

# Cisco Fabric Extender Technology



## Overview

Cisco Unified Fabric provides the foundational connectivity and unifies storage, data networking and network services delivering architectural flexibility and consistent networking across physical, virtual and cloud environment, enabling convergence, network scale, virtualization awareness, and intelligence through the industry-leading Cisco NX-OS.

As a key component to Cisco Unified Fabric, Cisco Fabric Extender Technology comprises of technologies that enable fabric extensibility with simplified management enabling the switching access layer to extend and expand all the way to the server hypervisor as the customer's business grows.

## Challenges

Today's trends are moving toward data center consolidation, virtualization, cloud services, and high-performance computing. Customers face the need for better utilization of compute and network resources like efficient usage of cabling, 10 Gigabit Ethernet bandwidth utilization, and increased costs to maintain and manage the network, server adapters, cables, and power.

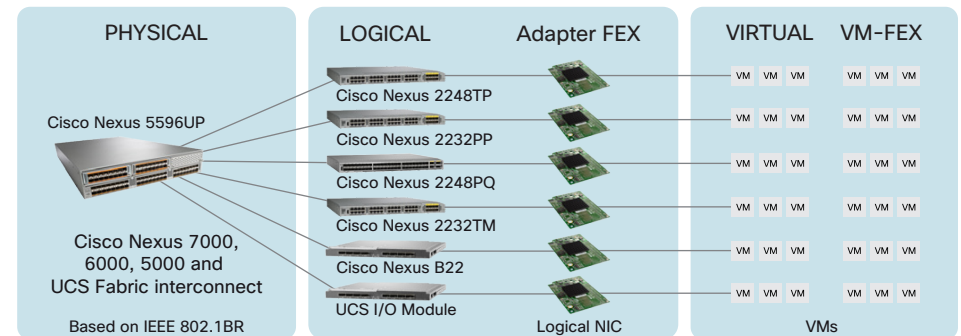
## Cisco FEX Technology

Based on the emerging standard IEEE 802.1BR, Cisco FEX Technology solution comprises of a parent switch that can be a Cisco Nexus 5000 Series Switch, Nexus 6000 Series Switch, Nexus 7000 Series Switch or a Cisco UCS Fabric Interconnect. The parent switch is then extended to connect to the server either as a remote line card with Nexus 2000 Series Fabric Extenders or logically partition or virtualize adapter ports to connect to any type of servers – rack and/or blades, with Cisco Adapter FEX and VM-FEX technologies.

### Cisco Nexus 2000 Series Fabric Extenders

Nexus 2000 Series Fabric Extenders behave logically like remote line cards for a parent Cisco Nexus 5000 or 7000 Series Switch. They simplify data center access operations and architecture as well as management from the parent switches. They deliver a broad range of connectivity options, including 40 Gigabit Ethernet, 10 Gigabit Ethernet, 1 Gigabit Ethernet, 100 MB and Fibre Channel over Ethernet (FCoE).

Figure 1. Cisco Fabric Extender Technology Portfolio



### Cisco UCS 2200 Series Fabric Extenders

The Cisco UCS 2200 Series extends the Cisco FEX Technology to Cisco Unified Computing System™ blade servers. The Cisco UCS 2200 Series Fabric Extenders together with the Cisco UCS 6200 Series Fabric Interconnects form a similar parent switch and line card architecture to deliver scalability.

### Cisco Nexus B22 Fabric Extender

The Cisco Nexus B22 extends the Cisco FEX Technology to high-density blade server chassis, providing consistency across rack and blade server environments. It supports third-party blade servers, including HP, DELL and Fujitsu blade servers. Cisco Nexus 5000 Series and Nexus 6000 Series Switches act as parent switches for the blade servers, for simplified management.

### Cisco Adapter FEX

Cisco Adapter FEX extends the Cisco FEX Technology into traditional rack servers. Cisco Adapter FEX enables the server adapter to be logically partitioned into multiple virtual network interface cards (vNICs). Each vNIC behaves like a physical NIC port and meets the network connectivity needs for each application, so that security and quality of service (QoS) policies can be applied for each vNIC and application. Cisco has partnered with server adapter vendors including Emulex, Broadcom and QLogic to deliver this capability.



## Cisco Data Center VM-FEX

Cisco Data Center VM-FEX extends the Cisco FEX Technology to virtualized servers. Cisco Data Center VM-FEX partitions the server adapter into multiple vNICs, and each vNIC is assigned to individual virtual machines. By providing switching of VM traffic in hardware switches instead of using a software switch within the hypervisor, Cisco customers achieve greater performance through the consolidation of the virtual and physical access layers.

## Business Benefits

The main benefits of Cisco FEX Technology include:

### Simplified operations with efficient resource utilization

FEX Technology enables better utilization of network resources by consolidating multiple 1 Gigabit Ethernet adapters to a single 10 Gigabit Ethernet adapter and ensure efficient usage of 10 Gigabit Ethernet bandwidth across multiple workloads and virtual machines. It now extends this benefit towards 40 Gigabit Ethernet bandwidth usages too.

FEX Technology enables a consistent enforcement of policies across the fabric and providing a single point of management from the parent switches, Cisco Nexus 5000, Nexus 6000 or Nexus 7000 switch.

### Architectural flexibility

FEX Technology enables support for multiple architectures be it physical, virtual or cloud. It enables the architecture to scale as the business grows with increased number of applications, virtual machines and servers.

FEX Technology further lowers total cost of ownership by providing investment protection and providing flexibility to support multi-vendor network devices.

### Fabric Extensibility

FEX Technology delivers a consistent homogeneous server access architecture to extend and scale the fabric as the datacenter grows. This technology can support more than 1500 1 Gigabit Ethernet ports and 1000 10 Gigabit Ethernet ports, all managed from single parent switch acting as a single point of management.

## Increased business agility

Operating expense (OpEx) and capital expenditure (CapEx) savings through consolidation, cabling reduction, rack space reduction, reduced power and cooling needs, investment protection through feature inheritance from the parent switch, and the capability to add functions without the need for a major equipment upgrade of server-attached infrastructure.

## For More Information

- Cisco FEX Technology: [www.cisco.com/go/fex](http://www.cisco.com/go/fex)
- Cisco Nexus 2000 Series: [www.cisco.com/go/nexus2000](http://www.cisco.com/go/nexus2000)
- Cisco Nexus B22: [www.cisco.com/go/b22fex](http://www.cisco.com/go/b22fex)
- Cisco Adapter FEX: [www.cisco.com/go/adapterfex](http://www.cisco.com/go/adapterfex)
- Cisco Data Center VM-FEX: [www.cisco.com/go/vmfex](http://www.cisco.com/go/vmfex)