Sonus SBC SWe Session Border Controller

The Sonus SBC SWe Session Border Controller is the industry's only software-based Session Border Controller (SBC) that delivers unlimited scalability with the same advanced features and functionality of hardware on a virtualized platform – without compromise. The SBC SWe features the same code base, resiliency, media transcoding and security technology found in Sonus' award-winning hardware-based Sonus SBC 5000 Session Border Controller Series. The only difference is how customers choose to deploy it: on industry-standard servers, in virtualized environments or as a hosted service. The SBC SWe operates seamlessly with the existing Sonus SBC product portfolio.

Sonus is the only vendor on the market with a common code base across its hardware and software SBC portfolio, giving customers investment protection and peace of mind about the security of their network. Scalable from 25 to an unlimited number of sessions, the unique architecture of the SBC SWe allows customers to define where on the performance curve their network needs to reside. Designed to be simple but robust, and agile but predictable, the SBC SWe makes it easy for customers to reach new markets and new revenues with secure SIP and Unified Communications (UC) services:

- Rapidly extend interworking capabilities with just a license
- Deliver the same advanced SBC functionality and features to small, medium and large businesses anywhere in the world
- Deliver hosted SBC services from a virtual environment for scalable performance at a flexible price
- Deploy SBC services into new regions without a truck roll

Media Services

- Transcoding G.711, G.722, G.723, G.726, G.729A/B and iLBC
- Wireline, wireless, wideband and clearchannel codec pass through
- VAD, Silence Suppression, Dynamic Jitter Buffer, DTMF/Tone Relay/ RFC2833/RFC4733 interworking
- NAT/NAPT on media
- DTMF Trigger Detection and Notification
- Generic audio codec relay
- Tones & Announcements
- Local Ring Back Tone (LRBT) support with centralized PSX Policy Server
- RTP inactivity monitoring
- Video codec relay

Redundancy

- 1:1 Redundant Instances for Service High before Availability

Management Capabilities

- Graphical based wizards for ease of configuration
- Secure embedded web-based management GUI
- Sonus CLI, SSH
- Centralized support by Sonus Insight EMS
- SNMP V2 status and statistics
- Local logging of events, alarms, and traps; Call trace
- Sonus DSI Level 0 support for storing CDRs; RADIUS accounting records
- Live Software Update (LSWU)

Signaling

- Back to Back User Agent (B2BUA)
- SIP, SIP-I/SIP-T, SIP/H.323
- SIP protocol normalization/ protocol repair; SIP message manipulation
- NAT/NAPT on signaling

Protocol Support

- IPV4, IPV6, IPV4/IPV6 interworking
- SSH; sFTP
- SNMP; NETCONF; NTP
- HTTP/HTTPS
- RTP/RTCP
- UDP, TCP
- DNS, ENUM

Routing/Policy

- Embedded policy/routing engine
- Centralized support by Sonus PSX Policy/Route Server using DIAMETER+
- Screening, blocking, routing, presentation, call type filters
- Route prioritization
- Leading digit routing; international routing; URI based routing
- Digit/parameter manipulation
- E911 support; Priority Call handling

Security

- Session aware firewall; Topology Hiding
- Line rate DoS/ DDoS, and Rogue RTP protection
- Line rate malformed packet protection
- TLS, IPSec (IKEV1) for signaling encryption
- Secure RTP/RTCP for media encryption

Quality of Service (QoS)

- Bandwidth management
- Call admission control (CAC) per trunk group, per zone
- Per call statistics
- TOS/ COS packet marking

Packet Network Time Source

- Network Time Protocol (NTP) per RFC-1708

Minimum Requirements

- VMWare ESXi 5.1 or higher
- 1 virtual CPU; 2GHz or higher
- 5GB of RAM
- 4 virtual NICs (1 – MGMT, 1 HA and 2 packet ports)
- 65GB hard disk size

Software-Based Session Border Controllers are Critical to the Evolution of Communications

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ZK Research
A Division of Kerravala Consulting

Section I: Communications Agility Is a Business Imperative

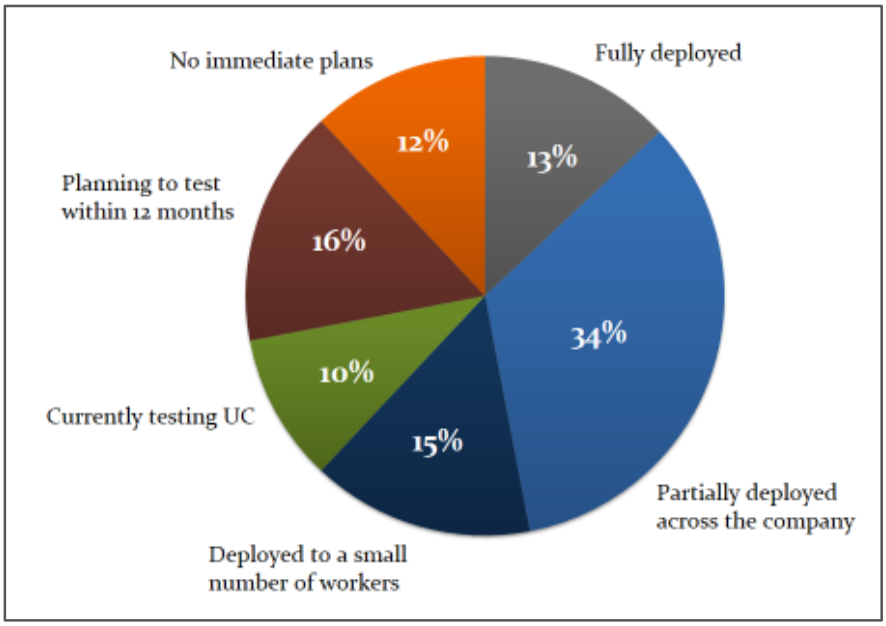
The role of the CIO has changed more in the past five years than any other position in business. Historically, the CIO and IT leaders were responsible for managing the technology infrastructure, but had little to do with transforming the business. Today's mandate for IT leaders is to deploy technology as a catalyst for change and drive business change and worker productivity.

A new world of work is emerging alongside the CIO's changing role. Competitive advantage used to be defined by a single core competency, but is now determined by speed and agility — making the best decision in a fraction of the time. This can only be done by harnessing the power of the extended enterprise and bringing the best people together at a moment's notice — making collaboration a key initiative for business and IT leaders. Today's CIO must know:

- **Unified communications (UC) must become mainstream**: If making faster decisions is the key to competitive advantage, a robust UC solution is the foundational platform on which competitive advantage is built. UC has been a nice-to-have, tactical technology, but is now need-to-have and strategic. Exhibit 1 shows most organizations have deployed UC to a portion of the company — but full deployment remains in the minority.

Exhibit 1: UC Deployments Are Wide But Not Deep

What is the status of UC within your organization?



Source: ZK Research, 2013

Influence and insight through social media

- **Communications must be an agile resource**: Many areas of IT — servers, storage and applications — have become more agile; but not communications. The static nature of the technology makes change time- and resource-intensive and difficult to execute. To deliver a truly agile IT environment, communications must evolve and align with the rest of IT.
- **Use virtualization to change the economics of communications**: Virtualization has redefined the economics and elasticity of the data center, particularly server technology. By leveraging virtualization, organizations can provision services by orders of magnitude faster than with legacy technology. Compute is a fluid resource that can be allocated or reallocated as the business requires. CIOs should leverage virtualization technology to bring the same benefits to the communications environment.

Section II: The Challenges with Legacy Communications

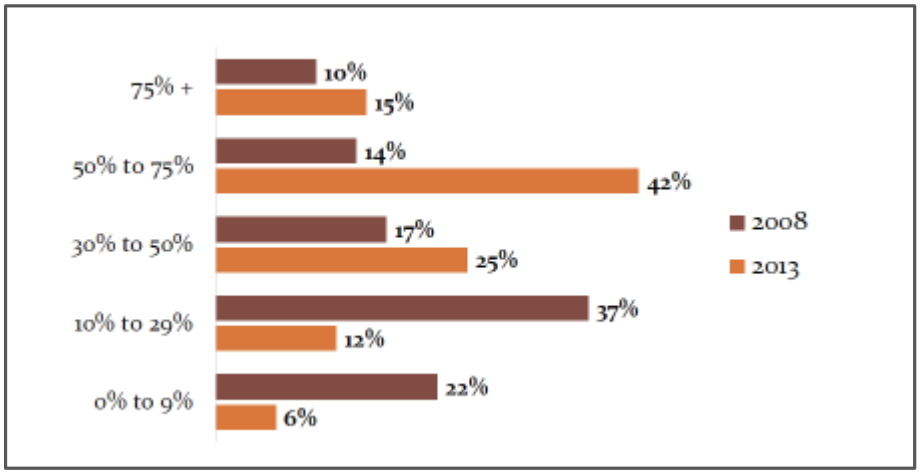
Implementing an agile communications environment is critical to business success today. However, legacy infrastructure is not well aligned with this vision. Although many current solutions use IP as the main communications protocol, architecture has not changed significantly over the past several decades. Traditional communications infrastructure is built on dedicated hardware; and while highly reliable, offers very little in the way of flexibility and agility. Other challenges with legacy infrastructure are as follows:

- **Lengthy upgrade cycles**: Legacy upgrades or regular maintenance often require swapping out hardware, site visits and unwanted downtime. Companywide system upgrades can take weeks or even months. Long lead times can mean companies miss out on business opportunities.
- **Lack of service flexibility**: Hardware-only solutions are ideal for static environments. However, the rigidity of the solution offers little flexibility, making deployment long and arduous.
- **Inconsistent features across the company**: Hardware-based solutions are typically deployed on a location-by-location basis. Each location may have its own platform, often from different vendors, leading to inconsistent features across the company. Even if the company standardizes on a single vendor, it is often difficult to keep each box at the same software version, which also creates feature inconsistency. This can impair productivity, as employees work one way in one location and must alter it in another.
- **Long lead times for new features**: Implementing new features on hardware-based solutions often requires administrators to upgrade software and sometimes hardware — one location at a time. For large organizations, this can take weeks or even months.

While most of IT is transformed by virtualization, communications has yet to realize the same benefits. Server virtualization is now mainstream as over half of the workloads today are virtual (Exhibit 2). If companies want the communications agility required for today's fast-moving business environment, communications must evolve and leverage virtualization technology.

Exhibit 2: Virtual Servers Dominate the Data Center

What percentage of your servers are virtualized as compared to five years ago?



Source: ZK Research, 2013

Section III: Virtual Infrastructure Will Transform Communications Infrastructure

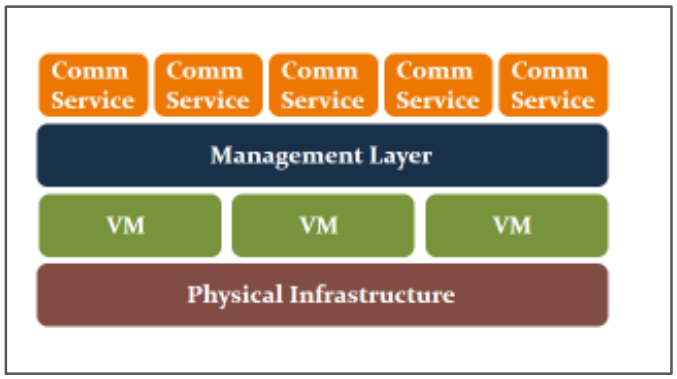
Virtualization dramatically impacted infrastructure costs, provisioning times and operational support. Prior to virtualization, ZK Research estimates the average utilization of compute infrastructure was about 25 percent. Today the utilization rate of infrastructure with virtualization is well over 50 percent, as high as 70 percent in some companies.

Virtualization has also had a significant impact on IT personnel costs. ZK Research finds organizations with over 50 percent of workloads virtualized see people-related costs fall from 40 percent to 30 percent of data center TCO.

Historically the communications industry has avoided virtual platforms. Virtual servers offered flexibility, but not the performance characteristics for the needs of a real-time communications platform. During the past few years, virtualization technology and server hardware evolved to a point where it can support challenging mission-critical workloads.

Virtualization enables communication services such as call processing and session management to be abstracted from physical hardware to run on a virtual platform (Exhibit 3). Services can be quickly provisioned, migrated and managed the way other corporate applications are run today.

Exhibit 3: Virtualization Creates Service Agility



Source: ZK Research, 2013

As virtualization grows in the communications industry, the following shifts transpire:

- **Communications becomes an agile IT resource**: Decoupling communications services from hardware enables a significantly greater level of agility compared to hardware platforms. Virtualization means services can be invoked almost on-demand, migrated from one location to another and managed like any other virtual workload.
- **Resource utilization improves**: Historically the average utilization of communications hardware has been marginally better than compute, but far below an optimal level. ZK Research estimates that by virtualization of communications technology, utilization will improve from 35 percent to more than 70 percent.
- **Network Functions Virtualization (NFV) becomes a reality**: The lack of flexibility with hardware-based solutions limits deployment options. Organizations must provision hardware for peak utilization, meaning the platform goes underutilized most of the time. By shifting to a virtual platform, companies can provision network functions, virtually on-demand.
- **Communications aligns with the vision of software-defined networks (SDNs)**: The increased flexibility and agility gained from virtual platforms allows communication services to interoperate with the network better. The rise of network virtualization and SDNs combined with virtual infrastructure enables the network to automatically reconfigure when voice and video services require it.
- **Unprecedented scale**: Historically, the scalability of communication services was limited by the underlying hardware. If more performance is required, a forklift upgrade is often required. The shift to a virtual platform means the hardware can be upgraded without interrupting the services running on a virtual machine.

- **Greater alignment between business goals and IT goals**: The use of virtual platforms means IT leaders can respond to line-of-business requests orders of magnitude faster than legacy solutions. Virtual services can be provisioned in days if not hours, which is much faster than the weeks or months legacy infrastructure required.

The emergence of virtual platforms for communication services will deliver better scale and utilization while lowering hardware costs, operational expenses as well as power and cooling charges. More importantly, virtual platforms create ultimate flexibility enabling the IT department to deploy critical services when and where required.

Section IV: The Role of Software-Based Session Border Controllers

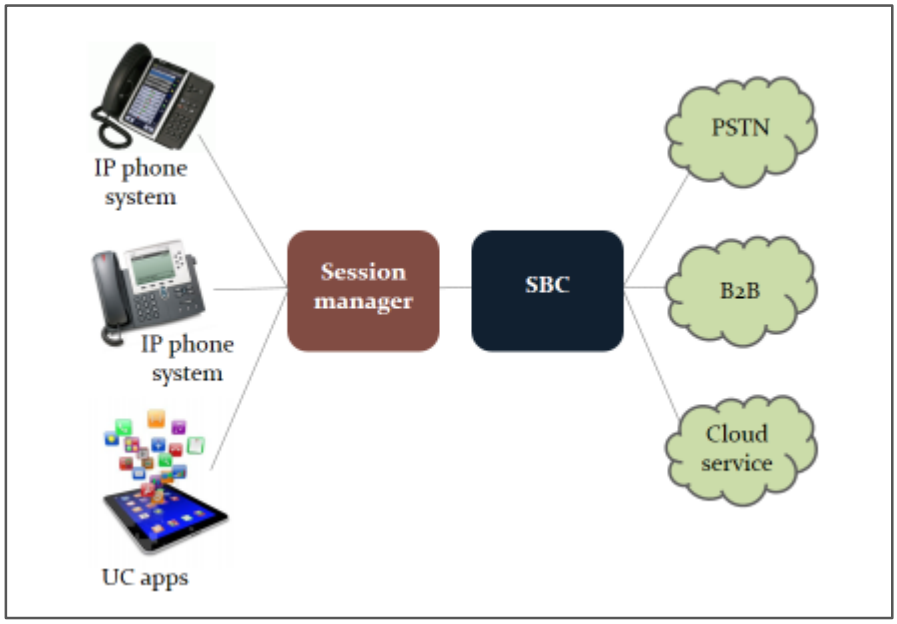
The UC industry is rapidly becoming predominantly software-based. This, combined with virtualization is a significant leap forward for communication infrastructure. This brings the industry closer to the vision of delivering any service to any device at any time. The evolution to a virtual platform also brings greater scale, reliability and deployment flexibility to communications at a significantly lower cost.

A communications components that can benefit greatly from this shift is a session border controller (SBC). SBC functionality applies control over signaling and media streams that set up, conduct and tear down IP communications streams such as VoIP and video. Enterprise SBC sits at the demarcation point of two networks (Exhibit 4) and provides a wide range of functionality including:

- **Security**: Denial of service protection, malformed packet protection, protection from toll fraud and encryption of traffic.
- **Connectivity**: Widespread throughput, NAT traversal, protocol translation, IPv4 to IPv6 interworking and SIP trunking termination.
- **Traffic optimization**: QoS, rate limiting, call admission control and network policies.
- **Regulatory issues**: Prioritization of emergency calls, lawful intercept, centralized call recording, encryption (signaling and media).
- **Media services and transcoding**: HD and wireless voice transcoding, DTMF fax interworking, codec normalization / standardization.

The network demarcation point has historically been to bridge an enterprise VoIP deployment with the public switched telephone network (PSTN) but the SBC is playing a critical role in B2B communications as well as enterprise-to-cloud deployments.

Exhibit 4: The Role of the SBC



Source: ZK Research, 2013

SBCs also play a critical role in scaling UC, as it addresses a number of issues that hold deployments back today. This includes security issues, interoperability challenges with multivendor UC deployments as well as making connections to legacy PBXs simpler. When used in conjunction with a session manager, the SBC can normalize protocol differences, manage dial plans and provide a common trunk-side interface for a broad range of UC applications. Any organization looking to make the most of their UC deployment should consider making an SBC part of the deployment.

As powerful as SBCs are today, deployment of the technology is limited to service providers and very large enterprises. Traditional hardware-based solutions offer guaranteed performance but not the level of elasticity required for mass adoption. Even for the Global 2000, many companies deploy an SBC at headquarters but do not leverage the technology in branch offices or other locations due to the cost and complexity of hardware platforms.

Software-based SBCs running on virtual platforms can deliver all of the functionality of a leading SBC without the high cost, long deployment times and rigidity of traditional hardware platforms. Additionally, the emergence of soft SBCs allows the technology to be deployed in any location the organization chooses, no matter how small or whether there is local IT support available.

Organizations that choose to leverage a soft SBC will realize many benefits, including the following:

- **Fast, secure migration to SIP trunking**: There are many benefits of a company migrating to SIP trunking, one of which is cost. ZK Research studies show that organizations that migrate trunk lines away from traditional trunks to centralized SIP trunks can save up to 70 percent on trunking costs. SIP trunks also extend the IP capabilities of the UC solution to the cloud, making B2B connections and connecting with UCaaS easier. As organizations migrate to SIP trunking, an SBC is required to terminate SIP sessions, secure the connection and provide optimization features. A software-based solution allows an organization to turn on SBC functionality almost immediately without compromising security.
- **Low TCO**: Because the soft SBC runs on commercially available, off-the-shelf hardware, the deploying organization can choose a platform that meets the requirements today and easily upgrade when required. This is a much lower cost option than having to purchase dedicated hardware optimized for peak utilization.
- **Accelerated application integration**: A soft SBC means application developers or anyone else in IT can create a virtual instance of an SBC for testing purposes or any other reason. Application developers looking to integrate UC functionality can test the applications on the same platform that will be used in production deployments, speeding up deployment times.
- **SBCs can be deployed pervasively across the enterprise**: Organizations no longer have to choose between cost and the functionality provided by an SBC. Hardware-based solutions may be too expensive for many organization's to deploy in every location, meaning the UC deployment may be relegated to a few large locations.

Section V: What to Look For in a Solution Provider

The evolution of SBCs to software running on virtual machines allows organizations to accelerate UC deployments securely with the assurance of the best possible user experience. This transformation brings communications in alignment with the rest of corporate IT, making it a critical step in the evolution of UC. A software based SBC should be a top priority for any IT leader looking to get the best UC ROI. However, the choice of a solution provider may not be obvious. ZK Research recommends looking for the following in the search for the best provider:

- **Same codebase across all products**: Organizations should not have to choose between feature-rich hardware platforms or flexible software products with limited feature sets. Choose an SBC provider with feature parity across all of its products, including the hardware platforms.
- **Broad range of products**: The solution provider should have SBCs that meet the needs of SMBs, but also the largest service providers. This enables organizations to start with a small implementation and scale the deployment at any pace. While a soft SBC offers flexibility, large enterprises should look to traditional hardware platforms where guaranteed performance outweighs the elasticity of software products.
- **Breadth of use of cases**: The solution provider should be able to provide a wide range of use cases that includes contact centers, UC deployments and SIP trunking.
- **Ability to start with a small footprint, but grow to unlimited capacity by adding licenses and server resources**: This allows a business to rapidly expand without waiting or installing hardware solutions.
- **Media interworking**: The provider should be able to deliver UC via IP via faxes, IVR and other applications.
- **Runs on market-leading VM platforms**: When it comes to virtualization technology there are many solutions available. Look for a provider that runs on the leading virtualization platforms.
- **Broad range of industry-leading partners**: The flexibility of software-based SBCs lets it run as a virtual service on third-party products. When evaluating a solution provider, pay close attention to technology partners. A wide range of partners means a number of choices and options for deployment.

Section VI: Conclusion and Recommendations

The migration of communications to software combined with virtualization is a significant milestone for the industry, as it allowed for unprecedented scale, flexibility and deployment options. Virtualization is now driving the next wave of UC as it brings the same agility and elasticity to the communications industry as it brought to servers and storage over the past decade. IT leaders that wish to create a dynamic communications environment should look to leverage the power of software and virtualization. To help understand how to best do this, ZK Research offers the following recommendations:

- **Embrace virtualization as part of the communications strategy**: Virtualization is not just for server consolidation any more. The technology has rapidly evolved over the past several years and is now fully capable of supporting the most demanding, real time applications, such as voice and video. It's time to shed legacy thinking and align communications with the rest of the IT organization.
- **Change the underlying architecture to leverage virtualization**: The current node-by-node deployment architecture served the industry well in the era of dedicated hardware and when best effort was the norm. The shift to software and virtualization mandates that a more centralized architecture be used and the network becomes leveraged as the delivery platform.
- **Leverage the benefits of session border controllers**: SBCs play a critical role in scaling, securing and optimizing UC. Some UC vendors may have integrated platforms that provide limited functionality but these are generally a small subset of what's required of an SBC. Use an SBC as a vendor-neutral middleware platform to help scale to an all-IP environment.