Open Mobile Evolved Core

https://www.opennetworking.org/omec/
OMEC Tutorial Organization

- Opening - Stage setting
- Architectural Overview - Features, Functionality, Performance
- Demo Video - Test Drive OMEC
- Contribution of features and bug fixes to OMEC
- OMEC CI/CD
- Q & A
Can we securely run Telco core infrastructure on high volume servers to deliver operational capacity?
OMEC repositories

- [https://github.com/omec-project](https://github.com/omec-project)

**OMEC - Open Mobile Evolved Core**

Open Source Virtualized Mobile Core Project from ONF

[https://www.opennetworking.org/omec](https://www.opennetworking.org/omec)

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### Pinned repositories

- **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, S...)

  - C++
  - Stars: 10
  - forks: 6

- **ngic-rtc**

  NGIC-RTC is Control User Plane Separated (CUPS) architecture 3GPP TS23501 based implementation of EPC Service and Packet Gateway functions (SGW, PGW)

  - C
  - Stars: 19
  - forks: 18

- **openmme**

  OpenMME is a ground-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...

  - C
  - Stars: 13
  - forks: 12
OMEC repositories

**omec-project-ci**
Resources for CI/CD Jobs
- Groovy 2
- Updated 13 days ago

**freediameter**
FreedDIAMETER 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.
- C 3
- Updated on Feb 23

**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 n...
- C 2
- Updated on Feb 14

**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.
- Shell
- Updated 23 hours ago

**oss-util**
OSS-Util provides Application Programming 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.
- C++ 2
- Updated on Feb 12
The Open Mobile Evolved Core (OMEC) is a package of seven individual repositories comprising 13 Virtual Network Functions (VNF): Mobility Management Entity (MME), Home Subscription Server (HSS), Database (DB), Serving Gateway Control (SGWC), Serving Gateway User Plane (SGWU), Packet Gateway Control (PGWC), Packet Gateway User Plane (PGWU), Charge Data Function (CDF), Charge Trigger Function (CTF), Intel® Secure Guard Extensions CDR Dealers-In (SGX-DLR-IN), Intel® SGX Dealer-Out (SGX-DLR-OUT), Intel® SGX Key-store (SGX-KMS) and CDR-ROUTER.

OMEC includes:

- Components that have gone through Intel's SWLC and SDL process (including code scans to prevent license contamination)
- Complete connectivity, Secure billing and charge data handling capabilities
- 3GPP Release 13 compatible*
- Optimization for lightweight cost effective deployments and IoT applications
- Integrated CI/CD test and verification capabilities

* Refer release notes- issues and constraints
OMEC 1.0 – Fully Featured & Intel® SGX Secure Billing

E2E Comprehensive EPC Infrastructure:
- Fully secured distributed Xeon E3 based SGX enabled billing system, automated, real time billing data collection and storage.
- SGX based secured, auditable mutual attestation. Guaranteed confidentiality and integrity of Charge Data Records (CDRs)
- Cross platform deployment orchestration, provisioning and network configuration tools ready- KVM, AWS, Docker, K8, …
Application gains ability to defend its own secrets
- Smallest attack surface (App Memory + processor)
- Malware that subverts OS/VMM, BIOS, Drivers etc. cannot steal app secrets

Familiar development/debug
- Single application environment
- Build on existing ecosystem expertise

Familiar deployment model
- Platform integration not a bottleneck to deployment of trusted apps

Reducing the “Attack Surface” with Software Guard Extensions (SGX)
OMEC Functionality & Performance

1. Comprehensive E2E- 12x VNFs (MME, HSS, DB, SGWC, PGWC, SGWU, PGWU, SGX-DLR-IN, SGX-KMS, CDR-RTR, SGX-DLR-OUT, CTF, CDF)*

2. Fully secured, scalable and auditable SGX based integrated billing record processing
   - SGX E3 server platform based system - One SGX Billing Frame capable of handling upto 7 DP Frames

3. DP (SGWU-PGWU) Run-To-Completion model
   - 4 cores delivering ~2.5 MPPS across 500K flows
   - SGWU/PGWU can also be protected with Intel® SGX based servers

4. SGWU-PGWU* interfaces are Linux aware and operable. Key Operational requirement.
   - Linux commands, Route, ARP tables direct fast path frames

* Refer release notes - issues and constraints
DEMO VIDEO