Directory Structure and Network Management (IE3020)

3rd Year, 1st Semester

Assignment

Learning Outcome:

- ISO Network Management Framework
- Network Management in a practical perspective

Implementation of a Linux-based Domain Controller with Active Directory and Zabbix Monitoring

Overview:

In this assignment, you will set up a domain controller on a Linux environment using Samba to emulate Active Directory services. You will also configure at least one client machine to join this domain and authenticate using Active Directory user accounts. Additionally, you will install and configure Zabbix on the same server to monitor the network and its functionalities.

Objectives:

1. **Set up a Linux-based domain controller** using Samba to implement Active Directory services.
2. **Configure a client machine** to join the domain and authenticate using the Active Directory user accounts.
3. **Install and configure Zabbix** to monitor the server and client machine.

Requirements:

- **Operating System**: Any popular Linux distribution (e.g., Ubuntu, CentOS)
- **Services**: Samba, Kerberos, DNS, DHCP (optional but recommended for a complete setup)
- **Monitoring Tools**: Zabbix Server
- **Client Machine**: Can be a virtual machine or a separate physical machine, which will join the domain

Instructions:

Part 1: Setting Up the Domain Controller

1. **Install Linux** on a server machine. This server will act as the domain controller.
2. **Install and configure Samba** to act as an Active Directory compatible domain controller.
    - Configure `smb.conf` to include the necessary settings for a domain controller.
    - Initialize the domain using `samba-tool domain provision` command. Use the naming convention for the domain name: `[student's surname].[first two characters of first name]`. For example, if your name is John Smith, the domain would be `smith.jo`.
    - Set up Kerberos and DNS within the Samba setup for authenticating and resolving domain names.
3. **Set up DHCP** (if using) to assign IP addresses within the network that include settings for DNS that point to your new domain controller.

Part 2: Configuring the Client Machine

1. **Install a Linux or Windows operating system** on at least one client machine.
2. **Join the client machine to the domain**:
    - For Linux clients, use `sssd` and `realmd` to join the domain.
    - For Windows clients, join the domain through System Properties.
3. **Test authentication** using user accounts created in the Active Directory.

Part 3: Installing and Configuring Zabbix

1. **Install Zabbix Server** on the domain controller server.
2. **Configure Zabbix** to monitor both the domain controller and the client machine. Include checks for:
    - System health (CPU, disk, memory usage)
    - Network connectivity
    - Authentication services functionality
3. **Create a comprehensive dashboard** in Zabbix that displays all critical metrics and system statuses.

Deliverables:

1. **Documentation**:
    - Installation and configuration steps for the domain controller, client machine, and Zabbix.
    - Screenshots of each step, showing successful setup and configuration.
    - A short description of each configuration file altered, with an explanation of the settings chosen.
2. **Demonstration and Viva**:
    - Prepare for a live demonstration of logging into the client machine using an Active Directory account and navigating the Zabbix dashboard to show system statuses.
    - Be ready to answer technical questions and justify your setup choices during the viva.

Assessment Criteria:

- **Functionality**: The domain controller must be able to manage user authentication, and the client must successfully join and authenticate through the domain.
- **Monitoring Setup**: Zabbix should be properly monitoring and alerting based on predefined conditions.
- **Documentation and Demonstration**: Clarity, completeness, and understanding demonstrated in both written documentation and live demonstration.

Assignment Information

***This is an individual Assignment**

- You need to compile a detailed report on the steps concepts involved in the process including troubleshooting or debugging mechanisms included. Make sure that you include screenshots of all the steps or configuration involved.
- Use the "Cover page" uploaded to the CoursWeb as the first page and change your details in correct placeholders before uploading your report to the link provided.
- In your demo setup, it should at least contain 1 server and 1 or 2 clients. Preferred to use virtual machines (VMware/Oracle VB) to install your servers and client machines.
- Your installation and configuration can be done at your home.
- You can follow any material to install and configure.
- You have to bring all your virtual machines to the demonstration, and you have to setup those machines in your allocated lab session before the demonstration.
- All scenarios and configuration flows will be questioning during the time of demonstration.
- Refer to the viva schedule and All should be stick to the time allocated to you. You are free to perform any mutual exchanges any other change of time is not accommodated.
- A viva session will be carried out to evaluate the configurations that have being done and those who are ABSENT from viva session will not receive any marks for the assignment.

Important:

You should aware regarding the important theory concepts.

You should remember the important configuration directives that you have used.

Deadline for Report Submission: 2nd May 2024

Viva Schedule : will be updated accoordingly

Marks allocation for the Assignment

Linux Server Setup and Configuration	10
Active Directory Services Setup	20
Client Machine Configuration	10
Zabbix Monitoring Implementation	30
Documentation	15
Demonstration and Viva	15
Total	100

***Important - Plagiarism is strictly prohibited. Plagiarized submissions will get zero marks for the assignment. No late submissions are accepted.**