

FlexPod and You

Navigating to and thru the core of the Modern Data Center

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About this Course

This course focuses on enabling you to do the following:

- Describe a Flexpod
- Describe the FlexPod solution portfolio, features, and benefits.
- Describe FlexPod Components, Solutions, and configuration.
- Describe the FlexPod Management tools.
- Describe FlexPod Requirements and Supported Configurations.

Course Modules

This course focuses on enabling you to do the following:

Module 1:

- Introduction to the FlexPod.
- Core Principles of FlexPod.
- Benefits of FlexPod.
- FlexPod Values.

Module 2:

- FlexPod Technical Basics
- FlexPod Management
- FlexPod Requirements and Support

Module 1

Introduction to FlexPod



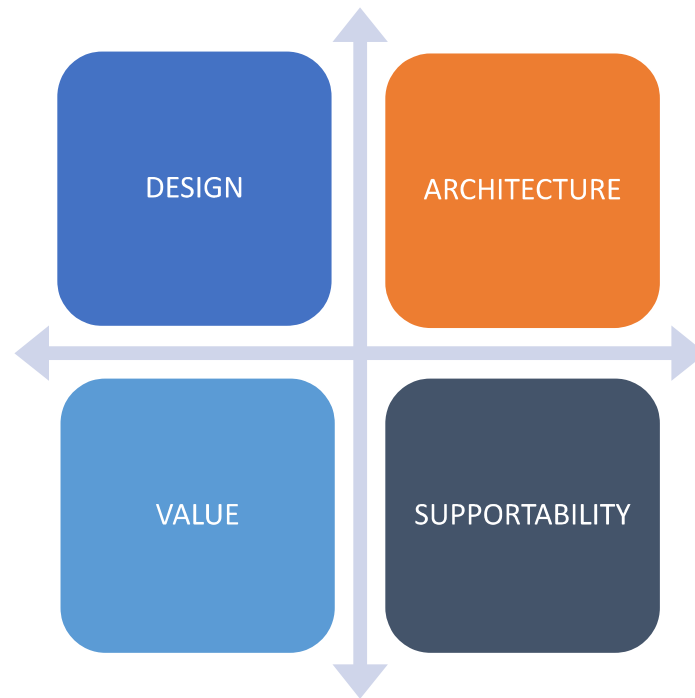
What is a FlexPod?



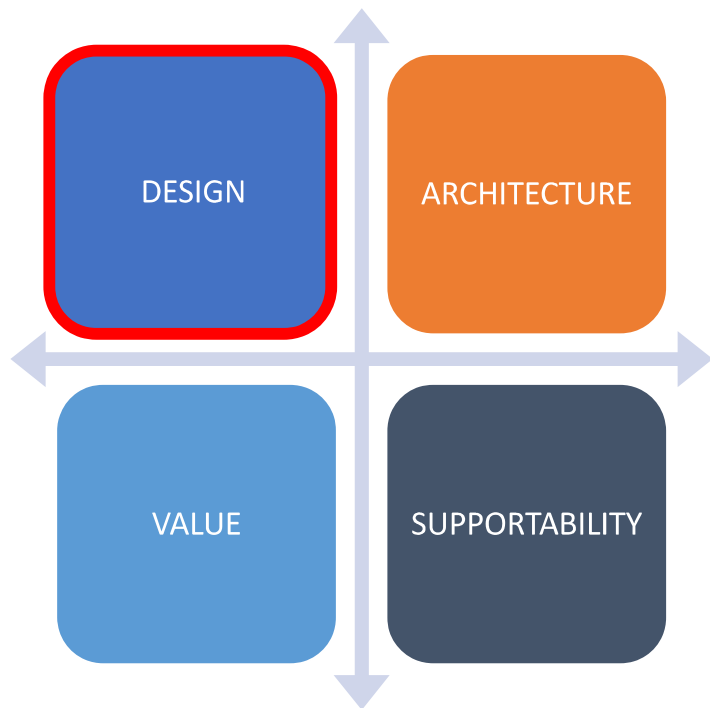
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What is a FlexPod?

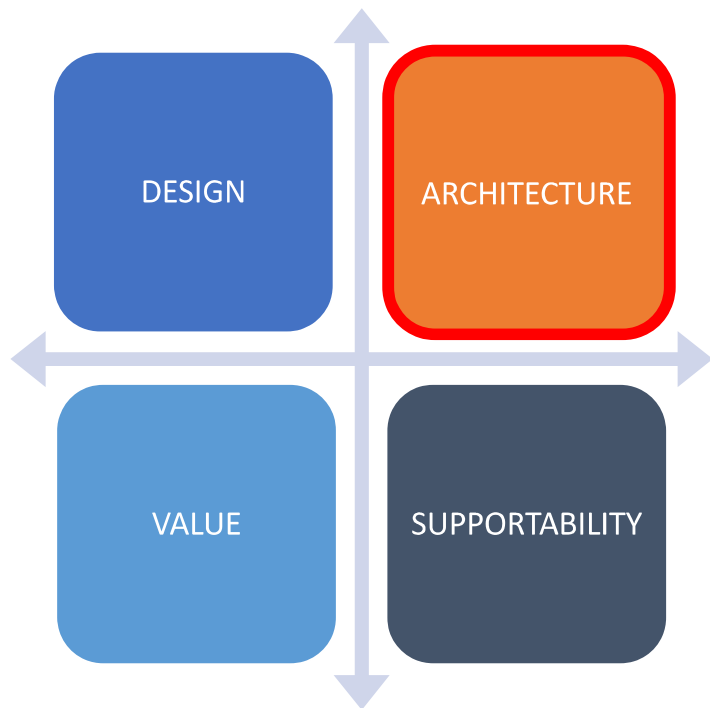


What is a FlexPod?



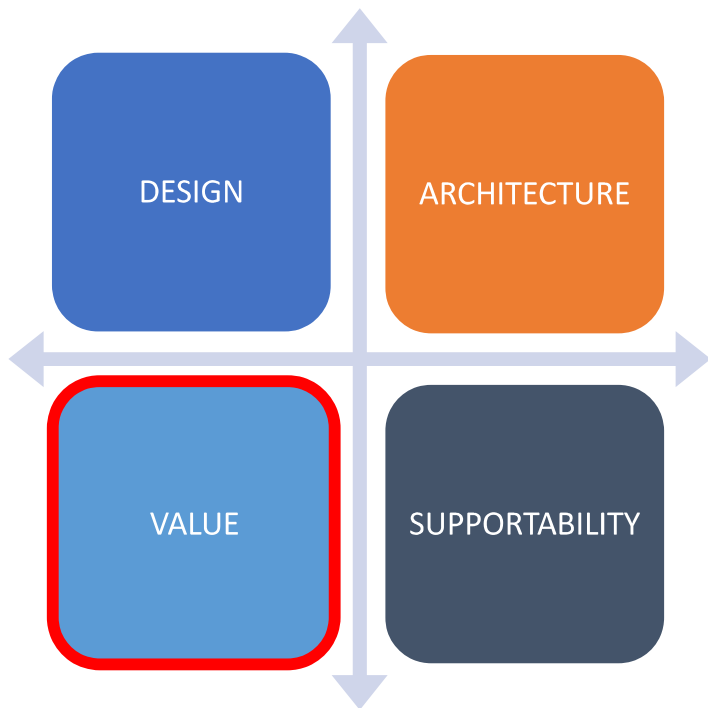
- “Great design is not just a solution; it is the elimination of the problem.” M. Cobanli
- If you don't understand how to run an efficient operation, new machinery will just give you new problems of operation and maintenance. The sure way to increase productivity is to better administrate man and machine.” - W. Edwards Deming

What is a FlexPod?



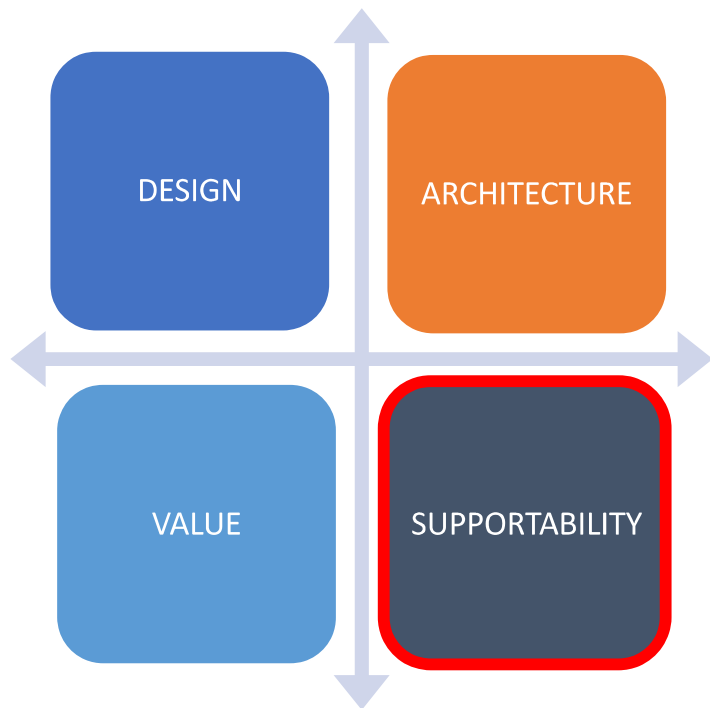
- **Everything is designed. Few things are designed well.” - Brian Reed**
- **As an architect you design for the present, with an awareness of the past, for a future which is essentially unknown. - Norman Foster**

What is a FlexPod?



- **“Time is more value than money. You can get more money, but you cannot get more time”. - Jim Rohn**
- **“You want your customers to value your service.” - Jeff Bezos**

What is a FlexPod?



- **“It is only when they go wrong that machines remind you how powerful they are.” - Clive James**
- **Computers are heaven-sent when they work and hell-spawn when they don't. There's just not much middle ground when it comes to technology. - Dani Harper**



What does that mean for FlexPod?



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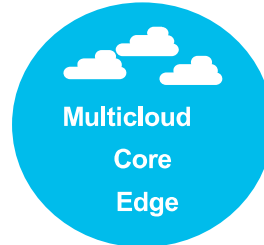


Digital Transformation and FlexPod Innovation



Modern Applications

Seamlessly adopt new applications.



Modern Workflows

Easily connect and optimize.



Proven, Trusted Solutions

Use validated solutions by industry leaders.

Cisco and NetApp Partnership

Deeper Relationship



Large Co-Investments



More Opportunity



Flexible Procurement Options

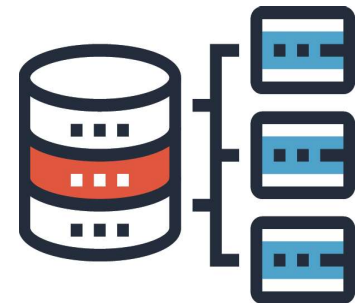
Order from partner



Build your own



Order preracked



What Is the FlexPod Solution?

- Standardized, prevalidated, converged platform
- One flexible platform that scales to fit many mixed workloads
- Benefits
 - Reduced risk
 - Flexibility
 - Built-in data center efficiencies
- Cooperative Support program
- Validated designs





What Value does FlexPod bring to the table?



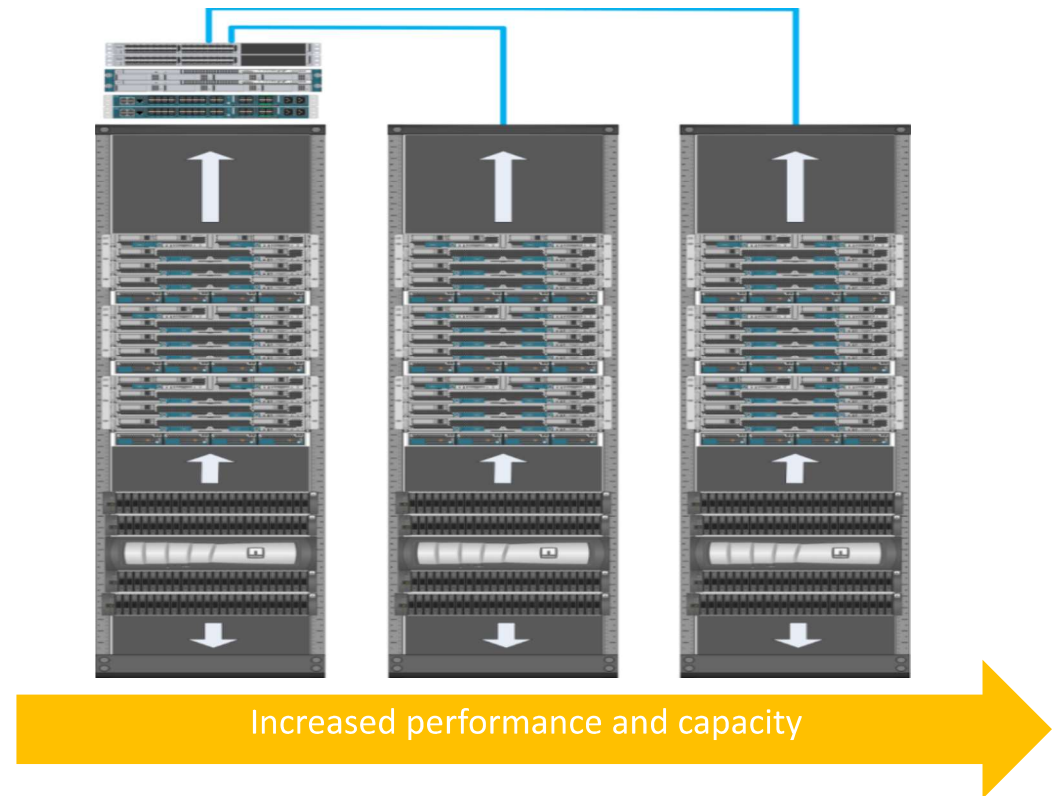
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FlexPod Scale

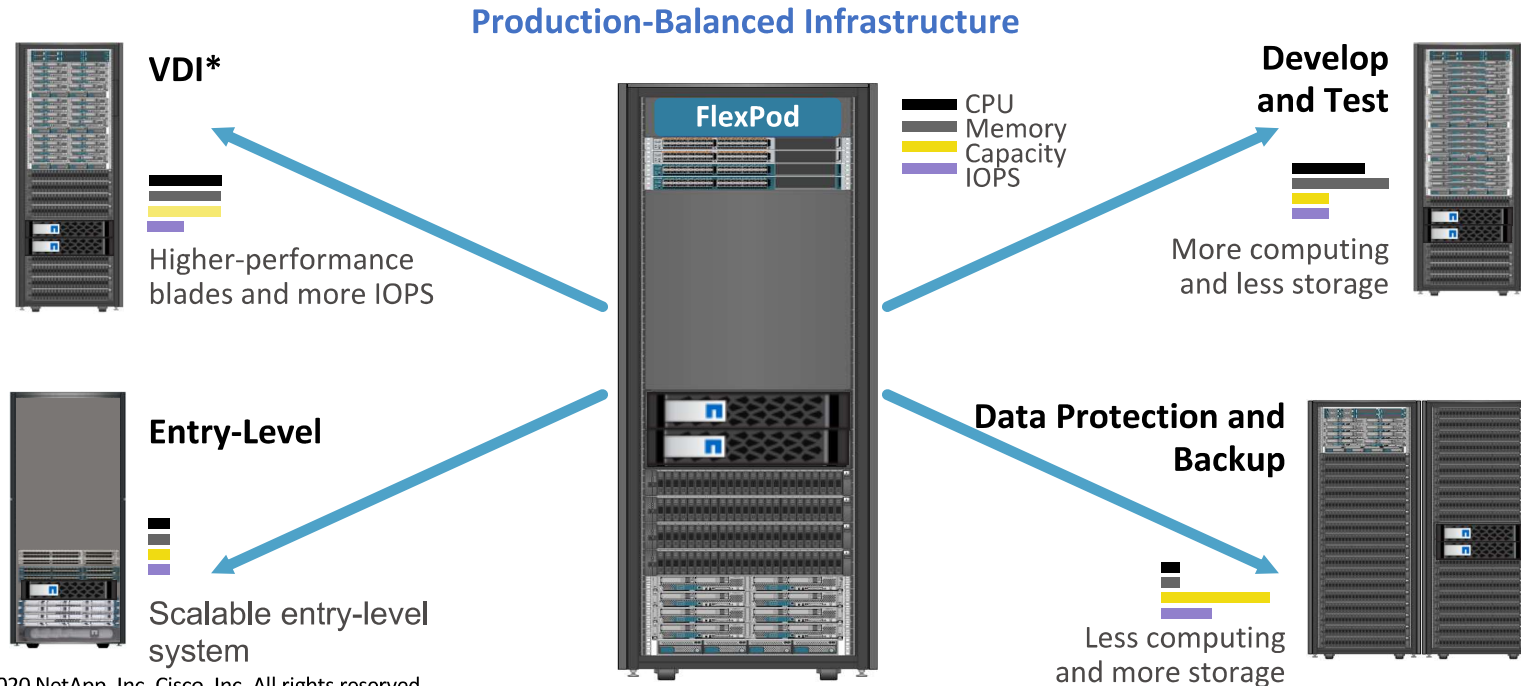
Scale out with standard and proven configurations.

- Gain predictability and high efficiency.
- Manage pools of resources, not individual systems.
- Easily scale vertically or horizontally.



Optimize for Any Workload

- * VDI = virtual desktop infrastructure



Reduce Risk

- Design guides
- Deployment guides
- Technical specifications
- Validated application workloads
- Solution guides
- Sizing guidance

Guides for high-quality,
repeatable deployments



[NetApp Validated Designs](#)

[Cisco FlexPod Design Guides](#)

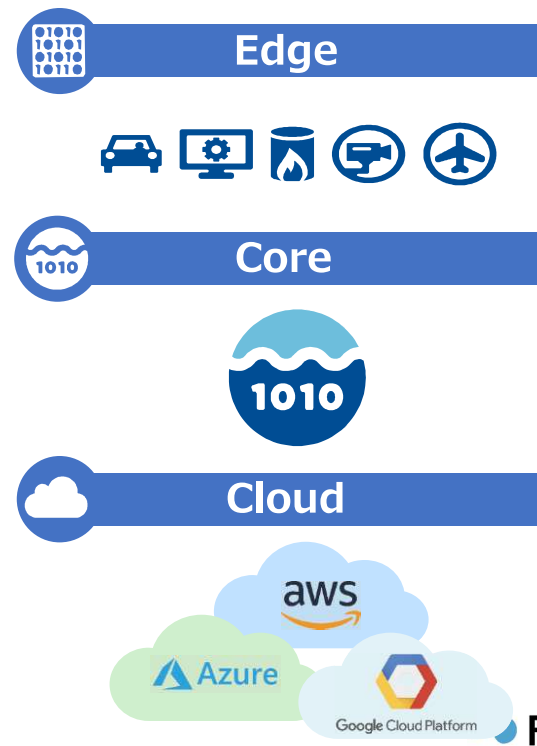
Embrace the Cloud with Confidence

✓ Integrate advanced cloud services.

✓ Orchestrate across edge-core-cloud.

✓ Meet the needs of diverse workloads.

✓ Get nondisruptive operations for your applications.





*Being patient is very good advice,
but the waiting makes me curious*

Module 2

FlexPod Technical Basics

FlexPod Technology

Cisco Nexus Switches

- Unified Fabric
- Innovative performance with cloud scale
- Build Flexible High-Density Fabrics

NetApp Storage

- Unified multiprotocol storage platform with NetApp ONTAP software.
- Eliminate costly, disruptive downtime with Clustered Data ONTAP® nondisruptive operations
- Support for private, public, or hybrid cloud strategies with a consistent set of data management tools from flash to disk to cloud.

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Cisco Unified Computing System (Cisco UCS)

- Unified management
- Stateless programmable infrastructure
- Increased Performance and agility

Centralized Management with Automation

- Cisco Intersight and Cisco UCS Director
- NetApp Active IQ Unified manager and Cloud Insights.
- Open APIs



FlexPod Portfolio

FlexPod Express Solution



FlexPod Datacenter Solution



FlexPod Components

App

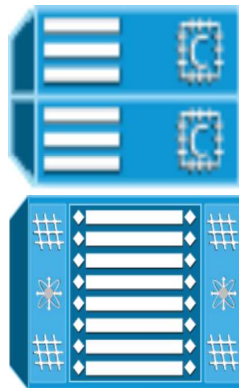
App

App

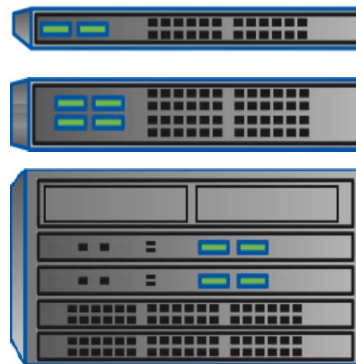
Cisco UCS Fabric Interconnect
and Cisco UCS Manager



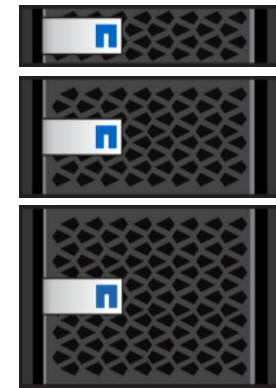
Cisco UCS C-Series or
B-Series Servers



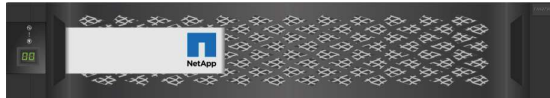
Cisco Nexus 5K, 6K, 7K, 9K
Series Switches



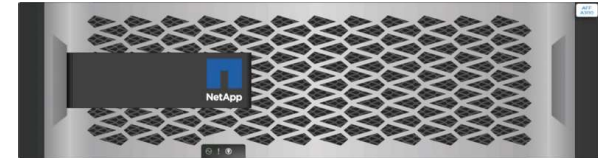
NetApp® FAS (2K, 8K, 9K Series) or AFF
Controllers



NetApp ONTAP Storage



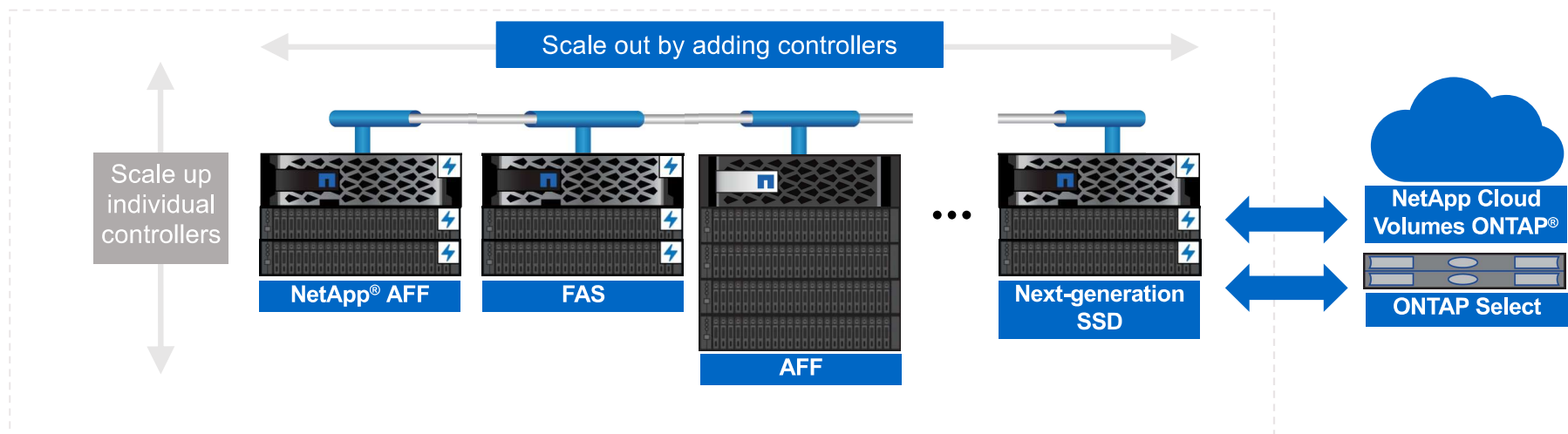
- NetApp FAS controller families
 - FAS2700 hybrid flash system
 - FAS8300 hybrid flash system
 - FAS8700 hybrid flash system
 - FAS9000 hybrid flash system
- Unified NAS and SAN support
- Storage efficiencies
- Multinode cluster support
- Storage virtual machines (SVMs)



- NetApp AFF models
 - AFF C190 all-flash storage system
 - AFF A220 all-flash storage system
 - AFF A400 all-flash storage system
 - AFF A700 all-flash storage system
 - AFF A800 all-flash storage system
- High I/O with consistent low latency
- Same ONTAP software with flash optimization

NetApp ONTAP Storage

Respond to Business Needs with Seamless Scale-out



- Scale out by intermixing your choice of flash and hybrid nodes
- Upgrade hardware/software or scale up without disrupting users
- Incorporate software-defined, cloud, and future-generation flash

ONTAP 9

- Unmatched versatility
- Comprehensive data protection
- Leading efficiency



Cisco UCS

- Unites compute, network, storage access, and virtualization
- Reduces TCO and increases business agility
- Includes management tools
 - Cisco Intersight
 - Cisco UCS Central
 - Cisco UCS Manager
 - Cisco UCS Director



FlexPod UCS M5 Server Portfolio

Enterprise Performance



UCS C240 M5

56 Cores – 20% more cores per socket
100% more memory
Optane / MAXDATA Ready



UCS C220 M5

56 Cores – 20% more cores per socket
100% more memory
Optane / MAXDATA Ready



UCS B200 M5

56 Cores – 20% more cores per socket
100% more memory
Double the GPU support
Optane / MAXDATA Ready

Intensive/Mission Critical



UCS C480 M5

Triple the number of GPUs
Up to 28 cores per socket
Optane / MAXDATA Ready



UCS B480 M5

112 Cores – 28 cores per socket
Up to 12 TB of Memory
Up to 4 GPUs
Optane / MAXDATA Ready

AI / ML



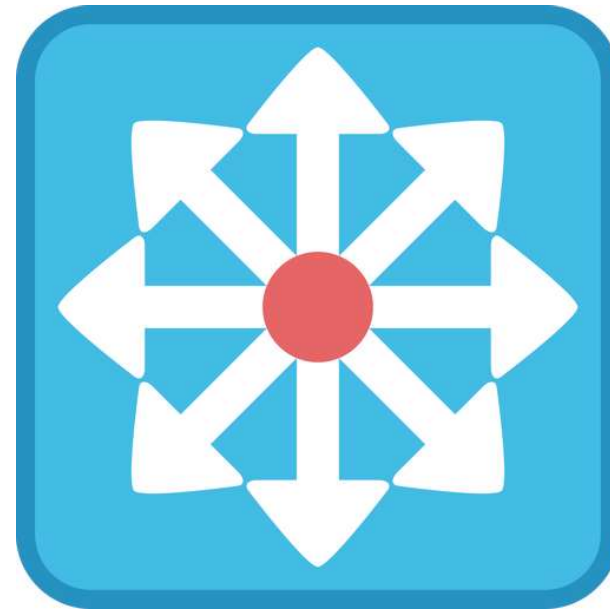
UCS C480 ML M5

The Cisco UCS® C480 ML M5 Rack Server is a no-compromise purpose-built Cisco UCS C-Series server for Deep Learning in a 4-Rack-Unit (4RU) form factor.

56 Cores – 28 cores per socket
Up to 3 TB of Memory
Up to 8 NVIDIA GPUs with NVLink Interconnect

Cisco Networking

- Cisco Nexus switches provide Unified Fabric connectivity.
- Cisco Application Centric Infrastructure (ACI) integrates infrastructure automation.
- Cisco NX-OS provides a highly available, programmable infrastructure.
- You can optionally use Cisco MDS switches to create an FC SAN fabric.



Cisco Networking

Cisco Nexus 9000: Supports both NX-OS and ACI mode

Cisco Nexus 7000: Modular and delivers full NX-OS features

Cisco Nexus 3000: General-purpose use

What are NX-OS and ACI modes?

NX-OS:

NX-OS is a standalone mode and uses Cisco NX-OS software.

ACI:

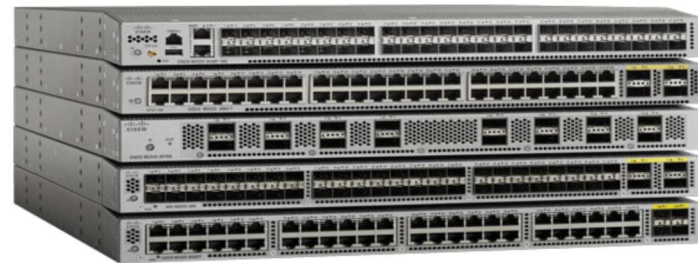
In ACI mode, the switch participates in a leaf-spine based architecture that depends on application policy.



Cisco Nexus 9000 Series



Cisco Nexus 7000 Series



Cisco Nexus 3000 Series





FlexPod Management



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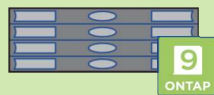
Standardized Data Management

Support new and traditional apps, block and file workloads



ONTAP 9 Software

Edge



Data Center

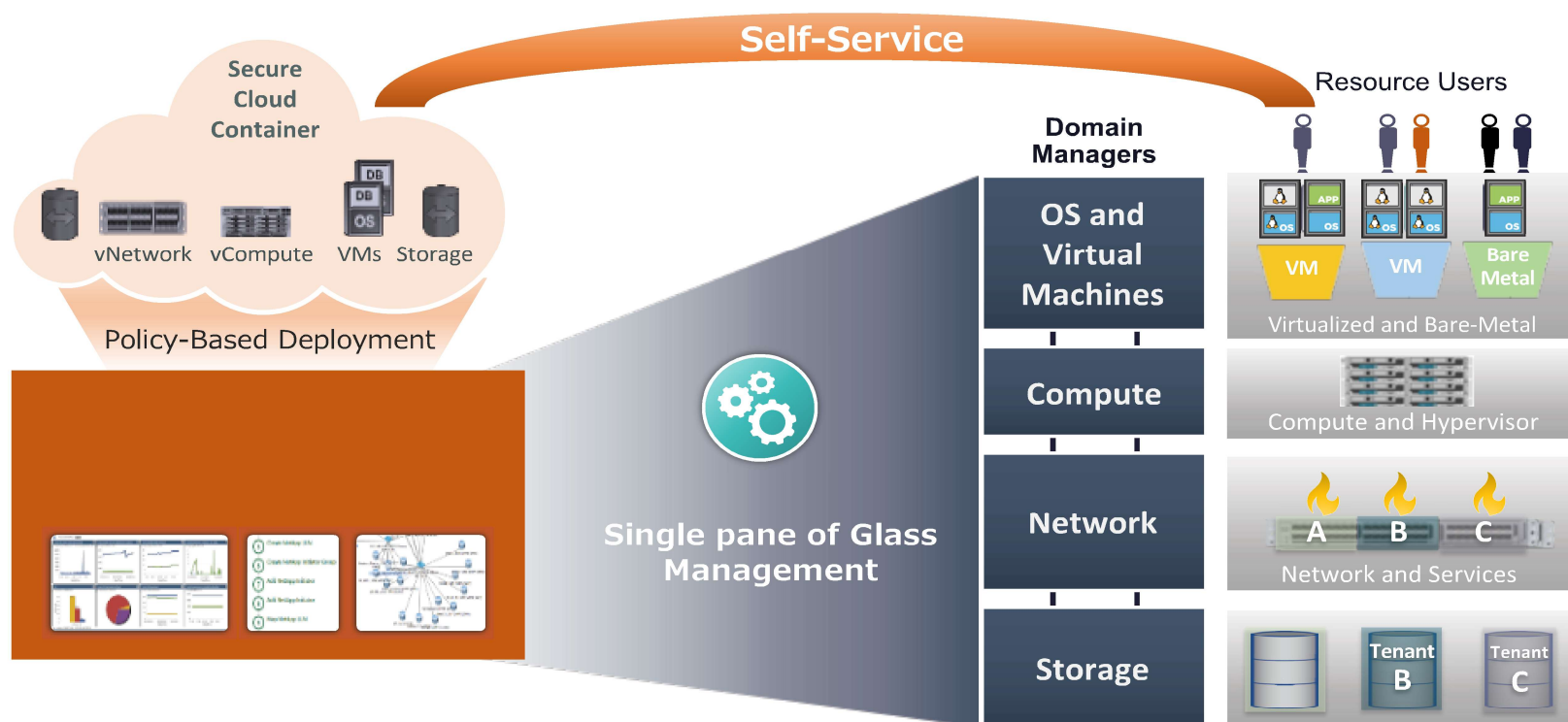


Cloud

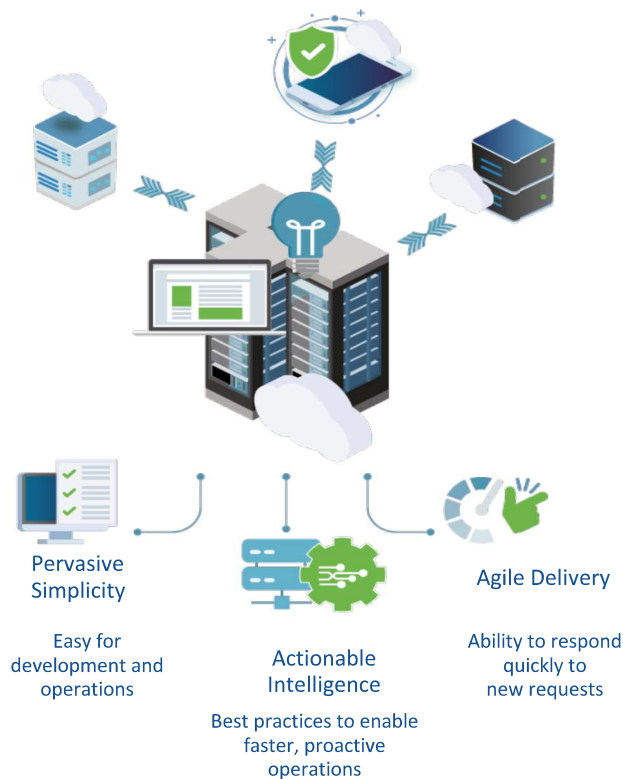


Common data management and data services

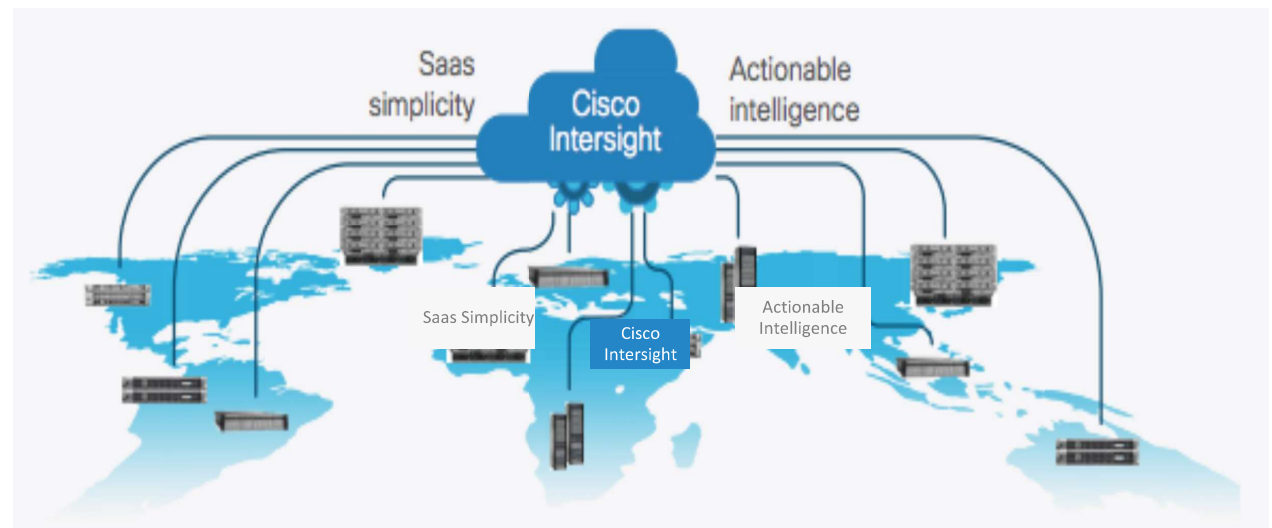
Cisco UCS Director



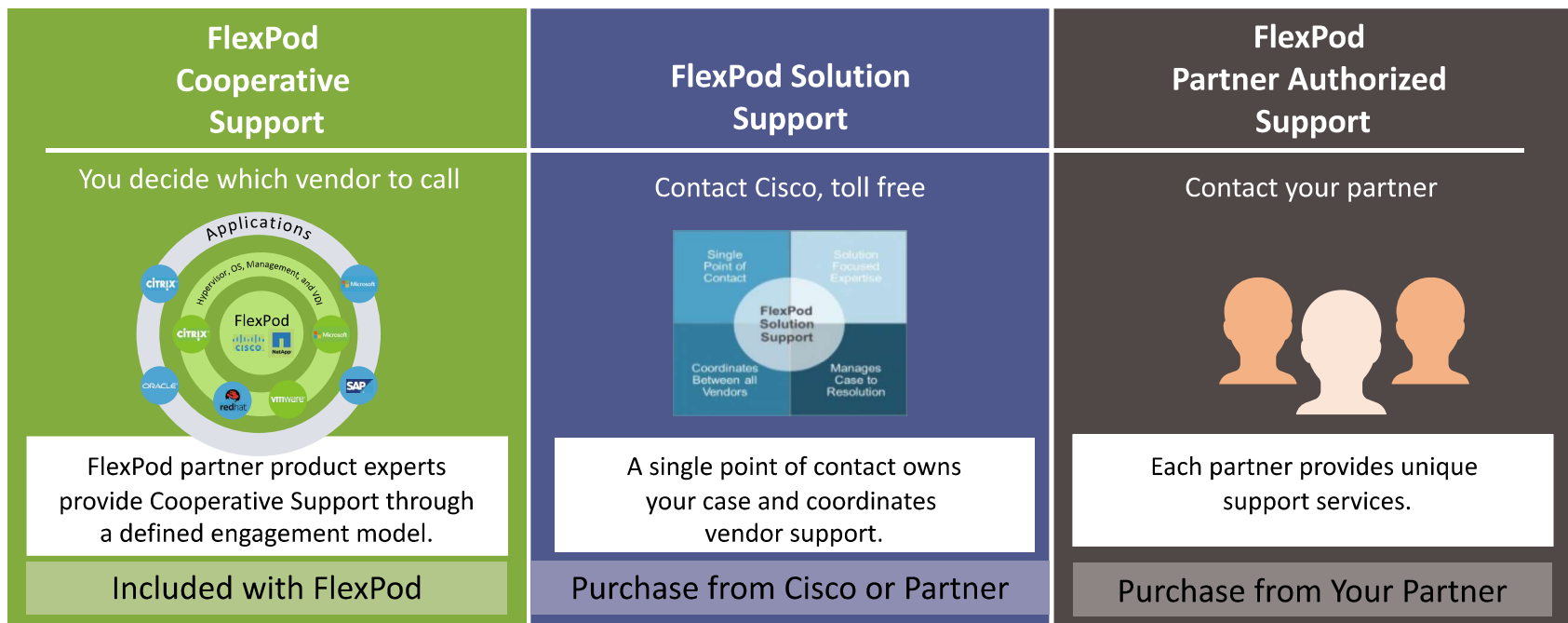
Cisco Intersight



- Provides management as a service (MaaS) for Cisco UCS Ecosystem
- Manages operating system and hypervisor deployments
- Provides configuration, management, alerts, and optimization

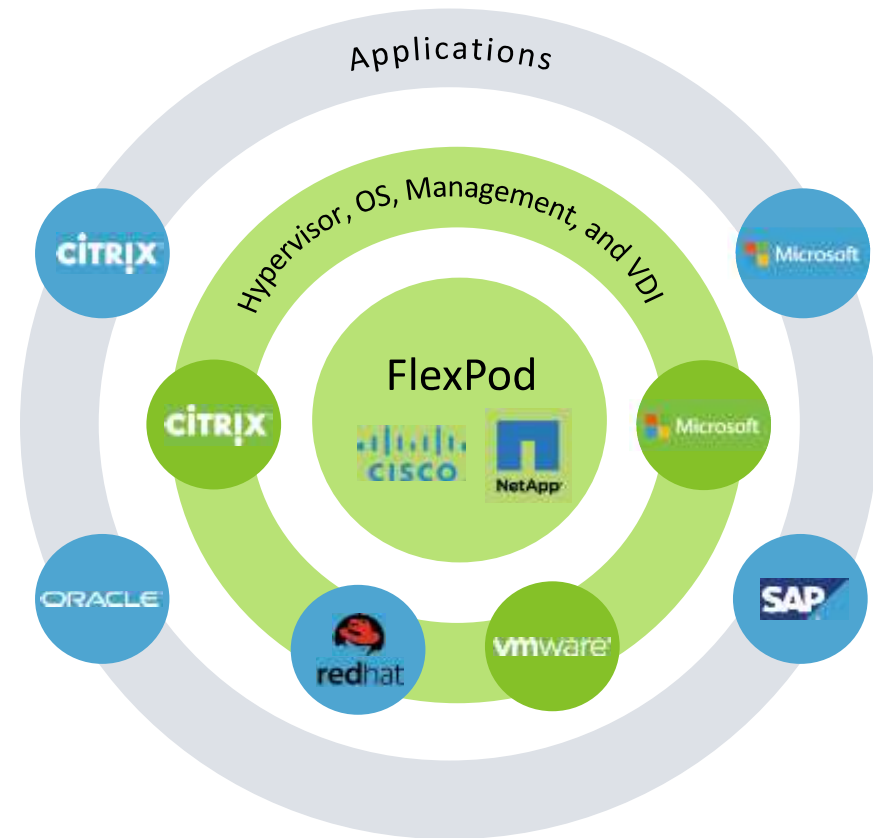


FlexPod Support Options



Cooperative Support: An Ecosystem of Partners

- Coordinated support among NetApp, Cisco, Citrix, Microsoft, VMware, and Red Hat
- Strong relationships among best-in-class partners
- Formal processes to expedite cross-company escalations when necessary



FlexPod Requirements



FlexPod Configuration Requirements

- Minimum hardware requirements
 - Cisco UCS
 - Redundant Cisco UCS Fabric Interconnects
 - Redundant Cisco Nexus switching
 - Redundant AFF and FAS
- Minimum software requirements
 - ONTAP software
 - Cisco UCS Manager
 - Port count and model of Cisco Nexus switching

Validated and Supported Configurations

Validated

- Cisco Validated Design (CVD)
- NetApp Verified Architecture (NVA)

Supported

- NetApp Interoperability Matrix Tool (IMT)
- Cisco Hardware Compatibility List (HCL)

Both are 100% FlexPod Solutions.

FlexPod Infrastructure Solutions

FlexPod supports multiprotocol connectivity support. The support includes



FlexPod End-to-End NVME-FC Connectivity.



FlexPod FC Connectivity.



FlexPod IP Based SAN(ISCST) and NAS(NFS) connectivity.



FlexPod Hybrid Cloud Platform.



FlexPod Metro-Cluster Connectivity.



FlexPod with ACI.



FlexPod Direct Connect with UCS Switching Mode.

FlexPod Application Solutions

Cisco

ACI, Nexus Data Center Switches,
Secure Enclaves

NetApp

SnapMirror, MetroCluster

Microsoft

Private Cloud, Exchange, SQL Server,
SharePoint, Hyper-V

Oracle

Oracle Real Application Clusters
(Oracle RAC), Oracle Linux, Oracle VM
Server

SAP

Applications and HANA

VMware

vSphere, Horizon View

Citrix

Desktops, Hypervisor

Red Hat

Enterprise Linux, OpenStack

Cloudera

Hadoop

Hortonworks

Data Platform

Validated workloads



Secure options

Secure Separation

Secure Multitenancy

Bare-metal operating
system

Hyper-V

Red Hat Kernel-Based
Virtual Machine

Oracle VM

Citrix Desktops

VMware vSphere

FlexPod Datacenter for AI Workloads

With FlexPod Datacenter for AI solution:

- Deploy AI Frameworks with confidence.
- Support large learning datasets with ONTAP FlexGroup volumes
- Reduce data storage capacity requirements up to 10 times



Cisco Nexus 9000 Series

High-speed fabric

Cisco UCS Fabric Interconnects

Unified compute management

NetApp AFF A800

Cloud-connected flash for artificial intelligence (AI) and deep learning (DL)

Cisco UCS 480 ML M5

Optimized for AI and machine learning (ML) with 8 NVIDIA SXM2 V100 32GB modules and NVLink interconnect

Thank You