

Business and Data Continuity with FlexPod Datacenter for Metropolitan Deployments

Imagine tying your data centers together to improve availability. Now imagine having confidence that your deployment strategy makes it easy to accomplish.

Demand for robust business continuity and strategic disaster avoidance often results in the placement of data centers across metropolitan areas. Sites are generally chosen based on locality, environmental or weather considerations, available floor space, and cost constraints. Finding ways to optimize and easily use these data centers, and keep them running, requires interconnection and innovation.

Cisco metropolitan solution with FlexPod

Cisco and NetApp make it easy to interconnect and centrally manage geographically dispersed data centers. Using FlexPod Datacenter running Cisco® Application Centric Infrastructure (Cisco ACI®) Multi-Pod and NetApp® MetroCluster™ IP software for synchronous replication, you can deploy a multiple-data center solution that elevates business and data continuity. Your IT staff can balance workloads between two data centers, non-disruptively move workloads, and migrate services among sites with little or no downtime.

FlexPod Datacenter

The solution uses the FlexPod Datacenter platform, which combines Cisco Unified Computing System™ (Cisco UCS®) B200 M5 Blade Servers, Cisco UCS C-Series Rack Servers, Cisco Nexus® 9000 Series Switches, next-generation NetApp AFF storage systems, VMware vSphere 6.7 software, and Cisco ACI software. You can run your business applications on a shared pool of high-performance resources that are easy to deploy and manage.

Highlights

Metropolitan deployment

- Integrates two geographically dispersed data center sites into a single domain
- Delivers a highly available multi-data center solution
- Provides access to data from both sites

Availability and recovery

- Implements an active-active cluster configuration
- Supports seamless migration of all workloads to a safe site
- Integrates with VMware vSphere Metro Storage Cluster (vMSC) best practices

Simplicity

- Streamlines IT procurement and operation processes
- Offers native integration of hardware and software
- Automates data provisioning, replication, and availability

Reduced risk

- Supplies prevalidated configurations through Cisco Validated Designs
- Offers cooperative support

Easy-to-deploy IT infrastructure resources

FlexPod with Cisco ACI provides a common programmable automation and management framework for your network, application, virtualization, and security teams. Your IT staff defines application-centric profiles, and the solution automatically configures the entire infrastructure as needed. By automating layers of repeatable and error-prone manual configuration that your IT staff likely performs today, you can consistently deliver the data center resources that your applications need in less time and with end-to-end security.

Multiple sites, one logical data center

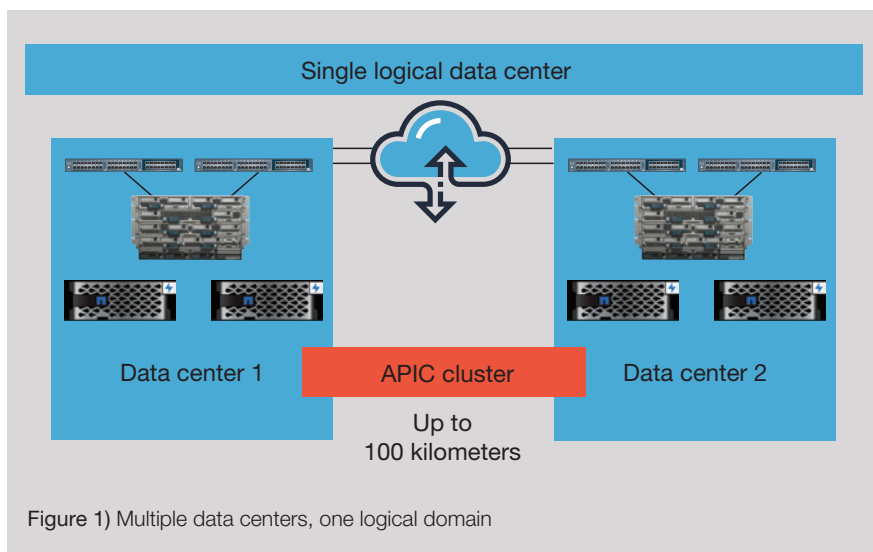
Building on Cisco ACI, Cisco ACI Multi-Pod provides seamless network connectivity across two or more sites. Whether the sites, called pods, are physically colocated or geographically dispersed, they can be interconnected and controlled within a single cluster. The result is a logical grouping of physically separated pods that function as a single Cisco ACI fabric (Figure 1).

Cross-site connectivity

The solution interconnects two geographically dispersed data centers at the network layer using a multicast-enabled IP-based network. In this approach, a Cisco Application Policy Infrastructure Controller (APIC) cluster manages all pods, whether they reside on different floors or buildings within a campus or in a local metropolitan region. Each pod is a localized fault domain. Using the Virtual Extensible LAN (VXLAN) forwarding features in Cisco ACI, the compute infrastructure in both data centers is connected such that hosts and storage at one site can reach the hosts and storage at the other site without the need to configure any Layer 3 routing.

One logical virtual infrastructure

To enable a single logical virtualized architecture across two physical data centers, each VMware vSphere ESXi host is configured with the same virtual LANs (VLANs) and subnets. Storage controllers at both data centers are also configured using the same VLANs and IP subnets. The Cisco ACI Multi-Pod configuration allows virtual machine kernel (VMkernel) interfaces on the compute nodes in each data center to communicate with the logical interfaces for storage systems as if they resided on



Cisco ACI Multi-Pod

- Groups sites into a single logical fabric
- Provides seamless network connectivity across sites
- Connects and manages sites using the same Cisco APIC cluster

NetApp MetroCluster

- Maximizes uptime for your storage infrastructure
- Supports synchronous replication over IP networks in a metropolitan environment
- Optimizes data with built-in deduplication, compression, and compaction
- Reduces storage costs and administrative overhead
- Simplifies infrastructure by reducing the number of components to manage
- Delivers near-zero failover time, with a recovery time objective (RTO) under 120 seconds

the same LAN segment. And adding the VMware vSphere ESXi hosts across the two sites to the same VMware High Availability (HA) cluster supports additional high availability features across the two sites.

Easy, cost-effective data access and continuous data availability

NetApp MetroCluster IP technology connects the sites at the storage layer. Using an IP-only network, the solution provides an active-active storage-array cluster with continuous data availability for critical applications and virtual environments. Data is served from both NetApp controllers using separate data stores. Various traffic segments, including SCSI over IP (iSCSI) and Network File System (NFS) storage traffic, can seamlessly span the two data centers. The hosts in each physical data center can access both local and remote storage systems and use data paths within and across the data centers (Figure 2). Built-in data reduction technologies, including deduplication and compression, help save space across the data centers.

There is no need to create and maintain complicated failover scripts, and all data is duplicated on a transaction-by-transaction basis, with replication performed synchronously. Together, these capabilities help ensure that your users have uninterrupted access to applications and data, reduce the likelihood of data loss, and eliminate the complexities associated with host-based clustering solutions.

Disaster avoidance and recovery

Your organization can't wait a long time for applications to be up and running after a disruption. To help shorten recovery time, the solution contains redundancy at every layer in the infrastructure stack so that data continues to be served even if a component fails. In the event of an impending natural disaster or planned upgrade, your IT staff can seamlessly migrate all workloads to the "safe" site. The endangered site can then be shut down safely and brought online at a later time.

The solution features a stretched cluster environment that can span distances. During a regional power outage or natural disaster, control can be switched to the surviving site and applications can continue to run with minimal downtime. Data services are restored at the secondary site in a matter of seconds using an automated single command, with no complex failover scripts or restart procedures.

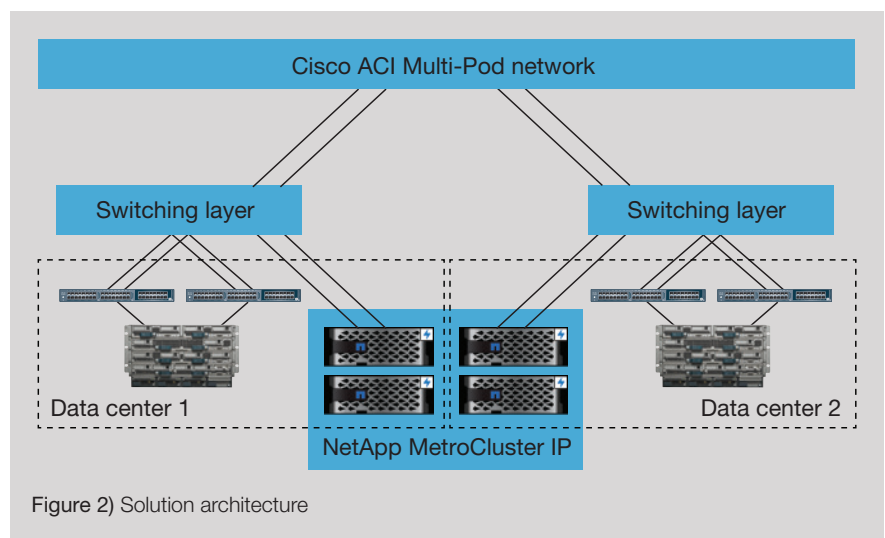


Figure 2) Solution architecture



For more information

- [Cisco Validated Design](#)
- [FlexPod on Cisco.com](#)
- [FlexPod on Netapp.com](#)
- [Cisco ACI](#)
- [Cisco CloudCenter™](#)

Comprehensive management

We make it easy for you to manage your data center your way. Our programmable infrastructure approach provides a consistent way to refer to, define, configure, and manage your IT resources. Every component is incorporated into an object model that maintains a single source of truth regarding system inventory and configuration. The object model is available to Cisco and third-party management tools through a unified API and set of plug-ins. As a result, you can manage your infrastructure with fine-grained control at any level you choose.

- **Integration of Cisco ACI with VMware software** provides a single point of policy management for your physical and virtual environments. With these management capabilities, your IT staff can accelerate application deployment, transparently instantiate applications in VMware vSphere virtual machines, and seamlessly move workloads across overlay networks. All controller and data paths are decoupled, helping ensure that network traffic is not affected due to the loss of a controller. In addition, your IT staff gains visibility into the health of the application through the holistic aggregation of information across physical and virtual environments.
- Expanded management capabilities are provided through **Cisco UCS Manager** and **Cisco UCS Central** software. Using Cisco UCS Manager, your IT staff can manage fabrics and logical servers and use models that deliver consistent, error-free, policy-based alignment of server personalities with workloads. As your deployment grows, you can use **Cisco UCS Central** to manage multiple globally distributed domains with thousands of servers from a single pane, simplifying your operations at scale.

Reduced risk

We can guide you in making design choices to help ensure that your performance is always optimal. We tested our configuration through the Cisco Validated Design program to help you make the most of your IT resources. Our verified, lab-tested architecture provides detailed design and implementation guidance that reduces guesswork by giving your architects and administrators a guidebook for implementation. By following the guidelines in this Cisco Validated Design, you can easily connect your data center sites to support IT and business continuity.

Keep your business running with a metropolitan solution

Using FlexPod Datacenter with Cisco ACI Multi-Pod, NetApp MetroCluster IP, and VMware vSphere 6.7, you can easily tie your data center sites together to achieve new levels of availability. With the capability to interconnect and centrally manage two or more fabrics deployed in separate, geographically dispersed data centers, you can safeguard your IT infrastructure against site failures and keep your business running.