

5G MEC Practice and Future Plan of China Unicom

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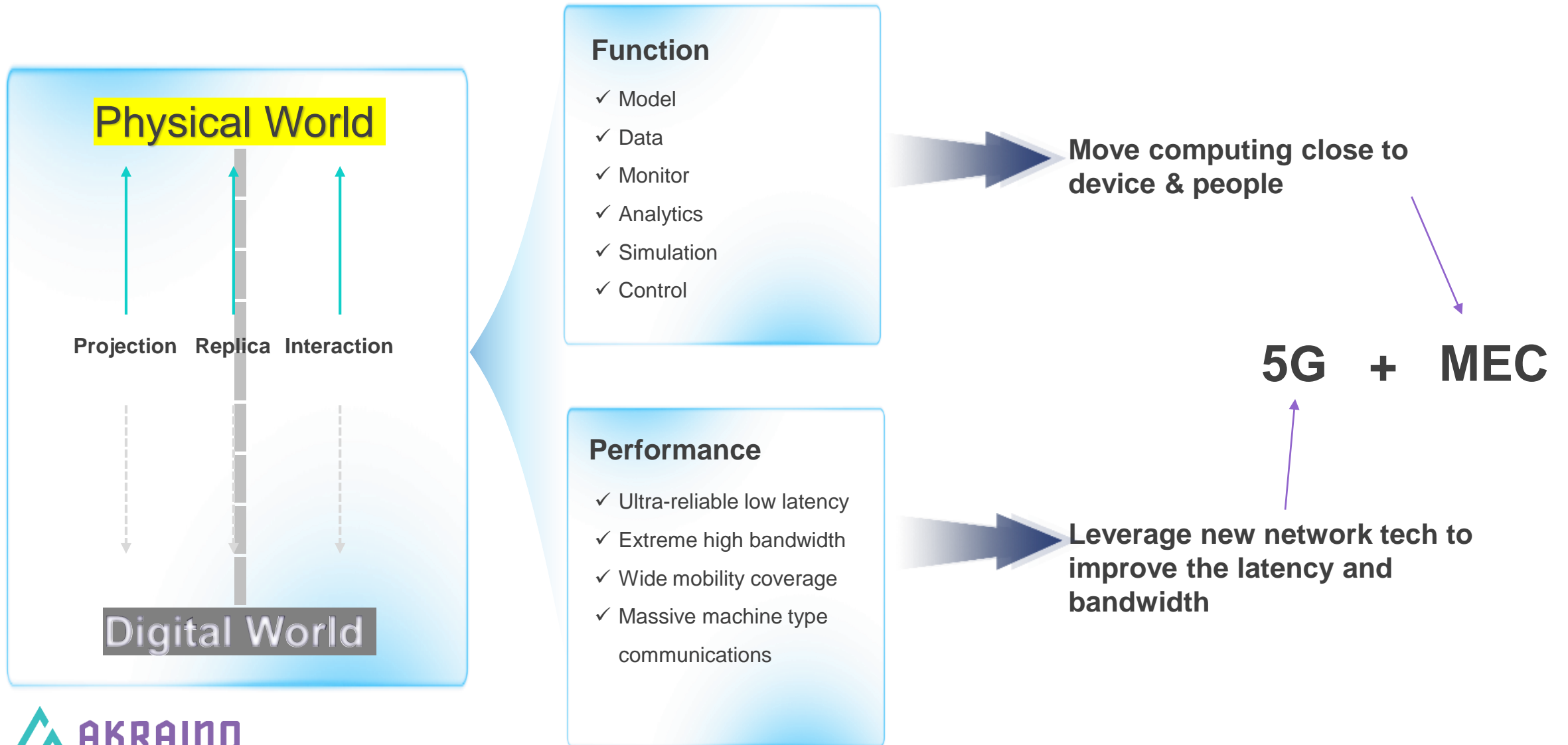


Agenda

- › 5G MEC Value Proposition
- › China Unicom's Practice on MEC
- › Future Plan for MEC

5G + MEC Value proposition

- Leverage the new network tech and move computing/function closer to business



Challenges and Gaps

- Architecture transformation : from “Cloud-End” to “Cloud-Edge-End”

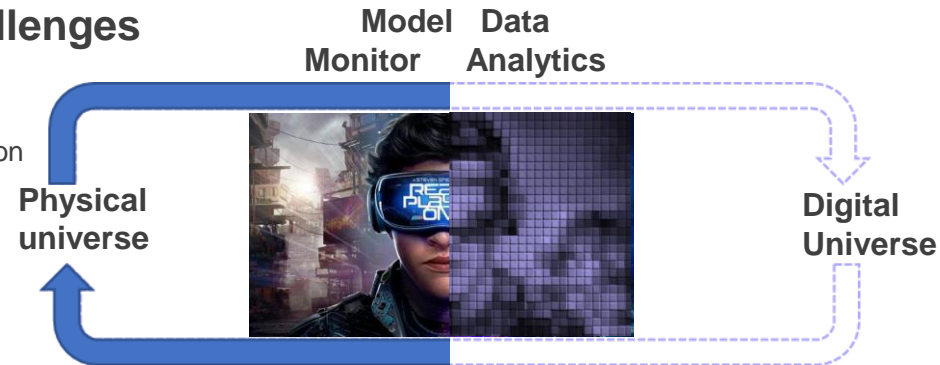


- Virtual body interaction: virtual reality, industrial control, remote driving, etc
- Challenges: extreme bandwidth, extremely low latency and mobility challenges
- Architecture evolution: transformation from "end + cloud" architecture to "end + 5G + edge + cloud" Architecture
- Technical realization: digital human, AI, micro display (near eye display), VR \ AR, dynamic capture, 5G, MEC , etc

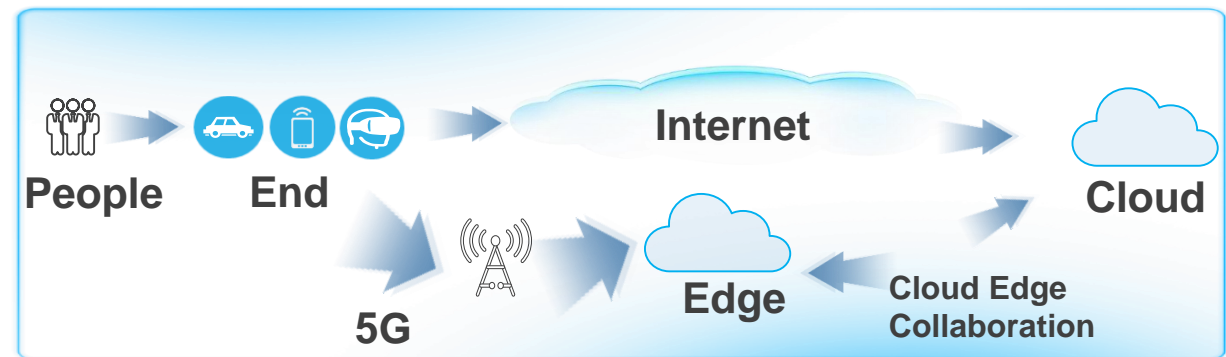


New challenges

Maximum Data Transmission
Low Latency Interaction
Wide Spatial Coverage



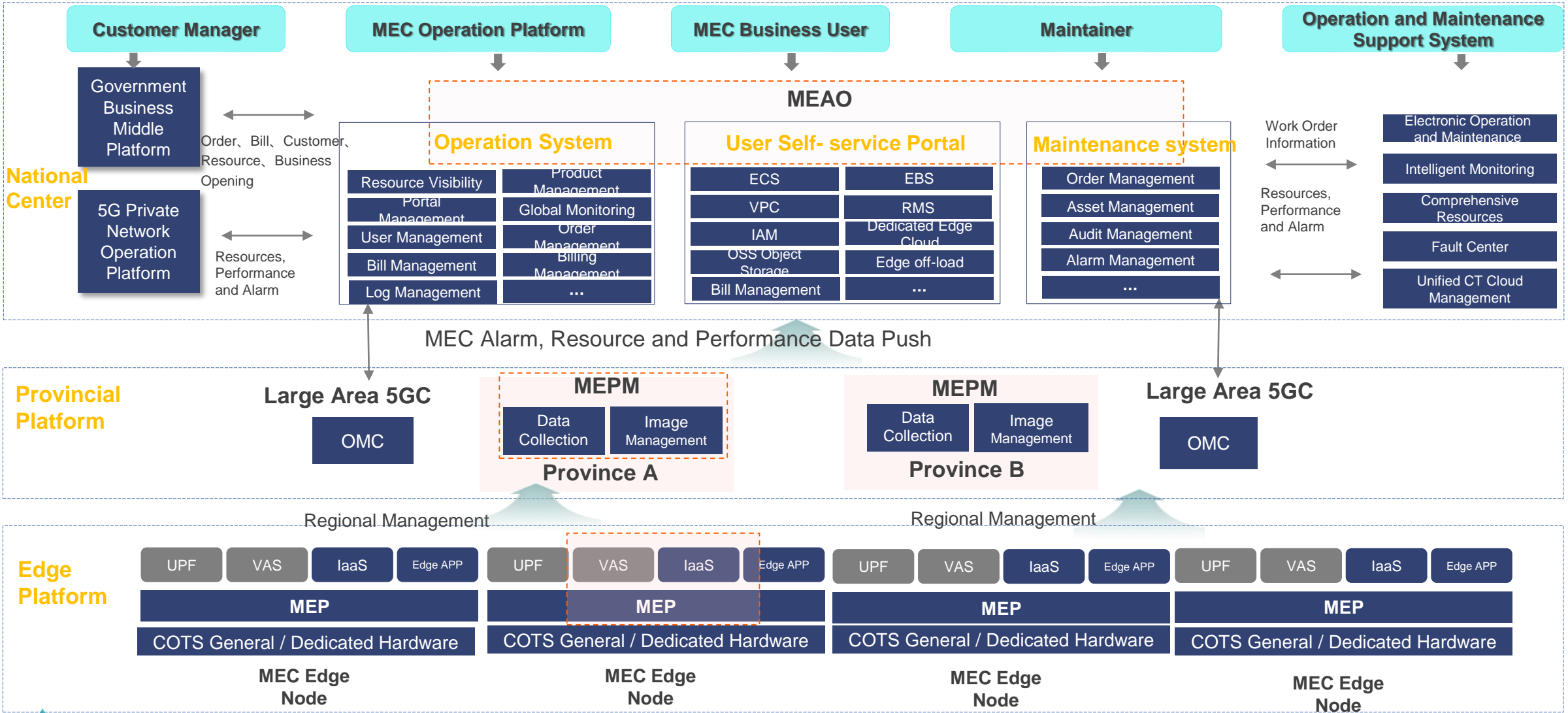
New Architecture



Agenda

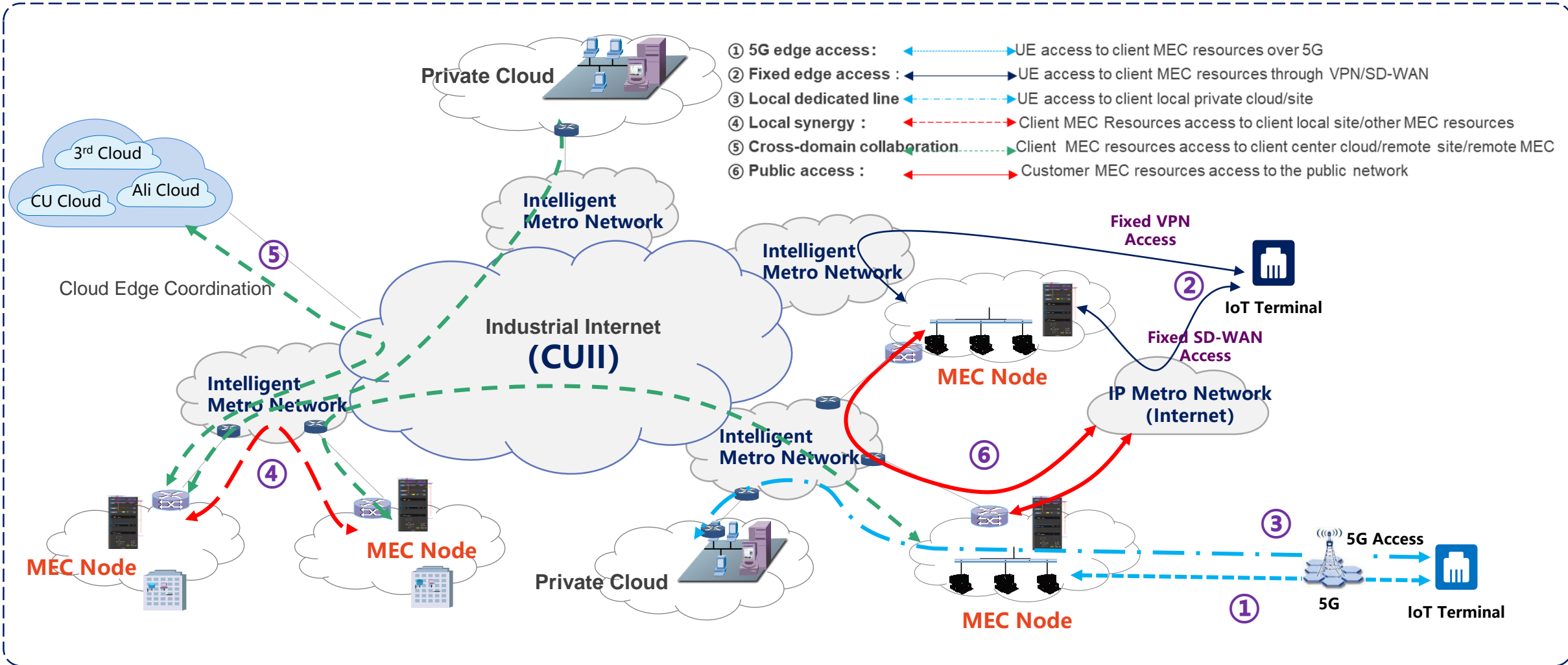
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MEC Platform Design of China Unicom



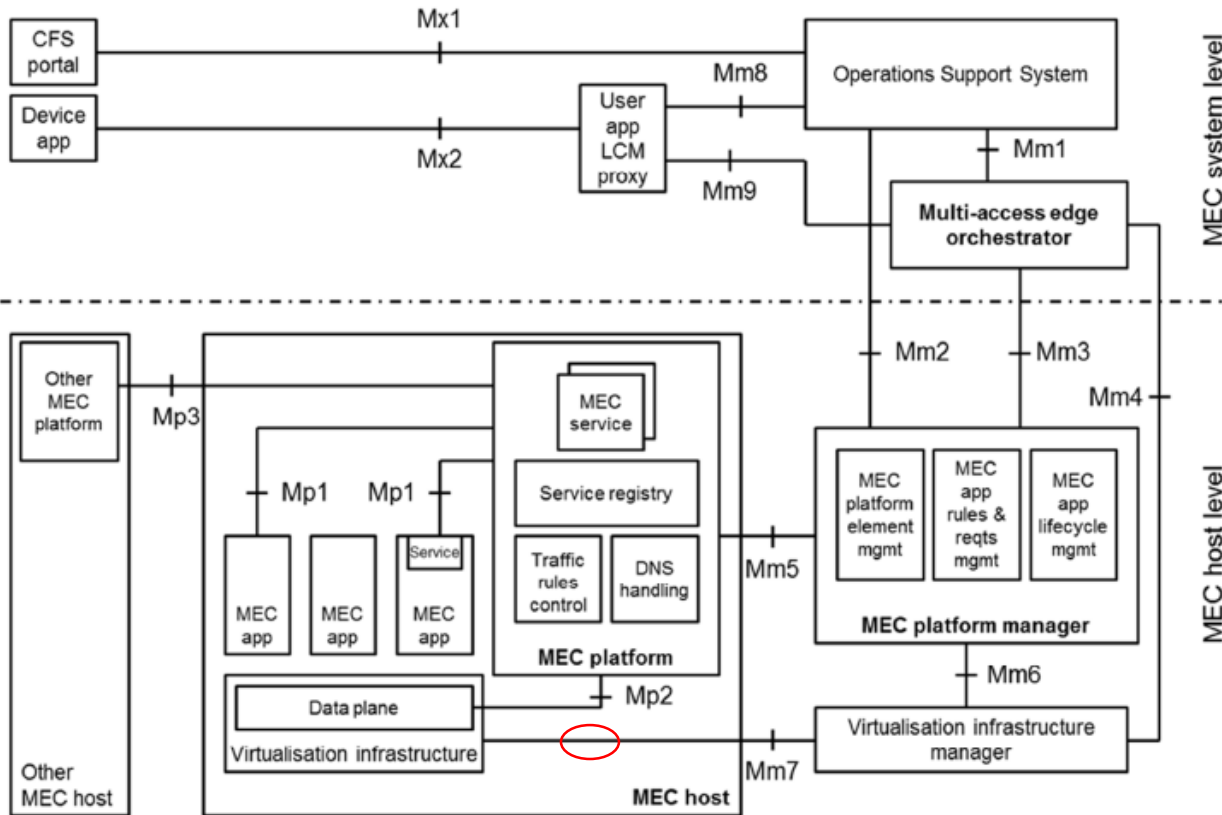
Maximizing the Value of Operator's Network

- Edge-Centric Networking



Maximizing the Value of Operator's Network

- Mp2 Interface



The Mp2 Reference Point

between the MEC platform and the data plane of the virtualization infrastructure, is used to inform the data plane how to route traffic among applications , networks, services, etc.

➤ Commercially Available Features

- Indication for IP + Port based traffic offload
- Indication for DNS based data traffic offload
- Bandwidth management at application level /session level
- Others, UE Black and white list, etc. (Under Development)

Cross-Region Edge Orchestration Case: Ferro Tech

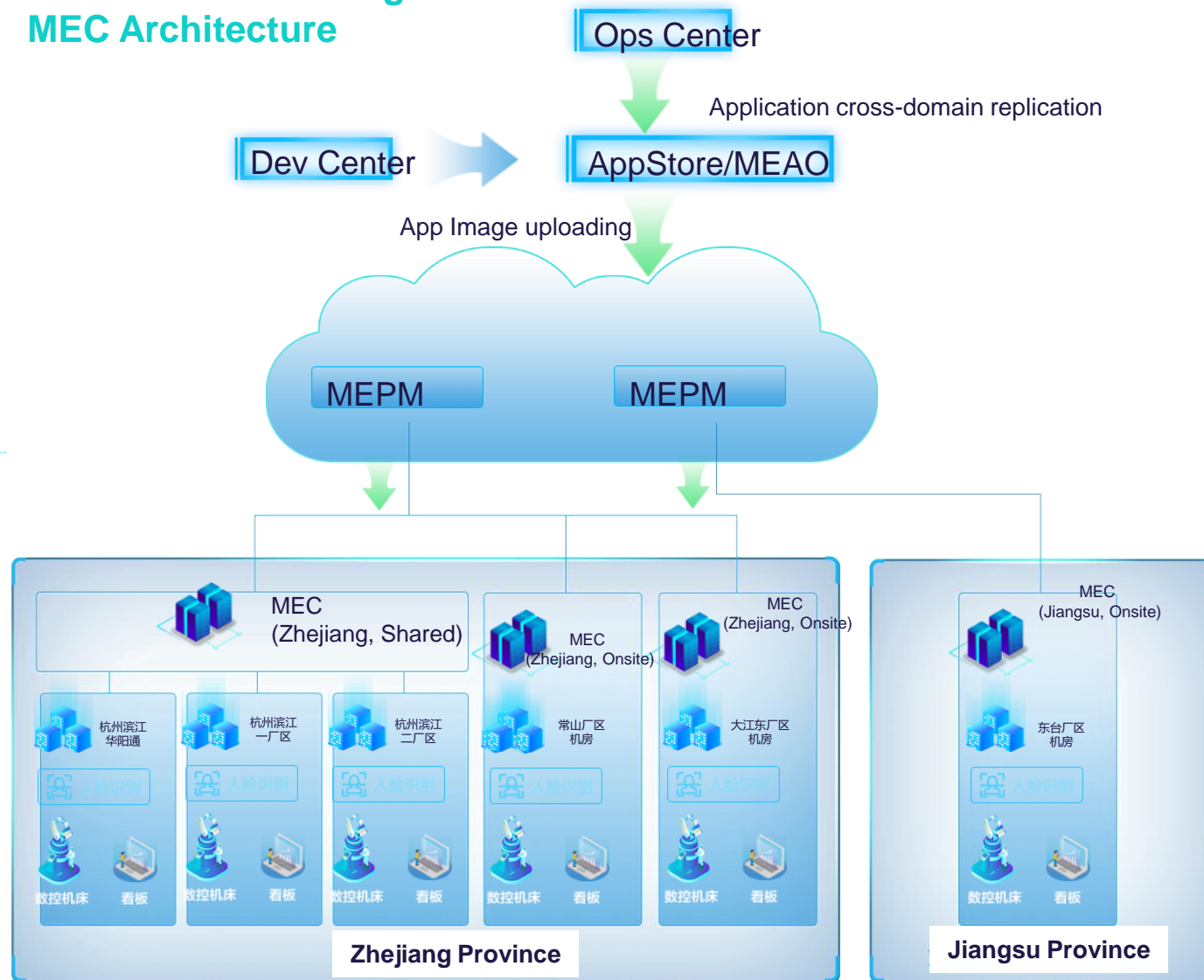
Cross-Region Demand

- Most leading industry companies have multi-region factories or branches
- How to manage cross-region edge resource

China Unicom MEC Solution

- Linking MEC sites with China Unicom virtual DL for on-site edge-2-edge connection
- Provide a central Ops portal to users for monitoring and management in a self service way.

FerroTech Cross-Region MEC Architecture



Smart Coal Mining Case: PangPangTa Coal Mining



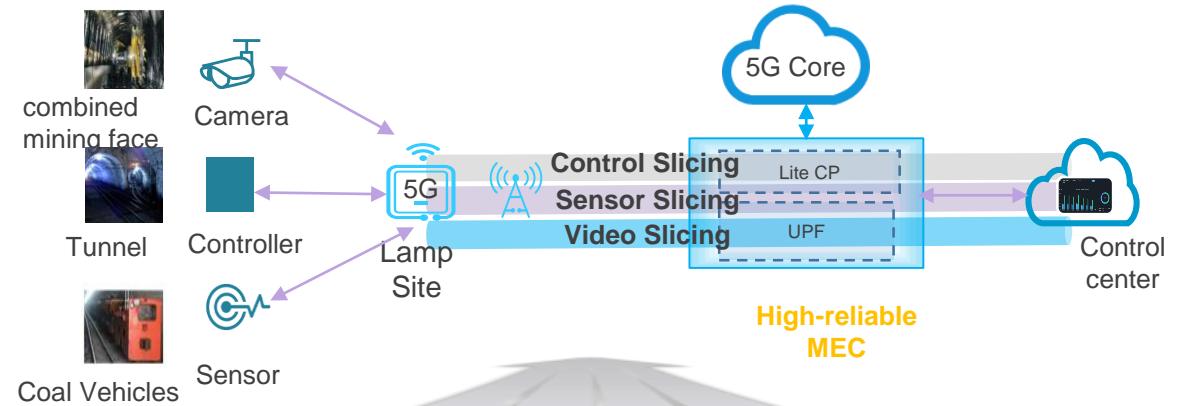
Unmanned surface remote digger



Underground staff monitoring



Underground sensing equipment connection



Application	Scenario	Network Requirement
Control system	The coal mining surface coal machine is controlled remotely and centrally	Latency<50ms Reliability>99.999%
coal mining Sensor	Underground environment and machine operation monitoring	>5000+ Devices
HD video streaming	Work surface, digging surface, transport reprint point, distribution video	Upstream bandwidth>1.6Gbps

- Dedicated wireless + Dedicated MEC
- MEC local traffic redirection
- Edge MEP + Vertical applications
- Network Slicing for isolation

Reliable Network

Lossless transmission

Low latency

Board bandwidth

Data Security

Explosion-proof BBU/HUB/PRRU



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The Evolution Stages of China Unicom's MEC in the Future

- Edge-Native Ecosystem & Keep Exploration in a New Area W/O Reference



(2019) Standard Compliance

- 3GPP
- ETSI

Key Difference

- 5G network edge traffic
- Edge Computing Pool

Gaps

- Copy UX from cloud
- Central Ops v.s Extremely distributed resource
- Security for 5G network protection



(2020) Beyond Standard

- Optimize Arch beyond standard
- Self-Service for 5G edge capability with security ;World's first case in Mp2 enabling
- Centralized Ops for extremely distributed edge sites

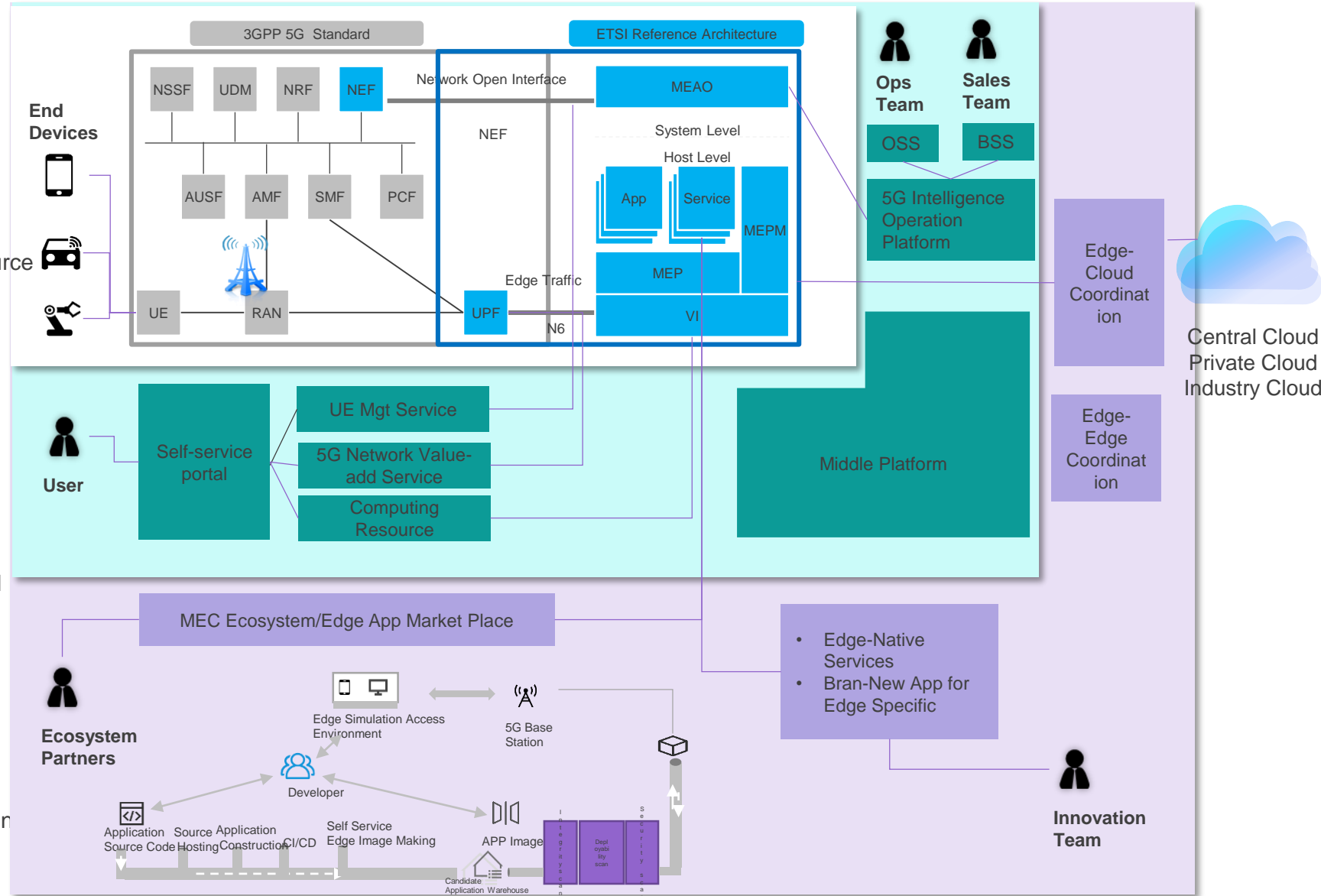
Gaps

- Ecosystem: migration from existing vertical
- Bran-new features for vertical
- Cloud-Edge coordination



(2021~) Edge-Native service & Ecosystem

- MEC Ecosystem
- Cloud-Edge Coordination
- Edge-Native features:
 - 1) Data-fabric for auto drive data roaming
 - 2) Coal Mining underground MEC



Future Plan on Edge Computing Products of China Unicom

Dedicated MEC Products

Shared MEC Products

MEC Value Added Application Products

1. General Edge all-in-one EdgePod

2. Industrial Edge Integrated EdgePod-1

3. Shared Edge Computing Products

4. Video Edge Computing Products

5.V2X (Future) Edge Computing Products

6. Edge Cloud NAS

7. Edge Gateway CDN

Provide "plug and play integration" services for customers in hospitals, ports and mines

provide low delay, high reliability and stable services
To industrial use cases, such as remote control, collaborative AGV.

Provide multi-tenant shared edge services for customers of government departments, enterprises and institutions

Focus on edge video processing scenarios and services
PaaS, such as rendering, acceleration.

It is oriented to wide area vehicle road cooperation and meets the requirements of low delay and cross node agile switching of edge services

The edge node is linked with the home gateway system to provide near source digital storage services for home scenarios

Provide CDN services based on layout edge nodes and home gateway resources

Fixed Access

Edge Native

Cloud

Computer Service

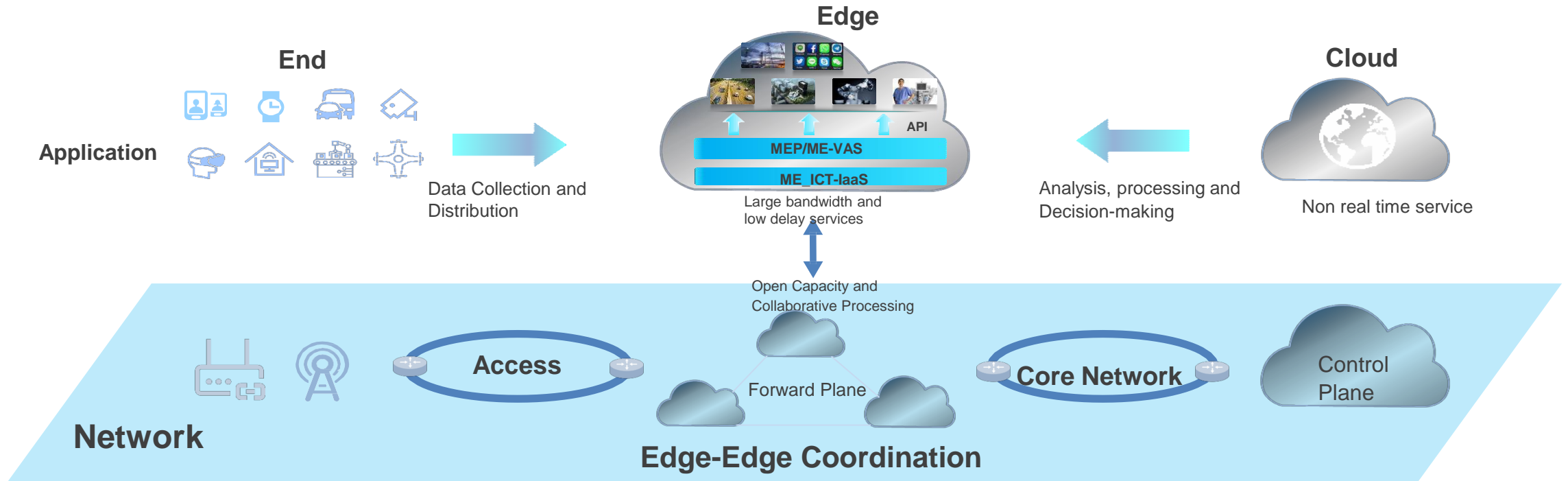
Network Service Enhancement

Automatic Opening of Intensive Management

User Self- service

Future Plan for the Edge Computing Network

- Architecture transformation : “Cloud-Network-Edge-End-Application” Coordination



- **Edge Native Platform:** The platform will support heterogeneous computing, be cloud-native and support distributed applications.
- **Virtualization of Network Function:** Network function virtualization will be supported based on the ME ICT IaaS and provide programmable API to edge application developers for network capability exposure.
- **Ubiquitous Edge Node Resources:** Flexible scheduling to achieve continuous service consistency for users, such as quick application and network migration for moving users.

Thank you.

