

# Casa Systems Axyom™ Evolved Packet Core

Virtualization of the Evolved Packet Core (EPC) allows service providers to reduce costs, improve network efficiency, and deploy new services faster. However, mobile service providers are finding that the virtualized EPC solutions from their traditional vendors are very inefficient and are causing them to purchase more servers than expected. As a result, capital and operating costs are skyrocketing.

The EPC is the central element in a wireless network and the data traffic it is handling is growing at a fast rate. Legacy EPCs are struggling to keep up with the growth and new thinking is required. Casa Systems Axyom EPC is built from the ground up and is optimized for virtualized environments. The Axyom EPC is a component of Casa's Axyom Software Platform, a multi-service modular software architecture that delivers the following:

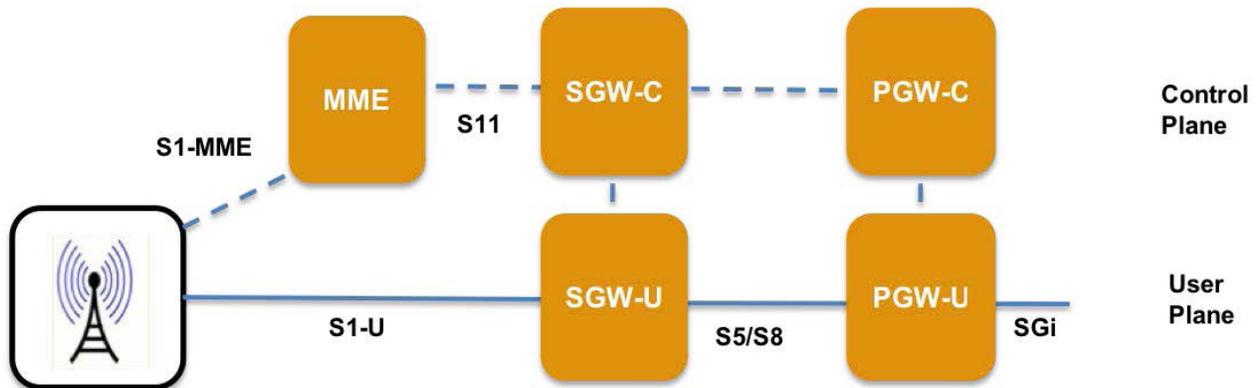
- Industry-leading performance per vCPU – The Axyom EPC delivers up to 5X the performance of its competitors. The overall result is that the Axyom EPC requires fewer servers and a lower footprint when compared to competitive alternatives.
- Lean computing requirements - Each EPC Virtual Network Function (VNF) can be scaled down to as low as 5 vCPUs with our “lean” configuration. Small footprint VNFs allow service providers to reduce OPEX related to power consumption and to support multiple tenants on a single server.
- Differentiated Scaling - The addition of a new scaling dimension with support for both vertical and horizontal scaling. Vertical scaling delivers the ability to increase and decrease vCPUs within a single VNF. This translates into more efficient and responsive use of compute resources.
- Superior deployment flexibility - Casa's Control and User Plane Separation (CUPS) solutions provides independent scaling and the ability to locate functions in a centralized data center or at the edge of the network for Multi-access Edge Computing (MEC) applications. As an example, if the Axyom SGW-U & PGW-U (the user plane) VNFs are located at the edge, latency can be reduced and performance can be improved.
- Elegant evolution to 5G - Casa's flexible VNF implementation will allow for a smooth migration to the 5G Core standards.

## Highlights

- High performance virtualized solution
- Up to 5X the performance of competitors
- Deployment flexibility - VNFs can be deployed at the network edge or in a centralized data center
- Bare metal, virtual machine or container-based deployments supported
- EPC implementing CUPS
- VNFs: SGW-U, SGW-P, PGW-U, PGW-C, MME and/or SAE-GW
- 5G-ready with seamless upgrade path
- 3GPP R13 compatibility
- Multi-dimensional VNF scaling - vertical and horizontal
- Independently scalable control and user planes
- High availability; carrier-grade
- Lower TCO
- Accelerated time-to-market for new services

## Axyom EPC

The Axyom EPC provides MME, SGW-U, SGW-C, PGW-U and PGW-C functions in an optimized CUPS software framework. Each VNF can scale independently, allowing rapid adaptation to changes in traffic. Each VNF can be located either at the network edge or in the data center. This provides the mobile service provider with maximum flexibility and optimizes network resources, which in turn reduces CAPEX and OPEX. The Axyom architecture enables line rate throughput, even for small packet sizes.



Casa's EPC can be deployed stand alone or in conjunction with other Casa Axyom products. For example, the Security Gateway, Small Cell Gateway and EPC can be deployed together to create an end to end small cell core network leveraging Axyom's superior performance benefits. The Axyom P-GW supports up to 11 EPS bearers per UE (user equipment). Each bearer can be assigned a different QoS as needed, enabling service providers to flexibly define and enforce policy control and charging rules.

The Axyom S- and P- gateways are also available as an SAE (System Architecture Evolution) Gateway. This architecture enhances operational efficiency by avoiding the need to process the subscriber context through independent data plane services. At the same time, it has the capacity to break out an independent PGW in order to anchor S8 calls from subscribers in visited roaming networks.

As the diagram above shows, Casa's EPC solution implements Control and User Plane Separation (CUPS). Casa realized prior to the 3GPP's effort to standardize CUPS that the ability to scale the control and data plane independently and to increase flexibility made CUPS the right architecture.

For the EPC VNFs, the Axyom Virtual Management Controller (VMC) provides life-cycle Management, EMS functions and Northbound interfaces to NFV Orchestrators. With the ability to support multiple application level KPIs, the VMC provides the control and visibility needed to orchestrate large numbers of VNFs instances running simultaneously and to manage them through their lifecycle.

Casa's Axyom EPC is the right solution. As with all Axyom VNFs, the Axyom EPC was built from the ground up using cloud native design principles. The Axyom EPC is optimized for a virtual compute environment and delivers:

- Superior performance
- Leading virtual compute efficiency
- Maximum service flexibility
- Superior deployment flexibility