

Mavenir vCSGN

Driving Operator CloT Revenue with a Virtualized, Dedicated Packet Core

Mobile operators are under increasing pressure to meet capacity demand, prepare for 5G, and compete with OTTs, who now control almost 90% of subscriber services. According to a recent Dell’Oro Group report, IoT (Internet of Things) represents a major opportunity for operators to expand their revenues. The IoT Report suggests that IoT applications will generate nearly \$33B of revenue for service providers and mobile infrastructure vendors by 2022, growing around 2.5 times 2017 levels.¹

Targeting the emerging NB-IoT (Narrowband IoT) ecosystem, Mavenir’s Virtualized Cellular IoT Serving Gateway Node (vCSGN) is an innovative collapsed packet core solution designed for virtualized environments to support CloT (Cellular IoT) traffic. Running on Intel x86 servers, the solution is deployable in network slices that can be dedicated to CloT device traffic. Mavenir’s vCSGN features simple deployment and optimization with reduced backhaul costs, enabling operators to quickly react to market changes, thus ensuring a high return on investment and a lower total cost of ownership.

KEY BENEFITS

- Supports Cellular IoT (CloT) traffic for NB-IoT and Cat-M1 devices
- Efficiently scales the control plane, supporting very high density CloT deployments
- Network slicing and CGSN features support 3GPP 13, 14
- Deploys into a dedicated network slice or as a greenfield EPC deployment
- Interworks with Service Capability Exposure Function (SCEF) to simplify IoT service enablement
- Reduces latency with collapsed EPC functions that create a CSGN offering with minimal footprint and internodal overhead

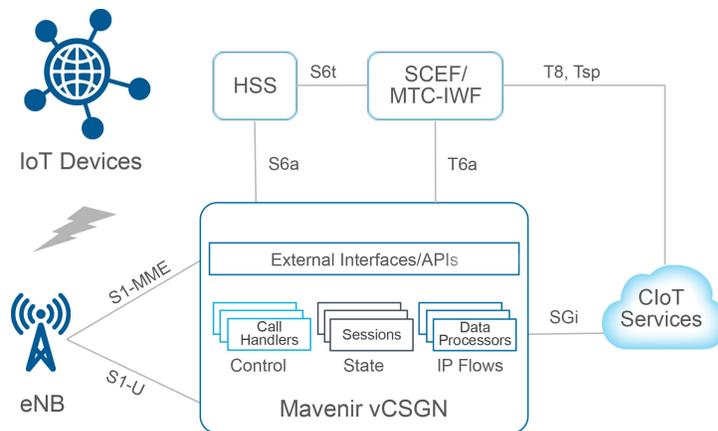


Figure 1: Mavenir vCSGN logical architecture.

¹ Advanced Research: Wide Area IoT Report, The Dell’Oro Group, January 2018

Mavenir vCSGN: The Only vCSGN with Collapsed Architecture

Mavenir's Virtualized Packet Core architecture transforms mobile networks through a highly scalable, Virtualized Evolved Packet Core (vEPC) implementation. By combining MME (Mobility Management Entity), SGW (Serving Gateway), and PGW (PDN Gateway) functionality within the vEPC, Mavenir has created the industry's first vCSGN in a truly collapsed architecture – a single entity that serves NB-IoT devices. This collapsed approach eliminates excessive protocol handling between components, greatly reducing latency. In this virtualized environment, operators can quickly create a vEPC instance, a separate network slice that enables NB-IoT devices, covered by a particular eNodeB, to attach and utilize the slice.

As an open solution, the Mavenir vCSGN can provide higher service velocity than traditional architectures, which are far more rigid and complex. Its service-based, modular design, combined with open API support, enables operators to quickly create and implement new features for maximum business agility. Operators can add infrastructure to support new users or new services in just days, instead of months. The fully virtualized deployment allows operators to grow their mobile networks at market speed.

Solution Description: Mavenir vCSGN

The Mavenir vCSGN leverages proven industry tools and software to provide an open and highly flexible virtualized solution. Utilizing general purpose servers and standard operating systems (Linux), Mavenir's vCSGN is designed for maximum interoperability, allowing seamless integration with third-party tools for extended functionality.

The solution is designed to transform mobile networks by giving operators the flexibility to scale the control plane, user plane, and session plane independently. This architecture enables the implementation of a control plane–centric network function (CSGN) and can easily scale from a few users to millions of users, accommodating the significant growth expected in IoT devices. The stateless design of the Mavenir vCSGN, aided by a separately scalable and low latency session plane, ensures a highly available and optimized solution (Figure 1).

NB-IoT Optimization Based on 3GPP Release 13

3GPP Release 13 includes the CSGN concept and architecture, with multiple new features envisioned for NB-IoT device management. These features accommodate the Low Power Wide Area (LPWA) requirements of NB-IoT devices. In line with 3GPP Release 13, Mavenir's vCSGN enables small data delivery over the control plane, supports Extended Discontinuous Reception (eDRX) handling by modifying paging timers, implements Robust Header Compression, and introduces data buffering for latency-tolerant devices. The solution also allows control and user plane optimization in order to efficiently support NB-IoT devices.

Service Capability Exposure Function (SCEF) Interworking

The Mavenir vCSGN interworks with the Mavenir SCEF, which securely exposes the services and capabilities provided by 3GPP network interfaces to the CIoT-enabling application servers. The Mavenir SCEF provides a layer of abstraction between the 3GPP interfaces and the CIoT application servers. This way, the application servers do not need to support multiple protocol stacks and interoperate with a range of 3GPP network elements, such as the MME and HSS. Instead, the application servers integrate with Mavenir SCEF open APIs for the services required. All underlying protocol selection, translation, and routing is performed by the Mavenir vCSGN. A tightly integrated SCEF and CSGN simplifies the packet core and network control of NB-IoT devices.

Summary

Mavenir enables mobile operators to capitalize on the rapidly growing IoT market and generate new revenue with the industry's only collapsed packet core, vCSGN solution. The vCSGN can be deployed into a dedicated network slice, for seamless integration in an existing network, or as part of a combined greenfield EPC deployment that supports diverse NB-IoT traffic types.

The Mavenir vCSGN greatly reduces latency with a collapsed architecture that eliminates excessive protocol handling between components. The solution provides higher service velocity than traditional architectures, and with its open API support, mobile operators can create and implement new features in just days, instead of months, for maximum business agility.