

## Introducing High Resiliency and Network Convergence in Data Centers

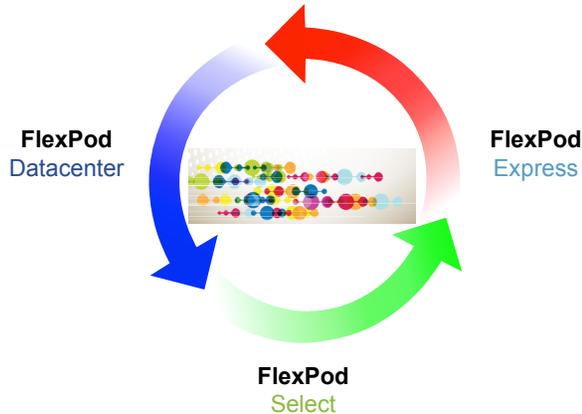
“FlexPod is one of the most complete private cloud architectures available.”  
—IDC

### Introduction

FlexPod is a converged infrastructure platform developed by Cisco and NetApp. Since its introduction in 2010, it has been adopted by more than 2700 customers in 35 countries. FlexPod supports a diverse set of enterprise-critical workloads, including virtual desktops and Microsoft Exchange, Oracle Real Application Clusters (RAC), and SAP applications.

FlexPod has solutions that focus on three different domains: FlexPod Datacenter addresses enterprise data centers, FlexPod Express serves the needs of medium-sized enterprises, and FlexPod Select is optimized for specialized workloads (Figure 1).

Figure 1. FlexPod Domains



This document discusses the benefits of incorporating Cisco Nexus® 7000 Series Switches and NetApp Clustered Data ONTAP into the FlexPod Datacenter infrastructure.

## Cisco Nexus 7000 Series Switches

Cisco [Nexus 7000](#) Series Switches create the network foundation for the unified data center. The Cisco Nexus 7000 Series was designed on the basis of three principles:

- **Infrastructure scalability:** Virtualization, efficient power and cooling, high density, and performance all support efficient data center infrastructure growth.
- **Operation continuity:** The design integrates hardware, Cisco® NX-OS Software features, and management to support zero-downtime environments.
- **Transport flexibility:** You can incrementally and cost-effectively adopt new networking innovations and technologies.

The modular architecture of the Cisco Nexus 7000 Series enables FlexPod customers to use its port scalability and Cisco In Service Software Upgrade (ISSU) feature to deploy a more scalable converged infrastructure.

## Operation Continuity with the Cisco Nexus 7000 Series

The Cisco Nexus 7000 Series provides a set of hardware and software features that enable the system to continue providing network services in the event of component failure or other problem with no disruption of service:

- Zero-service disruption architecture
- No single point of failure in the hardware
- Multifaceted system resiliency with a modular operating system with built-in operation continuity mechanisms such as Cisco ISSU
- Resilient and stable network services based on time-proven Layer 2 and 3 technologies and protocols combined with innovative technologies such as stateful process restart to help ensure nonstop operation in the most demanding environments

## Customer Benefits

- Data center operators have lean IT departments and want to consolidate physical devices to reduce the management and operation burden. These customers often prefer modular solutions that allow them to pay as they grow. To offset the risks of consolidation, these customers need the high availability and nondisruptive features of the Cisco Nexus 7000 Series.

- Enterprises are increasingly adopting virtualized solutions for data center network infrastructure. The Cisco Nexus 7000 Series can consolidate the core and aggregation layers while segmenting them using virtualization technologies. This approach results in equipment and operating cost savings while improving FlexPod scalability.
- IT service providers and network operators need high-density 10/40/100 Gigabit Ethernet solutions to underpin their expanding computing and storage infrastructure. A FlexPod solution with Cisco Nexus 7000 Series Switches allows them to create true multitenant environments in which they can deliver IT and enterprise software as a service.

## NetApp Data ONTAP Cluster Mode

NetApp Clustered Data ONTAP is a new mode of operation that provides a highly scalable storage architecture that supports nondisruptive operations, nondisruptive upgrades, and agile data infrastructure. Clustering enables users to move data resources without disruption across storage nodes as well as to move logical network interfaces.

When combined in a single solution, the Cisco Nexus 7000 Series and NetApp Clustered Data ONTAP provide the highly scalable, nondisruptive infrastructure for application delivery through FlexPod:

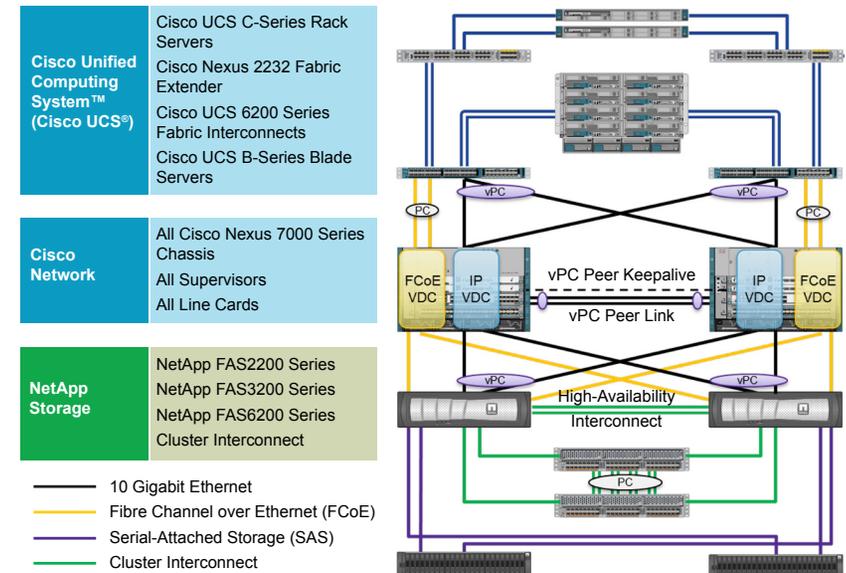
- **Always on:** Each component is installed in pairs, with all components supporting some form of peering or clustering. All connections between components incorporate specific features to allow at least two cables or links per connection.
- **Nondisruptive:** Several features enable administrators to perform certain functions nondisruptively on system components that historically required disruptive operations:
  - In-service upgrades and technology refreshes
  - Updates
  - Capacity and performance expansion
  - Maintenance of data access across product lifecycles
  - Rebalancing of performance or capacity for critical workloads
- **Agile:** Although the architecture contains physical components, specific configuration details remain logical, which allows identities and virtual objects to be migrated or cloned within specific layers of the infrastructure. Agile objects include service and switch port profiles, templates, and logical interfaces.

## FlexPod Infrastructure

Figure 2 shows the FlexPod Datacenter infrastructure.

**Figure 2.** FlexPod Datacenter with Cisco Nexus 7000 Series and NetApp Data ONTAP with Cluster Mode

### Cisco Nexus 7000 Series and NetApp Cluster Mode with Multihop FCoE



## For More Information

[Cisco Nexus 7000 Series Switches](#)

NetApp:

[Data ONTAP 8 Operating System](#)

[Cisco Interactive Design Zone for Data Centers](#)

[Clustering to achieve non-disruptive operations](#)

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