



Openet Accelerate* Service Capsule Enables VoLTE Services

Intel® Xeon® Processor-Powered VoLTE Service Capsule is a preintegrated and pretested solution from its ecosystem of vendors that delivers VoLTE rapidly.



Overview

Mobile network operators (MNOs) are adopting voice over LTE (VoLTE) services to bring new agility and capabilities to their consumer voice service offerings. VoLTE replaces circuit-switched voice services removing the last non-IP network connection. The promise to customers is new features such as the ability to switch between voice and video calls, or to transfer a call from one device to another during a conversation.

VoLTE is coming of age just as MNOs are embracing network functions virtualization (NFV), which gives these operators an opportunity to develop virtualized services from the start—a much different undertaking than virtualizing an existing service.

Network transformation can be complicated, especially when it involves adopting a radical new approach like NFV. One of the critical challenges MNOs face when implementing virtualized VoLTE is integrating the vast ecosystem of components comprising multiple devices/manufacturers (with different data sharing processes), operating systems, VNFs, development and testing tools, service assurance, networks, carriers, clouds, management and orchestration (MANO), and applications.

Deploying an NFV-enabled VoLTE network can be an expensive undertaking if offloading to an incumbent vendor, or a cumbersome undertaking if spending staff time to select and on-board functions from newer vendors. To alleviate this challenge, Openet Accelerate* has integrated all of the software and virtual network functions required for a VoLTE service core network into the VoLTE Service Capsule. The VoLTE Service Capsule features software from Openet Accelerate ecosystem partners and runs on Intel® architecture-based servers.

The VoLTE Service Capsule can be added to the MNO existing network as it uses separate APNs.

Openet Accelerate Service Capsule for VoLTE

Automating service creation and integrating applications from the Openet NFV vendor ecosystem is the key to accelerating complex NFV rollouts. Openet Accelerate has created a prepackaged, automated VoLTE Service Capsule that provides service enablement to quickly and easily deploy and assure differentiated services. (The company also has developed an IoT Service Capsule.¹)

The Openet Accelerate VoLTE Service Capsule brings together automation technologies, virtualization, NFV vendor ecosystem, and NFV architecture to deliver a prepackaged VoLTE mobile core. Critically, all components have been pretested and preintegrated to ensure a smooth rollout with little additional on-site integration work required.

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The Openet Accelerate VoLTE Service Capsule allows MNOs to easily target new markets and more quickly generate new revenue streams using fully functional software packages that contain all the functions required to launch and configure a new service (see Figure 1).

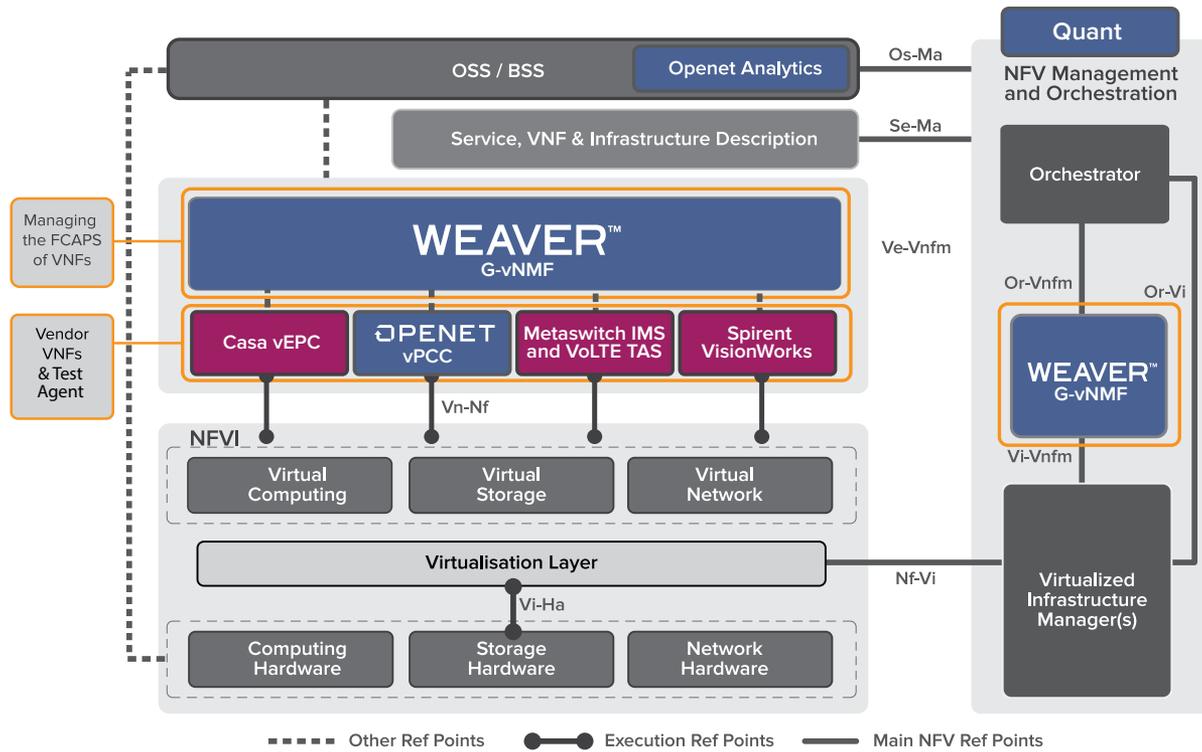


Figure 1. Service Capsule Architecture²

Service Capsule Components

Openet Accelerate leverages its own software in the Service Capsule, but also integrates components from its ecosystem to ensure a complete solution. The VoLTE Service Capsule comprises the following software components:

Openet* vPCRF is Openet's 3GPP standards-compliant, next-generation network policy management server that enables MNOs to dynamically control network resources with real-time policies based on service, subscriber, or usage context. By enforcing business rules at the network edge, Openet vPCRF enables dynamic allocation of bandwidth, quality of service (QoS) variables, and access to network resources by interfacing with any inline network enforcement points—whether they are compliant with standards, or based on proprietary interfaces. The server can enforce business rules that do not just control network capacity and QoS, but they enable new business models and innovative new services within LTE's System Architecture Evolution (SAE) or IP multimedia subsystem (IMS) architectures. In the VoLTE Service Capsule, the Openet vPCRF is configured with the policy and charging rules that are needed for enabling the delivery of voice, video, or messaging services over IP, as well as emergency calls in the evolved packet system (EPS).

metaswitch **Perimeta*** is a session border controller (SBC) that is purpose-built for distributed deployments within both the control and transport layers of next-generation networks.

Conforming to 3GPP specifications for decomposed SBC functions, the Perimeta architecture comprises two distinct components: a signaling session controller (SSC) and media session controller (MSC). As VoLTE, rich communication services (RCS), and mobile unified communications (Mobile UC) traffic increase, they challenge the relationship between signaling servers and media servers. Scaling these otherwise distinct components individually eliminates costly oversubscription and stranded capacity.

Metaswitch Clearwater Core* is a 100 percent cloud native virtualized network function (VNF) that provides a hardened, carrier-class IP multimedia server (IMS) core. Following a unique microservices deployment philosophy, Clearwater Core includes the following components:

- I-CSCF - interrogating call session control function
- S-CSCF – serving call session control function
- BGCF – border gateway control function
- CCF - charging control function
- HSS Interface - home subscriber service interface

These functions combine to provide a resilient infrastructure for voice, video, and rich messaging services while extending all appropriate accounting and subscriber management interfaces. Clearwater Core is architected around highly distributed state maintenance and N+K redundancy, providing low-cost carrier-class resiliency. Each Clearwater Core component can dynamically scale out on demand.

Metaswitch's Rhino* telephony application server (TAS) and service creation platform is grounded in GSMA reference documents IR.51, IR.92, and IR.94, and it is the first mobile TAS architected from inception for NFV. Employing the same cloud-native architecture as massively scalable Internet applications, the Rhino TAS can be deployed in private, public, or hybrid elastic cloud environments and NFV infrastructures with complete management and orchestration (MANO), and it can grow automatically—with granular network slices—to meet traffic or application demands.

The Rhino TAS platform helps mobile operators evolve their networks from classic time-division multiplexing (TDM) to all-IP.

- The Rhino TAS is a complete multimedia telephony application server (MMTel-AS), extending a full complement of GSM supplementary services in compliance with packet voice and video standards.
- A service capability interaction manager (SCIM) provides feature parity between TDM and IP network infrastructures.
- An integrated service centralization and continuity application server (SCC-AS) facilitates voice call continuity in the event a mobile handset roams into an area where only circuit-switched (CS) coverage exists.
- The Rhino TAS enables transport-level interworking for SMS between circuit-switched and packet-switched networks via its IP short message gateway (IP-SM-GW), while unstructured supplementary service data (USSD) can be sent over the common IMS layer with the USSD simulation service in IMS application server (USSI-AS).



casa systems

Casa* Axyom* vEPC provides 3GPP industry standard, high capacity MME,

Serving-GW and PDN-GW functions in an optimized virtual software framework. Axyom is based on a modular, cloud native design with independently scalable control and data plane processes. It is ideally suited to a Service Capsule solution that easily delivers adjunct capability with minimal risk to an existing telco LTE infrastructure. It is built from the ground up to enable its fullest performance capability in a virtualized environment. Each service (MME, S-GW and P-GW) provides multi-dimensional scaling, allowing real-time adaptation to changes in user sessions/bearers, call-event processing, and throughput requirements. Casa's Axyom vEPC is state of the art, utilizing the latest in open source virtualization solutions and compliant with 3GPP R13 specifications. The Axyom architecture enables line rate throughput, even for small packet sizes. The Axyom vEPC provides a virtual management controller (VMC) with FCAPS integration to OSS/BSS along with complete VNF lifecycle management.

Openet Weaver* is based on the same technology used by Openet's tier 1 MNO customers to successfully manage multiple VNFs at scale across data centers. It has already been used to deploy VNFs across hundreds of servers in multiple data centers. This has resulted in reducing deployment and maintenance timeframes significantly. Using

a metadata-driven architecture to deliver a highly flexible and converged generic VNF manager (VNFM) and element management system (EMS) layer, it can manage the variation of lifecycle management requirements for diverse NFVs. It simplifies integration by providing the operator's global orchestrator with a single, unified interface to manage the lifecycle of all NFVs on their network, instead of having to integrate with separate VNFM and EMS silos.

Weaver's agnostic approach provides consistent management capability to a complex NNF ecosystem. It can integrate with vendor-specific VNFMs, or it can provide this management functionality to VNFs where a native VNFM does not exist or lacks capability. It can also deliver management capability to custom "ad hoc" virtual solutions.

Openet Enigma* is an analytics and reporting module that generates intelligence from the data collected from various service elements directly, or via an enrichment engine. Enigma can detect patterns and trends in real time and provide reports on this information using a reporting visualization module. It uses an event-driven architecture that allows the operator to quickly find insights from the data generated by the network.

Analytics help guide MNOs by using network intelligence to proactively target new services to key customer segments based on contextual information. They can then use the data to quickly respond to changing market conditions. Analytics can also enable MNOs to understand how to better service customers by offering self-service capabilities and other high-value offerings.

Openet Quant*

Quant solves the cost and profitability challenges that come with the multivendor, dynamic nature of automation. With features like forecasting cost, return of services, and "what-if" testing, Quant allows MNOs to see what's impacting profitability, then adapt rapidly. It also creates a quicker, more accurate feedback loop so MNOs can evaluate service options that are more commercially viable to your business.



Spirent* VisionWorks* is a fully virtualized test and service assurance platform that supports applications for benchtop, lab, and production network testing of mobile and Wi-Fi networks. VisionWorks supports testing mobile core, Wi-Fi, Diameter, and IMS network

functions for complete lifecycle service assurance across development, product verification, predeployment, and post-launch needs.

As a virtualized solution, VisionWorks brings flexibility, ensuring that highly optimized networks and services can be delivered with minimal risk. The testing component of the Service Capsule further reduces the time MNOs must spend to validate and deploy a new service with prebuilt automated test cases, allowing for the realization of the DevOps model within a Service Capsule.

Powered by Intel Architecture-Based Servers

The VoLTE Service Capsule runs on servers powered by Intel® Xeon® processors E5-2600 exclusively. The Intel Xeon processors E5 provide outstanding performance for NFV and virtualized data center applications. Some key performance-

enabling features include Intel® Virtualization Technology, which delivers 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 antivirus software. VoLTE has significant data plane performance needs, and Openet Accelerate solutions also feature the Data Plane Development Kit (DPDK), which is series of poll mode drivers and libraries for fast packet processing. DPDK is now an open source Linux Foundation* project of which Intel is a gold member.

Conclusion

VoLTE services are a significant advance for MNOs that should delight customers with new features. But rolling out these virtualized services requires a level of software integration that is new for MNOs that have based legacy services on fixed-function appliances. With the Openet Accelerate VoLTE Service Capsule, MNOs get a one-stop solution with no additional integration challenges and with the excellent performance that comes with running on the Intel Xeon processor-based servers.

About Openet Accelerate

Openet Accelerate, a dedicated business unit of Openet, is focused on enabling automated software-centric networks to deliver end-to-end service capability. Openet Accelerate has integrated leading VNF vendors into a prepackaged, innovative NFV software product, to rapidly deploy new services. The multivendor Service Capsules include VoLTE enablement, and IoT infrastructure management.

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>.

TABLE OF ABBREVIATIONS

3GPP	3rd Generation Partnership Project
BSS	business support system
DevOps	(software) development operations
EMS	element management system
FCAPS	fault, configuration, accounting, performance, security
IMS	IP multimedia subsystem
IoT	Internet of things
I/O	input/output
MME	mobility management entity
MNOs	mobile network operators
NFV	network functions virtualization
OSS	operations support system
PDN-GW	packet data network gateway
vEPC	virtualized evolved packet core
VNF	virtualized network functions
VNFM	virtualized network functions manager
VoLTE	voice over LTE
vPCRF	policy and charging rules function



¹ <http://accelerate.openet.com/iot/>

² Figure provided courtesy of Openet.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. **No computer system can be absolutely secure.** Check with your system manufacturer or retailer or learn more at intel.com.

Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

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