BAKER COLLEGE
STUDENT LEARNING OUTCOMES

MNP 4320 Advanced Server Administration IV
3 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Designing an Administrative Model
   a. Design an administrative management model for your environment including user rights and built-in groups, delegation of administration structure for Microsoft System Center 2012 R2, design of self-service portals using System Center Service Manager, delegating rights for managing private clouds using App Controller and System Center Virtual Machine Manager.

2. Designing a Monitoring Strategy
   a. Design a monitoring strategy including monitoring servers using Audit Collection Services (ACS) and System Center Global Service Monitor, centralized monitoring and reporting of performance/applications, implementing and optimizing System Center 2012 Operations Manager using management packs, and monitoring Active Directory.

3. Planning and Implementing Automated Remediation
   a. Plan for automated remediation methodologies and determining the best methods based on the environment. Planning can include the type of remediation implementation to use such as WSUS or System Center 2012 R2, determining what baselines and minimum update levels for physical, virtual, and imaged systems should be established, and planning to handle downtime during updates.
   b. Implement automated remediation including: Creating/implementing baselines using Virtual Machine Manager and Desired State Configuration (DSC), implementing Virtual Machine Manager integration with Operations Manager, configuring Virtual Machine Manager to move a VM dynamically based on policy, integrating System Center 2012 for automatic remediation into your existing enterprise infrastructure, and designing and implementing a Windows PowerShell Desired State Configuration (DSC) solution.

4. Planning and Implementing Failover Clustering
   a. Plan for providing a highly available enterprise structure and determining the best approach based on the environment. Planning can include the use of fail-over clustering, networking storage, network redundancy/priority, resources failover/failback, and cluster aware updating.

b. Implement a highly available enterprise structure including multi-node and multi-site clustering, networking storage, name resolution, Global Update Manager (GUM), network redundancy/priority, resource failover/failback, Quorum configuration, storage placement/replication, and cluster-aware updates.

5. Planning and Implementing Highly Available Network Services
   a. Plan for highly available network services and determining the best approach based on the environment. This planning can include the use of Network Load Balancing (NLB), fault-tolerant networking, or other configuration, as well as how to plan for NLB in Virtual Machine Manager template design.
   b. Implement highly available network services including Network Load Balancing (NLB), fault-tolerant networking, multicast vs. unicast configuration, state management, and automated deployment of NLB using Virtual Machine Manager service templates.

6. Planning and Implementing Highly Available Storage Solutions
   a. Plan for highly available storage solutions and determining the best approach based on the environment. Planning will include what technologies to use, such as Storage Spaces and Storage Pools, multireplica DFS namespaces, iSCSI Targets, and multi-channel SMB.
   b. Implement highly available storage solutions including Storage Spaces and Storage Pools, highly available multireplica DFS namespaces, multi-path I/O (MPIO), iSCSI Targets and iSNS Server, RDMA and multi-channel SMB.

7. Planning and Implementing Highly Available Roles
   a. Plan for highly available roles and determine the best approach based on the environment. Planning includes how Dynamic Host Configuration Protocol (DHCP), Hyper-V, Continuously Available File Shares, and DFS Namespaces should be deployed.
   b. Implement highly available roles including Dynamic Host Configuration Protocol (DHCP), Hyper-V, Continuously Available File Shares, DFS Namespace Server; highly available applications/services/scripts using Generic Application/Script/Service clustering roles.

8. Planning and Implementing a Business Continuity and Disaster Recovery Solution
   a. Plan for business continuity and disaster recovery solutions. This planning will include reviewing the environment and determining the best approach to recover from a disaster. Items to be considered will be Active Directory recovery, Hyper-V replicas, and domain controller restoration and cloning.
   b. Implement a business continuity and disaster recovery solution including Active Directory domain and forest recovery, Hyper-V replicas, Microsoft Azure Site Recovery, domain controller restore and cloning, Active Directory object and container restore, and implementing backup/recovery by using System Center Data Protection Manager (DPM).

9. Planning and Implementing Virtualization Hosts
    a. a. Plan for the uses of a virtualization environment in the enterprise. Based on the environment's needs, planning will include what virtualization environment (hosts/services/VMs) will be used, integration of third-party virtualization platforms, and deployment of Hyper-V hosts to bare metal.
    b. Implement virtualization hosts including delegation of the virtualization environment (hosts/ services/VMs), selfservice capabilities, multi-host libraries, host resource optimization, integrating third-party virtualization platforms, and deploying Hyper-V hosts to bare metal.

10. Planning and Implementing Virtual Machines
    a. Plan for the deployment of virtual machines within a virtualization environment. Planning includes provisions for highly available VMs, shared VHDx, and Virtual Machine Manager templates.
    b. Implement virtual machines including highly available VMs, guest resource optimization, shared VHDx, configuring placement rules, and creating Virtual Machine Manager templates.

11. Planning and Implementing Virtualization Networking
    a. Plan for the deployment of virtualized networking solutions within a virtualized environment. Planning includes provisions for Virtual Machine Manager logical networks, virtual switch extensions, logical switches, IP address and MAC address settings, VLANs, and optimization of the virtual networks.
    b. Implement virtual networking including configuring Virtual Machine Manager logical networks, virtual switch extensions, logical switches, configuring IP address and MAC address settings across multiple Hyper-V hosts, network virtualization, Windows Server Gateway, VLANs/pVLANs, converged networks, and optimizing virtual networks.

12. Planning and Implementing Virtualization Storage
    a. Plan for the deployment of virtualized storage solutions within a virtualized environment. Planning will evaluate the needs of the environment and create a best use scenario implementing technologies such as hosted clustered storage, virtual machine storage, iSCSI, shared VHDx, and/or SMB 3.0 file shares.
    b. Implement storage for virtualization including host clustered storage, virtual machine storage, Virtual Fibre Channel, iSCSI, shared VHDx, storage optimization, and SMB 3.0 file shares.

13. Planning and Implementing Virtual Machine Movement
    a. Plan for the movement of virtual machines within a virtualized environment. Planning will evaluate the uptime necessities of the environment and best approaches to virtual machine movement.

b. Implement virtual machine migration including live and storage migration between Hyper-V hosts, Physical to Virtual (P2V)/Virtual to Virtual (V2V)/migration between clouds.

14. Managing and Maintaining a Server Virtualization Infrastructure
   a. Manage using Operations Manager with System Center Virtual Machine Manager/System Center Service Manager.
   b. Maintain a virtualized server infrastructure including dynamic/resource optimization, updating virtual machine images in libraries, backup and recovery of virtualized infrastructure using System Center Data Protection Manager (DPM), and using Operations Manager with System Center Virtual Machine Manager/System Center Service Manager.

15. Designing a Certificate Services Infrastructure
   a. Design a Certificate Services infrastructure including multi-tier Certificate Authority (CA) hierarchy, offline root CA, multiforest CA deployment, Certificate Enrollment Web Services, Certificate Enrollment Policy Web Services, Network Device Enrollment Services (NDES), certificate validation and revocation, disaster recovery, and planning for trust between organizations via Certificate Trust Lists (CTL)/cross certifications/bridge CAs.

16. Implementing and Managing a Certificate Services Infrastructure
   a. Implement a Certificate Services infrastructure including configuring offline root CA, Certificate Enrollment Web Services, Certificate Enrollment Policy Web Services, Network Device Enrollment Services, and Online Certificates Status Protocol (OCSP) responders.
   b. Manage a Certificate Services infrastructure including offline root CA, Certificate Enrollment Web Services, Certificate Enrollment Policy Web Services, Network Device Enrollment Services, Online Certificates Status Protocol (OCSP) responders, CA migration, administrative role separation, managing trust between organizations, Certificate Trust Lists (CTL)/cross certifications/bridge CAs, and monitor CA health.

17. Implementing and Managing Certificates
   a. Implement certificate deployment/validation/renewal/revocation/publishing and configuring archival and recovery of certificates.
   b. Manage certificates including managing certificate templates, certificate deployment/validation/renewal/revocation/publishing, and configuring/managing key archival and recovery.

18. Designing and Implementing a Federated Identity Solution
   a. Design a Federated Identity Solution to allow single sign-on access to multiple environments utilizing Claims Provider/Relying Party Trust rules, attribute stores, and Active Directory Federation Services (AD FS) certificates. Design will also look at integration with cloud services and Web Application Proxy with AD FS.

b. Implement a federated identity solution including claims-based authentication, Relying Party Trusts, Claims Provider/Relying Party Trust claim rules, attribute stores, Active Directory Federation Services (AD FS) certificates, Identity Integration with cloud services, and Web Application Proxy with AD FS.

19. Designing and Implementing Active Directory Rights Management Services
    a. Design an Active Directory Rights Management Services solution to provide information rights management to an environment. Design will include determining the necessary access permissions and policies necessary to enforce information rights management to an environment's data.
    b. Implement Active Directory Rights Management Services (AD RMS) including highly available AD RMS deployment, Trusted User Domains, Trusted Publishing Domains, Federated Identity support, and upgrade/migration/decommission of AD RMS.

These SLOs are approved for experiential credit.

These SLOs are designed to match the Microsoft Certification test criteria for Exam 70-414 – Implementing an Advanced Server Infrastructure

Effective: Spring 2018