China Unicom's perspective on CORD

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Central Office：today and tomorrow

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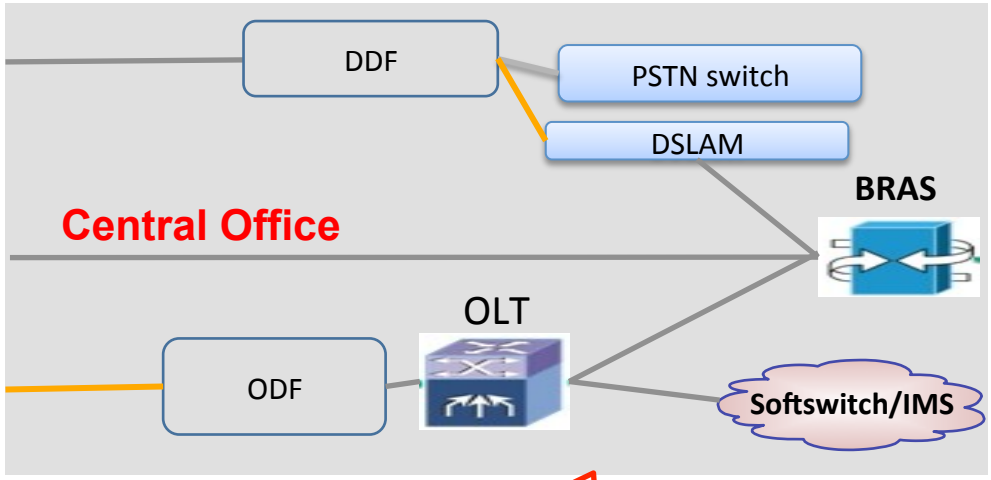
创新·改变世界

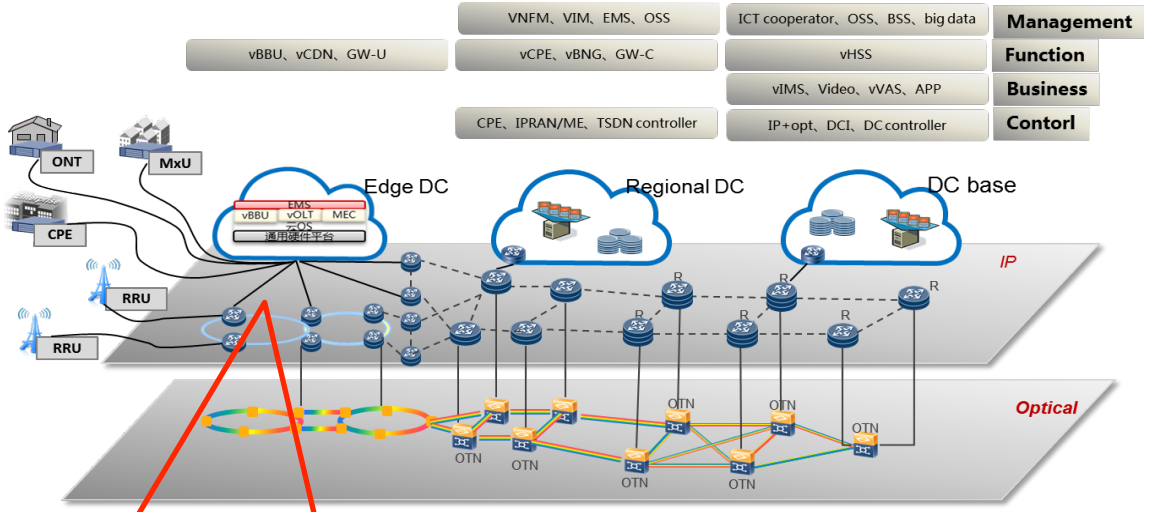
Today: Traditional Network



China Unicom

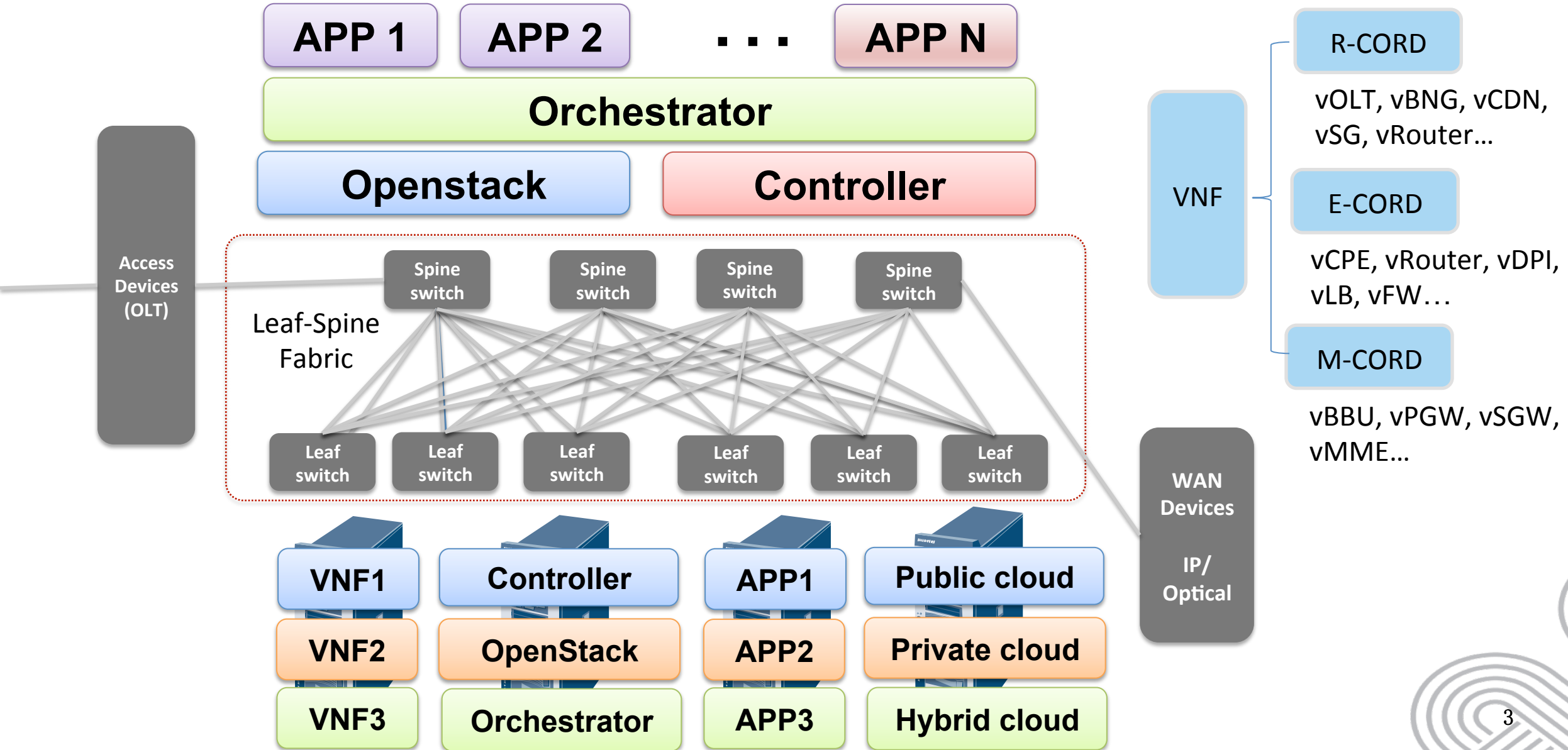
- >2500 COs for PSTN
- With the development of FTTH, all PSTN switches will be out of services

Future: DC-Centric Network on SDN/NFV

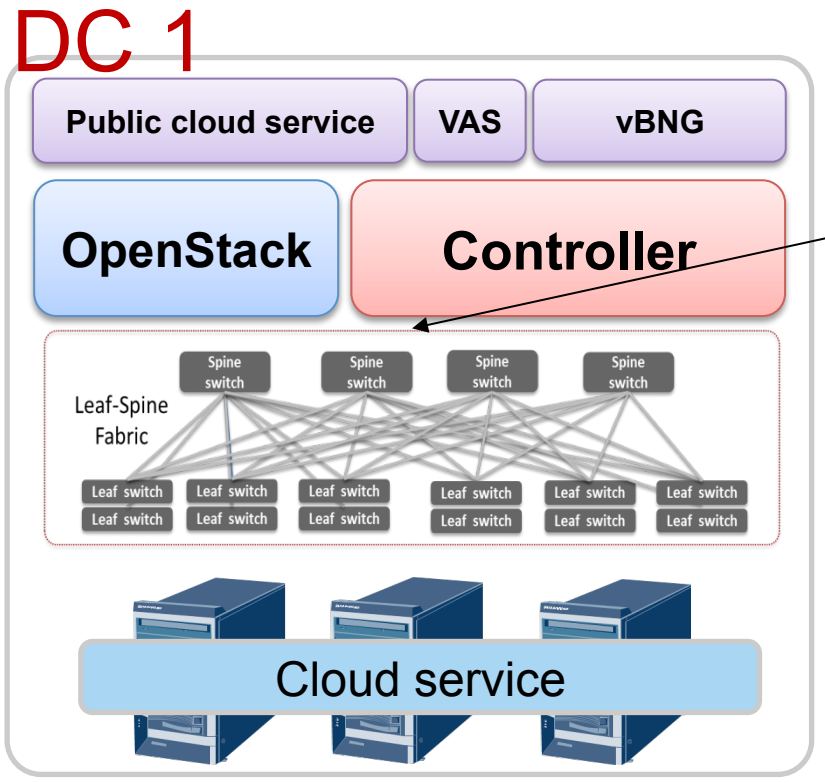


- Some COs reconstructed as edge DCs
- Edge cloud for both telecom NFV and public/ private cloud services

What are in NG-CO (or CORD)?



China Unicom started Central Office re-architecture



VxLAN/ MAN

Applications of today: Public cloud services and private cloud of enterprise customers

DC 3

DC 2

Which CO is suited for re-architected as DC?

- height>3.5M
- Weight bearing>=6KN/M^2
- Size>200m^2
- Enough electric supply
- Good transmission network

Resource pool

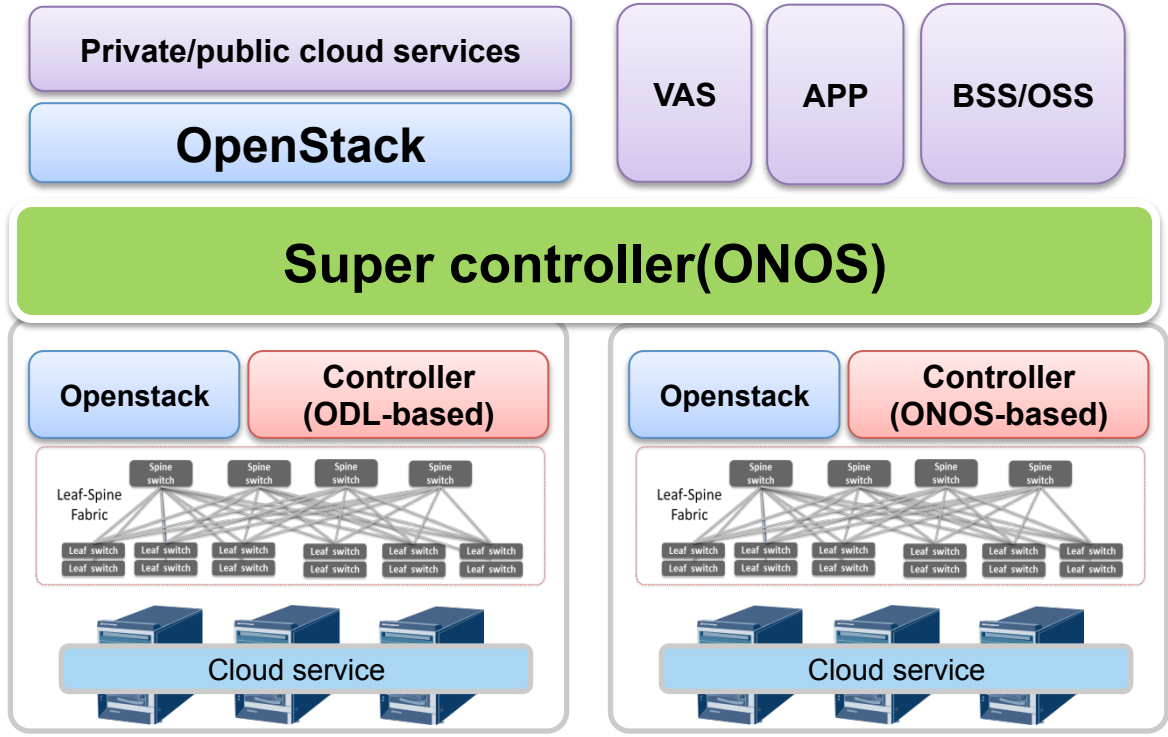
- Using SDN and VxLAN technologies to integrate multiple PSTN COs in the MAN area into one logical resource pool

Our R&D activities: white box and ONOS

White box in DC

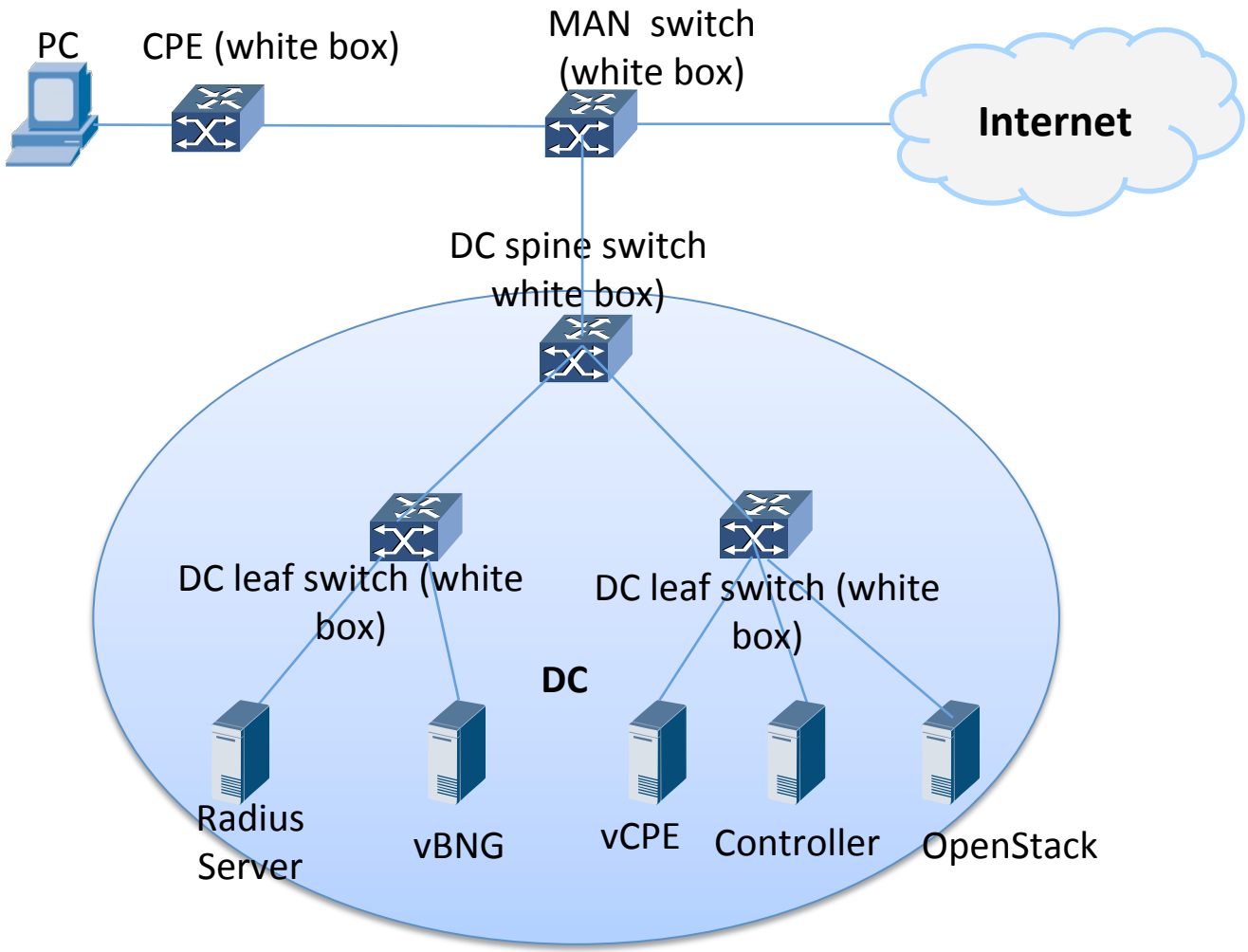
- HW and SW disaggregation
- OpenFlow 1.3
- EVPN & VxLAN
- IPoE
- IPv6
- …

Super controller for multi DCs



- ONOS-based super controller
  - ✓ SB: vendor-specific DC controllers
  - ✓ NB: OpenStack neuron

CORD experiment platform of China Unicom



White box switch

- CPE
- MAN switch
- DC spine/leaf switch

Commodity Server

- OpenStack
- vCPE； radius； vBRAS
- Controller

China Unicom's customers: "C E O"

R-CORD and M-CORD for Consumer Internet:

260million+ mobile users
75million+ FBB

Enterprises

- OA and ICT
- Leased Line
- VPN

E-CORD for Business Internet

Consumers: R+M

- Voice
- MBB+FBB
-

OTT Providers

- IDC
- DCI
- QoS

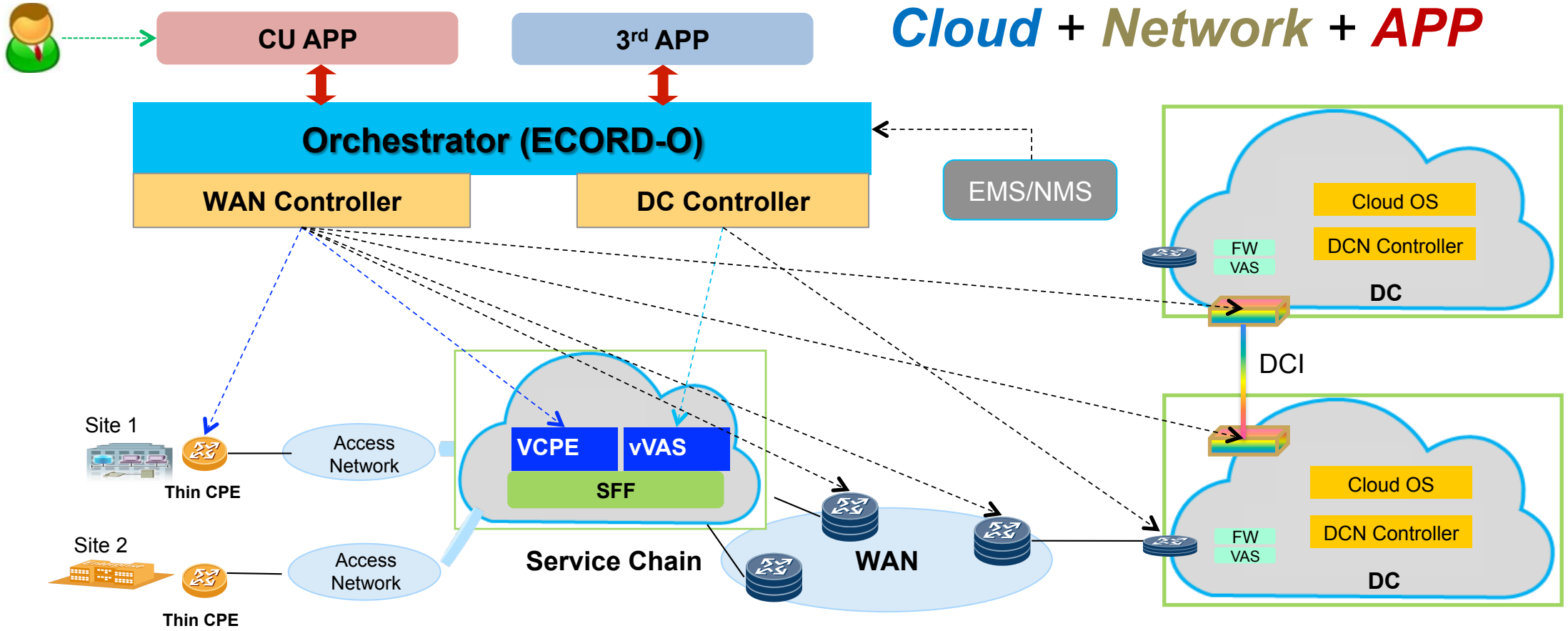
Carrier's Network

Enterprises and OTTs are the focuses of E-CORD projects

Today's requirements of enterprise customers

- Quick response to requirement changes
- Automatic service provisioning
- Self-care, self-control
- Easy to maintenance
- Rapid creation of new services
- Cloud and networking convergence
- Innovative ICT services： security services; video services; cloud service; IoT; ……
- Lower cost
- ……

E-CORD architecture of China Unicom：CORD+WAN



Software：

- Orchestration：ECORD-O
- Network Controller：ONOS
- VNF Manager：VNFM
- vCPE
- vVAS：vFW, vLB
- Platform：Cloud OS

Hardware：

- OTN/WDM/ROADM: SDN Transport
- CE/PE ： SDN Router
- LSW/TOR：SDN Switch
- Server: Commodity Servers

E-CORD use cases

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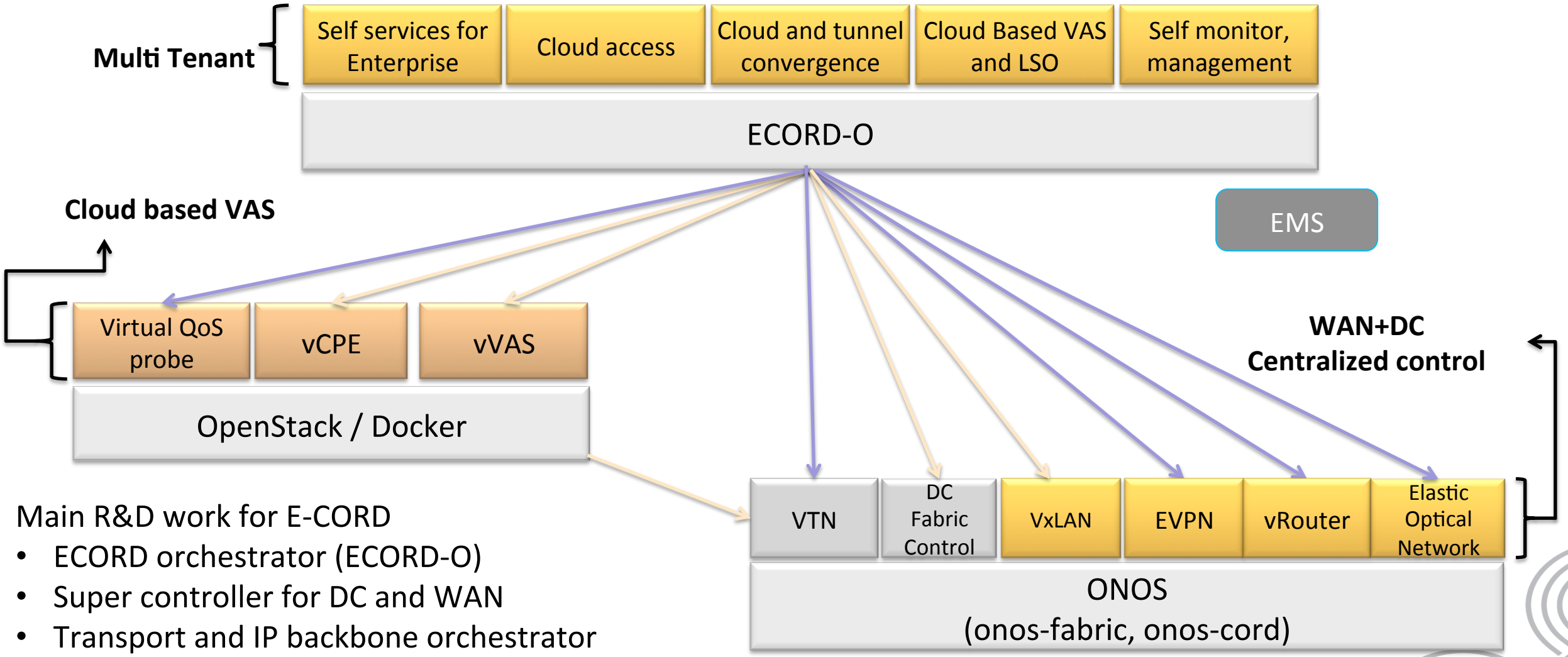
Case1	Case2	Case3	Case4
L2/L3 VPN on demand	Cloud access and Cloud-network integration	Elastic WAN transport for DCI	Virtual Value-added Services provision
 Self services	 Resource pool	 Elastic tunnel	 App on demand
site to site	site to DC	DC to DC	VAS

Virtual Networks as a Service

R&D work for E-CORD in China Unicom

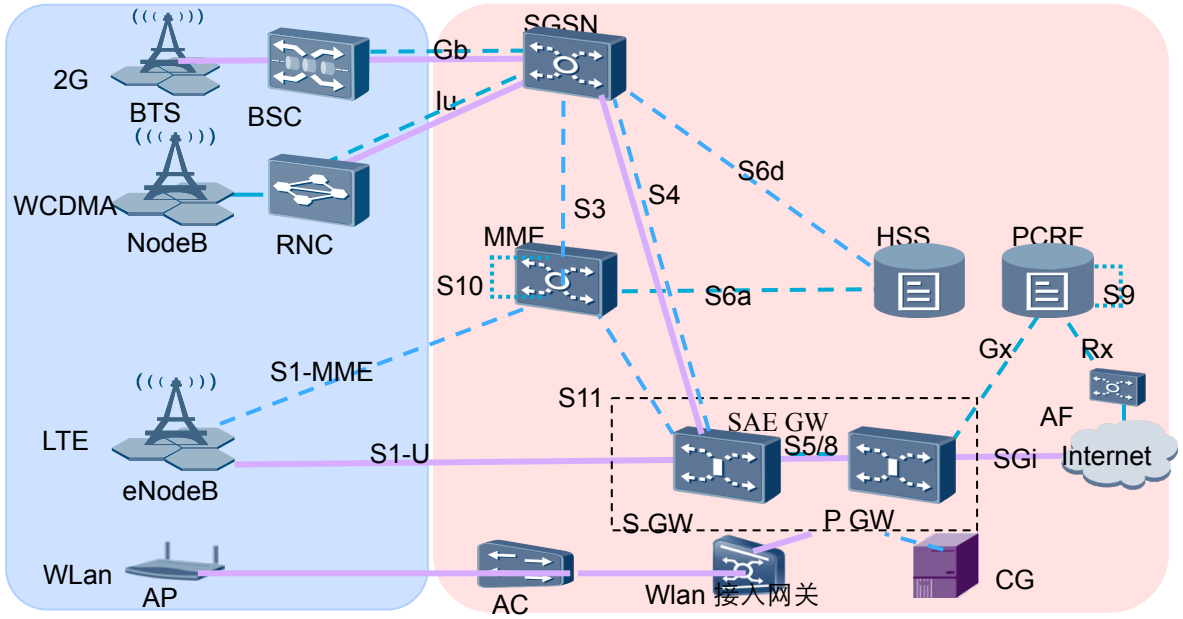


Main R&D work for E-CORD

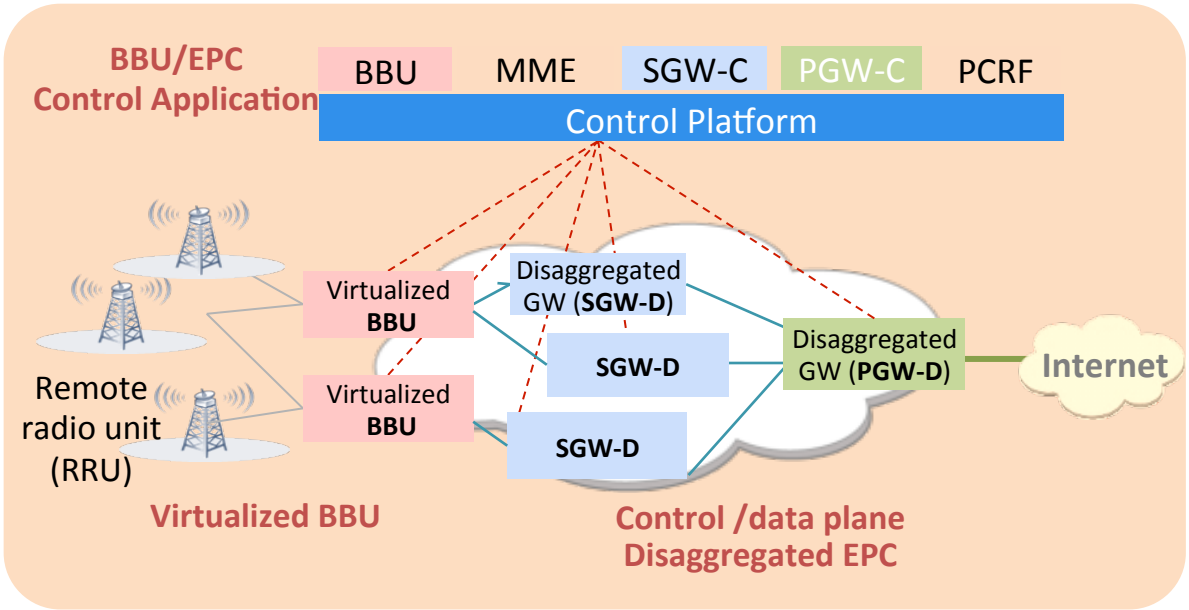
- ECORD orchestrator (ECORD-O)
- Super controller for DC and WAN
- Transport and IP backbone orchestrator
- vCPE for enterprises

M-CORD in China Unicom

Mobile network of today

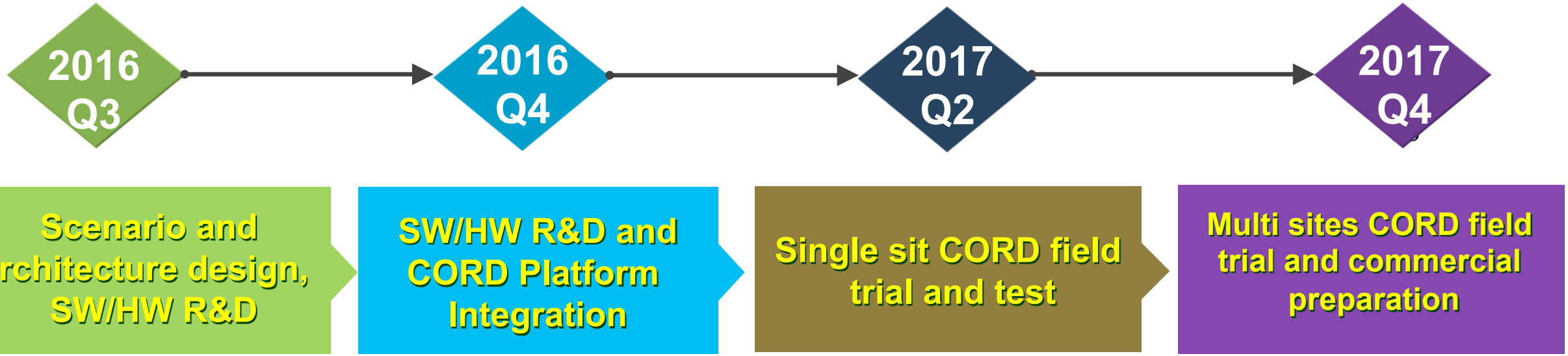


M-CORD for 5G



- CORD platform
- vBBU
- vEPG
- vIMS

Roadmap of China Unicom CORD project



Main challenges for us

Open source SW and white box HW

not yet become commercial products, just for POC

Legacy network and vendor-locked

How to coexist and integrate with vendor-depend legacy network elements

Integration and operation

Lack of integration abilities and operation experience for open source and white box

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Thank You !

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