

Experience with E-CORD

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China Mobile

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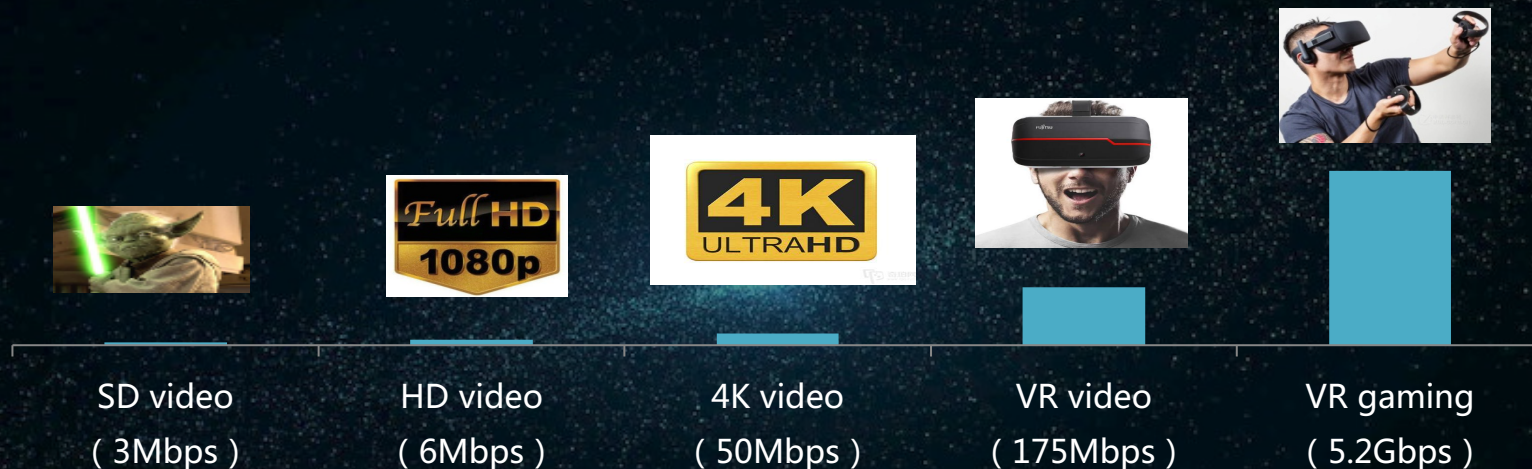
Our Vision of Future Network

2

Our experience with E-CORD

Market Triggers Operator's Network Transformation: Huge Traffic

Large granularity of video is the major part of the traffic in future

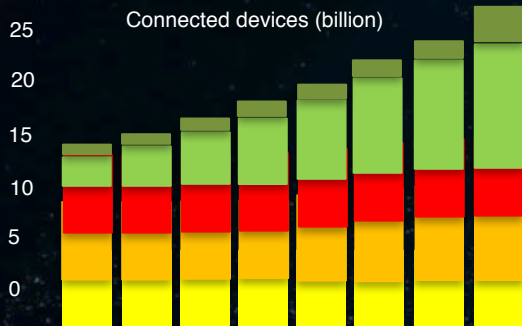


Challenges

- E2E traffic flow optimization is difficult
- Traffic not terminating at edge

Market Triggers Operator's Network Transformation : Large Connection

Number and type of connection will increase significantly



	15 Billion	28 Billion	CAGR 2015-2021
Cellular IoT	0.4	1.5	27%
Non-cellular IoT	4.2	14.2	22%
PC/laptop/Tablet	1.7	1.8	1%
Mobile Phones	7.1	8.6	3%
Fixed Phones	1.3	1.4	0%

- IoT equipment CAGR is 23% between 2015 and 2021, will exceed the phone and become the largest Internet equipment.
- Global networking equipment is expected to reach 28 billion in 2021 , 16 billion relates to IoT

Challenges

- Large amount of on-demand and dynamic business requirements

Market Triggers Operator's Network Transformation: Digital service



Past
(Voice、 SMS)



Now
(OTT、 Pipe)



Future
(Customer self service , NaaS)



Challenges

- Operators will change from selling resources to sell services.
- Traditional static, closed, pre-planned network will change to dynamic, open, on-demand network.

NovoNet – Our Vision of Future Network



New Network Architecture

- Virtualized Network Function
- Centralized Control
- Programmable Network



New Network Operation

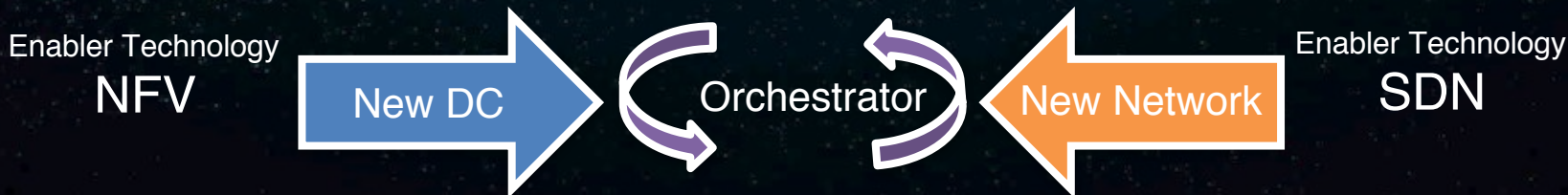
- Auto Deployment
- Flexible Orchestration
- Maximal Usage



New Network Service

- More Open
- More Agile
- On-demand

Future Network need deploy Cloud-based DC and Smart Schedule of Network



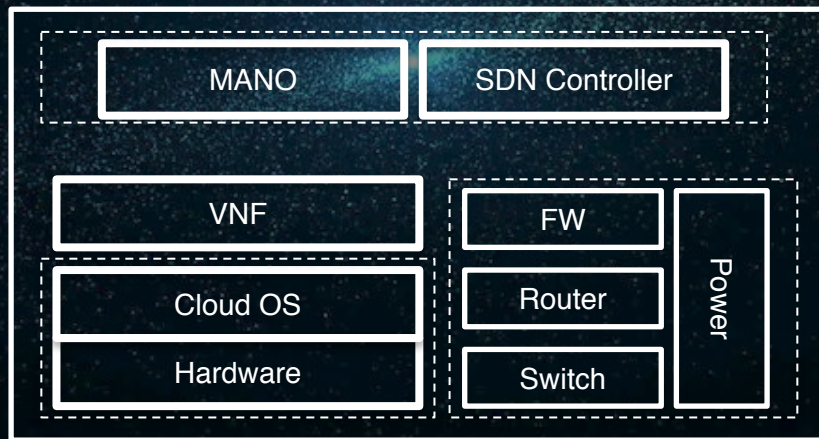
TIC is the Standard Unit for Future Network



- TIC is the standard unit for NovoNet. It supports telecom software app based on carrier-grade infrastructure
- TIC is based on standard network, infrastructure and orchestrator. It is easy to copy and quickly deployed.

Standard Infrastructure

- Unified hardware design with limited number of models suitable for different category of services.
- Unified Cloud OS



TIC : Telecom Integrated Cloud

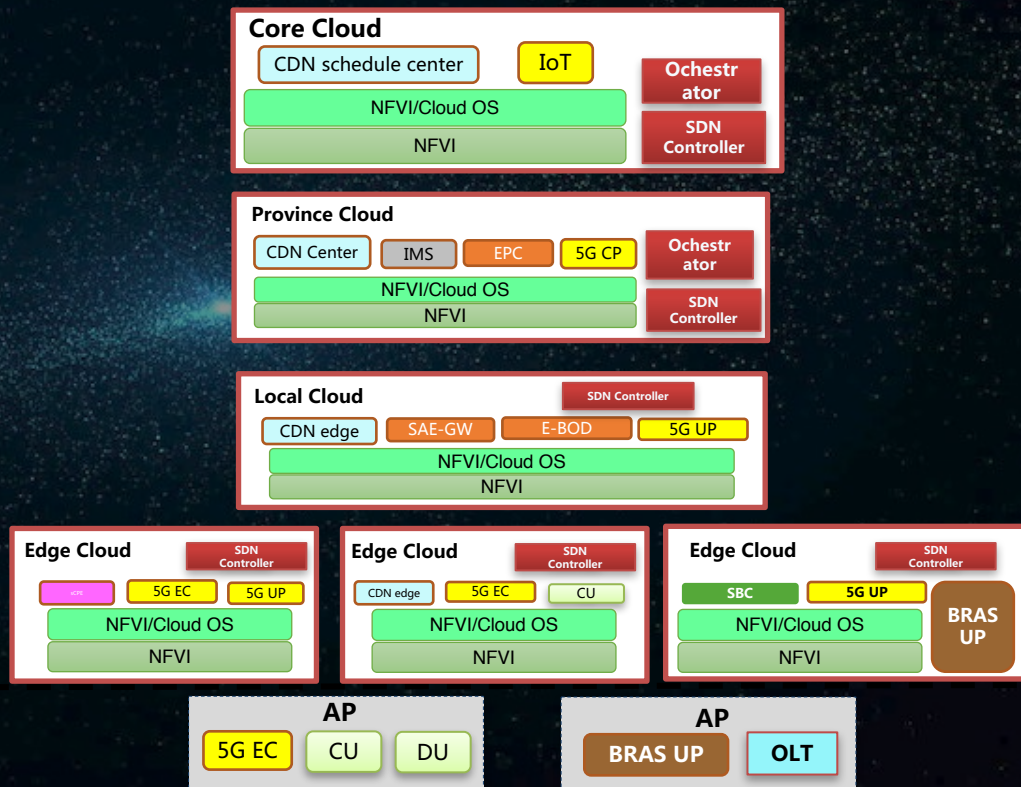
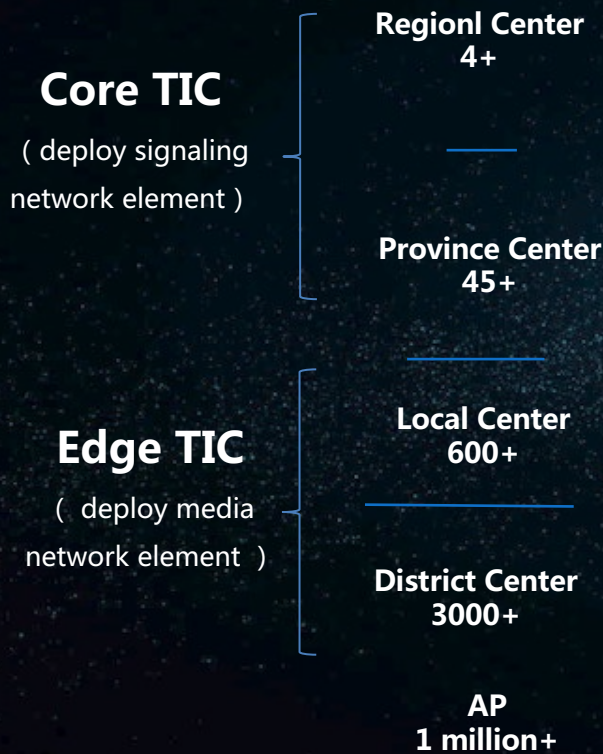
Standard Orchestration

- Integrated NFV & SDN Orchestration

Standard network

- Strict network plane partition, including Management net, service net, and storage net.

Re-architected Network



CORD can be a good reference solution for TIC

In the development of NFV/SDN, open source communities and the standard organizations are the driving force to promote the transformation of the CT industry.

Closed Proprietary

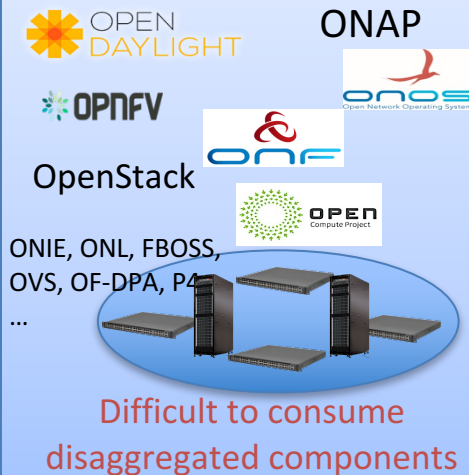


Vendor locked-in and
Difficult to innovate

1. Disaggregation
2. Softwarization
3. Open Source



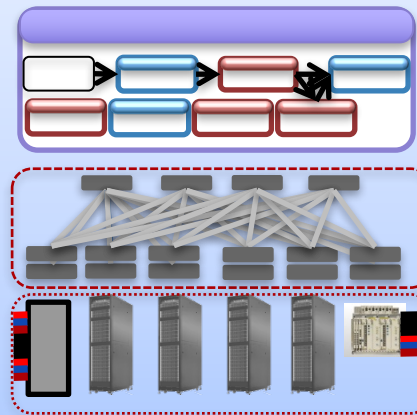
Open Source+Standards



Open Source
Integrated
Solution



CORD



With scalability, performance,
HA, ease of use & deployment

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Our Vision of Future Network

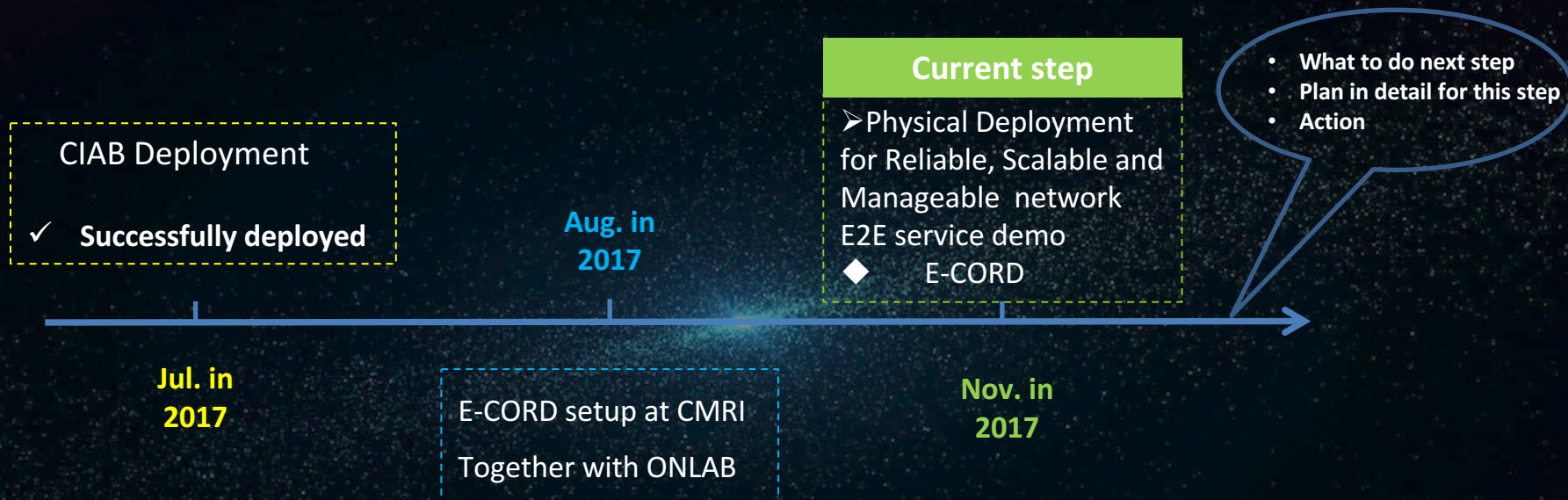
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Our experience with E-CORD

Open source CORD advantages

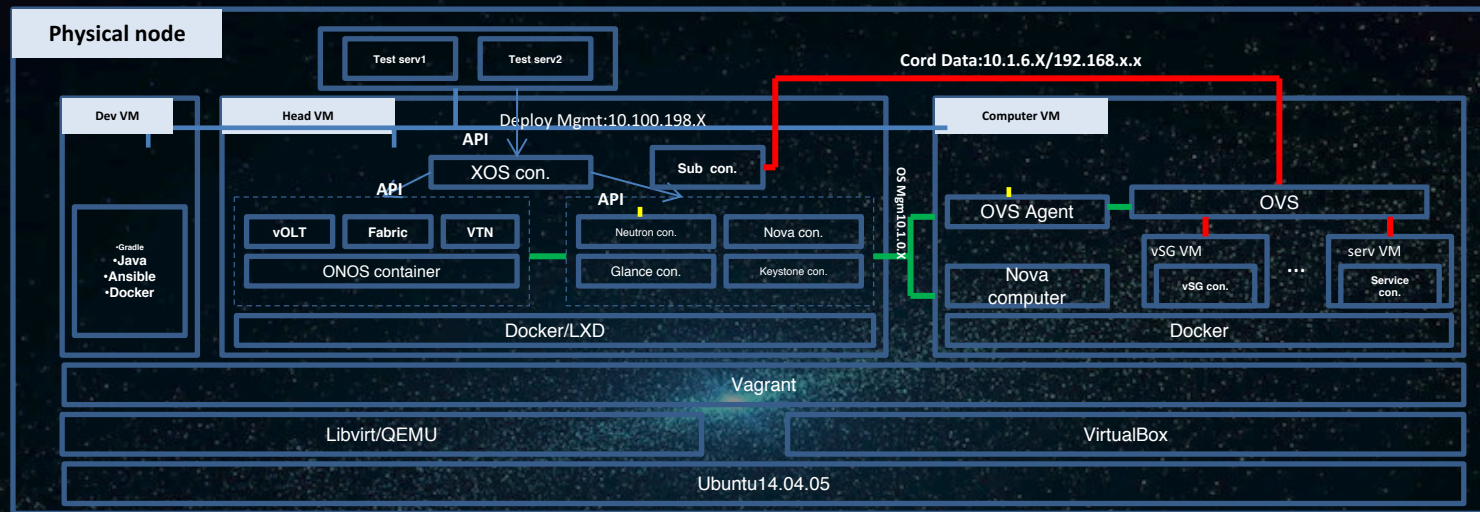
- A little faster pace on CORD platform development and deployment than other competitive solutions
- R/E/M cord service development together with CORD platform where we operators wish have as quick as possible PoC of SDN network and service deployment
- Carrier Grade Network controller platform

CMRI cord deployment plan



- Evaluate the stability, performance, reliability, scalability of CORD platform
- Work together to push CORD into practice

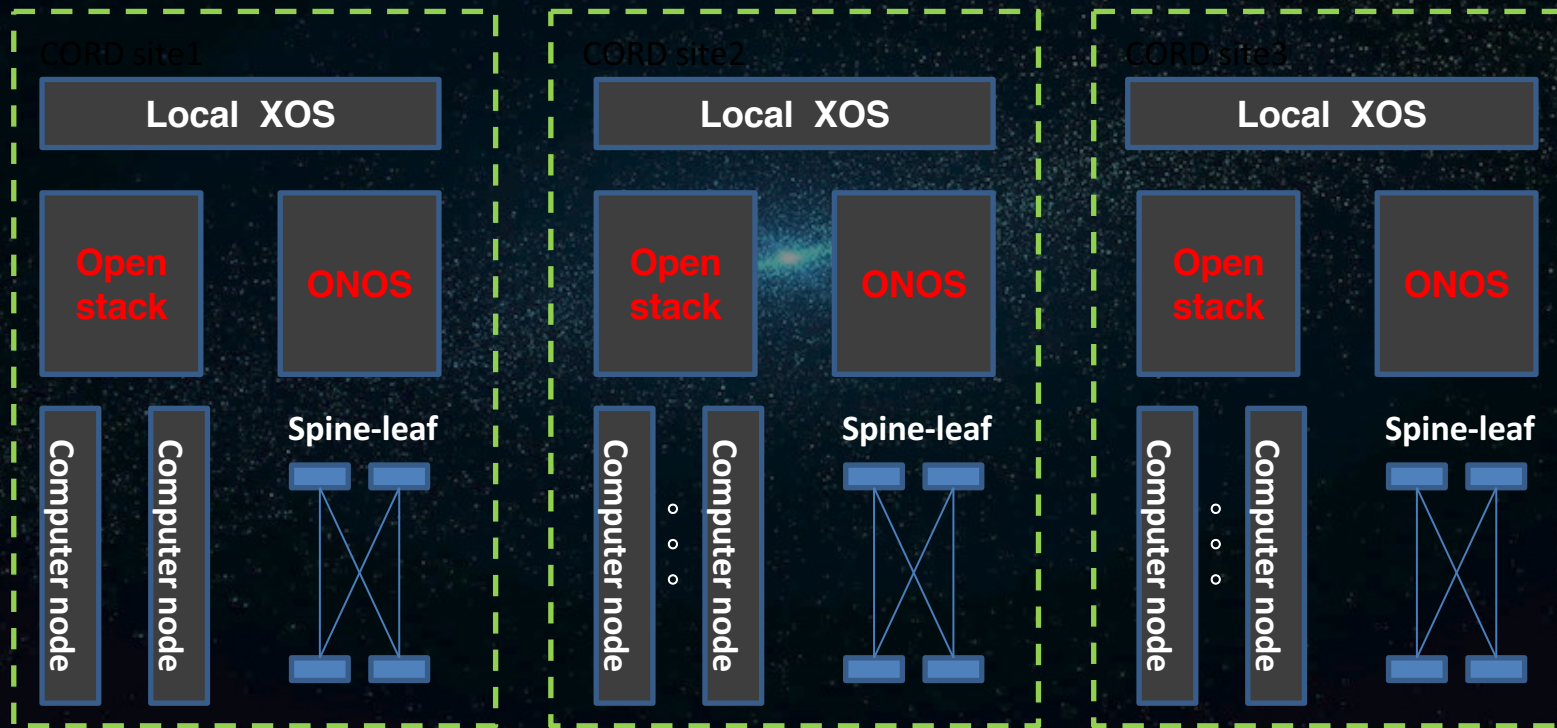
CMRI contribution of customization work for CIAB cord deployment



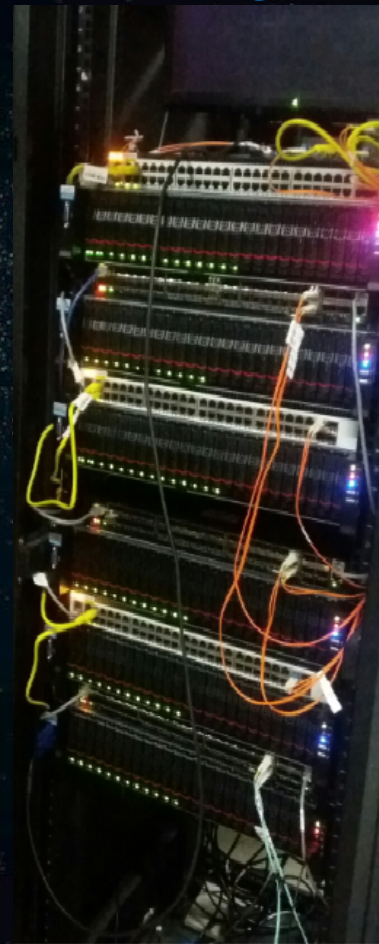
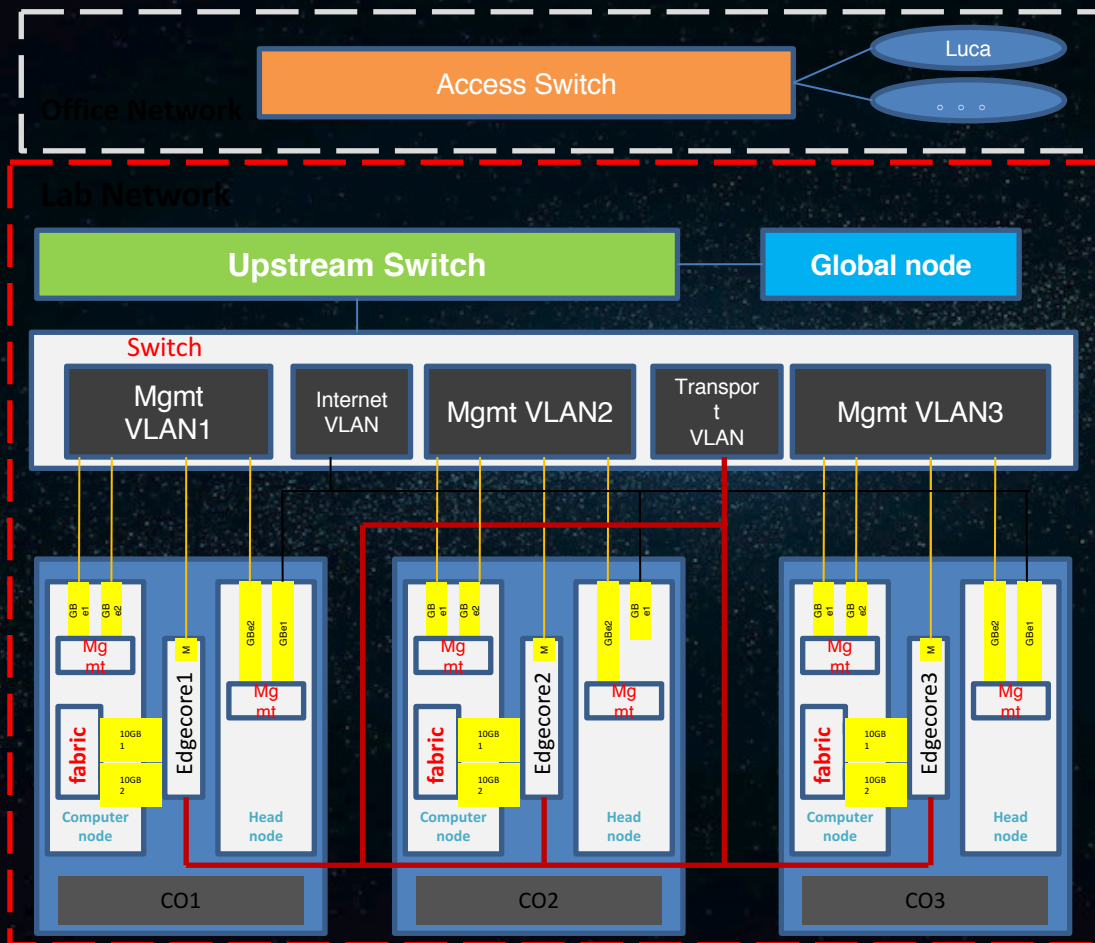
- Scope
 - Fetch: vpn setup, reconfiguration of docker image mirror, ftp server setup for locally access frequent downloaded file
 - Build: configuration of local mirror site in china of Maven library for fast building
 - Deploy: configure openstack without SSL, service containers DNS reconfiguration
 - Service onboarding: rewrite related scipts for bootstrap, service container dns reconfiguration
- Updated files: 30+

Logical CORD setup at CMRI

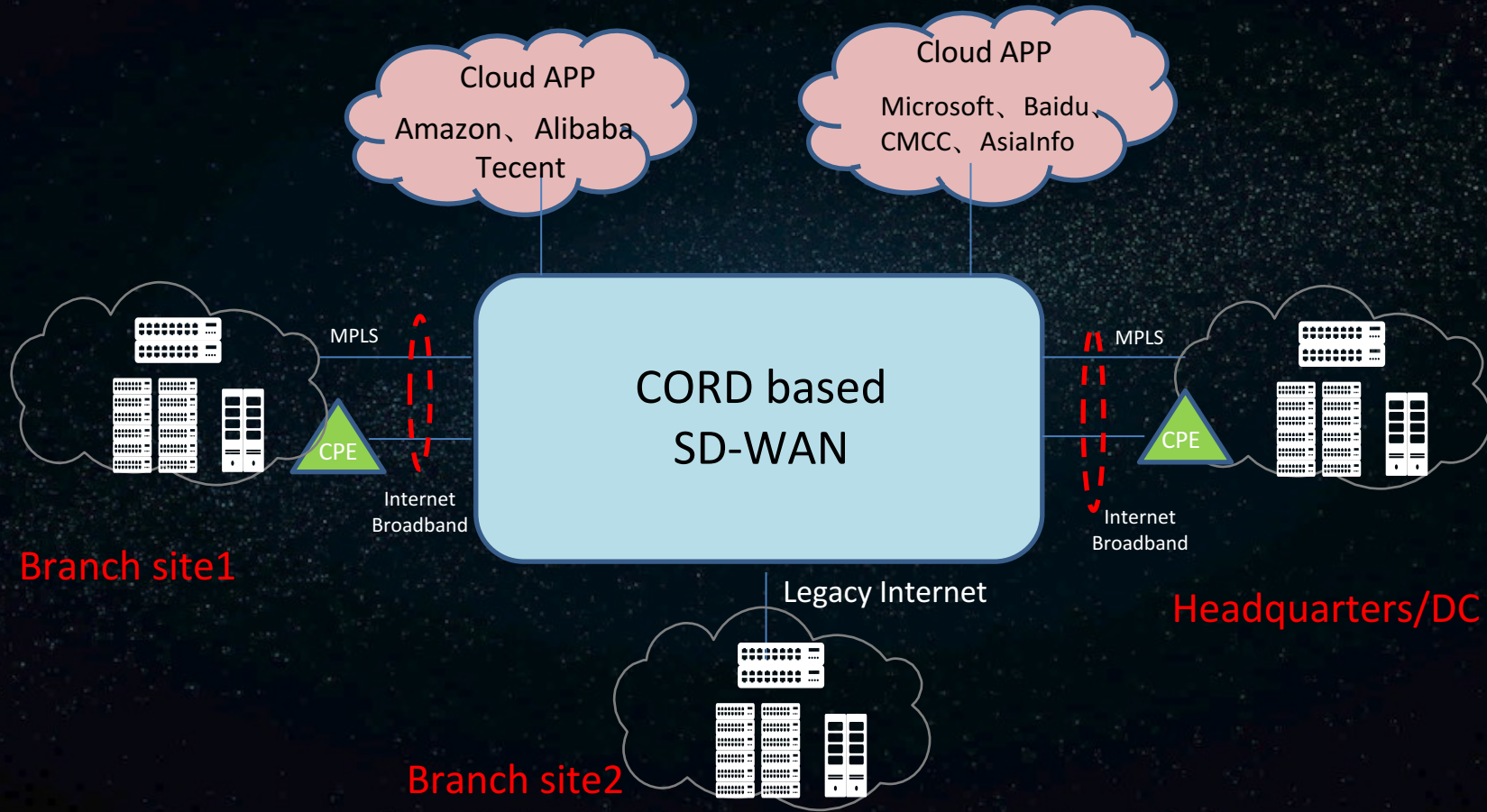
Global XOS



Physical CORD platform setup at CMRI



E-CORD deployment at CMRI-whole view



Current Step-E2E Enterprise service setup in E-CORD platform



- Service features
 - Automatic and fast service deployment
 - Branch VPN connection/L2VPN
 - Dynamic bandwidth allocation at service peak time
 - Multi path bonding and forwarding
 - APP visibility\forwarding\SLA/Qos
 - Personal untrusted apps\trusted cloud app\trusted enterprise dc app
 - Differentiated service forwarding
 - Local packet flow breakout
 - Co-exist E-BoD and legacy branch sites
 - Service Management
 - self-service for customs
 - service management for operators

CMRI contribution to cord deployment together with ONF



- Setup of physical test bed at CMRI
 - 3 pod sites
 - Access devices
- Auto-deployment script customanization for successful local deployment
- Great support form ONF
 - help for Physical cord platform deployment and work shop in Aug. 2017
 - remote support and guidance for deployment and problem debugging

Suggestions on CORD Platform evolution

- Further improve stability and efficiency of building and deployment
 - easy update cord platform without re-deploying from scratch
 - More stable process for PXE booted computer nodes
 - Multiple options for computer node installation: MaaS booted vs. others ways for computer node installation
- Cooperation with other Open Source Community and Standard Organization
 - ONAP 、 OPNFV、 OCP、 OVS....
 - MEF、 BBF、 ONF...
 - Work together with all partner to build the ecosystem

Suggestions on CORD Platform evolution

- The mechanism is different between operator and the Open Source Community
 - Development: per-plan the development plan、slow speed of development
 - Operation: service change at any time 、quickly deployment and adjustment
 - The lab testing vs deployment in real network
- Distribute architecture of head nodes for practical deployment: De-couple among the cord platform infrastructure services
 - XOS cluster
 - Openstack cluster
 - ONOS cluster

Thank You !