Preface

Compute consolidation through virtualization has been a consistent factor in data center trends over the last decade. Systems evolved from separate compute, network, and storage administrative silos to converged infrastructures and operational domains, and from traditional top-down network management and hierarchical infrastructure models, to newer models incorporating centralized controllers and increasingly virtualized, software-defined infrastructures.

Capex savings achieved by leveraging under utilized CPU and memory resources are a key driver of server virtualization. For many years, VMware has led the market for compute virtualization, but in recent years a more frequently encountered theme is that of hypervisor commoditization, as hypervisors from Microsoft, Citrix, and even open source projects have evolved to match, or in some cases exceed, VMware capabilities. As function and feature gaps narrow, some vendors have significantly lowered licensing costs to further hasten reevaluation of solution cost/benefit ratios, particularly for entry point use cases.

A key consideration for those virtualizing Windows environments is that there is no licensing for the Microsoft Hyper-V hypervisor. Microsoft offers Hyper-V in a free standalone version, or bundled into its Windows Server 2012 license. These advances are great news for customers, who now have more choices for virtualization solutions. Customers can select the virtualization environment which best meets their needs, in terms of cost, scale, performance, and application requirements.

The news for customers who adopt the Cisco Virtualized Multiservice Data Center (VMDC) reference model in their data centers is that a recent code release (Release 5.2(1)SM1(5.1)), enables the Nexus 1000V Switch for Microsoft Hyper-V to support advanced switching for Hyper-V virtual machines (VMs), along with Systems Center Virtual Machine Manager (SCVMM) integration. The networking benefits of the Nexus 1000V Switch for Microsoft Hyper-V were previously available only in vSphere environments (per-VM visibility, granular QoS, security policies, segmentation, and vPath service chaining for virtualized services such as Virtual Security Gateway), are now also available in the Windows Server 2012 environments.

This consistent operational model enables customers to leverage preferred management solutions. As noted, the Nexus 1000V Switch for Microsoft Hyper-V now offers SCVMM integration; for those who rely on Systems Center Operations Manager (SCOM), Cisco partnered with Jalasoft to develop an SCOM plug-in. Finally, for those who have Powershell expertise and prefer to use it for simple “CRUD” (create, update, delete) operations, the Nexus 1000V Switch for Microsoft Hyper-V offers RESTful APIs.

The Nexus 1000V Switch for Microsoft Hyper-V and Cisco VM Fabric Extender (VM-FEX) bring VM visibility and policy granularity to the virtualized compute environment as the “missing link” for service assurance in the architecture that VMDC addresses: highly consolidated, highly virtualized yet highly secure, multi-service public or private cloud data centers. This represents a significant step toward hypervisor-agnosticism and enhanced customer options, while maintaining key architectural advantages.

Document Goal

This document presents a “first look” at inserting SCVMM and Hyper-V-based compute resources into the compute tier of the VMDC reference architecture. We highlight differences from vSphere in terms of networking constructs, including policy profile implications and “tenancy.”

The following areas are addressed:

- **VMDC Architecture Overview**—VMDC architectural components and framework
- **Implementation Guidance**—on deploying Nexus 1000V Switch for Microsoft Hyper-V and Hyper-V in a VMDC environment
- **Management**—Management tools for monitoring (SCOM) Hyper-V

Audience

The target audience for this document includes sales engineers, field consultants, professional services, IT managers, Cisco channel partner engineering staff, and customers who have need cloud-ready data centers or have an existing VMDC implementation, and are considering Hyper-V based compute resources.