POC Giải pháp Liqid Composable

Thành Phạm
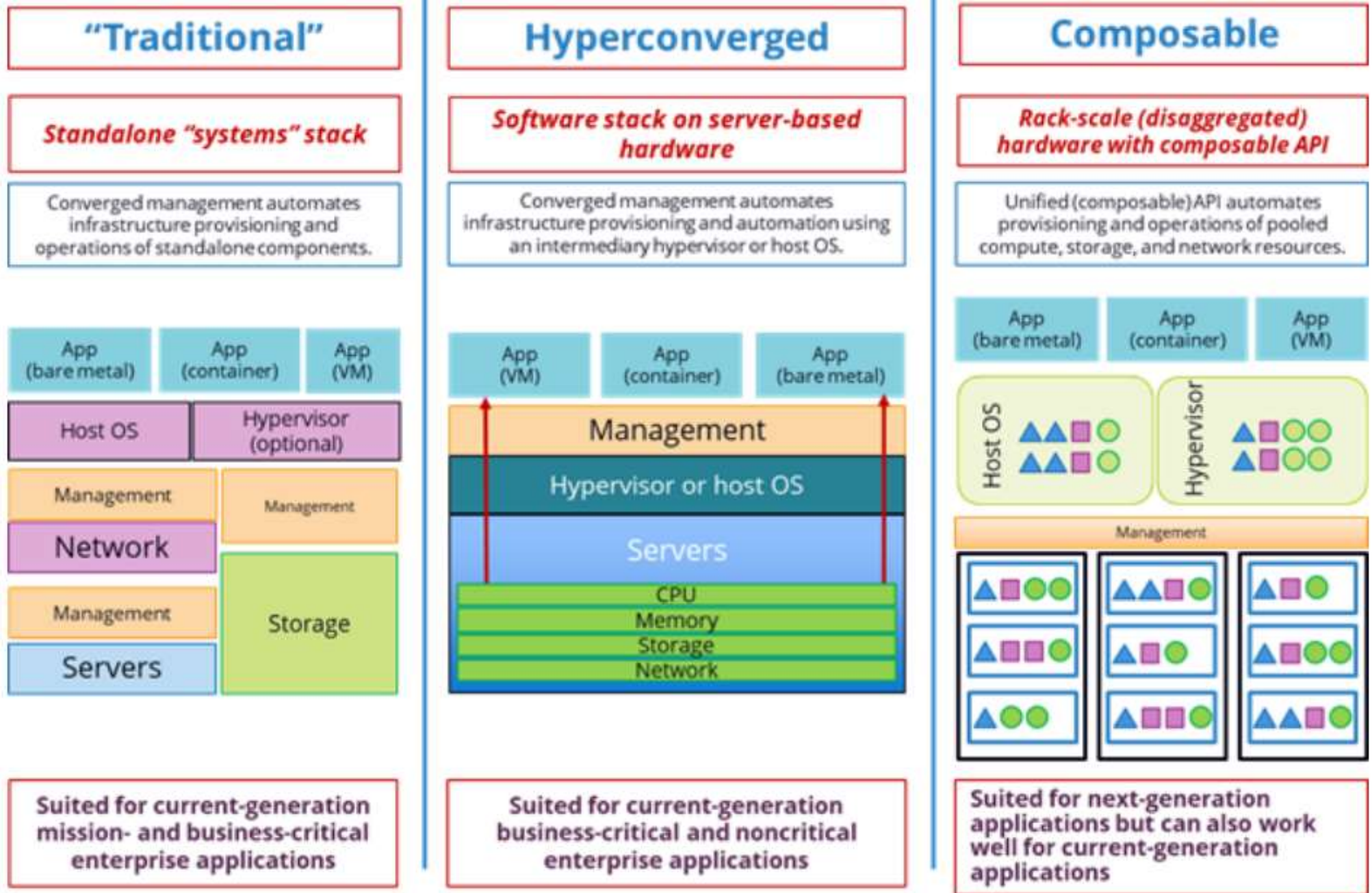
NỘI DUNG

- Liqid Composable

- Nvidia DGX

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Liqid Composable

Composable overview

"Traditional"

Standalone "systems" stack

Converged management automates infrastructure provisioning and operations of standalone components.

App (bare metal)	App (container)	App (VM)

Host OS	Hypervisor (optional)

Management	Management
Network	
Management	Storage
Servers	

Suited for current-generation mission- and business-critical enterprise applications

Hyperconverged

Software stack on server-based hardware

Converged management automates infrastructure provisioning and automation using an intermediary hypervisor or host OS.

App (VM)	App (container)	App (bare metal)

Management

Hypervisor or host OS

Servers

CPU
Memory
Storage
Network

Suited for current-generation business-critical and noncritical enterprise applications

Composable

Rack-scale (disaggregated) hardware with composable API

Unified (composable) API automates provisioning and operations of pooled compute, storage, and network resources.

App (bare metal)	App (container)	App (VM)

Host OS ▲▲■◯ ▲▲■◯

Hypervisor ▲■◯◯ ▲■◯◯

Management

▲■◯◯   ▲▲■◯   ▲■◯
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Suited for next-generation applications but can also work well for current-generation applications
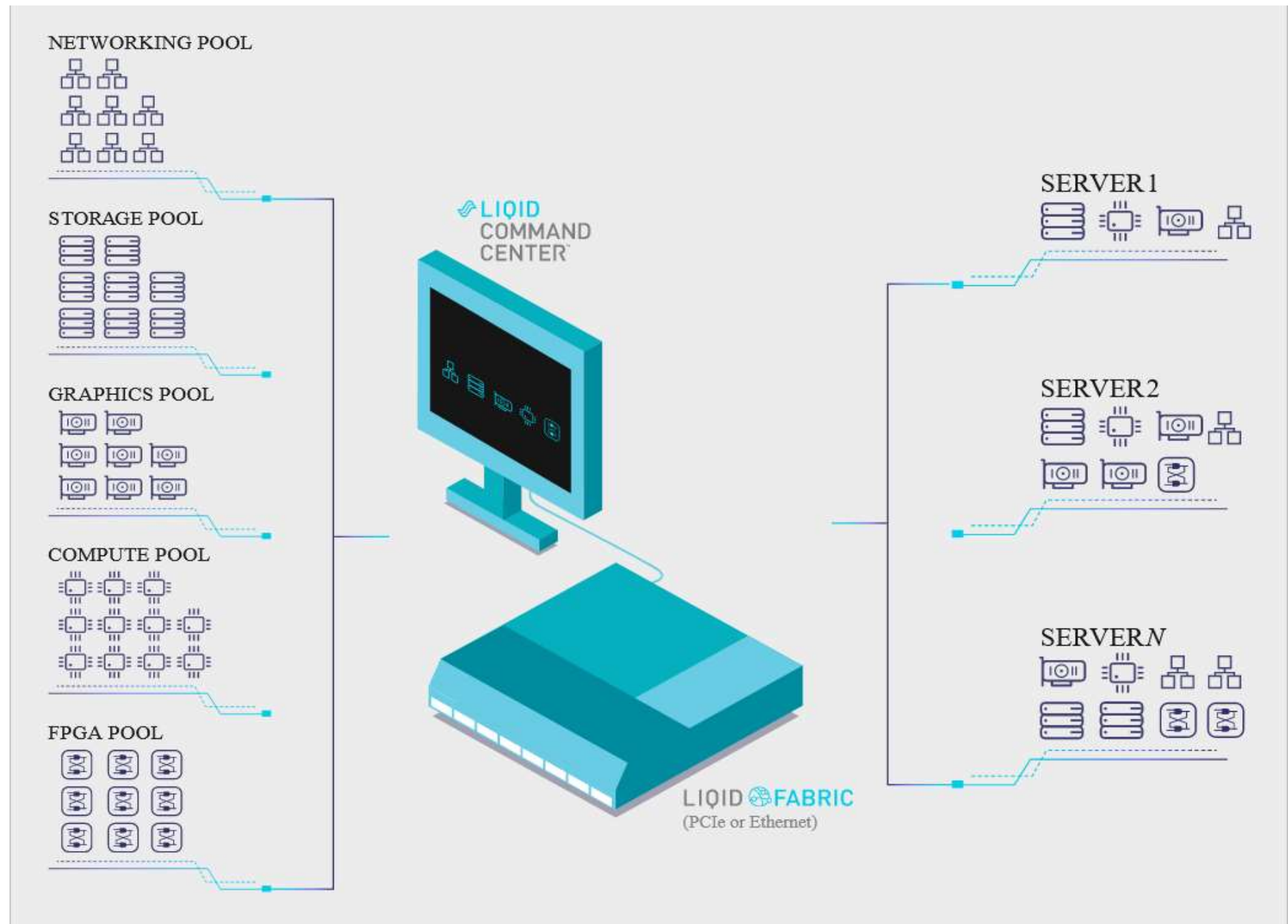
Disaggregation resource

Evolution of Disaggregating Physical Server Racks
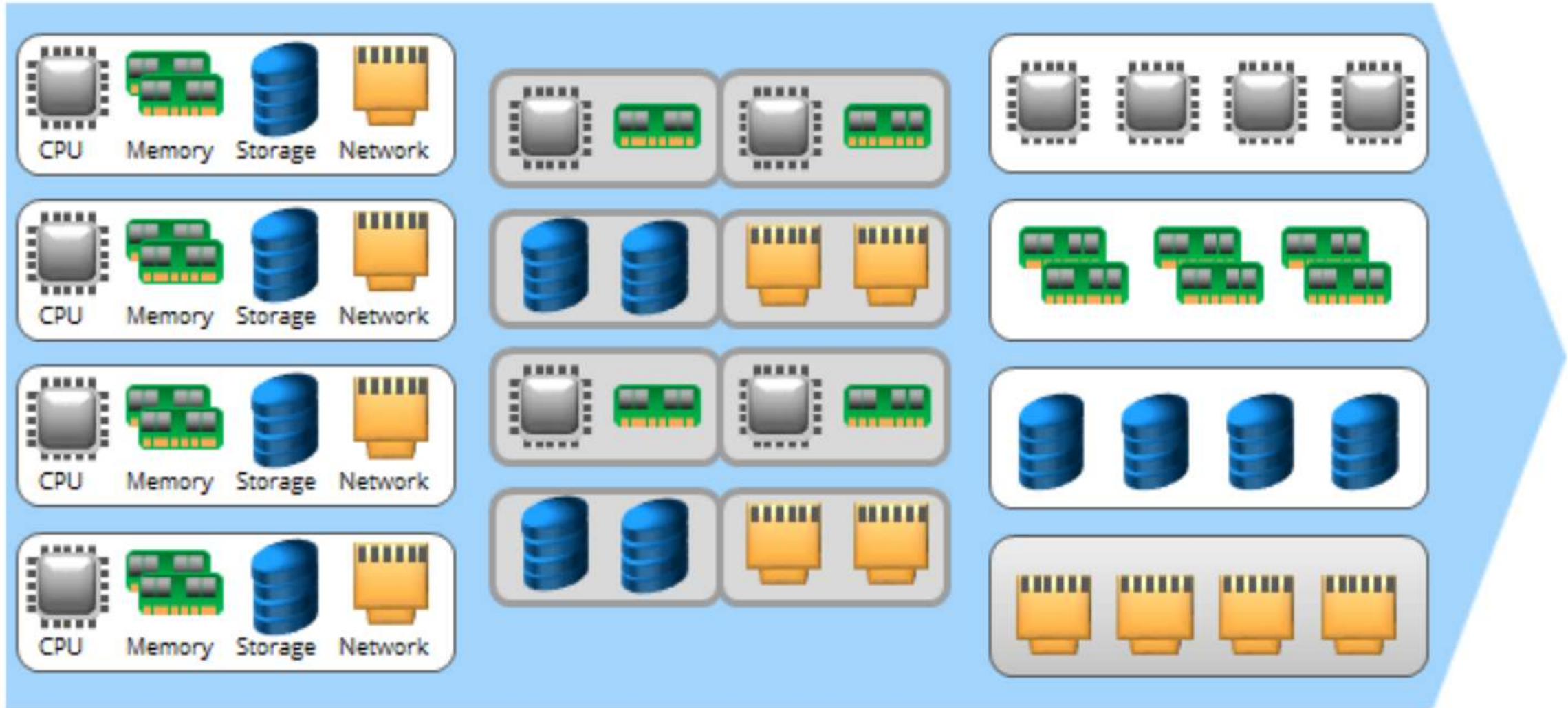
Liqid Deployment Breakdown

Deployment Breakdown

PCIe Adapter Card (Dual x8 or Single x16)

Dell EMC PowerEdge FX2s

Liqid PCIe Fabric Switch & Liqid Command Center™

JBOF NVMe Expansion Chassis

JBOG GPU Expansion Chassis

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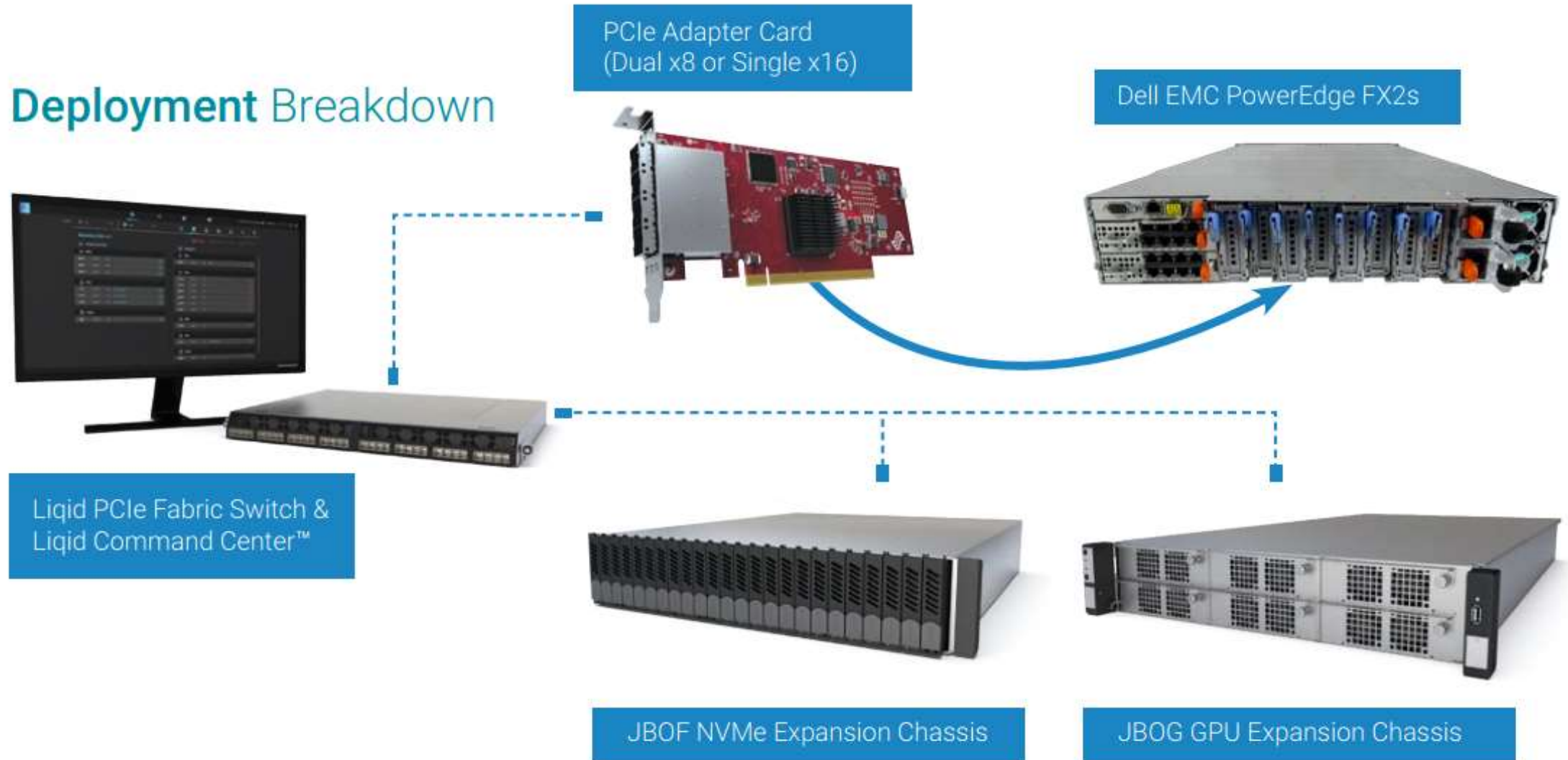
Liqid – proposal for Viettel

Viettel Gen4 SmartPod Topology

- - - - - → Management Link
←────────→ 32 GBytes / sec PCIE Connection

Liqid Management Node
- Qty 2

Liqid Gen4 24 port switch
- Qty 2

Liqid Gen 4 Expansion Chassis
-    Qty 1
-    Nvidia A30 x10

Liqid Host Servers
-    Liqid Gen4 HBA x6
-    Dell R740 x 3
-    Up to 4 host servers

Liqid BOM
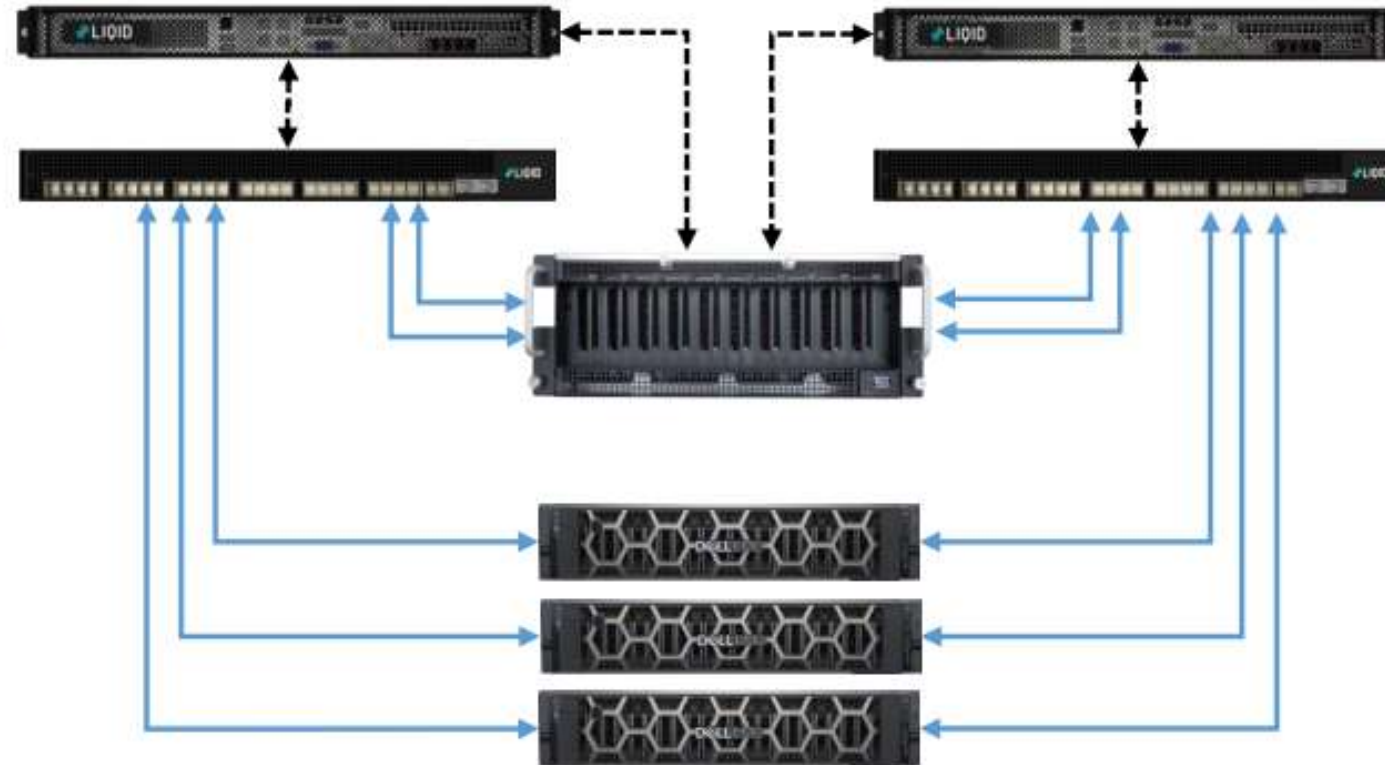
Liqid Smartpod BOM:
Qty 2 – Liqid 16 Port Director
Qty 2 – Liqid Gen4 24 Port Switch
Qty 1 – Liqid Gen4 Expansion Chassis (EX4410)
Qty 6 – Liqid Gen4 HBA (LQD1416)
Qty 32 – Liqid PCI Gen4 Cables
Qty 0 – APC PDU (L100P-P208-10M) – Customer will purchase on their own
Qty 10 – GPU Power Cables – Nvidia A30
Qty 2 – Liqid HHHL NVME Storage (15.36 TB)
Qty 1 – Liqid spare/FRU kit

Liqid Software and Support BOM:
Qty 3 – Liqid Host Software Licenses
Qty 3 – Liqid Premium Support, 3 years
Qty 2 – Liqid Remote Installation Days

Liqid BOM of Included Items:
Qty 8 – Liqid PCI Gen4 Cables
Qty 2 – Liqid PCI Management Cable (Medusa)

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Liqid 16 port Director

Rear view

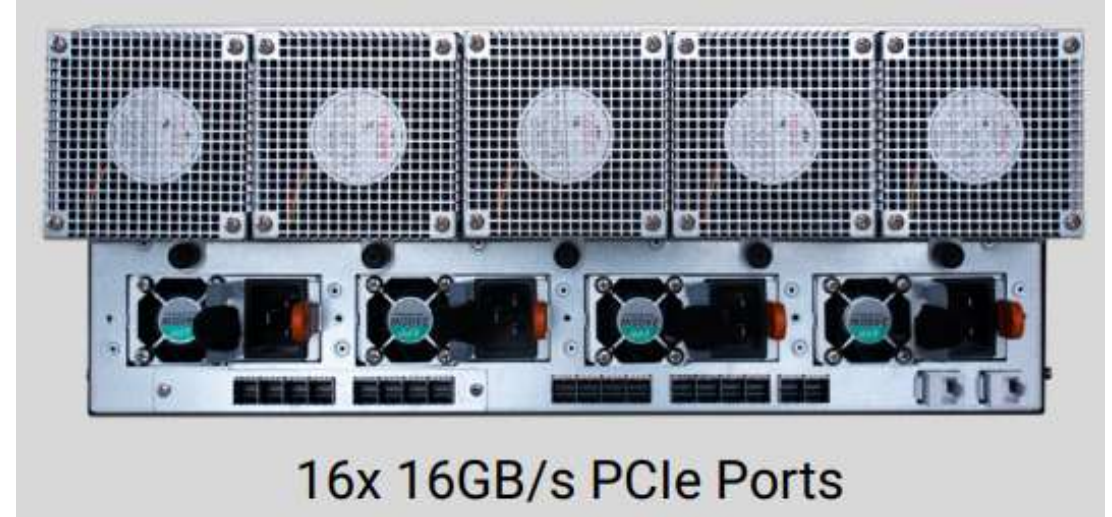| Item	Feature	Description
1	Dual Power Supply	400W Platinum Level power supplies
2	I/O Backpanel	IPMI network interface
3	I/O Backpanel	Ethernet interface
4	PCIe HBA	4x Mini SAS HD connection

Mini-SAS HD 1-Port to 4-Port Breakout Cable

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Liqid others component

Gen4 24 Port Switch

Gen4 HBA card

16x 16GB/s PCIe Ports

Fabric-Integrated Expansion Chassis

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Liqid – Failover script

- Ensure the primary Liqid director state has been backed up
- Transfer the latest Liqid director state to the backup director (process TBD)
- Power down primary Liqid director, switch and expansion chassis
- Power on expansion chassis, backup switch and backup director
- Reclaim the HBA currently composed to the host, and compose HBA 2 (which is connected to backup switch)
- Compose PCI devices to hosts now using HBA 2
- Reboot host servers

Liqid service

- Liqid will work with the customer remotely via Zoom or remote meeting application of customer's choosing
- Liqid will provide detailed cable diagram and configuration documentation for the physical Liqid hardware
- Liqid will configure the Liqid PCI fabric per customer requirements based on expected use cases and PCI devices that will be installed
- Liqid will provide remote training via Zoom or remote meeting application of customer's choosing. Training will cover an overview of the Liqid Matrix user interface, and the basics of how to compose PCI devices to host servers
- Liqid will provide remote support services for the duration of the support contract. Remote support offers various levels of response time depending on the severity of the issue (see attached PPT document)
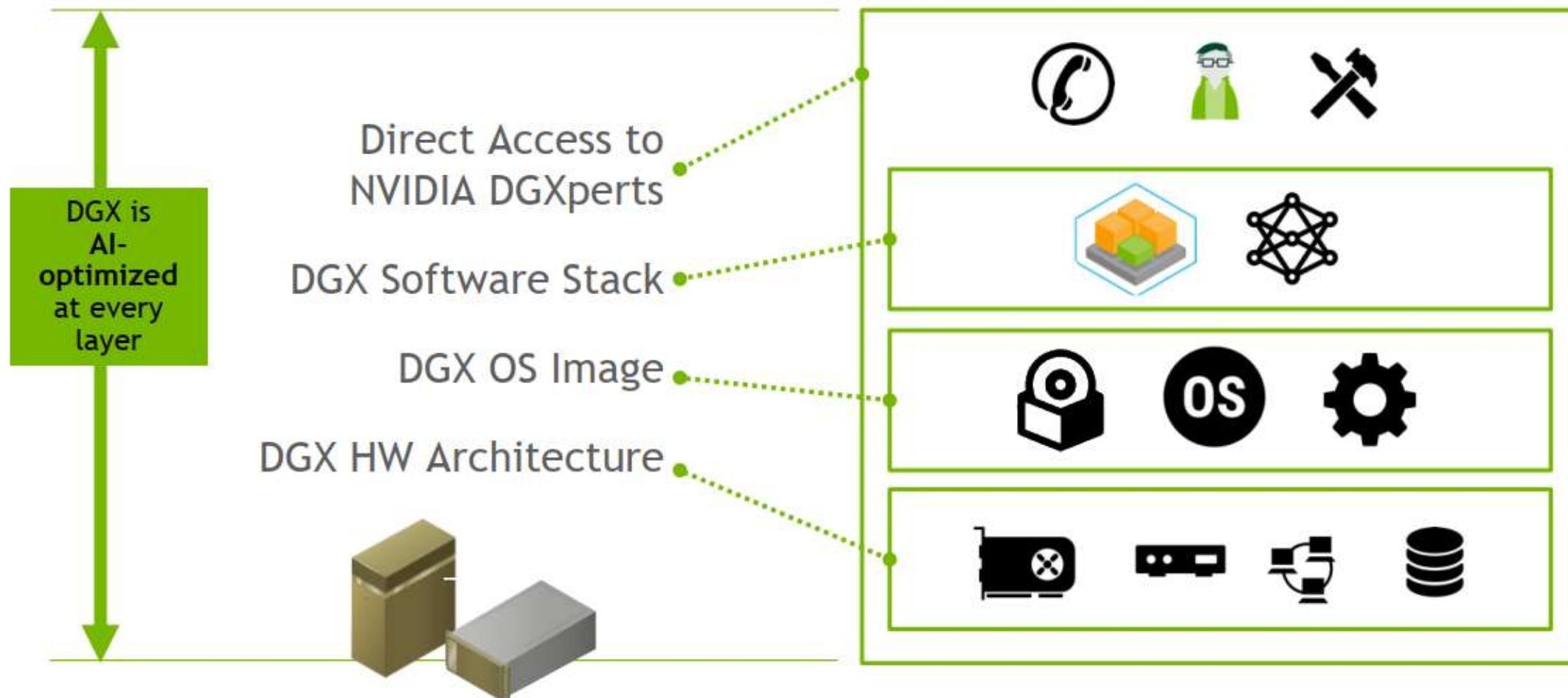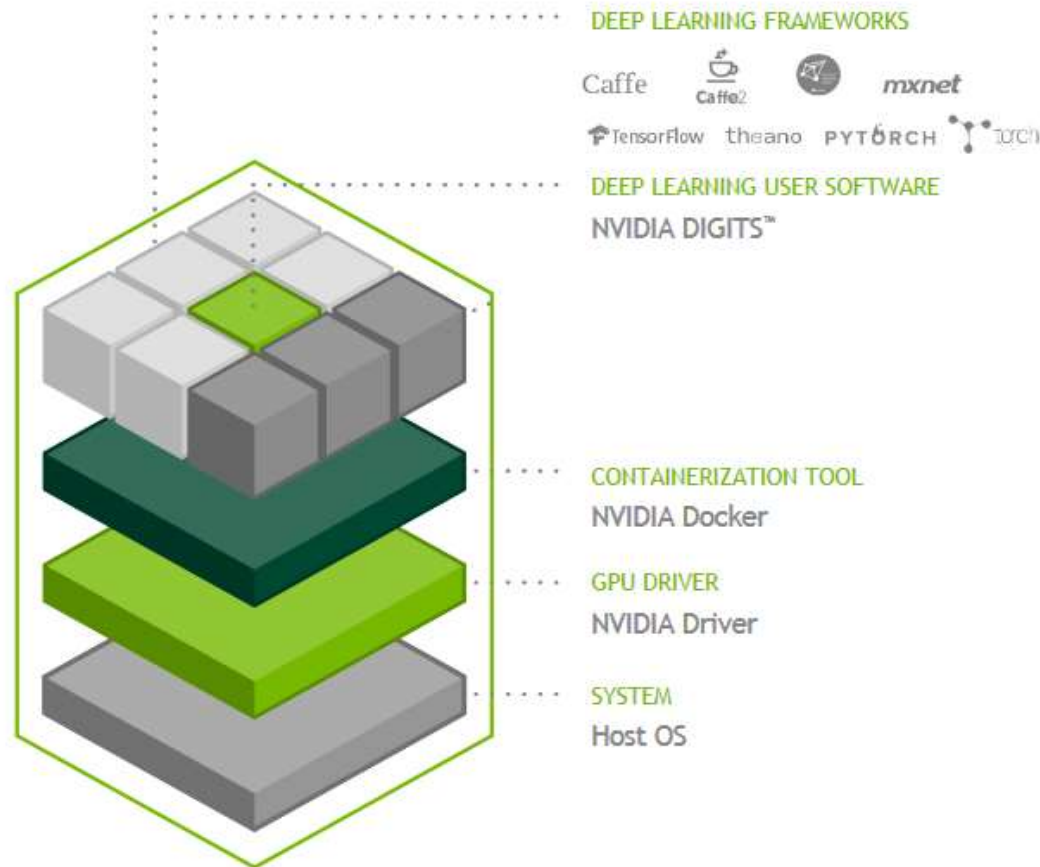
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Nvidia DGX

Nvidia DGX Appliance

DGX: PURPOSE-BUILT FOR AI
More than a Server: Looking Beyond the Spec Sheet

DGX is AI-optimized at every layer

Direct Access to NVIDIA DGXperts

DGX Software Stack

DGX OS Image

DGX HW Architecture

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Nvidia DGX Software Stack

DEEP LEARNING FRAMEWORKS

Caffe Caffe2 mxnet
TensorFlow theano PYTORCH TORCH

DEEP LEARNING USER SOFTWARE
NVIDIA DIGITS™

CONTAINERIZATION TOOL
NVIDIA Docker

GPU DRIVER
NVIDIA Driver

SYSTEM
Host OS

NVIDIA DGX SOFTWARE STACK
Fully Integrated Software for Instant Productivity

Advantages:

Instant productivity with NVIDIA optimized deep learning frameworks

Caffe, CNTK, MXNet, PyTorch, TensorFlow, Theano, and Torch

Performance optimized across the entire stack

Faster Time-to-Insight with pre-built, tested, and ready to run framework containers

Flexibility to use different versions of libraries like libc, cuDNN in each framework container
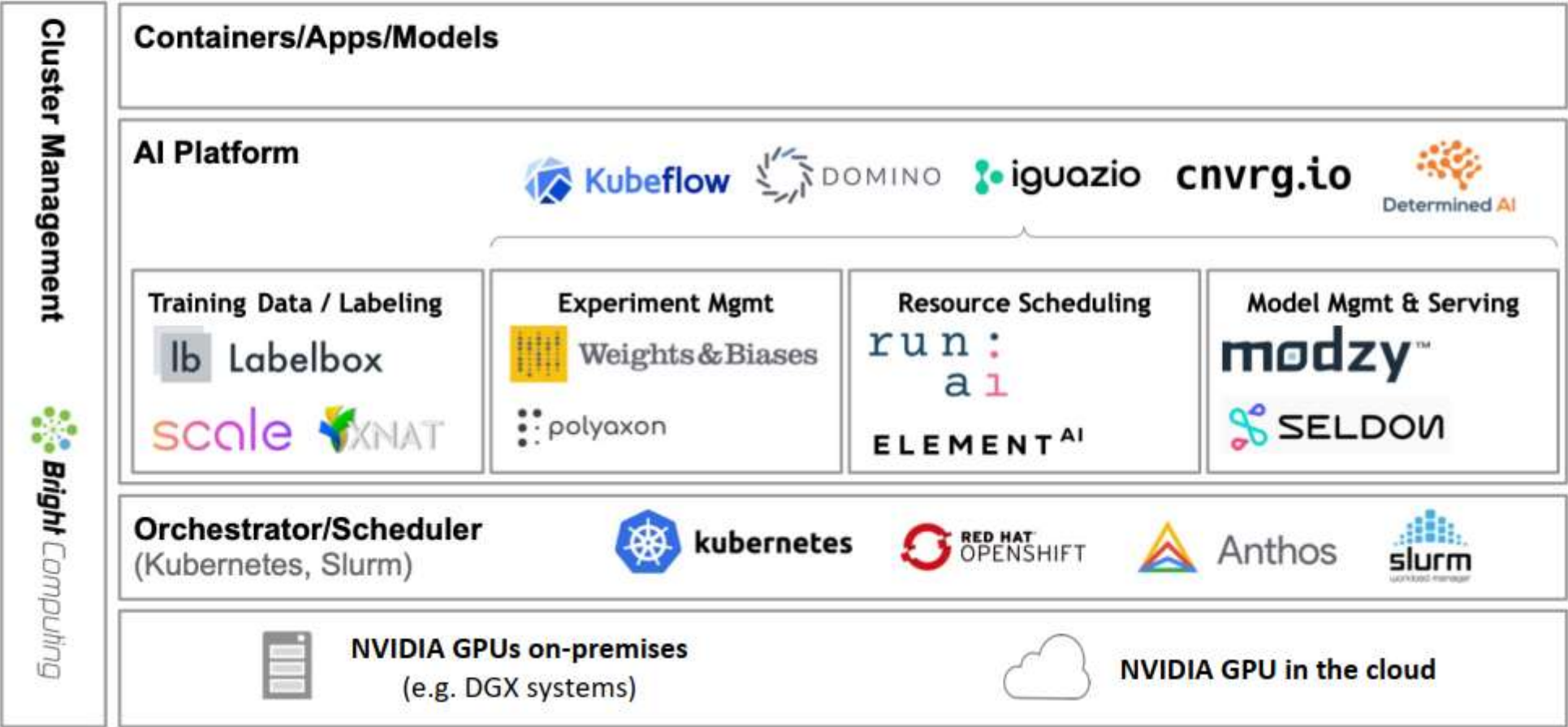
AI Platform

Bright Cluster Management

AUTOMATED CLUSTER PROVISIONING & SETUP

▼

- Provisions nodes from bare metal
- Sets-up network, user directory & security
- Deploys workload managers & frameworks
- Runs pre-checks across the entire cluster prior to deployment

AUTOMATED PROBLEM DETECTION AND ISOLATION

▼

- Provides detailed monitoring metrics & health-checks
- Reports resource usage by job and user
- Allows automated corrective actions to be taken
- Automatically detects and images replacement nodes

AUTOMATED CHANGE MANAGEMENT

▼

- 1-step propagation of updates
- Auto-update nodes without reimaging
- Easily add more servers & new components
- Replace failing nodes without disruption
- Prevents image-drift amongst nodes

UNPARALLELED FLEXIBILITY

▼

- Supports mixed processor, accelerator and Linux combinations within the same cluster
- Run jobs on bare-metal, VMs or containers in the same cluster
- Host HPC, machine learning and data analytics applications on the same cluster
- Extend to the public cloud for additional resources
- Provision and manage edge compute as part of your central cluster
- Dynamically allocate resources where they're needed based on demand
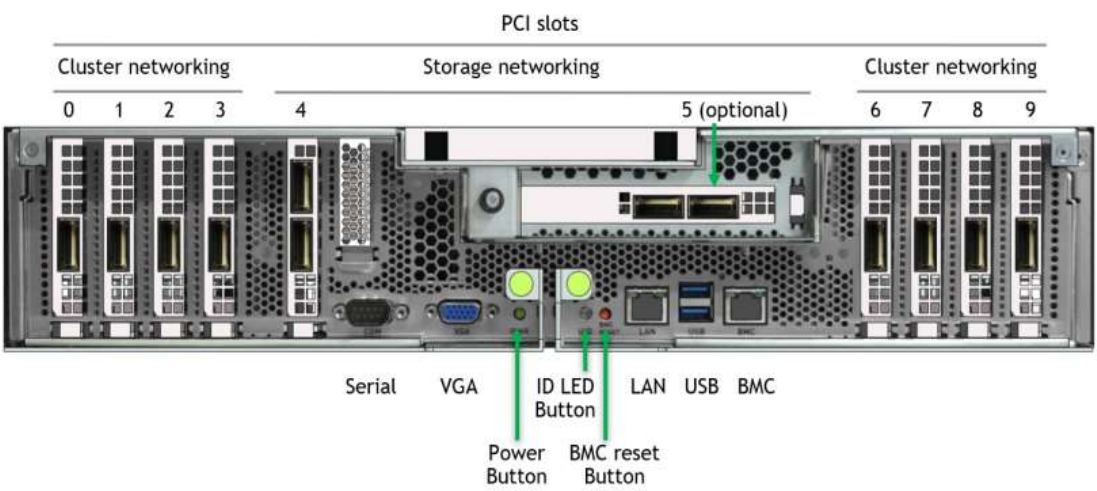
Nvidia DGX front and rear view
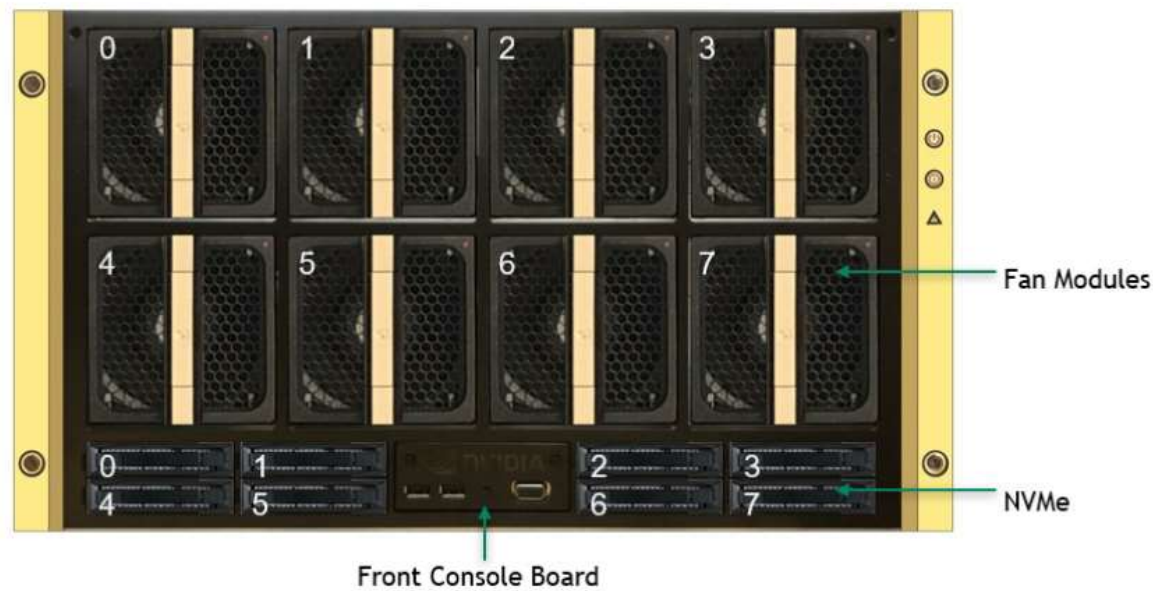
Front-view (Bezel removed)

Rear-view

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Nvidia DGX Motherboard

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THANK YOU

CONTACT US:

svtech@svtech.com.vn
www.svtech.com.vn
2A Phan Thuc Duyen Street, Tan Binh District, HoChiMinh City, Vietnam

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