Preface

This preface explains the objectives and intended audience of the Cisco® Virtualized Multiservice Data Center (VMDC) 2.3 solution and outlines the organization of the VMDC 2.3 Implementation Guide.

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Implementation Guide Purpose

Infrastructure as a Service (IaaS) simplifies application development and implementation by virtualizing underlying hardware resources and operating systems. This allows IaaS users to significantly cut development and deployment times by cloning the environments best suited for an application without having to factor in the underlying hardware environment. Units of this infrastructure, including compute, storage, and networks, collectively form a cloud infrastructure.

This guide describes implementation details for a reference architecture that brings together core products and technologies from Cisco, NetApp, EMC, BMC, and VMware to deliver a comprehensive end-to-end cloud solution. Focused on IaaS cloud deployment, the Cisco VMDC solution provides customers with robust, scalable, and resilient options for cloud Data Center (DC) deployments.

This Cisco driven end-to-end architecture defines how to provision flexible, dynamic pools of virtualized resources that can be shared efficiently and securely among different tenants. Process automation greatly reduces resource provisioning and Time to Market (TTM) for IaaS-based services. Shared resource pools consist of virtualized Cisco unified compute and virtualized SAN and NAS storage platforms connected using Cisco DC switches and routers.

This solution addresses the following problems:

- **Inefficient Resource Utilization—**Traditionally, Enterprises design their DCs using dedicated resource silos. These silos include access switches, server racks, and storage pools assigned to specific applications and business units. This approach results in inefficient resource use, where resource pools are customized per application, resulting in fewer shared resources. This design cannot harness unused or idle resources, is complex to administer, and is difficult to scale, which

results in longer deployment times. For the public cloud Service Provider, inefficient resource utilization translates to higher Capital Expense (CAPEX) and Operating Expense (OPEX) and decreases revenue margins.

- **Security Guarantees—**In a multiservice environment, access to resources must be controlled to ensure isolation and security among users. This becomes more challenging when resources are shared. Tenants need to be assured that in new highly, virtualized systems their data and applications are secure.
- **Resource Provisioning and TTM—**Facility consolidation coupled with increased deployment of virtualized servers results in larger, very dense DC systems. Manual provisioning often takes two to four weeks or longer. In many cases, this lengthy duration fails to meet business agility and TTM requirements of Enterprises and Service Providers.
- **Complex and Expensive Administration—**Network, server, security, and application administrators must collaborate to bring up new resources for each new or expanding tenant. Collaboration based on manual methods no longer scales in these new highly virtualized systems, resulting in slow responses to business needs due to complex IT operations. It is complicated and time consuming to streamline manual configuration and resource provisioning tasks. It also increases capital and operating expenditures and overhead caused by resource churn.

As Enterprise IT departments evolve, they are looking for a DC solution that is efficiently shared, secured, and rapidly provisioned. Similarly, Service Providers are looking for solutions that enable them to reduce TTM for new revenue-generating services and reduce ongoing OPEX. The Cisco VMDC infrastructure design provides a model for flexible sharing of common infrastructure, maintaining secure separation of tenant data and enabling per-tenant differentiated services.

This guide provides the implementation and configuration details, feature overviews, and best practices needed to deploy a VMDC 2.3-based cloud DC.

Audience

This guide is intended for, but not limited to, system architects, network/compute/storage design engineers, systems engineers, field consultants, advanced services specialists, and customers who want to understand how to deploy a public or private cloud DC infrastructure. This guide assumes that the reader is familiar with the basic concepts of IP protocols, Quality of Service (QoS), High Availability (HA), Layer 4 (L4) - Layer 7 (L7) services, DC platforms and technologies, SAN and VMware hypervisor. This guide also assumes that the reader is aware of general system requirements and has knowledge of Enterprise or Service Provider network and DC architectures and platforms and virtualization technologies.

Document Organization

Table 1-1 provides the organization of this document.

Table 1-1 *Document Organization*

Topic	Description
Chapter 1, "Implementation Overview"	This chapter provides an overview of the VMDC solution.
Chapter 2, "Compute and Storage Implementation"	This chapter discusses compute and storage implementation for this solution.
Chapter 3, "Layer 2 Implementation"	This chapter discusses Layer 2 implementation for this solution.
Chapter 4, "Layer 3 Implementation"	This chapter discusses Layer 3 implementation for this solution.
Chapter 5, "Services Implementation"	This chapter discusses services implementation for this solution.
Chapter 6, "QoS Implementation"	This chapter discusses QoS implementation for this solution.
Chapter 7, "Resiliency and High Availability"	This chapter discusses resiliency and redundancy for this solution.
Chapter A, "Best Practices and Caveats"	This appendix lists the recommended best practices and caveats when deploying this solution.
Chapter B, "Related Documentation"	This appendix lists the Cisco Validated Design (CVD) companion documents for this solution.
Chapter C, "Configuration Templates"	This appendix lists the configurations per-tenant type for this solution.
Chapter D, "Glossary"	This glossary provides a list of acronyms and initialisms used in this document.

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