SOLUTION BRIEF

Communications Service Providers
Virtualized Session Border Controllers

Italtel* and Intel Team Up for NFV Session Border Controllers

Italtel pioneers high-performance virtualized session border controllers, bringing new agility to networks and enabling innovative all-IP communication solutions.

Introduction

The rise of all-IP communications has led to a proliferation of services offering enhanced messaging and voice calling using voice over Wi-Fi (VoWiFi) and Voice over LTE (VoLTE) technologies, enabled by IP Multimedia Subsystem (IMS) core networks. The value provided by these services is augmented when the network also supports web-based real-time communications (WebRTC) in order to enable advanced real-time communications over IP.

With this technology, communications service providers (CommSPs) have the opportunity to compete with over-the-top (OTT) competitive services and re-center their user relationship away from essential, but commodity "dialer apps," and toward in-demand IP-based experiences including voice, video, mobile payments, and geo-targeted services.

In particular, bridging WebRTC with IMS-based networks forms the basis for innovations in contextual web-based communications options for CommSPs, future proofing their offerings and strengthening their value to consumer and business customers alike.

Session border controllers (SBCs) control and manage real-time multimedia communication traffic flows at the border of IP networks. They also allow for network interconnection to support all the new IP-based services with the high voice and video quality that users demand. Italtel has taken its experience with fixed-function, appliance-based SBC solutions and pioneered the NetMatch-S Cloud Inside (NM-S CI)* virtual SBC based on network functions virtualization (NFV) technology. By partnering with Intel, the NM-S CI delivers all the promise of NFV with exceptional performance and capacity.

The Challenge

Many CommSPs are adopting NFV technology to replace their fixed and custom hardware solutions to reduce network costs and improve network agility in an environment of rapidly increasing data consumption and service innovation. Across the board, NFV solutions deliver flexibility, scalability, and dynamic allocation of new resources and features using low-cost shared resources. But SBCs have been one area where CommSPs have not rapidly adopted NFV implementations. In fact, as of November 2016, almost all the network operators who replied to a survey by IHS Markit said they were reliant on hardware-based SBCs.

In part, this is due to the difficult task of virtualizing the SBC at the required performance levels. SBCs require very high data plane processing performance as they can process tens of thousands of simultaneous sessions. In addition to setting up, conducting, and tearing down interactive media calls, they also must provide secure, encrypted data flows to protect against attacks. Transitioning the SBC

functionality to a software-based virtual network function running on an Intel architecture server requires both data plane performance and SBC efficiency.

Italtel is a pioneer in developing fully virtualized SBCs that are compliant with European Telecommunications Standards Institute (ETSI) standards and CommSP requirements. Demand for these solutions is high, leading one industry analyst firm to predict that by 2018, adoption of virtualized SBCs is expected to rapidly grow.[1]

The Solution

Italtel's NM-S CI virtual SBC offers increased performance[2] due to the adoption of Intel DPDK technology. The addition of DPDK increased NM-S CI performance, using the same amount of virtualized resources, from 6,000 concurrent sessions handled to 60,000 concurrent sessions. Similarly, transcoding performance was also increased.

The NM-S CI incorporates critical features found in physical network function (PNF) session border controllers:

- Interworking and interoperability between different networks and devices.
- Effective signaling and handing off of media data functions at the points of interconnection between an operator's network and other networks.
- Session management, signaling interworking, media adaptation with session routing, access control, and address translations between different addressing schemes.
- Quality of Service (QoS) control for real-time communication services with policy control and bandwidth policing enforcement.
- Robust security features that protect networks from attacks.
- Compliance with network interoperability standards.

The virtualization of the NM-S CI expands the capabilities of session border controllers to scale and adapt to all the promises of entirely software-based SBCs.

- Complete access and interconnectivity with mobile VoLTE, VoWiFi, and SIP IMS fixed networks for residential and business services.
- Integration with the Italtel suite of verticals for WebRTC contextual communications.
- Scalability to match rapidly expanding traffic growth in the future networks.
- Rapid launch of new services and monetization opportunities to support network expansion.
- Flexible deployment with various dimensioning options that allow for scalability with future network growth.
- Ability to readily update network logistics per changes in traffic patterns and predictive evolution with implementation of Italtel's i-RPS, the centralized network routing and policy engine.
- Integration with any standard management-layer network protocols (SNMP, REST, sFTP, etc.); or utilizing Italtel's i-NEM network element manager.
- Compliance with the ETSI NFV architectural framework, allowing it to be readily integrated with other critical NFV infrastructure functions, including management and orchestration (MANO).

The Intel Difference: Delivering Performance and Capacity

Italtel could deliver a high-performance virtualized SBC only by adopting the Data Plane Development Kit (DPDK), a Linux Foundation Project that provides an open source set of libraries and drivers for fast packet processing. Intel is a key supporting member of DPDK.

The other key to performance was the use of servers powered by Intel® Xeon® processors E5 2600. The Intel Xeon processors E5 2600 product family is Intel's flagship family of processors for NFV and virtualized data center applications. These CPUs feature Intel® Virtualization Technology, which provides hardware assist to virtualization software to eliminate virtualization performance overhead in cache, I/O, and memory. Also, built into the processors is Intel® Trusted Execution Technology (Intel TXT), a hardware feature that provides security assist capability to improve runtime defenses such as anti-virus software.

With these performance technologies, the NM-S CI can scale and adapt to a variety of networks configurations with varying traffic, throughput, number of media streams or need for transcoding, with very efficient and very fast packet processing to keep up with traffic demands.

Conclusion

Italtel's NM-S CI NFV-centric software architecture delivers the full promise of NFV including rapid scaling, remote software deployment for fast introduction of new services and reduced complexity and capital expenses. When running on servers powered by Intel® Xeon® processors E5 2600, the NM-S CI achieves outstanding capacity and throughput to deliver on the promise of the new communication solutions and the advantages of all-IP networks.

About Italtel

Working where telecommunications meet information technology, Italtel addresses some of the main technological challenges the world of communications is facing today. IP network, cloud, network function virtualization, SDN, WebRTC, IoT, are just some of the areas where the company is present with end-to-end solutions. Italtel solutions include proprietary products, engineering and network consultancy services, managed services and solution. Italtel counts more than 40 customers worldwide, and among them there are several major service providers and multinational enterprises. In addition to having a leading position in the Italian market, Italtel has focused its foreign operations in EMEA and Latin America countries. You can find more information about Italtel at http://www.italtel.com.

About Intel Network Builders

Intel Network Builders is an ecosystem of independent software vendors (ISVs), operating system vendors (OSVs), original equipment manufacturers (OEMs), telecom equipment manufacturers (TEMs), system integrators (SIs), enterprises, and service providers coming together to accelerate the adoption of network functions virtualization (NFV)-based and software-defined networking (SDN)-based solutions in telecom networks and in public, private, and hybrid clouds. The Intel Network Builders program connects service providers and enterprises with the infrastructure, software, and technology vendors that are driving new solutions to the market. Learn more at http://networkbuilders.intel.com.

[1] Source: IHS – SBC Strategies and Vendor Leadership – November 2016 (paid report)

[2] Testing conducted by Italtel utilizing an NFV infrastructure composed of servers powered by Intel Xeon® processors E5-2680 v4 with 64 GB of memory and Intel® Ethernet Controller X710 10G Ethernet interface.

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