

Simplified Hybrid Cloud Infrastructure

With 100 Gbps of End-to-End Network Connectivity

As you deploy and grow your hybrid cloud, it is important to have an underlying infrastructure that supports the performance, flexibility, reliability, and simplicity needed to quickly add applications and realize the promise of cloud computing. This FlexPod® Datacenter solution comprises the Cisco

FlexPod: Innovative platform for your hybrid cloud

- Simplifies your on-premises, hybrid-cloud deployment and management
- Delivers an adaptable system designed for modern applications
- Is trusted worldwide for reliability, scale, security, and performance

UCS® X-Series Modular System and NetApp® ONTAP® storage managed with the Cisco Intersight® platform is uniquely qualified to deliver a simplified hybrid-cloud infrastructure that grows simply and easily with your business.

Overcome challenges

One of the key challenges of today's virtualized infrastructure is that, as CPU power and the number of cores increase, the demand for bandwidth must also increase to satisfy the demands that virtual machines place on network and storage access. This solution is designed and tested for 100-Gbps of bandwidth throughput, including compute, network, and storage.

But that's not all. This solution is designed to deliver on a number of the challenges that IT organizations face in supporting hybrid-cloud infrastructure. The solution provides:

- A resilient design with no single point of failure
- Scalability with the flexibility to add compute, storage, and network capacity as needed
- A modular design that can be scaled up and out to meet business needs as they grow
- Simplified infrastructure that can accommodate many generations of updated technologies
- Flexibility to support NAS- and SAN-attached storage
- Cloud-managed infrastructure that can be configured, managed, and orchestrated through a cloud-based GUI or through an API available to scripting tools.

FlexPod Datacenter for Hybrid Cloud

This FlexPod Datacenter solution is converged infrastructure optimized for virtual workloads. The solution (Figure 1) includes the Cisco UCS X-Series Modular System with Cisco UCS X-Series compute nodes, Cisco Nexus® 9000 Series Switches, Cisco UCS 6500 Series Fabric Interconnects, Cisco UCS 15000 Series Virtual Interface Cards (VICs), and NetApp All-Flash FAS (AFF) A-Series flash storage arrays with NetApp ONTAP data management software. Figure 1 illustrates IP-based storage; the solution also supports a 32-Gbps Fibre Channel option.

- **Cisco UCS X-Series Modular System.** The Cisco UCS X-Series Modular System is ready to serve your data center well into the future with an architecture designed to support many future generations of server, I/O, and networking technologies. With cloud-based lifecycle management through the Cisco Intersight platform, you can simplify your data center in multiple ways. Simplify with this cloud-operated infrastructure that can respond at the speed and scale of your business by shaping resources to workload requirements. Simplify with an adaptable system designed for modern

Cisco UCS X-Series Modular System

Shaped through Cisco Intersight to match workload needs, the Cisco UCS X210c M6 Compute Node includes:

- High-performance computing with two 3rd Gen Intel® Xeon® Scalable processors
- Up to 8 TB of DDR4 memory
- Up to 6 SAS/SATA/NVMe drives
- Up to two SATA/NVMe M.2 boot drives
- Fifth-generation Cisco UCS virtual interface cards designed to deliver up to 200 Gbps of connectivity per server

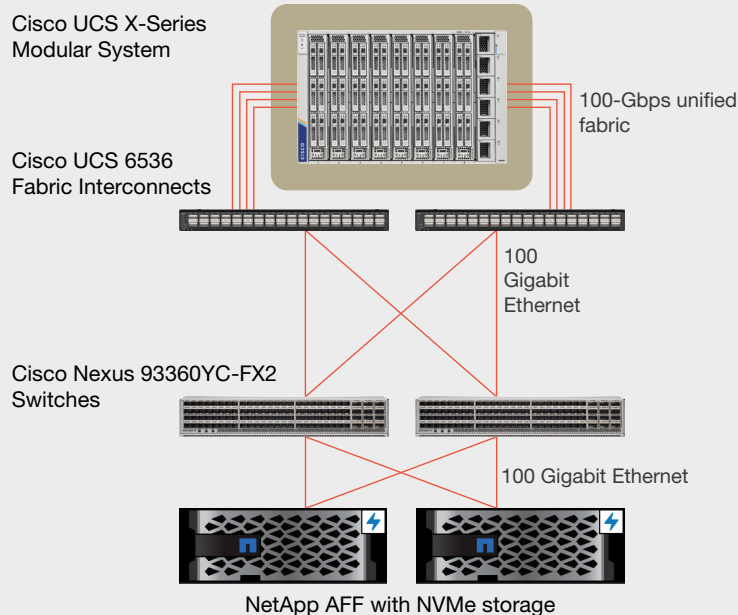


Figure 1) Example FlexPod Datacenter configuration with 100-Gbps connectivity.

applications—the system can meet the needs of your enterprise applications. Simplify with a system engineered for the future. Cisco is known for blade server chassis that stand the test of time, and the X-Series designed to serve your data center well into the future by accommodating new technologies, including liquid cooling and CXL connectivity, as they arise.

NetApp AFF A800 All-Flash Storage Array

- End-to-end NVMe enterprise all-flash array
- Support for 100-Gbps Ethernet or 32-Gbps Fibre Channel including NVMe over TCP (NVMe/TCP) and NVMe over Fibre Channel (NVMe/FC)
- Store up to 2 PB of data in a four-rack-unit (4RU) compact storage system
- Reduce the amount of SSD storage needed by 5 to 10 times with inline data reduction technologies
- Unify data services across SAN and NAS environments, both on premises and in the cloud
- AFF is the only all-flash array that enables you to combine different controllers, SSD sizes, and new technologies so that your investment is protected. The newer NVMe-based AFF systems also support SAS SSDs, maximizing the flexibility and cost effectiveness of your upgrade
- Safeguard your data with best-in-class integrated data protection and seamless cloud backup and recovery

- **Cisco UCS X210c M6 Compute Nodes.** 3rd Gen Intel® Xeon® Processors deliver the computing power to handle enterprise applications and databases. Through a pair of Cisco UCS X9108-100G Intelligent Fabric Modules, the chassis links compute nodes with Cisco UCS 6536 Fabric Interconnects through Cisco Nexus 9300 Series switches to NetApp storage with NetApp ONTAP software.
- **Next-generation nodes.** The solution supports Cisco UCS M7 compute nodes that feature 4th Gen Intel Xeon Processors with up to 60 cores per CPU, including the 2-socket Cisco UCS X210c and the new 4-socket Cisco UCS X410c compute nodes. Also supporting 5th generation Cisco® fabric, testing is pending on these new options.
- **NetApp ONTAP.** The ONTAP software built into NetApp storage systems makes it easy to create seamless data stores with high speed and low latency, supporting many I/O streams in parallel. With NetApp Cloud Volumes ONTAP, you can access your data equally on premises or in the cloud.

- **NetApp AFF A800 storage.**

This NetApp storage array supports a “cloud-first” strategy with enterprise-grade data services for a shared environment across on-premises data centers and the cloud. Powered by NetApp ONTAP data management software, AFF systems deliver industry-leading performance, flexibility, and best-in-class data services with cloud integration to help you accelerate workloads and manage and protect your business-critical data in a hybrid cloud.

Achieve IT and business advantage

This FlexPod Datacenter solution is fully equipped to power your hybrid-cloud workloads and databases. By deploying this highly scalable architecture, your organization can take advantage of built-in technology advancements and a unified approach to management to achieve many IT and business benefits.

Automated deployment

Get your on-premises and hybrid cloud up and running faster and with less risk. We provide

infrastructure as code through Ansible scripts. These drive deployment through the Cisco Intersight API so that you get an accurate and repeatable day-0 configuration.

Simplify management

The FlexPod Datacenter solution with Cisco UCS X210c M6 Compute Nodes and NetApp storage can be managed alongside your existing FlexPod infrastructure and data sources through the Cisco Intersight platform.

FlexPod XCS is a suite of capabilities from Cisco and NetApp designed to bring visibility and hybrid-cloud operations to the FlexPod portfolio. This helps tackle the many challenges of hybrid cloud and accelerate the delivery of modern applications and data.

Deliver extreme performance

Delivering better results in less time requires speed at every layer of infrastructure. The extremely low-latency, high-bandwidth performance of NetApp AFF storage systems and 100-Gbps networking accelerates movement of data from where it

resides to where it is processed. From the storage system to the network, this solution is built and tested for 100-Gbps end-to-end bandwidth. There's no better way to ensure that your Cisco UCS X-Series Modular System speeds your virtualized environments.

Scale computing and storage, capacity

Expand your hybrid-cloud deployments as your business demand changes. You can purchase exactly the infrastructure you need for your applications today and easily scale as needed. You can scale up by adding more computing power through additional compute nodes or rack servers, or with more storage in your NetApp systems. You can scale out by replicating FlexPod instances. With the massive scalability created with Cisco Nexus 9000 Series Switches and ONTAP software, you can deploy environments that scale to 300 PB and beyond.

Support continuous integration and development

NetApp FlexClone® makes it easy for administrators to create development and test

Agile and efficient: how FlexPod drives datacenter modernization



65%
more time spent
on innovation and
new projects



43%
fewer staff
needed to manage



32%
faster software
installation and
management



23%
savings on
cloud computing



34%
reduction in data
center floor space



28%
savings on
services,
outsourcing,
and consulting



29%
less time spent
on monitoring,
troubleshooting,
and remediation



24%
CapEx reduction
for both hardware
and software



23%
savings on annual
maintenance fees



29%
savings on
power and cooling

Source: [IDC document #US45212519](#)

environments for sandboxes and configuration testing or copies of data sets. Traditional copies can take many minutes or hours to make. With FlexClone technology, even the largest volumes can be cloned in a matter of seconds, enabling you to rapidly improve model accuracy and development velocity as your developers and test engineers spend less time waiting for access to data sets and more time doing productive work.

Reduce risk

We validated and tested this solution and documented it through a Cisco Validated Design. These designs allow you to deploy faster and extract more performance from your solution. In addition, your business data stays protected through the use of continuous data protection methods that provide short recovery times (RTs) and recovery point objectives (RPOs).

Accelerate business with FlexPod

If your organization needs to accelerate hybrid-cloud initiatives, consider a FlexPod Datacenter solution. This popular architecture has helped thousands of organizations worldwide deploy infrastructure that is optimized for enterprise applications and databases, and naturally extends to AI/ML environments. With technology advancements and infrastructure optimizations for virtualized workloads, the solution makes it easy to power your modern applications to achieve better and faster business insight. And if you have an existing FlexPod deployment, you can add the Cisco UCS X-Series Modular System and extract more intelligence from the valuable infrastructure already being used in your data center.

Learn More



- flexpod.com
- netapp.com/flexpod
- cisco.com/go/flexpod
- Read the Cisco Validated Design: [FlexPod Datacenter with End-to-End 100G](#)