The BorderNet™ Session Border Controller and Network Function Virtualization

Service providers today are making a fundamental shift away from their traditional ways of doing business and delivering services as they face alternative communication models from a new generation of service providers offering over the top (OTT) and web based communications (think WebRTC or RCSe). Traditionally, service providers have built dedicated networks to support the different services they deliver to customers, but that has also typically meant locking themselves to vendor-specific hardware and software offerings. Historically, launching a new service has often meant a fairly significant CAPEX investment as well as finding additional space and power to accommodate new equipment.

In an evolving and highly competitive landscape, there is immense scrutiny by service providers on all CAPEX spending and greater focus on ROI optimization. With this heightened focus on improving revenues and increasing profitability, the current deployment model using purpose-built proprietary hardware does not provide sufficient flexibility and is not agile enough to keep up with the speed needed for delivering new services, especially in the context of web and social media enabled applications. Increasingly Software-As-A-Service (SaaS) and Cloud-based initiatives have been embraced by service providers as an effective alternative to the traditional approach of deploying purpose-built, dedicated hardware. There are also service provider led activities to define the requirements and develop the reference standards for deploying and orchestrating infrastructure in virtualized environments, as well as for fast-tracking the adoption of software delivery models in the telecommunication sector.

Network Functions Virtualization (NFV) is a new effort from leading telecom operators around the globe and supported by telecom equipment vendors; it focuses on deployment and delivery of telecom services over a software-based network infrastructure. With NFV, various core telecom network infrastructure elements such as call control, IMS core, session border controller, and media gateways would leverage server virtualization technology running on commercial-off-the-shelf (COTS) servers. This initiative has come about as a serious attempt to address several challenges faced by the telecom operators that accompany a hardware based - and typically proprietary - network infrastructure solution.

The session border controller (SBC), over the years, has emerged as a central component in IP-based communications networks. SBCs are increasingly taking on more responsibility over and above their traditional role of providing session security. An SBC can now perform complex tasks such as interworking, media adaptation, policy enforcement, session routing, regulatory compliance, billing and charging. Given the preeminent role SBCs play in today's modern networks, it follows that an SBC would be part of the first wave of the transformation and virtualization of the telecom infrastructure landscape.

Introducing the BorderNet Virtualized SBC

Dialogic® BorderNet™ Session Border Controllers (SBC) are designed to help telecom operators looking to deliver innovative IP-based communication services to their subscribers. BorderNet SBCs connect and secure disparate network technology domains, while delivering unmatched performance, protocol and media adaptation, advanced routing and policy enforcement in a cost effective platform. BorderNet SBCs have been deployed worldwide in top tier telecom networks to support a wide array of complex services including access, peering, SIP trunking, IP Packet Exchange (IPX), and wholesale applications.

The BorderNet Virtualized SBC is a newer addition to Dialogic’s BorderNet SBC portfolio to help service providers start rationalizing their NFV strategy. The BorderNet Virtualized SBC is a “carrier class” software-based SBC which offers a unique combination of performance, reliability and SBC functionality. The BorderNet Virtualized SBC can function within a virtualized hypervisor environment to provide advanced signaling and media plane processing including software based transcoding. Essentially, Dialogic has leveraged core SBC technology from the Dialogic® BorderNet™ 4000 SBC and from its revolutionary PowerMedia™ media server to provide call control, media processing and transcoding in a virtualized environment without reliance on special hardware components.
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Figure 1 - The BorderNet Virtualized SBC integrates software-based transcoding and session control in a virtualized network function container without the need for additional hardware acceleration or external servers.

The BorderNet Virtualized SBC has been tested on hypervisors such as VMware vSphere and is compatible with a wide array of the Intel based servers. The BorderNet Virtualized SBC can be deployed in either standalone or redundant (High Availability) mode to cater to a service provider’s architectural preference and deployment strategy. BorderNet Virtualized SBCs are licensed based on the desired session counts, and Dialogic offers a highly flexible licensing model designed to meet most common network deployment models and carriers’ requirements.

Benefits of the BorderNet Virtualized SBC

The BorderNet Virtualized SBC provides a compelling combination of key SBC features, carrier class reliability, ease of management, and a low total cost of ownership (TCO) along with important benefits associated with virtualization in general:

| Carrier Class SBC Functionality | • Software-based media processing and transcoding  
| • “Carrier class” reliability with advanced security, routing and session management  
| • Intuitive SIP and media manipulation through web-based or XML profiler  
| • Extensive interoperability and formal certification with third party products and industry standards  |
| Low TCO | • On-demand capacity expansion for fast time to market  
| • Pay-as-you-grow licensing flexibility  
| • Leverage existing data center infrastructure investment for low CAPEX and OPEX  |
| Ease-of-use and Operational Efficiency | • Modern Web2.0 Dashboard  
| • Advanced reporting and analytics  
| • SNMP, SOAP/XML, HTTPS, Bulk OAM&P interfaces for seamless backend network integration  |

The BorderNet Virtualized SBC Use Cases

The BorderNet Virtualized SBC is can support a number of common SBC use cases, such as:

Managed Enterprise services including SIP Trunking –SIP trunking and other enterprise voice offerings rely upon SBCs at the service provider access edge and on the enterprise premise. At the access edge, service providers can rapidly deploy a BorderNet Virtualized SBC to support multiple enterprise customers or dedicate the SBC resources to a single customer to provide SIP message normalization, interworking, topology hiding and security. At the enterprise premise or edge, service providers can deploy the BorderNet Virtualized SBC to better manage the delivery of services, provide SIPConnect 1.1 compliant features along with security and support for remote workers while establishing a logical demarcation for efficient management, problem isolation and troubleshooting.
Hosted Voice Services and Over the Top Service Providers – The BorderNet Virtualized SBC can play an integral part in helping deliver a service provider’s specialized voice solutions such as hosted contact center, messaging and IP Centrex services to provide advanced capabilities including mobility, video, conferencing, presence, and integration with enterprise communication and messaging applications. The BorderNet Virtualized SBC can provide security for these advanced services as well as interoperability between the service provider’s network and legacy equipment located at the customer premise. Since the BorderNet Virtualized SBC shares the same code base with the BorderNet 4000 SBC, it has many of the same carrier class features and management architecture, which means, in turn, that it can simplify training and reduce the operational cycles required to deploy and manage the network infrastructure.

Rapid service velocity through Software-based transcoding – The increased convergence of mobile platforms, traditional phone systems, and voice enabled web 2.0 applications (e.g., WebRTC) has meant that service providers need media transcoding to effectively connect disparate networks. Traditionally, specialized equipment, such as Digital Signal Processors (DSPs), has been used to provide the heavy lifting required for media processing; however, DSP solutions tend to be expensive and offer limited flexibility when it comes to support for new codecs (for example, Opus in WebRTC).

The hunt for effective alternatives to DSPs has been underway for some time. The BorderNet Virtualized SBC integrates Dialogic’s game changing PowerMedia™ XMS media server technology to efficiently provide flexible, on-demand media transcoding. This unique combination of technologies enables a cost efficient approach to rapidly providing voice, video and fax transcoding in software or virtualized platforms without the need for additional special purpose hardware. With software-based transcoding, service providers can rapidly introduce new services involving new codecs or can interwork new codecs with their legacy equipment.
**IP adjunct to class 4 deployments** – With the evolution and maturity of IP-based voice services, there is a significant accompanying push toward migrating the existing TDM infrastructure to an all-IP core. There is a considerable installed base of TDM-based class 4 softswitches which service providers are in the process of migrating to an NGN/IMS architecture. To effectively make this transformation, SBC functionality is required; for example, SIP routing, interworking, and policy implementation. Also, Network Functions Virtualization and Software Defined Networking (SDN) initiatives are making service providers rethink how they will architect their networks going forward. They are looking to leverage advances in commercially available server virtualization technology and CPU processing improvements to start implementing a software-based infrastructure to help them lower costs, provide greater flexibility, and improve time to market. NFV and SDN driven architectures are strongly influencing service providers as they increasingly look to build software-based core infrastructure to protect their network investment and realize cost efficiencies commonly associated with virtualization and cloud-centric models.

**Figure 4 - End-to-end Hosted/Managed and UC solution with BorderNet SBCs and ControlSwitch System softswitch**

**Conclusion**

There is a major technology shift underway towards virtualizing core network infrastructure elements. While this is appealing from a number of key perspectives, including OPEX and CAPEX reduction and improving service delivery intervals, it also brings with it a very complex set of technical and operational challenges. The BorderNet Virtualized SBC, with its broad functionality to help deliver multimedia services, provides network security and session control and interworking of both media and signaling traffic, and it can be a critical element in helping service providers address the challenges in moving their networks to all-IP. Dialogic, is a leader in delivering innovative software based communication solutions. The unique combination of media processing technology and advanced session control and management in a carrier class virtualized appliance makes the BorderNet Virtualized SBC well suited to give service providers a clear path forward as they implement their NFV strategy.

For more information about the Dialogic® BorderNet Virtualized Session Border Controller, please contact your local Dialogic representative or insidesales@dialogic.com. Additional product information is also available online at www.dialogic.com.