From Bare Metal Toward OCP Solution

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Consume. Collaborate. Contribute.

Edge to Cloud OCP Solutions

- Low Latency
- Compact
- Ruggedized
- High Throughput

OCP OpenEdge

Far Edge

OCP ACCEPTED

- New build DC
- Legacy Facilities with 19'' Racks

Aggregate Edge

- OCP ESA for EIA 19'' rack
- OCP openEdge

OCP ACCEPTED OCP INSPIRED

Regional

- OCP OpenRack
- OCP ESA for EIA 19'' rack

OCP ACCEPTED OCP INSPIRED

- High Density
- High Capacity
- Long-Term Data Analysis

Core

OCP Open Rack or EIA 19'' rack

OCP ACCEPTED OCP INSPIRED

OCP ACCEPTED

Far Edge

OCP OpenEdge

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OPEN Compute Project

The Considerations of Adopting an OCP Solution

OCP Adoption

Power limitation on current server racks infrastructure to support OCP?

Dimensions of OCP racks with current datacenter facility? (Height or other constraints)

Budget control on OCP racks upgrades?

OpenRack or EIA 310 with ESA

OCP Adoption

OPEN Compute Project ®

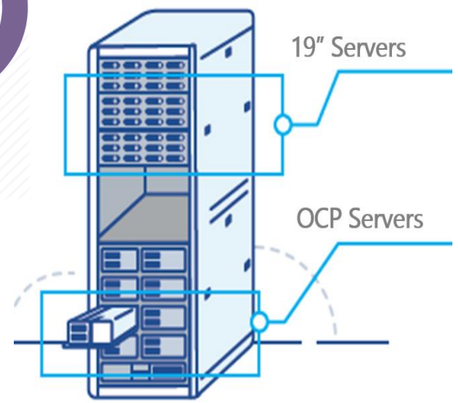
Difficulty in adopting OCP?

No Problem!

OCP Server Racks

Y

ESA Kit



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OCP ESA Kit in EIA 19’’ Rack

OCP ESA Kit

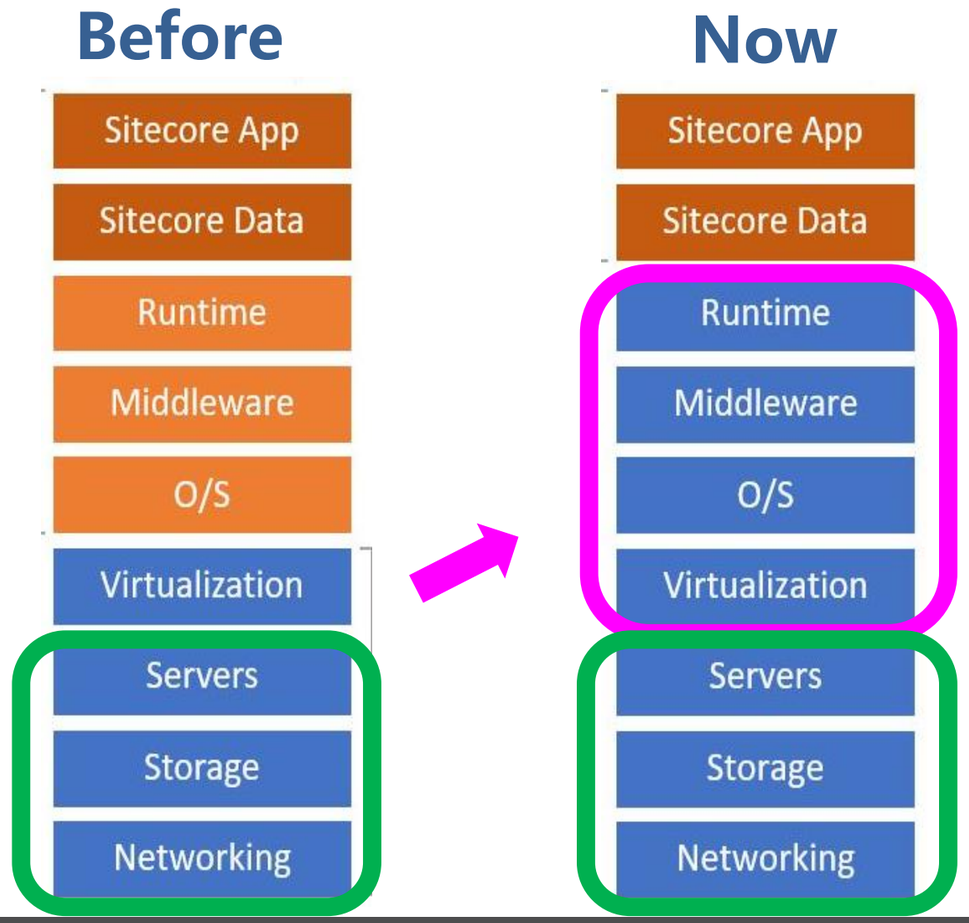
Install ESA Kit in 19” Rack

EIA 19” Rack

Less than 15 minutes
to migrate EIA racks
could use OCP solution

Install Power Shelf in 19” Rack

From Bare Metal Toward to Solution



What about the Future?

kubernetes openstack Linux

The certification MiTAC's Tioga Pass has done

- **Vmware ESXi 6.7 U3**
- **RHEL and RedHat Openstack**

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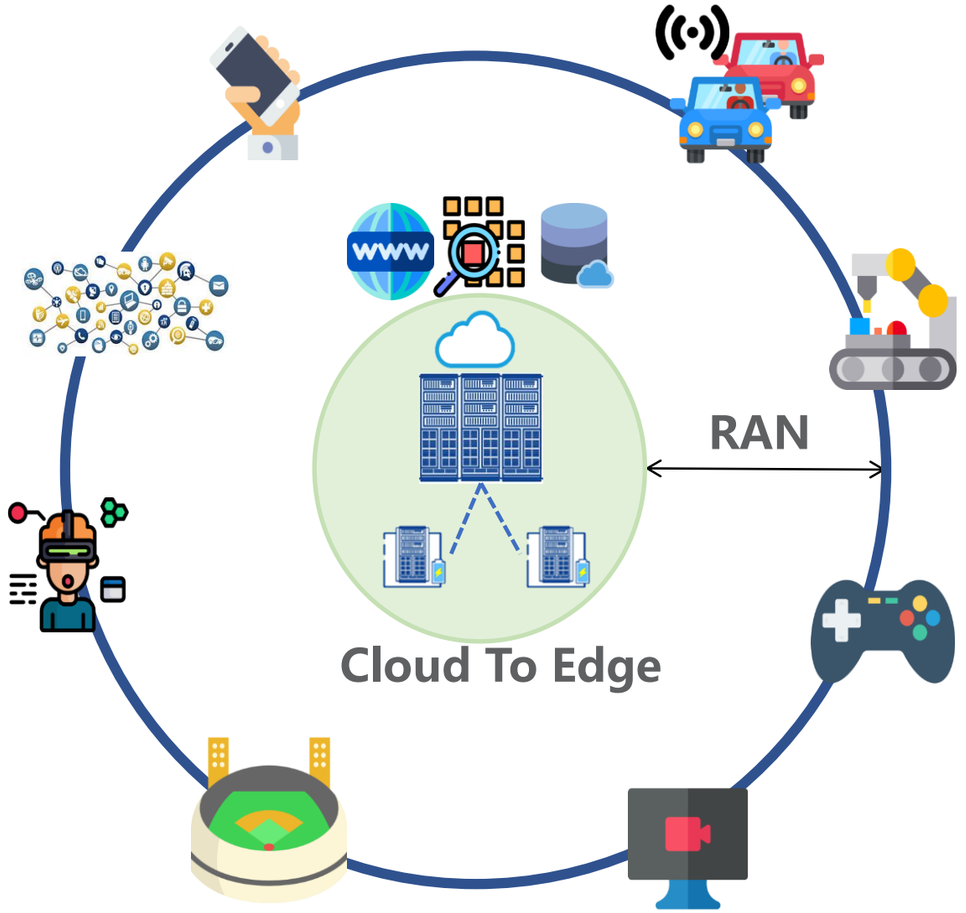
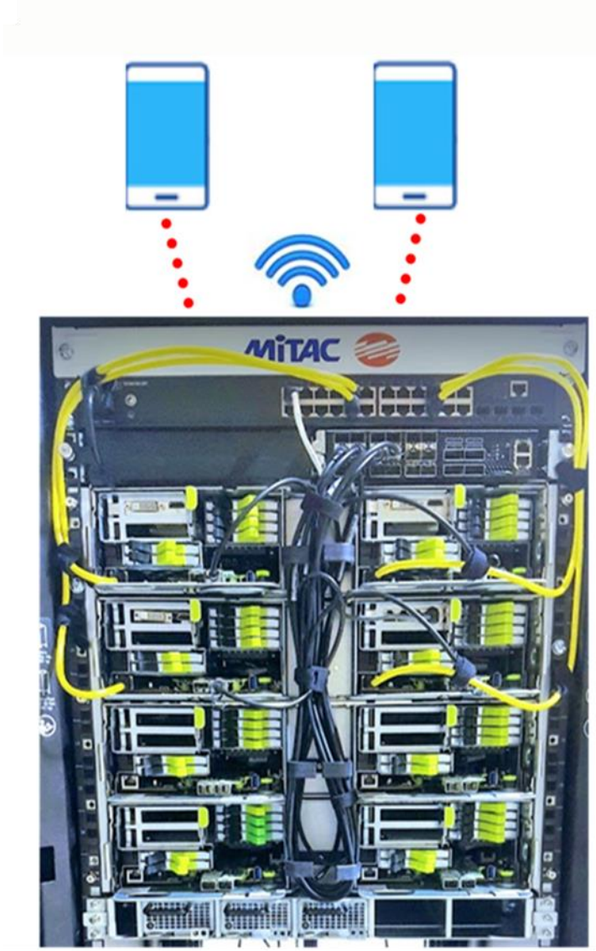
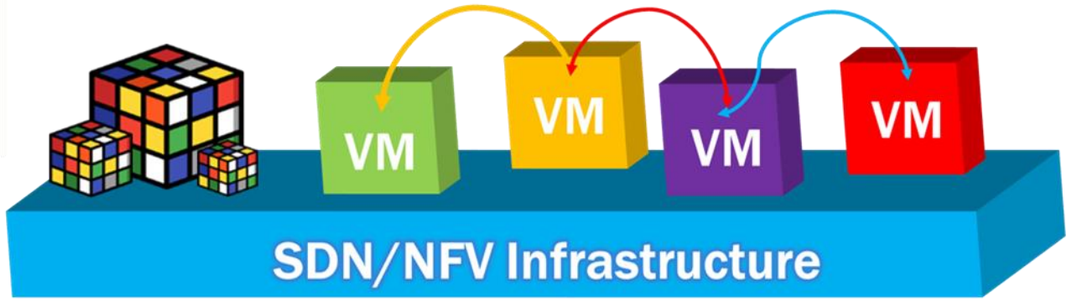
Next Gen. DC and Central Office

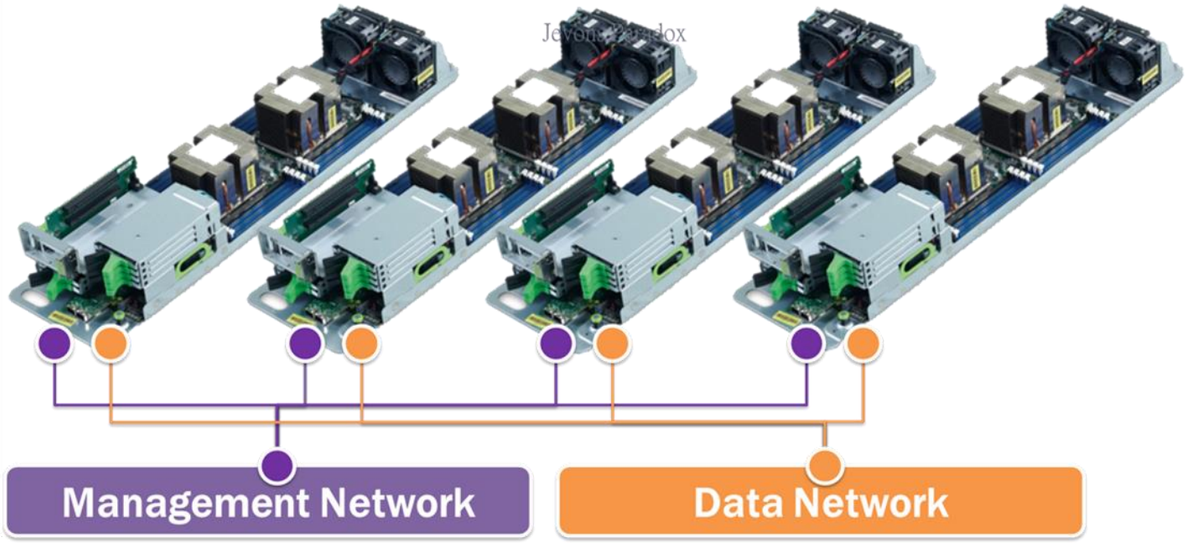
- Exponential growth of data streaming, especially video and IoT, response time is the key challenge to traditional DC.
- Successful experience in DC inspires telco industry toward SDN, NFV, and more open source including OCP
- Depends on latency demand, Wi-Fi, LTE, 5G become major building block of regional and edge DC that is closed to end users
- More challenge in distributed DC management
- Centralized DC / Central Office + Edge = Harmonious service experience to process balanced user workload in right place



Branch Office Rack of VCO 2.0







Mice Workload
Elephant Workload
Real-time Workload

openstack.
OPEN DAYLIGHT
onos
Open Network Operating System

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OCP Product Portfolio

- Tioga Pass OCP Server MP
- ESA Kit for EIA 19" Rack MP
- Crystal Lake OCP Storage 19'Q3

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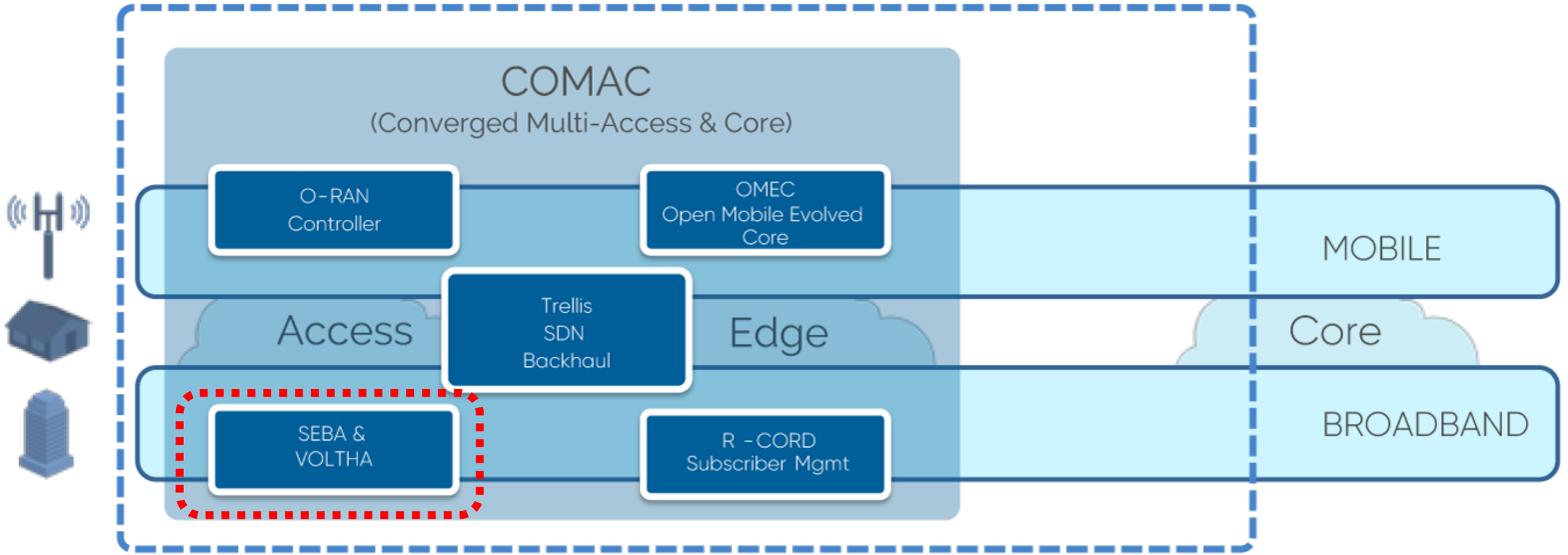
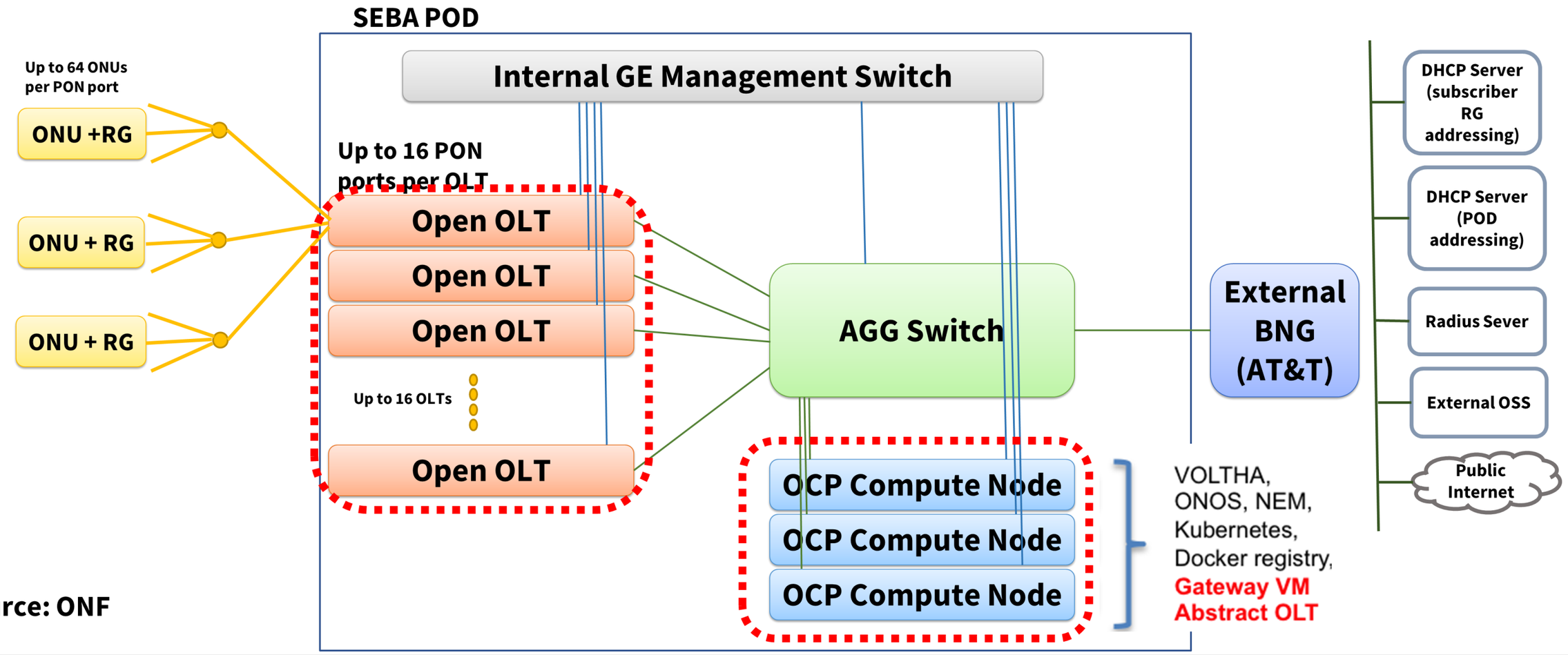
Converged Multi-Access and Core



Source: ONF

Adopting SEBA POD with OCP Solutions



Source: ONF

SEBA POD with OCP Solution

OCP SEBA
POD is coming

OCP Compute
Node with ESA

ONUs: Refer to SEBA equipment list

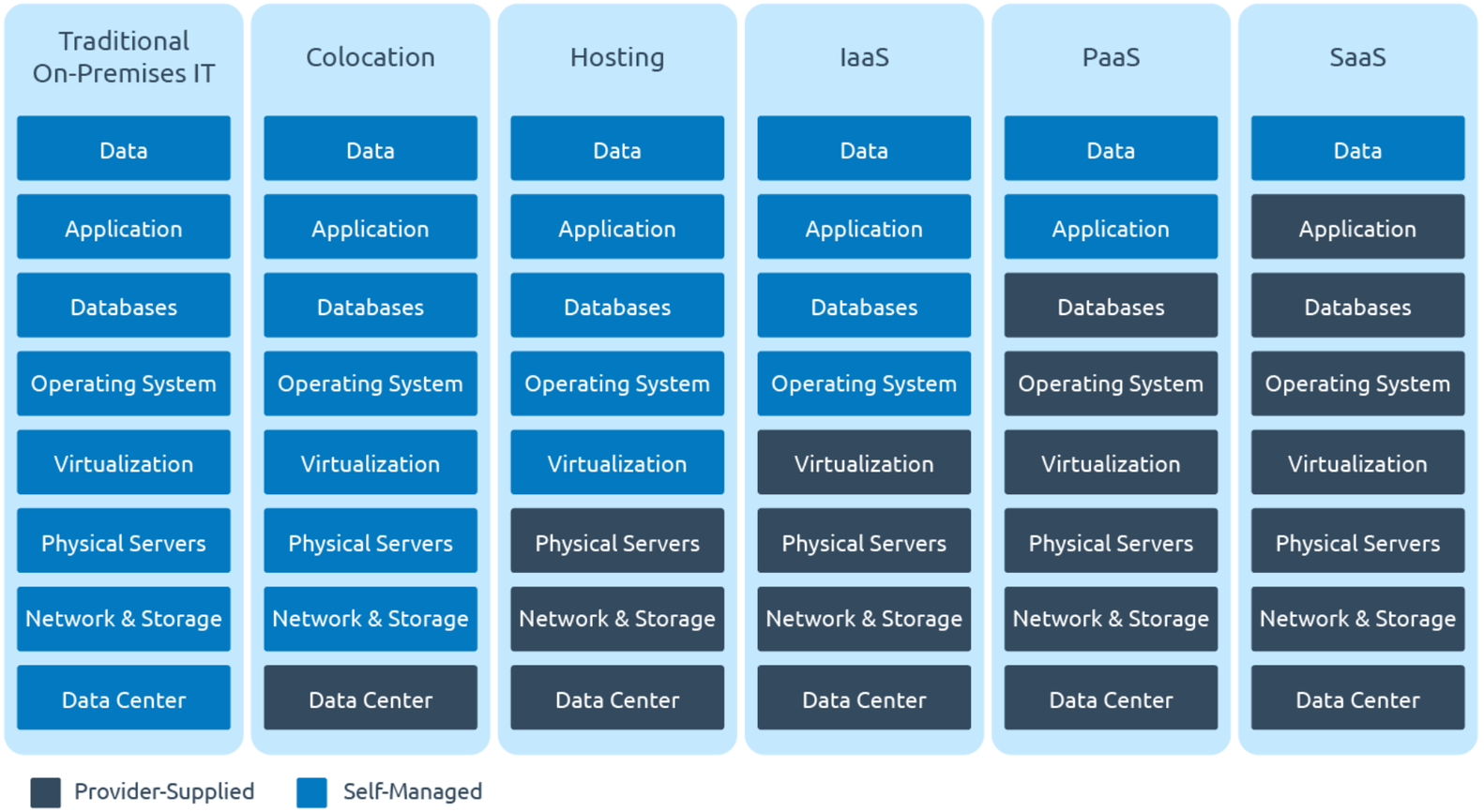
OLTs: Edgecore

AGG switch: EdgeCore

Servers: VOLTHA, ONOS, XOS, K8s, ELK, Docker, Prometheus, Grafana, Kibana

Source: ONF

XaaS – Everything as a Service



Source: Gartner

HaaS – Hardware as a Service

- **HaaS is a physical machine leasing service (PMLS)**
  - Each tenant gets a physical data center instance (PDCI), which consists of a set of physical servers, a physical network connecting them, and a set of local/remote storage volumes accessible to the servers.
- **Why Hardware as a Service(HaaS)?**
  - Specialized computing hardware, such as GPU, TPU and FPGA
  - Preferred virtualization method: VM, container, physical partition, etc.
  - Big data/DNN training/HPC: efficient utilization of HW resource is critical
- **Comparison among service models:**

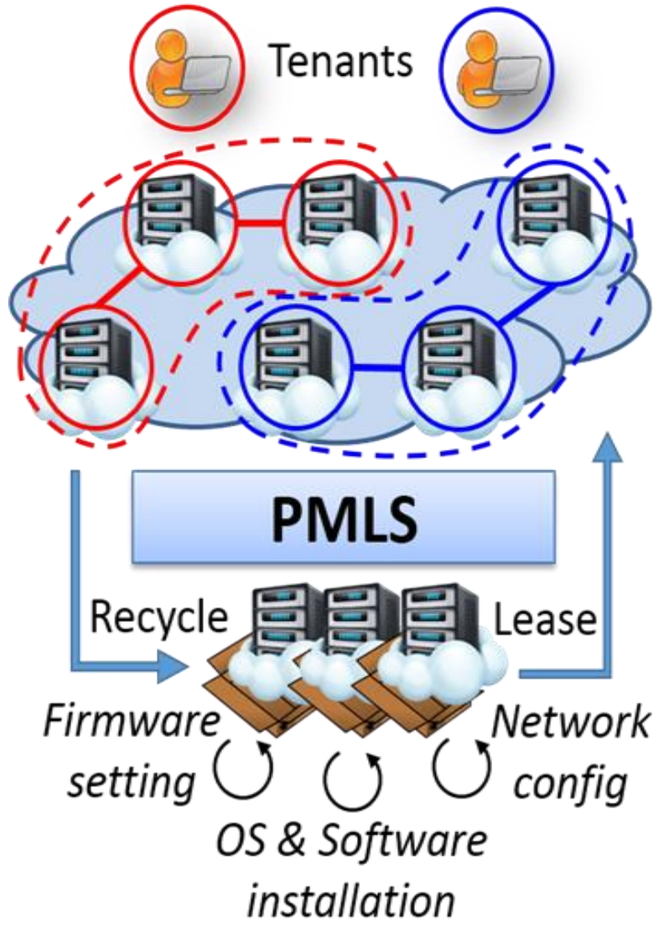
Model	Rental Unit	IT HW Ownership	HW Management
IaaS	Virtual machine	Service provider	Service provider
HaaS	Physical machine	Service provider	User
Colocation	Rack space	User	User

Source: ITRI

HaaS Service Model

- **An HaaS reservation consists of the following:**
  - **A set of servers, each with its hardware specification and configurations on BIOS, BMC, PCI devices, and OS**
  - **A set of storage volumes that exist in local or shared storage, and are attached to the servers**
  - **A set of IP subnets that connect the servers and how they are connected**
  - **A set of public IP addresses to be bound to some of the servers, and their firewall policies**

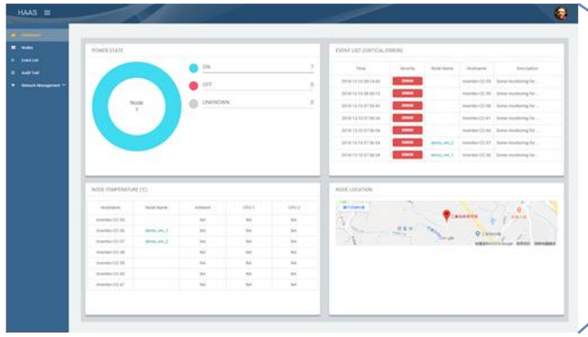
- **Server, storage and network provisioning: Bare Metal provisioning from ITRI(BAMPI), which is used in KDDI since 2014**

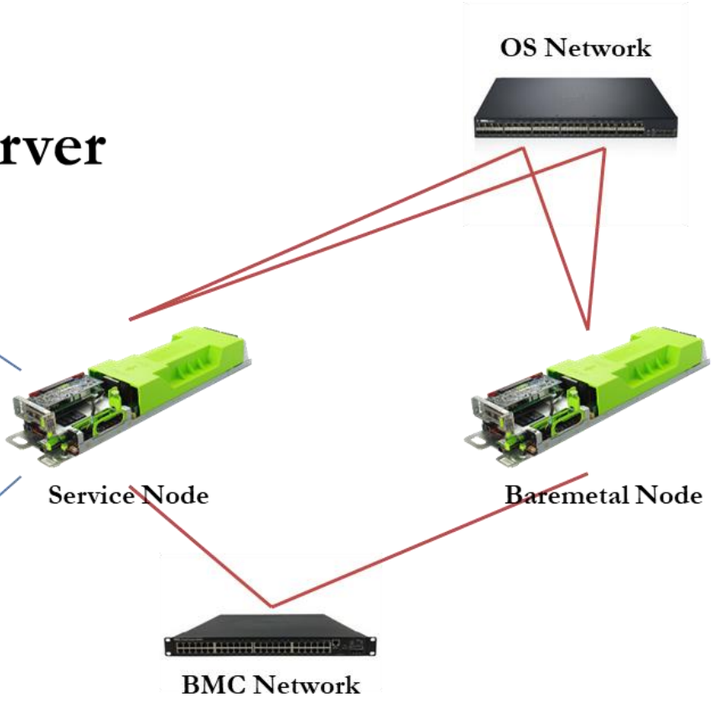


Source: ITRI

HaaS Service with Deep Learning on OCP

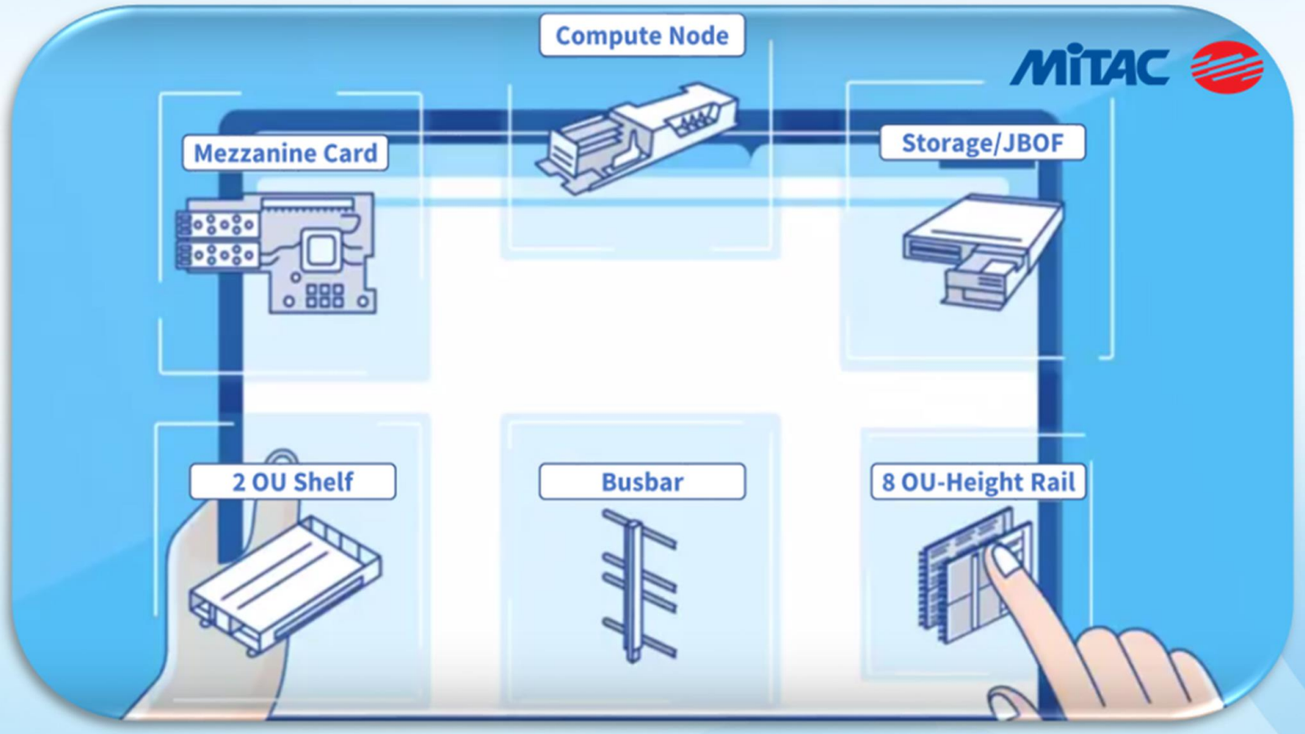
1. Allocate for renting 1 bare-metal server
2. Associate floating IP
3. DNN training appliance
4. Return the bare-metal server

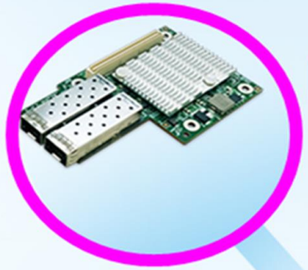




Source: ITRI

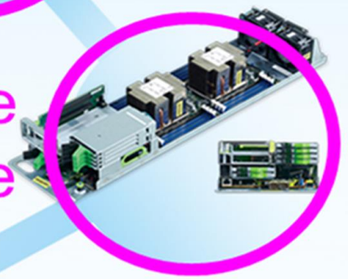
MiTAC OCP Solutions

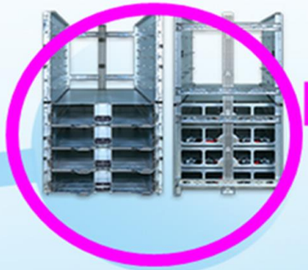




Mezzanine Cards

Compute Node





ESA Kit

Storage JBOF

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Thanks!

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