70-745: Implementing a Software-Defined Datacenter

Target Audience:
Candidates for this exam are IT professionals responsible for implementing a software-defined datacenter (SDDC) with Windows Server 2016 and Microsoft System Center 2016 Virtual Machine Manager (SCVMM).

These candidates are responsible for implementing and managing highly available SCVMM infrastructures as well as implementing software-defined storage, compute, and networking components. They are also responsible for managing and configuring tenant workloads, deploying and managing containers, and performing basic monitoring and maintenance tasks using System Center Operations Manager (SCOM). Candidates for this exam are additionally responsible for determining and implementing general business continuity and disaster recovery options.

Objective Domain

Note: This document shows tracked changes that are effective as of June 15, 2018.

Plan and Implement System Center Virtual Machine Manager (VMM) Core Infrastructure

Install and Configure Virtual Machine Manager (VMM)

Determine requirements for Installation of System Center Virtual Machine Manager; install VMM server, VMM Administrative Console, and VMM local agents; configure SQL ~~db~~ database requirements for the VMM database; add Hosts; upgrade VMM from previous versions of VMM including performing a rolling upgrade from Windows Server 2012 R2 host clusters; create service accounts for VMM; uninstall VMM; reinstall from a retained database.

Install and Configure VMM Host Servers

Determine requirements for bare metal installation of host servers; perform Hyper-V host deployment to bare-metal machine; integrate Windows Deployment Services (WDS) with VMM to provide PXE services for bare metal deployments.

Manage VMM Infrastructure

Integrate Windows Server Update Services (WSUS) with VMM infrastructure; plan and orchestrate updates and patches on VMM servers, SQL database host agents, and management consoles; create Update Baselines; run compliance scans; remediate host servers and clusters; manage host groups; backup and restore VMM servers.

Manage VMM Libraries

Install and configure library servers; add library servers and library shares to VMM; enable Data Deduplication on library server; synchronize libraries; manage library association; manage object equivalence.

Implement Highly Available VMM Infrastructure

Determine component requirements for Highly Available VMM infrastructure; create a highly available VMM management server; create a Hyper-V Host cluster by using Failover Cluster Manager; determine requirements and options for SQL server high availability; determine single site and multi-site high availability options; create highly available library servers; implement Scale-Out File Server; perform Scale-Out File Server cluster deployment to a bare-metal machine; implement Distributed Key Management Solution; determine upgrade scenarios and options for a highly available VMM deployment; perform Cluster-Aware Updating; implement Rolling Cluster Upgrades; implement stretch clusters; manage mixed-mode clusters.

Implement Software-Defined Networking (SDN)

Implement Core Network Fabric

Create logical networks; create logical network sites; create IP pool; configure uplink port profiles; configure virtual port profiles; configure port classifications; create and configure logical switches; configure Hyper-V extensible virtual switches; integrate VMM switches with Top-of-Rack (TOR) switches; implement max bandwidth policies; enable NIC teaming; enable Switch Embedded Teaming (SET); create and configure MAC pools; configure Domain Name System (DNS); configure and enable NIC offload technologies such as virtual Receive Side Scaling (vRSS) and Virtual Machine Multi-Queue (VMMQ), and configure Single-Root I/O Virtualization (SR-IOV) on capable NICs.

Plan for and Implement SDN solution

Plan for software-defined network infrastructure; define and document fabric resource endpoints such as host servers, logical networks, software load balancer (SLB) multiplexers (MUX), VLANs and service credentials; implement SDN using VMM Service Templates; configure for single tenant and multi-tenant scenarios; define front end Virtual IPs (VIPs) in multi-tier scenarios; define back end Dynamic IPs (DIPs) in multi-tier application scenarios; install and configure the SDN Host agent; configure DNS integration with SDN; configure DNS integration with Internal DNS Service (iDNS); create and configure Access Control Lists (ACL) for use in multi-tenant environments; configure virtual subnets;.

Configure Network Controller (NC)

Determine usage scenarios and requirements for the Network Controller; implement Network Controller in domain and non-domain environments; test successful Network Controller deployment; query Network Controller resources and provisioning state; define resource objects by using scripts; implement multi-node Network Controller deployments; implement highly available Network Controller resources; set up an Internet Protocol Address Management (IPAM) server.

Configure and Manage Software Load Balancer (SLB)

Determine infrastructure and tenant usage scenarios and requirements for load balancer deployment; configure SLB host agent; configure Border Gateway Protocol (BGP); configure

SLB Multiplexer (MUX) to advertise Virtual IP Address (VIP); configure SLB rules to map virtual IP (VIP) and ports to back end Dynamic IPs (DIP) and ports in multi-tier application scenarios; configure NAT for inbound and outbound traffic; configure North-South and East-West load balancing; scale SLB Multiplexers; configure health probes.

Configure Windows Server Gateway

Determine usage scenarios and requirements for Windows Server Gateway (WSG) deployment; deploy WSG using SCVMM Service Templates; implement a Layer 3 gateway; implement Generic Routing Encapsulation (GRE) tunnelling; implement multi-tenant gateways by using PowerShell; implement IPsec Site-to-Site (S2S) tunnel; create M+N redundancy gateway pools; scale gateway pools; manage gateway ~~via~~by using Network Controller; integrate gateways with SLB; integrate VLAN networks with SDN gateway for Azure hybrid networking; configure BGP routing for gateway; assign gateway pools for tenant usage; configure Windows Server Gateway as a forwarding proxy; implement highly available Windows Server Gateway.

Manage SDN Infrastructure

Install updates on network controllers, Software Load Balancer components, and gateway components; configure health probes; query configuration state health information in load balancer MUX object; configure NC/SLB and GW logs; manage SDN components for service branching and patching considerations; troubleshoot SDN stack by using Network Controller diagnostics.

Manage Tenant Virtual Networks

Use network virtual appliances on virtual networks; configure network Quality of Service (QoS) for tenant VM network adapter; connect container endpoints to a tenant virtual network.

Implement Software-Defined Storage

Implement Software-Defined Storage Solutions

Implement Storage Spaces Direct in hyper-converged scenario by using VMM; implement Storage Spaces Direct in a disaggregated scenario by using VMM; implement storage tiering; implement iSCSI storage; implement Storage Spaces fault tolerance; implement Cluster Shared Volumes (CSVs); determine usage scenarios and requirements for SMB 3 storage; configure and enable NIC offload technologies such as SMB Direct on Remote Direct Memory Access (RDMA) and SMB Multichannel on capable NICs for use as part of storage infrastructure; implement SMB file storage; encrypt cluster volumes; implement Storage QoS policies for Min/Max IOPs and Max Bandwidth; implement aggregated and dedicated QoS policies; provision Thin and Thick storage solutions; allocate Storage Array to a Host Group; create a LUN for a Hyper-V Cluster from allocated storage; allocate File Share to a Hyper-V Cluster; implement storage classifications for storage pools.

Manage Software-Defined Storage

Implement Storage Replica solutions; implement Hyper-V replica solutions; integrate Hyper-V Replica with Azure Site Recovery (ASR) for secondary on-premises site; implement Offloaded Data Transfer (ODX); determine LUN usage; decommission storage from Hyper-V Host; optimize Storage Spaces Direct storage pools; implement network QoS policies to control RDMA and SMB storage connections; implement SAN copy to rapidly provision VMs.

Implement Datacenter Compute Solutions with Virtual Machine Manager (VMM)

Implement Compute solutions

Determine requirements and usage scenarios for virtualized deployments; determine requirements for application deployments in virtualized infrastructure; create and configure virtual machine templates; configure hardware profiles; configure guest operating system profiles; configure application profiles; manage custom properties and placement rules; deploy and manage Nano server containers; perform operating system deployments using unattend.xml options; integrate sysprep with unattend.xml answer file; migrate existing virtual machine deployments to VMM; create and manage checkpoints; clone virtual machines; perform Virtual-to-Virtual (V2V) virtual machine conversions; implement and manage Linux virtual machines; deploy virtual machines from an existing VHD, template, P2V conversion, or VMM library; deploy containers ~~via~~ by using VMM templates; manage guarded hosts.

Implement Service Templates

Create and configure Service Templates; implement availability sets within a template; add tiers to a Service Template; add network components to a Service Template; implement Active Directory Service Template; configure SharePoint Server Service Template; deploy Service Templates; update and modify Service Templates; import and export Service Templates; implement Guest Clustering.

Secure your Software-Defined Datacenter

Secure the Compute Environment

Determine the requirements for Host Guardian Service, implement Host Guardian Service; implement shielded VMs for new VMs by using templates; implement shielded VMs for existing virtual machines; implement Guarded Fabric solutions; implement DHCP guard; configure Run as accounts and User Roles; implement Role Based Access Control (RBAC); implement Code Integrity solution; implement secure boot for Windows and Linux guests; implement Credential Guard; implement self-service.

Secure the Network Environment

Create and use port ACLs with VM networks, VM subnets and virtual NICs; create and use Global Settings for all VMs; implement Datacenter Firewall solutions using VMM; create ACL Rules using Datacenter Firewall; configure and apply Network Controller network policies; secure tenant networks; plan for integration of security appliances into tenant network infrastructure.

Monitor and Maintain the Software-Defined Datacenter

Install and Configure System Center Operations Manager (SCOM)

Determine requirements and usage scenarios for implementing Operations Manager; perform single and distributed deployment options for Operations Manager; install Operations Manager Agents by using Discovery Wizard or the command line; secure user access; create, ~~install~~install, and manage sealed and unsealed Management Packs.

Monitor and Manage Infrastructure and Virtual Machine Workloads using System Center Operations Manager (SCOM)

Tune Monitoring using Targeting and Overrides; configure maintenance schedules; suspend monitoring temporarily; configure notifications; configure reporting; integrate Operations

Manager and VMM; enable Performance and Resource Optimization (PRO) tips in VMM; determine requirements and usage scenarios for backing up and restoring Software-Defined Datacenter workloads and Virtual Machine Manager with tools such as Data Protection Manager (DPM) and Microsoft Azure.