

# Cisco UCS Performance Manager

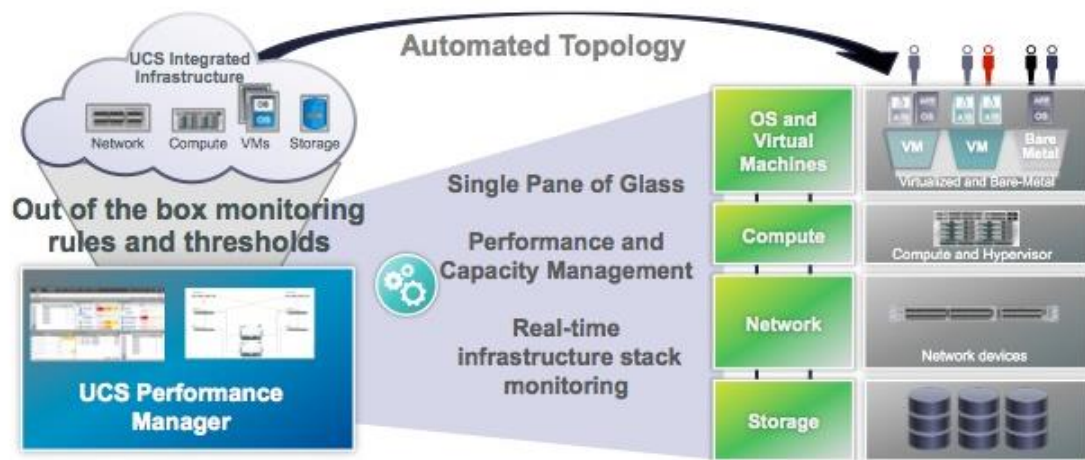
## Introduction

Today's integrated infrastructure data centers must be highly responsive with heightened levels of flexibility and visibility. Personnel are responsible for protecting a rapidly expanding volume of data, supporting an increasing number of mission-critical applications, managing complex, heterogeneous environments, and meeting challenging service-level expectations. All of these tasks must be accomplished while supporting a wide variety of critical, and sometimes competing, business initiatives that require increased IT service. And don't forget the limitations that fewer resources and smaller budgets add to the mix.

How do you deal with these issues if you are managing a data center network across physical, virtual, and cloud environments? What if you are a server administrator managing all of the software and hardware components of the Cisco Unified Computing System™ (Cisco UCS®) across multiple chassis and rack servers and thousands of virtual machines? How about a SAN administrator maintaining the health of the storage infrastructure, or an operations manager overseeing the entire integrated infrastructure?

Whatever your role, Cisco UCS Performance Manager can help you unify the monitoring of critical infrastructure components, network connections, applications, and business services across dynamic heterogeneous physical and virtual data centers powered by Cisco UCS.

**Figure 1.** Cisco UCS Performance Manager At-A-Glance



## Product Overview

With technology from Zenoss, Cisco UCS Performance Manager delivers detailed monitoring from a single customizable console. The software uses APIs from Cisco UCS Manager and other Cisco® and third-party components to collect data and display comprehensive, relevant information about your Cisco UCS integrated infrastructure.

With customizable views, your data center staff can see application services and view performance and service availability information for Cisco UCS integrated infrastructure. For example, staff can see underused or overused physical and virtual resources in the integrated infrastructure stack. They can also see the performance of an individual network port in a Cisco UCS chassis without having to switch to another tool.

Cisco UCS Performance Manager does the following:

- Unifies performance monitoring and management of Cisco UCS integrated infrastructure
- Delivers real-time views of fabric and data center switch bandwidth use and capacity thresholds
- Discovers and creates relationship models of each system, giving your staff a single, accurate view of all components
- Provides coverage for Cisco UCS servers, Cisco networking, vendor storage, hypervisors, and operating systems
- Allows you to easily navigate to individual components for rapid problem resolution

An Express version of Cisco UCS Performance Manager is also available for Cisco UCS-based compute platform coverage only (physical and virtual). The Express version covers Cisco UCS servers, hypervisors, and operating systems.

**Figure 2.** Cisco UCS Performance Manager View of Converged Infrastructure Components

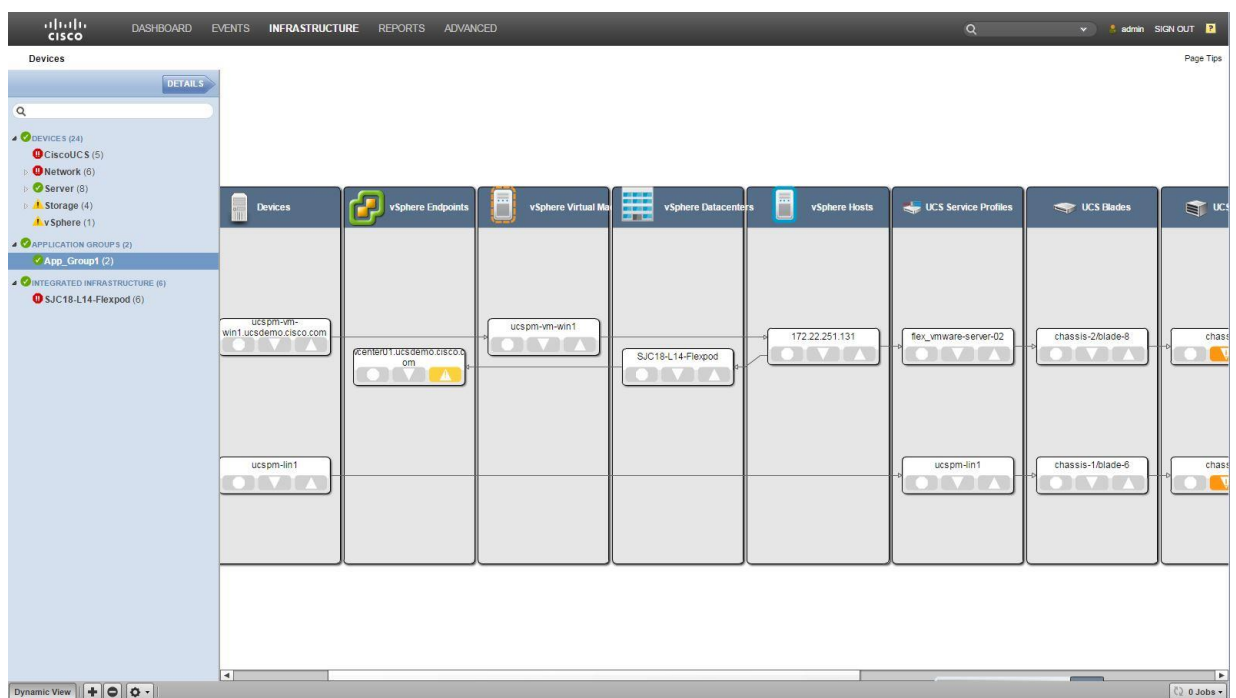
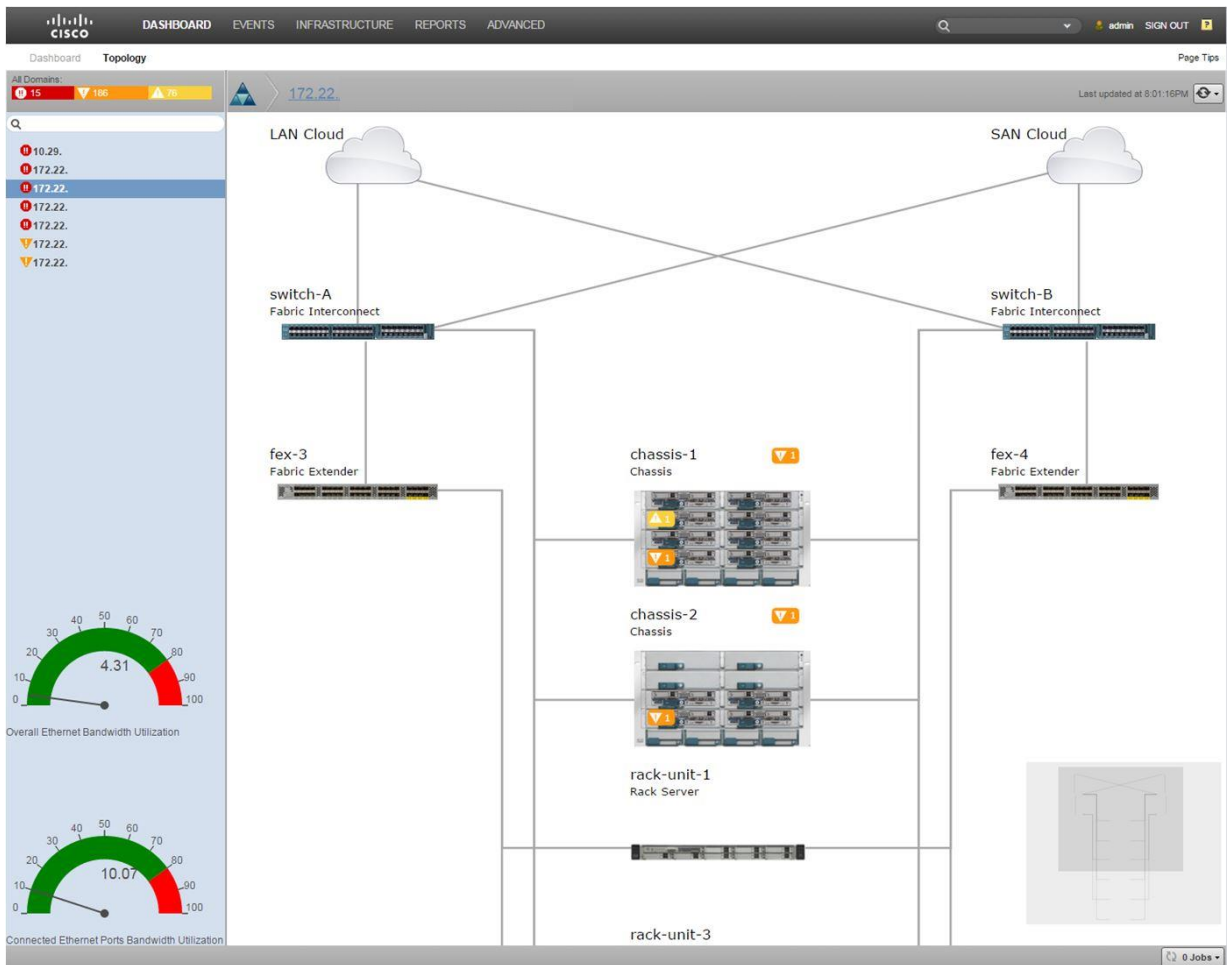


Figure 3. Cisco UCS Performance Manager Topology



## Major Benefits

Cisco UCS Performance Manager offers these main benefits:

- Provides deep visibility into UCS integrated infrastructure performance and capacity for service profiles, chassis, fabric extenders, adapters, virtual interface cards, ports, and uplinks for detailed data center monitoring
- Helps maintain service-level agreements (SLAs) by managing optimal resource allocation to prevent underprovisioning and avoid performance degradation
- Eliminates the need for multiple tools by enabling administrators to monitor SLA health and performance from a single console by defining component- or application-centric views of critical resources

## Technical Details

Monitored Cisco devices include the following:

- Cisco Nexus® 3000, 5000, 7000, and 9000 Series Switches
- Cisco UCS domain components
- Cisco Catalyst® 6500 and 3560 Series Switches
- Cisco Catalyst 6500 Series Virtual Switching System (VSS)
- Cisco MDS 9000 Series Multilayer Switches
- Cisco Nexus 2000 Series Fabric Extenders
- Cisco Nexus 1000V Switches

The following common features are available across the supported products (where applicable):

Base discovery	Base monitoring	Cisco UCS discovery	Cisco UCS performance monitoring
<ul style="list-style-type: none"> <li>• Chassis</li> <li>• Supervisor modules</li> <li>• Line cards</li> <li>• Power supplies</li> <li>• Fans</li> <li>• Temperature sensors</li> <li>• Physical ports and interfaces</li> <li>• PortChannels and bundles</li> <li>• Other logical interfaces</li> <li>• VLANs</li> <li>• Virtual Routing and Forwarding (VRF) instances</li> <li>• Quality-of-service (QoS) class maps</li> </ul>	<ul style="list-style-type: none"> <li>• Event collection from syslog and Simple Network Management Protocol (SNMP) traps</li> <li>• CPU and memory use for chassis and supervisor modules</li> <li>• Power consumption and status for chassis and field-replaceable units (FRUs)</li> <li>• Power available and drawn for power supplies</li> <li>• Temperature for temperature sensors</li> <li>• Use, throughput, error rate, and status for all physical Ethernet interfaces</li> <li>• Use, throughput, and status for all logical Ethernet interfaces</li> <li>• Throughput and status for VLANs</li> </ul>	<ul style="list-style-type: none"> <li>• Adaptor units</li> <li>• Backplane ports</li> <li>• Chassis</li> <li>• Ethernet ports</li> <li>• Fabric extenders</li> <li>• Fabric interconnects</li> <li>• Fabric ports</li> <li>• Fans</li> <li>• Fan modules</li> <li>• Fibre Channel ports</li> <li>• Host Ethernet interfaces</li> <li>• Host bus adapters (HBAs)</li> <li>• I/O modules (IOMs)</li> <li>• Management interfaces</li> <li>• Memory arrays</li> <li>• Organizations</li> <li>• Power supply units (PSUs)</li> <li>• Processor units</li> <li>• Rack servers</li> <li>• Server blades</li> <li>• Service profiles</li> <li>• Switch cards</li> <li>• Virtual HBAs (vHBAs)</li> <li>• Virtual network interface cards (vNICs)</li> </ul>	<ul style="list-style-type: none"> <li>• Chassis Ethernet ports</li> <li>• Fabric interconnects</li> <li>• Fibre Channel ports</li> <li>• Host Ethernet interfaces</li> <li>• HBAs</li> <li>• Server blades</li> <li>• Rack servers</li> <li>• Service profiles</li> <li>• Backplane ports</li> <li>• Chassis</li> <li>• Fabric extenders</li> <li>• Fabric interconnects</li> <li>• Fabric ports</li> <li>• IOMs</li> <li>• vHBAs</li> <li>• vNICs</li> <li>• Aggregation pools</li> </ul>

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## Third-Party Devices

Your Cisco UCS integrated infrastructure may include other third-party devices and virtualized instances. Following is a partial list of supported devices. See [Cisco UCS Performance Manager documentation](#) for more details.

- EMC VMAX and VNX Storage Arrays using the EMC Solution Enabler
- NetApp FAS storage systems in C- and 7- mode
- Linux server
- Microsoft Windows Server 2003, 2008, 2008 R2, 2012, 2012 R2
- VMware vSphere (Releases 4.1, 5.0, 5.1, and 5.5.)
- Microsoft Windows Hyper-V

## Event Management

Cisco UCS Performance Manager combines the events it collects for all the devices registered. The Cisco UCS Manager fault life cycle closely matches that of the Cisco UCS Performance Manager event life cycle, so when a Cisco UCS Manager fault is cleared, the equivalent event is cleared in Cisco UCS Performance Manager.

When initially connected to Cisco UCS Manager, network and storage devices, and hypervisors, Cisco UCS Performance Manager processes the full list of open faults. Subsequently, it subscribes to and receives only new faults and updates to existing faults. A counter is maintained for those events and faults that repeat.

## Capacity Monitoring

In addition to monitoring components, Cisco UCS Performance Manager allows you to monitor integrated infrastructure capacity. Network capacity is a measure of the maximum amount of data that can be moved between network locations. This measure includes data moving across or between ports, switches, fabric extenders (FEXs), fabric interconnects, and servers over a link or network path. An additional measure that is directly related to capacity is headroom, which is your system's amount of unused or available bandwidth. This measure includes aggregation pools, ports, fabric interconnects, FEXs, switches, servers, and more.

Identifying available headroom enables you to determine where excess bandwidth or load exists in your system. Then you can allocate resources differently to use the available headroom and alleviate oversubscription to other components.

Bandwidth use and available headroom data are available for individual ports, or collectively by role, in the aggregation pools view. Aggregation pools are logical bundles of multiple physical network interfaces, commonly known as PortChannels. For more information about aggregation pools, see the [Cisco UCS Performance Manager Administration documentation](#).

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By using Cisco UCS Performance Manager to analyze your system and its components, you can identify potential capacities and compare them with actual capacities. This analysis enables you to perform tasks that include the following:

- Determine how close to maximum capacity you are, so that you can plan for potential expansion or restructuring
- Determine whether a device is oversubscribed or has additional resources that can be used to alleviate oversubscription or help eliminate network pinch points
- Determine whether IOM server ports and Ethernet and Fibre Channel uplinks are congested now or have been historically; then you can alleviate the congestion, or forecast when the next cyclic congested event might occur
- Identify congestion sources and explore ways to address them, such as by moving service profiles between chassis
- Determine whether virtual or physical workloads and applications are affected by Cisco UCS fabric capacity constraints; then you can plan for or make changes to the system configurations or hardware components
- Determine whether virtual or physical workloads and applications are affected by Cisco UCS server CPU and memory configurations; then you can plan for or make changes to the server configurations or hardware components
- Compare current and historical performance across converged infrastructure components to find existing constraints and determine whether and how they can be removed

## Using Historical Data

Historical data enables you to determine cyclic and periodic trends in your system. By using historical data with point-of-time information about your Cisco UCS integrated infrastructure, you can identify potential problems and analyze any existing problems quickly and efficiently.

For easier monitoring, you can use Cisco UCS Performance Manager to view and analyze collected data about each physical and virtual component according to the way that they function as one unit. For example, an infrastructure unit can provide information about the following device types:

- Blade and rack servers
- Network switches
- Storage switches and arrays
- Hypervisors

Cisco UCS Performance Manager provides key performance indicators (KPIs) for your integrated infrastructure components. KPIs enable you to quickly identify system constraints that are contributing to or will eventually result in performance degradation. Historical data can be defined in terms of scope and time frame so that you can quickly arrive at conclusions and take action.

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Cisco UCS Performance Manager also lets you view service profiles, virtual machines, and operating systems. You can quickly identify and evaluate current and historical resource-derived constraints and component faults. Finer details in terms of the resources consumed by individual CPUs, interfaces, and memory are also available. For example, you can detect whether a particular virtual machine uses too much of the available resources or just the right amount. By using historical data to evaluate the severity, longevity, and frequency of issues, you can reassign resources or change profiles to prevent problems.

### Getting the Full Benefits of Cisco UCS Integrated Infrastructure

A single Cisco UCS domain can support thousands of different infrastructure components. Understanding all these physical and virtual components as well as the LAN and SAN resources needed to manage the Cisco UCS integrated infrastructure is not easy. Cisco UCS Performance Manager, however, makes the process easier by helping data center administrators identify network faults, bandwidth oversubscription, and resource capacity headroom. This information can help you understand existing capacity, how to best use it, and how to most cost-effectively increase it.

### IT Operations Management Best Practices

Cisco UCS Performance Manager provides unified server, network, storage, and virtualization visibility, as well as a logical view of application and IT services. This management solution helps you simplify data center operations, reduce costs, and provide all the capabilities needed to monitor today's dynamic, integrated infrastructure environments.

### For More Information

For additional information about Cisco UCS Performance Manager and related products, please visit <http://www.cisco.com/go/ucspfmgr>.



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