

# S-Series SBC Interconnect Solutions

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**GENBAND™**

DRIVING THE **NETWORK** EVOLUTION

## Business Requirements

A ubiquitous global voice service offering is the challenge among today's large service providers. The need to embrace multiple regions and technologies often leads to a fragmented solution that is economically inefficient and operationally complex.

This problem is more evident within the global service provider landscape where common services need to be extended into multiple geographic regions (such as the Americas, Europe, Middle East, and APAC). Typically, these services need to integrate with both mobile & fixed networks, as well as create a framework for the handling of both VoIP-based and traditional TDM voice technologies. While delivering a solution that spans these networks and technologies is difficult enough, the service provider also needs to consider the specific regional variations towards the specifications, standards and technologies required. Most importantly however, the service being offered must be profitable. This places enormous pressure on the operator to craft a solution that delivers both the technical requirements and meets the business goals regarding CapEx and OpEx expenditures.

Traditionally, large interconnect service providers utilized TDM voice networks that included Class 4 or tandem switches, but the high cost of deploying dedicated connections to each peer network makes the continuing evolution of a TDM network unattractive. Moreover, the rapid growth of VoIP is a disruptive technology in the telecommunication industry that has changed the way a service provider interfaces with peer networks. Those larger operators that have sought to tackle global VoIP service deployment have often chosen to grow the service opportunistically. This, in most cases has often led to deployments that are broken into disparate network "islands" with fragmented vendor technologies that are managed and operated individually. This results in inevitable technical & operational challenges around equipment interop, solution feature consistency & end-to-end service management – ultimately leading to unfavorable OpEx and CapEx fundamentals.

## Technical Challenge

Long distance termination to multiple regional interconnect providers through VoIP is a more cost effective solution than traditional TDM termination. The need to reduce costs while expanding customer and supplier reach has sparked the desire for service providers to make a change.

However, directly interconnecting to peer service providers with VoIP introduces challenges and requirements that were not an issue in TDM networks. Core TDM networks included thousands to millions of private dedicated trunks for transporting voice between circuit switches. On the other hand, VoIP utilizes shared connections, and often, public internet connectivity, to reduce costs and expand reach. Some of the challenges introduced by shared connectivity include

- Security – protecting network resources from theft of service and malicious attack
- Quality of Service – ensuring SLA requirements between peer networks during high traffic periods or across shared low bandwidth network resources
- Interoperability – engineering networks to interwork reliably between the multitude of new VoIP communication equipment and protocols
- Enhanced Services – supporting the demands of the next-generation communication customer applications and preventing market obsolescence
- Revenue Optimization – maximizing profit in a global market with shrinking margins while providing accurate session accounting on a massive scale

## Solution

The GENBAND S-Series SBC and GenView RSM are deployed worldwide in VoIP Interconnect applications such as Carrier Peering and Wholesale Long Distance. The S-Series SBC was designed from the ground up to provide the advanced network security, QoS, and interoperability to support enhanced next-generation VoIP communication services and the demands of Tier-1 operators. In addition, the S-Series SBC and GenView RSM gives interconnect service providers reliable and detailed tools required for high volume accounting and call rating.

VoIP Interconnect applications can be broken down into two sub-categories; one-to-many and many-to-many. A typical one-to-many scenario would include a carrier providing direct termination to the PSTN interconnecting with its local peers, such as a CLEC. In this case, the majority of the traffic through the SBC would be originating from or terminating to the carrier's own network. This is the traditional role of a Session Border Controller.

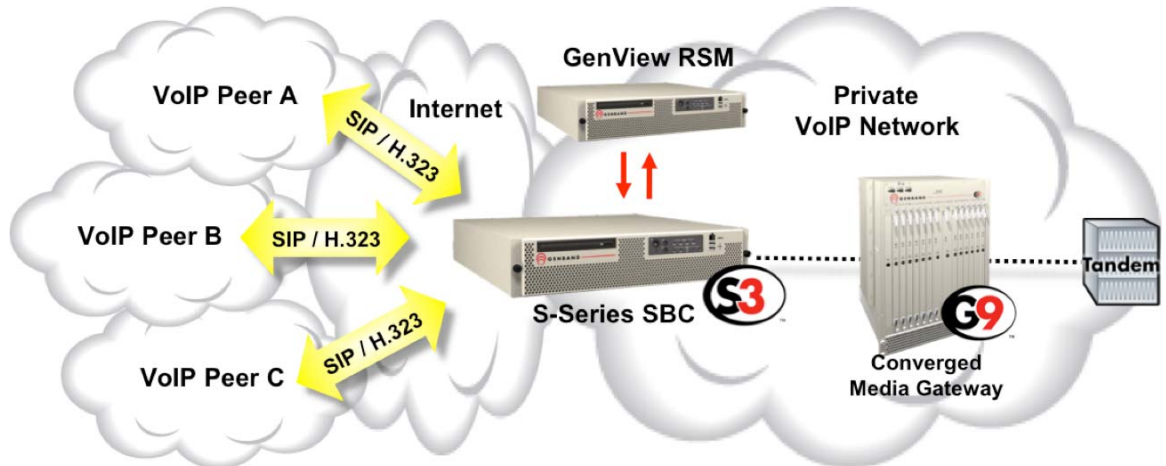


Figure 1 - One to many carrier peering interconnect scenario

In the example above, VoIP peers interconnect traffic is routed through the S-Series SBC to the GENBAND G9 Converged Media Gateway for termination on the service provider's legacy TDM network. Each VoIP peer may connect to the S-Series SBC via separate signaling and media IP addresses or even completely separate network realms. The GenView RSM provides dynamic routing, QoS management, and engineering reports for all S-Series SBCs in the network.

On the other hand, the extensive digit-based routing features of the GENBAND S-Series SBC combined with its flexible virtual proxy and realm functionality enables carriers to implement a many-to-many carrier peering scenario. These carriers are often international VoIP minute resellers that terminate traffic from numerous customers to numerous suppliers. In this scenario, the carriers utilizing the S-Series SBC and GenView RSM can take advantage of Lossless Least-Cost Routing (LLCR). While typical Least-Cost routing prioritizes destination routes on price, LLCR adds the ability place customer pricing on incoming routes. Moreover, profit-loss thresholds may be applied to prevent non-

profitable calls from being routed, or enforce a specific profit margin. The S-Series enables a carrier to host its own VoIP minute exchange market on a single platform.

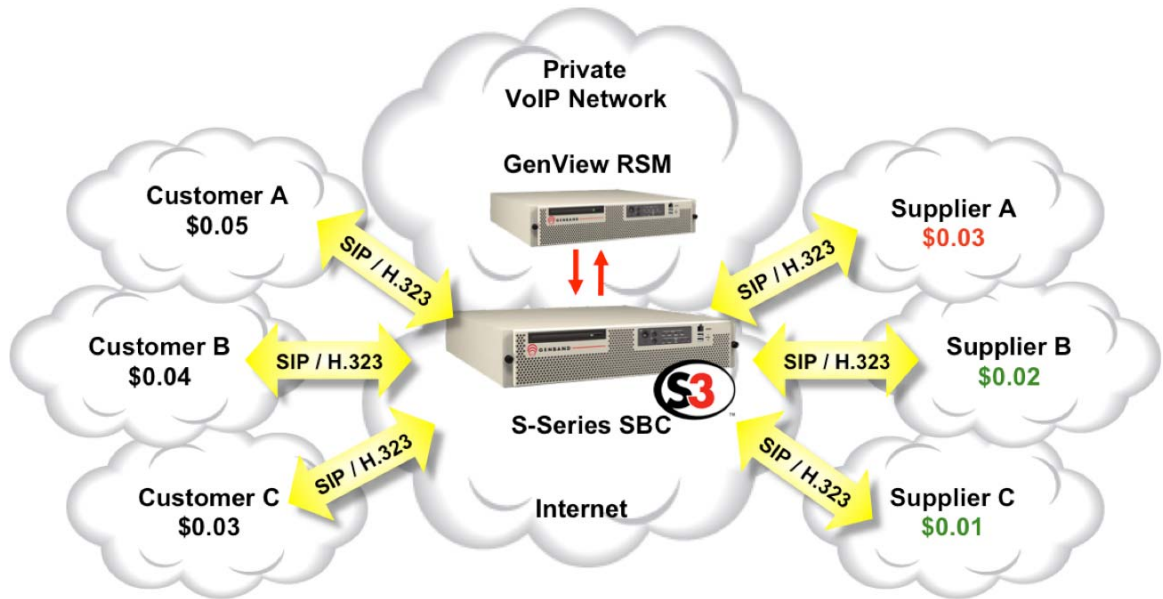


Figure 2 - Many to many carrier interconnect scenario with Lossless Least Cost Routing.

In the example above, Lossless Least Cost Routing can be used to require a \$0.01 threshold to prevent calls from Customer C from being routed to Supplier A. These decisions can be adjusted dynamically over numerous Customers, Suppliers, and Route regions.

As the number of SIP Peers to a carrier's network increases, so does the need for protocol normalization. Each new peer added to a network may include new softswitches, gateways, application servers, or direct user endpoints. Many peers may even be utilizing legacy protocols such as H.323. The potential for protocol incompatibility between network elements drastically increases. The S-Series SBC provides robust SIP and H.323 protocol normalization capabilities to reduce a carrier's need for expensive and time consuming multi-vendor interoperability exercises. The native Back-to-Back User Agent (B2BUA) functionality and stateful call management capabilities of the S-Series ensure all inter-network VoIP signaling is terminated on one side of the SBC and recreated in a normalized fashion on the other side. This protects each network from potentially harmful proprietary SIP extensions or poorly implemented protocol stacks. Carriers utilizing the S-Series SBC benefit from GENBAND's Tier-1 interoperability and partnerships that extend across more than 250 vendor devices and protocol implementations.

## Security Benefits

Interconnect service providers are often exposed to external network traffic which increases the risk of service theft and DoS attacks. The GENBAND S-Series provides a multi-stage security framework providing threat mitigation on both ingress and egress calls from the service provider's network

| Feature   | Benefit  |
|---|--|
| Separate signaling and media interfaces, each with dedicated multi-core processors            | Allows signaling and media to traverse separate network paths and distributes processing to prevent overload conditions.<br>Improves overall system capacity and scalability |
| Full Back-to-Back User Agent (B2BUA) functionality from the ground up                         | Total Network Topology Hiding by virtue of the underlying architecture   |
| TLS and IPsec encryption and authentication   | Protects sessions from eavesdropping   |
| Dynamic Access Control Lists (ACLs) based on endpoint address, authentication, and IP address | Automatically isolates rogue endpoints to prevent DoS attacks and overload conditions  |
| Traffic Policing per endpoint or source IP address  | Protects the SBC signaling processing resources to guarantee capacity for validated users  |
| Overload protection via load shedding   | Absorbs overload conditions at the network edge while protecting the service provider's core.  |
| Media Timers  | Eliminates abandoned calls and fraudulent calls.   |

## Quality of Service Benefits

The GENBAND S-Series QoS features ensure service levels and network availability during high traffic periods and oversubscription scenarios.

| Feature                        | Benefit   |
|--------------------------------|---|
| QoS classification and marking | SBC provides packet inspection and prioritization at the edge of the network<br>Ensures priority treatment of premium subscribers                                   |
| QoS Statistics and Reporting   | Provides detailed SLA reporting for packet loss, jitter, delay, R-Factor, and MOS<br>Monitors voice quality at the edge of the network—where it has the most impact |
| Bandwidth Policing             | Ensures QoS by enforcing bandwidth usage  |

|                                  |  |
|----------------------------------|--|
|                                  | limitations across links or subscribers  |
| Rate Limiting and Load Balancing | Prevents network element overload in the core<br>Enforces capacity policies across subscribers |
| Call Gapping                     | Prevents call flooding of core network elements during mass dialing events                     |
| Emergency Session Routing        | Priority routing and media treatment is given to emergency calls                               |

## Interoperability Benefits

The GENBAND S-Series offers unique interoperability features that maximize global market reach that are tailored to the needs of interconnect service providers.

| Feature   | Benefit  |
|---|--|
| Extensive interoperability across more than 250 vendor devices and protocol implementations | Service providers benefit from GENBAND's carrier-class interoperability and partnerships   |
| Protocol Signaling Interworking;<br>SIP, H.323, and H.248                                   | Evergreen support for legacy network signaling devices is provided<br>Mature protocol implementations allow the S-Series SBC to perform multiple functions within the IMS network architecture |
| Session routing and switching between partitions, realms, domains, and VLANs.               | Provides true any-to-any session routing   |

## Enhanced Service Benefits

The GENBAND S-Series SBC enables enhanced services and features that are in demand by today's next generation interconnect service providers.

| Feature                                | Benefit  |
|--|--|
| Partitioning for Virtual SBC instances | Allows a service provider to re-sell their SBC service to other carriers with completely independent |

|  |  |
|--|--|
| Partitioning for Virtual SBC instances | Allows a service provider to re-sell their SBC service to other carriers with completely independent operations, administration, management, and provisioning. |
| Traffic Separation                     | Within each virtual SBC, traffic may be separated by proxies, VLANs, domains, etc. for flexible network architecture.  |
| Multimedia Session Routing             | Voice, Video, and Wireless media codecs are supported  |
| Instant Messaging Support              | The latest subscriber collaboration features are supported across service provider networks  |

## Revenue Benefits

Success in the VoIP interconnect market requires detailed and accurate billing records, and close management of expenses across a global market reach. The GENBAND S-Series SBC provides unique features for ensuring the most efficient use of a service provider's network, while maximizing revenue and reducing costs.

| Feature                          | Benefit   |
|----------------------------------|---|
| Session Routing                  | Provides a complete Class 4 routing solution with Lossless Least-Cost Routing (LLCR)                        |
| ENUM Routing                     | Enables free termination between IP endpoints   |
| Endpoint Health Status Detection | Reduces downtime of vital network routes  |
| Radius accounting per-session    | Allows traffic planning and session-based billing<br>Allows traffic performance monitoring and audit trails |
| Business Reports                 | Reports true route Profit and/or Loss<br>Dynamically changes routing based on profit/loss                   |

## GENBAND S-Series Solution Benefits

GENBAND, a market leader of transformational gateway products, provides an extremely cost effective, scalable and easily managed solution to address service provider's global requirements today and for the future growth and evolution.

With the GENBAND S-Series, Tier-1 operators are assured of an end-to-end, manageable solution that enables operators to deliver both the technical requirements and meet the business goals regarding CapEx and OpEx expenditure. The GENBAND S-Series SBC and GenView RSM solution provides key benefits to an interconnect service provider including

- Reduction of costly legacy TDM circuits
- Diversified wholesale suppliers and profit-based routing intelligence
- Dynamically shaped Class-4 network routing functionality
- Unsurpassed network security, scalability, and call capacity
- Tier-1 reliability and expertise from GENBAND products

GENBAND is the only NGN equipment vendor in the market today that can offer a cost effective, true end-to-end global interconnect solution that encompasses VoIP, TDM and Mobile networks. The GENBAND market leading NGN management solutions offer the ability for full network management of the global interconnect – a huge differentiator for network operators and service providers.