OMEC Repositories

OMEC package is a Converged Telecom Core architectural reference implementation for deploying 5G network core Infrastructure. The seven constituent OMEC repositories are:

The **C**lean **C**ontrol User Plane Separated **C**ore **P**acket **O**ptimized (**C3PO**), Next Generation Infrastructure Core (**NGIC**), Open Mobility Management Entity (**OpenMME**), together with **FreeDIAMETER**, Operational Support System Utilities (**OSS-Util**), Intel-Labs Traffic Generator (**IL_Trafficgen**) repositories constitute a comprehensive Evolved Packet Core (EPC) infrastructure stack that include Intel® SGX based secure billing for protection and audit of sensitive Call Data Records (CDRs). The IL_Trafficgen together with the built-in test features in the NGIC provide a simple means of testing the performance envelope and operation of the EPC. The seventh repository is set of terraform based deployment tools for efficient and automated building of OMEC based VNF infrastructure.

The OMEC repositories are available on GitHub: http://www.github.com/omec-project

Clean Control User Plane Separated Core Packet Optimized (C3PO):

C3PO repository packages the Home Subscription Service (**HSS**), Database, Charge Data Function (CDF), Charge Trigger Function (CTF), Policy Control Rules Function (PCRF) and Intel® SGX (SGX-DLR-IN, SGX Router, SGX-DLR-OUT), a set of three VNFs/Processes that enable protection of sensitive Call Data Records (CDR) for adds security and audit capabilities to billing and charging.

Next Generation Infrastructure Core- Run to Complete (NGIC-RTC):

NGIC-RTC is Control User Plane Separated (CUPS) architecture 3GPP TS23501 based implementation of EPC Service and Packet Gateway functions (SGW, PGW) in a run to complete design to maximize packet processing performance per compute core. The NGIC-RTC allows runtime configurable SGWC-SGWU <S5/S8> PGWC-PGWU or SPGWC-SPGWU options. Interface with the Control and User plane i.e. S-PGWC and S-PGWU is ZMQ push-pull mechanism over TCP transport. Options for UDP transport or SDN integration are available.

Open Mobility Management Entity (**OpenMME**):

OpenMME is a grounds up implementation of the Mobility Management Entity EPC S1 front end to the Cell Tower (eNB). Its design is performance optimized for high speed mobility events over the S1-MME interface, while maintaining state coherent high transaction rate interactions over the S6a interface to the HSS and the S11 interface to the Serving Gateway Control (SGWC). The design allows maximum utilization of the transaction rate allowed by the S1-MME Non-Access Stratum (NAS) messages over SCTP, S6a DIAMETER Attribute Value Pairs (AVPs) over TCP and S11 GTPV2C messages over UDP protocols.

FreeDIAMETER:

FreeDIAMETER packages the IETF RFC 6733 DIAMETER base protocol to provide an Authentication, Authorization, and Accounting (AAA) framework between the EPC elements- MME <S6a interface> HSS; Packet Gateway Control (PGWC) <Gx interface> PCRF.

OSS-Util:

OSS-Util provides Application Programing Interface (API) to implement Command Line Interface (CLI) and logging support for all of the constituent OMEC applications. Using OSS-UTIL will make CLI and logging support common across all the applications. OSS-UTIL builds as a library which can be linked to any of the OMEC applications.

IL_Trafficgen:

IL_Trafficgen is a DPDK packet gen based traffic generator which together with the built-in test features in the NGIC provide a simple means of testing the performance envelope and operation of the EPC. The IL_Trafficgen S1U generator generates Uplink (UL) GTPU packets on the S1U interface to the Serving Gateway User Plane (SGWU) for a defined number of devices (one flow per attached User Equipment) at a defined packet rate and packet size. The de-capsulated processed emerging from the SGi interface the NGIC Packet Gateway User Plane (PGWU) are counted by the IL_Trafficgen SGi responder and fed back to the S1U generator over an out of band connection between the IL_Traffic S1U generator and the SGi responder. The IL_Trafficgen SGi responder also represents the Application Server being access by the User Equipment Flows and can generate Down Link (DL) response packets on the SGi interface to the PGWU. The DL processed encapsulated packets are communicated to the S1U generator, counted and tallied.

Deployment:

Deployment repository is a set of terraform based tools for efficient and automated building of OMEC based VNF infrastructure. It packages a set of scripts to build, configure and deploy the KVM based Virtual Machines (VM) over which the each of the constituent OMEC Network Functions can be installed, configured and operated.