Topic: Overview of High Availability and Disaster Recovery

Objective

The objective of this lab is to understand, plan, and implement high availability (HA) and disaster recovery (DR) solutions for virtualized environments using Hyper-V in Windows Server 2016. You will learn to design a business continuity plan, use Live Migration, Storage Migration, and configure Hyper-V Replica for planned and unplanned outages to minimize downtime and data loss.20740A-LAB.pdf

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Pre-requisites:

- **Lab Environment:**
    - VMware Workstation with the following VMs:
        1. LON-DC1: Windows Server 2016 Datacenter Evaluation GUI (Main Domain Controller)
        2. LON-SVR1: Windows Server 2016 Standard Evaluation GUI
        3. LON-SVR2: Windows Server 2016 Standard Evaluation GUI
        4. LON-CORE: Windows Server 2016 Datacenter Evaluation CLI
        5. LON-CL1: Windows 10 Pro
        6. LON-RHEL: Red Hat Enterprise Linux 10 (not joined to the Windows domain)
    - All Windows VMs except LON-RHEL joined to AD DS domain RPSLAB.COM.
- **Privileges:** Local administrator on all servers involved.
- **Hyper-V Environment:** At least two Hyper-V host VMs (e.g., LON-HOST1 and LON-NVHOST2).
- **Sample VMs:** At least one VM (e.g., LON-SVR1-B) to use as a replication and migration target.
- **Network Connectivity** among all Hyper-V hosts and VMs.
- **Credentials:** Standard lab password (Pa$$w0rd).
- **Screenshots Tool:** For capturing every major configuration step.

Procedure:

Exercise 1: Determining the Appropriate High Availability and Disaster Recovery Solution

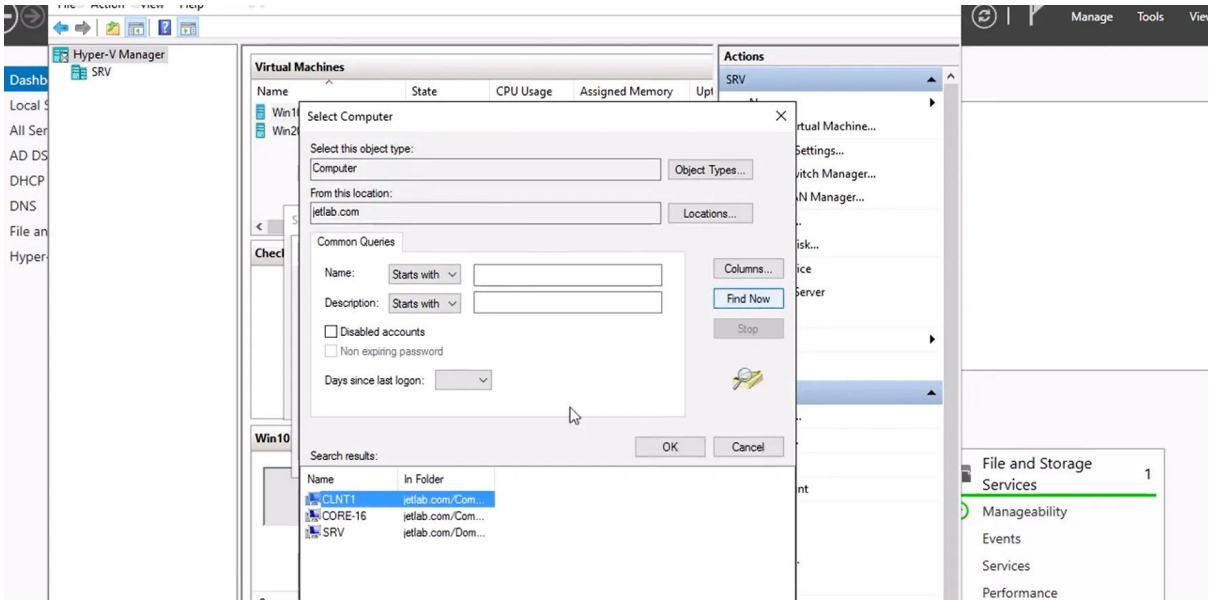
1. **Develop a Business Recovery Plan:**
    - Outline and prioritize divisional and service requirements. Assign the highest priority to customer-facing financial requirements.
2. **High Availability Recommendations:**
    - Use **Live Migration** for proactive/planned downtime (e.g., server maintenance or patching).
    - Use **Storage Migration** to move VM virtual hard disks (VHDs) between storage locations without VM downtime (e.g., to upgrade storage or for maintenance).
3. **Disaster Recovery Solution:**
    - Implement **Hyper-V Replica** (or Hyper-V Recovery Manager) to provide DR for critical VMs. This allows replication of VMs to another location so that they can be started in the event of a disaster.
4. **Documentation:**
    - Record your plan, including which workloads will be protected, recovery point objectives (RPO) and recovery time objectives (RTO), and any necessary prerequisites.

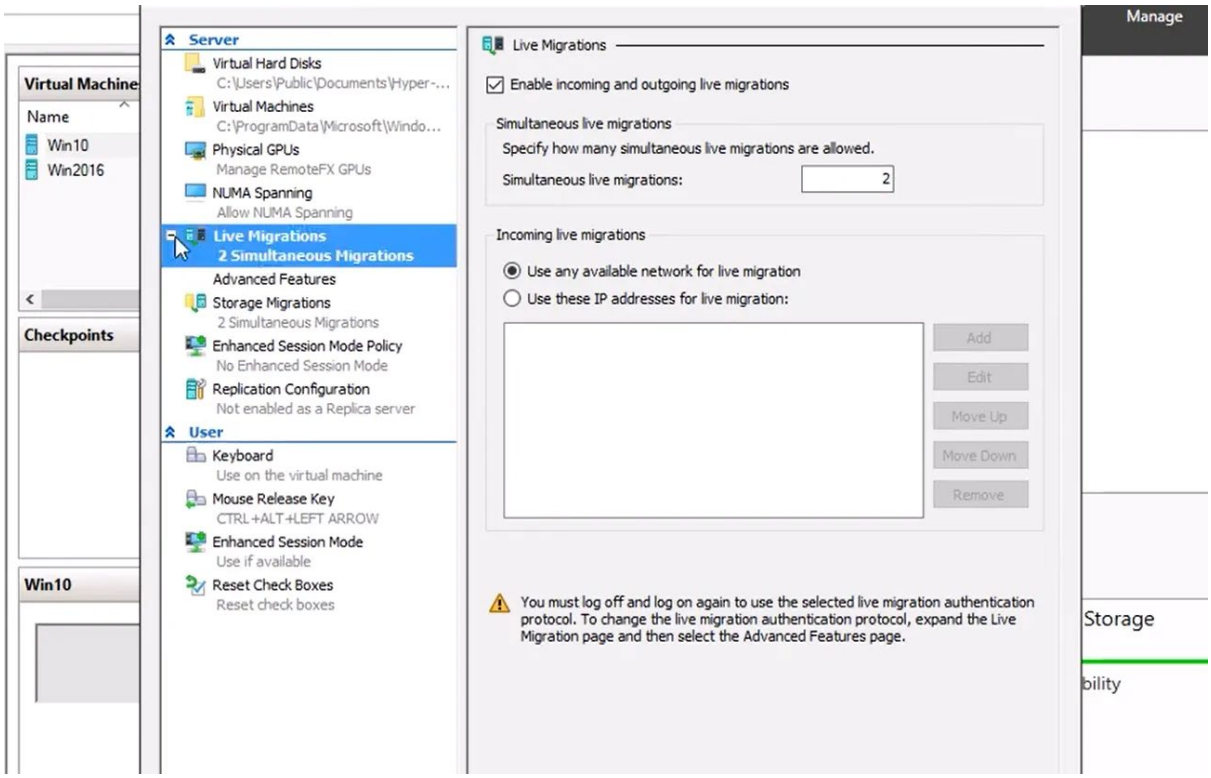
Exercise 2: Implementing Storage Migration

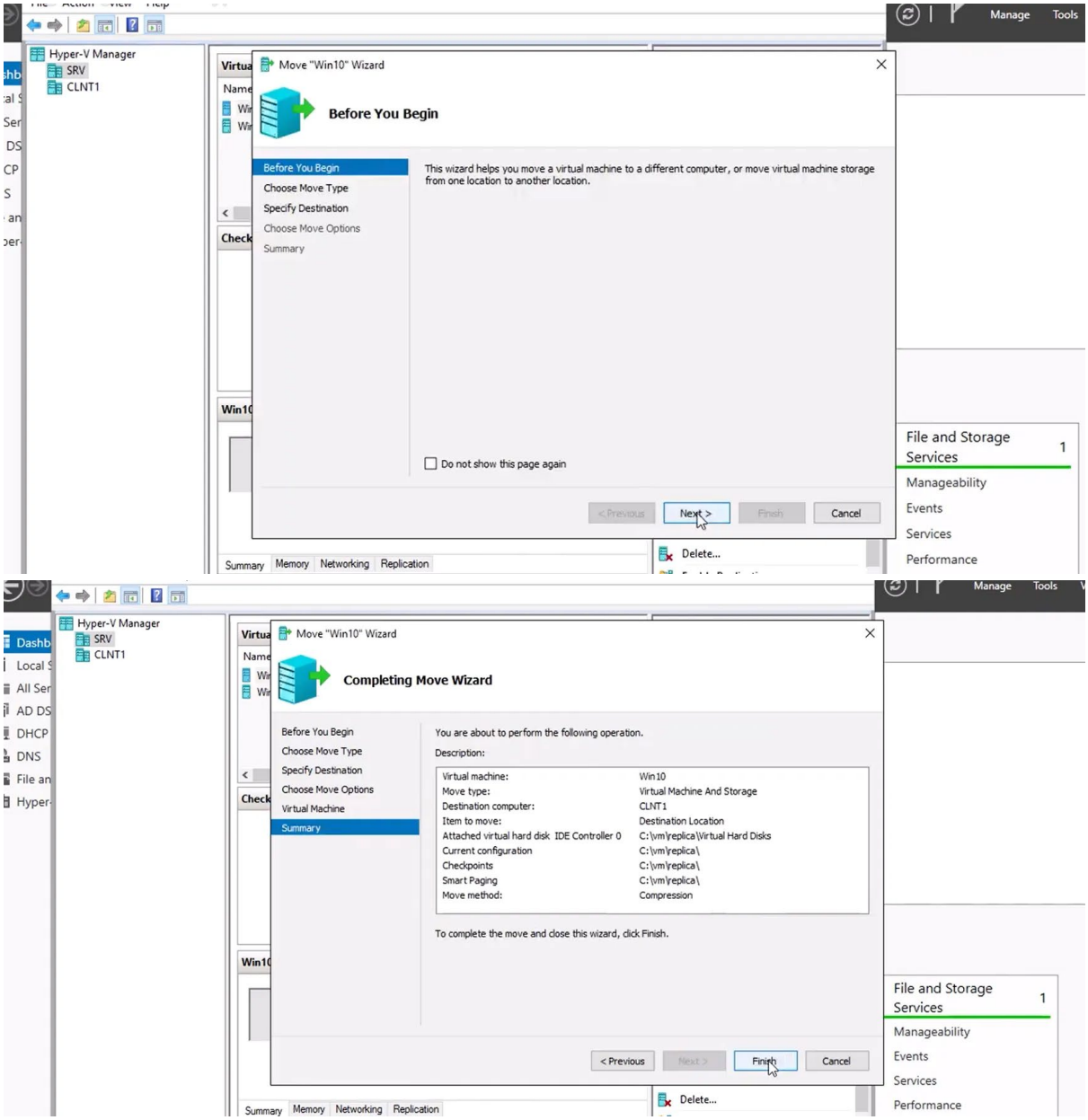
1. **Verify VM's Current Disk Location:**
    - In Hyper-V Manager, right-click LON-SVR1-B and select **Settings**.
    - Under **IDE Controller 0**, verify the VHD is stored locally (e.g., LON-SVR1-B.vhd).
2. **Move the VM Storage:**
    - In Hyper-V Manager, right-click 20740A-LON-SVR1-B, and select **Move**.
    - In the wizard, choose **Move the virtual machine's storage**.
    - Select **Move only the virtual machine's virtual hard disks**.

- Select the appropriate VHD for migration (e.g., 20740A-LON-SVR1-B-Allfiles.vhd).
- Specify the **destination folder** (e.g., C:\VMs\LON-SVR1-B).
- Complete the wizard.

3. **Verify Success:**
    - Check in Hyper-V Manager that the disk now resides at the new location while the VM remains running.







Exercise 3: Configuring Hyper-V Replicas

1. **Enable Replica on Both Hosts:**
    - On LON-NVHOST2 and LON-HOST1, open **Hyper-V Manager** > Right-click host > **Hyper-V Settings** > **Replication Configuration**.
    - Enable "This computer as a Replica server" ands select **Kerberos (HTTP)**.
    - Authorize replication from any authenticated server, set replica storage folder (e.g., C:\VMReplica).
    - On each host, enable the firewall rule **Hyper-V Replica HTTP Listener (TCP-In)**.

2. **Configure Replication for a VM:**
    - In Hyper-V Manager on LON-HOST1, right-click VM (e.g., 20740A-LON-SVR1-B) > **Enable Replication**.
    - Specify the replica server (LON-NVHOST2), authentication (Kerberos), and VHDs to replicate.
    - Set replication frequency (e.g., 30 seconds).
    - Select the latest recovery point and start replication immediately.
3. **Verify Replication:**
    - Monitor replication health and completion in Hyper-V Manager's **Status** column.

Exercise 4: Planned Failover

1. **Validate Replication Health:**
    - In Hyper-V Manager, right-click the VM on LON-HOST1 > **Replication** > **View Replication Health** (check for errors).
2. **Initiate Planned Failover:**
    - Power off the primary VM as needed.
    - On the host, right-click the VM > Replication > **Planned Failover** (ensure "Start the replica VM after failover" is checked).
    - Confirm that the replica VM is running on LON-NVHOST2.
3. **Cleanup:**
    - After validation, use **Cancel Failover** and **Remove Replication** on both hosts.

Conclusion

After completing this lab, you will be able to:

- **Analyze and design** a high availability and disaster recovery plan suitable for enterprise environments.
- **Perform live and storage migration** of VMs in Hyper-V with zero downtime.

- **Configure and validate Hyper-V Replica** for disaster recovery, enabling VMs to quickly failover to a replica site in case of outages.
- **Demonstrate planned failover** for business continuity and verify failback/cleanup.
- **Document** your configuration process with relevant screenshots and notations for future reference or audit.20740A-LAB.pdf

This hands-on experience prepares you to manage real-world HA and DR scenarios using Hyper-V in Windows Server 2016 environments.