

# The Intelligent SBC

*Simplify, Scale and Secure Your Network*

November 2011

---

**Table of Contents**

Introduction .....	3
Operator Challenges .....	3
Blended and Converged – Applications, Networks & Devices .....	4
Quality Assurance .....	4
Maximizing Profitability.....	4
The Intelligent SBC .....	4
Insightful Policy Enforcement:.....	5
Adaptive Security .....	5
Intelligent Session Management .....	6
Seamless Normalization.....	6
Holistic Evaluation with Dynamic Adaptation.....	6
Holistic Visibility.....	7
Dynamic Adaptation.....	7
Simplification.....	7
Deployment Simplicity & Flexibility.....	7
Operational Simplicity .....	7
Scale.....	8
Evolution Expertise.....	8
The GENBAND offering .....	8
Conclusion .....	10

## Introduction

The communications landscape is changing, and the pace of change is accelerating.

*Network Convergence is in full swing.* Ubiquitous broadband is no longer a “value add” service – it has become an imperative component of a productive society. Internet Protocol (IP) is the driving force responsible for both enabling and forcing carriers to converge their network assets, both fixed and mobile. Mobile networks are advancing to 3G and 4G architectures, supporting faster mobile data speeds. WIFI hotspot coverage is expanding and fiber is being deployed to residential dwellings at a rapid rate. Access to these networks has become integrated, applications are increasingly moving to the cloud, and plain voice services are being supplanted with rich multimedia services.

*Everything is becoming mobile.* The explosion of easy-to-use, next-generation smart phones and tablet devices is changing how people interact, socialize and do business. Mobility is the new norm, and users expect and demand connectivity at anytime, anywhere and on any device. Mobile-friendly content from Facebook, YouTube and elsewhere is driving data usage levels, and carriers must efficiently connect their 3G and LTE/4G mobile network to partners that can fulfill the

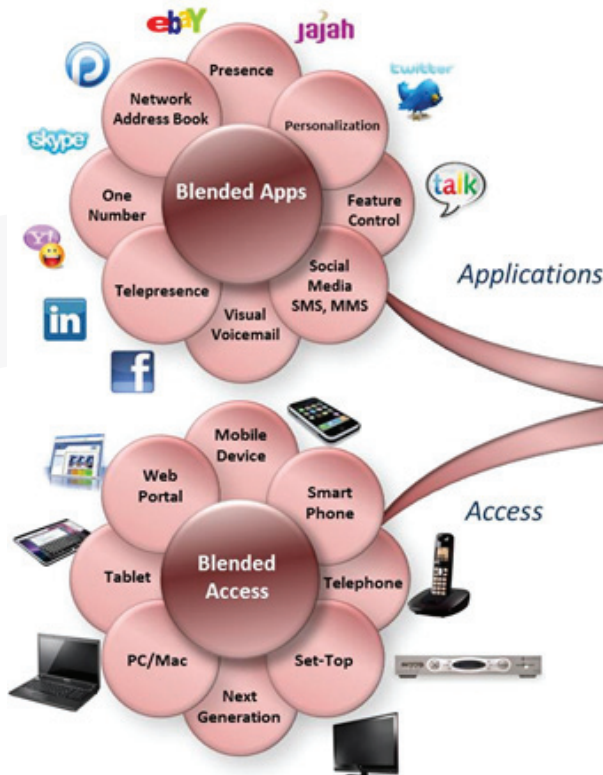
ever-growing demand for data and entertainment.

*Traditional carrier business models are under attack.* Average Revenue Per User (ARPU) is not keeping pace with network costs as Over-the-Top, bi-directional streaming video content and data-hungry smart phone applications drive bandwidth usage. The PSTN model centered on voice minutes continues to decline, and carriers must learn to work closely with OTT content providers to build new value chains on top of traditional telecom networks.

In this GENBAND white paper, we examine how these trends affect operators – and how a new generation of session border control technology addresses these challenges. By deploying an intelligent solution at the network edge, this new generation of Session Border Controllers (SBCs) enables seamless communications across evolving network borders.

## Operator Challenges

To better understand these hurdles and opportunities, it may help to examine them along three crucial dimensions – addressing the convergence of networks and services, ensuring a consistently high quality of experience, and maximizing profitability.



- ✓ **Stickiness** Across Operator's Access Types
- ✓ **Service assurance** through **seamless Interworking** across multiple networks and devices
- ✓ **Reduction** in Subscriber Churn by assuring **Quality of Experience**
- ✓ **Maximizing profitability** by reducing cost and increased ARPU
- ✓ **Simplified Operations & Management**

*How operators can uniquely position themselves to converge applications, and have them work over multiple access types*

**Blended and Converged – Applications, Networks & Devices**

In this era of multimodal communication, a dialog can begin in many ways and the context is likely to change regularly; IM will become a voice call, a voice call expands to include video or collaboration, and a simple person-to-person dialog will grow into a conference.

At the same time, devices themselves are converging, and carriers must respond to this far reaching dynamic. Phones now function as computers and computers are phones. Phones are TVs and vice versa. Mobile devices incorporate high-end camera capabilities. Devices across the spectrum play video and increasingly function as video broadcasters. Network operators must understand how, and on what device or devices, a given service is being consumed.

To survive and succeed in a converged, mobile and dynamic communications environment, carriers must provide seamless interworking across services, networks and devices. They must find a way to stitch historically distinct applications – voice, data and video, with newer presence-enabled rich communications – into a cohesive whole that embeds their business into the delivery value chain.

Carriers who cannot master this challenge risk losing their place in the service delivery value chain and face becoming a commoditized bit provider, much like utility companies now sell electricity.

**Quality Assurance**

Customers stick with a telecom carrier, versus churning to an OTT content player, for one simple reason: **QUALITY**.

Carriers must deliver high quality, integrated services across multiple networks and devices, or they will continue to shed customers, revenue and profits. Due to the way these voice networks were engineered, implemented and maintained, a

subscriber has high confidence that the service will be there when she needs and that the service provider can accurately bill for the service. Today, when placing a critical call, subscribers still prefer the carrier network over an OTT alternative. Carriers must not only preserve this preference, but must in fact extend that advantage beyond voice to the growing universe of other services.

**Maximizing Profitability**

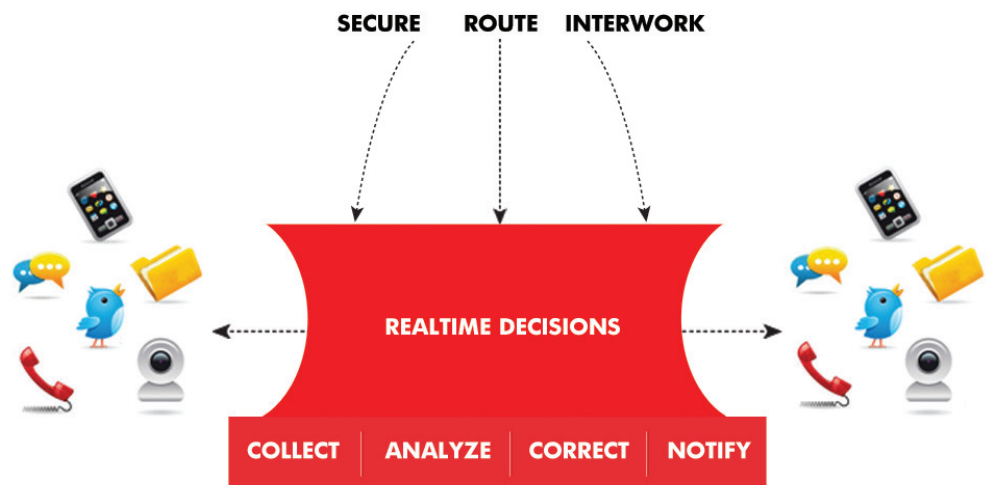
Telco revenues are declining, and may continue to decline. Newly introduced services evolve from being a “high value” offer to little more than table stakes, at an alarming pace. How can operators perform their traditional function, but do it cheaper? And how can they secure their position in the changing communications value chain?

The answer may be found at the network edge – where intelligent session border control can be deployed to reduce costs, improve performance and achieve higher customer satisfaction.

The following sections will cover how the Intelligent SBC can help solve these challenges.

**The Intelligent SBC**

Nothing impacts quality – or customer satisfaction – more than service unavailability. To address the must be able to intelligently and efficiently deal with traffic entering and exiting a service provider’s network.



WHITE PAPER

Session Border Controllers are designed to perform secure session management at the network borders; but unfortunately, the security mechanisms of traditional SBCs – topology hiding, NAT traversal, access control lists, call admission control – while still necessary, are insufficient to protect today’s more complex borders. Intelligent security mechanisms are needed to protect the new networks and to ensure service continuity.

However, security alone cannot ensure the quality and profitability of services. By deploying intelligence at the network borders, operators can quickly address irregularities before they enter and can thus shield their core networks from the dynamic environment of today’s communications.

The intelligent SBC must provide a combination of three key capabilities:

1. **Insightful policy enforcement** at the point of entry.
2. **Centralized, holistic evaluation** with dynamic adaptation
3. **Simplification**

Let’s explore each of these in detail:

### Insightful Policy Enforcement:

For every session entering and exiting the network, an intelligent system must be in place to inspect it, characterize it along multiple dimensions, and execute smart processing decisions.

- ✓ What’s the type of request – Voice, Video, IM, or simply capability exchange?
- ✓ Who it is from - trusted/ untrusted?
- ✓ Am I capable of processing it?
- ✓ Does it meet the processing criteria?
- ✓ Do I need to provide any normalization or other special treatments?
- ✓ Where shall it be routed and what’s the selection criteria?
- ✓ Where do I get the routing information from?
- ✓ Is the selected destination available to take requests?
- ✓ Will it be profitable to route request to the selected carrier?
- ✓ Is the selected destination delivering desired quality?
- ✓ What’s the capability of a destination network?

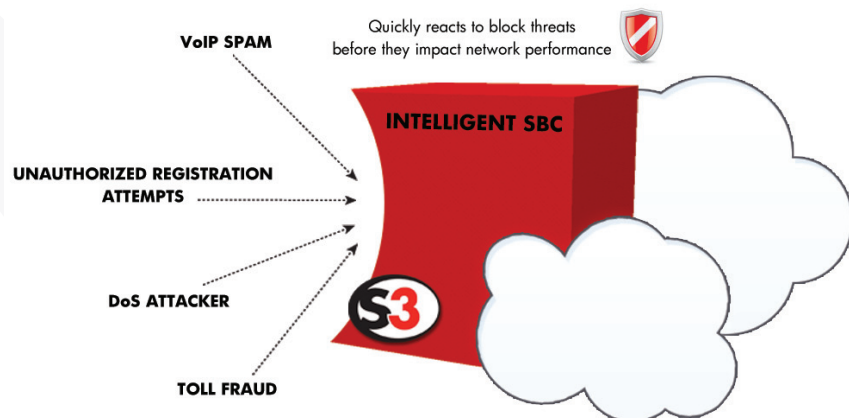
These are just some examples of the analysis to be done in the decision chain. These decisions should be based not just on static and quasi-static network engineering and business policies such as trunk groups called party number, time of day etc., but also on real-time insights gained via holistic evaluation of network behavior.

Once armed with this real-time intelligence, the key to success will be based on an ability to support dynamic adaptation of the network to respond.

### Adaptive Security

With each new border, device or application, the threat of attack is multiplied. Real-time VoIP, video, IM and other multimedia services are increasingly targeted for intrusion. DoS and other malicious acts are adapting to target emerging communications applications. Intelligent screening of traffic must include a deep awareness of the packet contents to correctly identify anomalies or malicious activities. Adaptive Security works proactively to keep the network secure. This can include dynamically blacklisting the source of malicious traffic, applying rate limits to drop packets, or automatically adjusting admission control policies.

Intelligent session border controllers are the knowledgeable sentry at the network edge, protecting against network attacks and service thefts, while ensuring communications privacy and regulatory compliance. To prevent dynamic attacks the Intelligent SBC constantly monitors traffic streams to recognize patterns and repeat behaviors, and continually adapts to provide preemptive protection against new risks that threaten to disrupt or disable IP-based networks.



In an intelligent SBC, connectivity is secured through granular controls that allow carriers to proactively manage session quality, capacity and availability. Multi-stage policies are used to admit, inspect and shape traffic to ensure policy enforcement, SLA management and session viability.

### Intelligent Session Management

One of the most critical factors in assuring the quality and profitability of a service is how accurately the session gets routed. Inefficient routing can cause unnecessary intermediate hops, session delays, or loop-around causing incompletions—any of which will seriously impact the quality of the customer experience.

Intelligent routing requires a very comprehensive understanding of the selection criteria. Traditional session routing was based on calling party number, called party number, trunk group and other static policies. Optimized destination selection shall take into consideration factors such as:

- ✓ Capabilities of the destination
- ✓ Availability of the destination
- ✓ Cost effectiveness and profitability of the destination
- ✓ Performance of the destination
- ✓ Service type

An intelligent session management approach provides for the logical association between traffic management policies and end devices, while statefully monitoring device usage and applying policy at network ingress, transit, and egress points.

Advanced session border controllers provide policy enforcement capabilities and a highly programmable session routing engine. Intelligent routing at interconnect borders enables service providers to traffic-engineer their IP networks and to leverage dynamic route hunting, adaptive routing based on response codes, and route selection by peering partner priority, type of service, SLA, cost, profitability, route performance and other variables. This sophisticated, intelligent approach to routing significantly reduces IP-to-IP session management complexity.

### Seamless Normalization

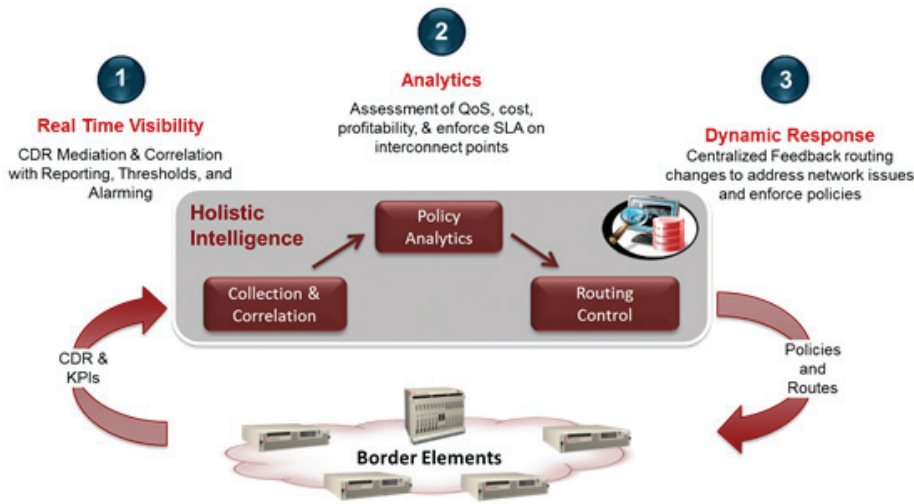
As communications networks evolve, interconnects tend to grow in numbers and complexity. Carriers and enterprises are converting core networks to IP, and are using IP to connect with peering entities. For the network core to deal with the emerging universe of applications, networks and devices, those elements must first be normalized at the edge. Through intelligent edge technologies, traffic must be inspected, understood, converted and routed – so that every internal system does not have to deal with every potential possibility. To gain the simplicity needed in this complex network environment, advanced session border controllers now function as the Rosetta Stone – or language translator – of the modern communications network.

Carriers must deploy intelligent controls and policies needed to seamlessly normalize and interoperate with multivendor and multiprotocol devices across different networks - TDM, IP, fixed and mobile; different standards – NGN, 3GPP IMS, Packet Cable; different transport mechanisms – UDP, TCP, SCTP, TLS, IPv4, IPv6, RTP; different protocols – SIP, SIP-I, SIP-T, H.323, MSRP, DIAMETER, RADIUS, ENUM; different media formats - G.711, G.729, AMR, iLBC, HD Voice, HD Video, DTMF; and deliver consistent, advanced multimedia services to partner, residential and enterprise customers.

An intelligent approach to session border control provides transparency via dynamic message based scripting to manipulate SIP header and message bodies in real time, dynamically react to SIP responses and optimally determine need for media normalization, thus ensuring smooth interworking between a large and diverse ecology of suppliers and partners across interconnect and access networks.

### Holistic Evaluation with Dynamic Adaptation

Successful management of networks begins with a deep understanding of network behavior. As disparate voice and data traffics converge to multi-media sessions, having clear service layer visibility on those sessions is critical for network operators. What's happening in my network now, what happened to my network, why are my customers complaining, where am I losing money – are some of the critical questions network operators must answer on a daily basis.



adjust (for instance) route priorities, admission control policies, and partner preferences to ensure quality, performance and profitability.

The intelligent SBCs must deliver these critical capabilities without adding operational complexity and tremendous cost incurred by using external probes, use of 3rd party systems, or the need for multiple boxes.

### Simplification

The art in intelligently solving complexities of new networks is to bring simplicity in network operations, deployments and scalability.

### Holistic Visibility

Troubleshooting a highly distributed IP network can be complex and time-consuming. To ensure quality performance and customer satisfaction, carriers need simple yet sophisticated tools to extract, view and manage real-time sessions and network performance. Often times, the only way to get adequate visibility into what's actually happening in the network requires 3rd party performance monitoring solutions, adding expense and complexity to a deployment.

Intelligent session analysis must provide holistic evaluation of the:

- ✓ Quality of the multimedia traffic
- ✓ Performance of the interconnect points
- ✓ Profitability of routes
- ✓ Performance of the network nodes
- ✓ Utilization of the system capacity

And monitor many other such network characteristics to provide detailed real-time reporting and alarming capabilities at both the network and service layers.

### Dynamic Adaptation

To deliver optimized quality, operators must go beyond visibility to leverage that information via automated feedback mechanisms, to gain a real understanding of network activities, and to translate that insight into policies that dynamically

### Deployment Simplicity & Flexibility

As communication networks are continuing to evolve from NGN to an all-IP architecture, network elements at the edge of communication networks, especially session border controllers, will need to continually adapt to the new roles and offer deployment flexibility and seamless migration. Today's SBCs are often stand-alone purpose built platforms, but as networks become more complex, integrated solutions to minimize the management and integration issues will become important when deploying new services. Intelligent SBCs must provide complete flexibility in architecting networks by deploying the same SBC software either as a standalone solution or as a module in a fully integrated, multi-application platform.

When delivered on common, off-the-shelf platforms, session border controllers can provide substantial and measurable deployment benefits. With common hardware, middleware and management, the intelligent platforms enable virtualization to handle many network roles and to support multiple applications. These intelligent platforms allow operators to save money on sparing inventory, training, integration and operating costs.

### Operational Simplicity

As network operators deploy new platforms, they want to ensure that these new systems can be easily integrated into their networks and that ongoing operations, administration, maintenance and provisioning costs are minimized. Having

simplified, web-based provisioning systems with simple drop-down menus, configuration templates for vendor specific profiles, and solution oriented configuration policies is important for faster deployment of service and avoiding operator errors. Standards-based interfaces must be available to enable the smooth integration of FCAPS (Fault, Configuration, Accounting, Performance, and Security) functions into an operator's existing operational support systems and network management systems. In-service software and platform upgrades must be supported with common software supported across different platform evolution.

**Scale**

Networks that were originally designed and built for a single set of customers are today being tasked to consolidate traffic from multiple sets of customers. The emergence of VoIP/SIP was tiny compared to the next wave, and the number of mobile VoIP subscribers will be exponentially larger.

The number of codecs and types of sessions are changing. "Lifestyle" communications, such as video calls between two parties, may include video calls lasting a day or more. Mobile phone and Instant Message (IM) type sessions tend to be short and bursty interactions – very different from the traditional call models. These variations create complex traffic engineering models.

Intelligent SBCs must address these capacity requirements without deploying hundreds of new boxes in their networks. These intelligent-edge devices must continue to improve in scale and performance, through hardware and software engineering, and also through new innovative traffic management techniques such as load balancing, virtualization, real time usage monitoring, and centralized routing across network elements.

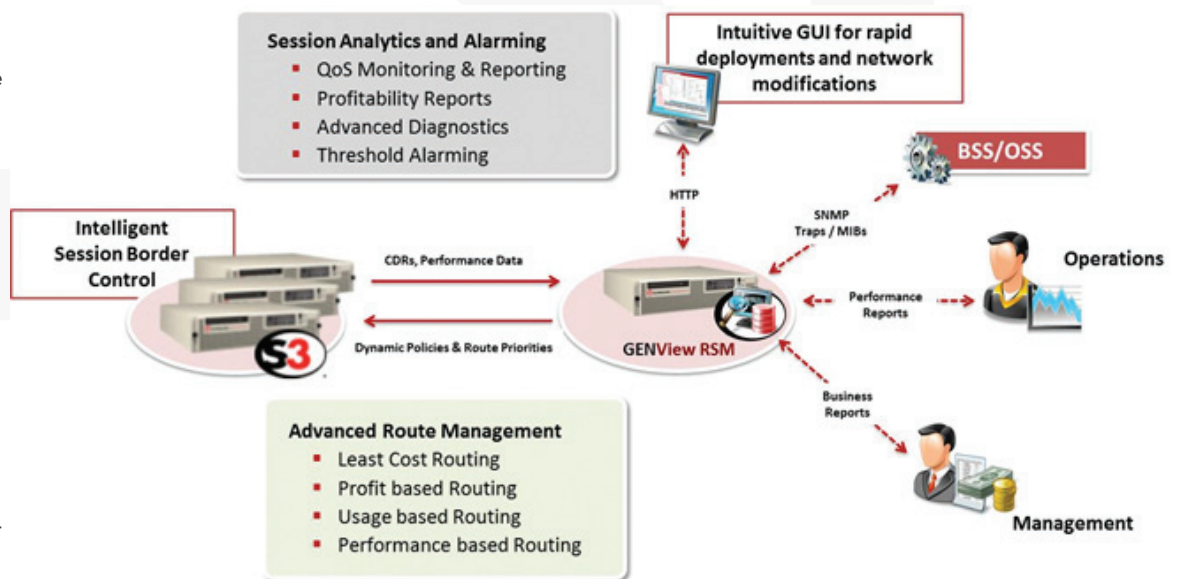
**Evolution Expertise**

To fully realize the potential of intelligent edge solutions, carriers should support those capabilities with robust service and technical support. Astute network managers seek support that offers proven NGN and IMS specialization, in-house and partner technical depth, network expertise, and the sophisticated toolsets needed to quickly and effectively transform and deploy IP networks.

A well-rounded service organization should offer both business and solution-level consulting, network evolution and transformation services, network integration assistance, managed spares capabilities, and managed services, training and multi-level customer support.

**The GENBAND offering**

GENBAND, a global leader of IP infrastructure and application solutions, is a pioneer in the SBC product category with a long history of success. The GENBAND S3™ is a feature-rich Intelligent SBC, enabling network transformation and convergence of fixed and wireless networks. The S3 delivers secure, carrier class, real-time communications for mobile and fixed line service providers, enabling new service offerings, rapid revenue generation and cost savings across NGN and IMS networks.

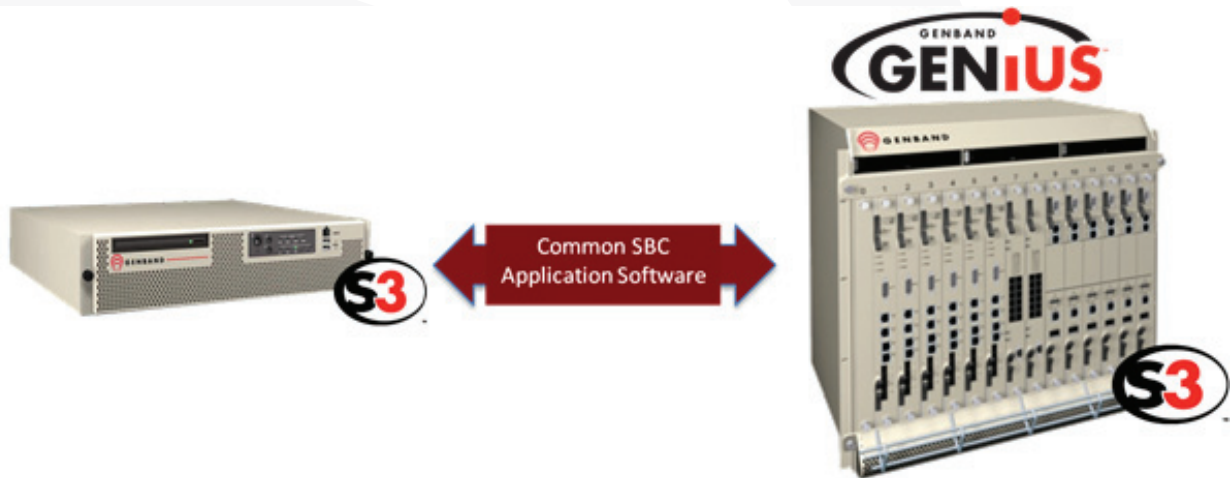


GENBAND's Intelligent SBC solution delivers a compelling set of capabilities for IP Interconnect, IPX, Hosted Unified Communications, SIP Business Trunking, VoLTE, and Rich Communications Suite. Through a combination of adaptive security, insightful policy enforcement, any-to-any seamless interworking, and advanced session routing capabilities, the S3 SBC brings service providers advanced levels of intelligence, flexibility and performance at IP network borders. Accompanying the S3 is the market leading Real Time Session Manager (RSM). The S3 ensures a secure and robust interoperable IP border, while the RSM provides visibility into the traffic that traverses the network edge and adds the analytical capabilities to dynamically modify the call routing behavior based on a combination of business policies, network QoS or subscriber usage patterns. The result is a network that is not only robust and secure, but one that provides the business flexibility needed to deliver highly profitable services.

- Regulatory compliance for Lawful Intercept and Emergency call prioritization
- Advanced multimedia support for voice, video, IM, and RCS-e services

**Holistic Visibility and Dynamic Adaptation**

- Powerful and flexible **adaptive call routing** - taking real-time inputs and re-shape routing policies to ensure business targets are met.
- **Operational Reporting** on historic and real-time performance of the network
- **Business Reporting** – providing visibility into which routes are most or least profitable
- **Quality / QoS Monitoring** – providing visibility in how the network is delivering service
- **Advanced call diagnostic** - enabling views into sessions that may straddle multiple SBCs.



**GENBAND Intelligent SBC Solution Delivers: Compelling Security, Service Interworking and Operational Control**

- Adaptive security - Dynamic blacklisting and multi-stage rate limiting for DoS/ DDoS protection
- Seamless signalling and media normalization via programmable policies
- IPv4 and IPv6 network interworking
- Proactive voice quality monitoring / reporting / notification
- Enhanced cost, profitability and usage based session routing

The S3 SBC is delivered on carrier class, highly redundant platforms, field-proven in over 500 operators worldwide and with millions of deployed sessions. GENBAND offers two hardware versions of the S3, one is built on a commercial , off-the-shelf 2U server platform and another on the ATCA-based GENBAND GENiUS platform, the industry's only unified IP Switching and Networking platform supporting multi-purpose IP solutions. The architecture of the GENiUS platform includes ATCA hardware; GENWare advanced middleware; as well as GENView, an integrated common management layer that is the cornerstone of operational simplicity.

## Conclusion

Driven by a changing marketplace – defined by network and service convergence, device proliferation, mobility and service portability – carriers are struggling to respond. To survive and succeed, they must continue to adapt the edges of their networks and address the pressing challenges of service interworking, quality of experience and profitability. Smart and flexible devices must be deployed to bring intelligence and apply insightful policies to simplify networks, to enhance the customer experience, to reduce costs, and drive revenue to produce an optimal business outcome.

The GENBAND S3 Intelligent Session Border Controller is a critical part of the network designed specifically to protect the core of the networks, to respond to a dynamic marketplace, and to ensure carriers' meaningful position in the value chain of the future.

GENBAND, the 3-rings logo, DCO, G6, the G6 logo, GENBAND C3, G2, G9, the G9 logo, GENView, S2, S3, and S9 are all trademarks or registered trademarks of GENBAND Inc. or its affiliates in the U.S.A. and other countries. All other listed trademarks, if any, are owned by their respective companies.

© 2011 GENBAND Inc.

All rights reserved. All copy, reproduction, derivatives (including, without limitation, translation), modification, distribution, republication, transmission, re-transmission and public display or showing of this document, whether in whole or part, is strictly prohibited, without the prior written permission of an authorized GENBAND Inc. representative. This document, and any software of GENBAND Inc. mentioned in this document, whether delivered electronically or via other media, are the sole property of GENBAND Inc. and are available only under and pursuant to license agreement.

For more information, please contact GENBAND.

GENBAND  
866.GENBAND  
+1.972.521.5800  
[www.genband.com](http://www.genband.com)