Practical Lab: Bank Case Study - IT Infrastructure Implementation with Hyper-V

Note:

- **Do not discard this lab it may be of use for the next lab**
- **Form a team of 3 persons maximum**

Objective:

The objective of this practical lab is to guide students through the process of implementing various components of IT infrastructure using Hyper-V virtualization technology, focusing on network design, server setup, and storage implementation within the context of a simulated bank environment.

Lab Setup:

1. Hardware Requirements:
    - Computers or laptops for each pair of students (3 students per group) with hardware virtualization support.
    - Network switches and Ethernet cables for creating a local network.
    - USB Ethernet adapters (if needed) for additional network interfaces.
2. Software Requirements:
    - Operating System: Windows 10 Pro or Enterprise edition with Hyper-V feature enabled.
    - Virtualization Software: Microsoft Hyper-V Manager for managing virtual machines.
    - Operating System Images: Windows Server ISO files for creating virtual machines.

Lab Exercises:

1. Network Design and Configuration:

- Task 1: Use Hyper-V Manager to create virtual switches (internal or external) for network connectivity.
- Task 2: Design a network topology for a simulated bank environment using virtual switches, including VLAN configurations if needed.
- Task 3: Configure IP addressing, subnetting, and routing on virtual machines to simulate LAN and WAN connectivity.

2. Server Setup and Configuration:
    - Task 1: Create virtual machines for different server roles using Hyper-V Manager.
    - Task 2: Install Windows Server operating systems on virtual machines and configure basic network settings.
    - Task 3: Configure server roles and features (e.g., Active Directory, DNS, DHCP, web server) using Server Manager or PowerShell.
3. Storage Implementation:
    - Task 1: Set up virtual hard disks (VHD or VHDX) for storage on Hyper-V virtual machines.
    - Task 2: Install and configure FreeNAS or Openfiler virtual machine for storage simulation.
    - Task 3: Configure storage volumes, RAID levels, and shared folders for centralized storage and file sharing.
4. Integration and Testing:
    - Task 1: Connect virtual machines to virtual switches to establish network connectivity.
    - Task 2: Test data access and transfer between virtual machines and storage devices, ensuring proper functionality and performance.
    - Task 3: Perform failover testing to validate redundancy and high availability configurations.
5. Security and Compliance:
    - Task 1: Implement security measures such as firewall rules, access controls, and encryption on virtual machines and storage.
    - Task 2: Configure auditing and monitoring tools to track and analyze network and server activities.
    - Task 3: Perform vulnerability scans and security audits to identify and address potential security vulnerabilities.

Lab Assessment:

- Students will work in pairs of three (3) to complete the lab tasks collaboratively.
- Emphasize the importance of teamwork, communication, and sharing of insights between group members.

- Remind students not to discard their lab setup as they may need it for future labs or reference.
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