# Cisco UCS M81KR Virtual Interface Card



## Cisco Unified Computing System Overview

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.

## Product Overview

A Cisco® innovation, the Cisco UCS M81KR Virtual Interface Card (VIC) is a virtualization-optimized Fibre Channel over Ethernet (FCoE) mezzanine card designed for use with Cisco UCS B-Series Blade Servers (Figure 1). The VIC is a dual-port 10 Gigabit Ethernet mezzanine card that supports up to 128 Peripheral Component Interconnect Express (PCIe) standards-compliant virtual interfaces that can be dynamically configured so that both their interface type (network interface card [NIC] or host bus adapter [HBA]) and identity (MAC address and worldwide name [WWN]) are established using just-in-time provisioning. In addition, the Cisco UCS M81KR supports Cisco VN-Link technology, which adds server-virtualization intelligence to the network.

**Figure 1.**    Cisco UCS M81KR Virtual Interface Card



## Features and Benefits

Unique to the Cisco Unified Computing System, the Cisco UCS M81KR is designed for both traditional operating system and virtualized environments. It is optimized for virtualized environments, for organizations that seek increased mobility in their physical environments, and for data centers that want to reduce TCO through NIC, HBA, cabling, and switch reduction.

The Cisco UCS M81KR presents up to 128 virtual interfaces to the operating system on a given blade. The virtual interfaces can be dynamically configured by Cisco UCS Manager as either Fibre Channel or Ethernet devices (Figure 2). To an operating system or a hypervisor running on a Cisco UCS B-Series Blade Server, the virtual

interfaces appear as regular PCIe devices. With Cisco UCS M81KR, deployment of applications that require or benefit from multiple Ethernet and Fibre Channel interfaces is no longer constrained by the available physical adapters. The card is ideal for workloads that require multiple separate interfaces to isolate different types of traffic: for example, application data, backup traffic, and cluster heartbeats.

In a virtualized environment, Cisco VN-Link technology enables policy-based virtual machine connectivity and mobility of network and security policy that is persistent throughout the virtual machine lifecycle, including VMware VMotion. It also enables a nondisruptive operational model that allows virtualization and enables network administrators to work independently and collaborate with each other. The Cisco UCS M81KR implements VN-Link technology in hardware, with each virtual machine connecting to a virtual interface to execute network policies and switching functions on application-specific integrated circuit (ASIC)-based fabric interconnects, enabling virtualization deployments to scale better. As a result of close cooperation between Cisco and VMware, network policies, called port profiles, can be defined by a network administrator in Cisco UCS Manager and then applied to virtual machines by a server or virtualization administrator in VMware vCenter, to facilitate a collaborative operations model.

Another significant virtualization innovation is a technology known as hypervisor bypass. The Cisco UCS M81KR has built-in architectural support enabling virtual machines to directly access the adapter when such technology is available in hypervisors. I/O bottlenecks and memory performance can be improved by giving virtual machines direct access to hardware I/O devices, eliminating the overhead of embedded software switches.
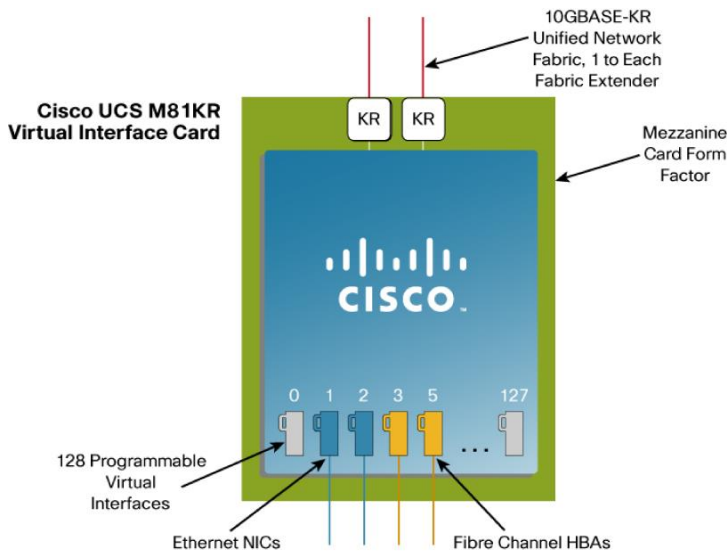
**Figure 2.**    Cisco UCS M81KR Architecture



Table 1 summarizes the features and benefits of the Cisco UCS M81KR.

**Table 1.**    Features and Benefits

| Feature | Benefit |
|---|---|
| **x16 PCIe interfaces** | Delivers greater throughput |
| **Unified I/O** | Helps reduce TCO by consolidating the overall number of NICs, HBAs, cables, and switches because LAN and SAN traffic run over the same mezzanine card and fabric |
| **Up to 128 dynamic virtual adapters and interfaces** | Creates fully functional unique PCIe adapters and interfaces (NICs or HBAs) without requiring single-root I/O virtualization (SR-IOV) support from OSs or hypervisors.<br>• Allows these virtual interfaces and adapters to be configured and operated just like physical interfaces and adapters<br>• Creates a highly flexible I/O environment needing only one card for all I/O configurations<br>**Note:** Cisco UCS VIC hardware is SR-IOV capable, and you can enable SR-IOV after SR-IOV is broadly supported by the popular operating systems. Please refer to UCS Manager configuration limits for your specific OS and environment in the configuration guide. |

| Feature | Benefit |
|---|---|
| Cisco VN-Link technology | • Provides network visibility to virtual machines<br>• Enables configurations and policies to follow the virtual machine during virtual machine migration<br>• Provides consistent network operations model for physical and virtual servers |
| Centralized management | Enables the mezzanine card to be centrally managed and configured by Cisco UCS Manager |
| Network architecture | Provides redundant path to fabric interconnect using dual 10 Gigabit Ethernet ports to the fabric carrying both Fibre Channel and Ethernet traffic |
| More than 600,000 I/O operations per second (IOPS) | Provides high I/O performance for demanding applications |
| Support for lossless Ethernet | Uses Priority Flow Control (PFC) to enable FCoE as part of the Cisco unified fabric |
| Optimization for VMware | • Provides hardware-based implementation of Cisco VN-Link technology that helps scale virtualization deployments<br>• Through tight integration between Cisco UCS Manager and VMware vCenter Server, enables collaboration between teams |
| Broad O/S and hypervisor support | Supports customer requirements for Microsoft Windows Server 2008, Red Hat Enterprise Linux 5.4, and VMware vSphere 4 Update 1 |

## Platform Support and Compatibility

The Cisco UCS M81KR is designed specifically for Cisco UCS B-Series Blade Servers and works in a dedicated environment with Cisco UCS Manager.

Table 2 summarizes the specifications for the Cisco UCS M81KR.

**Table 2.**     Product Specifications

| Item | Specification |
|---|---|
| Standards | 10 Gigabit Ethernet, IEEE 802.3ae, IEEE 802.3x, IEEE 802.1q VLAN, IEEE 802.1p, IEEE 802.1Qaz, IEEE 802.1Qbb, jumbo frames up to 9 KB, FCP (SCSI-FCP), and T11 FCoE |
| Components | Cisco Unified Computing System custom ASIC |
| Ports | 2x10-Gbps FCoE ports |
| Connectivity | Cisco Unified Computing System midplane |
| Performance | 10 Gbps line rate per port |
| Management | Cisco UCS Manager Version 1.1(1x) |
| Number of interfaces | 128 virtual interfaces (approximately 8 are reserved for internal use; other factors such as the OS and hypervisor may limit this number further) |
| Physical dimensions | Length = 7.25 in. (18.4 cm)<br>Width = 3.65 in. (9.3 cm) |
| Typical power | 18 watts (W) |
| Inlet operating temperature range | 50 to 95°F (10 to 35°C) |

## System Requirements

The Cisco UCS M81KR is designed to be used only on Cisco UCS B-Series Blade Servers. Each of the Cisco UCS B200 M1 and M2 Blade Servers as well as the UCS B230 M1 Blade Server have two sockets and can support one mezzanine adapter while the two socket Cisco UCS B250 M1 and M2 Extended Memory Blade Servers and the four socket UCS B440 M1 High-Performance Blade Server can each support two mezzanine adapters.Cisco UCS Manager Version 1.1(1x) only supports one Cisco UCS M81KR on the Cisco UCS B250 M1. The adapters are not designed or intended for other purposes.

## Warranty Information

Find warranty information at Cisco.com on the Product Warranties page.

## 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.

## Why Cisco?

The Cisco Unified Computing System continues Cisco's long history of innovation in delivering integrated systems for improved business results based on industry standards and using the network as the platform. Recent examples include IP telephony, LAN switching, unified communications, and unified I/O. Cisco began the unified computing phase of our Data Center 3.0 strategy several years ago by assembling an experienced team from the computing and virtualization industries to augment our own networking and storage access expertise. As a result, Cisco delivered foundational technologies, including the Cisco Nexus® Family, supporting unified fabric and server virtualization. The Cisco Unified Computing System completes this phase, delivering innovation in architecture, technology, partnerships, and services. Cisco is well-positioned to deliver this innovation by taking a systems approach to computing that unifies network intelligence and scalability with innovative ASICs, integrated management, and standard computing components.

## For More Information

For more information about the Cisco UCS M81KR Virtual Interface Card, visit http://www.cisco.com/en/US/products/ps10265/index.html and http://www.cisco.com/en/US/prod/collateral/ps10265/ps10276/solution_overview_c22-555987_ps10280_Product_Solution_Overview.html, or contact your local Cisco representative.

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