

QNAP

QuCPE

7010

SD-WAN / VNF / Intel® Xeon® D
10G Network Virtualization Equipment



SD-WAN / VNF

Intel Xeon-D / 10G

10G Network Virtualization Equipment

- QNE - next generation OS
- SD-WAN for Enterprises
- Agile operation with virtualized services
- Robust and fast 10Gbps
- SD-Branch surveillances
- High availability
- Service optimization

QuCPE
7010



QNE – QNAP next-generation operating system

Next generation OS

QNE (QNAP Network Equipment OS)

- Inherit the experiences for Enterprise storage OS
- The foundation for QNAP next generation products

Break-through design
than legacy Servers

Break-through architecture

- Redesigned architecture for virtualized services
- Extremely fast service's response and migration

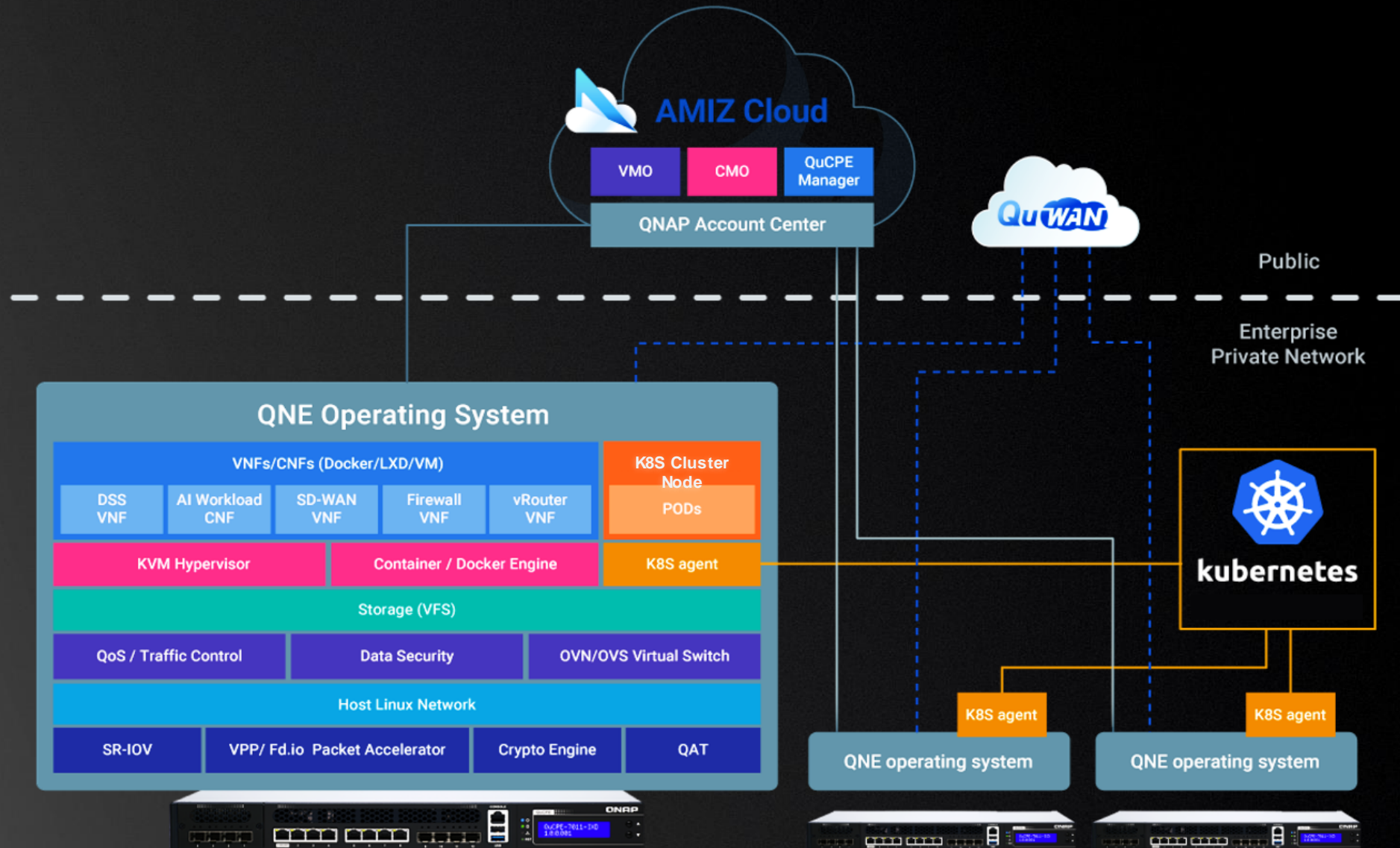
Data center technologies
from CSPs

Flexible software-defined and virtualized technologies

- Simplified the IT management for SD-Branch
- Remotely adjustment along with business locations



Integrated service architecture



*K8S agent: Estimated release by Q2-2021



QuCPE

Powerful Xeon® D
and 10G platform

QuCPE
7010

QuCPE hardware specifications



QuCPE-7010 series



	QuCPE-7010-D2123IT-8G	QuCPE-7010-D2146NT-32G	QuCPE-7010-D2166NT-64G
CPU	Intel Xeon D-2123IT 4C/8T data center processors	Intel Xeon D-2146NT 8C/16T data center processors	Intel Xeon D-2166NT 12C/24T data center processors
DRAM	8GB DDR4 (4GB x 2) ECC	32GB DDR4 (8GB x 4) ECC	64GB DDR4 (16GB x 4) ECC
Network	8 x 1GbE & 4 x 10GbE SFP+	8 x 1GbE & 4 x 10GbE SFP+	8 x 1GbE & 4 x 10GbE SFP+
Expansion	1x module for 4x10GbE/2x25GbE	1x module for 4x10GbE/2x25GbE	1x module for 4x10GbE/2x25GbE
Disk slots	2 x 2.5" SATA slots	2 x 2.5" SATA slots	2 x 2.5" SATA slots
PCIe slots	1 x PCIe Gen3 x 8 (FH/HL)	1 x PCIe Gen3 x 8 (FH/HL)	1 x PCIe Gen3 x 8 (FH/HL)

Inside the QuCPE

Intel® Xeon® D

Xeon D-2123IT
Xeon D-2146NT
Xeon D-2166NT



1 x PCIE Gen3 x 8
FH/HL

1 x Network module
Expansion for
10GbE / 25GbE

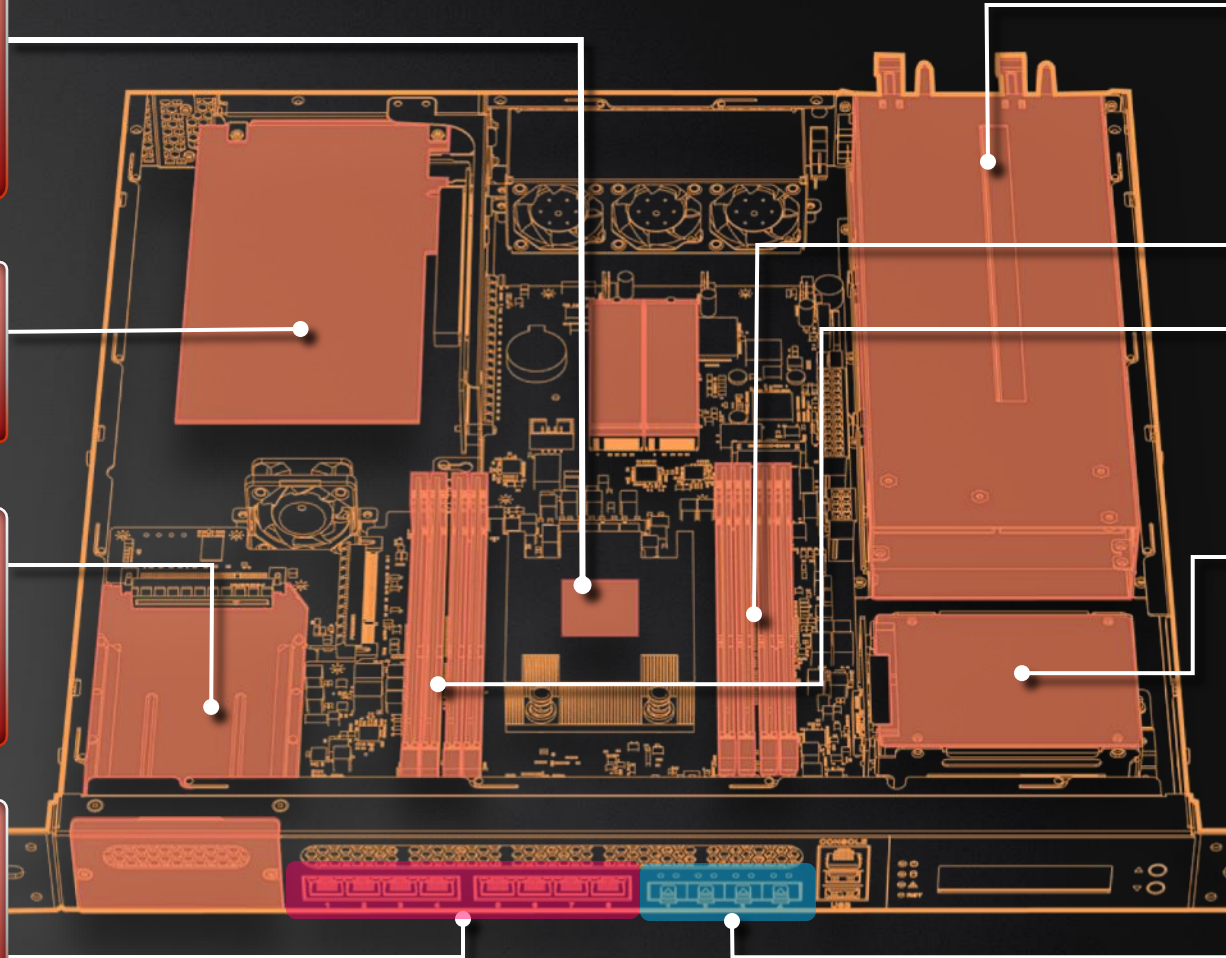
8 x 1GbE RJ45
ports

Dual 300W Power
(Main/Backup)

8 x DDR4 Slots, up
to 128GB (U-DIMM)
& 256GB (R-DIMM)

2 x 2.5" slots
Support SATA 6Gbps

4 x 10GbE SFP+
Fiber (SR-IOV
supported)



High speed expansion with Network module

PuIM-10G4SF-MLX




PuIM-10G4SF-XL710



PuIM-25G2SF-MLX

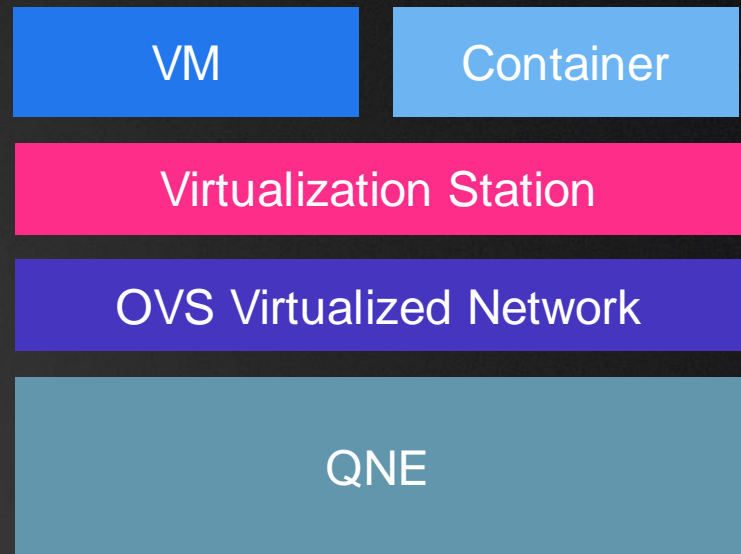


	PuIM-10G4SF-XL710	PuIM-10G4SF-MLX	PuIM-25G2SF-MLX
Speed	10 GbE	10 GbE	25 GbE
Ports	4	4	2
Interface	SFP+	SFP+	SFP28
Processor	Intel XL710	Nvidia Mellanox ConnectX-4	Nvidia Mellanox ConnectX-4
Bus	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8



Before the introduction
QNE application volume for
virtualized services

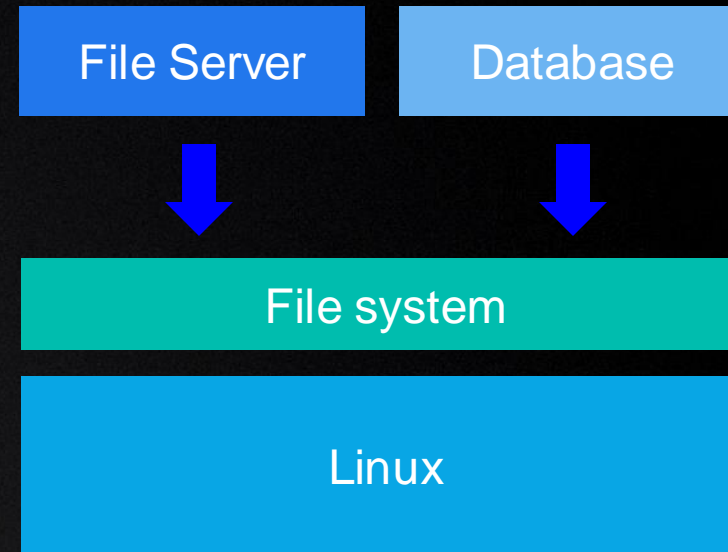
QNE differences to Server system



QNE

VM & Container (application) are virtualized on top of hypervisors

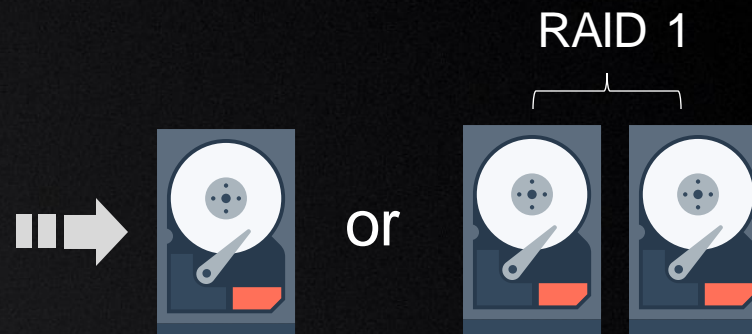
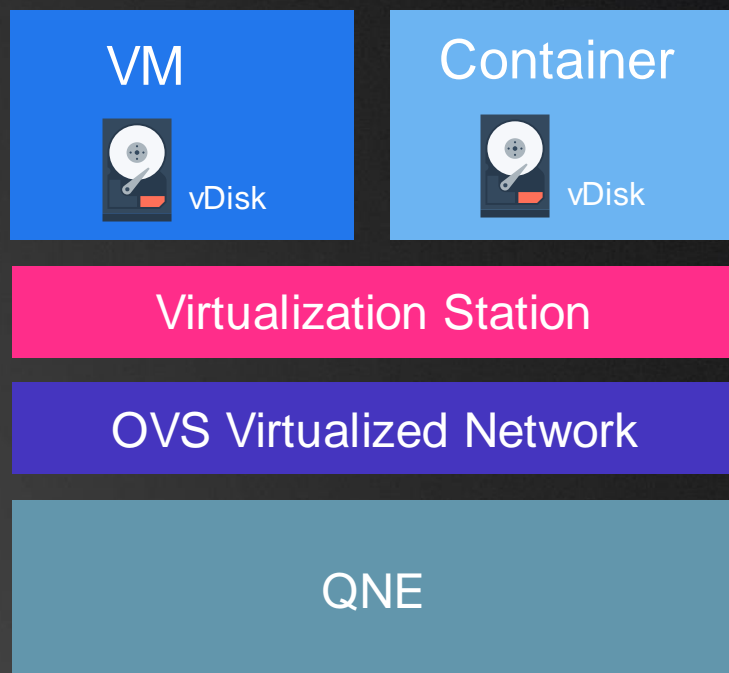
V.S.




Linux Server

Application (e.g., Database) assign disk volume from Linux

QNE differences to server system



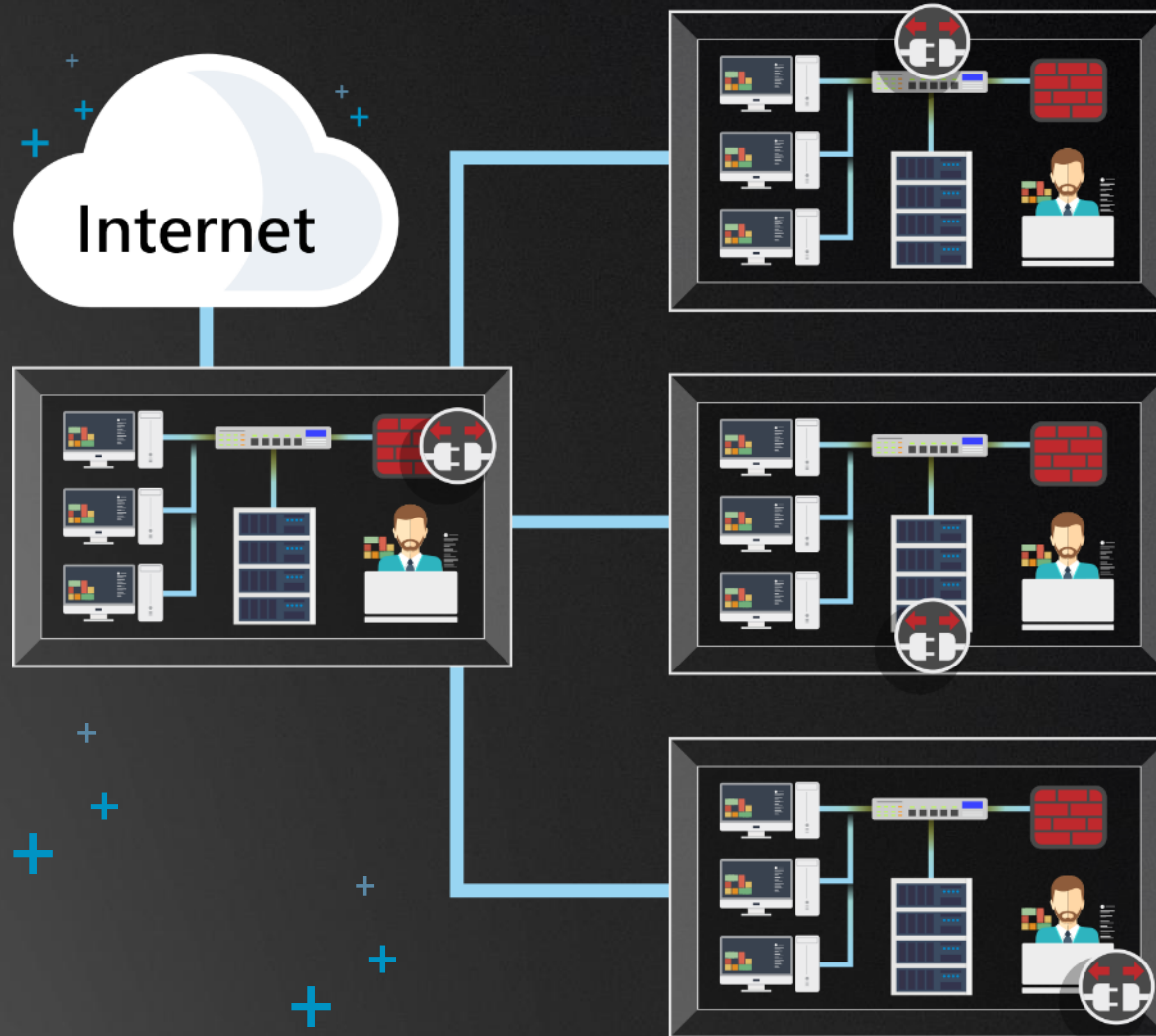
- Customer shall install 2.5" disk for "Application Volume"
- Assign "virtual disk" for VM/Container
- If 1 x disk or 2 x disks installed
 - 2 x 4TB 2.5 disk > System will build **RAID 1**
 - Total size is 4TB for application volume



QuCPE / QNE / AMIZ Cloud

Convergences of Network, Computing, and Cloud services

Current Enterprise WAN and IT infra for branch



- **More WAN investment of HQ**
 - WAN aggregation to HQ
- **Investment for IT staff**
 - Manage hundreds of network appliances
- **Keep business continuity**
 - Long / lead time to maintenance
 - Difficulties to upgrade

Agile & digital transformation require a disruptive-tech platform

- **More WAN investment of HQ**
 - Adoption of QNAP SD-WAN
- **Investment for IT staff**
 - Lean operation cost with QNE and centralized cloud management
- **Keep business continuity**
 - QNE, virtualized network and service

- SD-WAN
- QNE and vApps
- AMIZ Cloud

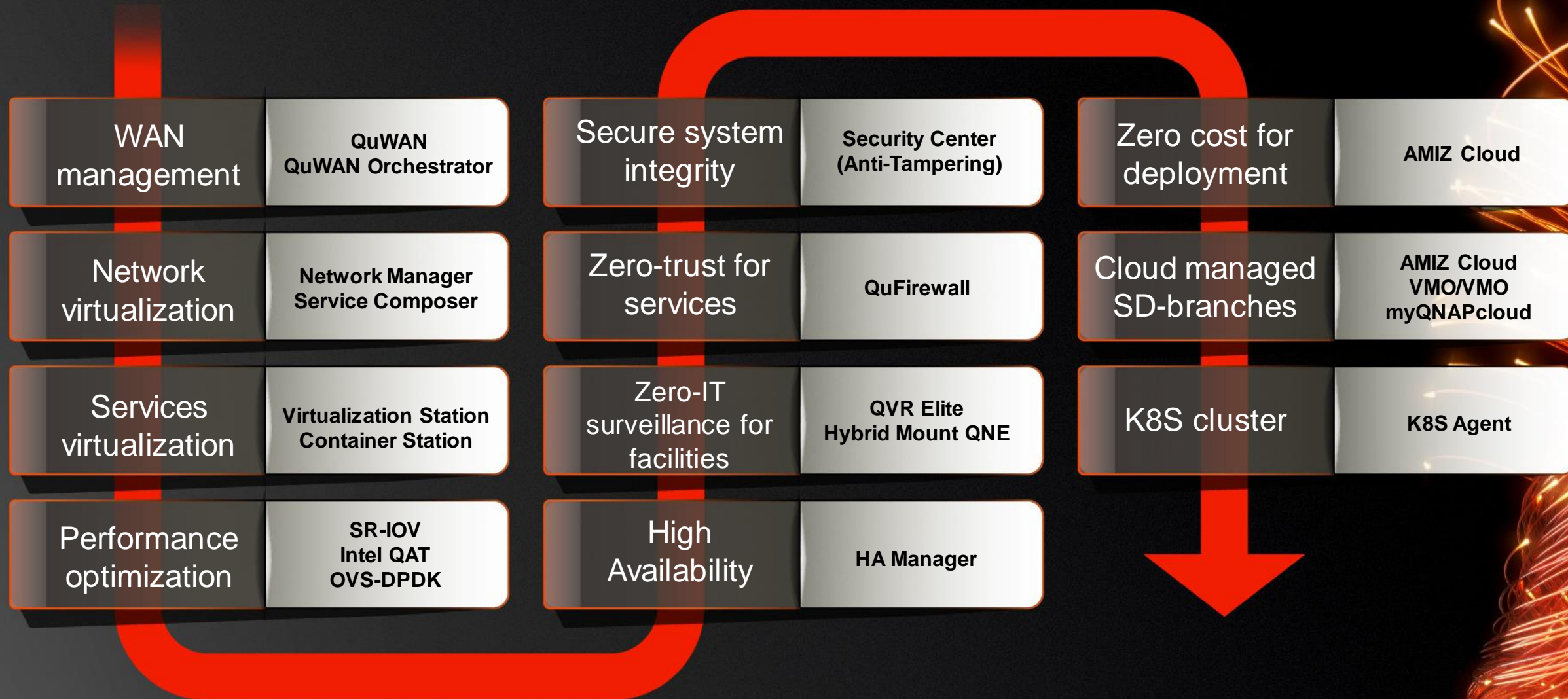


The PLAYBOOK

Scenario

vApp

Steps





SD-WAN (QuWAN)

SD-Branch and IT transformation

Why digital transformation requires SD-WAN

WAN Spike Traffic

**HQ & Branches
MPLS cost up**

Traffic from Remote
workers and re-
located branches

Unmanaged security

**Branches security
became unmanaged**

IT facilities and
network require more
IT staffs for
management

Higher growing cost via
business growth

**Subscription of all
kinds of IT service**

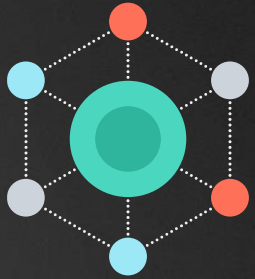
Non-disclosed high
operational cost
while business is
growing

QNAP SD-WAN – QuWAN



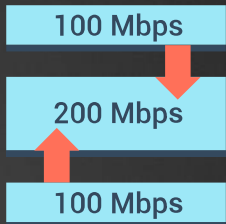
Build for digital transformation
Best-fit for Small-to-Medium Enterprises

Cost effective WAN than MPLS and VPN



Auto Mesh VPN

- Reduce 50% WAN cost
- Reliable than legacy VPN
- High-Gbps IPSec (QuCPE 7010 > 5Gbps)



WAN Optimization

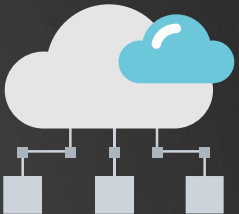
- Auto-aggregation of multiple ISP lines
- Auto-failover from unstable ISP lines

Cost effective WAN than MPLS and VPN



Firewall rules
Cloud deployment

- Simplified firewall rules on Branch WAN
- Subscription-free



500+ application QoS
via DPI technologies

- Near line-rate DPI technologies
- Auto-enabled application QoS
- Video-conference / modern workplace cloud application QoS optimization

Managed all-branch WAN over cloud QuWAN Orchestrator

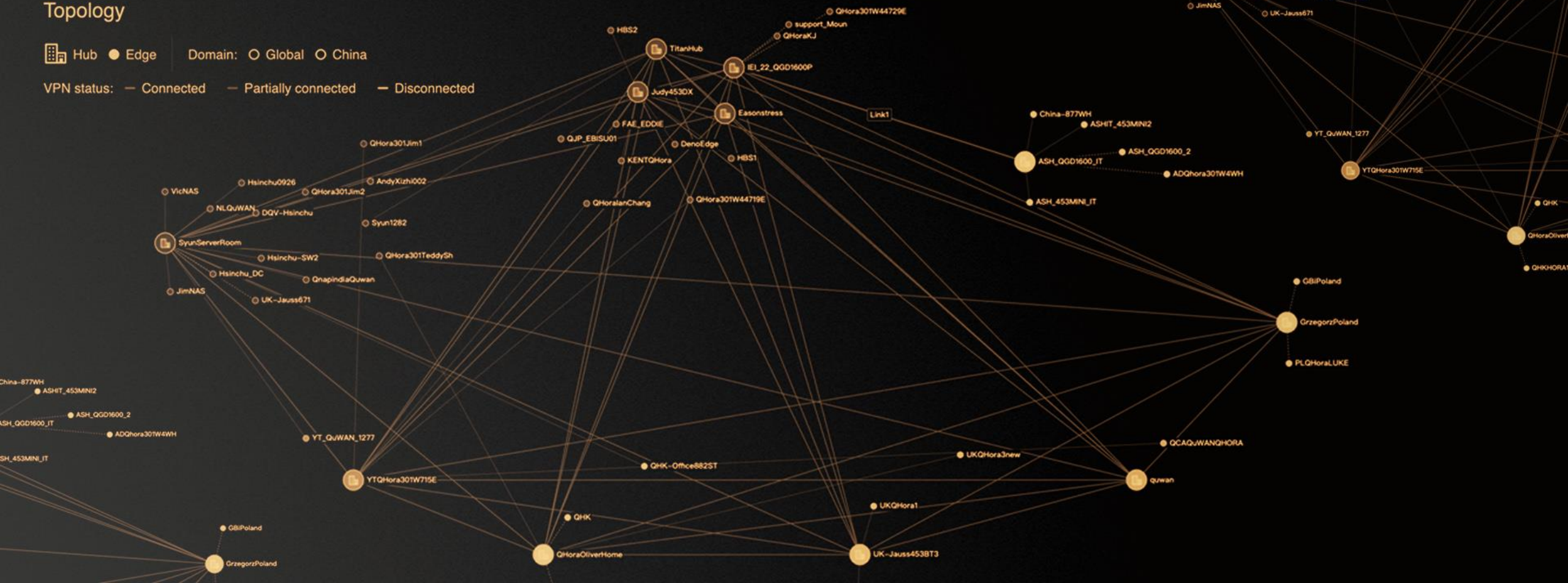
Topology



Hub ● Edge

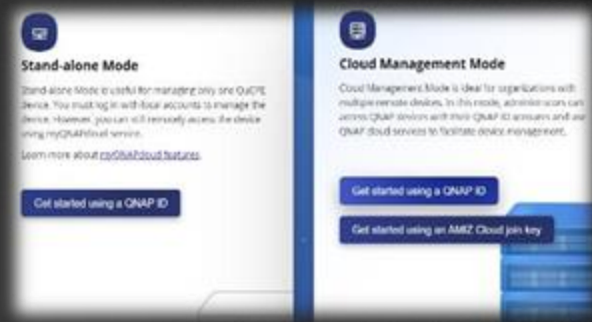
Domain: ☐ Global ☐ China

VPN status: — Connected — Partially connected — Disconnected



QuWAN – Easy deployment

QuWAN 1-2-3



1 Cloud REG
myQNAPcloud
SSO



2 Setup
Service Composer
>> QuWAN



3 Cloud CFG
Configure all on
QuWAN
Orchestrator

QuWAN is **subscription-free** on QuCPE

Upgrade your WAN and free-up your IT budget

	QuWAN (QNAP SD-WAN)	V/C Vendors SD-WAN	VPN	MPLS/T1
Fee	\$0 (Subs-Free)	\$300 to \$1000+ / monthly	Expansive VPN equipment	\$300 to \$1000+ / monthly
MPTCP	Y	Y	n/a	n/a
WAN Opt.	Y	Y	n/a	n/a
HQ cost	50% cost saving	Cost saving	\$\$\$	\$\$\$
IPSec Perf.	Half-10Gbps	100 Mbps to Gbps	100 Mbps to Gbps	n/a
Benefit	Business growth freely	Cost up while biz grows	Bottleneck and re-infra again	Extremely cost up while biz grows



QuCPE for virtualization

The Playbook

The PLAYBOOK

Scenario

vApp

Steps



WAN
management

QuWAN
QuWAN Orchestrator

Network
virtualization

Network Manager
Service Composer

Services
virtualization

Virtualization Station
Container Station

Performance
optimization

SR-IOV
Intel QAT
OVS-DPDK

Secure system
integrity

Security Center
(Anti-Tampering)

Zero-trust for
services

QuFirewall

Zero-IT
surveillance for
facilities

QVR Elite
Hybrid Mount QNE

High
Availability

HA Manager

Zero cost for
deployment

AMIZ Cloud

Cloud managed
SD-branches

AMIZ Cloud
VMO/VMO
myQNAPcloud

K8S cluster

K8S Agent



Still manage a messy network?
Virtualized your network



Two steps to virtualized network

Network Manager & Service Composer



Network Manager

- Assign physical ports for VNF
- Optimize performance by OVS-DPDK

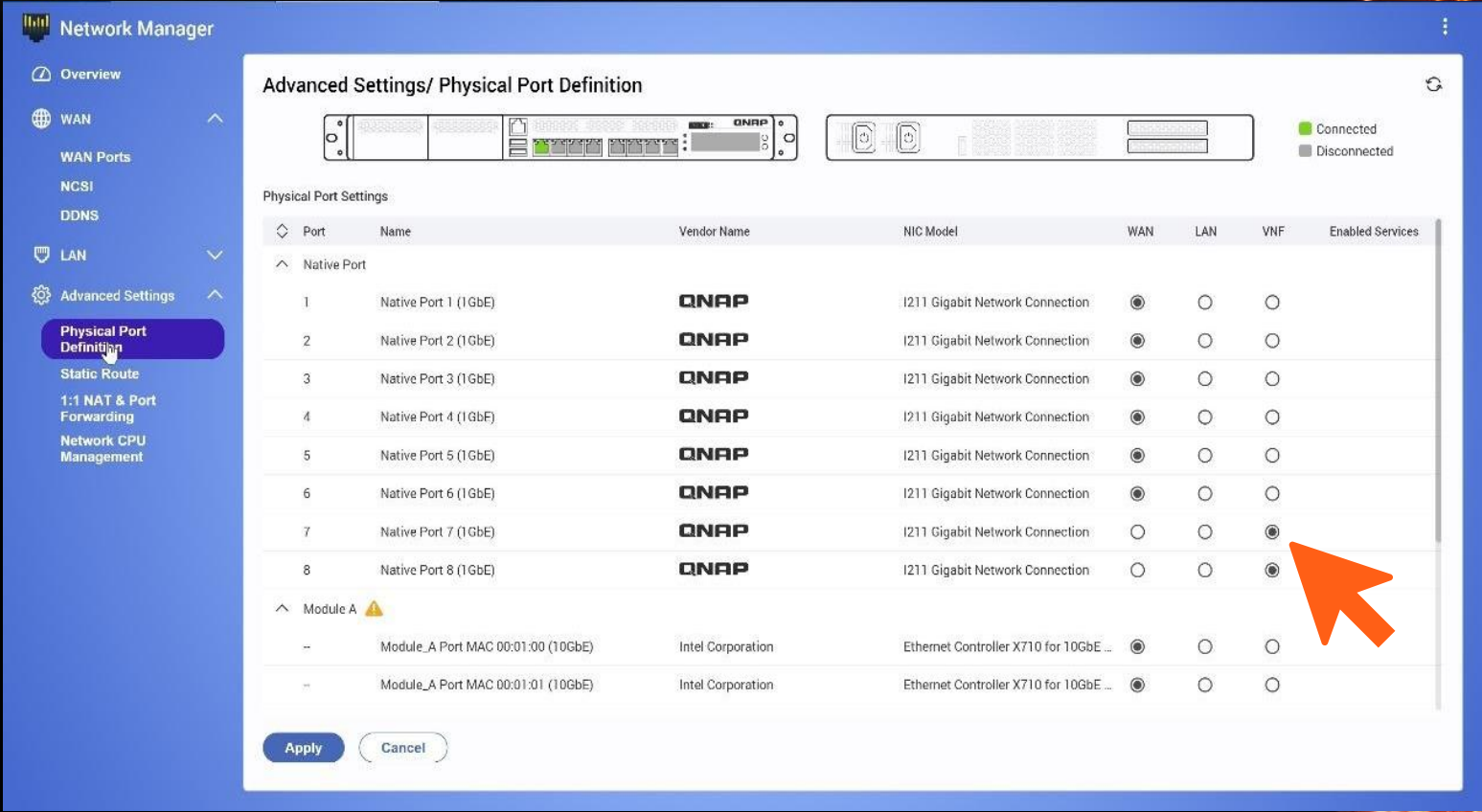


Service Composer

- Construct virtualized network
- Plan and edit your network

Network Manager – VNF ports

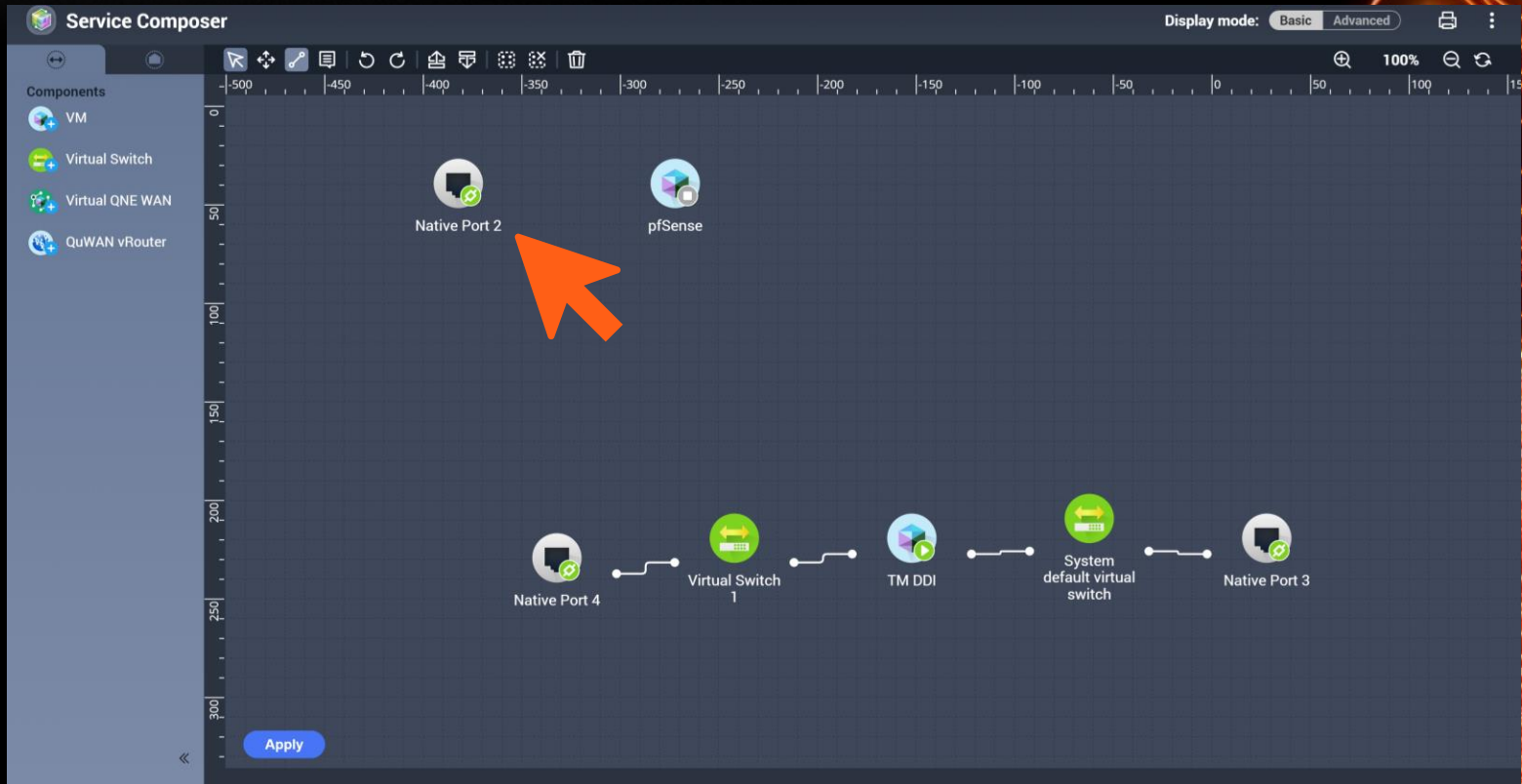
Assign connected physical ports to VNF (Virtualized Network Function) ports



Service Composer (1)

Service Composer

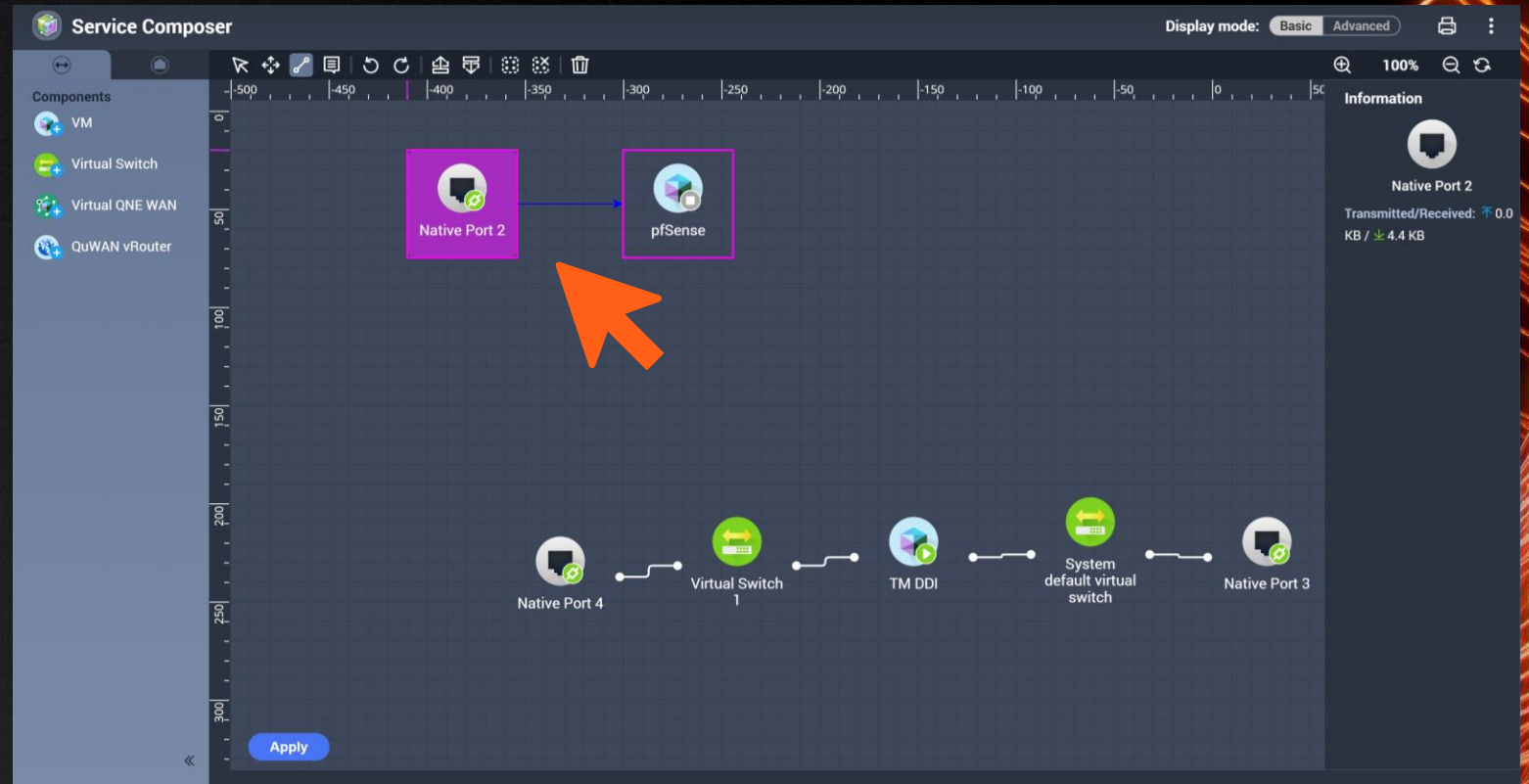
Mouse drag and drop the
VNF port to right



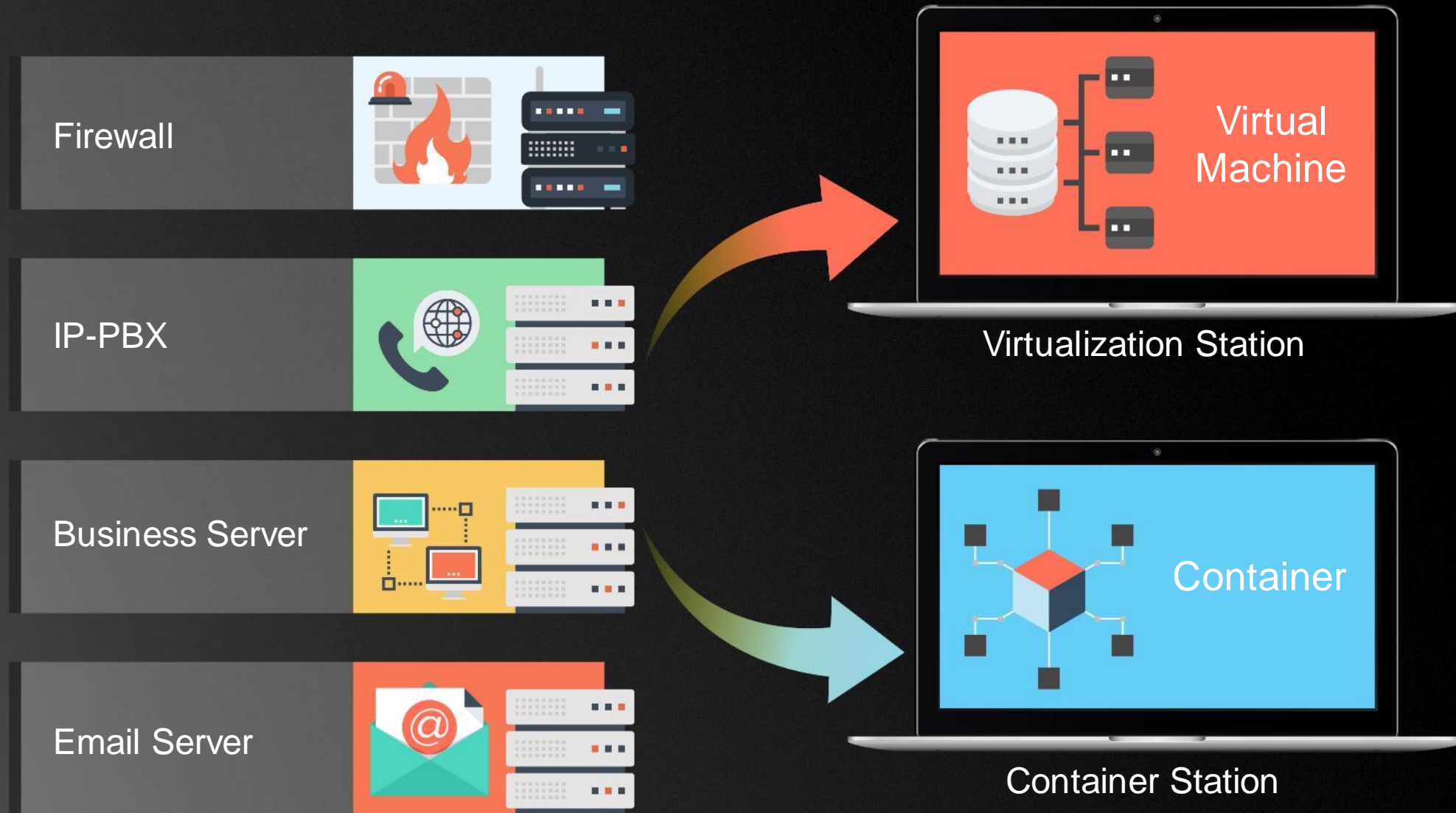
Service Composer (2)

Service Composer

- Setup the pFsense
- Add “connection” line to VNF ports
- Start the “VM service”



Network appliance and server virtualization

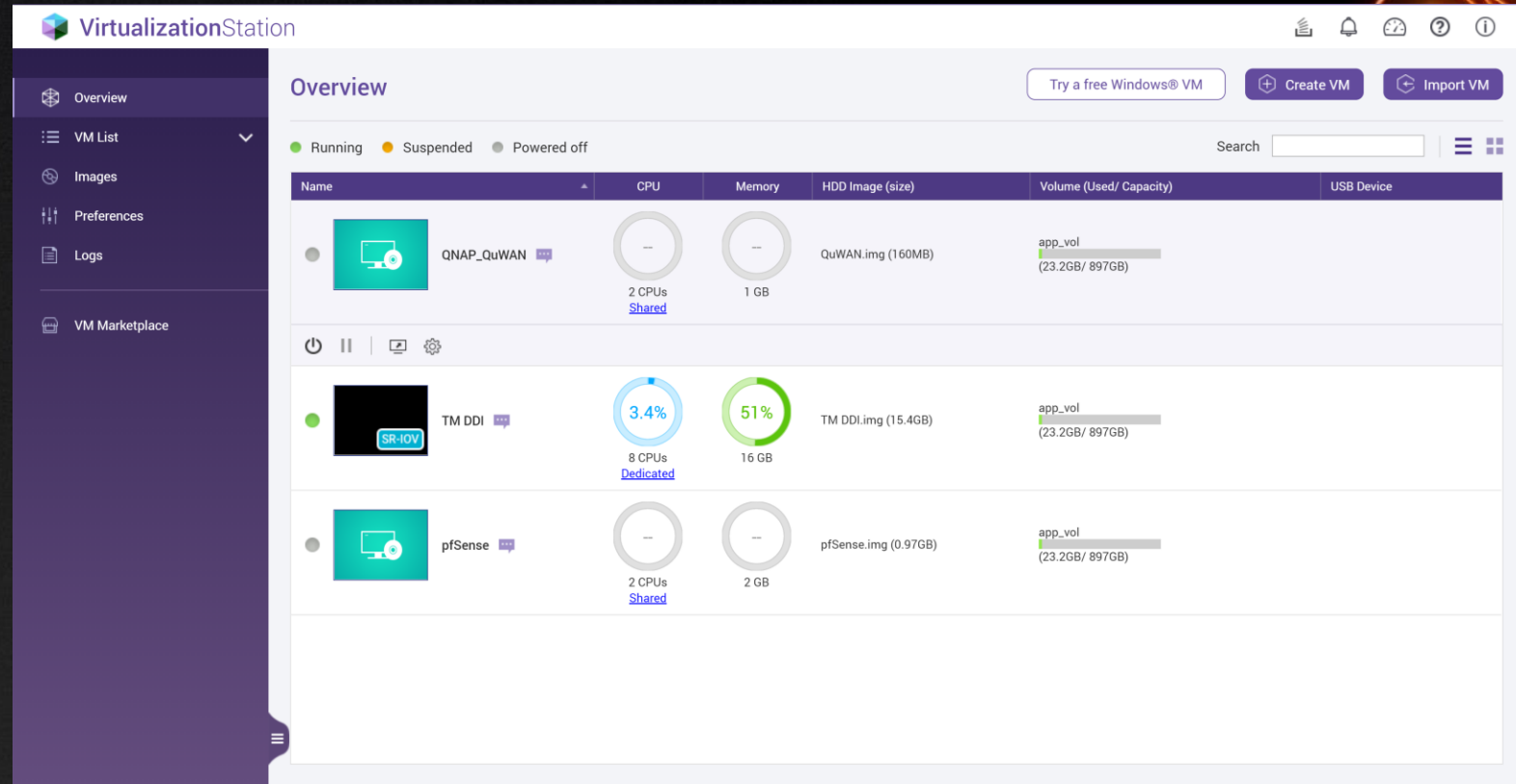


Virtualization Station (1)

Virtualization Station Manage all virtual machines

Overview

- VM status overview
- Configure resources for VMs



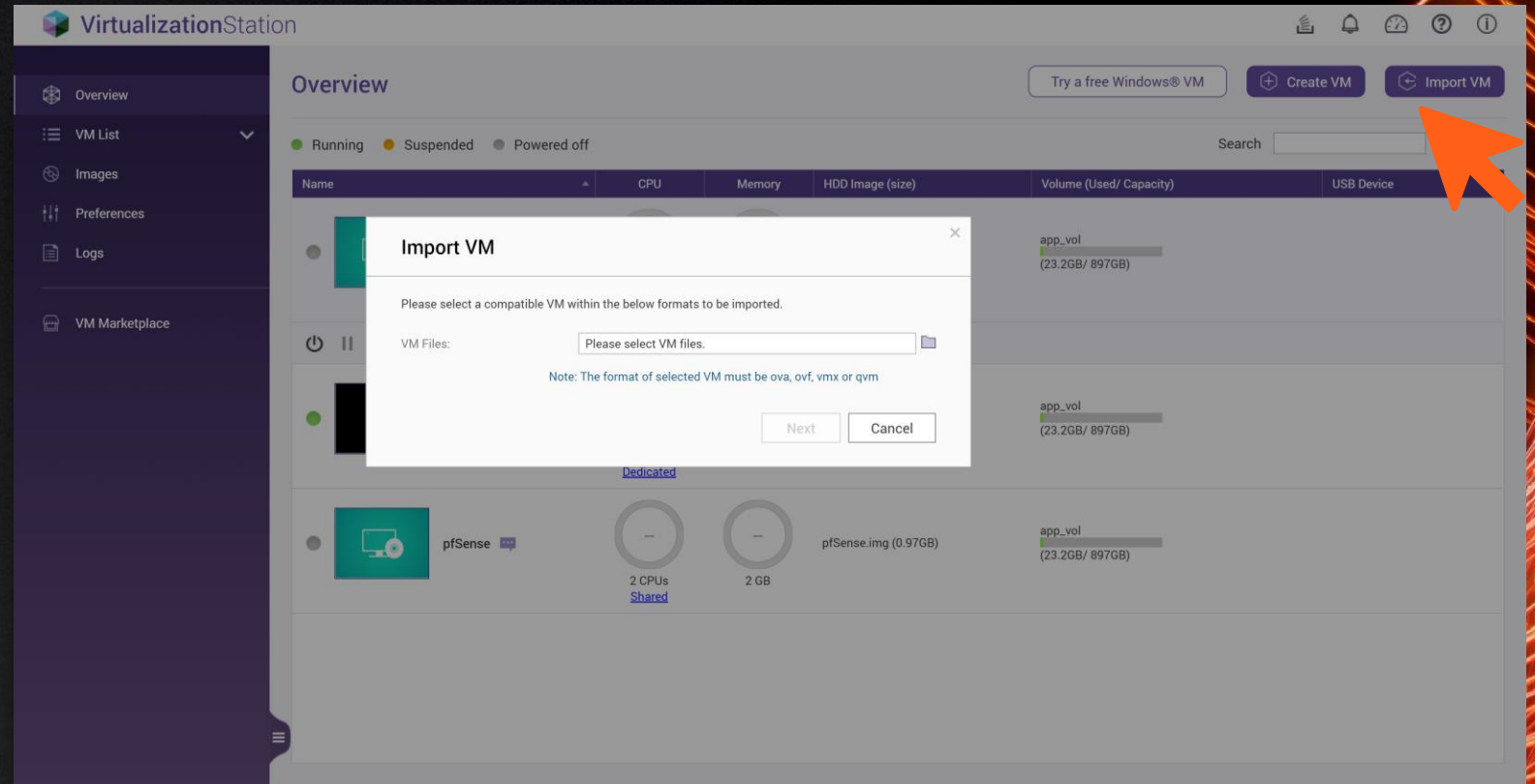
Virtualization Station (2)

Virtualization Station Manage all virtual machines

Import or build your VMs

- Upload installation ISO
- Or Import the VMs

Support ova, ovf, vmx, qvm

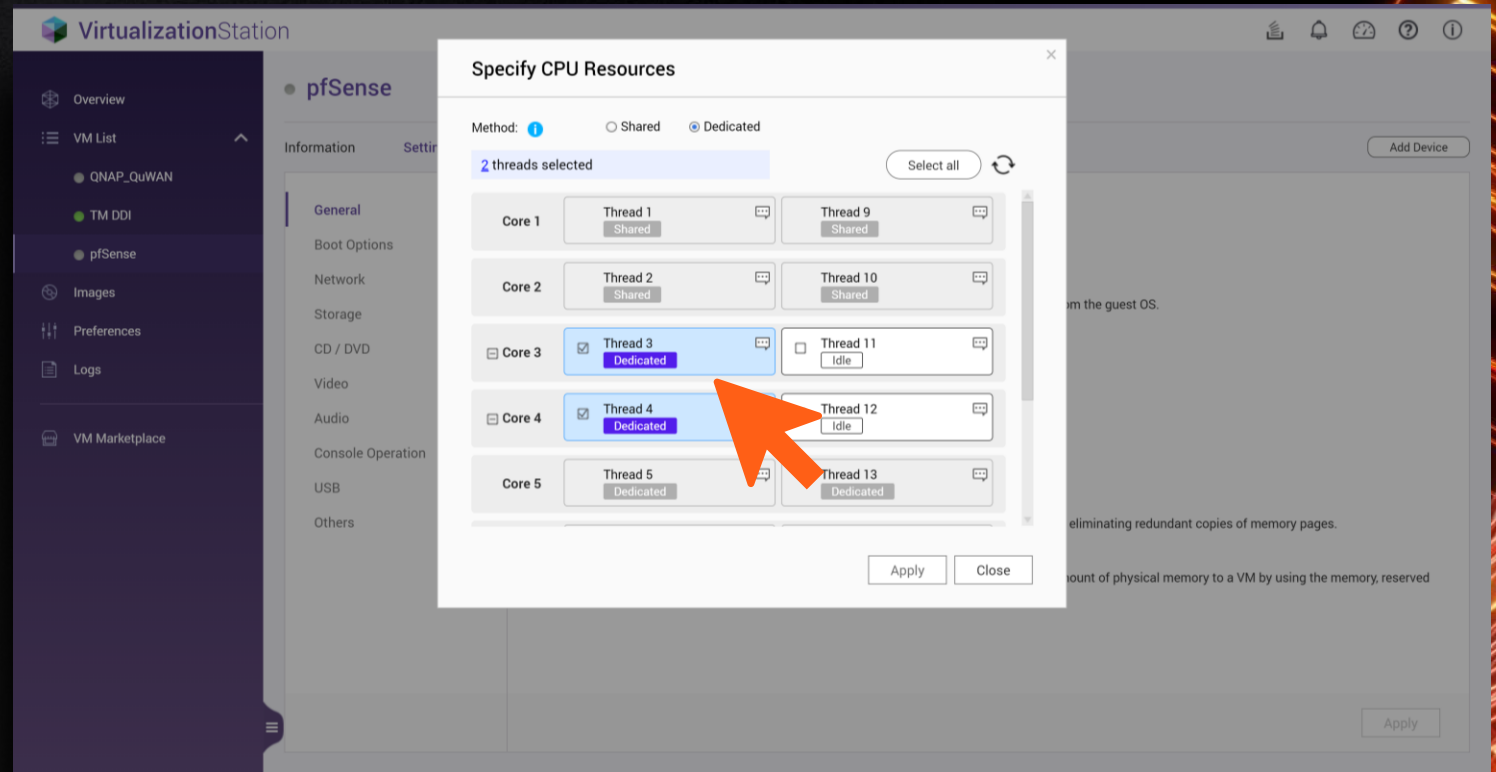


Virtualization Station (3)

Virtualization Station Manage all virtual machines

CPU Pinning

- Assign dedicated CPU for critical VMs (services)



Network performance acceleration

OVS-DPDK

Accelerate packet processing speed in between physical / virtual networks

SR-IOV

Accelerate 10Gbps+ Smart NIC via SR-IOV
Best-in-class passthrough for Smart-NIC

Intel @ QAT

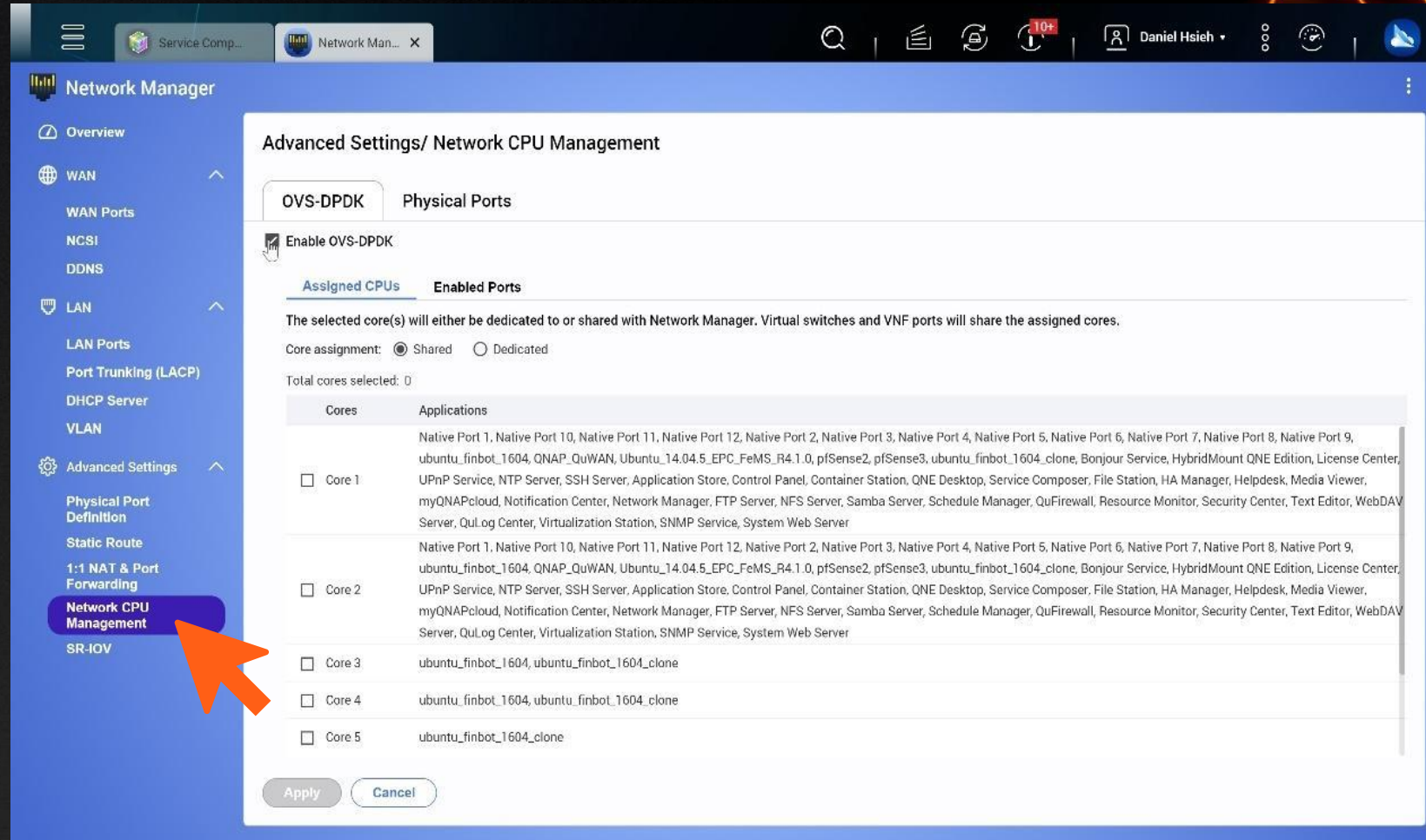
Speed up QuWAN or IPSec encryption and decryptions

*Note: QuCPE-7010-D2123IT-8G model has no Intel QAT support

OVS-DPDK

OVS-DPDK

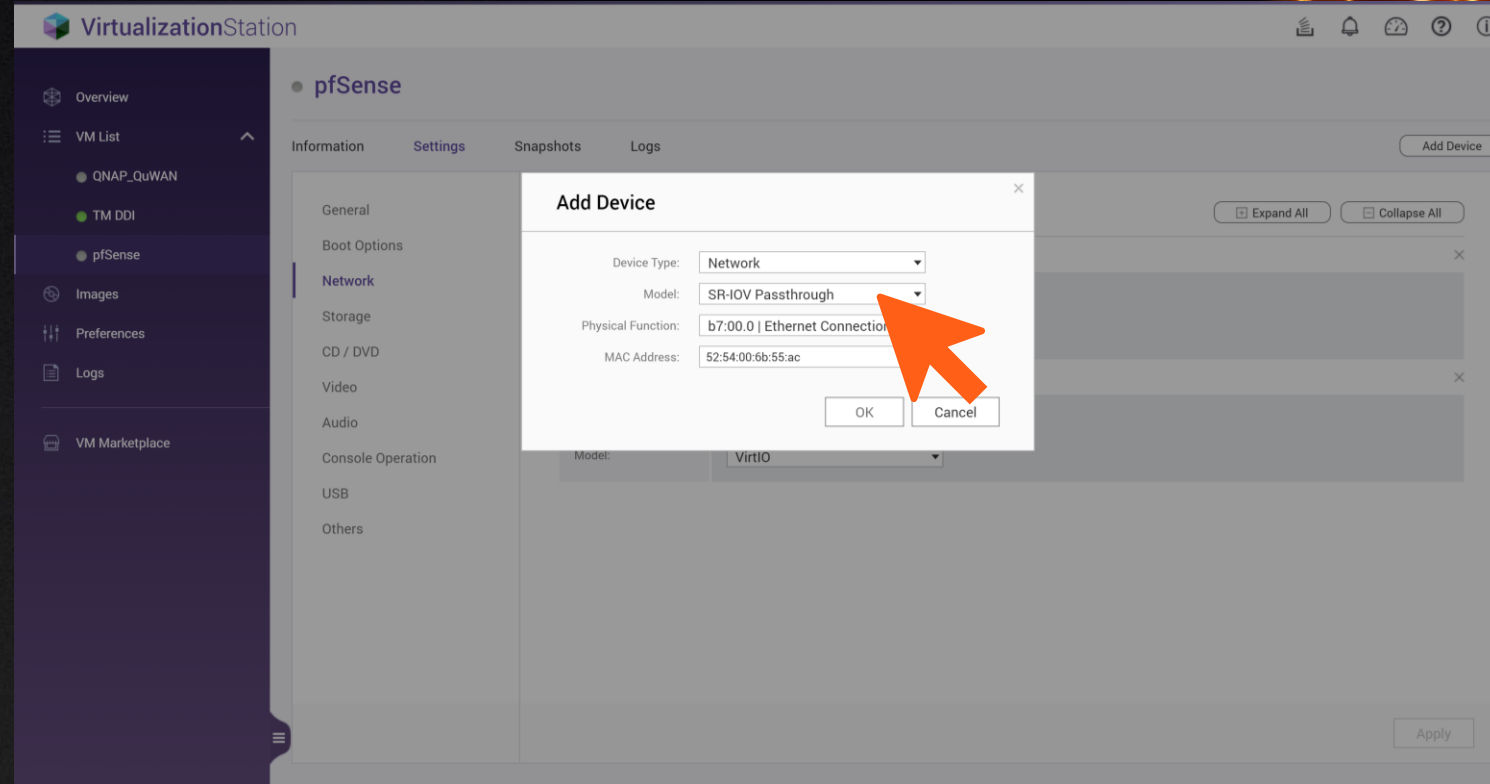
- Open vSwitch DPDK: Accelerate packet processing instead of kernel stacks
- Performance acceleration by assigning CPU cores



SR-IOV

Single-Root Input / Output Virtualization

- Accelerate Smart-NIC to gain best multiple-Gbps performance
- Virtualization Station >
 - Network
 - Add Device - **Smart NIC**
 - Set it as **SR-IOV passthrough**



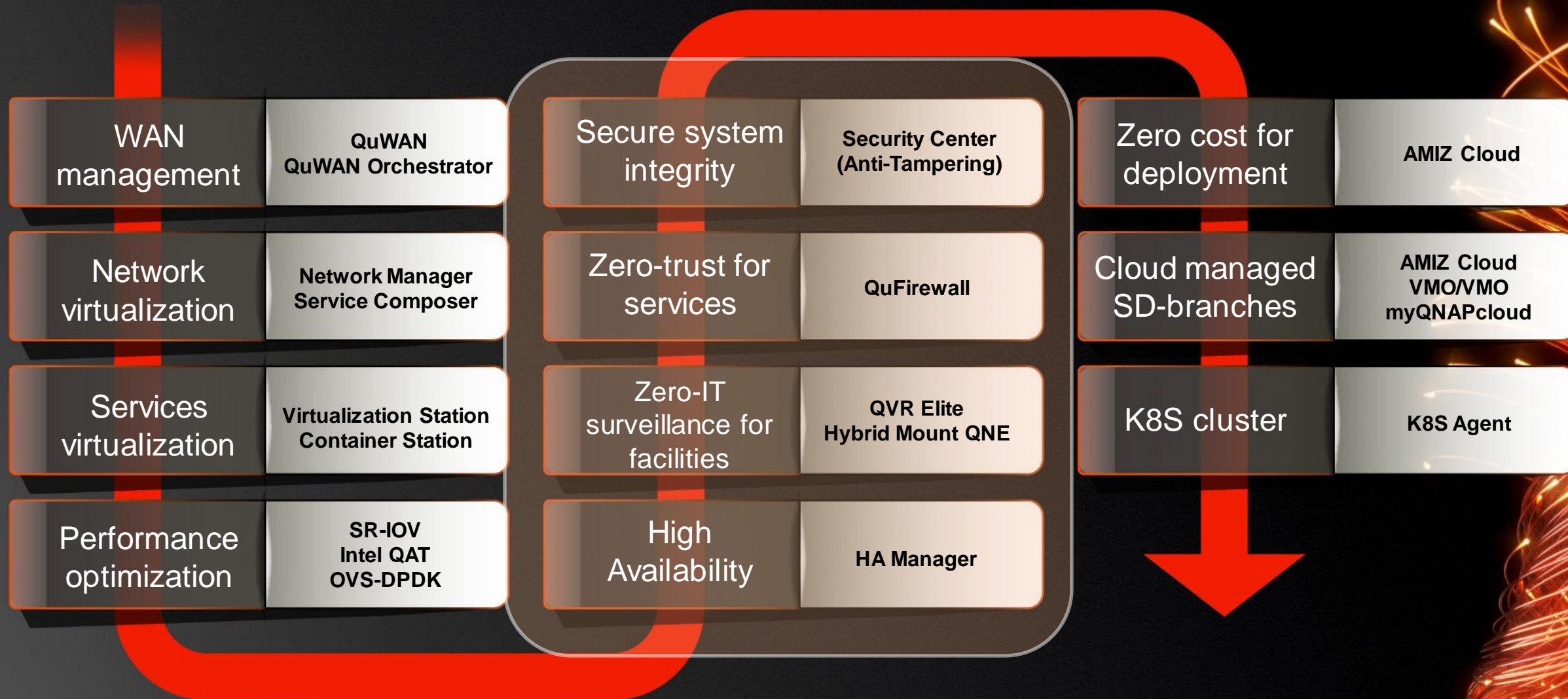
***Note:** SR-IOV could be enable on compatible NIC which include QuCPE-7010 10GbE SFP+ and 10GbE/25GbE expansion network module

The PLAYBOOK

Scenario

vApp

Steps



Security and reliability

Lean IT budget for
operation

Make
System
safe

HA for service and
business continuity

**Secure,
Reliable**

Monitor
branch IT
facility
easily

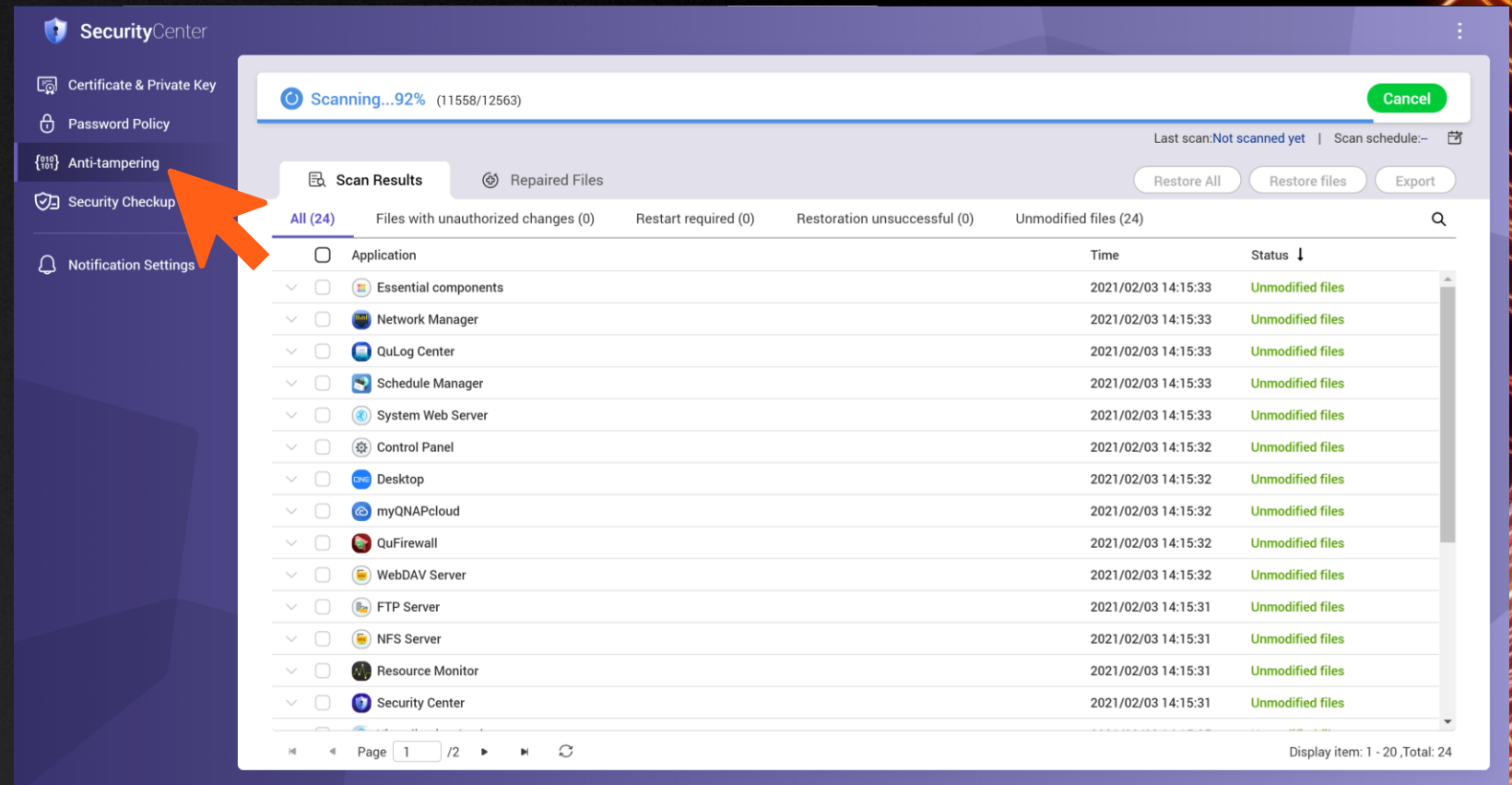
Prevent suspicious
Geo-IP accessing
QuCPE



Security Center – Anti-tampering

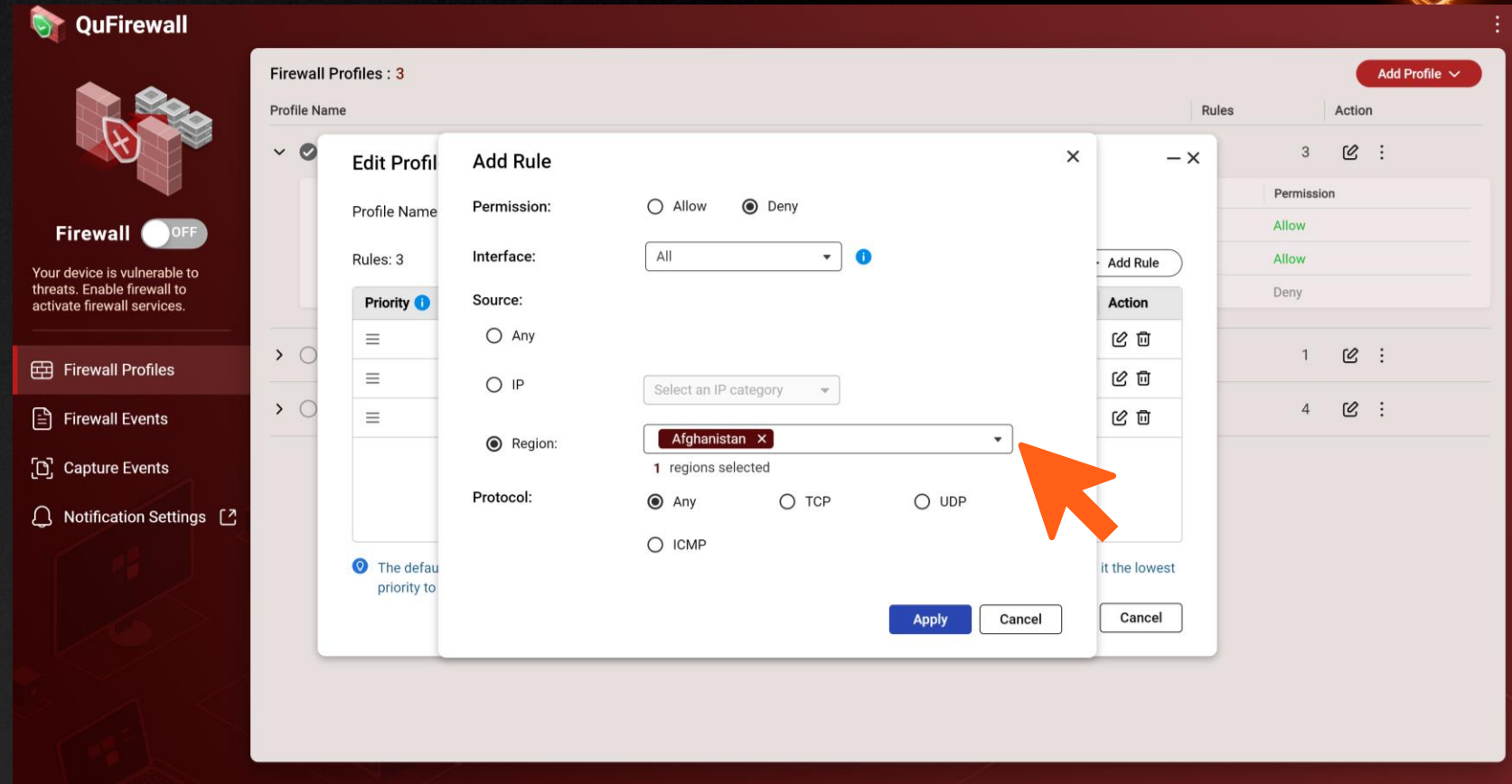
Anti-tampering

- Technologies to validate system integrity
- Prevent system being hacked and hidden for further attacks



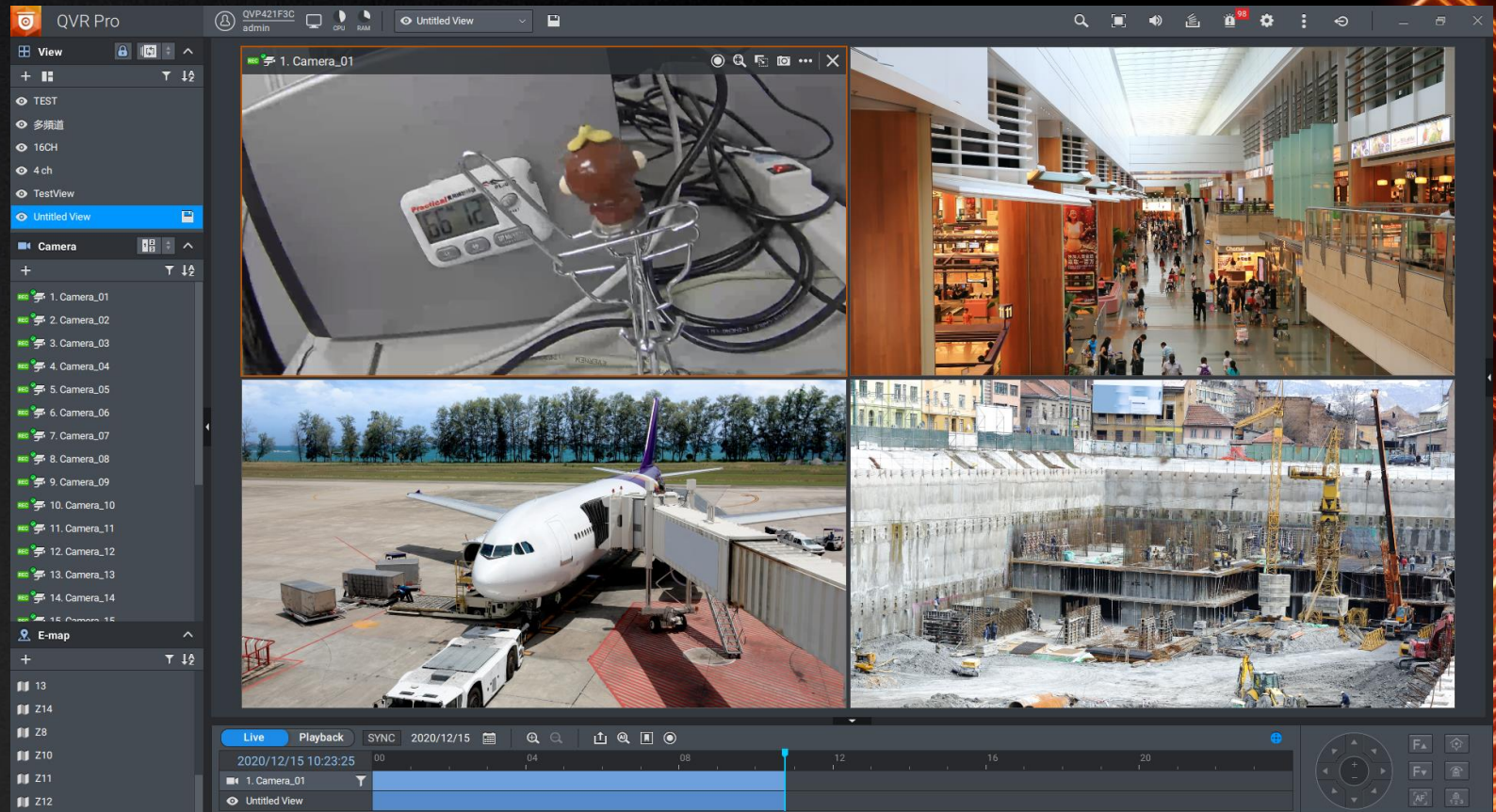
QuFirewall

- Firewall for QuCPE / QNE
- Prevent the suspicious access from certain regions
- Easily apply default rule by QuFirewall templates



QVR Elite – Branch or IT facility surveillance

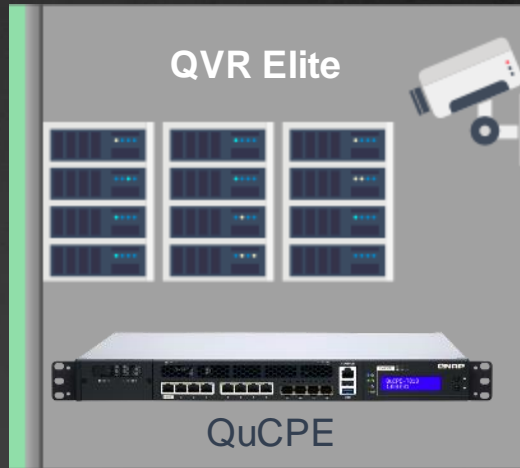
- Support 5,000+ IP Camera
- Easily setup and monitor IT facilities / rooms in the branches
- Budget-free for surveillances ^{*(1)} & ^{*(2)}



***Note 1:** QVR Elite (estimated) to release by 2021/Q2

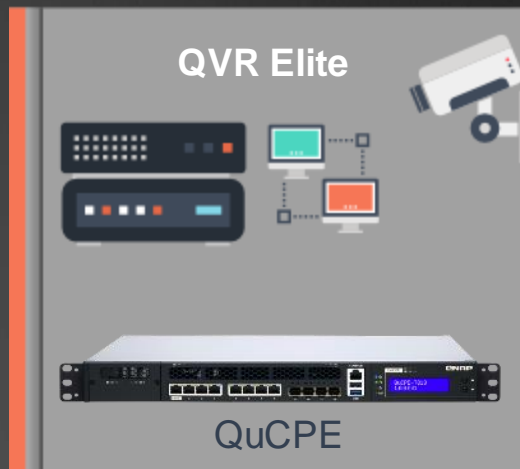
***Note 2:** QVR Elite support 2 channel / IP camera as free-of-charge

QVR Elite + HybridMount QNE Edition



HybridMount QNE Edition

IT
Rooms



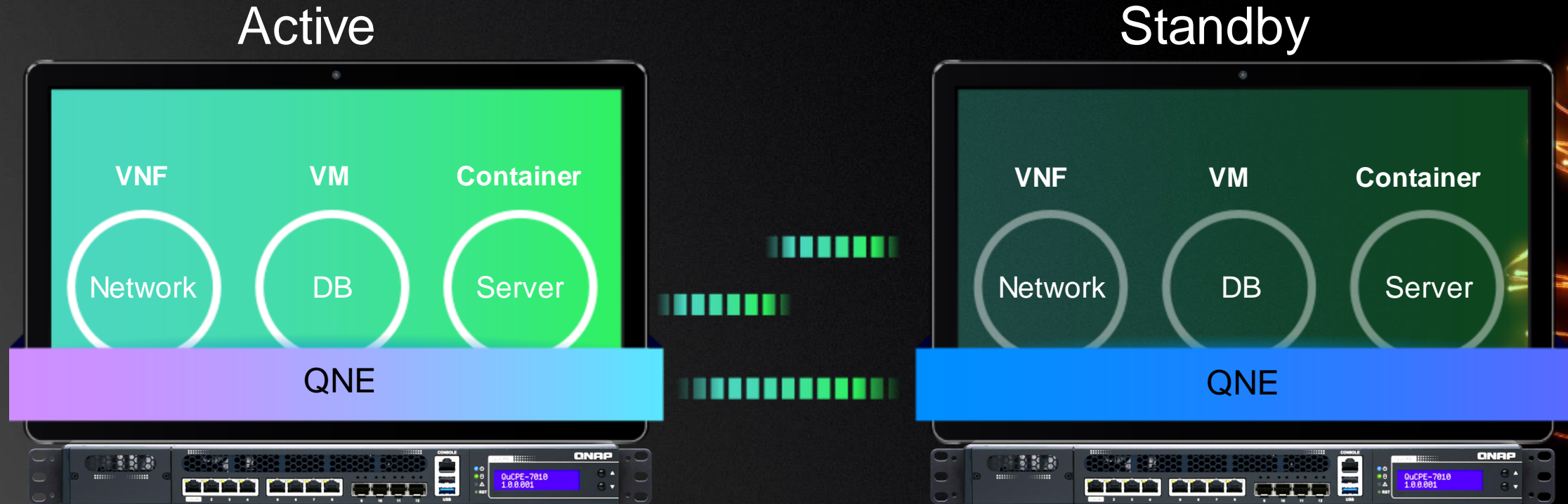
AIoT / OT
Equipment

HybridMount QNE Edition



- QVR Elite recording stores on HQ QNAP-NAS with HybridMount QNE
- Centralized auditing and no-risk to recording file missing

HA Manger – High availability of QuCPE

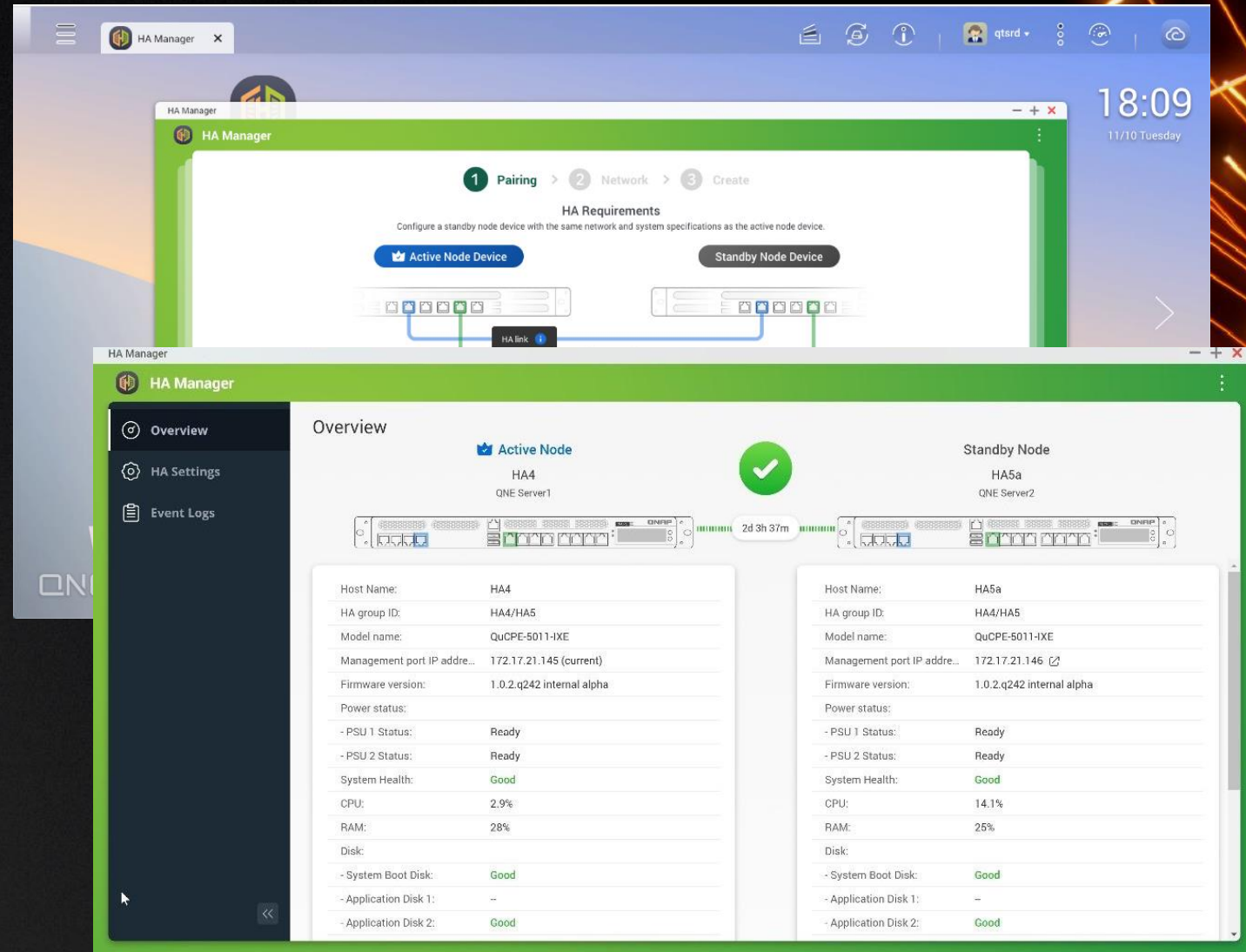


HA Manager will auto-sync the data of VM/Containers
From Active to Standby

* **Note:** HA function (estimated) release by 2021/Q2

HA Manger

- Wizard guides all setup
- Clear status of current HA setup and active / standby machine (QuCPE)



* **Note:** HA function (estimated) release by 2021/Q2

The PLAYBOOK

Scenario

vApp

Steps

WAN
management

QuWAN
QuWAN Orchestrator

Network
virtualization

Network Manager
Service Composer

Services
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Virtualization Station
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Performance
optimization

SR-IOV
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Zero-trust for
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QuFirewall

Zero-IT
surveillance for
facilities

QVR Elite
Hybrid Mount QNE

High
Availability

HA Manager

Zero cost for
deployment

AMIZ Cloud

Cloud managed
SD-branches

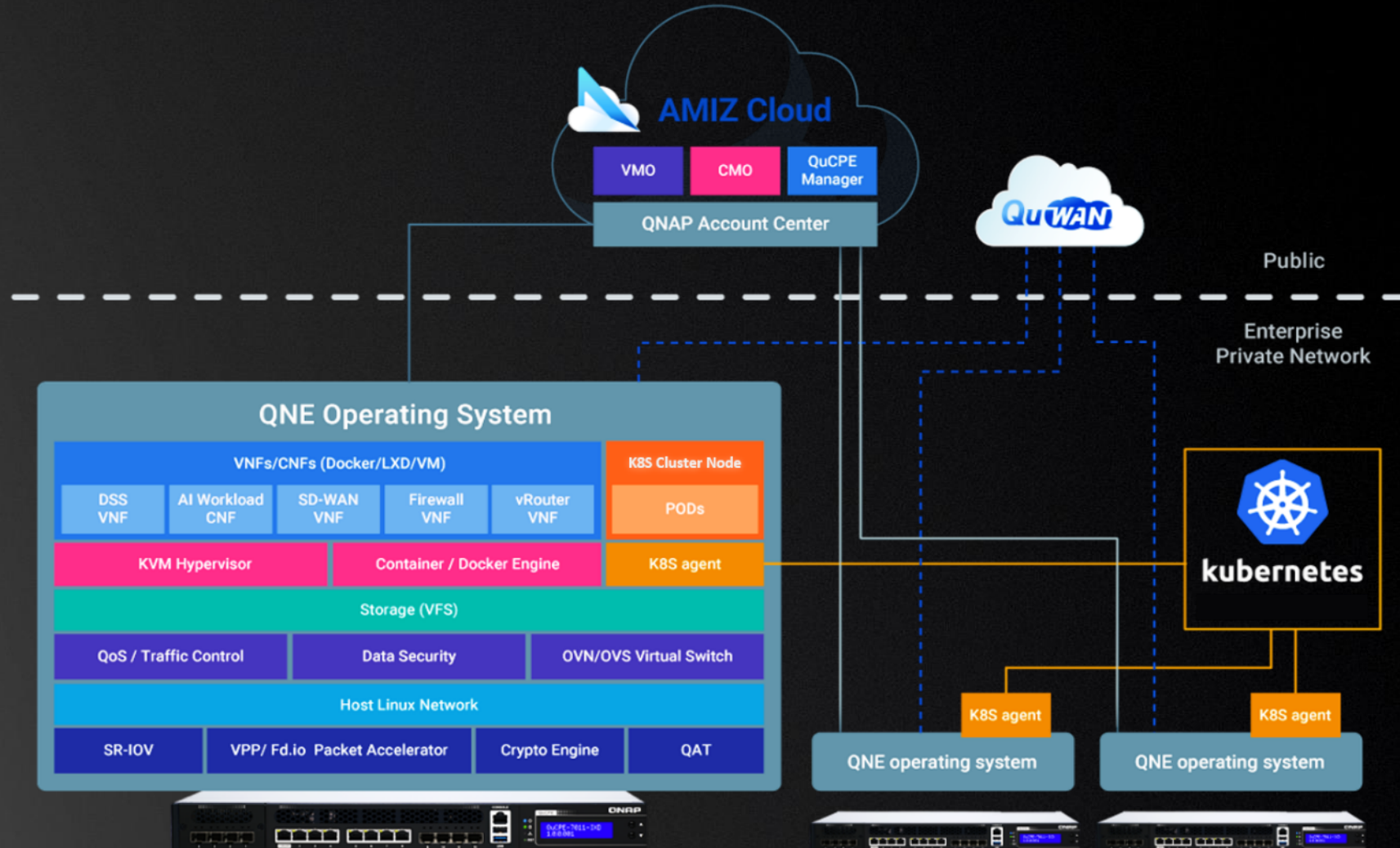
AMIZ Cloud
VMO/VMO
myQNAPcloud

K8S cluster

K8S Agent

AMIZ Cloud

Manage QuCPEs across multiple sites or organizations



Overview all QuCPE status from AMIZ Cloud

AMIZ Cloud monitors

- QuCPE alerts / warnings
- All managed QuCPE list
- Upgrade firmware or restart the machine, etc.

The image displays two overlapping screenshots of the AMIZ Cloud management interface. The top screenshot shows the main dashboard with a sidebar menu and several status cards. The bottom screenshot provides a detailed view of a specific device, 'WinnieQNE', with a context menu open for actions like 'Update Firmware' and 'Restart'.

AMIZ Cloud Dashboard Overview:

- Devices:** Caution status. Total: 3. Offline: 2, Alert: 0, Warning: 0, Good: 1.
- HA Groups (Coming Soon...):** Fully Operational status. Total: 0. Offline: 0, Error: 0, Warning: 0, Normal: 0.
- Virtual Machines:** Caution status. Total: 4. Offline: 1, Powered off: 2, Suspended: 0, Running: 1.
- Containers:** Caution status. Total: 1. Offline: 1, Stopped: 0, Paused: 0, Running: 0.

Alert Logs: Total: 0. Errors: 0. Timeline shows activity from 2021/02/01 06:27:38.

Device Details (WinnieQNE):

Hostname	Status	Site	myQNAPcloud Device Name	Model Name	Firmware V...	Serial Number	CPU Usage	Memory Usage
WinnieQNE	Alert	WinnieSite	WinnieQNE	QuCPE-5010-1XE	1.0.2.q232	Q18B112511	2.04%	45.39%

Context Menu Actions for WinnieQNE:

- Update Firmware
- Update Software Componen...
- Restart
- Shutdown
- Remove

VM and Containers management

Manage VM/CM @ Cloud

- Online/upgrade/shutdown (virtualized) service from cloud
- Create a service VM / container from cloud

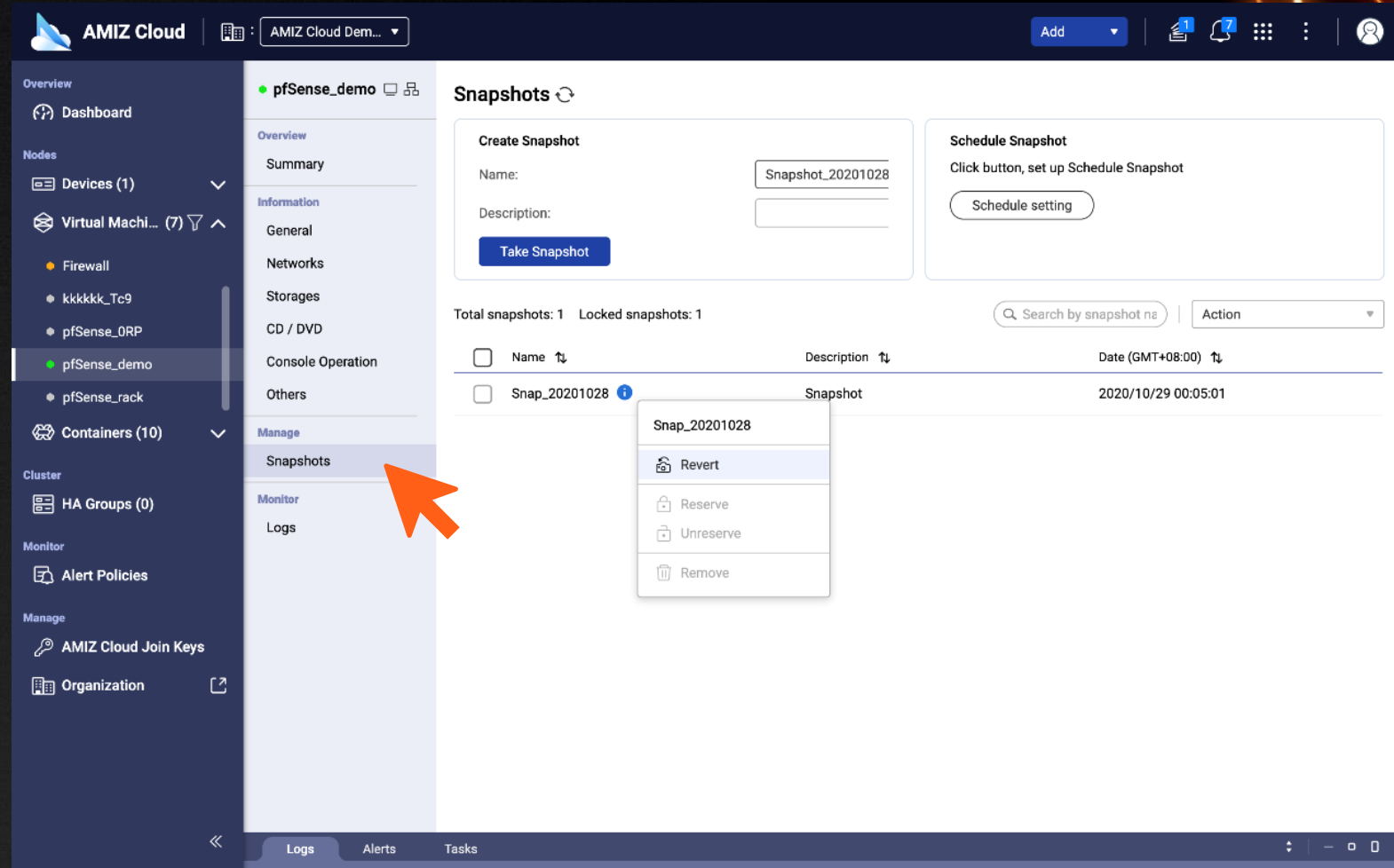
The screenshot displays the AMIZ Cloud management console. The left sidebar contains navigation options: Overview, Nodes, Cluster, Monitor, and Manage. The main panel shows a table of virtual machines with columns for VM Name, Status, Site, Host Device, OS Version, CPU, CPU Usage, Memory, Memory Usage, Total Disk Size, and Last St. A context menu is open for the 'demo' VM, showing actions like Start, Reset, Shutdown, Force Shutdown, Resume, Suspend, Take Snapshot, Clone, and Remove.

VM Name	Status	Site	Host Device	OS Version	CPU	CPU Usage	Memory	Memory Usage	Total Disk Size	Last St
AWS File Gatewa...	Powered off	WinnieSite	WinnieQNE	Generic	2	1.01%	4 GB	--	80 GB	2020/...
AWS Volume Gat...	Powered off	WinnieSite	WinnieQNE	Generic	2	--	4 GB	--	80 GB	--
Firewall	Suspended	WinnieSite	WinnieQNE	Ubuntu 17.0...	4	--	1 GB	--	250 GB	2020/...
kkkkkk_Tc9	Powered off	WinnieSite	WinnieQNE	Generic	2	--	4 GB	--	80 GB	--
pfSense_0RP	Powered off	WinnieSite	WinnieQNE	Generic	2	8.34%	4 GB	--	250 GB	2020/...
pfSense_d...	Running	WinnieSite	WinnieQNE	Generic	1	--	1 GB	--	250 GB	2020/...
pfSense_rack	Running	WinnieSite	WinnieQNE	Generic	3	14.75%	4 GB	--	250 GB	2020/...

Restore service: Snapshot

Snapshot over cloud

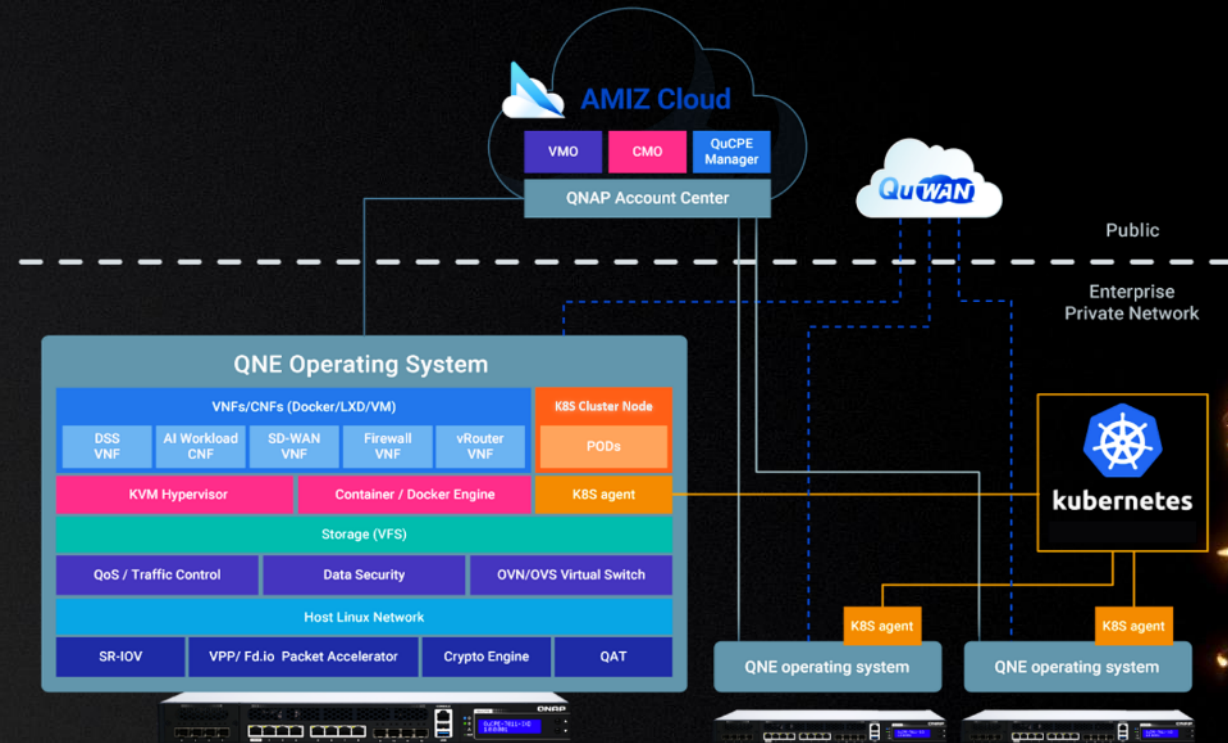
- Snapshot before service production
- Restore the production service in-time over cloud



Kubernetes integration for edge services

Manage and deploy services to Edge

- Seamless service deployment to QuCPE at edge
- Service management through Kubernetes^{*1}



^{*Note:} K8S Agent / Integration release date is estimated by 2021/Q2

^{*More information about Kubernetes :} <https://zh.wikipedia.org/zh-tw/Kubernetes>

QNAP

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SD-WAN / VNF / Intel Xeon® D
10G Network Virtualization Equipment



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