



Cisco Nexus Hyperfabric

A New Data Center Experience

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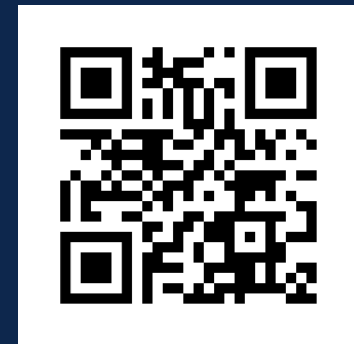
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Some of the features described herein remain in varying stages of development and will be offered on a when-and-if-available basis.

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Customers are rapidly adopting **Cloud Managed Networking**

35%

Projected YoY growth in global NaaS market 2023-2030

4M+

Customer networks managed by the Cisco Meraki Cloud

<https://www.fortunebusinessinsights.com/network-as-a-service-market-106700>



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Cisco has reimagined data
center **design, procurement,
and operations**



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Introducing Nexus Hyperfabric



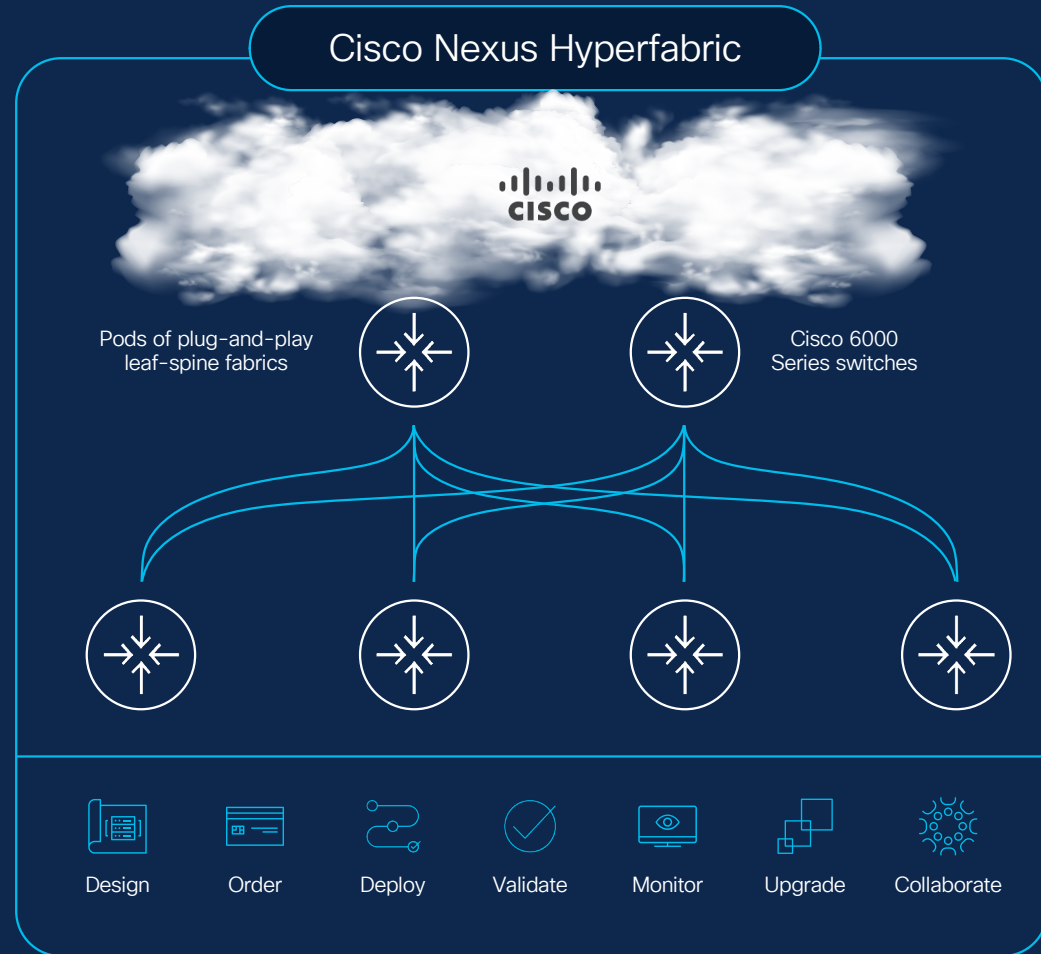
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ORDERABLE Q2 FY25

Cisco Nexus Hyperfabric

- ✓ Design, deploy and operate on-premises fabrics located anywhere
- ✓ Easy enough for IT generalists, application and DevOps teams
- ✓ Outcome driven by a purpose-built vertical stack

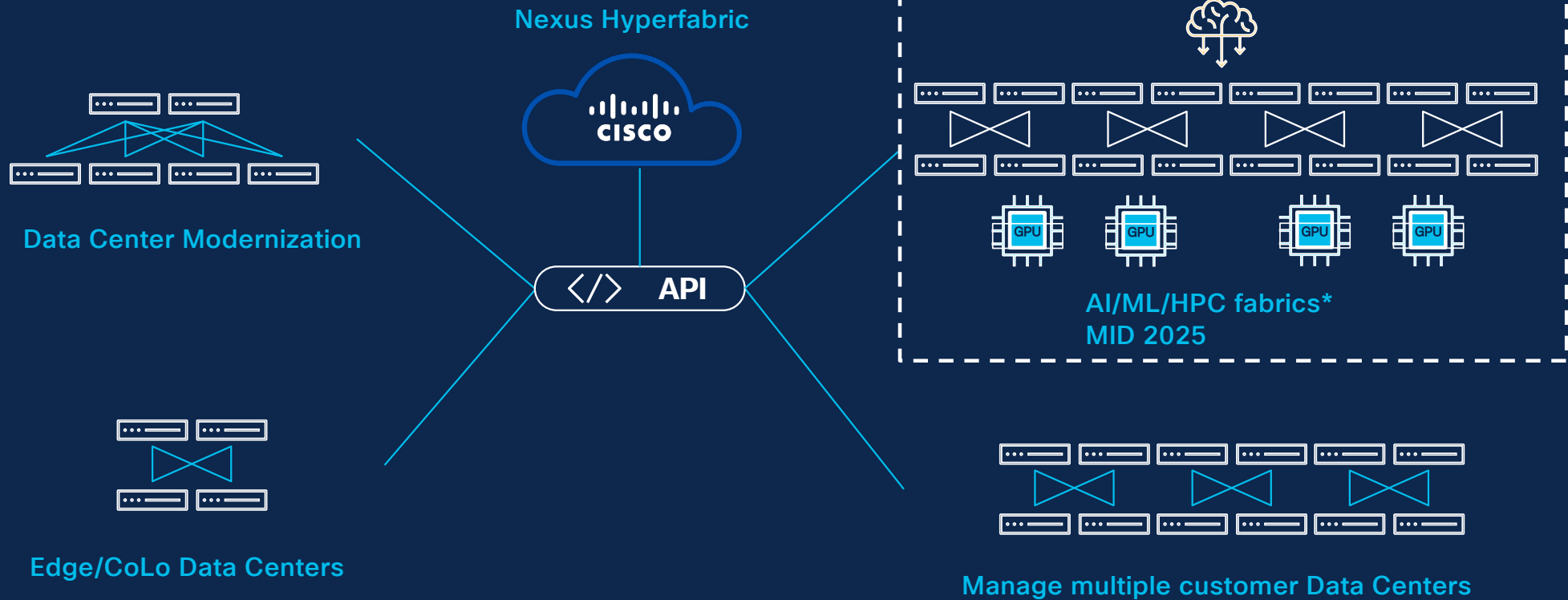


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Use Cases

Single global GUI / API endpoint for all owned fabrics



ORDERABLE 2H FY25

Cisco Nexus Hyperfabric AI

High-performance Ethernet

Cloud-managed operations

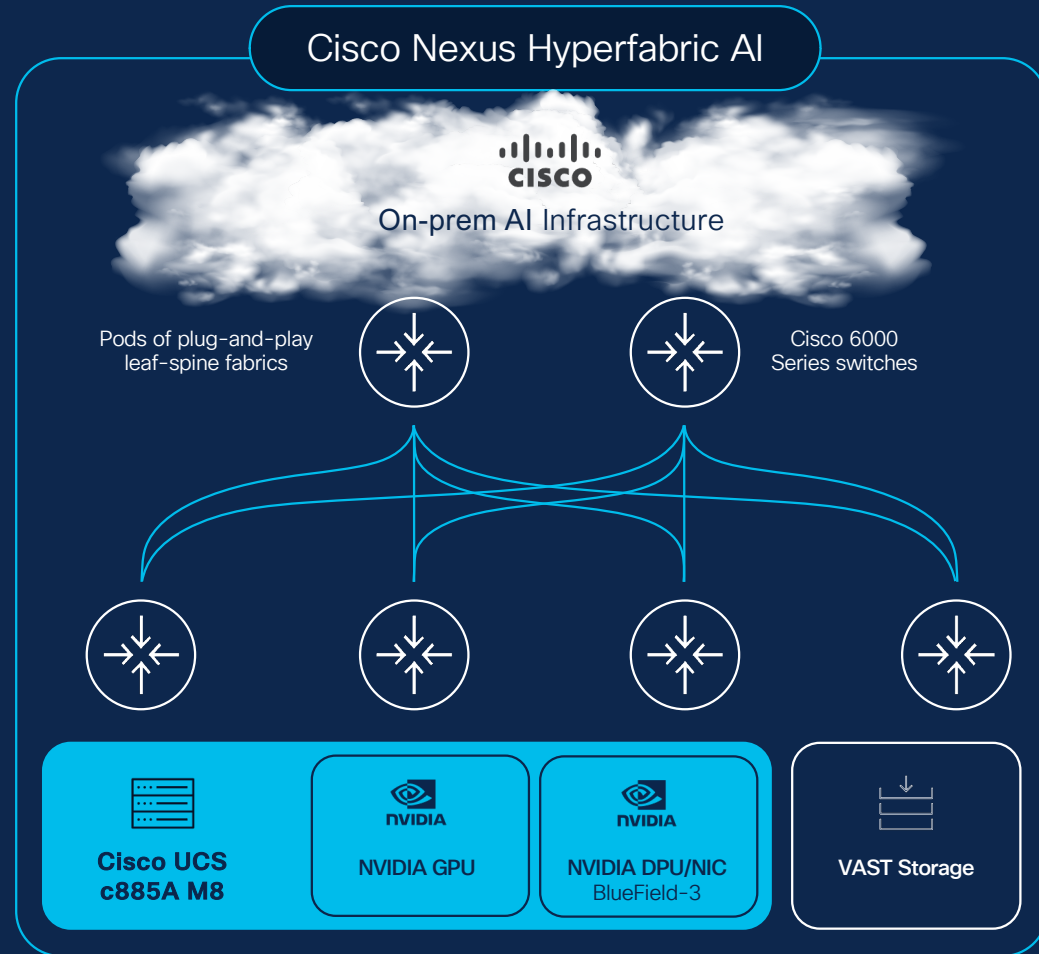
Unified stack including NVAIE

AI-native operational model

Democratize AI infrastructure

Visibility into full stack AI

Cisco Nexus Hyperfabric AI



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Nexus Hyperfabric

Pre-configured, cloud-managed **networking** for
Cisco 6000 switches

AVAILABLE
JANUARY 2025

Nexus Hyperfabric AI

Pre-configured, cloud-managed **networking,**
compute, and storage, partnered with NVIDIA

AVAILABLE
MAY 2025

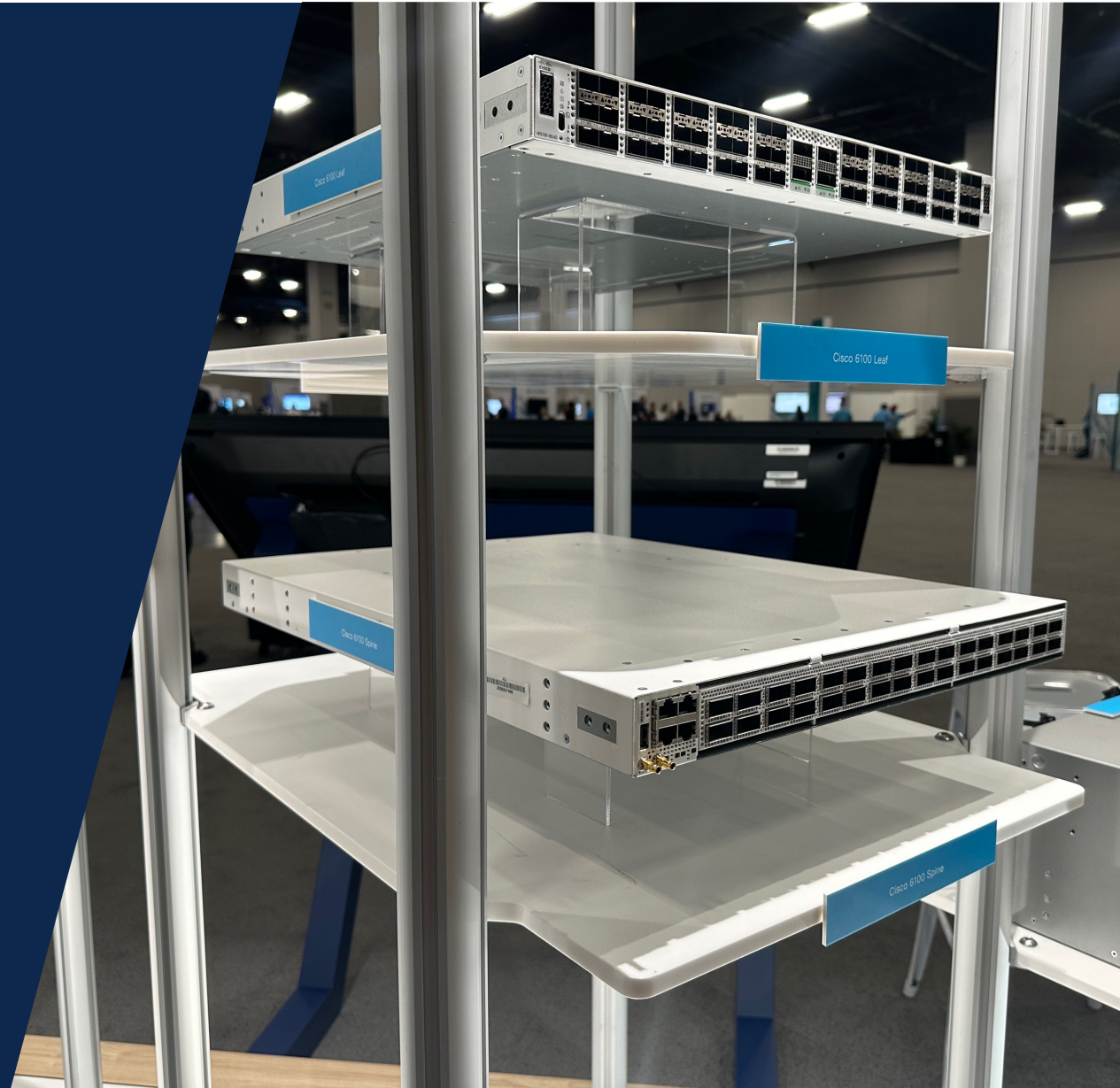


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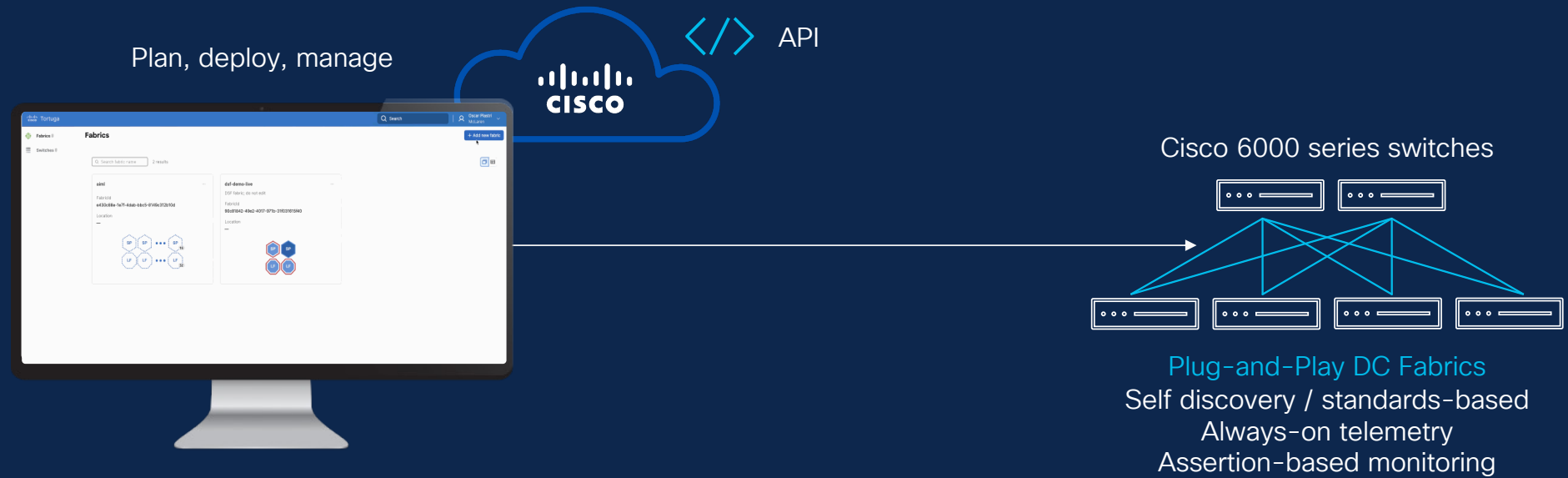
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Nexus Hyperfabric Experience



How It Works



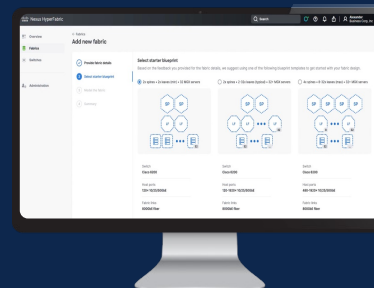
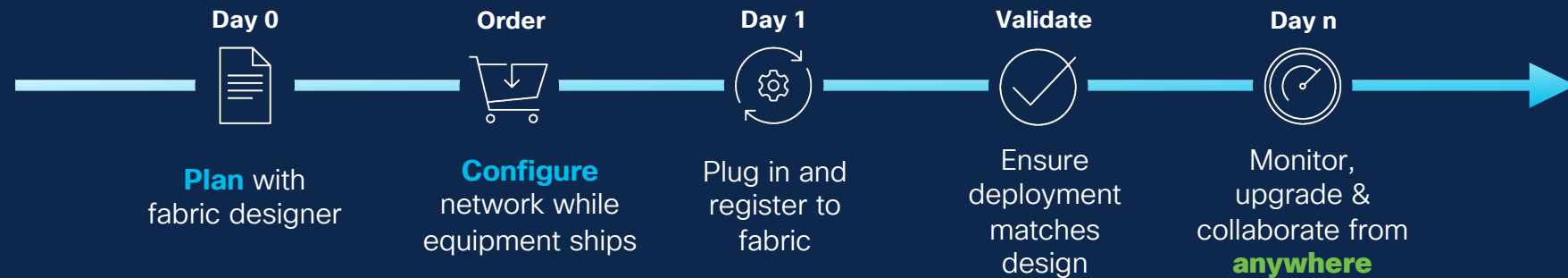
Purpose-built for **predictable outcomes** optimized for ease of use



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Complete Lifecycle Experience



Cloud-managed switch

- Cisco 6000 series
- Boots from cloud
- Full visibility & control from the cloud



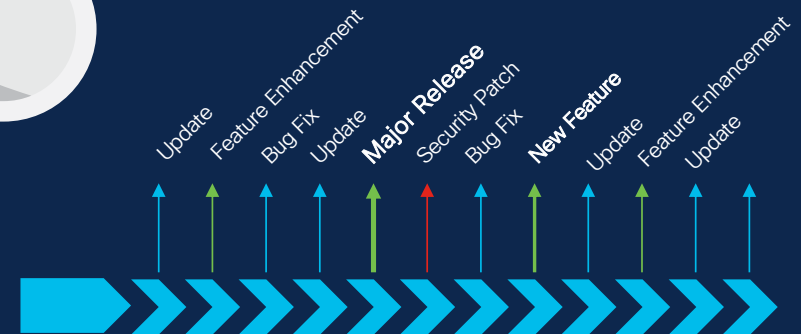
Software Lifecycle Management



Cloud SaaS controller:

Continuous delivery model: always up-to-date

- Continuous delivery of new features and software updates to the production cloud service.
- No user testing or software maintenance required



On-prem switch software

Cloud-delivered Software Upgrades: User-Driven Update Schedule

- Schedule firmware updates
- Software rollback support
- Intelligent sequencing of fabric upgrades

Flexible Architectures

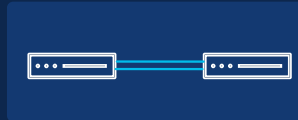
Deploy any fabric, anywhere

Mesh /
spine-less
fabrics

“A Fabric of One”



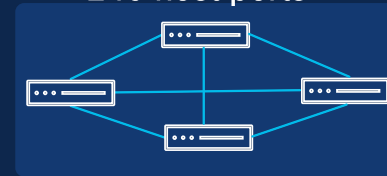
2-switch fabric
120 host ports



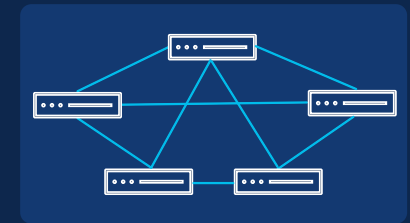
3-switch fabric



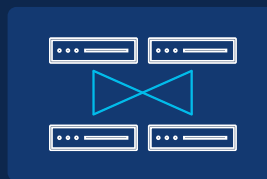
4-switch fabric
240 host ports



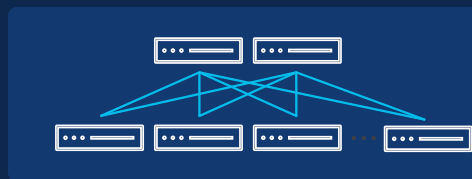
5-switch fabric



2 spine, 2 leaf



2- or 4-way spine, 2-32 leaf
Nearly 2000 host ports



Leaf-spine DC fabrics

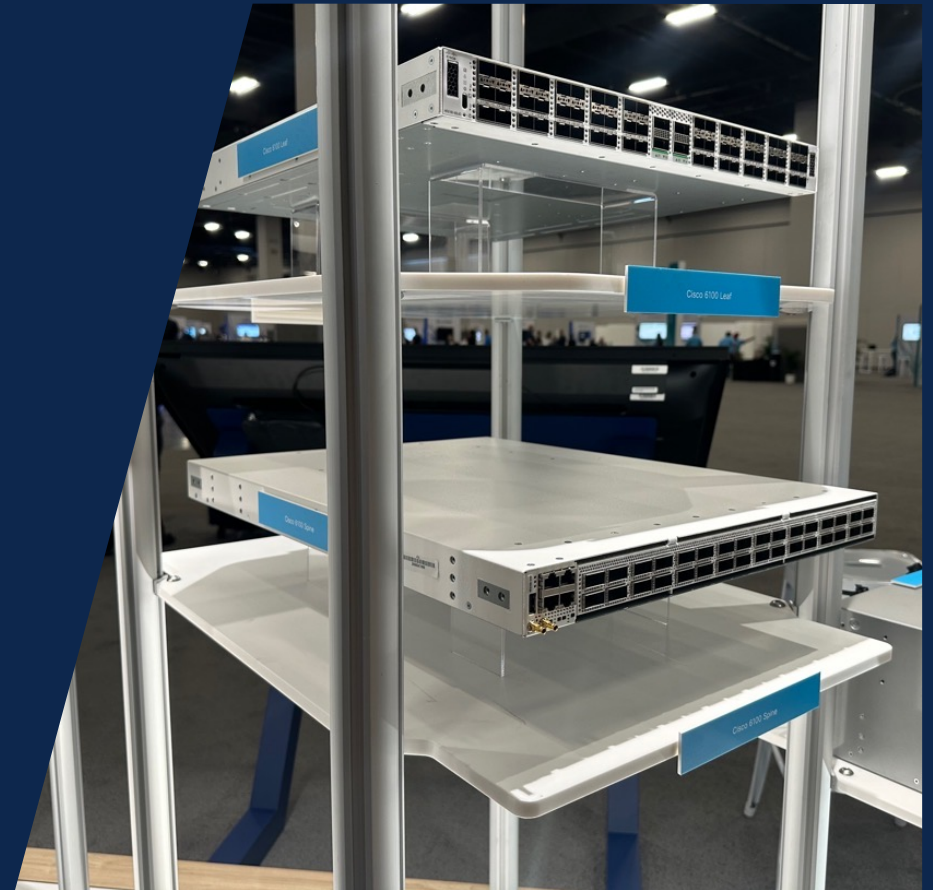
Cisco 6000 series switches

Leaf: HF6100-60L4D

- 4x 100/400GbE QSFP56-DD (16x 100G breakout)
- 60x 10/25/50GbE SFP56

Spine/Leaf: HF6100-32D

- 32x 100/400GbE QSFP56-DD
- 128x 100GbE via 400:100 breakout



Why is Hyperfabric Designed like this?

- Hyperfabric is not a data center fabric: it is an **OPERATIONAL MODEL** driven by cloud
- Hyperfabric is designed to **rethink network automation** from a top-down model, and is designed to work like cloud IaaS
- Hyperfabric is about creating an **ABSTRACTION MODEL** for the network that is consistent and scalable.
- Hyperfabric is about building a supportable and repeatable fabric architectures – **no snowflake fabrics**
- Hyperfabric is about building and reinforcing value in the **CONTROLLER/SERVICE** and not the hardware/NOS.
- Hyperfabric is designed to **leave legacy features behind** wherever we can (Hyperfabric will never have feature parity)
- Features implemented consider the **COST** to deliver as a service via cloud

Hyperfabrix User Experience



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Blueprint Creation

- Fabric Blueprints are created in an organization
- Initial Blueprint creation involves the following:
 - Fabric Name: Can include a text description, as well as Address, Location, and a Tags for automation purposes.
 - Switches/Cabling/Optics: You select the switch hardware, desired cabling, and optics based on the supported combination. You can choose to allow for multiple fabric connections between switches.
 - Topology: Choose the desired switch topology based on the deployment requirements.

Create a fabric

Name your fabric *

Description

Address Location

Tags

[+ Add](#)

DEFAULT MODEL FOR BLUEPRINT **DEFAULT CONNECTIONS FOR FABRIC PORTS**


Chassis model

Cabling Pluggable

Use multiple cables for links between spines and leaves. Note that this will reduce the number of supported leaves per spine device.


Spines (max 8)

8



Leaves

8



[Back](#) [Create fabric](#)

Per switch inventory information

The screenshot displays the Cisco Nexus Hyperfabric management interface. The main content area shows the 'Inventory' tab for 'Demo Fabric 1'. It features a search bar for device names and a 'Status' dropdown menu. Below this, there are expandable sections for 'Spine1', 'Spine2', 'Leaf1', and 'Leaf2'. The 'Spine1' section is expanded, showing a 'REQUIRED PARTS' table with columns for Item, PID, Status, SN, and Quantity. The table lists three categories: Power supply (2 items), Fan tray (6 items), and Optics for assigned ports (2 items).

Organization: Business Corp, Inc

Fabrics: Demo Fabric 1

Summary: Inventory

Assembly list: BOM calculations

Search device name: [] Status: [] 4 results Created Sep 5, 2024 2:31 PM CST [Download .csv]

Spine1 New

PID: HF6100-32D

- 32x 100/400GbE QSFP56-DD
- 128x 100GbE via 400:100 breakout

Status: New

Serial number: --

REQUIRED PARTS

Power supply 2

Item	PID	Status	SN	Quantity
1500W AC power supply	C9K-PWR-1500WAC	New	--	2

Fan tray 6

Item	PID	Status	SN	Quantity
Catalyst 9500X front to back (port-side intake) cooling fan	C9500-FAN-1U-R	New	--	6

Optics for assigned ports 2

Item	PID	Status	SN	Quantity
Ethernet1_1	QSFP-100G-AOC3M	New	--	1
Ethernet1_2	QSFP-100G-AOC1M	New	--	1

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BOM (total number of switches and optics)

The screenshot displays the Cisco Nexus Hyperfabric management interface. The main content area is titled "Demo Fabric 1" and shows the "Inventory" tab. Under "Inventory", the "BOM calculations" sub-tab is active, displaying a table of components and their quantities. The table includes columns for "Part number", "Description", "Qty deployed", and "Qty required". The data rows list various hardware and service items such as switches (HF6100-32D, HF6100-60L4D), a service (HF6100-32D-SVC), a fan tray (FT-XXX01234), a power supply (PSU-KYZ-PE), and passive cables (QDD-400G-DAC3M, QDD-400G-AOC3M).

Part number	Description	Qty deployed	Qty required
HF6100-32D	32x 100/400GbE QSFP56-DD, 128x 100GbE via 400-100 breakout	--	2
HF6100-60L4D	4x 100/400GbE QSFP56-DD (16x via 100GbE breakout), 60x 10/25/50GbE SFP56	--	2
HF6100-32D-SVC	Service	--	4
FT-XXX01234	Fan tray	--	24
PSU-KYZ-PE	Power supply (port exhaust)	--	24
QDD-400G-DAC3M	400G Passive Cable, 3m	--	12
QDD-400G-AOC3M	400G Passive Cable, 3m	--	12

Cable Map

Edit port connection for tsm-fabric-leaf0



tsm-fabric-leaf0

Port interface
Ethernet1_1

Port role
Fabric

Select optics

Pluggable
QDD-400-AOC15M

Plug type
N/A

Cable type
AOC

To switch
tsm-fabric-spine0

Port interface
Ethernet1_1

Port role
Fabric

Search: 400G [N/A] [400G] [DAC] 9 results [Reset all](#)

PID	Plug type	Max speed	Cable type	Length	Description
QDD-2Q200-CU3M	N/A	400G	DAC	3M	Preterminated breakout cable
QDD-400-CU1M	N/A	400G	DAC	1M	Preterminated cable
QDD-400-CU2.5M	N/A	400G	DAC	2.5M	Preterminated cable
QDD-400-CU2M	N/A	400G	DAC	2M	Preterminated cable
QDD-400-CU3M	N/A	400G	DAC	3M	Preterminated cable
QDD-4ZQ100-CU1M	N/A	400G	DAC	1M	Preterminated breakout cable
QDD-4ZQ100-CU2.5M	N/A	400G	DAC	1.5M	Preterminated breakout cable
QDD-4ZQ100-CU2M	N/A	400G	DAC	2M	Preterminated breakout cable
QDD-4ZQ100-CU3M	N/A	400G	DAC	3M	Preterminated breakout cable

[Cancel](#) [Save](#)

Nexus Hyperfabric

Organization: Business Corp, Inc

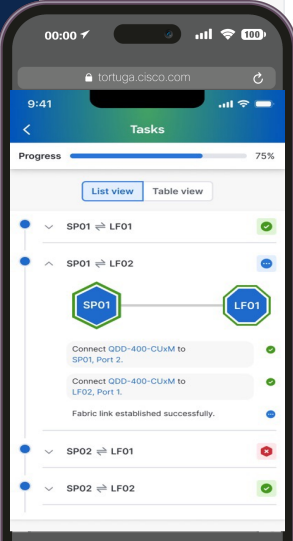
Demo Fabric 1

Summary **InVENTORY**

Assembly list BOM calculations **Cable map**

Global port connections Device connections

Device	Port	Connector	Pluggable (PID)	Plug type	Fiber type + grade	Plug type	Pluggable (PID)	Connector	Port	Device
Spine1	Ethernet1_1	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_1	Leaf1
Spine1	Ethernet1_2	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_1	Leaf2
Spine2	Ethernet1_1	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_2	Leaf1
Spine2	Ethernet1_2	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_2	Leaf2
Spine2	Ethernet1_16 (breakout)									
Ethernet1_16_3	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_1		Leaf3
Ethernet1_16_2	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_1		Leaf4
Ethernet1_16_3	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_1		Leaf5
Ethernet1_16_4	QSFP56-DD	QDD-4000-SR4.2-BD	LC	← MMF (multimode) + OM3	→ LC	QDD-4000-SR4.2-BD	QSFP56-DD	Ethernet1_1		Leaf6



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Bootstrapping the device

- Assign the switch with
 - management IP address/mask (IPv4/IPv6)
 - Gateway
 - DNS
 - and if needed, proxy
- Methods of initial configuration
 - Via management port / console -> dialog-based configuration
 - Via USB stick with configuration attached on first boot
 - USB stick can contain configuration for multiple devices
 - DHCP

Connecting to the cloud controller

- Connectivity via
 - Management port
 - In-band
 - Proxied via another switch in the same fabric
 - One is enough, more is better, monitored via assertions
- Forward proxy support with HTTPS decryption/inspection
 - Approve proxy certs on the switch
 - HTTPS within HTTPS

The fabric

- VXLAN BGP EVPN
- IPv6 IP unnumbered uplinks
- All of the underlay is managed by Hyperfabric, no CLI, no direct visibility
- VRFs supported
- VNI assignement – auto or manual
- SVI for VNI's, anycast GW

Assertions

- Tests on configured entities/features
- Prevents alert storms
- Latched assertions

Interfaces and VLANs

- VLAN to VNI mapping
- VLANs are port-significant
- MLAG – EVPN ESI
- Loop prevention via STP
 - all leaf switches are participating in the same L2GSTP

Demo

[Demo Link](#)



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External L3 connectivity

- Static routing
- BGP
 - Routed interfaces and subinterfaces supported
 - VRF aware
 - Multiple sessions in multiple VLANs supported
- No dynamic routing on SVIs, static only
- No L3 multicast within fabric

Assertions on intra-fabric connectivity

The screenshot displays the Cisco Nexus HyperFabric (Alpha) management interface. The left sidebar shows navigation options: Physical topology (Devices, Assertions, IP/MAC addresses, Cloud connectivity, LLDP), Attachments (VLAN memberships, DSCP), and Logical network (Logical networks (VNI), Route tables (VRF)). The main content area is titled 'Logical network' and shows 'Logical networks (VNI)' and 'Route tables (VRF)'. A 'Detections (1 of 1)' section is visible at the top. The 'Port assertions' section is expanded, showing a summary of 256 results: 2 Critical, 253 OK, and 0 Unknown. A table lists individual assertions with columns for status, name, latched status, time, interface, and description. A callout box highlights two assertions for 'Demo-fab-spine1' and 'Demo-fab-spine2' on 'Ethernet1_1', noting that they are not connected to the expected neighbor and suggesting a move to 'Demo-fab-leaf1/Ethernet1_2'.

Status	Name	Latched	Time	Interface	Description	Action
OK	Demo-fab-leaf2	Latched	Jul 29, 2024 10:59:56 am		Chassis connected to fabric switch	This chassis is connected to a fabric switch
OK	Demo-fab-spine2	Latched	Jul 30, 2024 07:48:35 am		Chassis connected to fabric switch	This chassis is connected to a fabric switch
OK	Demo-fab-spine1	Latched	Jul 30, 2024 07:48:02 am		Chassis connected to fabric switch	This chassis is connected to a fabric switch

Status	Name	Latched	Time	Interface	Description	Action
Critical	Demo-fab-leaf2	Latched	Jul 30, 2024 12:59:14 pm	Ethernet1_1	Port connected to expected neighbor	--
OK	Demo-fab-leaf2	Latched	Jul 30, 2024 12:59:14 pm	Ethernet1_2	Port connected to expected neighbor	--
Critical	Demo-fab-spine2	Latched	Jul 30, 2024 12:59:06 pm	Ethernet1_1	Port not connected to expected neighbor	Move from b4-4c-90-da-97-48/Ethernet1_2 to Demo-fab-leaf1/Ethernet1_2
OK	Demo-fab-spine2	Latched	Jul 30, 2024 01:04:19 pm	Ethernet1_2	Port connected to expected neighbor	--
Critical	Demo-fab-spine1	Latched	Jul 30, 2024 12:59:06 pm	Ethernet1_1	Port not connected to expected neighbor	Move from leaf1/Et
OK	Demo-fab-spine1	Latched	Jul 30, 2024 01:03:48 pm	Ethernet1_2	Port connected to expected neighbor	--
OK	Demo-fab-leaf2	Latched	Jul 30, 2024 12:59:14 pm	Ethernet1_25_2	Port not connected to fabric switch	--

Notice there are two assertions for Spine1 and Spine2 Ethernet connections to Leaf1. Go to the top of the screen to bind Leaf 1.

Monitoring and troubleshooting

- Metric collection
- Ad-hoc packet capture and analysis via cloud controller
- No Netflow to the cloud controller – BYO-NfC planned

Hyperfabric AI



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Cisco Nexus Hyperfabric AI

High-performance Ethernet

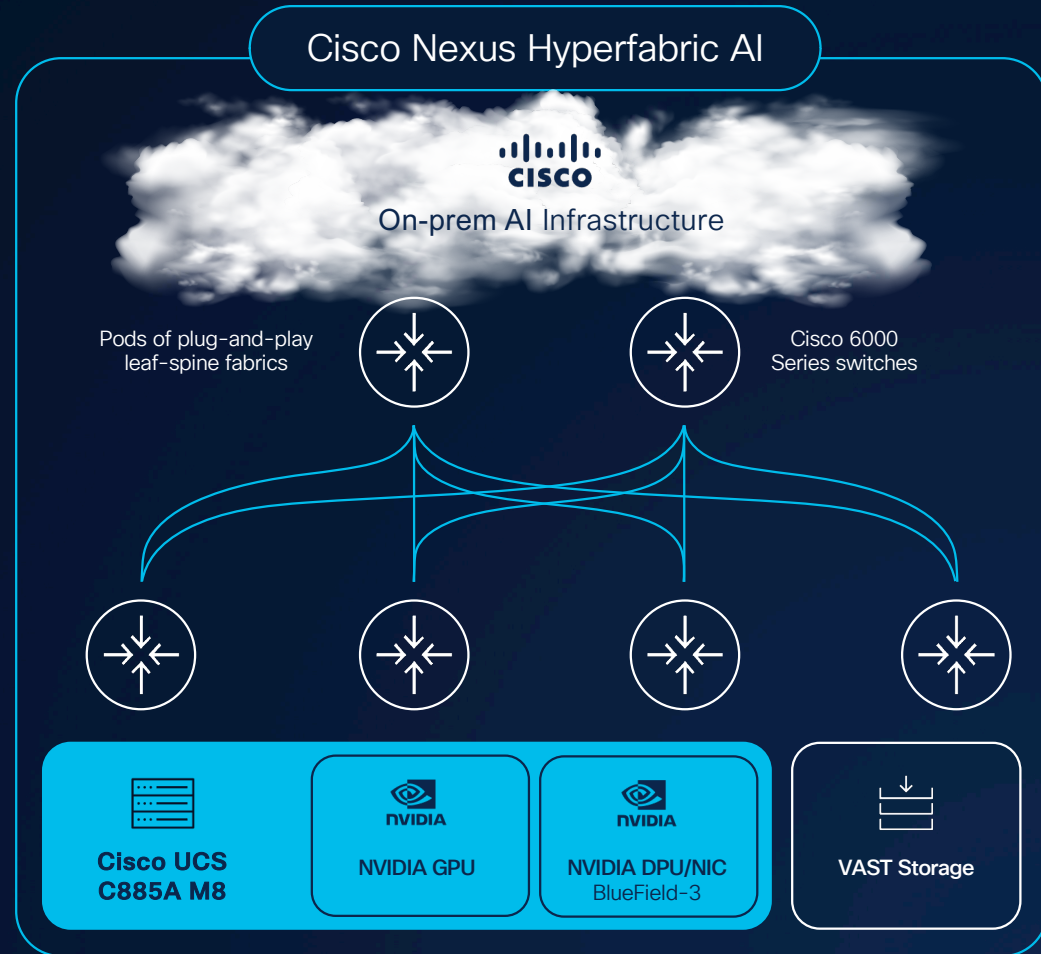
Cloud-managed operations

Unified stack including NVAIE

AI-native operational model

Democratize AI infrastructure

Visibility into full stack AI



Building high-density
GPU servers to the Cisco
UCS family and to Cisco's
AI solution portfolio

Discover data-intensive use cases
like model training and deep learning

Orderable in October 2024



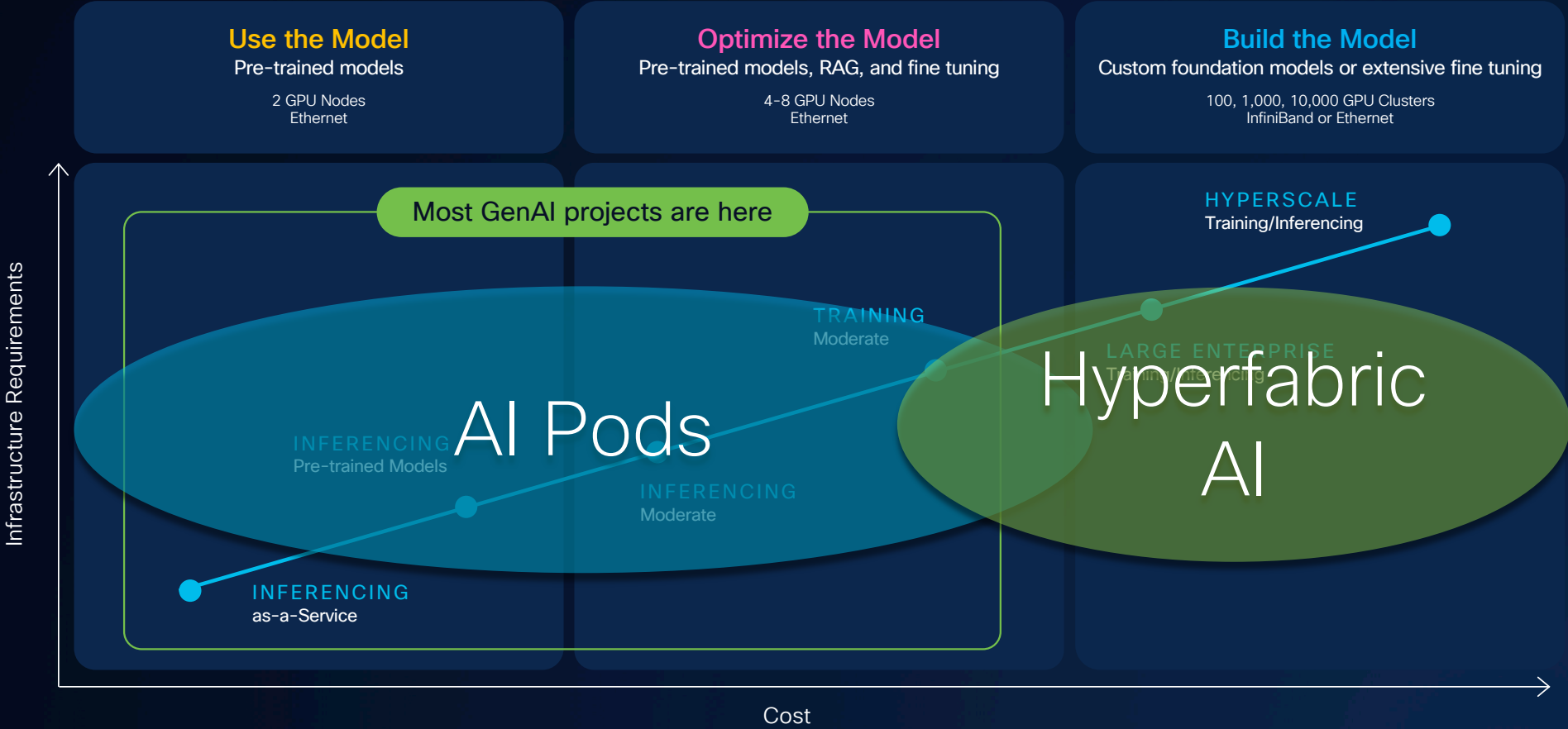
UCS Accelerated
UCS C885A M8

Nvidia HGX with
8 Nvidia H100 GPUs

AMD Mi300X

2 AMD 4th Gen
EPYC™ Processors

Generative AI Spectrum



Looking Ahead



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Product Direction

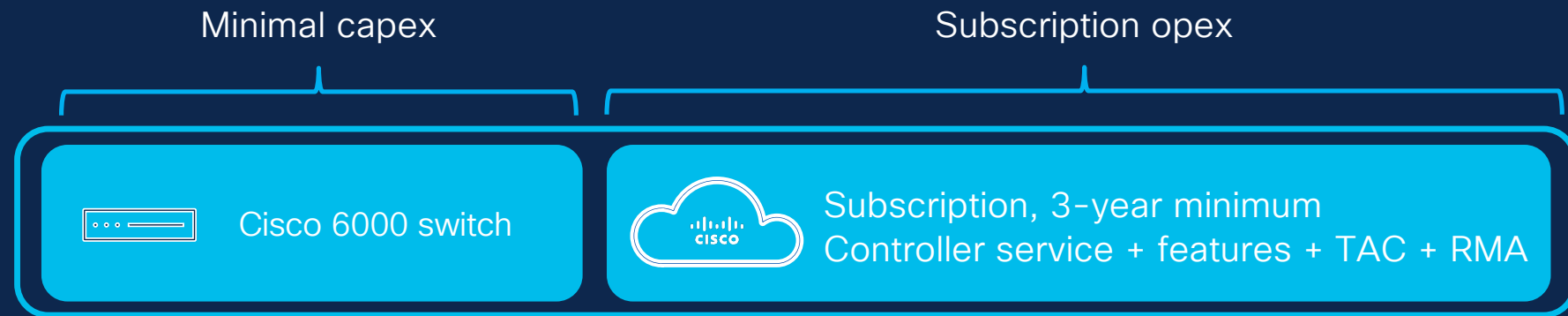
FCS

Future

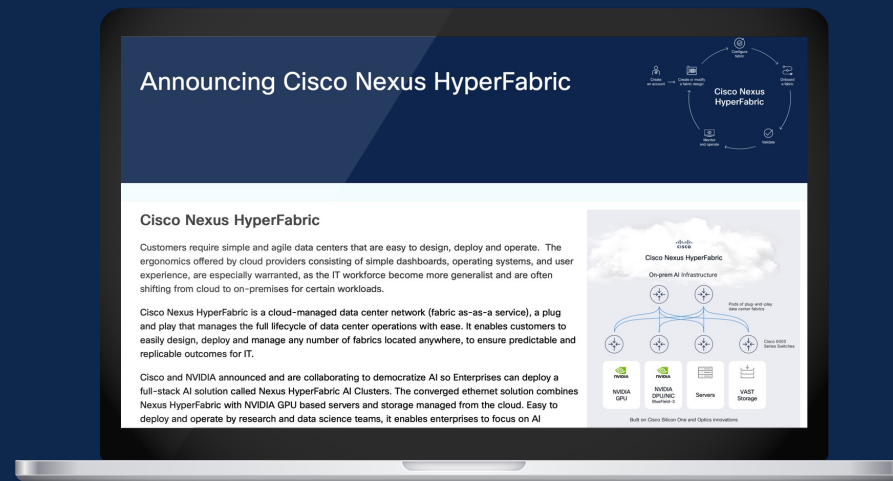
Designs	Mesh & spine/leaf	DCI (Border GW) Super-spine AI fabric
Fabric Scale	<50 switches <2K host ports	Increase in scale
Hosting	US	EMEA, then APJC
Features	EVPN, VXLAN underlay Static & BGP routing MLAG, IPv4/IPv6	Hypershield Common policy (SGT/SXP)
License Tier	Essentials	Advantage (advanced features) Premier (for Hyperfabric AI)
Models	HF6100-32D (32-port 100/400G) HF6100-60L4D (60-port 10/25/50G, 4x400G)	800G



New Pricing Model



Additional Resources



[Cisco.com](https://www.cisco.com) - Cisco Nexus Hyperfabric



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Other DC Switching News



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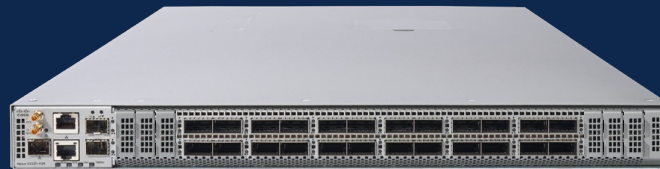
Secure & Futureproof Infrastructure

Programmability

Performance

Flexibility

Efficiency



Cisco Nexus 9000 Services Accelerated Switch



- Rich NX-OS Features and Services
- High-speed connectivity and scalable performance
- Optimized for latency and power efficiency



Routing/
Switching



EVPN/MPLS/
VXLAN/SR



Rich
Telemetry



Line-rate
Encryption



Power
Efficiency

- Software-defined Stateful Services
- Programmable at all layers: add new services without HW change
- Scale-out services with wire-rate performance



Large-Scale
NAT



IPSEC
Encryption



Distributed
Firewall



Event-Based
Telemetry



DoS
Protection

800GE DC Switching



Cisco Nexus 9364E-SG2

- 64x 800GE, capable of 100GE and 400GE breakouts
- high-performance compute (HPC), webScaler, media provider, and Telco SP segments
- NX-OS, and Nexus Dashboard



Cisco 8122-64EH/EHF

- 64x 800GE , capable of 100GE and 400GE hyperscalers and webScalers adopting the hyperscaler model
- open customizable solutions
- SONiC network operating system or other 3rd party NOS
- API support for open tooling

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Nové use-cases a zařízení v SP portfoliu

"Novinky v HW, managemente a monitoringu siete, prefixov a sluzieb"



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