**70-414: Implementing an Advanced Enterprise Server Infrastructure**

**Audience Profile:**

This exam is part one of a series of two exams that test the skills and knowledge necessary to design, implement, and maintain a Windows Server 2012 R2 infrastructure in an enterprise scaled, highly virtualized environment. Passing this exam validates a candidate’s ability to plan, configure, manage, and implement the Windows Server 2012 R2 services, such as server deployment, server virtualization, and network access and infrastructure, identity and access, high availability, and the server infrastructure. Passing this exam along with the other exam confirms that a candidate has the skills and knowledge necessary for designing, deploying, and maintaining infrastructure services in a Windows Server 2012 R2 environment.

1. **Manage and Maintain a Server Infrastructure**

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| **Tasks measured prior to April 4** | **Tasks added/updated April 4** |
| **Design an administrative model.**  Design considerations including user rights, built-in groups, and end-user self-service portal; design a delegation of administration structure for Microsoft System Center 2012 R2; design self-service portals by using System Center Service Manager; delegate rights for managing private cloud by using AppController and System Center Virtual Machine Manager | Updated:  Design considerations including user rights, and built-in groups; design a delegation of administration structure for Microsoft System Center 2012 R2  New:  Design self-service portals by using System Center Service Manager; delegate rights for managing private cloud by using AppController and System Center Virtual Machine Manager |
| **Design a monitoring strategy.**  Design considerations including monitoring servers using Audit Collection Services (ACS), performance monitoring, centralized monitoring, and centralized reporting; implement and optimize System Center 2012 - Operations Manager management packs; plan for monitoring Active Directory | Updated:  Design considerations including monitoring servers using Audit Collection Services (ACS) and System Center Global Service Monitor, performance monitoring, application monitoring, centralized monitoring, and centralized reporting  Unchanged:  Implement and optimize System Center 2012 Operations Manager management packs; plan for monitoring Active Directory |
| **Design an updates infrastructure.**  Design considerations including Windows Server Update Services (WSUS), System Center 2012 - Configuration Manager, and cluster-aware updating; design and configure Virtual Machine Manager for software update management; update VDI desktop images | This objective was removed |
| **Implement automated remediation.**  Create an Update Baseline in Virtual Machine Manager; implement a Desired Configuration Management (DCM) Baseline; implement Virtual Machine Manager integration with Operations Manager; configure Virtual Machine Manager to move a VM dynamically based on policy; integrate System Center 2012 for automatic remediation into your existing Enterprise Infrastructure; design and implement a Windows PowerShell Desired State Configuration (DSC) solution | Updated:  **Plan and implement automated remediation.**  New:  Design and implement a Windows PowerShell Desired State Configuration (DSC) solution  Unchanged:  Create an Update Baseline in Virtual Machine Manager; implement a Desired Configuration Management (DCM) Baseline; implement Virtual Machine Manager integration with Operations Manager; configure Virtual Machine Manager to move a VM dynamically based on policy; integrate System Center 2012 for automatic remediation into your existing Enterprise Infrastructure |

1. **Plan and Implement a Highly Available Enterprise Infrastructure**

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| **Tasks measured prior to April 7** | **Tasks added/updated April 7** |
| **Plan and implement failover clustering.**  Plan for and implement multi-node and multi-site clustering including the use of networking, storage, name resolution, and Global Update Manager (GUM); design considerations including redundant networks, network priority settings, resource failover and failback, heartbeat and DNS settings, Quorum configuration, storage placement and replication, and cluster-aware updates | Updated:  Plan for and implement multi-node and multi-site clustering including the use of networking, storage, name resolution, and Global Update Manager (GUM); design considerations including redundant networks, network priority settings, resource failover and failback, heartbeat and DNS settings, Quorum configuration, storage placement and replication, and cluster-aware updates |
| **Plan and implement highly available network services.**  Plan for and configure Network Load Balancing (NLB); design considerations including fault-tolerant networking, multicast vs. unicast configuration, state management, and automated deployment of NLB using Virtual Machine Manager service templates | Unchanged:  Plan for and configure Network Load Balancing (NLB); design considerations including fault-tolerant networking, multicast vs. unicast configuration, state management, and automated deployment of NLB using Virtual Machine Manager service templates |
| **Plan and implement highly available storage solutions.**  Plan for and configure storage spaces and storage pools; design highly available, multi-replica DFS namespaces; plan for and configure multipath I/O, including Server Core; configure highly available iSCSI Target and iSNS Server | Updated:  Plan for and configure multipath I/O (MPIO)  New:  Plan for and implement storage using RDMA and SMB multi-channel  Unchanged:  Plan for and configure storage spaces and storage pools; design highly available, multi-replica DFS namespaces; configure highly available iSCSI Target and iSNS Server |
| **Plan and implement highly available roles.**  Plan for a highly available Dynamic Host Configuration Protocol (DHCP) Server, Hyper-V clustering, Continuously Available File Shares, and a DFS Namespace Server; plan for and implement highly available applications, services, and scripts using Generic Application, Generic Script, and Generic Service clustering roles | Updated:  **Plan and implement highly available server roles**  Unchanged:  Plan for a highly available Dynamic Host Configuration Protocol (DHCP) Server, Hyper-V clustering, Continuously Available File Shares, and a DFS Namespace Server; plan for and implement highly available applications, services, and scripts using Generic Application, Generic Script, and Generic Service clustering roles |
| **Plan and implement a business continuity and disaster recovery solution.**  Plan a backup and recovery strategy; planning considerations including Active Directory domain and forest recovery, Hyper-V replica, domain controller restore and cloning, and Active Directory object and container restore using authoritative restore and Recycle Bin | Updated:  Planning considerations including Active Directory domain and forest recovery, Hyper-V replica including using Windows Azure Hyper-V Recovery Manager  New:  Plan for and implement backup and recovery by using System Center Data Protection Manager (DPM)  Unchanged:  Plan a backup and recovery strategy |

1. **Plan and Implement a Server Virtualization Infrastructure**

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| **Tasks measured prior to April 7** | **Tasks added/updated April 7** |
| **Plan and implement virtualization hosts.**  Plan for and implement delegation of virtualization environment (hosts, services, and VMs), including self-service capabilities; plan and implement multi-host libraries including equivalent objects; plan for and implement host resource optimization; integrate third-party virtualization platforms | New:  Deploying Hyper-V hosts to bare metal  Unchanged:  Plan for and implement delegation of virtualization environment (hosts, services, and VMs), including self-service capabilities; plan and implement multi-host libraries including equivalent objects; plan for and implement host resource optimization; integrate third-party virtualization platforms |
| **Plan and implement virtualization guests.**  Plan for and implement highly available VMs; plan for and implement guest resource optimization including smart page file, dynamic memory, and remote FX; configure placement rules; create Virtual Machine Manager template | Updated:  **Plan and implement virtual machines.**  Plan for and implement guest resource optimization including shared VHDx  Unchanged:  Plan for and implement highly available VMs; configure placement rules; create Virtual Machine Manager template |
| **Plan and implement virtualization networking.**  Plan for and configure Virtual Machine Manager logical networks including virtual switch extensions and logical switches; plan for and configure IP address and MAC address settings across multiple Hyper-V hosts including IP virtualization; plan for and configure virtual network optimization; plan and implement Windows Server Gateway; | Updated:  Plan for and configure Virtual Machine Manager logical networks including virtual switch extensions and logical switches; plan for and configure IP address and MAC address settings across multiple Hyper-V hosts including network virtualization  New:  Plan and implement VLANs and pVLANs; plan and implement VM networks; plan and implement converged networks  Unchanged:  Plan for and configure virtual network optimization |
| **Plan and implement virtualization storage.**  Plan for and configure Hyper-V host storage including stand-alone and clustered setup using SMB 2.2 and CSV; plan for and configure Hyper-V guest storage including virtual Fibre Channel, iSCSI, and pass-through disks; plan for storage optimization | Updated:  Plan for and configure Hyper-V host clustered storage; plan for and configure Hyper-V virtual machine storage including virtual Fibre Channel, iSCSI, and shared VHDx  New:  Plan and implement storage using SMB 3.0 file shares  Unchanged:  Plan for storage optimization |
| **Plan and implement virtual guest movement.**  Plan for and configure live, SAN, and network migration between Hyper-V hosts; plan for and manage P2V and V2V | Updated:  **Plan and implement virtual machine movement.**  Plan for and configure live and storage migration between Hyper-V hosts; plan for and manage P2V and V2V  New:  Plan and implement virtual machine migration between clouds |
| **Manage and maintain a server virtualization infrastructure.**  Manage dynamic optimization and resource optimization; manage Operations Manager integration using PRO Tips; automate VM software and configuration updates using service templates; maintain library updates | Updated:  Integrate Operations Manager with System Center Virtual Machine Manager and System Center Service Manager; update virtual machine images in libraries  New:  Plan for and implement backup and recovery of virtualization infrastructure by using System Center Data Protection Manager (DPM)  Unchanged:  Manage dynamic optimization and resource optimization |

1. **Design and Implement Identity and Access Solutions**

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| **Tasks measured prior to April 7** | **Tasks added/updated April 7** |
| **Design a Certificate Services infrastructure.**  Design a multi-tier Certificate Authority (CA) hierarchy with offline root CA; plan for multi-forest CA deployment; plan for Certificate Enrollment Web Services; plan for network device enrollment; plan for certificate validation and revocation; plan for disaster recovery; plan for trust between organizations | Updated:  Plan for Certificate Enrollment Web Services and Certificate Enrollment Policy Web Services; plan for Network Device Enrollment Services (NDES); plan for trust between organizations including Certificate Trust Lists (CTL), cross certifications, and bridge CAs;  Unchanged:  Design a multi-tier Certificate Authority (CA) hierarchy with offline root CA; plan for multi-forest CA deployment; plan for certificate validation and revocation; plan for disaster recovery |
| **Implement and manage a Certificate Services infrastructure.**  Configure and manage offline root CA; configure and manage Certificate Enrollment Web Services; configure and manage Network Device Enrollment Services; configure Online Certificates Status Protocol responders; migrate CA; implement administrator role separation; implement and manage trust between organizations; monitor CA health | Updated:  Configure and manage Certificate Enrollment Web Services and Certificate Enrollment Policy Web Services; configure Online Certificate Status Protocol (OCSP) responders; implement and manage trust between organizations including Certificate Trust Lists (CTL), cross certifications, and bridge CAs  Unchanged:  Configure and manage offline root CA; configure and manage Network Device Enrollment Services; migrate CA; implement administrator role separation; monitor CA health |
| **Implement and manage certificates.**  Manage certificate templates; implement and manage deployment, validation, and revocation; manage certificate renewal including Internet-based clients; manage certificate deployment and renewal to network devices; configure and manage key archival and recovery | Updated:  Implement and manage certificate deployment, validation, renewal, revocation, and publishing including Internet-based clients, CAs, and network devices  Unchanged:  Manage certificate templates; configure and manage key archival and recovery |
| **Design and implement a federated identity solution.**  Plan for and implement claims-based authentication including planning and implementing Relying Party Trusts; plan for and configure Claims Provider Trust rules; plan for and configure attribute stores including Active Directory Lightweight Directory Services (AD LDS); plan for and manage Active Directory Federation Services (AD FS) certificates; plan for Identity Integration with cloud services | Updated:  Plan for and configure Claims Provider and Relying Party Trust claim rules; plan for and implement Identity Integration with cloud services  New:  Integrate Web Application Proxy with AD FS  Unchanged:  Plan for and implement claims-based authentication including planning and implementing Relying Party Trusts; plan for and configure attribute stores including Active Directory Lightweight Directory Services (AD LDS); plan for and manage Active Directory Federation Services (AD FS) certificates |
| **Design and implement Active Directory Rights Management Services (AD RMS).**  Plan for highly available AD RMS deployment; manage AD RMS Service Connection Point; plan for and manage AD RMS client deployment; manage Trusted User Domains; manage Trusted Publishing Domains; manage Federated Identity support; manage Distributed and Archived Rights Policy templates; configure Exclusion Policies; decommission AD RMS | New:  Upgrade or migrate AD RMS  Unchanged:  Plan for highly available AD RMS deployment; plan for AD RMS client deployment; manage Trusted User Domains; manage Trusted publishing domains; manage Federated Identity support; decommission AD RMS |