MultiAcces-CORD

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M-CORD: Enabling the Programmable 5G Edge Cloud

Disaggregation

Cloudification

Open Source

Virtualization

Programmability

PROGRAMMABLE 5G EDGE CLOUD
Edge Cloud

Wireless Access

Edge Cloud

Core Cloud

DISAGGREGATE Core
VIRTUALIZE all components
Realize virtualized components in the CLOUD
PROGRAMMATICALLY instantiate use case specific core network slices

DISAGGREGATE RAN
VIRTUALIZE some of its components
Realize virtualized components in the CLOUD
SDNize it for PROGRAMMABILITY
PROGRAMMATICALLY instantiate RAN slices for different use cases

EPC
M-CORD as the Edge Cloud

RRU + DU

M-CORD Edge Cloud

Core Cloud

PDN
MultiAccess CORD

Demo Collaborators

T... radisys
Multi-Access CORD allows combining wireline access and wireless access paths to provide hybrid access.

**More Bandwidth for User Applications:** By using hybrid access through a Residential Gateway (CPE), any connected user device (e.g. smartphone, tablet) can use more capacity for bandwidth-hungry applications.

**Managed Connectivity:** The path selection behavior can be managed to allow selecting different paths per application and to load-balance traffic across different paths allowing a best-fit per application.

**Extensibility:** The Multi-Access CORD POD provides a flexible and extensible environment for the hybrid aggregation point.
A home gateway device (RG/CPE) is connected to the CORD POD via fixed (PON) and cellular (LTE) access links. A client device (smart phone) is connected via WiFi to the CPE device.

Traffic of the client applications will be load balanced, i.e. routed via fixed, or cellular access links between the CPE and the Multi-Access CORD aggregation point based on the source ports the applications are using.
Multi-Access CORD: Convergence of M-CORD and R-CORD
TOWARDS CONVERGENCE (A4 + 5G = ?)

**STRUCTURAL CONVERGENCE**

**Location consolidation**
Traffic grooming, local coupling
- Multi-Access CORD
- Edge Cloud
- Low Latency

**User Plane consolidation**
Same data path for fixed and mobile user plane (UP)
- Bare Metal-based UP,
- virtualized CP

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**FUNCTIONAL CONVERGENCE**

**Control Plane consolidation**
converged control plane
- includes slicing
- Following 3GPP+BBF work

Diagram:
- PGW-C
- BNG-C
- Bare Metal
- Control Plane
- Bare Metal

LIFE IS FOR SHARING.
CONTROL PLANE / USER PLANE SPLIT
NO FRAGMENTATION, PLEASE...

Fixed / mobile or converged CP application
(usually on x86)

A common protocol and data model for forwarding
(avoid having multiple standards...)

Conflict resolution
Host for any kind of drivers

Open vs. proprietary interfaces

Programmable hardware on bare metal
(Differentiate through performance & exposed feature sets)
THANK YOU

M-CORD (Disaggregation, IoT, Slicing)
Mobility Network (Traditional)

Traditional Architecture

With Proprietary Boxes & Solutions

RU/DU Integrated RAN
- Limited Scalability
- Inefficient Coordination
- Sub-optimal Spectrum Usage
- High Cost

Control/Data Plane Integrated EPC
- Limited Scalability
- Discrete Control
- Proprietary H/W for All-purpose
- High Cost
M-CORD (Disaggregated Architecture)

Target Architecture

BBU/EPC Control Application

- BBU
- MME
- SGW-C
- PGW-C
- PCRF

Control Platform

Virtualized BBU

Disaggregated GW (SGW-D)

SGW-D

Disaggregated GW (PGW-D)

Internet

Virtualized BBU

Control / Data Plan

Disaggregated EPC

With Commodity H/W & Open Sources/Open API

Disaggregated & Virtualized RAN
- High Flexibility & Scalability
- Centralized Coordination
- Spectrum Usage Optimization
- Reduced Cost
- Enable New Innovative Services

Disaggregated & Virtualized EPC
- Independent Scalability
- Centralized Control
- Choice of Solutions
- Reduced Cost
- Enable New Innovative Services
M-CORD (IoT Optimized Core)

1. CORD Open Software Platform
2. Open source RAN and EPC
3. Disaggregation of MME functions
4. Slice selection service/function
5. “Connectionless” data plane (Non-GTP)
M-CORD (IoT Optimized Core)

1. CORD Open Software Platform
2. Open source CORE
3. Disaggregation of control and data
4. DPDK-based scalable data plane
5. “Connectionless” data plane (Non-GTP)
M-CORD (End to End Slicing)

1. CORD Open Software Platform
2. RAN Slicing
3. CORE Slicing
4. End to End Slicing Orchestration