

SOLUTION DESCRIPTION

# MAVENIR VIRTUALIZED EVOLVED PACKET CORE (vEPC)



# 1 Mavenir vEPC: The Industry's Most Scalable and Agile Evolved Packet Core

Mavenir vEPC cloud-based core network architecture transforms mobile networks through a highly scalable and nimble virtualized EPC that can adapt to a range of emerging 4G LTE deployment use cases. Its visionary nature allows it to be natively extensible to emerging 5G architectural standards. This approach eliminates the expensive hardware, long upgrade cycles, overprovisioning, and years-in-advance budgeting that traditionally characterize mobile service provider networks. Now operators can offer services to both 4G and 5G subscribers, and then scale to support Multi-Access Edge Computing (MEC) and Private LTE use cases on small form factor and white box solutions.

The complete Mavenir Packet Core Portfolio is shown below:

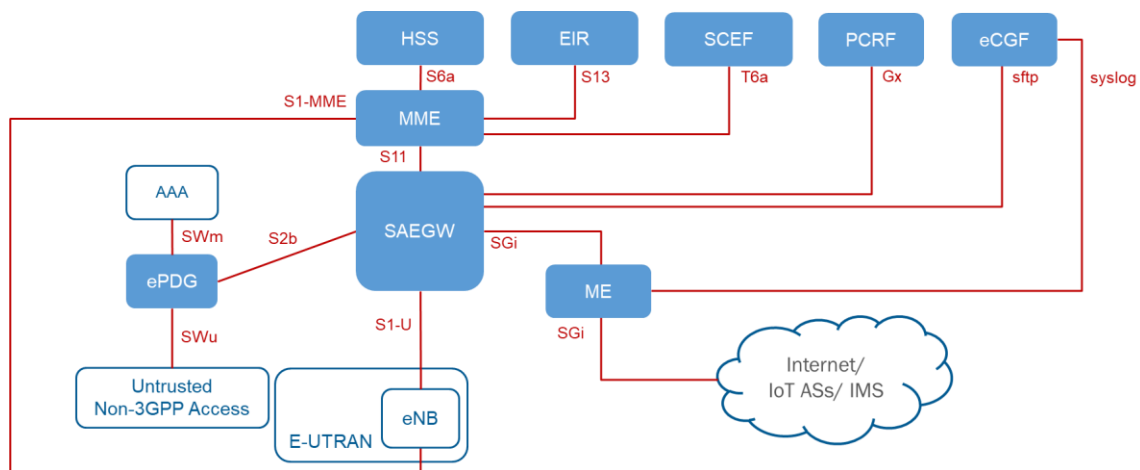


Figure 1: Mavenir 4G Packet Core Product Portfolio

## 2 Mavenir vSAEGW Product Description

Mavenir vSAE-GW provides the System Architecture Evolution (SAE) gateway functionality, which is a combination of SGW (Serving gateway) and PGW (Packet data network gateway) functions as specified in the 3GPP standards.

The inherent scalability of the software allows any-size deployment and incremental growth. Independent scaling in signalling, throughput, and storage can be achieved while preserving industry-leading performance.

In SAEGW architecture, the Serving Gateway (SGW), Packet Data Network Gateway (PGW), are distributed across several physical systems, where each system is called a node. Almost all these nodes are installed on proprietary operating systems and run vertically integrated application functions.

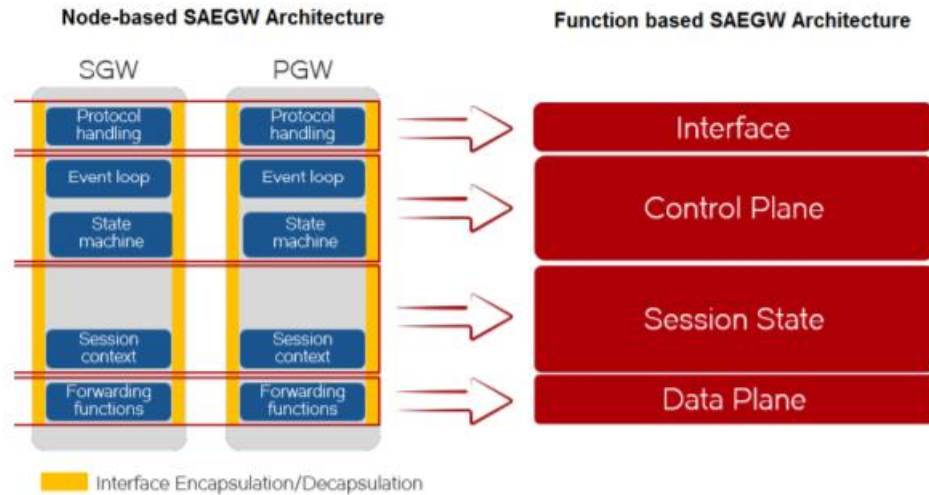


Figure 1: Mapping node-based architecture to function-based architecture

In function-based architecture, all SAEGW functions are grouped logically and horizontally into four different groups based on commonalities. A list of SAEGW functions are:

- Interface function - Comprises Diameter, GPRS Tunneling protocol (GTP), Stream Control Transmission Protocol (SCTP), and SIAP protocol-handling functions from all network nodes.
- Control Plane Function - Comprises the control plane functions from SGW, and PGW.
- Session State Function - Comprises the session and mobile context-processing functions.
- Data Plane Function - Comprises the data plane functions from the SGW and PGW.

The Mavenir vSAEGW is divided into four tiers based on the four different commonalities identified above. The four tiers of Mavenir vSAEGW are:

- Interface - The interface function maps to this tier. The interface tier performs protocol handling and communication with external entities.
- Service Logic - The control plane and data plane functions map to this tier. The service logic tier handles the control plane and data plane. The control plane and data plane are separated so that each can scale independently.
- Database - The session state function maps to this tier. The database tiers maintain the session state. The subscriber database stores information such as authentication keys and allowed access point names (APNs).
- Management - The management tier performs network management and provisioning.

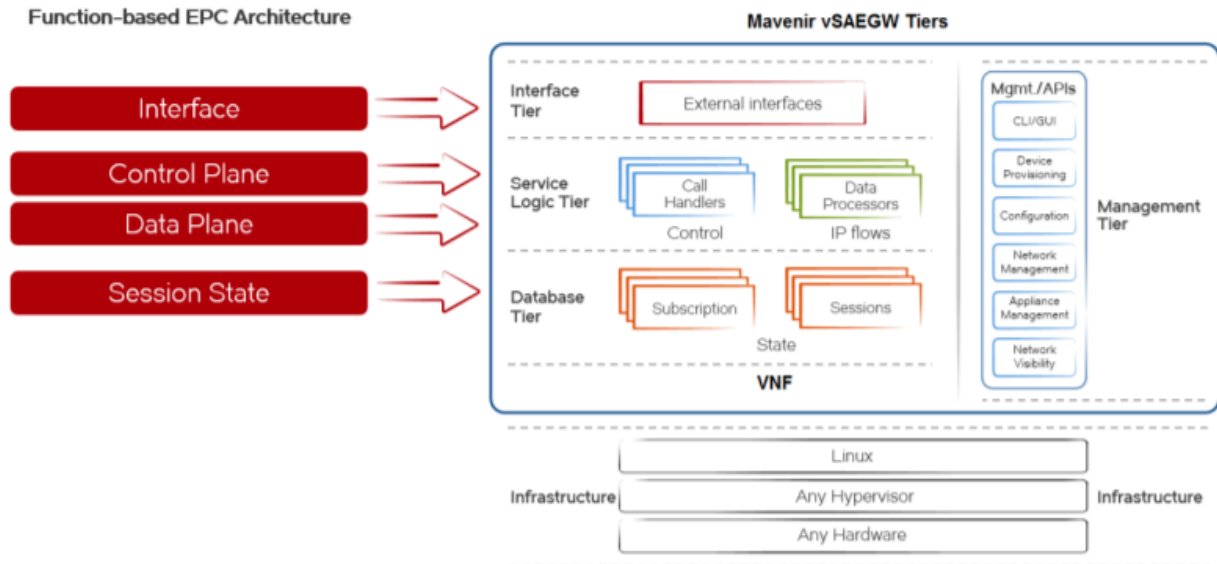


Figure 2: Mapping function based SAEGW architecture to Mavenir SAEGW tiers

Mavenir vSAEGW has the following Virtual Network Function Components (VNFCs):

- VEM - VCM Element Manager
- EMS - Element Management System
- SDB - Session Database
- CPE - Control Plane Entity
- DPE - Data Plane Entity
- CDF - Charging Data Function
- EIF - External Interface

Mavenir vSAEGW uses the S1-U interface to communicate with an eNodeB.

### 3 Mavenir Mobility Management Entity (MME)

The Mavenir Mobility Management Entity (MME) is an integral part of the Mavenir Evolved Packet Core (EPC) offering. It supports 3GPP Release 15 based NSA Option 3/3a/3x which allows Communication Service Providers (CSPs) to seamlessly evolve to 5G while preserving infrastructure investments in the 4G EPC.

Mavenir MME is designed for deployment in virtualized environments. It is free of the architectural restrictions posed by traditional, physical node-based network elements. Running on Intel x86-based general purpose servers, it can efficiently and cost-effectively support networks of any size and scale. Mavenir MME provides the lowest total cost of ownership and ensures that all the benefits of running a virtualized network function get passed on to operators and their customers, leading to a renewed focus on business growth.

## MME HIGHLIGHTS:

- 3GPP standard compliant interfaces
- Proven interoperability with major incumbent vendor products
- Deployed with Tier-1 CSPs
- 5G NSA Option 3/3a/3x enables seamless 5G services evolution
- Supports MME pooling for seamless subscriber capacity expansion
- Décor/eDecor network slicing enables efficient Dedicated Core Network (DCN) creation
- VoLTE, SRVCC and CSFB for voice calling
- Cellular IoT features support
- 2G/3G Packet Core interworking
- N26 interworking with 5GC
- On-demand scalability for optimal resource usage and business agility

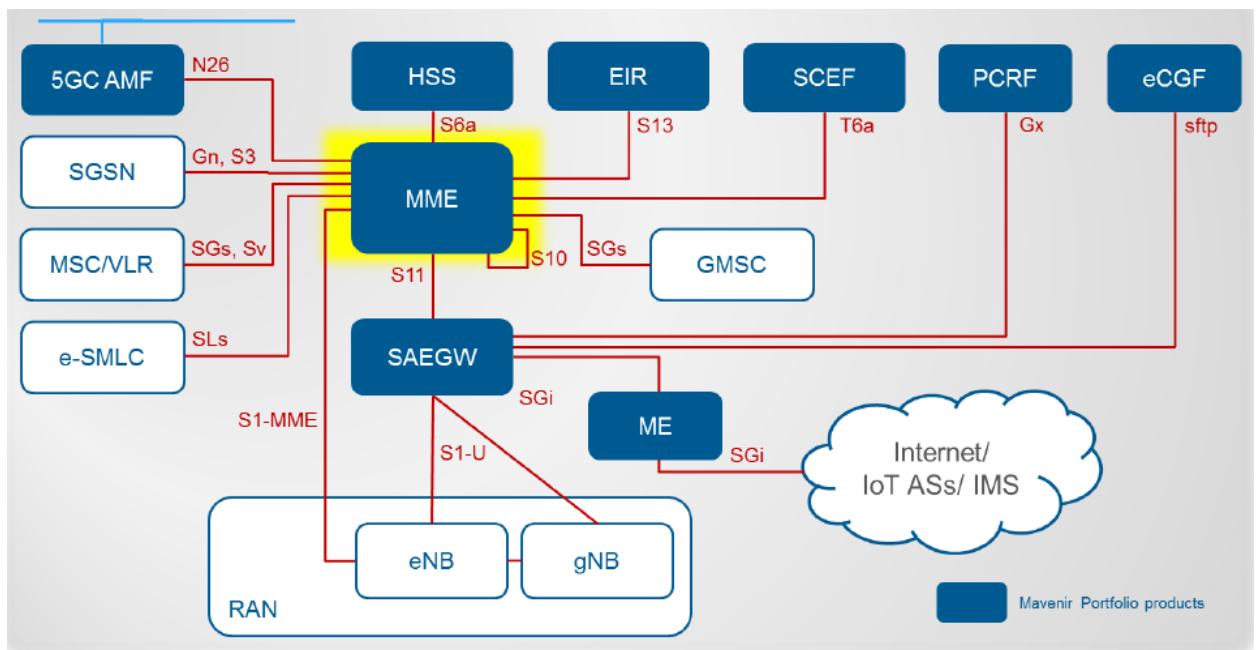


Figure 3: Mavenir MME in Evolved Packet Core

MME is the key component and main signalling node in the EPC. MME main functionality includes providing NAS Security, mobility management and session management for 4G UEs. MME retains location information at the tracking area level for each user and then selects the appropriate gateway during the initial registration process. Multiple MMEs can be grouped together in a pool to meet increasing signalling load in the network. MME also plays a vital part in handover signalling between LTE and 2G/3G networks. Mavenir's cloud native MME offers the speed, flexibility and performance necessary to streamline mobility management, regardless of the state of the current mobile network. The innovative design cost-effectively scales on demand to meet



requirements of traffic volume spikes and ebbs. It provides CSPs with the ability to deliver on the promise of current and future use cases related to CloT for the energy, health and transportation industries, for example. The proven capabilities of Mavenir's MME increases resiliency and reduces risk while decreasing service interruptions through a redundant and self-healing design.

#### MAVENIR MME PLATFORM FEATURES & BENEFITS:

- Carrier-grade high availability on cost-effective commercial off the shelf hardware delivers rapid value
- Linear scaling to meet the capacity demands of both current and future use cases
- Overload control management eliminates bottlenecks to meet SLAs
- Geo-redundant deployment configuration reduces risk and improves user experiences