COMAC
Converged Multi Access & Core

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Outline

- COMAC – What is it?
- Achieving Convergence
  - Disaggregate first
  - Integrate with programmable access
  - Enable co-existence
  - Re-aggregate next
  - User plane convergence
  - Control plane convergence
COMAC

Scope

- Develop a modular, cost-efficient platform and components with well-defined interfaces to enable access and core networks, including
  - A streamlined, simple and cost-efficient implementation of 3GPP cellular core,
  - A converged user plane function (CUPF) that unifies user plane components of fixed broadband network gateway, 3GPP cellular core and virtualized 3GPP cellular radio access that would be hosted at the multi-access edge cloud,
  - A suite of control plane functions/applications that would intelligently be engaged to ensure proper, and standards compliant and programmatic control of CUPF,
  - Access and Core Controllers that intelligently and programmatically map CUPF with the corresponding suite of control plane applications.
Supporting Operators
Big Picture: Edge Cloud

Why Multi Access? Why Convergence?
Evolution Towards the Edge

Telco Network

3GPP RAN

eNB/gNB

OLT

ONU

UEs

3GPP CORE

BNG

APPS

Public Cloud

OTT APPS
Evolution Towards the Edge

Telco Network
Evolution Towards the Edge
COMAC Pillars

Why is Convergence Relevant Now?

- Virtualization
- Functional Disaggregation
- CUPS
- Cloudification at the Edge
COMAC Pillars

Why is Convergence Relevant Now?

Builds on RAN Disaggregation
RU and DU are distributed, CU is centralized, further CUPS disaggregated

Builds on CORE CUPS Disaggregation
UPF and disaggregated core control plane VNFS

Converged User Plane Function & Converged Control Plane Functions

Builds on BNG CUPS Disaggregation
BNG UP and disaggregated core control plane VNFS
COMAC Evolution

Phased Approach

Multi-Access Co-Existence
3GPP cellular and broadband access sharing the same infrastructure and edge cloud control and orchestration

OMEC
Use-case optimized, disaggregated, open source 3GPP core

User-Plane Convergence
Converging the user planes of 3GPP RAN CU, 3GPP Core and BNG

Control-Plane Convergence
Converging control plane functions of authentication, subscriber management, session management, etc.

COMAC
Platform hosting converged user and control planes with SDN control, FCAPS-capable edge services mediation with global orchestration connectivity
COMAC
Disaggregate First
Access & Core

Cellular Network

- UE
- eNB
- Cellular Packet Core
- INTERNET

Broadband Network

- CPE
- ONU
- OLT
- BNG
- INTERNET
Disaggregation & Virtualization

Cellular Network

Broadband Network
Disaggregation & Virtualization

Cellular Network

INTERNET

GW-U

GW-C

MME

HSS

PCRF

DU

CU

RU

UE

CPE

ONU

OLT

BNG

INTERNET
Disaggregation & Virtualization

Cellular Network

INTERNET

HSS

PCRF

MME

GW-C

GW-U

CU-C

CU-U

DU

RU

UE
Disaggregation & Virtualization

Cellular Network

Broadband Network
Disaggregation & Virtualization

Cellular Network

Broadband Network
Disaggregation & Virtualization
Disaggregation & Virtualization

Cellular Network

Broadband Network

CPE

ONU

OLT

BNG-C

BNG-U

INTERNET

Disaggregation & Virtualization

CPE

ONU

OLT

BNG-C

BNG-U

INTERNET
COMAC
Integrate with Programmatic Access
Programmable Access

Cellular Network

Broadband Network

- UE
- ONOS
- VOLTHA
- VOLT
- CPE
- ONU
- OLT
- BNG-C
- BNG-U
- INTERNET

- HSS
- PCRF
- MME
- GW-C
- GW-U
- DU
- CU-C
- CU-U
- Sub Access Mgt
- Sub Mgt
- Address Mgt
- AAA
- Service Ctrl
COMAC
Enable Co-Existence
Control Plane Convergence

- RIC
- vOLT
- ONOS ACCESS
  - Mobility Mgt
  - Conv Auth
  - Conv Session Mgt
  - Conv Sub Mgt
  - Conv Policy Mgt
  - Conv Admis Ctrl
  - Conv Address Mgt

- CONVERGED CORE-C
  - CU-C
  - ONOS
    - P4Runtime
  - CUPF

- UE
- RU
- CPE
- ONU

ONOS ACCESS

ONOS

INTERNET
COMAC EP v.1.0 Release
COMAC EP v1.0 Release
Graduating from Demo Quality to Field Trial Quality Towards Production Readiness

China Unicom will use this platform in its field trials for SD-RAN and MAEC

OMEC dev follows the same processes that other ONF projects use
Mobile subscriber state for FCAPS is OMEC based and
MME component is being enhanced towards deployment

ONF Mobile Edge Cloud Platform
Official Release Date: September 20, 2019

OMEC dev follows the same processes that other ONF projects use
Mobile subscriber state for FCAPS is OMEC based and
MME component is being enhanced towards deployment

M-CORD has conducted very successful demonstrations
Focus has been on showcasing cutting-edge technology

Prometheus / Grafana
Mobile Subscriber State
NEM
Trellis Apps
RAN Apps*
OMEC
ONOS
Kubernetes
ONOS SD-RAN*

* Will not be part of v1.0 release, but subsequent releases

SD-RAN controller is based on ONOS which has been hardened for
Mobile subscriber state for FCAPS is OMEC based and
MME component is being enhanced towards deployment

Further development will be in synch with μONOS processes
RAN Apps development will follow the same processes that other ONF projects use
THANK YOU