Lab: Planning and configuring storage technologies and components

Scenario You are a Storage Administrator in A. Datum Corporation, and part of your job is to ensure that your data storage systems meet both short-term and long-term business needs that evolve regularly. **Objectives** After completing this lab, you will be able to: - Plan storage requirements. - Configure iSCSI storage. - Configure and manage shares.

Lab Setup - Estimated Time: 60 minutes - Virtual machines: 20470C-LON-DC1 and 20470C-LON-SVR1 - User name: Adatum\Administrator - Password: Pa55w.rd

For this lab, you will use the available virtual machine environment. Before you begin the lab, you must complete the following steps: 1. On the host computer, start Hyper-V Manager. 2. In Hyper-V Manager, click 20470C-LON-DC1, and then in the Actions pane, click Start. 3. In the Actions pane, click Connect. Wait until the virtual machine starts. 4. Sign in by using the following credentials: 1. User name: Administrator 2. Password: Pa55w.rd 3. Domain: Adatum 5. Repeat steps 2 through 4 for 20470C-LON-SVR1.

Exercise 1: Planning storage requirements

Scenario The A. Datum Corporation wants to design new storage solutions to support several recent changes. These changes include: - External customers are using web applications more, and these customers need more and new business services. - Internal users need more support and internal infrastructure services. - Requirements for managing block-level storage and shared file access have expanded. - A recently acquired company uses a different IT infrastructure than A. Datum. The IT department now needs to manage a mixed environment that includes remote geographical areas in London, New York, and Japan. - The cost of storage has decreased significantly over recent years. - The amount of data produced by A. Datum business groups has increased even faster.

Requirements In general, the new system should be low-cost, have reasonable performance, and the storage administrators in A. Datum and the newly acquired company should be able to manage it easily. The new storage system should include: - Centralized management and control over the storage infrastructure. - Support for applications that require large amounts of storage for SQL databases. - An easy, inexpensive way to provision block-level storage that has minimal management overhead. - The provisioning of VMWare ESX/ESXi virtual machines. - The provisioning of Hyper-V virtual machines. - Support for UNIX clients that require access to shared folders. - Share access for older clients, if it is required. - As part of fulfilling this requirement, you will determine if older clients—including Windows XP and Windows Vista—need access to shares, and you then will remove any legacy shares that your users are not utilizing.

Proposals As a senior server administrator at A. Datum, you are responsible for implementing the new file storage technologies for the organization. After reviewing the requirements, you propose a plan based on answers to the following questions: - You plan to evaluate how iSCSI, Fibre Channel, and InfiniBand solutions meet the requirements. Which solution do you expect to select? - Which storage—block-level storage or file-level storage—do you plan to implement for the SQL databases? - How will your solution minimize administrative overhead for the storage administrators? - Which server role(s) do you plan to use for the provisioning of VMWare ESX/ESXi virtual machines? - Will you run the Hyper-V virtual machines on NFS or

SMB? - Which file sharing protocol will you use for UNIX clients that require access? - How do you plan to disable legacy SMB access for existing SMB file shares?

The main tasks for this exercise are as follows: 1. Read the supporting documentation. 2. Record your planned course of action.

Task 1: Read the supporting documentation

- Read the supporting documentation in the lab exercise scenario.

Task 2: Record your planned course of action Record your answers to the following questions:

1. You plan to evaluate how iSCSI, Fibre Channel, and InfiniBand solutions meet your requirements. Which solution do you expect to select?
2. Which storage type do you plan to implement for the SQL databases, block-level storage or file-level storage?
3. How will your solution minimize administrative overhead for storage administrators?
4. Which server role(s) do you plan to use for the provisioning of VMWare ESX/ESXi virtual machines?
5. Will you run the Hyper-V virtual machines on NFS or SMB?
6. Which file sharing protocol will you use for UNIX clients that require access?
7. How do you plan to disable legacy SMB access for existing SMB file shares?

> **Results:** After completing this exercise, you should have successfully planned a storage solution that will meet your organization's requirements.

Exercise 2: Configuring iSCSI storage

Scenario You need to implement highly available iSCSI storage by using MPIO. There are two independent network paths between the file server and the iSCSI target. You will configure MPIO to use both paths to provide redundancy at the network level. The main tasks for this exercise are as follows: 1. Install the iSCSI target feature. 2. Create and configure an iSCSI target. 3. Configure MPIO. 4. Connect to the iSCSI target. 5. Initialize the iSCSI disks.

Task 1: Install the iSCSI target feature - On LON-DC1, in Server Manager, install the iSCSI Target Server role service in File and Storage Services.

Task 2: Create and configure an iSCSI target 1. On LON-DC1, in Server Manager, in File and Storage Services, browse to iSCSI. 2. Create a new iSCSI virtual disk with the following settings: 1. Name: iSCSIDisk1 2. Disk size: 5 GB 3. iSCSI target: New 4. Target name: LON-DC1 5. Access servers: 10.100.100.3,10.200.100.3 3. Create a second iSCSI virtual disk with the following settings: 1. Name: iSCSIDisk2 2. Disk size: 5 GB 3. iSCSI target: LON-DC1

Task 3: Configure MPIO 1. On LON-SVR1, in Server Manager, add the Multipath I/O feature. 2. After installation is complete, restart LON-SVR1, and then sign in as Adatum\Administrator with the password Pa55w.rd. 3. In Server Manager, on the Tools menu, open iSCSI Initiator. 4. In the iSCSI Initiator, perform a quick connect to the target 10.100.100.2. 5. In Server Manager, on the Tools menu, open MPIO. 6. In MPIO Properties, on the Discover Multi-Paths tab, add support for iSCSI devices, and then restart when prompted. 7. After restarting, sign in as Adatum\Administrator with the password Pa55w.rd. 8. In Server Manager, open MPIO, and then

verify that MSFT2005iSCSIBusType_0x9 is listed as a device.

Task 4: Connect to the iSCSI target1. On LON-SVR1, in Server Manager, on the Tools menu, open iSCSI Initiator. 2. On the Targets tab, disconnect from all sessions. 3. Connect again, select the following options, and then enter the Advanced settings: o Enable multi-path o Add this connection to the list of Favorite Targets. 4. In the Advanced Settings dialog box, select the following settings: 1. Local adapter: Microsoft iSCSI Initiator 2. Initiator IP: 10.100.100.3 3. Target Portal IP: 10.100.100.2 / 3260 5. Connect a second time, select the following options, and then enter the Advanced settings: 1. Enable multi-path 2. Add this connection to the list of Favorite Targets. 6. In the Advanced Settings dialog box, select the following settings: 1. Local adapter: Microsoft iSCSI Initiator 2. Initiator IP: 10.200.100.3 3. Target Portal IP: 10.200.100.2 / 3260 7. On the Volumes and Devices tab, select the Auto Configure option. 8. On the Targets tab, select the iqn.1991-05.com.microsoft:lon-dc1-lon-dc1-target target, and then view the Devices. 9. For MPIO, verify that: 1. Load balance policy: Round Robin 2. The path details match the IP addresses you configure for source and destination addresses

Task 5: Initialize the iSCSI disks 1. On LON-SVR1, in Server Manager, in File and Storage Services, browse to Disks. 2. Select an offline disk with a bus type of iSCSI, and then bring it online. 3. Right-click that disk, and then create a new volume with the following properties: 1. GPT disk 2. Drive letter: J 3. Volume label: SMBShares 4. Other settings: default 4. Select an offline disk with a bus type of iSCSI, and then bring it online. 5. Right-click that disk, and then create a new volume with the following properties: 1. GPT disk 2. Drive letter: K 3. File system: NTFS 4. Volume label: NFSShares 5. Other settings: default 6. Use File Explorer to verify that SMBShares and NFSShares are available in This PC.

> **Results:** After completing this exercise, you should have successfully configured an iSCSI target that uses MPIO for redundancy.

Exercise 3: Configuring and managing the share infrastructure

Scenario After configuring iSCSI storage for LON-SVR1, you need to create shares to support clients that are running both Windows and Linux operating systems. The main tasks for this exercise are as follows: 1. Create an SMB share on iSCSI storage. 2. Create an NFS share on iSCSI storage. 3. Use Windows PowerShell to view share information. 4. Disable the legacy SMB1 protocol. 5. Prepare for the next module.

Task 1: Create an SMB share on iSCSI storage1. On LON-SVR1, in Server Manager, in File and Storage Services, browse to Shares. 2. Create a new share by using the following settings: 1. File share profile: SMB Share – Quick 2. Select by volume: J: 3. Share name: Data 4. Enable access-based enumeration 5. Add permission: Domain Users, Modify

Task 2: Create an NFS share on iSCSI storage1. On LON-SVR1, in Server Manager, in File and Storage Services, browse to Shares. 2. Create a new share with the following settings: 1. File share profile: NFS Share – Quick 2. Select by volume: K: 3. Share name: LinuxData 4. Authentication method: Kerberos v5 authentication(Krb5) 5. Add share permission: All Machines, Read / Write

Task 3: Use Windows PowerShell to view share information1. On LON-DC1, open File Explorer, and then browse to \\LON-SVR1\Data. 2. Create a new text file named NewFile.txt, and then open it in Notepad. 3. On LON-SVR1, open a Windows PowerShell prompt. 4. At the Windows PowerShell prompt, type the following

command, and then press Enter: `Get-NfsShare` 5. Type the following command, and then press Enter: `Get-NfsShare LinuxData | FL *` 6. Type the following command, and then press Enter: `Get-SmbShare` 7. Type the following command, and then press Enter: `Get-SmbShare Data | FL *` 8. Type the following command, and then press Enter: `Get-SmbSession` 9. Type the following command, and then press Enter: `Get-SMBSession -ClientUserName Adatum\Administrator | FL *` 10. Type the following command, and then press Enter: `Get-SmbOpenFile`

> *Note:* There are two entries for Adatum\Administrator. File Explorer creates one, and Notepad creates the other. If NewFile.txt is not included, it is because the file connection is maintained only for brief periods when you open the file initially or save it. If you do not see two entries, switch to LON-DC1, close Notepad, and then double-click NewFile.txt. Then, on LON-SVR1, repeat step 10.

1. Leave the Windows PowerShell prompt open for the next task.

Task 4: Disable the legacy SMB1 protocol 1. On LON-SVR1, at the Windows PowerShell prompt, type the following command, and then press Enter: `Set-SmbServerConfiguration -AuditSmb1Access $true` 2. Type the following command, and then press Enter: `Get-SmbServerConfiguration | FL enable*` 3. Type the following command, and then press Enter: `Set-SmbServerConfiguration -EnableSMB1Protocol $false` 4. Type the following command, and then press Enter: `Get-WindowsFeature *SMB*` 5. Type the following command, and then press Enter: `Remove-WindowsFeature FS-SMB1`

Task 5: Prepare for the next module After you finish the lab, revert the virtual machines to their initial state by completing the following steps: 1. On the host computer, switch to the Hyper-V Manager console. 2. In the Virtual Machines list, right-click 20740C-LON-DC1, and then click Revert. 3. In the Revert Virtual Machine dialog box, click Revert. 4. Repeat steps 2 and 3 for 20740C-LON-SVR1.

> **Results:** After completing this exercise, you should have successfully created SMB and NFS shares.