China Telecom's Demand & Practice in the Lossless DC Network

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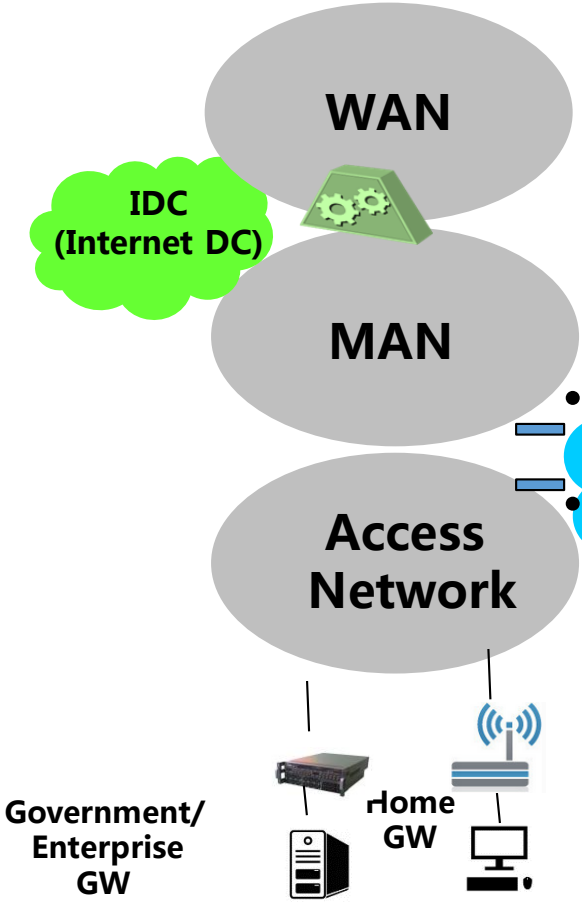
Agenda

- The Trend of the Cloud Network Evolution
- New Central Office – New DC bearing “Virtualized NE”
- China Telecom demands lossless DC Network
  - CT Cloud : improve the link level utilization over the whole network
  - MEC Scenario: enhance the low latency application experience
  - Public Cloud Scenario: Differentiated competitive advantage
- Practice Plan

The Trend of Cloud Network Evolution

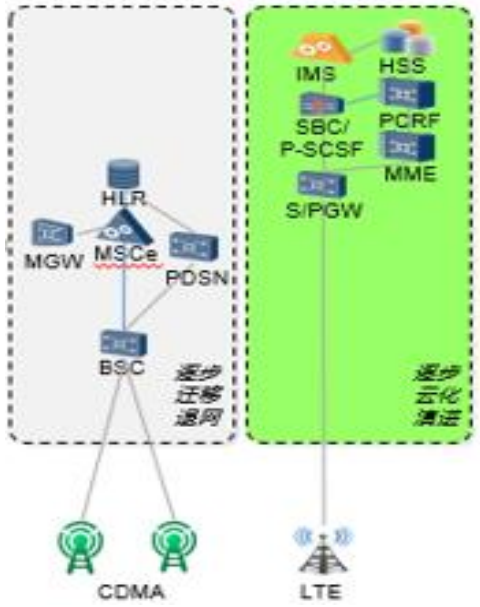
Broad-band Network



- Central Office to DC
- NFV (vBNG、vCDN、vFW、vCPE)

- Terminal customized, business load from the cloud at any time.

Mobile Network



3 Clouds Architecture

Control Cloud
- The control plan of vIMS
- The control plan of CORE network

Forwarding Cloud
- Sink the forwarding plane to improve the end user experience

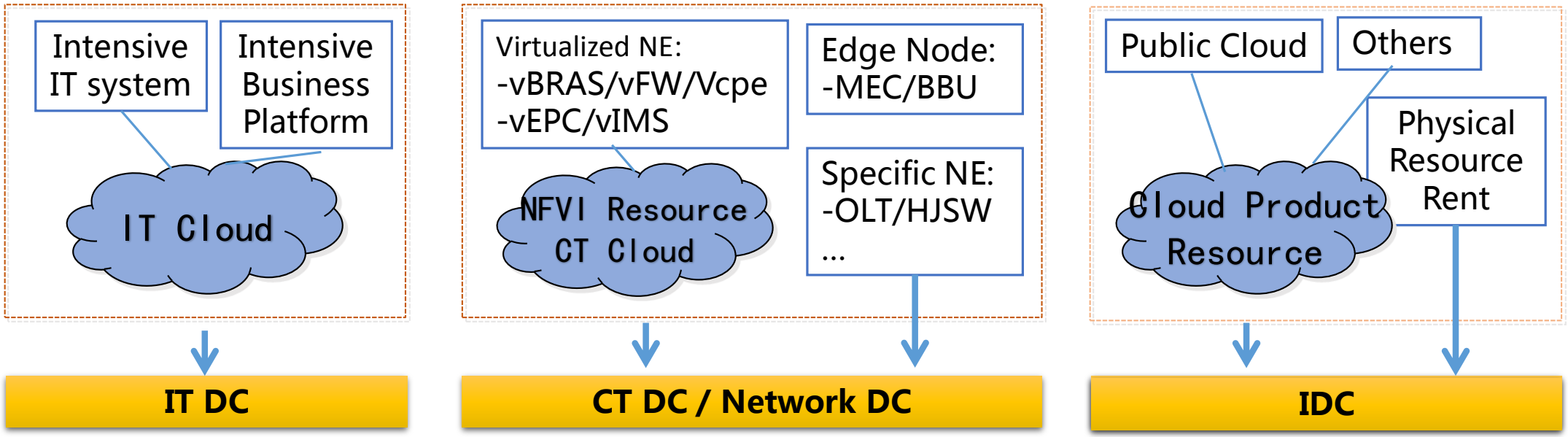
Access Cloud
- Virtualized RAN
- vBBU, MECC

- **5G：**

Direct virtualization deployment, three clouds

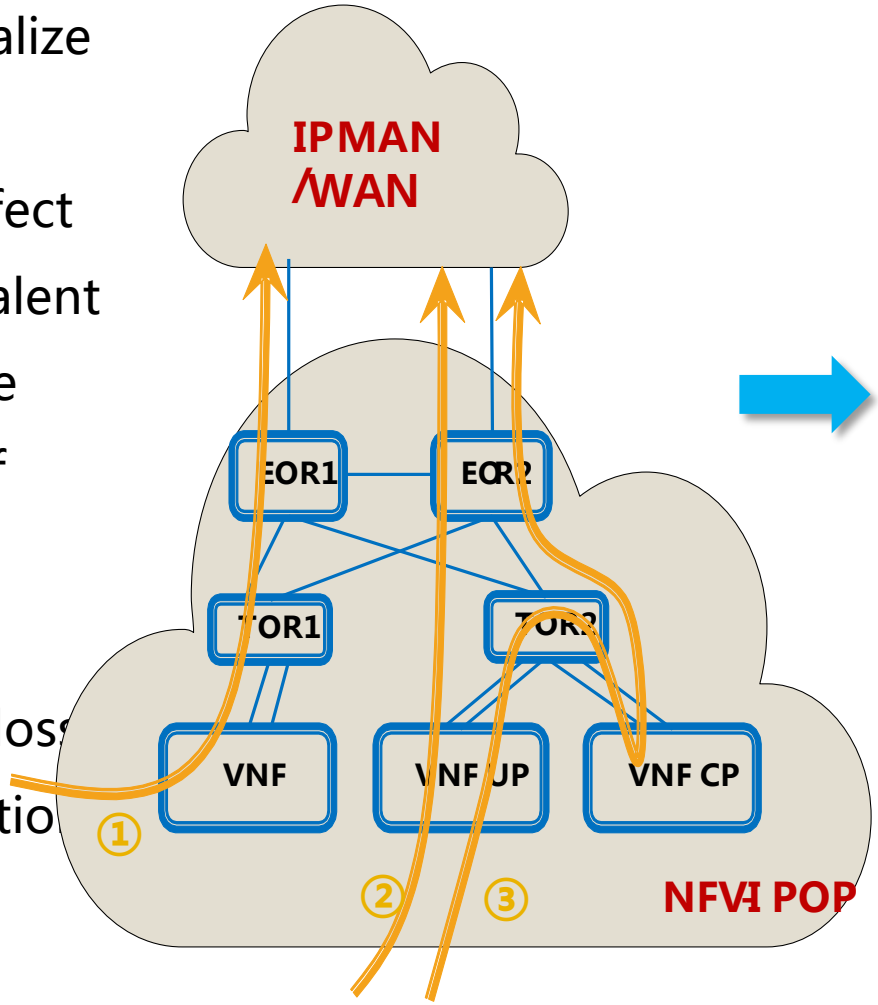
Future CO- New Type DC bearing Virtualized NE

- Operator’ s DC continues to evolve, including **IT DC, CT DC, IDC** and more. Different kinds of cloud resource pool bring new challenges to data center networks.
- Network DC - A new type of network office hosting virtualized network elements and using the dedicated devices.
- Combined with NFV, CORD evolution, start to deploy the NFVI resource pool at COs

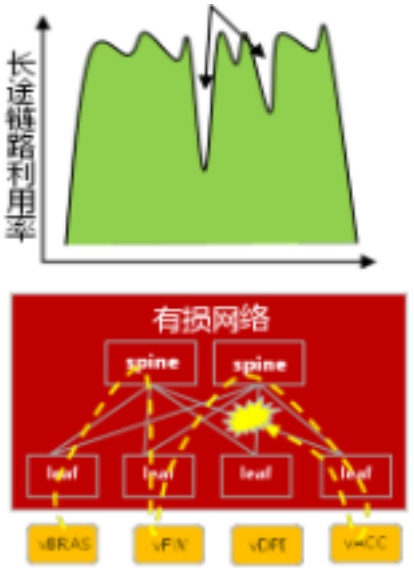


Improve the Link Utilization under CT Cloud Network Scenario

- NFV realize Cloud Network. CT cloud realize the flexibility of the service deployment
- Latency and packet loss will seriously affect the performance of CT cloud. It is equivalent to the packet loss within an intermediate node in WAN, reducing the utilization of long-distance links.
- **The lossless DCN technologies** can effectively eliminate the latency, packet loss on the cloud network, ensure the utilization of long-distance links and support the flexibility of the business.



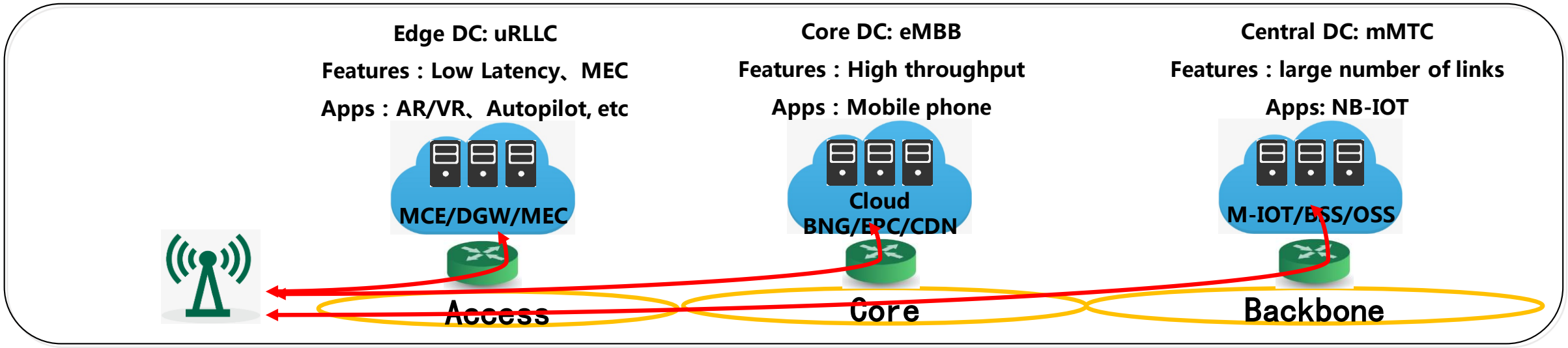
The degradation of NFVI network performance will lead to the reduction of long-distance link utilization



Packet loss, latency will seriously affect the NFVI network performance.

Improve the Low Latency Experience under MEC Scenario

	MEC(Mobile Edge Computing)
Type of Service	Provide deployment capabilities at the edge of the mobile network
Hardware	Limited capabilities of computing, storage and network.
Deployment	Distributed or small area deployment. Physical location (or transport) close to the end users
Environment	Outdoor(street, park) or indoor (shopping mall, stadium, etc.)



■Lossless DCN technologies effectively improve network quality and enhance application experience.

Competitive advantage under Public Cloud Scenario

E-surfing Cloud possess Competitive Advantage in different services

- E-surfing Hybrid Cloud services would provide security and reliable telecom services for government and enterprise customers, such as VDC, cloud disaster recovery services, dedicated line link services, CDN services, domain services, cloud storage service and other high quality services.

IDC "2+31+X"

- 2 Group Campus DC
- 31 Province Star DC
- X DC covering different cities and close to the customers
- More than 400 DC, 230,000 racks, emphases on 2 Group Campus DC (Guizhou, Inner Mongolia)

Requirements for the Public Cloud

- High throughput
- Low latency
- Low/No packet loss

天翼 surfing

PoC(Proof Of Concept) and Standardization Plan

- Select 1 or 2 scenarios to verify the business performance. For example: Central Office, MEC(Edge DC)
- PoC test based on the Lossless DCN technologies:
  - ✓ Architecture Design: network topology，NE functions, protocol, etc
  - ✓ Technical point verification in the CT Lab.
    - Congestion/Flow Control: ECN, PFC, Congestion Isolation, etc.
    - Load Balancing: with finer granularity. Flow -> Flowlet->Packet ; such as Packet Spraying
    - E2E Credit Based Flow Control
    - Other Future Data Center Network technologies from the industry.
  - ✓ Cooperate with 1 or 2 test beds with commercial traffic
- Standard contribution in IEEE, IETF, CCSA, etc.

Thank You