GENBAND,* Intel Show Virtual Media Processing and Transcoding

GENBAND's NFV-based advanced media software delivers performance needed for VoLTE applications using Intel and Wind River* technologies.

Introduction

A mobile user calls home to her landline phone. Four colleagues dial into a conference line. Two friends across the world have a video chat. A family streams a movie. For all those scenarios, and many more, communications service providers (CommSPs) employ media interworking and transcoding solutions to deliver network compatibility and real-time network performance for real-time voice and media applications.

The demand for these services is growing dramatically along with the growth in the complexity of the mobile device landscape. According to Cisco's Global Mobile Data Traffic Forecast Update, 2016–2021, video bandwidth is projected to grow from 4.375 million terabytes of data in 2016 to 38 TB in 2021. Additionally smartphone growth is projected to rise from 5.8 million devices in the field in 2016 to 42 million by 2021.[1]

To keep pace with the proliferation of media applications across the gamut of communications devices—to say nothing of the advancements of mobile networks such as the transition to 5G and the blending of fixed and mobile experiences—it is critical for CommSPs to migrate away from the limitations and high cost of fixed, proprietary media processing and transcoding hardware to adopt more agile and scalable virtual network function (VNF)-based solutions.

GENBAND* Advanced Media Software (AMS) VNF running on Intel® architecture-based servers enables high-performance, software-based media processing and media transcoding that scales with this increased demand while delivering the performance required by service providers.

The Challenge

Like most legacy CommSP network functions, media processing and transcoding functions have been delivered by proprietary, single-function hardware appliances that limit deployment flexibility and have higher costs to deploy, support, and update due to their proprietary design.

Media transmission across a service provider network involves many different video standards and technologies. Codecs, for example, are not always interoperable within a CommSP's network and certainly not outside an operator's network. The technology diversity adds additional processing requirements to the transcoders that can introduce latency to a media stream. Transcoders also must provide insight into network performance issues that can be otherwise lost in the heterogenic environment.

There are two key factors driving CommSPs toward virtualizing media processing for more agile and cost-effective scalability. The first is the extraordinarily rapid growth

of media applications across fixed and mobile networks. The second is the cost and competitive pressure to keep up with interoperability and compatibility.

As the transition from proprietary and fixed networking functions moves to the cloud and virtualization, concerns remain that migrating media processing and transcoding to virtual network functions (VNF) will not meet performance requirements.

The Solution

GENBAND Advanced Media Services (AMS)* VNF running on an Intel architecture-based server delivers an at-scale audio and video transcoding software application with on-demand, dynamic scalability. AMS supports a broad set of audio and video codecs and delivers transcoding between codecs. This assures interoperability between an extensive set of devices, between legacy and emerging network technologies, and between fixed-to-mobile communications.

The AMS VNF uses a common resource pool across applications (see Figure 1), scaling media transcoding elastically to utilize network resources efficiently and realize cost efficiencies. GENBAND's processing engine captures media processing and transcoding workload metrics without impacting packet processing performance to help diagnose problems that could impact streaming performance. In addition, monitoring of sensor data for analytics is non-intrusive and does not impact performance.
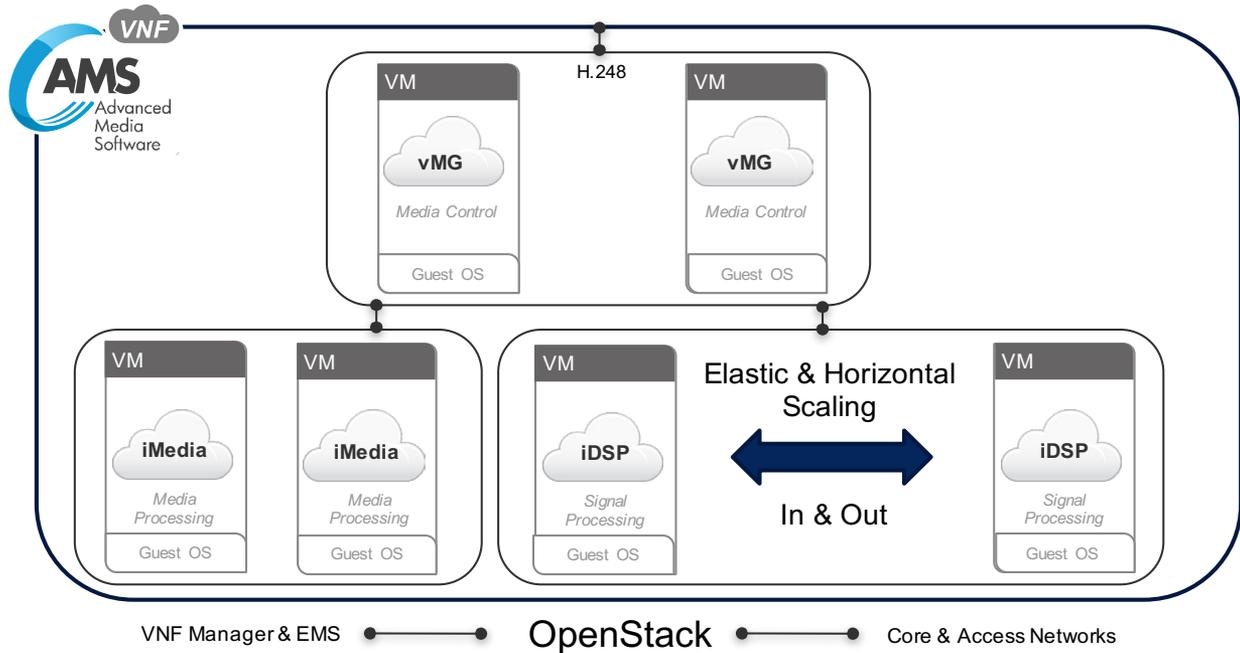

Figure 1. GENBAND AMS Architecture[2]

Compared to fixed-function appliances, the fully virtualized AMS implemented with the Data Plane Development Kit (DPDK) for improved packet processing performance enables solutions for next-generation cellular network technology like voice over long-term evolution (VoLTE) with a high-performance, elastically scalable VNF that reduces total cost of ownership for CommSPs.

The Intel® Advantage

The GENBAND AMS VNF running on Intel architecture-based servers delivers accelerated performance of media transcoding running in an NVF environment. The solution can leverage a DPDK-accelerated Open vSwitch* or Wind River* Titanium Cloud* Accelerated vSwitch to boost throughput. With the Titanium Cloud AVS implementation, the virtualized AMS demonstrated throughput levels within 10 percent of bare metal implementations. Additionally, the metrics collection engine collected roughly 200 KPIs in real-time without impacting packet processing performance.[3]

GENBAND AMS VNF Benefits

- A common media processing platform shares media transcoding across various applications, resulting in network efficiencies.

- Media transcoding scales dynamically for ideal network performance.

- The monitoring of large amounts of data for KPIs occurs without being intrusive and without impacting performance.

- CommSPs achieve resource and cost efficiencies automatically and on-demand.

- As new voice and media technologies are introduced, such as VoLTE, interoperability with existing network transcoding and media interworking is assured.

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Conclusion

GENBAND AMS VNF is a virtualized media processing and transcoding solution that can offer the performance required by CommSPs to stay ahead of the rapid deployment of disparate media technologies across emerging and legacy networks. Configured on Intel® Xeon® CPUs, it achieved accelerated performance with significantly higher packet performance and throughput, with monitoring that doesn't degrade performance.[3]

About GENBAND*

GENBAND is a global provider of real-time communications software solutions for service providers, enterprises, ISVs, system integrators, and developers. GENBAND's technology- and network-transformation product-and-services portfolio consolidates and optimizes core and edge service-provider networks while enabling migration to the telco cloud with a broad offering of NFV and VNF solutions.

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.
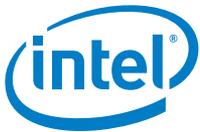
[1] Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html

[2] Figure provided courtesy of GENBAND.

[3] Tests conducted by Prowess Consulting. Hardware configurations: HPE* ProLiant* DL160 Gen9 servers with Intel® Xeon® processors E5-2660 v3; Dell* PowerEdge* R630 rack servers with the Intel Xeon processors; Dell* Force10* S-Series S4820T high-performance 1/10/40 GbE switches. Software: Intel® Media SDK acceleration, Intel® Data Protection Technology with Advanced Encryption Standard New Instructions, Wind River Titanium Server R15.12 based on OpenStack* Kilo, Ubuntu* OpenStack Liberty release, Ubuntu 14.04 and openSUSE* 13.1, GENBAND AMS v1.0.0.13, and GENBAND VNF Manager (VFM) (Aroha).

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