



Unified Computing through Unified Fabric

The Cisco Unified Computing System™ is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system designed to reduce total cost of ownership (TCO) and increase business agility. The system integrates a low-latency, lossless 10 Gigabit Ethernet unified network fabric with enterprise-class, x86-architecture servers. The system is an integrated, scalable, multichassis platform in which all resources participate in a unified management domain.

Within the Cisco Unified Computing System, all I/O, including LAN and SAN traffic, is carried between the network adapters on the server side and the Cisco® UCS 6100 Series Fabric Interconnects by the unified network fabric.

Benefits of Cisco Network Adapters

- **TCO:** Fewer network interface cards (NICs), host bus adapters (HBAs), cables, and switches needing to be powered, cooled, configured, etc.
- **Simplified operations:** Compatibility, flexibility and embedded management
- **Performance and availability:** 10 Gigabit Ethernet and up to 128 virtual interfaces on a single card

Cisco offers a variety of mezzanine adapter cards designed for use with Cisco UCS B-Series Blade Servers. All Cisco UCS B-Series network adapters:

- Are managed by Cisco UCS Manager software
- Feature dual 10 Gigabit Ethernet connections to the chassis midplane
- Can be used in a redundant configuration with two fabric extenders and two fabric interconnects
- Allow cabling to be configured once, with features enabled and configured through software
- Support Fibre Channel multipathing

Cisco offers a choice of three types of adapters so that organizations can choose the technology most appropriate for their data centers and applications. They can be mixed and matched in the same chassis and blade server (Table 1).

Table 1: Criteria for Choosing the Right Network Adapter for Your Environment

Cisco UCS M81KR Virtual Interface Card	Cisco UCS M7 1KR Converged Network Adapters	Cisco UCS 82598KR-CI 10 Gigabit Ethernet Adapter
Optimized for virtualization	Compatible with existing drivers	Ideal for efficient, high-performance Ethernet
Total of 128 dynamic, programmable Ethernet and Fibre Channel interfaces	Total of 4 fixed interfaces: 2 Ethernet and 2 Fibre Channel	Total of 2 fixed Ethernet interfaces
Hardware- and/or software-enabled Cisco VN-Link capability	Software-enabled Cisco VN-Link capability	Software-enabled Cisco VN-Link capability
Hardware-enabled Ethernet NIC teaming	Hardware-enabled Ethernet NIC teaming*	Ethernet NIC teaming through software with bonding driver

* Hardware enabled Ethernet NIC teaming feature will be available for these products in future version releases.

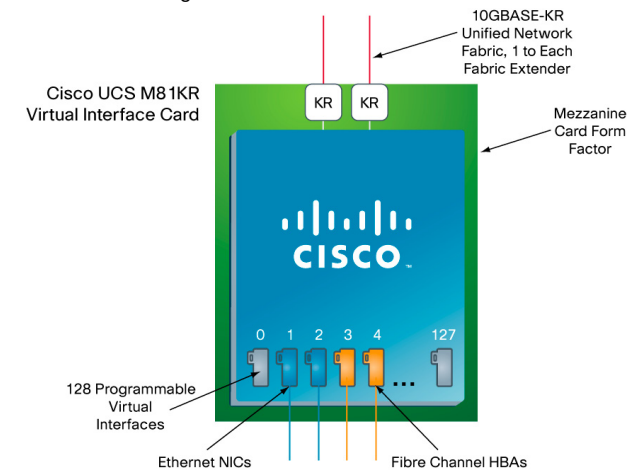
Virtualization-Optimized Virtual Interface Card

A Cisco innovation, the Cisco UCS M81KR Virtual Interface Card is a virtualization-optimized Fibre Channel over Ethernet (FCoE) mezzanine card designed for use with Cisco UCS B-Series Blade Servers (Figure 1). It offers these benefits:

- Allows up to 128 complete I/O configurations to be provisioned in virtualized or non-virtualized environments using just-in-time provisioning, providing tremendous system flexibility and allowing consolidation of multiple physical adapters

- Delivers uncompromising virtualization support, including hardware-based implementation of Cisco VN-Link technology and pass-through switching
- Improves system security and manageability by providing visibility and portability of network policies and security all the way to the virtual machine

Figure 1: Cisco UCS M81KR Virtual Interface Card Supports 128 Just-in-Time Configured Virtual Interfaces



The virtual interface card makes Cisco VN-Link connections to the parent fabric interconnects, which allows virtual links to connect virtual NICs in virtual machines to virtual interfaces in the interconnect. Virtual links then can be managed, network profiles applied, and interfaces dynamically reprovisioned as virtual machines move between servers in the system.

Compatibility-Optimized Converged Network Adapters

Two converged network adapters (CNAs) are designed to make the existence of the unified network fabric completely transparent to the operating system or hypervisor. The Cisco UCS M7 1KR-E Emulex and UCS

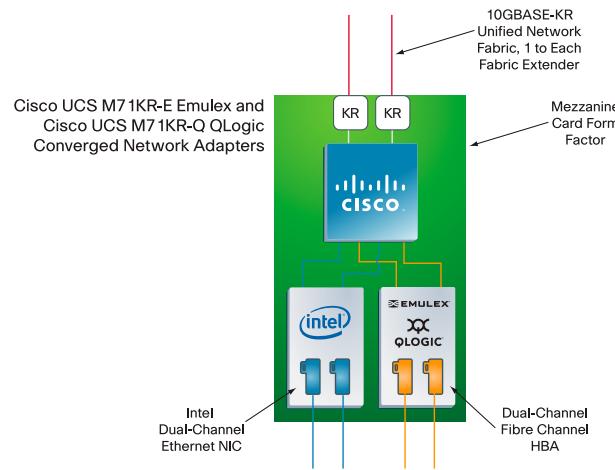
M71KR-Q QLogic Converged Network Adapters present dual 10 Gigabit Ethernet NICs and dual Emulex or QLogic Fibre Channel HBAs to the peripheral card interconnect (PCI) bus, respectively (Figure 2). The CNAs offer these benefits:

- Use existing drivers, integrated with Cisco UCS Manager, to make the existence of the unified network fabric transparent, saving administrator time and retraining
- Reduce risk and ease migration to the Cisco Unified Computing System through compatibility with existing Fibre Channel and Ethernet drivers
- Reduce TCO through consolidation of LAN and SAN traffic over the same mezzanine card and fabric
- Offers both HBA and NIC firmware and settings that are just-in-time provisioned by Cisco UCS Manager

By using standard HBA-vendor application-specific integrated circuits (ASICs) and Cisco ASICs to encapsulate multiple traffic streams onto the unified network fabric, these CNAs offer complete compatibility with existing data center best practices that are based on the use of Emulex or QLogic HBAs. This approach helps increase compatibility with target storage systems and may reduce the effort needed for an IT department to qualify the CNAs.

When running virtualization software on blade servers having two adapter slots, one can be populated with a virtual interface card for virtual machine access to the network, and one can be populated with a compatibility-optimized CNA for hypervisor access to storage, helping preserve existing best practices while helping IT build on the benefits of Cisco VN-Link supported networking.

Figure 2: Compatibility-Optimized CNAs Use Emulex or QLogic HBA ASICs and Intel Silicon to Present Compatible Interfaces to the OS or Hypervisor



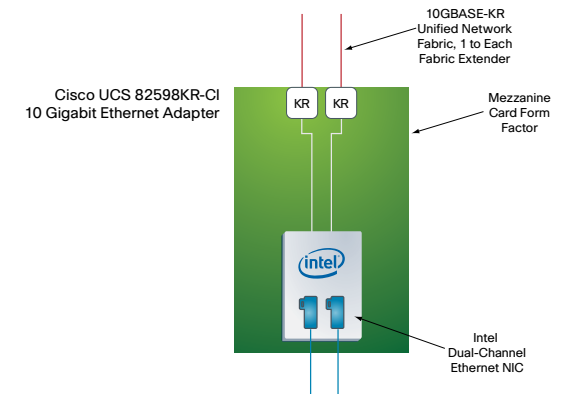
Efficiency and Performance-Optimized Ethernet Adapter

The Cisco 82598KR-CI 10 Gigabit Ethernet Adapter is designed as an efficient, high-performance Ethernet interface (Figure 3). It offers these benefits:

- Efficient, high-performance network connectivity
- State-of-the-art 10 Gigabit Ethernet NIC that supports Cisco Data Center Ethernet features for manageability and performance
- Just-in-time provisioning by Cisco UCS Manager

The adapter uses a dual-channel Intel 10 Gigabit Ethernet NIC to provide high-performance network connectivity. This highly efficient device is designed primarily for environments using Small Computer System Interface over IP (iSCSI) or Network File System (NFS) for file I/O, such as front-end web servers in which all content is accessed and all transactions are conducted over IP networks.

Figure 3: An Efficient, High-Performance 10 Gigabit Ethernet Adapter Provides I/O Connectivity for Network-Focused Environments



A Network Adapter for Every Application

Cisco UCS B-Series network adapters are the server-side on-ramps to the unified network fabric. With options that are optimized for virtualization, compatibility with existing environments, and efficient, high-performance Ethernet, Cisco B-Series network adapters offer a range of choices that ease migration to the Cisco Unified Computing System and help deliver the system's full benefits to customers.

Cisco Unified Computing Services

Using a unified view of data center resources, Cisco and our industry-leading partners deliver services that accelerate your transition to a unified computing architecture. Cisco Unified Computing Services help you quickly deploy your data center resources, simplify ongoing operations, and optimize your infrastructure to better meet your business needs. For more information about these and other Cisco Data Center Services, visit <http://www.cisco.com/go/unifiedcomputingservices>.

For More Information

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