

ONIC2019

タイトル調整中 ← 大規模NFV基盤の事例紹介

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クラウドR&D課

→HW～OpenStackまでやっています

→これからコンテナ基盤やります



Agenda

Rakuten Mobile: Network Overview

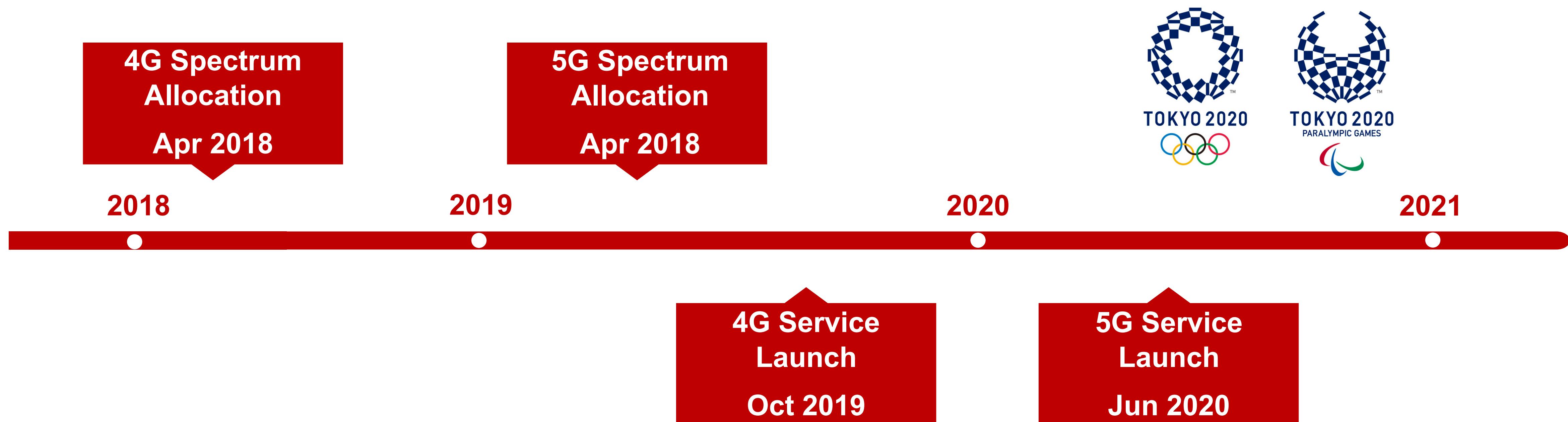
Virtualized RAN (vRAN)

Centralized & Regional DC (CDC, RDC)

Compute Node Setup

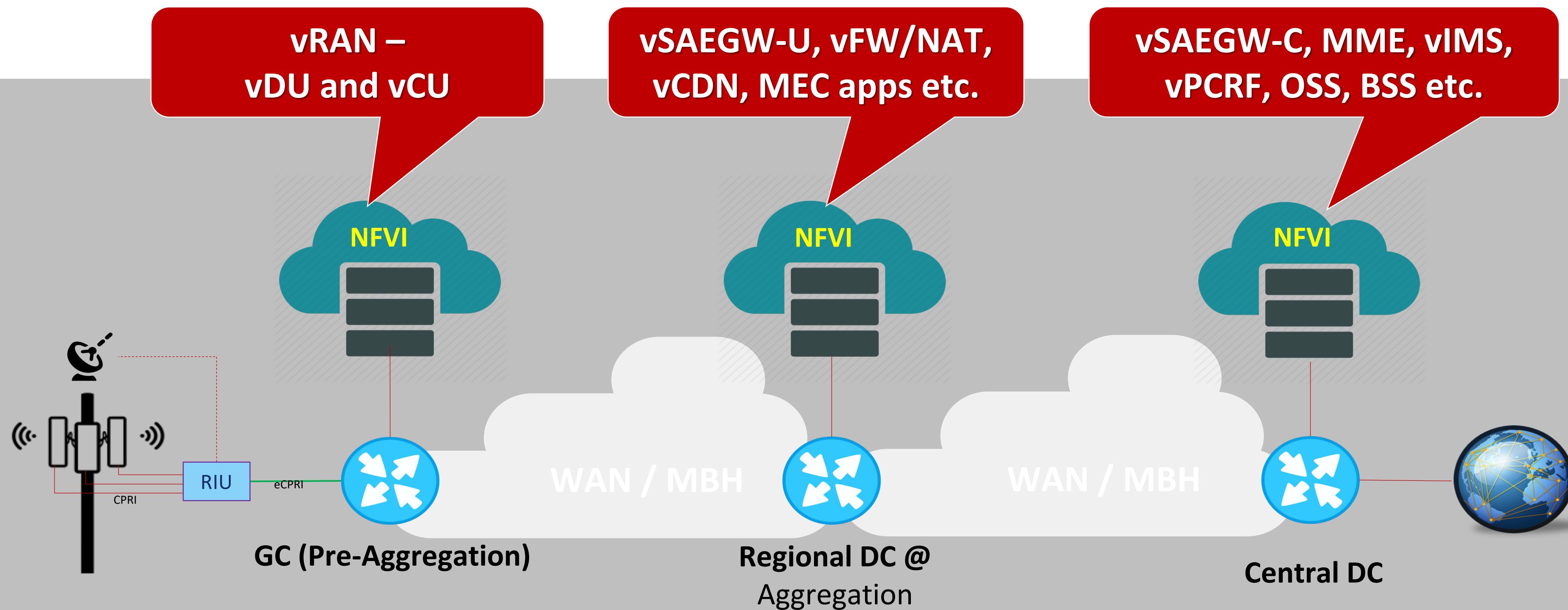
Automation

Rakuten 4G/5G Timeline



Distributed Telco Cloud

Spanning Across 1000s of Locations. Enabled by Rakuten Cloud Platform & Cisco VIM, NSO & ESC

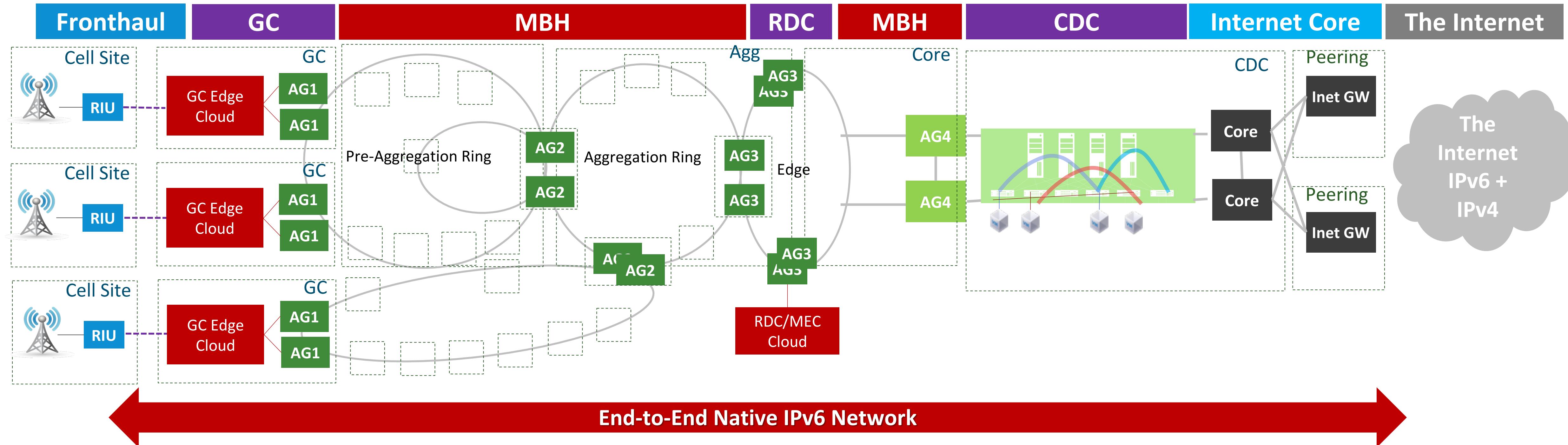


Optimized for smallest
footprint and Performance

Optimized for Application
Flexibility

Optimized for Capacity and
Scale

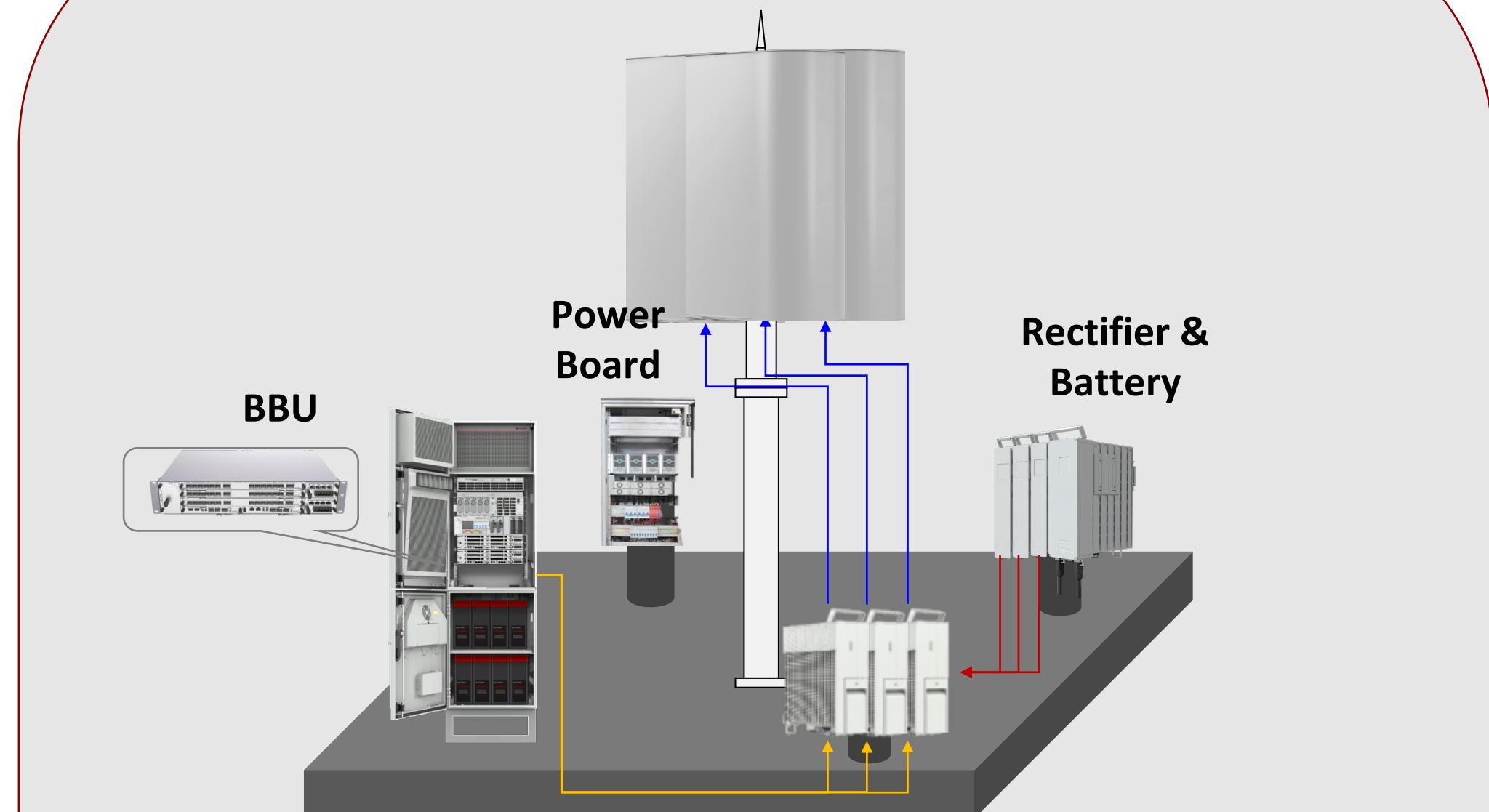
IPv6 Transport/Backhaul Network



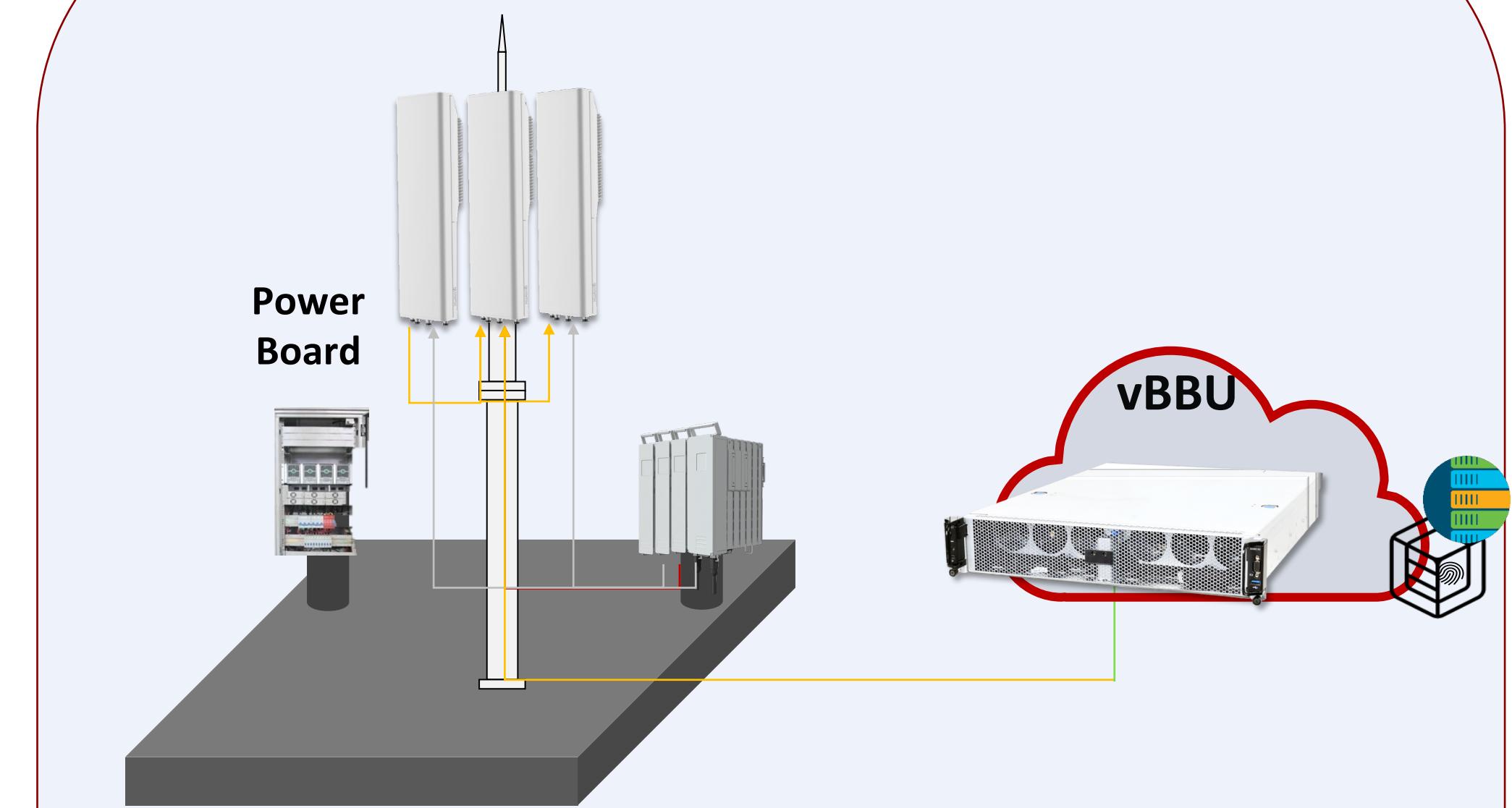
- Software defined, programmable WAN, native IPv6 networking
- Built for 5G with up to 400Gbps of bandwidth of Pre-Agg (GC) locations (vs. traditional 1G/10G)
- Terabits of Capacity in the Mobile Backhaul Core Network
- Scale with IPv6 to support zillions of connected devices

Compact cell site

Traditional Site Deployment

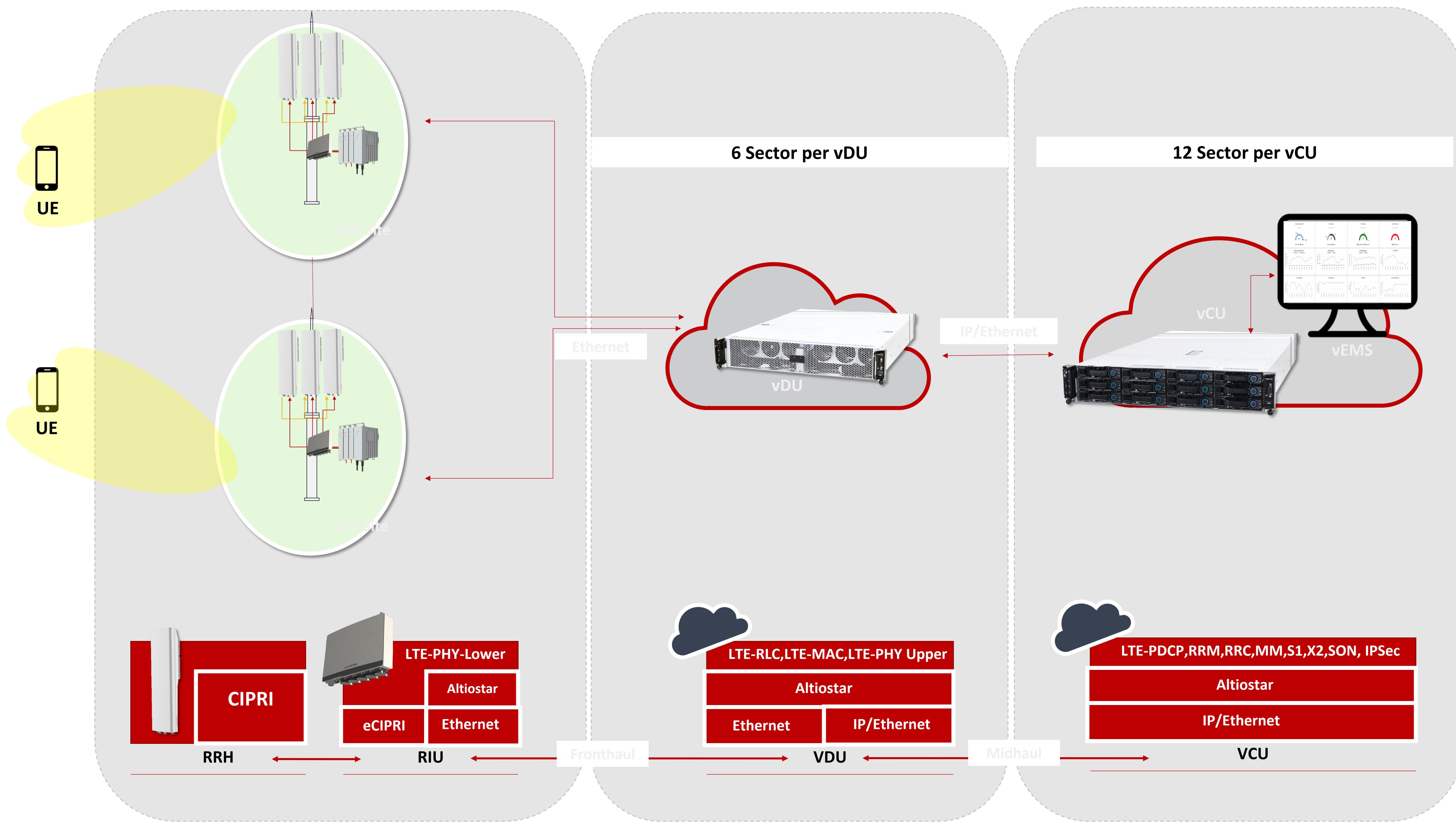


Rakuten Simplified Site Deployment



vs

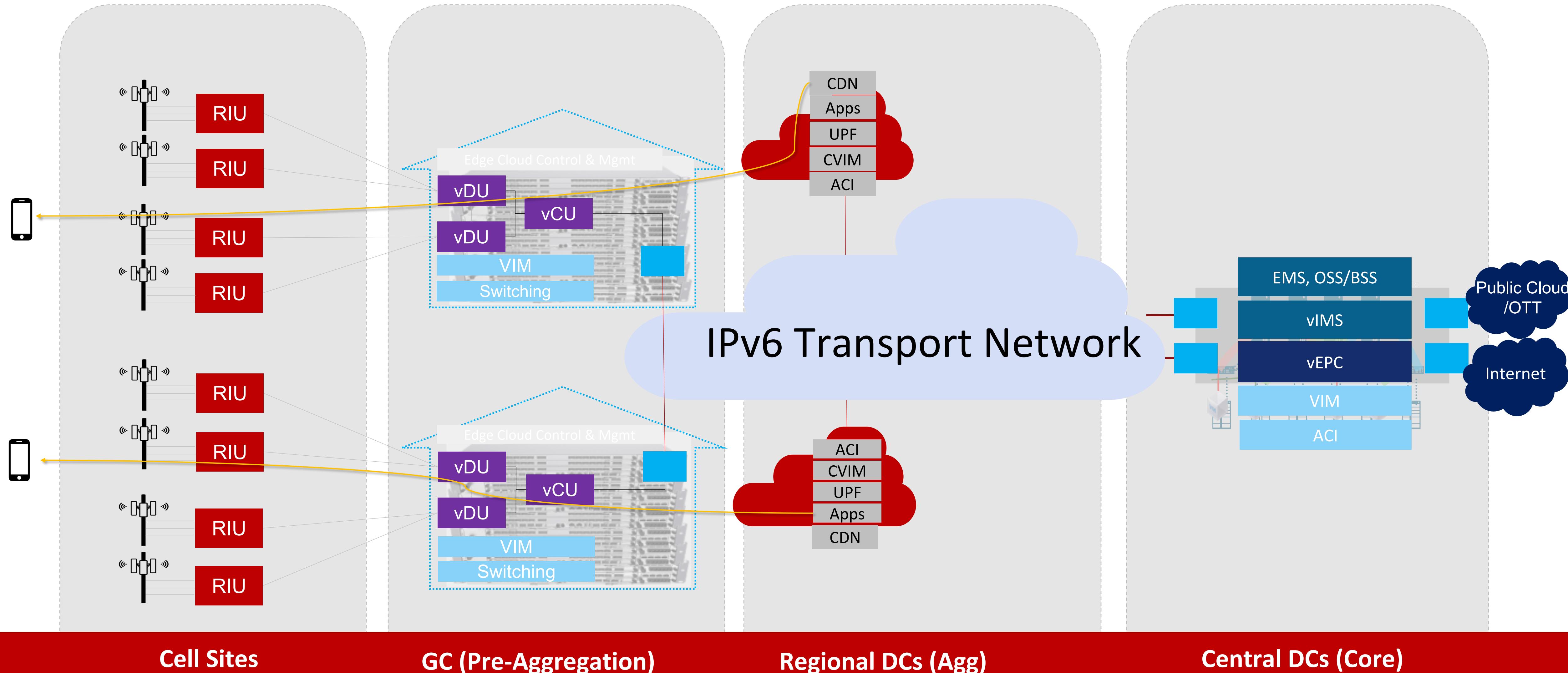
vRAN Architecture





https://news.mynavi.jp/photo/article/20190801-rakuten_optimism_2019_2/images/0021.jpg

Open, Disaggregated and Virtualized RAN

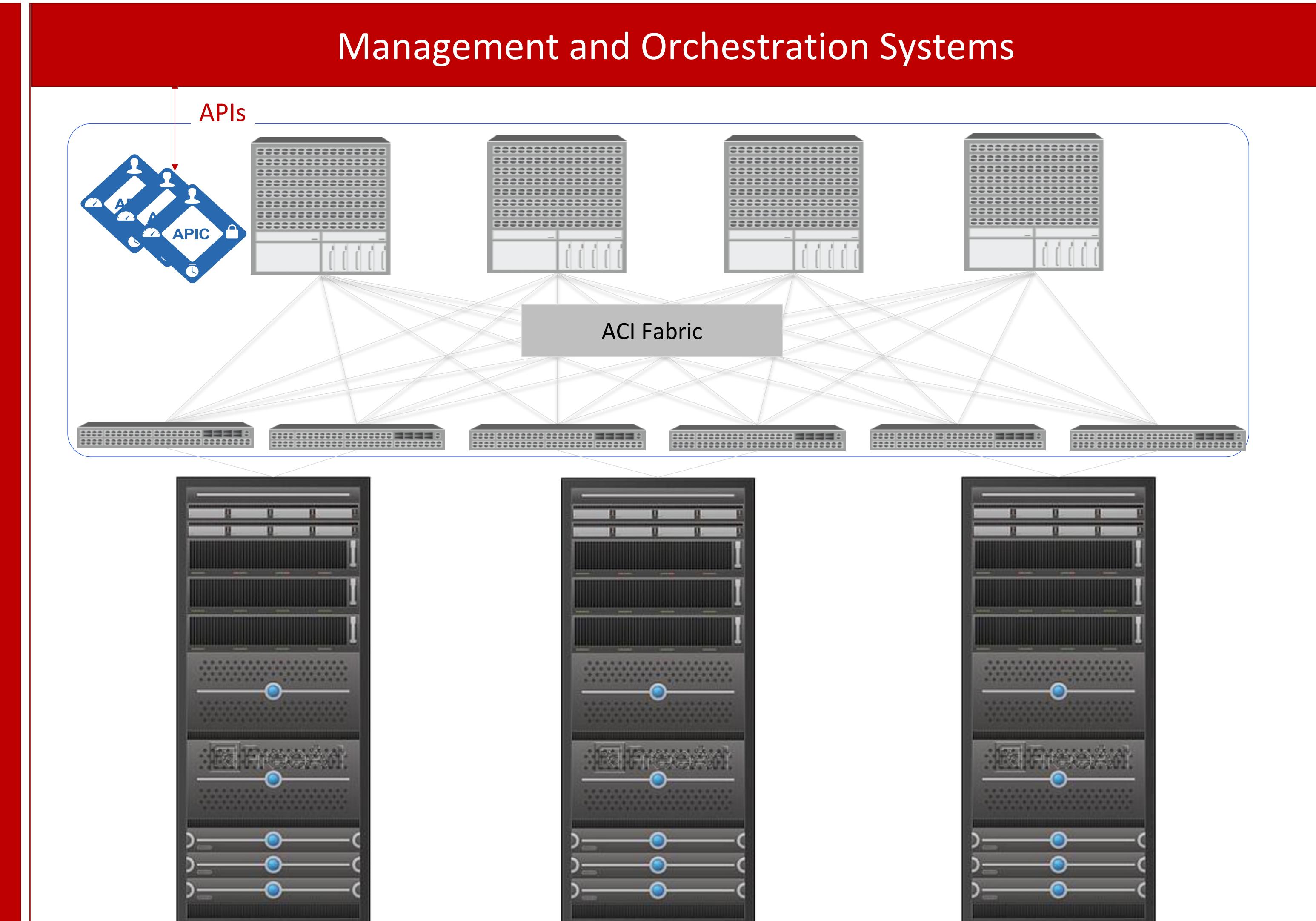


Leaner Cell Site, Zero Touch Provisioning, Speed of Software

Mobile Edge Computing **Low Latency. Edge Offload**

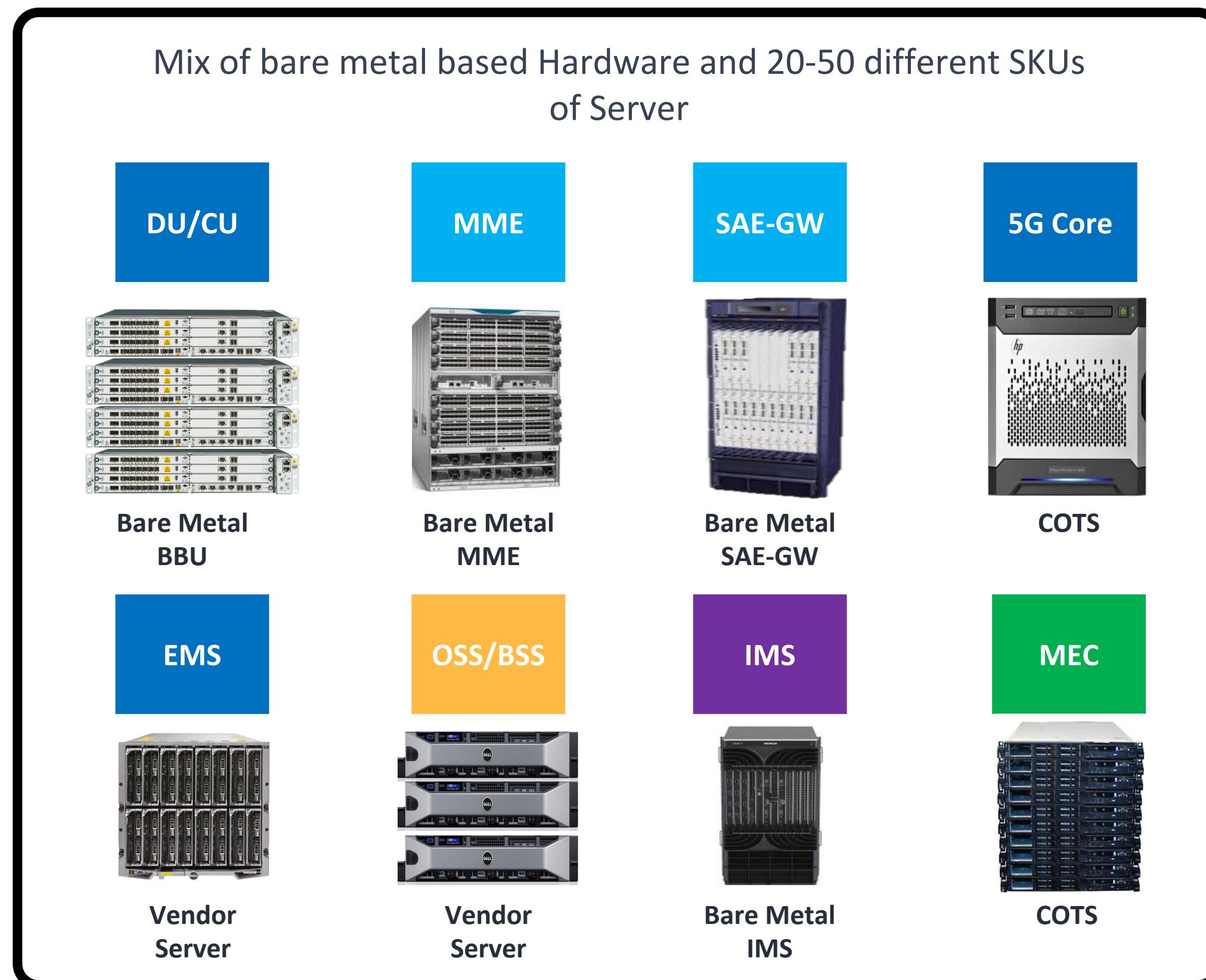
SDN Based Centralized & Regional DC

- Modular DC Architecture
- Fully automated
- Policy driven
- Built for 5G scale in mind
- VM, Containers, Bare Metal
- Service Chaining
- Carrier Grade
- Highly secure
- Telemetry and assurance

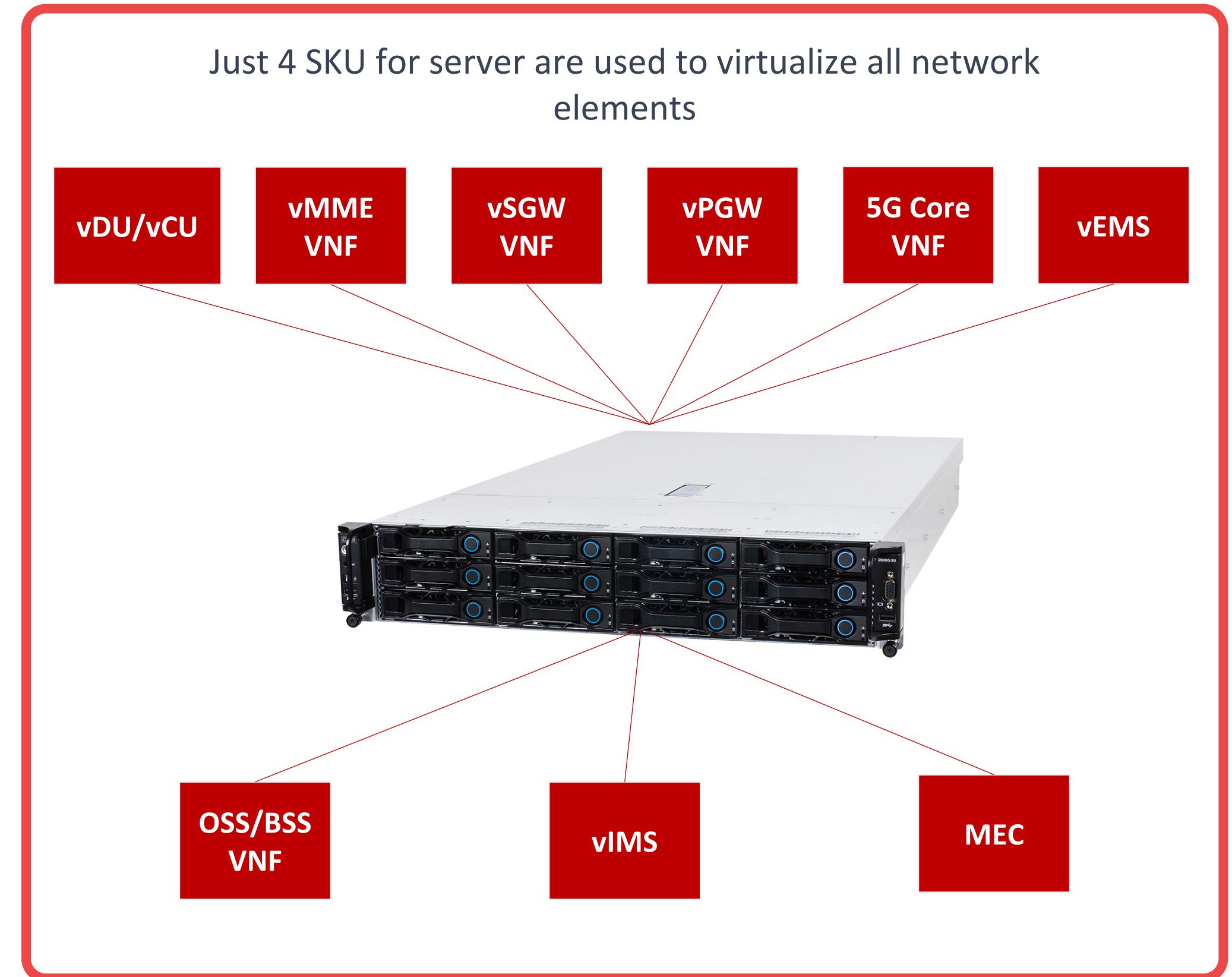


Low complexity hardware design

Traditional Network



Rakuten Network



Cisco NFVI

North Bound APIs

NFVO, Resource Orchestration & VNF Service Orchestration

NSO – Network Services Orchestrator enabled by Tail-f

Virtual Network Functions

EPC

IMS

OSS

BSS

vRAN

CPNR

...

VNF Manager

Cisco ESC

Nokia CBAM



Infrastructure Management

Virtual Infrastructure

Virtual Compute
(RHEL)

Virtual Storage
(Ceph)

Virtual Network
(OVS, SR-IOV)

Infrastructure Abstraction with RHEL, KVM/Qemu, Host Packages, vSwitches

Cisco Physical Infrastructure

Compute (Quanta)

Network (N9k)

Storage (Quanta)

Red Hat OSP

Cisco VIM Lifecycle Manager



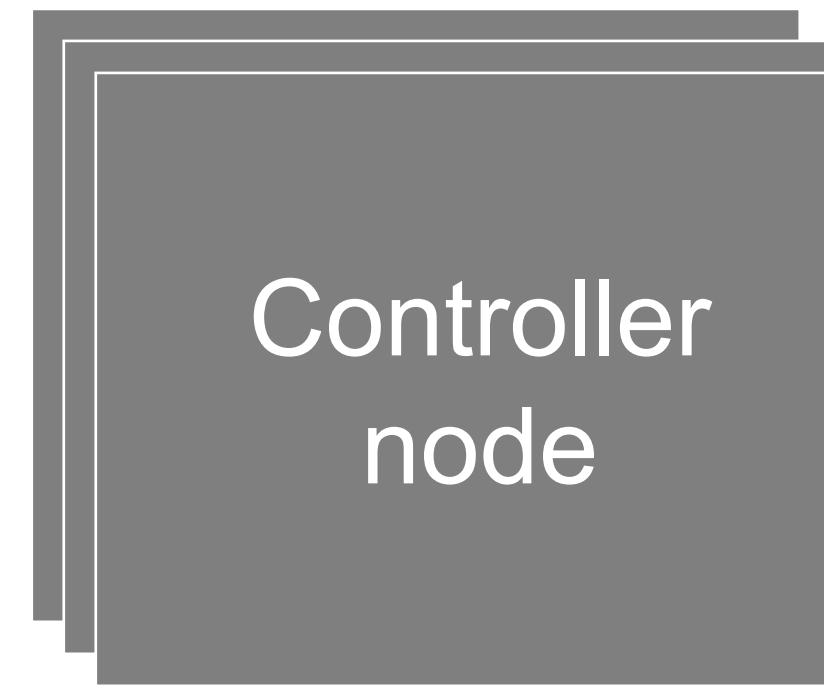
VIM

Cisco NFVI Scope

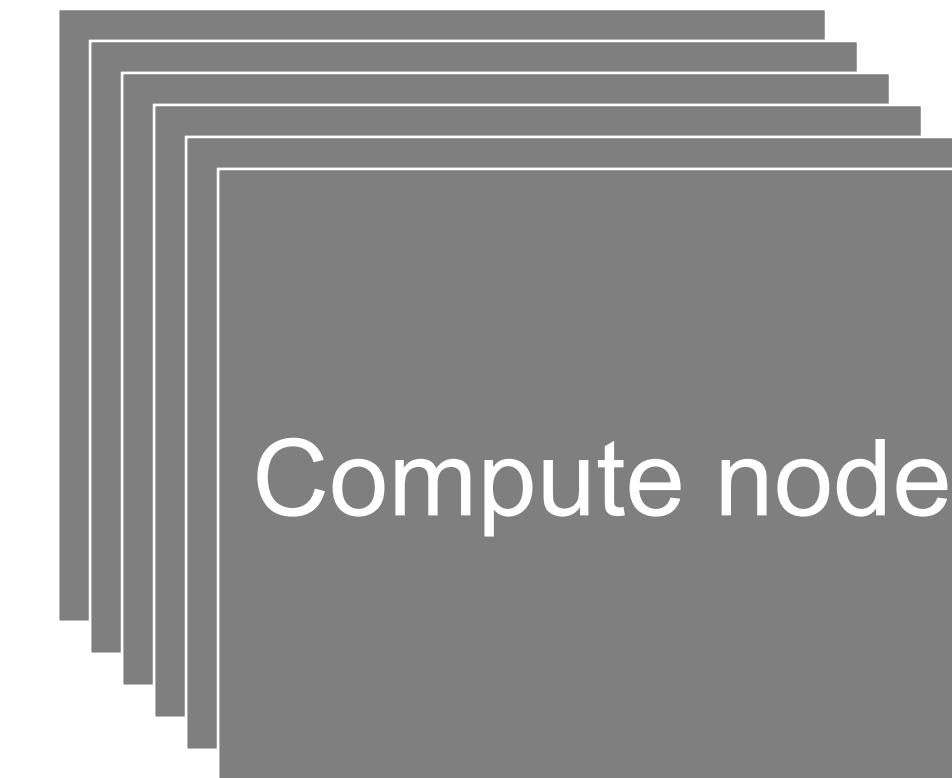
Cloud Infra Nodes



Management
node



Controller
node



Compute node



Storage node

CDC&RDC

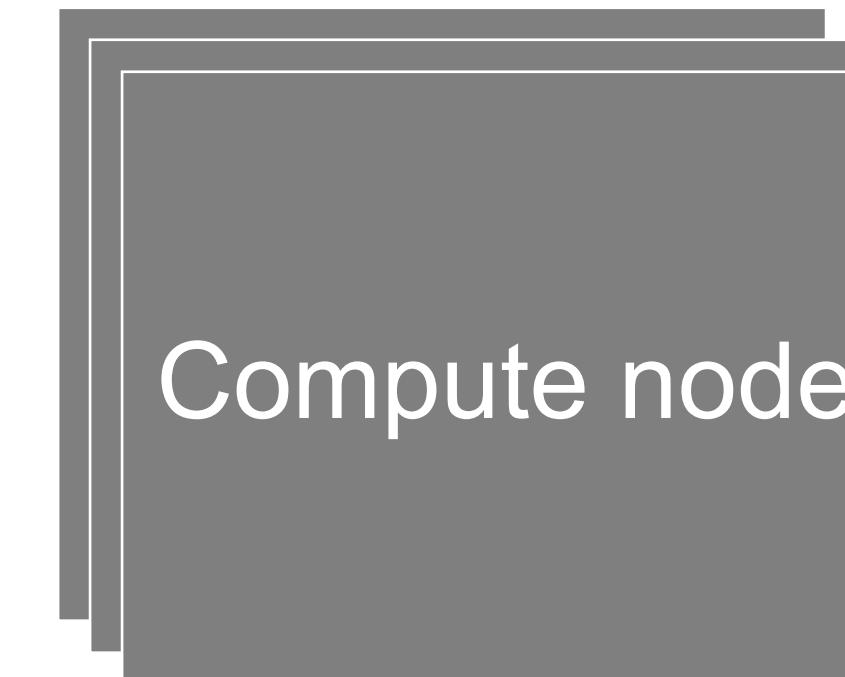
GC



Management
node

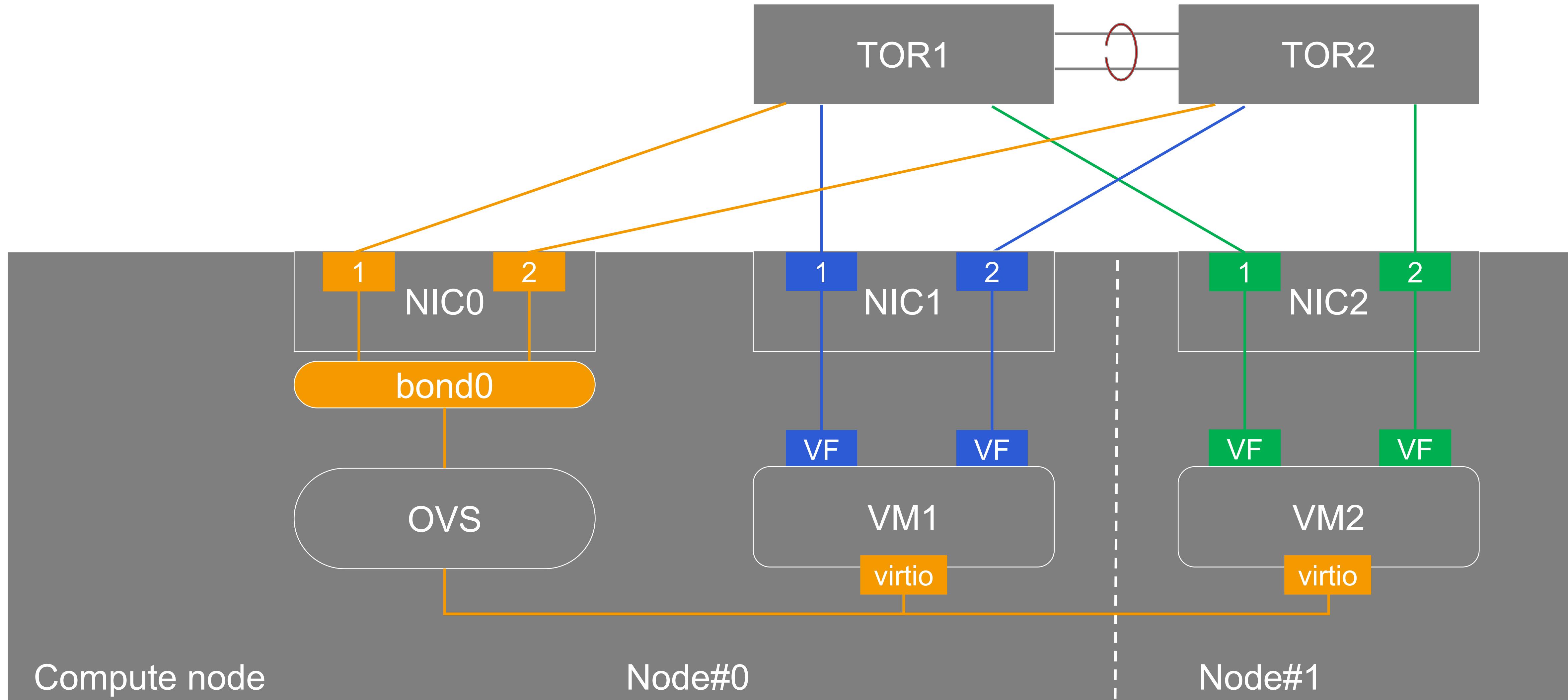


Controller &
Compute node



Compute node

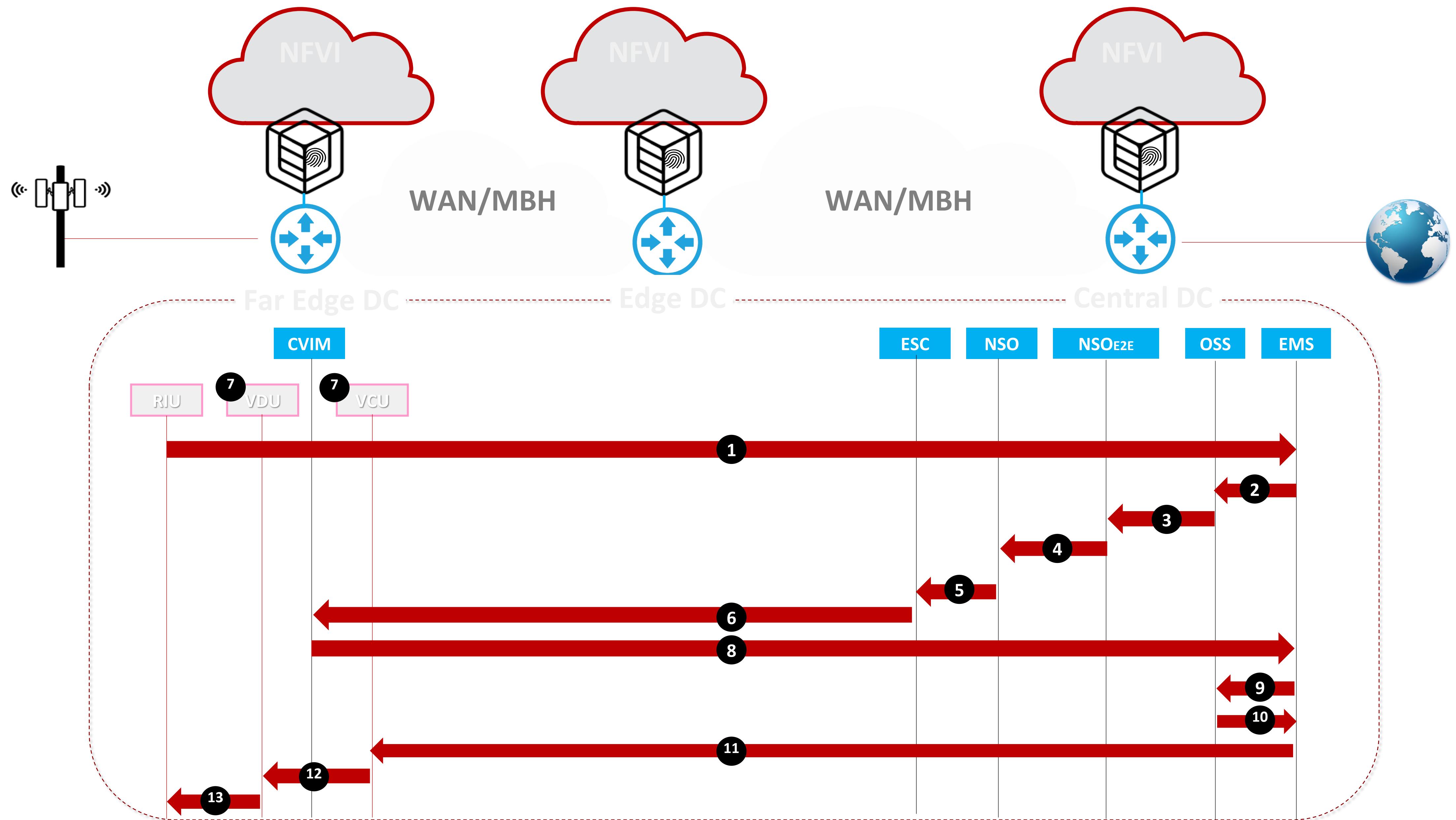
Compute Node Network Setup Example



One CPU Socket BBU SKU



End-to-End Automation in Action



Automated GC Setup

The screenshot shows the Configuration Management interface with the following details:

View Instantiation: POD - Tokyoomori2/tkomr2

Data Center Configuration:

- Data Center Registration: COMPLETED 06-Sep-2019

TOR Configuration:

- TOR Configuration User Approval: COMPLETED 06-Sep-2019
- TOR DHCP Registration: COMPLETED 06-Sep-2019
- TOR Config Upload: COMPLETED 06-Sep-2019
- TOR Registration Request: COMPLETED 06-Sep-2019
- TOR Registration: COMPLETED 06-Sep-2019

CVIM Configuration:

- Setup Data Generation: COMPLETED 09-Sep-2019
- Setup Data User Approval: COMPLETED 09-Sep-2019
- Fetch Cvim Detail: COMPLETED 09-Sep-2019
- Request Offline Validation: COMPLETED 10-Sep-2019
- Offline Validation Status: COMPLETED 10-Sep-2019
- Create Configuration: COMPLETED

OpenStack Configuration:

- POD Registration: COMPLETED 10-Sep-2019
- Project and user Creation: COMPLETED 10-Sep-2019
- Image Onboarding: COMPLETED 10-Sep-2019
- Create host Aggregates: COMPLETED 10-Sep-2019
- Create host Flavours: COMPLETED 10-Sep-2019
- Create Network Subnet: COMPLETED

RIU EMS Configuration:

- EMS Registration: COMPLETED 10-Sep-2019
- RIU DHCP Registration: COMPLETED 10-Sep-2019

Infra Monitoring Tool (CVIM-MON)

