

## Cisco Data Center Solution for Microsoft Exchange: Gain Business Agility and Reduce Costs with Virtualized Platform

### Overview

As enterprises face the critical problem of growing their data center when they are already reaching maximum capacity for space, cabling, power, cooling, and management, they should consider consolidating and virtualizing their application servers into their data center. At the top of the list of applications to virtualize are those mission-critical enterprise applications that typically require deployment of a large number of physical servers. Microsoft Exchange Server 2010 is one such application as it requires four different server roles for a complete system and often requires at least double that number of servers to provide minimal redundancy in the server roles. A virtualization infrastructure design that supports an enterprise-level Exchange 2010 deployment also provides the necessary services to address manageability of solution components, disaster recovery, high availability, and rapid provisioning.

Running Microsoft Exchange Server 2010 on a virtualized data center platform such as the Cisco Unified Computing System™ with Microsoft Hyper-V can reduce IT costs by up to 20 to 30 percent and deliver on-demand provisioning of scalable, reliable data center resources.

This paper introduces the Cisco Reference Design for Microsoft Exchange. The reference design provides guidance on how to design a Cisco and Microsoft data center architecture that provides network, server, and application-level services for the consolidation and virtualization of Exchange 2010 workloads. Data Center Architects can use the best practices in this design guide to implement this solution in their enterprise. The Reference Design Guide is provided to facilitate faster, more reliable, and more predictable customer deployments.

### Challenge

Pressure is increasing for IT to deliver business applications with high service levels while also providing more agility to the business and constantly improving efficiency. For business-critical applications like Microsoft Exchange Server for enterprise email, IT is being asked to do more with less.

One challenge in efficiently deploying Windows Server-based applications to meet service levels is in identifying an application architecture with the following five attributes:

- **Performance:** Highly tuned hardware and software deployments that increase the end user's productivity
- **Availability:** Decreased downtime to meet critical business requirements and rapid provisioning of new users
- **Scalability:** Capability to meet business needs and IT demand through scalability to increase system capacity without the need for a new architecture or management tools
- **Integrated management:** Streamlined application and infrastructure management to reduce support efforts
- **Low total cost of ownership (TCO):** Lower ongoing capital expenses and operational costs to meet tightly managed budgets

## Business Benefits

The Cisco Data Center Solution for Microsoft Exchange, is designed to meet today's high service levels and increase IT efficiency and business agility by providing a next-generation Microsoft Exchange and Windows Server application infrastructure, from the data center to the branch office, that dramatically speeds deployment cycles, reduces IT costs, and simplifies system management. This innovative solution is an ideal enabler of data center consolidation, virtualization, and ultimately, automation, which can provide dramatically lower IT costs compared to siloed architectures with fragmented management models.



By using the Cisco Data Center Solution, which includes Cisco compute, network, security, and storage access technologies, together with the Microsoft Optimized Core Infrastructure, which includes operating system, virtualization, and system management technologies, this solution provides the following benefits to Microsoft Exchange deployments:

- **Availability:** Full redundancy of all Cisco hardware and software infrastructure combined with Microsoft Clustering technology provides exceptional uptime and access to vast infrastructure resources and on-demand provisioning through an integrated Cisco and Microsoft management interface.
- **Scalability:** Up to 320 servers with thousands of virtual machines can be deployed within a single architecture from a single management framework.
- **Lower costs:** The solution enables up to 30 percent lower capital expenditures (CapEx) and up to 20 percent lower operating expenses (OpEx) through Cisco Unified Computing System and Management infrastructure, and up to 80 percent lower virtualization software costs for Microsoft Hyper-V running on Microsoft Windows Server 2008 Release 2 (R2).
- **Integrated management:** Cisco UCS Manager provides unified, embedded management of all components of the Cisco Unified Computing System. Through integration with Microsoft System Center, Cisco UCS Manager will provide system administrators with visibility into and control of Microsoft application and Hyper-V workloads within the Cisco Unified Computing System, streamlining administrative processes and reducing complexity and risk.
- **Reliability:** Cisco UCS meets the Microsoft Certified for Windows Server 2008 R2 requirements which demonstrates that UCS meets Microsoft's highest technical bar for stability, security, reliability and availability.

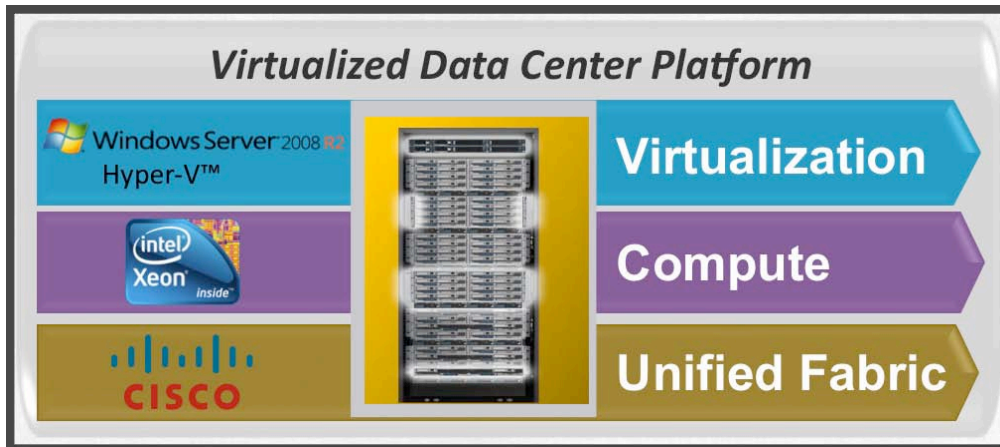
## Reference Design for Cisco Data Center and Microsoft Exchange

The Reference Design provides guidance on how to design a Cisco and Microsoft data center architecture that provides network, server, and application-level services for the consolidation and virtualization of Exchange 2010 workload. Data Center Architects can use the best practices in this design guide to implement this solution in their enterprise. The Reference Design Guide is provided to facilitate faster, more reliable, and more predictable customer deployments.

## Virtualized Data Center Platform: Cisco Unified Computing System and Microsoft Windows Server 2008 R2 with Hyper-V

The virtualized data center platform combines the Cisco Unified Computing System with Microsoft Windows Server 2008 R2 with Hyper-V into a cohesive data center system that is preconfigured and certified by Microsoft and optimized to run business-critical applications in both physical and virtual server environments (Figure 1).

**Figure 1.** Virtualized Data Center Component



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 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.

Microsoft Windows Server 2008 R2 Hyper-V, Microsoft's data center software virtualization platform, provides rich, low-cost server virtualization for thousands of third-party business applications. With the release of Microsoft Windows Server 2008 R2, Hyper-V has features that increase the performance, availability, and management of virtualized infrastructures.

The combination of the Cisco Unified Computing System and the Microsoft virtualization platform provides an excellent foundation for private cloud services and a stateless computing infrastructure that improves agility and reduces costs through a tight integration of the hardware up to the application stack. Enabled by role-based access control (RBAC) for hardware and software resources, application workloads can be easily and safely scaled up and down to meet organization needs.

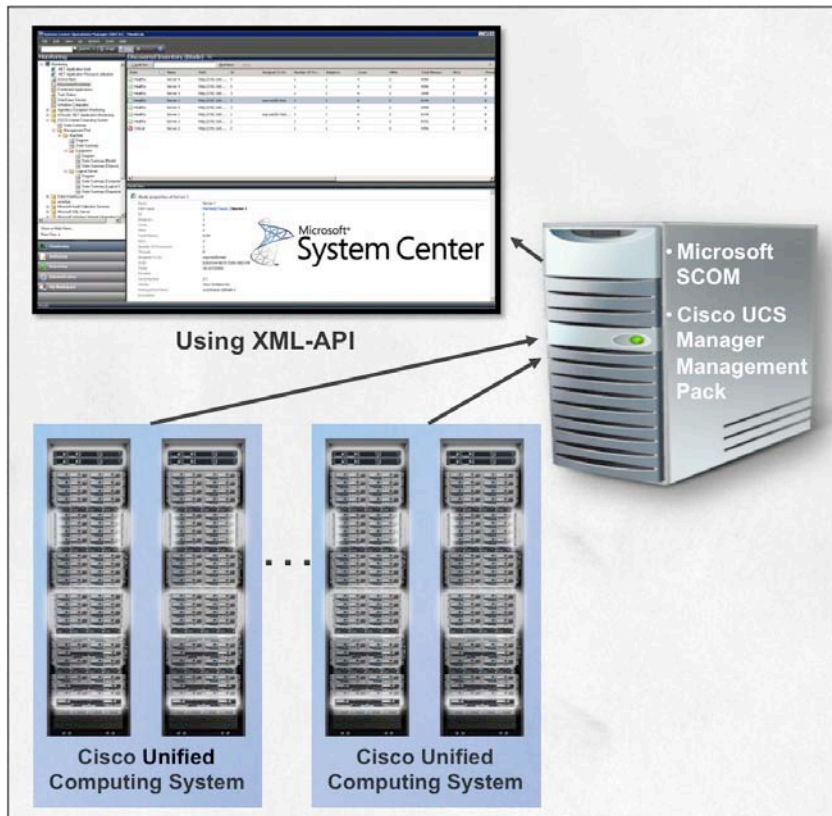
### Integrated System Management: Cisco UCS Manager and Microsoft System Center

The management layer of the Cisco Data Center Solution for Microsoft Business Applications extends the granularity and flexibility of Cisco UCS Manager to Microsoft System Center for more cohesive, dynamic management of Microsoft workloads. Three components combine to harmonize all aspects of workload management and performance within a single interface (Figure 2):

- Cisco UCS Manager, which provides stateless computing through service profiles, templates, and pools
- The Cisco UCS Manager Management Pack, which allows users to view near real-time inventory and state information for all Cisco Unified Computing System resources from within the Microsoft System Center Operations Manager (SCOM) user interface through the Cisco UCS Manager XML API

- Microsoft System Center Virtual Machine Manager (SCVMM), which provides dynamic and responsive management of physical and virtual infrastructure, consolidation of underutilized physical servers, and rapid provisioning of new virtual machines

**Figure 2.** Integrated System Management



The powerful integration of these elements reduces the management complexity and risk associated with virtualized environments, while reducing provisioning times to minutes rather than days.

### Summary

The reference design for Cisco Data Center and Microsoft Exchange provides an end-to-end architecture that addresses challenges that IT organizations encounter in their network when the Microsoft Exchange server farms are virtualized. The issues that must be addressed are not limited to the server hardware or the virtualization platform; they extend beyond the data center server farm through the data center LAN and SAN to the branch and remote office locations. As more servers are consolidated at the data center, there are questions of how to manage the growing number of application servers and physical servers and how to deliver applications to users at the branch offices or remote locations given the bandwidth limitations on WAN links. In addition, it is important that the architecture can support the addition of security and other services like QoS to the data center, branch, and remote sites as network requirements evolve. The Cisco Data Center Solution for Microsoft Exchange Reference Design Guide is available to address these questions and to facilitate faster, more reliable, and more predictable customer deployments.

## For More Information

- Cisco Data Center Solution for Microsoft Exchange Reference Design Guide: [www.cisco.com/en/US/docs/solutions/Enterprise/Data\\_Center/App\\_Networking/hypervexchange.html](http://www.cisco.com/en/US/docs/solutions/Enterprise/Data_Center/App_Networking/hypervexchange.html)
- Cisco Unified Computing System for Microsoft Exchange Server and SQL Server benchmark reports: [www.cisco.com/en/US/prod/ps10265/at\\_work\\_promo.html#~custom\\_benchmark\\_reports](http://www.cisco.com/en/US/prod/ps10265/at_work_promo.html#~custom_benchmark_reports)
- Windows logo certification for Cisco Unified Computing System: [www.windowsservercatalog.com/item.aspx?idItem=3f397011-80c7-ee98-831d-f9748211d310&bCatID=1333](http://www.windowsservercatalog.com/item.aspx?idItem=3f397011-80c7-ee98-831d-f9748211d310&bCatID=1333)
  - Cisco UCS B200 M1 Blade Server and UCS B250 M1 Extended Memory Blade Server: Certified for Microsoft Windows Server 2008 R2, certified for Microsoft Windows Server 2008, and designed for Microsoft Windows Server 2003
- Cisco and Microsoft data center partnership: [www.cisco.com/en/US/netsol/ns963/index.html](http://www.cisco.com/en/US/netsol/ns963/index.html)



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