



Lesson Plans

Planning, Implementing, and Maintaining a Microsoft Windows Server 2003 Active Directory Infrastructure

(Exam 70-294)

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Module 1

Module 1 provides an introduction to Active Directory. Students receive an overview of Active Directory topology and components, including forests, trees, domains, containers, and objects.

Module 2

Module 2 teaches students how to install Active Directory. The module also covers troubleshooting tools and techniques.

Module 3

Module 3 covers the methods for securing Active Directory. Topics include security principals, group types, group strategies, permissions, and delegation.

Module 4

Module 4 covers the Active Directory management tasks. Students learn design principles as well as management tools and procedures for establishing Active Directory.

Module 5

Module 5 covers Group Policy. Many students find Group Policy a difficult subject to master. You may want to spend additional time on the sections in this module.

Module 6

Module 6 covers Active Directory management across multiple sites. Student learn about replication, site links, site link costs, universal membership caching, and the different types of services that Active Directory uses.

Section 1-1: Introduction to Active Directory

Preparation

This section introduces the components of Active Directory. The students should be familiar with many of the terms.

Windows Server 2003 Active Directory Infrastructure Objectives

101. Plan a strategy for placing global catalog servers.

103. Implement an Active Directory directory service forest and domain structure.

Lecture Focus Questions:

- What was the first directory service?
- What is a directory information tree?
- How does Active Directory use DNS?
- What is the purpose of a global catalog server?
- Is a global catalog server useful in a single domain environment?
- What are three examples of a Microsoft Management Console provided with Windows Server 2003?

Time

About 1 hour

Section 2-1: Installing Active Directory

Preparation

You should be familiar with Active Director installation. If possible, perform an installation operation for the students to observe.

Windows Server 2003 Active Directory Infrastructure Objectives

103. Implement an Active Directory directory service forest and domain structure.

- Create the forest root domain.
- Create a child domain.
- Install and configure an Active Directory domain controller.

Lecture Focus Questions:

- What does DCPromo do?
- What are the domain options you'll be offered during installation?
- What domain configuration information will you need to provide during installation?

Time

About 1 hour

Lab/Activity

- Create a forest root
- Create a new tree
- Create a new domain
- Install a domain controller

Section 2-2: Advanced Installation

Preparation

If possible, create a domain on which you can perform management operations, like renaming and removing Active Directory.

Windows Server 2003 Active Directory Infrastructure Objectives

103. Implement an Active Directory directory service forest and domain structure.

- Create the forest root domain.
- Create a child domain.
- Create and configure Application Data Partitions.
- Install and configure an Active Directory domain controller.

Lecture Focus Questions:

- What are two advanced methods of installing active directory?
- What commands must you run before installing the first Windows Server 2003 server into a Windows 2000 tree?
- What are the ramifications of renaming a Domain?
- Which command to you use to remove a domain controller from Active Directory?

Time

About 1 hour

Section 2-3: Verifying Installation

Preparation

Be familiar with the Active Directory installation so that you can show students the settings they should check when troubleshooting problems. Demonstrate the use of the troubleshooting tools.

Windows Server 2003 Active Directory Infrastructure Objectives

103. Implement an Active Directory directory service forest and domain structure.

Lecture Focus Questions:

- How can you verify that Active Directory is installed?
- What settings should you check as you begin to troubleshoot Active Directory?
- How can you use each of the available tools to troubleshoot Active Directory?

Time

About 1 hour

Section 2-4: Backup and Restore

Preparation

Know the difference between authoritative and nonauthoritative restores. Prepare examples of each for use during lecture.

Windows Server 2003 Active Directory Infrastructure Objectives

204. Restore Active Directory directory services.

- Perform an authoritative restore operation.
- Perform a nonauthoritative restore operation.

Lecture Focus Questions:

- What limitations make System State backups different from regular data backups?
- What happens during a nonauthoritative restore?
- What happens during an authoritative restore?
- What is the difference between the two restore types?
- What are the steps for an authoritative restore?
- What are the steps for a nonauthoritative restore?
- How can you ensure data integrity after doing a restore?

Time

About 1 hour

Lab/Activity

- Backup Active Directory
- Perform a nonauthoritative restore
- Perform an authoritative restore

Section 3-1: Managing Groups

Preparation

Divide the students into groups. Create a domain, domain local, and universal group. Explore the differences among them with the students. Discuss the differences between builtin and custom groups. Explain when to use custom groups. Prepare examples to show the differences among GUID, SID, and RID.

Windows Server 2003 Active Directory Infrastructure Objectives

103. Implement an Active Directory directory service forest and domain structure.
301. Plan a security group strategy.

Lecture Focus Questions:

- What are two security principals?
- What is a DACL?
- What is inheritance?
- What are the types of Active Directory groups?
- Why do you create groups?

Time

About 1 hour

Lab/Activity

- Create a domain group
- Create a domain local group
- Create a universal group

Section 3-2: Group Security Planning

Preparation

Prepare examples to illustrate each of the group strategies. Understand nesting and inheritance. Introduce permissions and the idea of inheritance.

Windows Server 2003 Active Directory Infrastructure Objectives

105. Plan an administrative delegation strategy.

- Plan an organizational unit (OU) structure based on delegation requirements.
- Plan a security group hierarchy based on delegation requirements.

301. Plan a security group strategy.

Lecture Focus Questions:

- What is group nesting?
- When is a Universal group available?
- Which type of group has users added to it?
- How does a Universal group differ from a Domain Local group in its use and membership?

Time

About 1 hour

Lab/Activity

- Implement group strategy
- Assign Active Directory permissions

Section 3-3: Delegating Authority

Preparation

Organize the students into groups of administrators and users. Give permissions to the administrators groups. Let the students explore the permissions. (Do not perform this activity on a live network.)

Windows Server 2003 Active Directory Infrastructure Objectives

105. Plan an administrative delegation strategy.

- Plan an organizational unit (OU) structure based on delegation requirements.
- Plan a security group hierarchy based on delegation requirements.

303. Plan an OU structure.

- Analyze the administrative requirements for an OU.

Lecture Focus Questions:

- What are the two types of administration?
- Why would you want to delegate administration?
- What are two ways of delegating administration?

Time

About 1 hour

Lab/Activity

- Delegate control

Section 4-1: Planning the Structure

Preparation

Design some scenarios that allow the students to consider different design considerations.

Windows Server 2003 Active Directory Infrastructure Objectives

303. Plan an OU structure.

- Analyze the administrative requirements for an OU.
- Analyze the Group Policy requirements for an OU structure.

Lecture Focus Questions:

- What is a forest?
- Why would you need more than one forest?
- What is a domain?
- Why would you need more than one domain?
- What is the primary reason for creating Organizational Units?

Time

About 1 hour

Lab/Activity

- Plan an Active Directory structure

Section 4-2: Trust Relationships

Preparation

Draw some trust relationships. Help the students analyze site link costs.

Windows Server 2003 Active Directory Infrastructure Objectives

103. Implement an Active Directory directory service forest and domain structure.

- Establish trust relationships. Types of trust relationships might include external trusts, shortcut trusts, and cross-forest trusts.

201. Manage an Active Directory forest and domain structure.

- Manage trust relationships.

Lecture Focus Questions:

- What is a trust?
- What is a transitive trust?
- When would you install a non-transitive trust?
- If you create two domains, do you have to create a trust manually?
- Why would you use a one-way trust?

Time

About 1 hour

Lab/Activity

- Create an external trust
- Create a shortcut trust
- Create a forest root trust

Section 4-3: Functional Levels

Preparation

Create a chart of the functional levels, their requirements, and their characteristics to use for class discussion.

Windows Server 2003 Active Directory Infrastructure Objectives

103. Implement an Active Directory directory service forest and domain structure.

- Set an Active Directory forest and domain functional level based on requirements.

Lecture Focus Questions:

- What are the functional levels of a domain?
- What functions do each of the different levels have?
- When would you raise the domain functional level?
- What are the requirements to raise functional levels?
- What are the functional levels of a forest?
- What determines the forest functional level?

Time

About 1 hour

Lab/Activity

- Raise the domain functional level
- Raise the forest functional level
- Raise the domain and/or forest level

Section 4-4: Operation Masters

Preparation

Understand each of the operation master roles. Prepare a chart that helps the students understand the tasks each server performs.

Windows Server 2003 Active Directory Infrastructure Objectives

102. Plan flexible operations master role placement.

- Plan for business continuity of operations master roles.
- Identify operations master role dependencies.

205. Troubleshoot Active Directory.

- Diagnose and resolve issues related to operations master role failure.

Lecture Focus Questions:

- What is the purpose of an operation master role server?
- What is a schema master?
- What is a domain naming master?
- What is the RID master role?
- What is the function of a PDC emulator?
- What does the infrastructure master role do?
- What is the difference between transferring a role and seizing a role?

Time

About 1 hour

Lab/Activity

- Transfer an operation master
- Transfer the naming master
- Identify operation master placement

Section 4-5: Schema

Preparation

Make a list of Active Directory objects and their attributes that make up the schema. Discuss the function of each object and its attributes.

Windows Server 2003 Active Directory Infrastructure Objectives

201. Manage an Active Directory forest and domain structure.

- Manage schema modifications.

Lecture Focus Questions:

- What is the schema?
- What is metadata?
- Why does Active Directory store the object definitions as objects?
- What does it mean to extend the schema?

Time

About 1 hour

Section 4-6: Active Directory Objects

Preparation

Create several OUs to work with during the course of the lecture. Show the students how to migrate an OU. Show its attributes. Create objects inside the OU.

Windows Server 2003 Active Directory Infrastructure Objectives

303. Plan an OU structure.

304. Implement an OU structure.

Lecture Focus Questions:

- What does the ADMT do?
- Why is it better to rename or move an object than delete and recreate it?
- What tools can you use to create an OU in Active Directory?

Time

About 1 hour

Lab/Activity

- Create OUs

Section 5-1: Creating and Linking GPOs

Preparation

Group policy is a concept the students will find difficult. For this module, you need to prepare plenty of examples. You also need an in-depth understanding of Group Policy.

Windows Server 2003 Active Directory Infrastructure Objectives

501. Troubleshoot issues related to Group Policy application deployment. Tools might include RSoP and the gpresult command.

Lecture Focus Questions:

- What is a group policy?
- Why would you institute a group policy?
- What Active Directory objects can you link to a group policy?

Time

About 1 hour

Lab/Activity

- Link an existing GPO
- Create and link a GPO

Section 5-2: Editing GPOs

Preparation

Set some group policies to review with your students. If possible, implement them on a limited scale to examine their effects.

Windows Server 2003 Active Directory Infrastructure Objectives

402. Configure the user environment by using Group Policy.

- Distribute software by using Group Policy.
- Configure user security settings by using Group Policy.

403. Deploy a computer environment by using Group Policy.

- Distribute software by using Group Policy.
- Configure computer security settings by using Group Policy.

Lecture Focus Questions:

- What is the purpose of an Administrative Template?
- What does the Software Settings option allow you to do?
- What operations do you use the Windows Settings for?
- What does Security Settings allow an administrator to do?

Time

About 1 hour

Lab/Activity

- Configure GPO settings

Section 5-3: Group Policy Inheritance

Preparation

If possible, set some policies on a computer or group of computers. Perform some of the management tasks like blocking inheritance and setting the No Override value. Examine and discuss the effects of the changes with the students.

Windows Server 2003 Active Directory Infrastructure Objectives

402. Configure the user environment by using Group Policy.

- Configure user security settings by using Group Policy.

403. Deploy a computer environment by using Group Policy.

- Configure computer security settings by using Group Policy.

503. Troubleshoot the application of Group Policy security settings. Tools might include RSoP and the gpresult command.

Lecture Focus Questions:

- In what order are group policies applied?
- If there is more than one group policy linked to a domain, what controls the order of application?
- How does group policy inheritance affect computer or user settings?
- What is the difference between No Override and Block Inheritance?
- How can you apply group policy settings to specific users or groups?

Time

About 1 hour

Lab/Activity

- Change the GPO order
- Disable a GPO
- Remove a GPO link
- Block inheritance
- Set No Override

Section 5-4: Planning GPOs

Preparation

If possible, set some policies against which you can run the RSoP wizard in both its modes. Discuss the results as part of the lecture.

Windows Server 2003 Active Directory Infrastructure Objectives

401. Plan Group Policy strategy.

- Plan a Group Policy strategy by using Resultant Set of Policy (RSoP) Planning mode.
- Plan a strategy for configuring the user environment by using Group Policy.
- Plan a strategy for configuring the computer environment by using Group Policy.

Lecture Focus Questions:

- What are two reasons to use RSoP?
- What tools or utilities are available for managing group policies?
- What are best practices for using group policy?

Time

About 1 hour

Lab/Activity

- Implement GPOs
- Use RSoP

Section 5-5: Delegating Administration

Preparation

Prepare different scenarios that would require different delegation strategies. Discuss the pros and cons of each delegation strategy.

Windows Server 2003 Active Directory Infrastructure Objectives

105. Plan an administrative delegation strategy.

- Plan an organizational unit (OU) structure based on delegation requirements.
- Plan a security group hierarchy based on delegation requirements.

303. Plan an OU structure.

- Analyze the Group Policy requirements for an OU structure.

304. Implement an OU structure.

- Delegate permissions for an OU to a user or to a security group.

Lecture Focus Questions:

- What are common group policy administration tasks?
- What are the differences between centralized and decentralized administration control?
- What is tasked-based administration?

Time

About 1 hour

Lab/Activity

- Delegate GPO control

Section 5-6: Software Distribution

Preparation

Discuss the types of software that administrators most commonly need to apply across networks. Be familiar with the recommended best practices and discuss them with the students.

Windows Server 2003 Active Directory Infrastructure Objectives

402. Configure the user environment by using Group Policy.

- Distribute software by using Group Policy.

403. Deploy a computer environment by using Group Policy.

- Distribute software by using Group Policy.

501. Troubleshoot issues related to Group Policy application deployment. Tools might include RSoP and the gpresult command.

502. Maintain installed software by using Group Policy.

- Distribute updates to software distributed by Group Policy.
- Configure automatic updates for network clients by using Group Policy.

Lecture Focus Questions:

- What type of drive mapping would you use to point to a software distribution point?
- Can you use group policies to remove software?
- Who determines the order software packages are installed?
- What is a file with the extension MSI?
- What is a repackaged application?

Time

About 1 hour

Lab/Activity

- Publish software
- Assign software
- Design software distribution

Section 5-7: Administrative Templates

Preparation

Familiarize yourself with the most common Administrative Template settings. Configure some settings to discuss with the students.

Windows Server 2003 Active Directory Infrastructure Objectives

401. Plan Group Policy strategy.

- Plan a strategy for configuring the user environment by using Group Policy.
- Plan a strategy for configuring the computer environment by using Group Policy.

402. Configure the user environment by using Group Policy.

403. Deploy a computer environment by using Group Policy.

Lecture Focus Questions:

- What does an administrative template contain?
- What is the purpose of an .ADM file?
- Where do administrative templates come from?

Time

About 1 hour

Lab/Activity

- Configure Administrative Templates

Section 5-8: Folder Redirection

Preparation

Redirect the My Documents folder for your students or on some test machines. Discuss the effects of folder redirection on clients.

Windows Server 2003 Active Directory Infrastructure Objectives

402. Configure the user environment by using Group Policy.

- Redirect folders by using Group Policy.

Lecture Focus Questions:

- What is the impact of a roaming user profile and folder redirection?
- How do you implement folder redirection?
- What types of folders are redirected?
- How can you test folder redirection to make sure it is working properly?

Time

About 1 hour

Lab/Activity

- Redirect folders

Section 5-9: Managing Logon

Preparation

Familiarize yourself with the different account settings. Discuss how each of the settings ties into the design of password and logon policies. Discuss the pros and cons of configuring each setting.

Windows Server 2003 Active Directory Infrastructure Objectives

302. Plan a user authentication strategy.

- Create a password policy for domain users.

Lecture Focus Questions:

- What are the settings administrators can use to enforce password policies?
- What are the characteristics of complex passwords?
- What is the purpose of an account lockout policy?
- What does each of the account lockout settings do?

Time

About 1 hour

Lab/Activity

- Configure account settings
- Configure password settings

Section 5-10: Managing Certificate Enrollment

Preparation

This is another difficult concept that the students may find troublesome. Familiarize yourself with the principles of PKI and certificates to clarify students' confusions.

Windows Server 2003 Active Directory Infrastructure Objectives

302. Plan a user authentication strategy.

- Create a password policy for domain users.

402. Configure the user environment by using Group Policy.

- Automatically enroll user certificates by using Group Policy.

403. Deploy a computer environment by using Group Policy.

- Automatically enroll computer certificates by using Group Policy.

Lecture Focus Questions:

- What comprises the Public Key Infrastructure?
- What is a digital certificate?
- What is a Certificate Authority responsible for doing?
- How do public and private keys work?
- What makes smart cards an effective means of authentication?
- What requirements must a network meet before implementing smart cards?
- What are the costs involved in implementing a smart card solution?
- What does a public key policy allow you to control?
- What is a trusted root CA?
- What does a CTL do?
- What are the uses of auto enrollment?

Time

About 1 hour

Lab/Activity

- Configure automatic certificate enrollment

Section 6-1: Managing Sites

Preparation

Prepare examples of sites and subnets. Show students the different types of configurations that can be implemented. Prepare trust examples for discussion. Understand the importance of trusts to be able to explain it to the students.

Windows Server 2003 Active Directory Infrastructure Objectives

104. Implement an Active Directory site topology. (6.2)

- Configure site links.

202. Manage an Active Directory site. (6.2, 6.1)

- Configure replication schedules.
- Configure site link costs.

Lecture Focus Questions:

- What is a site?
- What is a site used for?
- What is the purpose of a site link?
- What does a site cost do?
- What are advantages of having sites with transitive trusts?
- How are replication links chosen?

Time

About 1 hour

Lab/Activity

- Rename the default site
- Create a site and subnet

Section 6-2: Customizing Replication

Preparation

Familiarize yourself with the concept of replication. Understand the components involved in replication like intra- and intersite replication, bridgehead servers, site links.

Windows Server 2003 Active Directory Infrastructure Objectives

104. Implement an Active Directory site topology.

- Configure site links.
- Configure preferred bridgehead servers.

202. Manage an Active Directory site.

- Configure replication schedules.
- Configure site link costs.

205. Troubleshoot Active Directory.

- Diagnose and resolve issues related to Active Directory replication.

Lecture Focus Questions:

- What are the differences between intrasite and intersite replication?
- What are the characteristics of intra- and intersite replication?
- What is a site schedule?
- What are two intersite transport protocols?
- What is the purpose of a KCC?
- What is the function of the bridgehead server?
- How is a preferred bridgehead server determined?

Time

About 1 hour

Lab/Activity

- Modify site links
- Configure intersite replication
- Configure intrasite replication
- Force replication
- Designate a bridgehead server

Section 6-3: Troubleshooting Replication

Preparation

Be familiar with how each of the troubleshooting tools works. If possible, generate data to use as examples during your lecture.

Windows Server 2003 Active Directory Infrastructure Objectives

203. Monitor Active Directory replication failures. Tools might include Replication Monitor, Event Viewer, and support tools.

- Monitor Active Directory replication.
- Monitor File Replication service (FRS) replication.

Lecture Focus Questions:

- How does Repelmon help with troubleshooting?
- What does Repadmin do?
- What do you use Dsastat for?
- What is an update sequence number (USN)?
- What is the Up-to-dateness vector?
- What is the function of the attribute version number?
- What is a tombstoned object?
- What happens during garbage collection?
- What can you find in Lost and Found?

Time

About 1 hour

Lab/Activity

- Troubleshoot replication

Section 6-4: Global Catalogs

Preparation

Understand the function of the global catalog server. You should also be familiar with universal group membership and the advantages and disadvantages of using universal groups.

Windows Server 2003 Active Directory Infrastructure Objectives

101. Plan a strategy for placing global catalog servers.

- Evaluate network traffic considerations when placing global catalog servers.
- Evaluate the need to enable universal group caching.

205. Troubleshoot Active Directory.

- Diagnose and resolve issues related to Active Directory replication.

Lecture Focus Questions:

- How does a Global Catalog query work?
- What are the advantages of having more than one Global Catalog server?
- What kind of data does a Global Catalog server store?
- Why doesn't a single domain network need a Global Catalog server?
- What is the function of Universal Group Membership caching?
- What considerations should you make before implementing a Global Catalog server?

Time

About 1 hour

Lab/Activity

- Designate a global catalog server
- Enable universal group membership caching

Section 6-5: Site License Servers

Preparation

Be familiar with the importance of licensing. Discuss licensing issues with the students, including the risks of running unlicensed products on a network.

Windows Server 2003 Active Directory Infrastructure Objectives

202. Manage an Active Directory site.

Lecture Focus Questions:

- What does a site license server do?
- How does the license monitoring process work?

Time

About 1 hour

Lab/Activity

- Select the site licensing server

Section 6-6: Application Directory Partitions

Preparation

There are several different types of partitions. Know and understand each of them. Be familiar with the differences between application directory partitions and other partition types.

Windows Server 2003 Active Directory Infrastructure Objectives

202. Manage an Active Directory site.

- Configure replication schedules.

Lecture Focus Questions:

- What factors make application directory partitions ideal for storing dynamic data?
- What types of objects can an application directory partitions store?
- What limitations do objects in application directory partitions operate under?

Time

About 1 hour