OPEN SOURCE NETWORKING DAYS
Singapore
ONF Reference Design and CORD ‘Umbrella’ Project
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ONF Reference Designs

Active Operators*

- SEBA
  - SDN Enabled Broadband Access
- Trellis NFV Fabric
  - SDN Spine Leaf Fabric
- UPAN
  - Unified Programmable Automated Network
- ODTN
  - Open Disaggregated Transport Network

Reference Designs

Trailblazing Projects & Emerging Reference Designs

- CORD (Central Office Re-architected as a Datacenter)
  - Access & Edge Cloud
- M-CORD
  - vRAN & 5G Mobile

* These are the operators truly investing. Broader sets of operators are modestly investing & publicly support the work
Exemplar Platforms are ‘Swim Lanes’ assembling platforms backed by operator demand

**Reference Designs**

- **SEBA-RD**
  - SDN Enabled Broadband Access
- **NFV Fabric-RD**
- **UPAN-RD**
  - Unified Programmable Automated Network
- **ODTN-RD**
  - Open Disaggregated Transport Network

**Exemplar Platforms**

- **SEBA**
- **Trellis**
- **UPAN**
- **ODTN**
- **M-CORD**
  - 5G R&D, in PoCs and Lab trials
- **CORD**
  - Multi-Access Edge Cloud (MAEC) forward looking research

- Variant of R-CORD, with prototypes in early production
- In production
- Stratum component slated for production with Google 2018
- Field Trials
CORD

Unifying umbrella project.

Pulls together all the pieces from all the exemplar platform tracks, vehicle for MAEC research and ultimately provides a unified whole.
SEBA Exemplar Platform (variant of R-CORD)

Mobile Services

Enterprise Services

Residential Services

Mobile

Radio Units

PON OLTs

PON OLTs

Shared Cloud Infrastructure

Residential

ORAN

VOLTHA

Stratum

ODTN

ROADM (Core)

NEM
Network Edge Mediator
OSS mediation & FCAPS support for operationalization
Leverages XOS project & toolchain

Trellis

ONOS
Trellis Exemplar Platform

Mobile Services
Mobile

Enterprise Services
Enterprise

Residential Services
Residential

XOS

Trellis

ONOS

ORAN
Radio Units

VOLTHA
PON OLTs

PON OLTs

Shared Cloud Infrastructure

ODTN
ROADM (Core)

NFV Fabric

OF-DPA, ONL & OCP OpenFlow Switch
CORD as a Platform for New Network Edge
CORD - Reinventing the Network Edge

Users

Edge Cloud

Telco Cloud

Public Clouds

White Box Peripherals
CORD as the New Network Edge Platform: Specifics

Software Stack:
- OpenStack/Docker/Kubernetes
- ONOS, XOS

~25 services residential, mobile, & enterprise use cases

Built with
- Merchant Silicon
- White Boxes
- Open source
- OpenFlow/Permitted
- White Boxes
- ONOS as SDN OS
- Fabric Apps on ONOS

Zero-touch Provisioning
Config & Operation
With MAAS, Ansible, Docker, Kubernetes, XOS
SEBA Exemplar Platform Overview

SEBA POD

All control software deployed as containers on compute nodes using Kubernetes

Network Edge Mediator (NEM)

Provisioning FCAPS & Inventory

vOLT, dhcp, mcast, SR, FPM, T3

ONOS Cluster

Redfish

ONAP

OSAM-Central

Legacy OSS

OSAM-Local

EMS/NMS-adaptor

Subscriber traffic ‘fast-path’ to Internet

OLT

AGG Switch

UNI

NNI

ONU

VOLTHA

TP

BNG is a workload option
- External physical BNG
- vBNG in compute
- BNG in Agg switches
- BNG in OLT boxes
Trellis Exemplar Platform

Trellis
Multi-purpose leaf-spine fabric designed for NFV

Open Source Software

White Box Hardware

SDN Based
Thank You!

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