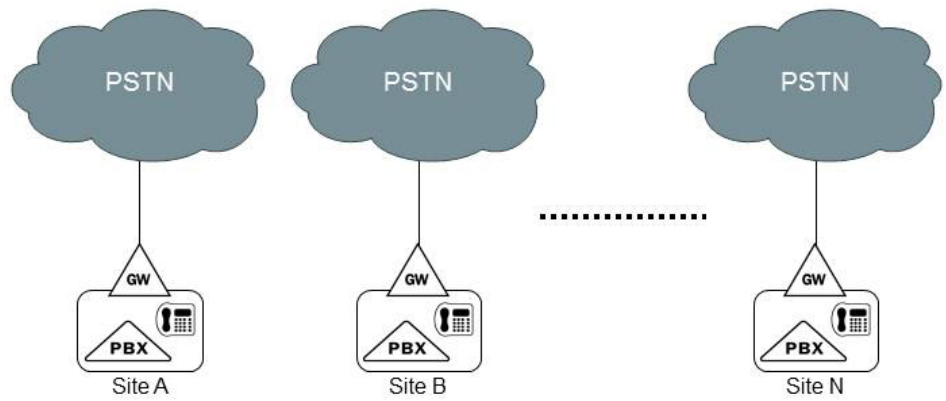
For network consolidation applications

- Overcome multi-vendor interoperability issues
- Enable protocol interworking with legacy systems
- Ensure compliance with E911 and other regulations
- Implement unified dial plans and 4/5 digit internal dialing with rich call control functionality
- Optimize service quality by enforcing QoS and access control policies
- Enable high availability and business continuity with resilient architecture
- Guard against internal security threats and mitigate service overloads

Incumbent TDM-based telephony networks are costly and inefficient

While most enterprises have deployed IP-based PBXs and communications servers many still rely on conventional TDM circuits for site-to-site connectivity and to connect to the public telephone network. Incumbent TDM-based telephony networks are costly and inefficient. Limitations include:

- **Siloed telephony environment** – each site acts as an independent telephony island with its own PBX, dial plan and PSTN trunks. Small offices and teleworkers typically aren't tied into the corporate telephony network and rely on the PSTN to communicate with coworkers.
- **Redundant communications infrastructure** – IT is forced to maintain parallel communications networks – a TDM-based voice network and an IP-based data network – with extra equipment and operational overhead.
- **Costly recurring telecommunications charges** – site-to-site calls flow over leased PRI circuits with high monthly fees. Calls to remote offices and home workers are terminated over the PSTN at additional expense.
- **Lack of flexibility** – adding PRI circuits can take weeks or even months in certain parts of the world. IT is challenged to meet the needs of the business in a timely fashion.

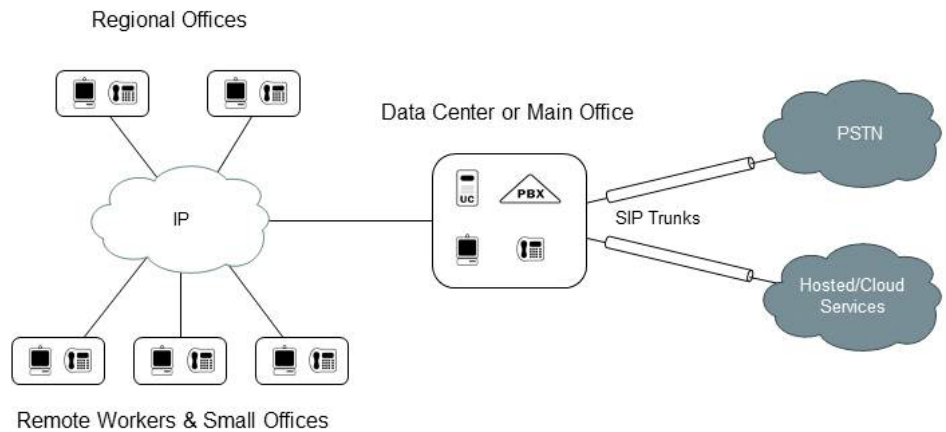


Conventional voice networks are a costly and inefficient collection of independent telephony islands

End-to-end SIP networks reduce cost and complexity and improve communications

By converging interactive voice, video and UC onto a common SIP-based infrastructure, enterprises can reduce CAPEX and OPEX while delivering richer end-user experiences. Specific applications and benefits include:

- **Network consolidation** – businesses can reduce equipment expenses and simplify ongoing administration and maintenance by consolidating PBXs, UC servers and trunks into central data centers. SIP traffic can be backhauled across the private IP network and handed off to central trunk pools or to hosted IP communications service providers. For example, worldwide meet-me conferencing traffic can be backhauled across the enterprise IP network and handed off to a central hosted audio conference service provider to eliminate local PSTN access fees.
- **Converged IP network** – enterprises can reduce CAPEX and OPEX by leveraging the IP data network for interactive communications. They can retire legacy voice equipment, eliminate site-to-site TDM circuits, bypass the PSTN and utilize the private IP network for toll-free internal calls anywhere in the world.
- **Enhanced communications and collaboration** – businesses can tap into the large and growing SIP solution ecosystem to exploit the latest advancements in communications technology. SIP is supported in a wide variety of communications products including IP-PBXs, UC servers, and videoconferencing systems as well as hard-phones, soft-phones, instant messaging clients and new business-oriented tablet PCs.



SIP networks reduce cost and complexity by unifying communications and consolidating resources

SIP trunking reduces PSTN connectivity expenses and accelerates service delivery

Many service providers now offer SIP trunking services – flexible, cost-effective alternatives to conventional PRI (Primary Rate Interface) trunks for PSTN origination/termination. Enterprises can reduce long distance and international calling fees and improve service agility by using a SIP trunk service provider for PSTN access. SIP trunking advantages include:

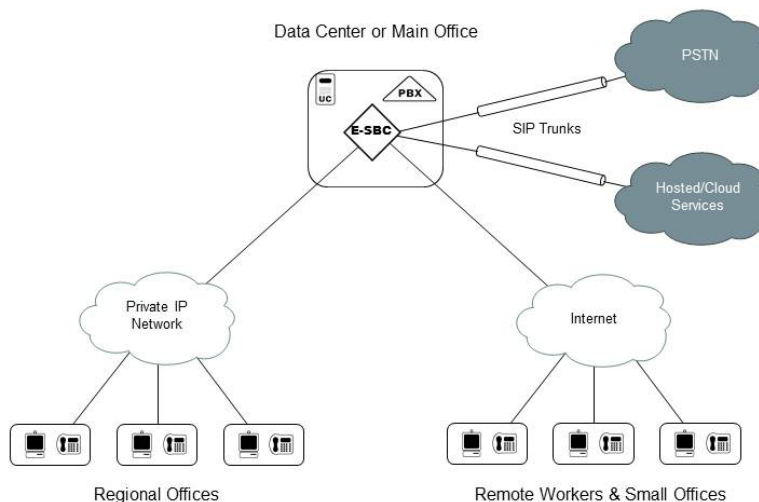
- **Lower facility costs** – according to Gartner¹ SIP trunks cost at least 28% less than PRI trunks with comparable throughput. While a PRI is capable of carrying 23 voice channels over a T1 (and 30 over an E1) Gartner’s experience with SIP trunking suggests that at least 50 conversations can be supported on a single T1 line – with no impact on call quality.
- **Cost-effective scalability** – PRIs must be leased in increments of 23 (or 30) channels. With SIP trunking businesses only pay for the capacity they need. In addition, many SIP trunk service providers support a “bursting” option to temporarily throttle capacity to accommodate intermittent traffic spikes.
- **Converged infrastructure** – by carrying voice and data over the same trunks businesses can consolidate T1/E1s and reduce recurring telecommunications charges.
- **Cost-effective access to hosted services** – SIP trunks can be used to provide efficient, low-cost access to cloud-based communications services, including audio and video conferencing services.

Additional ways to save money and improve communications with SIP

- **Internet-facing services** – leverage the Internet to extend corporate communications services to small offices, remote workers and mobile professionals. Implement cost-effective business continuity plans in the event of site closings.
- **Contact center modernization** – eliminate costly carrier take back and transfer fees by redirecting calls over the corporate IP network. Incorporate home-based agents and offshore employees over the Internet.
- **Hosted services** – leverage hosted service providers to reduce on-site equipment expenses and hassles. Free up critical IT resources to focus on strategic business initiatives. Outsource telephony, contact center or conferencing functions.
- **Communications-enable business processes** – add interactive communications to software applications and business processes to eliminate inefficiencies and boost worker productivity.
- **Business-to-business connectivity** – “federate” with suppliers and partners to improve communications and streamline business procedures.

Acme Packet E-SBCs protect and control SIP network borders

As with any new technology, enterprises must consider a number of technical matters when implementing end-to-end SIP networks or interfacing with SIP trunk service providers. Interactive IP communications introduces security, interoperability and reliability issues which are beyond the scope of existing IP networking solutions. Conventional IP firewalls, application layer gateways (ALGs) and IP security appliances weren’t designed with real-time interactive IP communications in mind and leave the enterprise vulnerable to a variety of SIP-based security threats. IP traffic shapers, load balancers, bandwidth management solutions and policy management systems weren’t designed to control interactive voice or video sessions, and can’t guarantee high-quality rich media experiences. IP routers, firewalls and application layer gateways can’t resolve the multi-vendor interoperability and multi-protocol interworking issues businesses often encounter when implementing SIP communications services.



Acme Packet E-SBCs address IP communications security, interoperability and reliability challenges

Acme Packet E-SBCs are specifically designed to address the unique security, interoperability and reliability challenges that accompany the implementation of SIP-based networks and services. Enterprises typically install E-SBCs at SIP network borders in the same way they install firewalls at IP network borders.

Acme Packet E-SBCs provide extensive security features to safeguard enterprise IT assets, extensive protocol normalization features to resolve interoperability and compatibility issues, and rich session control and high availability features to ensure service availability. Key features and functions include:

Feature	Function
Security	
<ul style="list-style-type: none"> Granular access control 	<ul style="list-style-type: none"> Prevent fraud and service theft
<ul style="list-style-type: none"> IP address and SIP signaling concealment 	<ul style="list-style-type: none"> Safeguard privacy and confidentiality
<ul style="list-style-type: none"> Layer 3-5 topology hiding and signaling overload controls 	<ul style="list-style-type: none"> Prevent reconnaissance scans and DoS/DDoS attacks
<ul style="list-style-type: none"> IP telephony spam protection 	<ul style="list-style-type: none"> Mitigate nuisance calls
<ul style="list-style-type: none"> Stateful deep packet inspection 	<ul style="list-style-type: none"> Remove malicious viruses and worms from SIP messages
<ul style="list-style-type: none"> Signaling and media encryption 	<ul style="list-style-type: none"> Prevent eavesdropping, hijacking and impersonation
Interoperability	
<ul style="list-style-type: none"> SIP message normalization Response code translation SDP and DTMF manipulation Number and URI manipulation Signaling message header manipulation 	<ul style="list-style-type: none"> Resolve multi-vendor interoperability issues
<ul style="list-style-type: none"> Transport interworking (TCP, UDP, SCTP) Encryption interworking (TLS, MTLS, SRTP, IPsec) NAT and firewall traversal IP address translation: private/public, IPv4/IPv6 Transcoding 	<ul style="list-style-type: none"> Interconnect autonomous IP telephony islands Implement end-to-end IP communications
Reliability	
<ul style="list-style-type: none"> Stateful signaling & media failover 	<ul style="list-style-type: none"> Enable high availability
<ul style="list-style-type: none"> QoS marking, VLAN mapping, access control 	<ul style="list-style-type: none"> Guarantee service quality
<ul style="list-style-type: none"> Registration storm avoidance Call rate limit enforcement 	<ul style="list-style-type: none"> Prevent network and system overload
<ul style="list-style-type: none"> Trunk load balancing 	<ul style="list-style-type: none"> Optimize performance
<ul style="list-style-type: none"> Stateful session routing 	<ul style="list-style-type: none"> Circumvent equipment and facility failures
<ul style="list-style-type: none"> Stateful signaling & media failover 	<ul style="list-style-type: none"> Enable high availability



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