適用於最新雲端資料中心的超融合HCI 架構

AIC營邦企業-前瞻技術研發中心
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Outline:

- About AIC
- Traditional virtualization architecture and HCI
- HP20x series design for HCI
- Intel Eagle Stream and AIC HP202-KT
- HCI solution
- Partner's virtualized HCI system
- HCI All-In-One appliance
- Use Case

關於營邦企業 AIC (1/2)

Fremont, California

New Jersey

Netherlands

1996 Founded in Taoyuan, Taiwan.

2000 Moved HQ office and plant to Luchu, Taoyuan and increased production capacity threefold.

2001 Established Subsidiary in City of Industry, California, USA.

2003 Established Sales Office in East Hanover, New Jersey, USA.

2004 Established Subsidiary in the Netherlands.

2007 Built Plant-II in Dachu Industrial Zone, Taoyuan, Taiwan.

2008 Established Sales Office in Shanghai, China.

2013 Taipei Exchange Market Public Listed.

2015 Q2 – New HQ Building Established at Ching-Pu, Taoyuan City.
Q3 – Established Sales Office in Fremont, California, USA.
Q4 – Established Sales Office in EMEA.

2018 Built Plant-III and Plant-IV with automated production lines in Dachu Industrial Zone, Taoyuan, Taiwan.

2020 China sales office scaled up and established as a subsidiary

Taiwan (Global HQ)

EMEA

China

關於營邦企業 AIC (2/2)

AIC HQ

4.5km
(10 mins by car)

Plant 1

120m

Plant 2

70m

Plant 3

30m

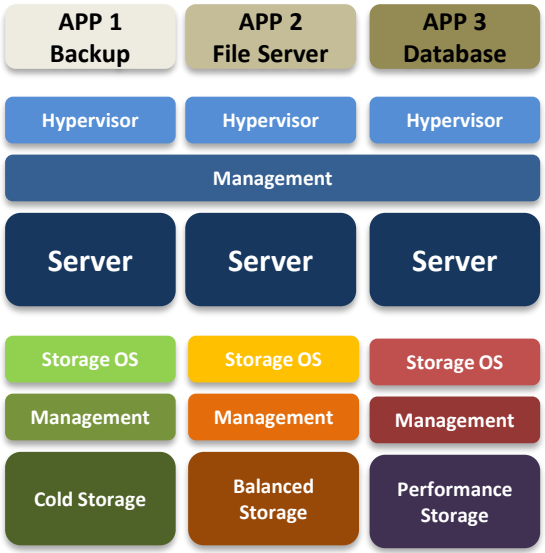
Plant 4

Sales & Marketing, R&D Center
No. 152, Linghang North Road, Section 4th,
Dayuan District, Taoyuan City, Taiwan 337

Traditional Virtualization Architecture and HCI (1/2)

Traditional

Purpose built standalone hardware managed independently or with common protocol

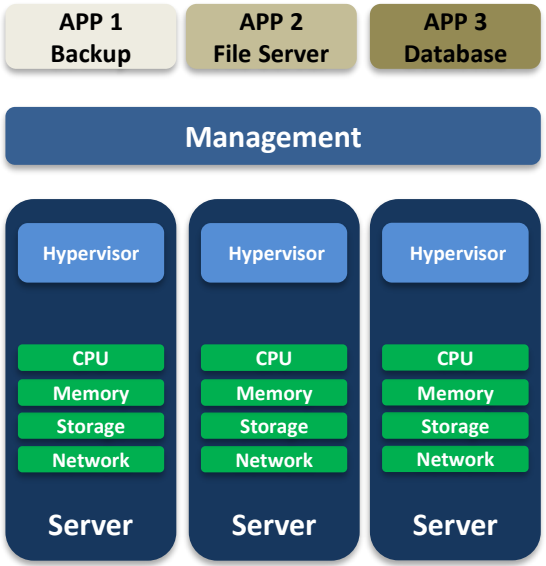


Simplified Hardware and Management

One type of storage for all types of application?

Hyperconverged

Converged and homogenous hardware with unified management



Traditional Virtualization Architecture and HCI (2/2)

MEC

·Flexibility Intel and AIC platforms ensure the best cost scenario
· High Density Compute

HCI

·Cluster in a box for easy deployment
· High density compute, storage, and network

HPC

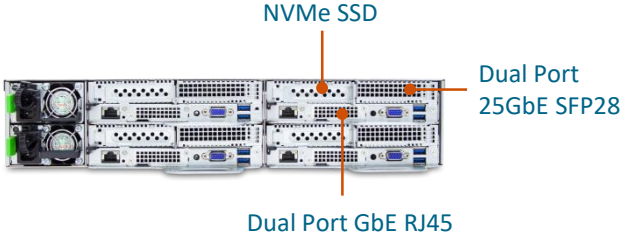
·8 CPU + 64 DDR4 + 24 NVMe SSD +
12 PCIe x16 adapters all in 2U space

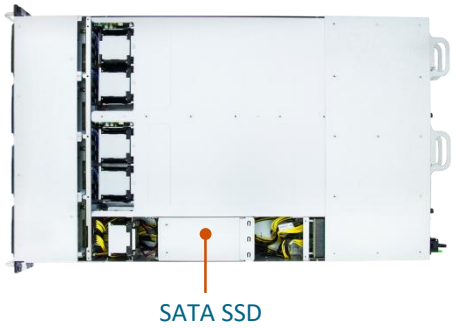
HP20x series design for HCI (1/2)

Traditional + **Hyperconverged**

- ★ **Multi-Tier Storage Support**
- ★ **Configerable Resiliency-Policy options**
- ★ **Heterogeneous Hardware Support**

Easy to Manage HCI Soiution with Storage Options that adapt different Application Needs.





Customer preference

·HCI Appliance:

Easy to deploy, Virtualization + Storage + Network Cluster-In-a-Box

·Different storage media types for Storage Tiering

·Expansion flexibility for different network requirements

HP20x series design for HCI (2/2)

- **HP201 series**
- **24x total 2.5” NVMe drives**

  - 6x NVMe drives per node

- **HP202 series**
- **12x total 3.5” SATA/SAS drives**

  - 3x SATA/SAS drives per node

24 x NVMe

12 x 3.5” SATA/SAS

Intel Eagle Stream and AIC HP202-KT (1/3)

4th Gen Intel® Xeon® Scalable Processors are Redefining Performance

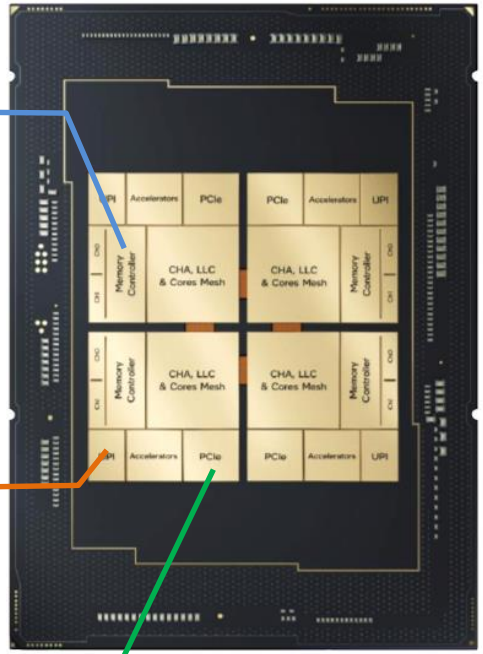
Formerly codenamed Sapphire Rapids

8ch DDR 5 (per CPU)

Redefine performance with 4th Gen Intel® Xeon® Scalable processors—featuring built-in accelerators to improve performance across the fastest-growing workloads in AI, analytics, networking, storage, and HPC.

- AI gets even better with all-new Intel® Advanced Matrix Extensions (Intel® AMX), delivering exceptional AI training and inference performance through accelerated matrix multiply operations.
- Other seamlessly integrated accelerators speed up data movement and compression for faster networking, boost query throughput for more resp
queue management to dynamically balance loads
- By making the best use of CPU core resources, built-in accelerators can result in more efficient utilization and power efficiency advantages, helping businesses achieve their sustainability goals.
- Intel® Software Guard Extensions (Intel® SGX) and other security features help bring a zero-trust security strategy to life while unlocking new opportunities for business collaboration and insights—even with sensitive or regulated data.

UPI 2.0 (Up to 4 UPI links)



Built-In Accelerators & Security

PCIe 5.0(Up to 2X vs. PCIe 4.0)

Intel Eagle Stream and AIC HP202-KT (2/3)

Front View

12 x 3.5" hot swap drive bays

Rear View

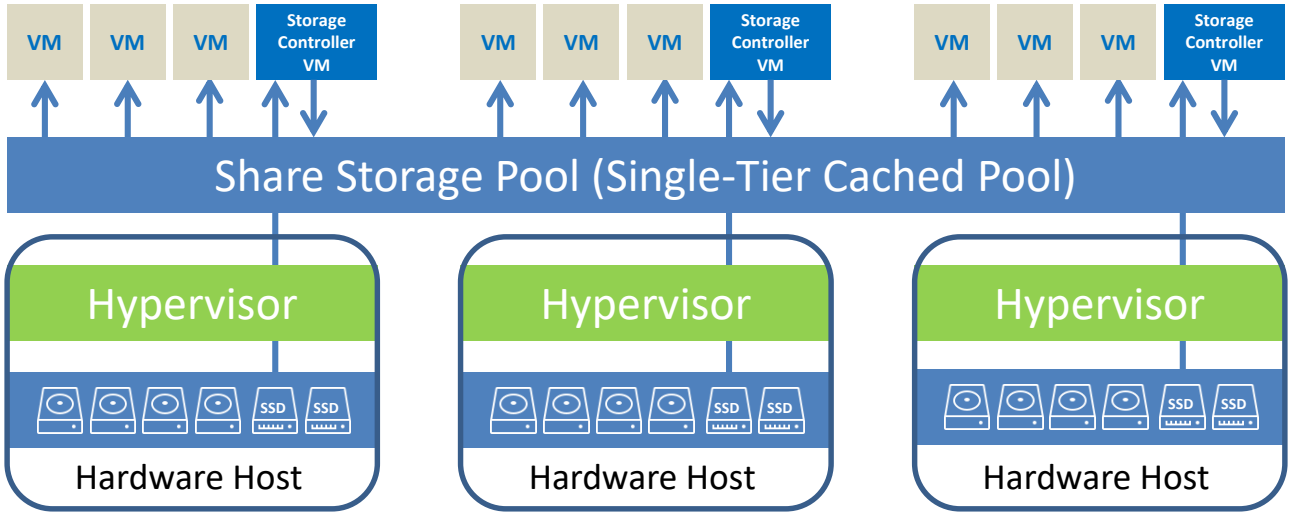
Model	4th Gen. Intel® Xeon®	AIC HP202-KT
Specifications		
Multi-node Server	4th Gen. Intel® Xeon® Scalable processors 2U4Nodes	
Motherboard	AIC Kratos	
Processor	Intel® next Gen Sapphire Rapids–SP/ Emerald Rapids-SP Family Processors UPI 2.0 up to 16GT/s	2 x Socket E2: 4677 pins
Chipset	Intel® Emmitsburg PCH	
System Memory (Per node)	DDR5 up to 5600 MTs	16 x DDR5 DIMM slots
Drive Bays (Per node)	3 x 3.5" hot-swap (12 x drives total)	
Expansion Slots (Per node)	PCIe 5.0	• 2 x PCIe X16 slots (HHHL) • 1 x OCP 3.0 bay (PCIe X16 width)
Riser Cards (Per node)	PCIe 5.0	• 1 x BRC-PE10050AA01 PCIe 5.0 x16 (Left side) • 1 x BRC-PE10051AA01 PCIe 5.0 x16 (Right side)

Intel Eagle Stream and AIC HP202-KT (3/3)

AIC HP202-KT
Key Features
•2U 4-Node hybrid storage server supports 12 hot swap 3.5” SATA/SAS drive bays
•Supports 4th Gen. Intel® Xeon® Scalable processors (Sapphire Rapids)
•Maximizing the use of the processor, memory, and add-on cards in one single system
•Onboard Baseboard Management Controller for system management and IPMI control
•3 x PCIe Gen5 X16 extensions on each node
•3 x 3.5" hot-swap (12 x drives total)
•Front-to-back airflow and easy swap redundant fans to provide optimal thermal conditions

HCI solution (1/4)

Mainstream HCI Architecture



Pain Point

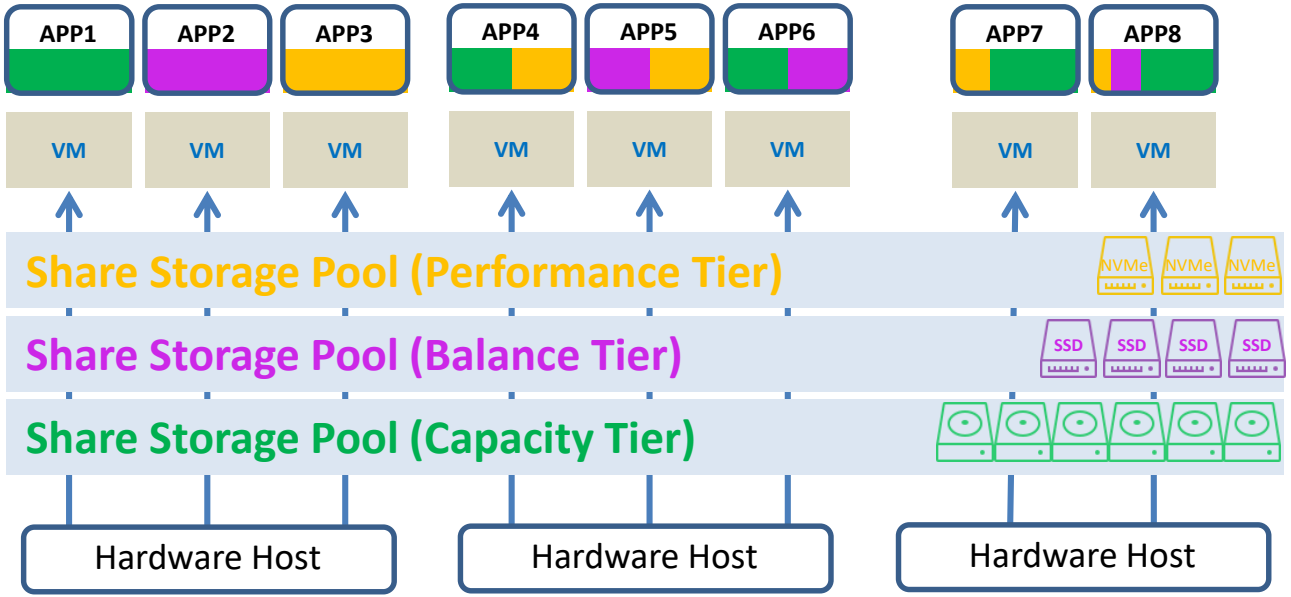
Mainstream HCI solutions only support a Single Storage Tier

Pain Point

Pre-defined cache ratio which can not be adjusted according to each application

HCI solution (2/4)

- **Multi-Tier Storage:** Assign different type of storage media according to the needs of your applications.
- **Composable:** Cache or no cache? Compose according to your applications.
- **Proprietary Resource Scheduler**: Automatically finds hosts with available hardware resources to launch VM.

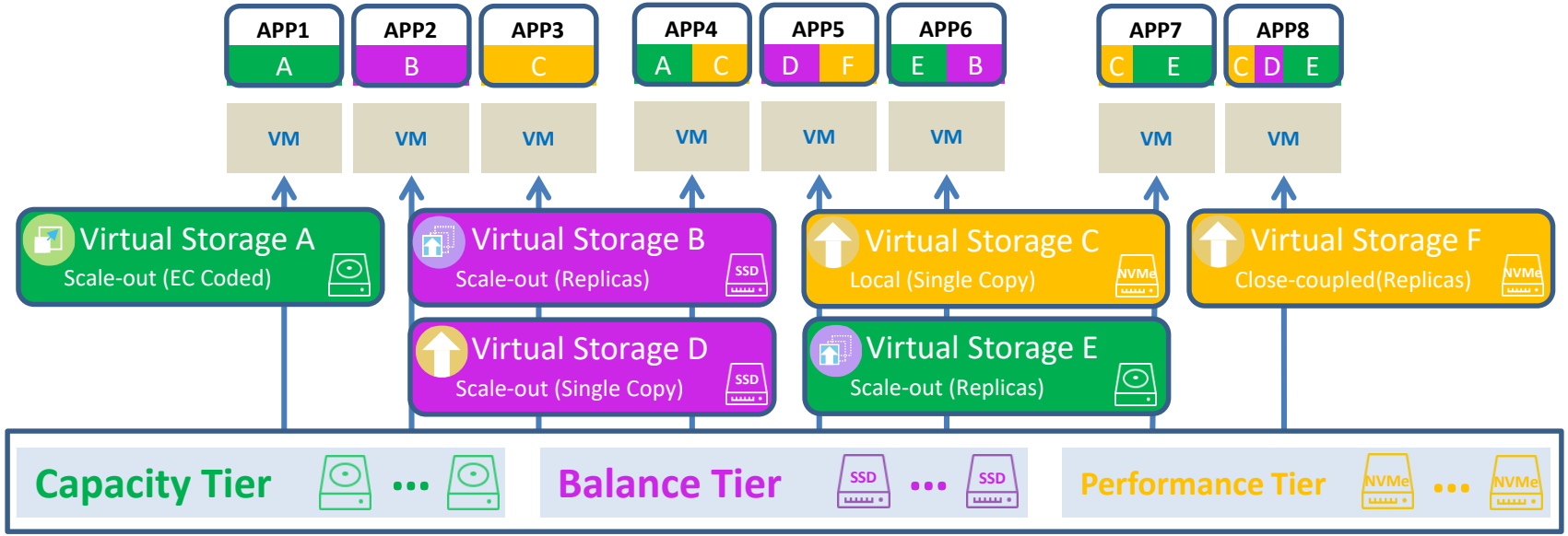


HCI solution (3/4)

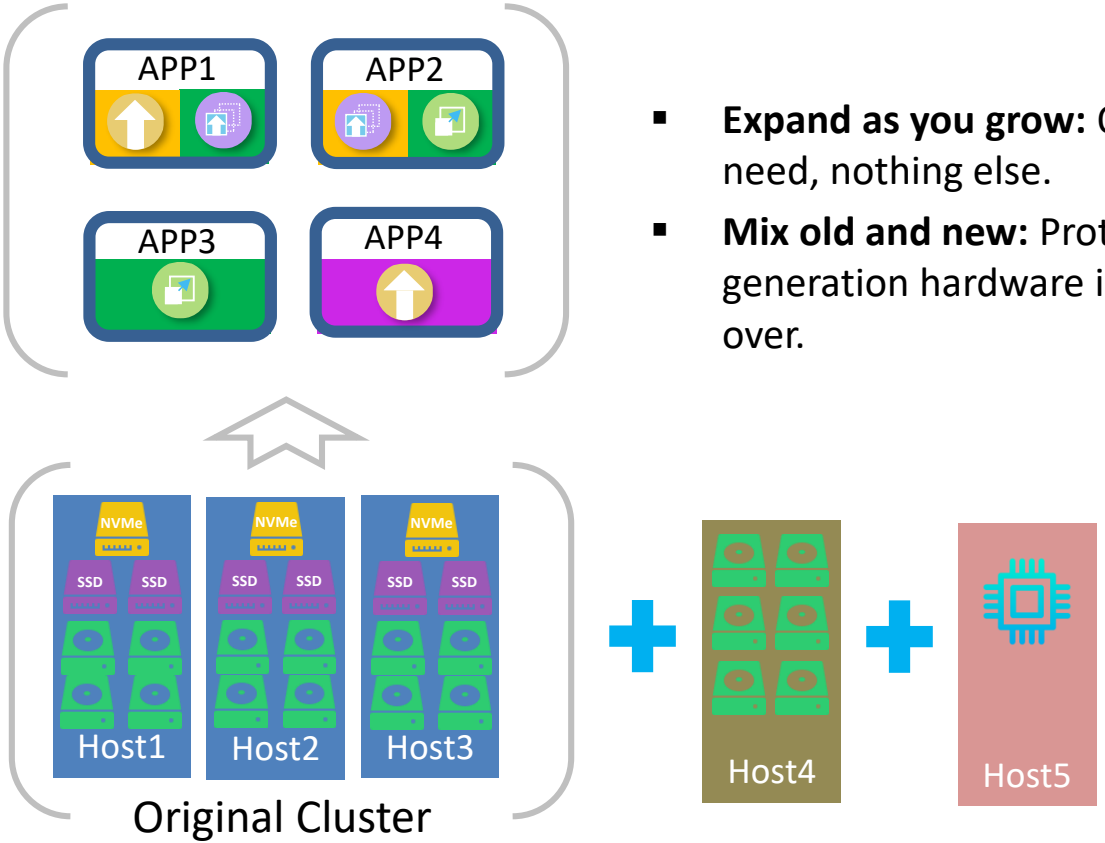
Local: Single Local Copy VM Disk that provides the Highest performance but no protection

Close-coupled: User defined number of replicas that protects data with *minimum performance penalty* at the *expense of disk space*.

Erasure Coding: User defined EC ratio that protects data with *minimum sacrifice of disk space* at the *expanse of performance*.

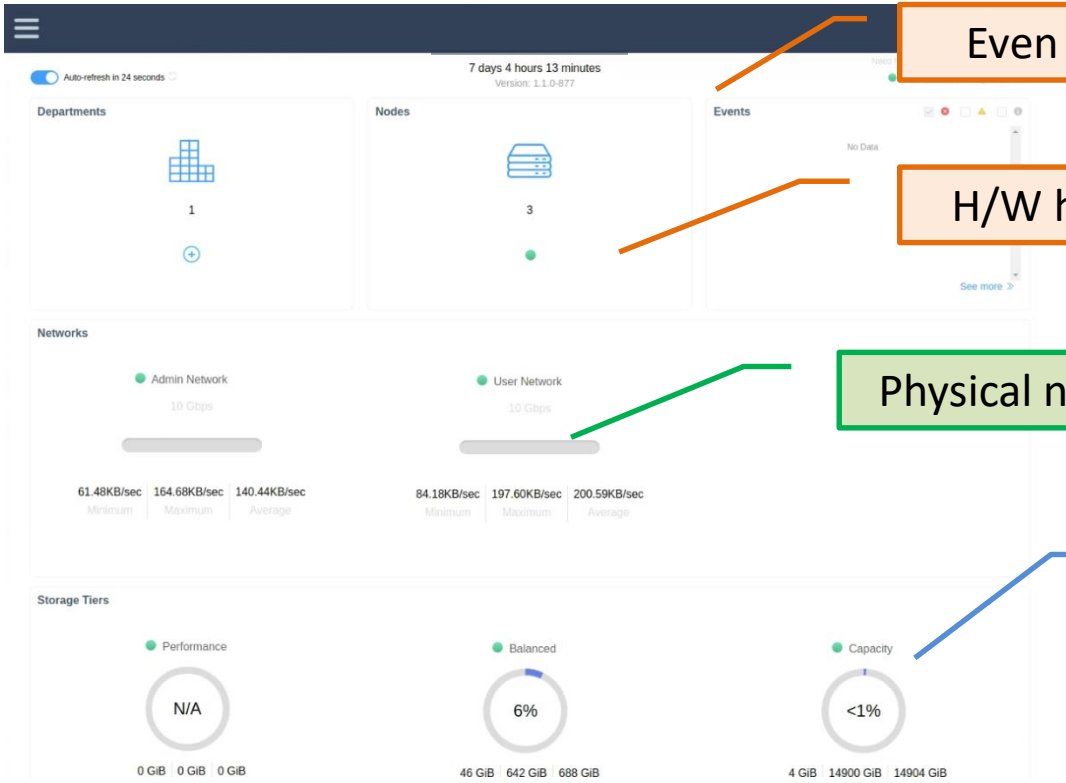


HCI solution (4/4)



- **Expand as you grow:** Only purchase the equipment that you need, nothing else.
- **Mix old and new:** Protect your investment by adding new generation hardware into existing cluster instead of starting over.

Partner's virtualized HCI system (1/6)



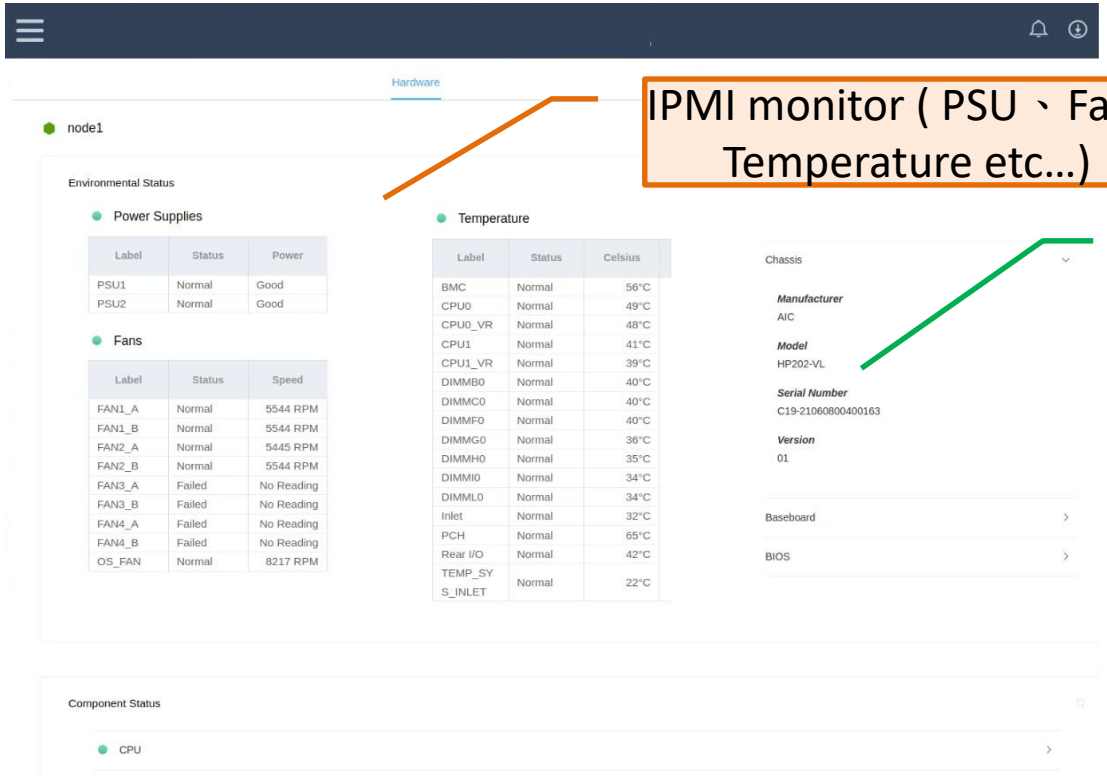
Even monitor

H/W health management

Physical network monitor

NVMe、SATA SSD and HDD usage

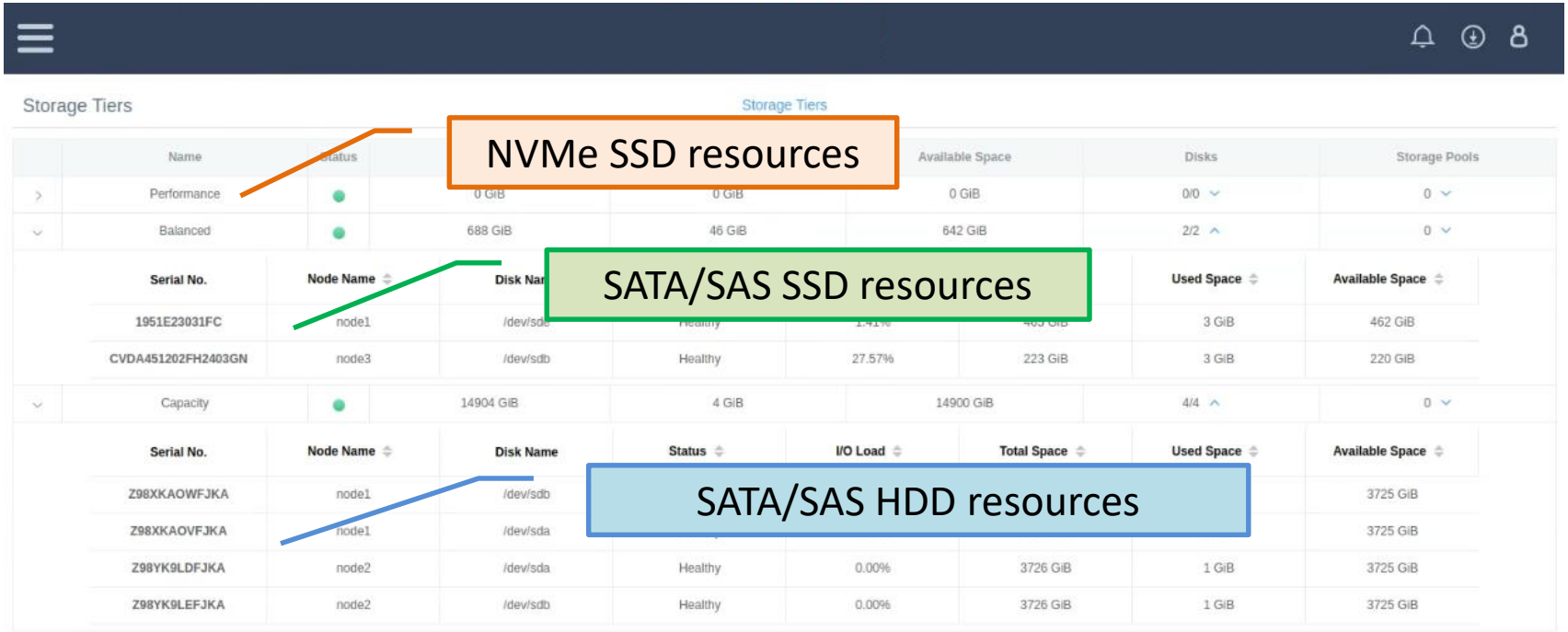
Partner's virtualized HCI system (2/6)



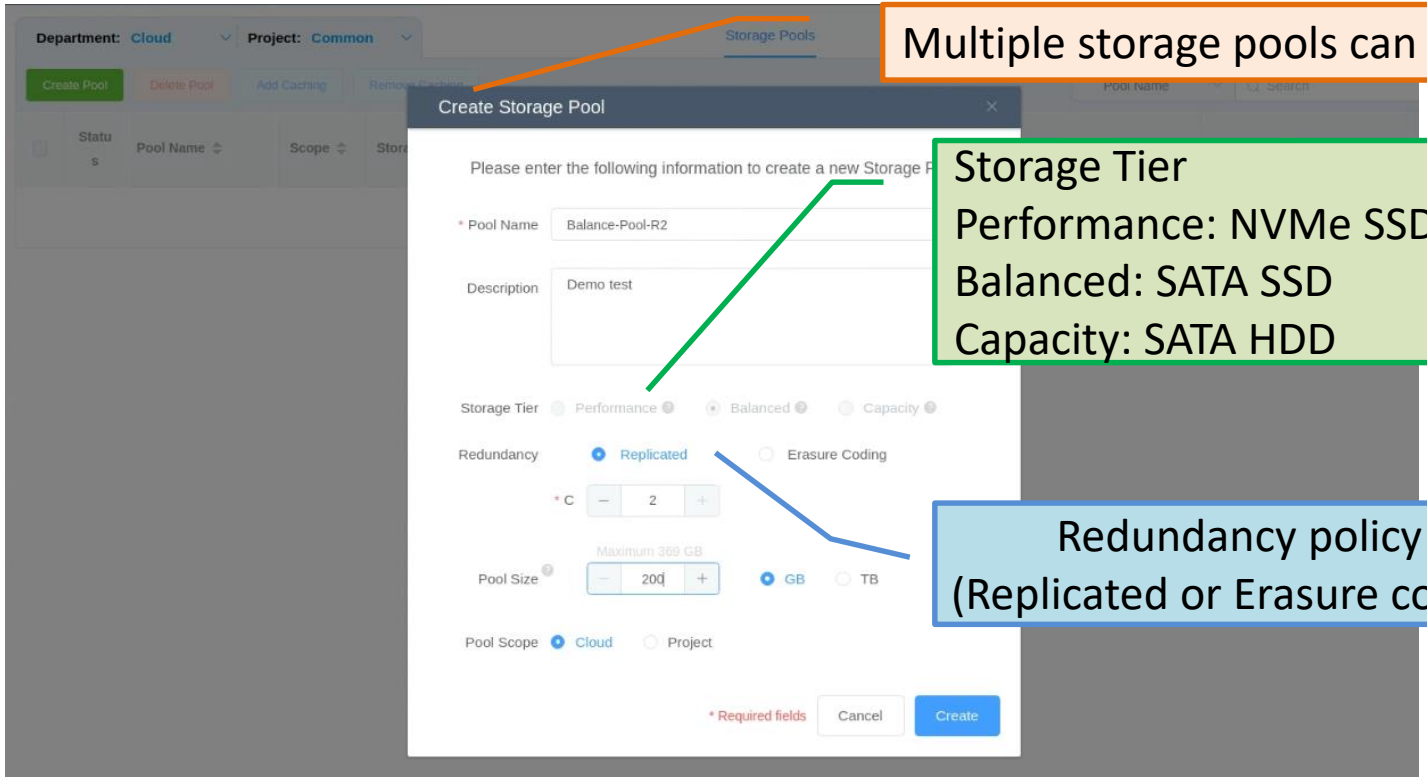
IPMI monitor (PSU、Fans、Temperature etc…)

Chassis information (Vendor、Model、F/W version)

Partner's virtualized HCI system (3/6)



Partner's virtualized HCI system (4/6)

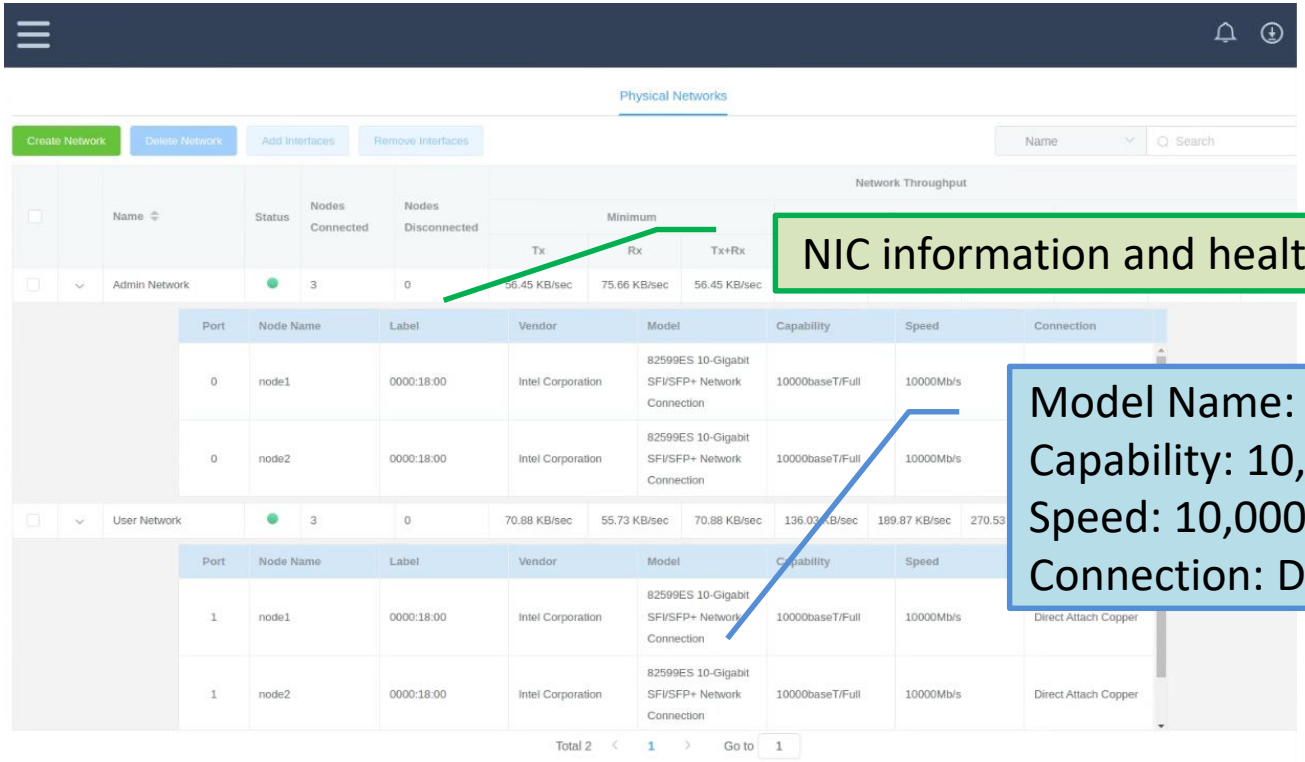


Multiple storage pools can be customized

Storage Tier
Performance: NVMe SSD
Balanced: SATA SSD
Capacity: SATA HDD

Redundancy policy
(Replicated or Erasure coding)

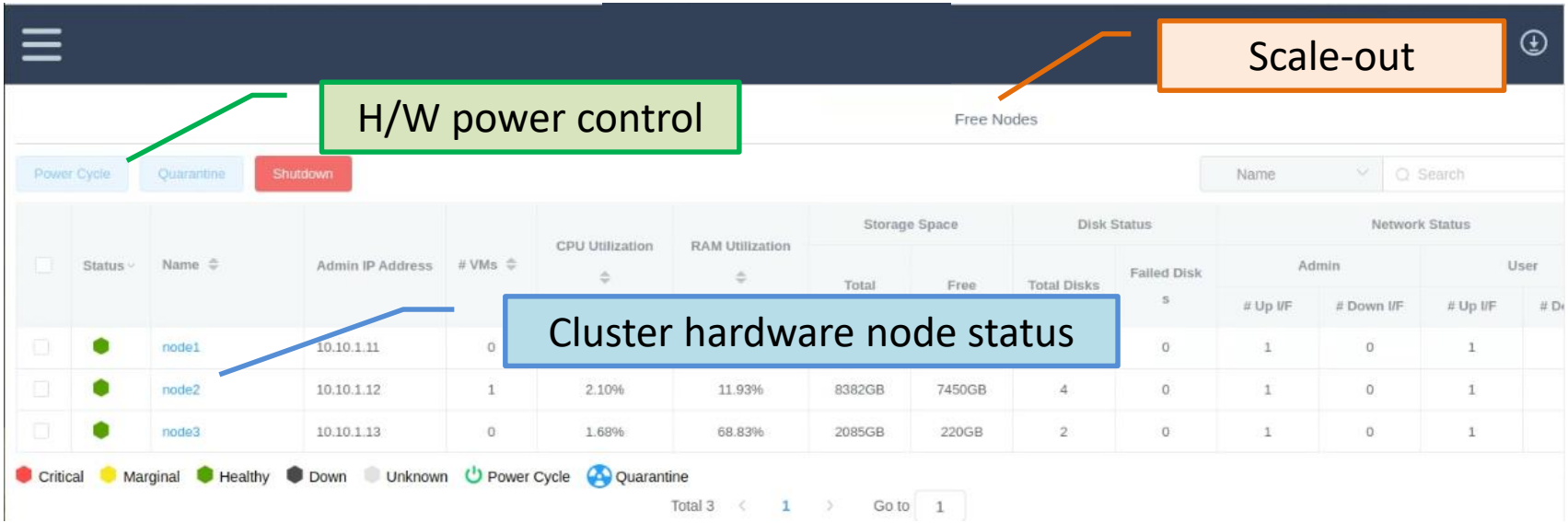
Partner's virtualized HCI system (5/6)



NIC information and health status

Model Name: Intel 82599
Capability: 10,000BaseT/Full
Speed: 10,000Mb/s
Connection: DAC cable

Partner's virtualized HCI system (6/6)



Status	Name	Admin IP Address	# VMs	CPU Utilization	RAM Utilization	Storage Space		Disk Status		Network Status			
						Total	Free	Total Disks	Failed Disks	Admin # Up I/F	Admin # Down I/F	User # Up I/F	User # D
	node1	10.10.1.11	0						0	1	0	1	
	node2	10.10.1.12	1	2.10%	11.93%	8382GB	7450GB	4	0	1	0	1	
	node3	10.10.1.13	0	1.68%	68.83%	2085GB	220GB	2	0	1	0	1	

HCI All-In-One Appliance (1/2)

2.5” 2*960GB SATA SSD (each node)

3.5” 3*4TB 7200RPM SATA HDD (each node)

2*500GB SATA M.2 SSD for OS(each node)

1* NVMe SSD for storage(each node)

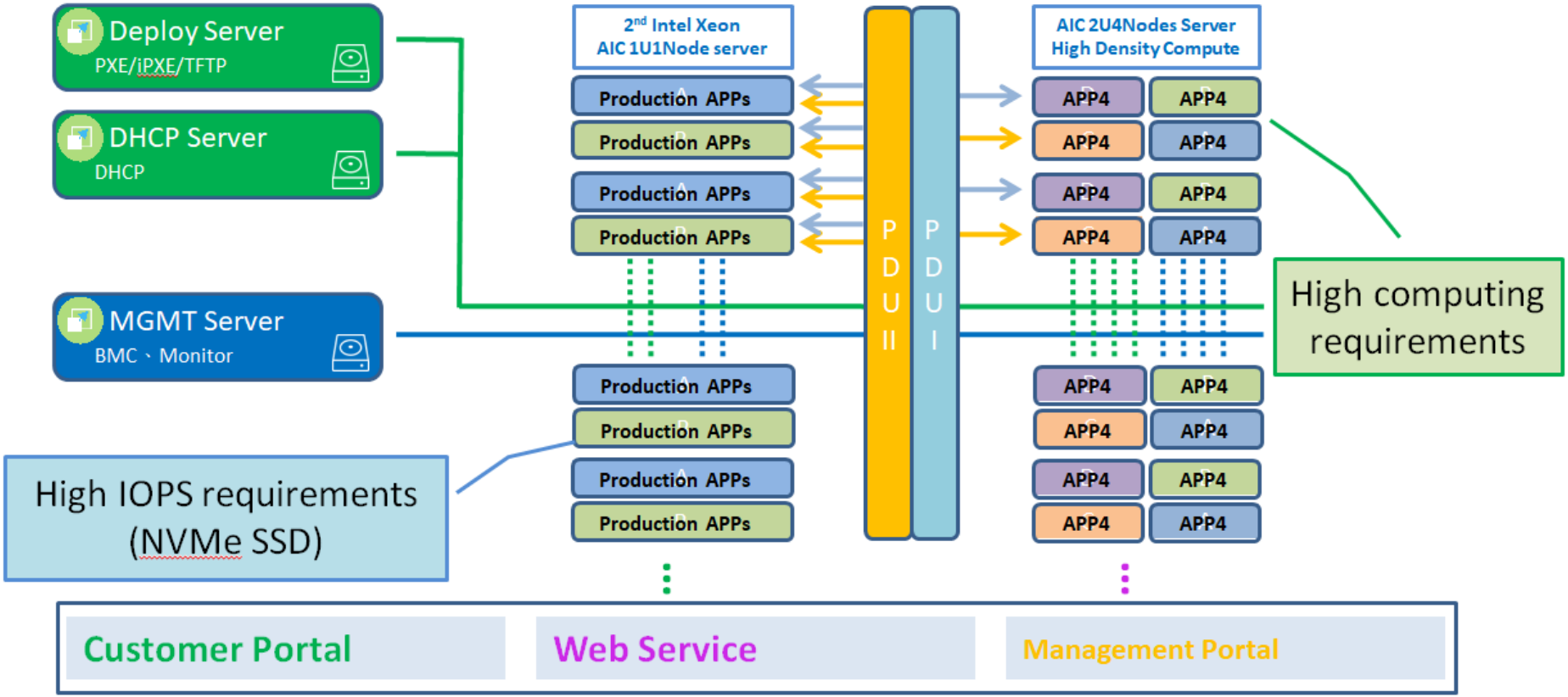
Dual Port 10GbE SFP+

Dual Port GbE RJ45 OCP2.0

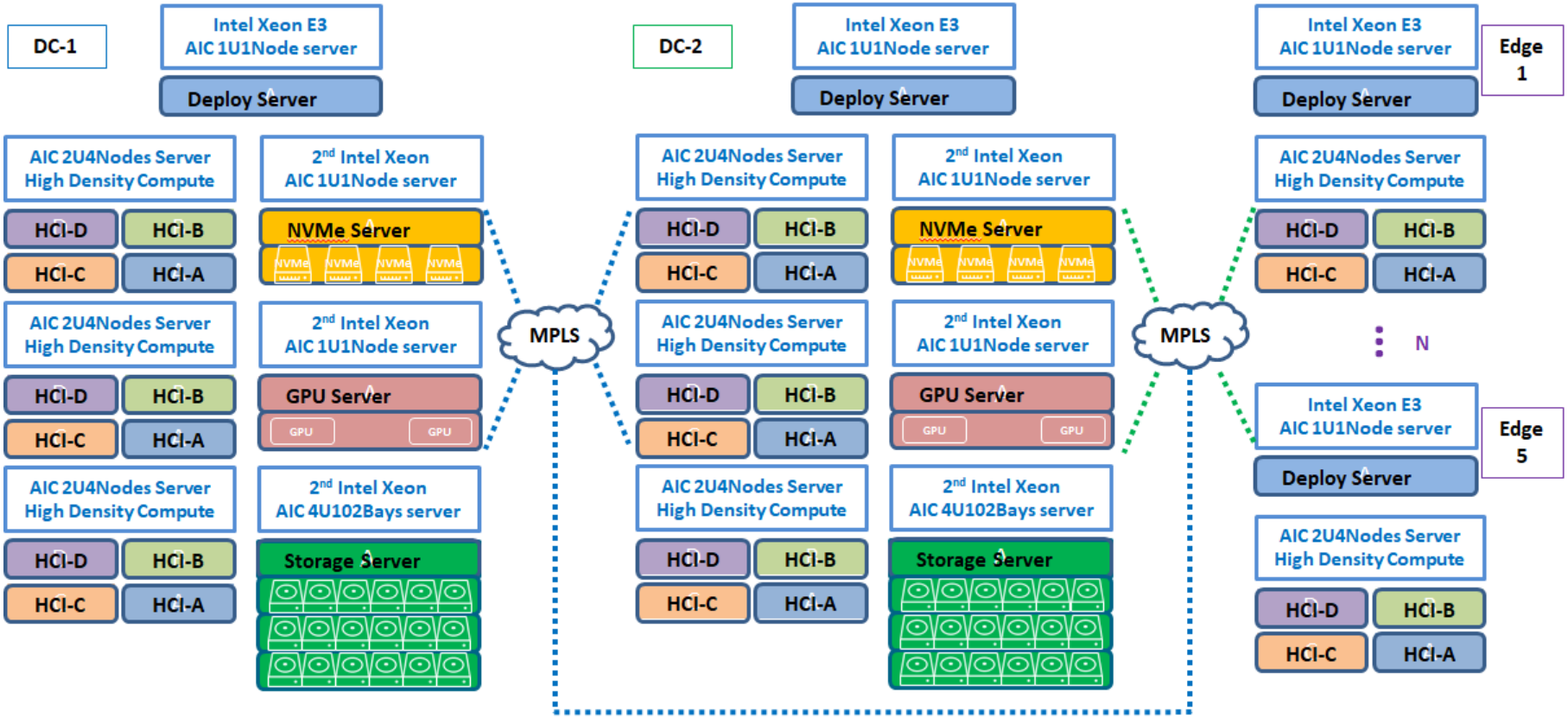
HCI All-In-One Appliance (2/2)

Model	AD202-VL Lite	AD202-VL
Specifications		
Number of Nodes	**3 Nodes per Block (Cluster size limit 16 nodes)**	**4 Nodes per Block (Cluster size limit 256 nodes)**
Software	Airdeck Express version	Airdeck Enterprise version
CPUs per Node	2 x Intel® Xeon® Silver 4214 Processor 2.2GHz, 12 Cores	2 x Intel® Xeon® Gold 6230 Processor 2.1GHz, 20 Cores
Memory per Node	128GB DDR4-2666 RDIMM	256GB DDR4-2666 RDIMM
Data Disk per Node	a. 2x 4TB HDD 7200RPM b. 1x 960GB SATA SSD	a. 3x 8TB HDD 7200RPM b. 2x 960GB SATA SSD Option: 2x 1.92TB SATA SSD c. 1x 2TB TLC NVMe SSD (HHHL) Option: 1x 4TB TLC NVMe SSD (HHHL)
OS Disk per Node	2x 480GB M.2 SATA SSD	2x 480GB M.2 SATA SSD
Network Adapters per node	a. 1x Dual port GbE RJ45 (OCP) b. 1x Dual port 10GbE SFP+	a. 1x Dual port GbE RJ45 (OCP) b. 1x Dual port 10GbE SFP+ / Option: 1x Dual port 25GbE SFP28
Dimensions per Block	W x D x H: 438 x 800 x 87.5 (mm)	
Data Protection Configuration Options		
Hard Drives (Capacity Tier)	1 Replica (Local)	1 Replica (Local)
	2 Replica (Close-Coupled) / 3 Replica (Close-Coupled)	2 Replica (Close-Coupled) / 3 Replica (Close-Coupled)
	2+1 EC (Scale-Out)	2+1 EC (Scale-Out) / 3+1 EC (Scale-Out) / 2+2 EC (Scale-Out)
SATA SSD (Balanced Tier)	1 Replica (Local)	1 Replica (Local)
	2 Replica (Close-Coupled) / 3 Replica (Close-Coupled)	2 Replica (Close-Coupled) / 3 Replica (Close-Coupled)
	2+1 EC (Scale-Out)	2+1 EC (Scale-Out) / 3+1 EC (Scale-Out) / 2+2 EC (Scale-Out)
Optane NVMe SSD (Performance Tier)		1 Replica (Local)
		2 Replica (Close-Coupled) / 3 Replica (Close-Coupled)

Use case I - Automatic deployment of Linux clusters



Use case II - HCI+GPU、NVMe and Storage server



Key Takeaways

- Intel + AIC platform確保成本、高密度運算、虛擬化存儲靈活性最佳方案。
- 最新**AIC HP202-KT**，HCI server提供2U四節點以及12個3.5”Disk Drive。
- 搭載Intel Eagle Stream提供PCIe 5.0、DDR5 memory、UPI 2.0高速傳輸。
- 每個節點提供2 x PCIe 5.0 x16 slots (HHHL)、1 x OCP 3.0 (PCIe 5.0 x16) 。

Thank You