Module 1

Installing and configuring domain controllers

Module Overview

- Overview of AD DS
- Overview of AD DS domain controllers
- Deploying a domain controller

Lesson 1: Overview of AD DS

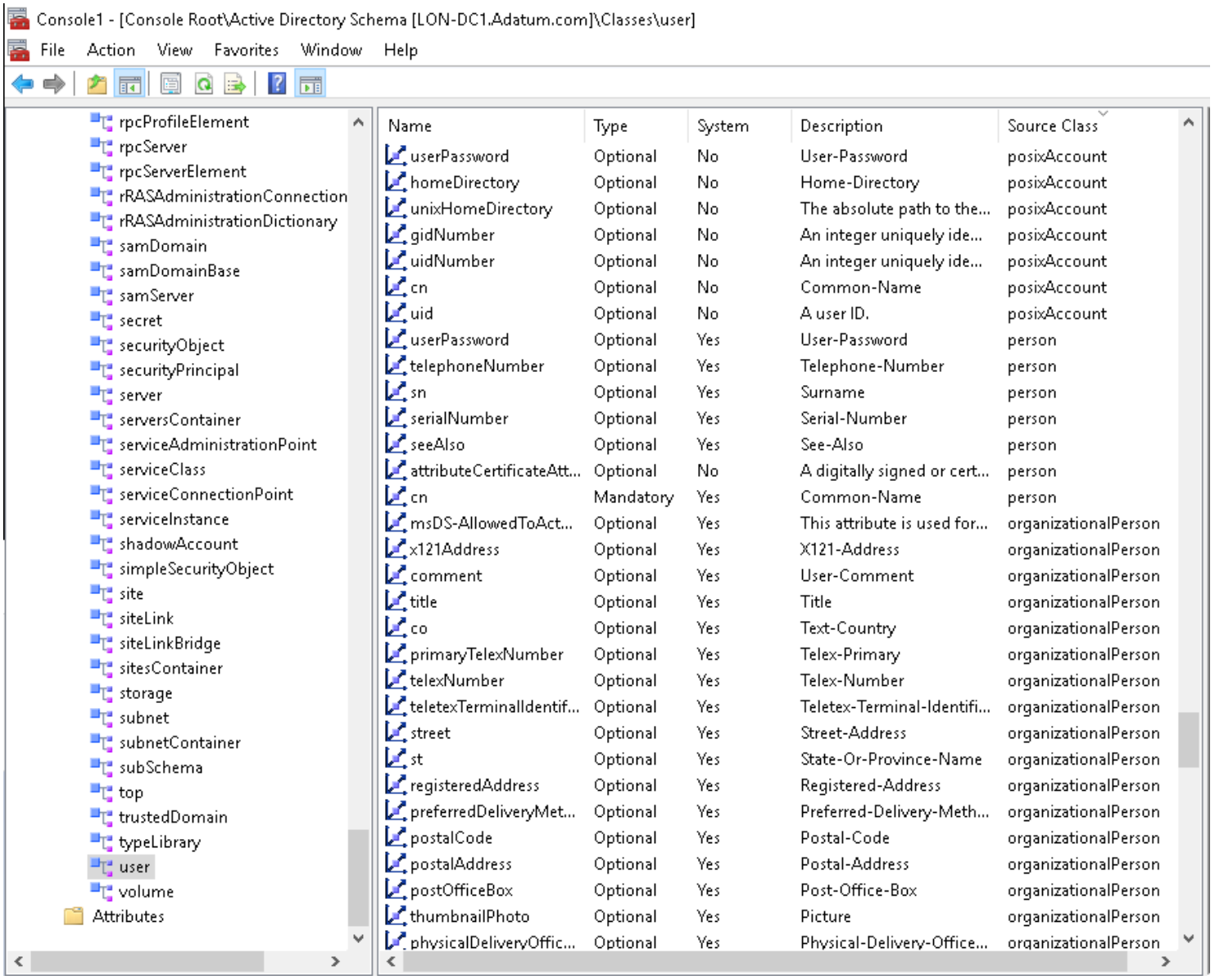
- AD DS components
- What is the AD DS schema?
- What is an AD DS forest?
- What is an AD DS domain?
- What are OUs?
- What is new in AD DS in Windows Server 2016?
- What is Azure AD?
- Overview of AD DS administration tools
- Demonstration: Using the Active Directory Administrative Center to administer and manage AD DS

AD DS components

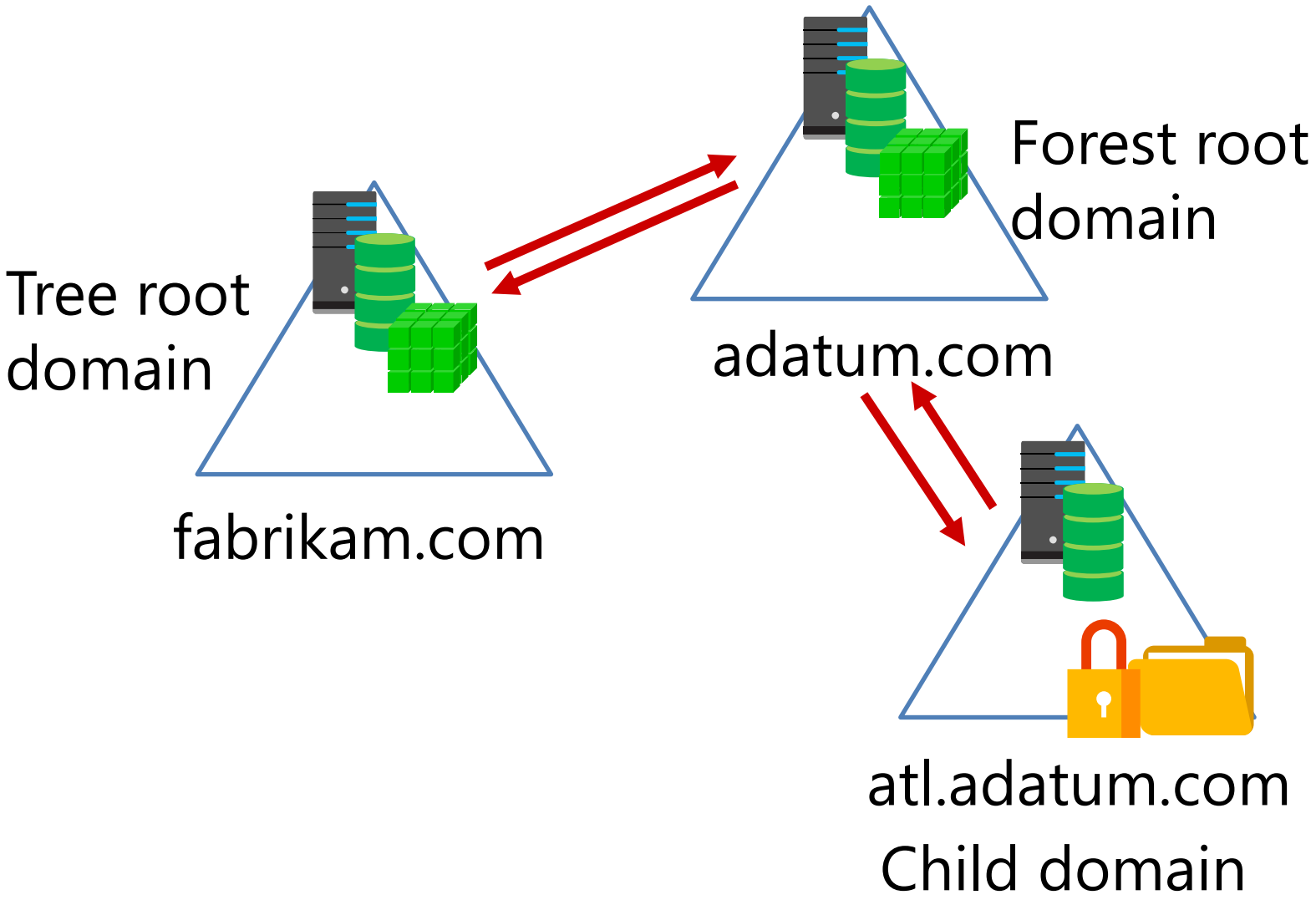
AD DS is composed of both logical and physical components

Logical components	Physical components
• Partitions • Schema • Domains • Domain trees • Forests • Sites • OUs • Containers	• Domain controllers • Data stores • Global catalog servers • RODCs

What is the AD DS schema?

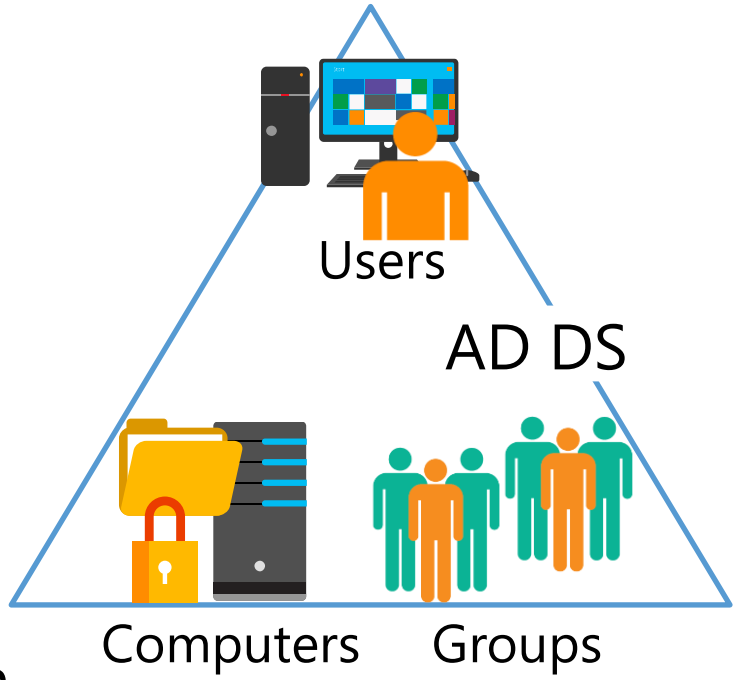


What is an AD DS forest?



What is an AD DS domain?

- AD DS requires one or more domain controllers
- All domain controllers hold a copy of the domain database, which is continually synchronized
- The domain is the context within which user accounts, computer accounts, and groups are created
- The domain is a replication boundary
- The domain is an administrative center for configuring and managing objects
- Any domain controller can authenticate any sign-in anywhere in the domain
- The domain provides authorization



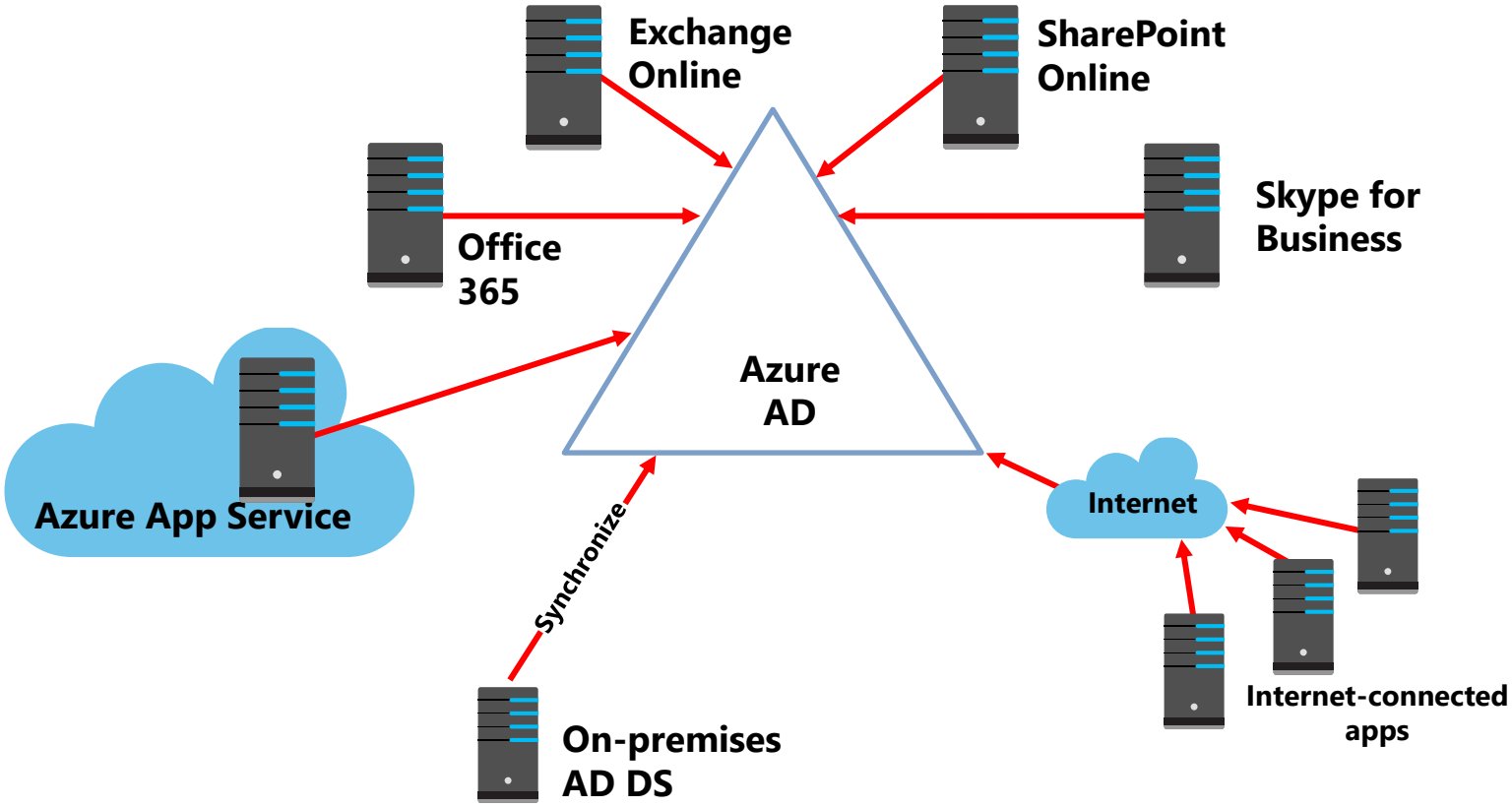
What are OUs?

- Use containers to group objects within a domain:
  - You cannot apply GPOs to containers
  - Containers are used for system objects and as the default location for new objects
- Create OUs to:
  - Configure objects by assigning GPOs to them
  - Delegate administrative permissions

What is new in AD DS in Windows Server 2016?

- PAM
- Azure AD Join
- Microsoft Passport

What is Azure AD?



Overview of AD DS administration tools

You typically perform AD DS management by using the following tools:

- Active Directory Administrative Center
- Active Directory Users and Computers
- Active Directory Sites and Services
- Active Directory Domains and Trusts
- Active Directory Schema snap-in
- Active Directory module for Windows PowerShell

Demonstration: Using the Active Directory Administrative Center to administer and manage AD DS

In this demonstration, you will see how to:

- Navigate within the Active Directory Administrative Center
- Perform an administrative task within the Active Directory Administrative Center
- Create objects
- View all object attributes
- Use the Windows PowerShell History viewer in the Active Directory Administrative Center

Lesson 2: Overview of AD DS domain controllers

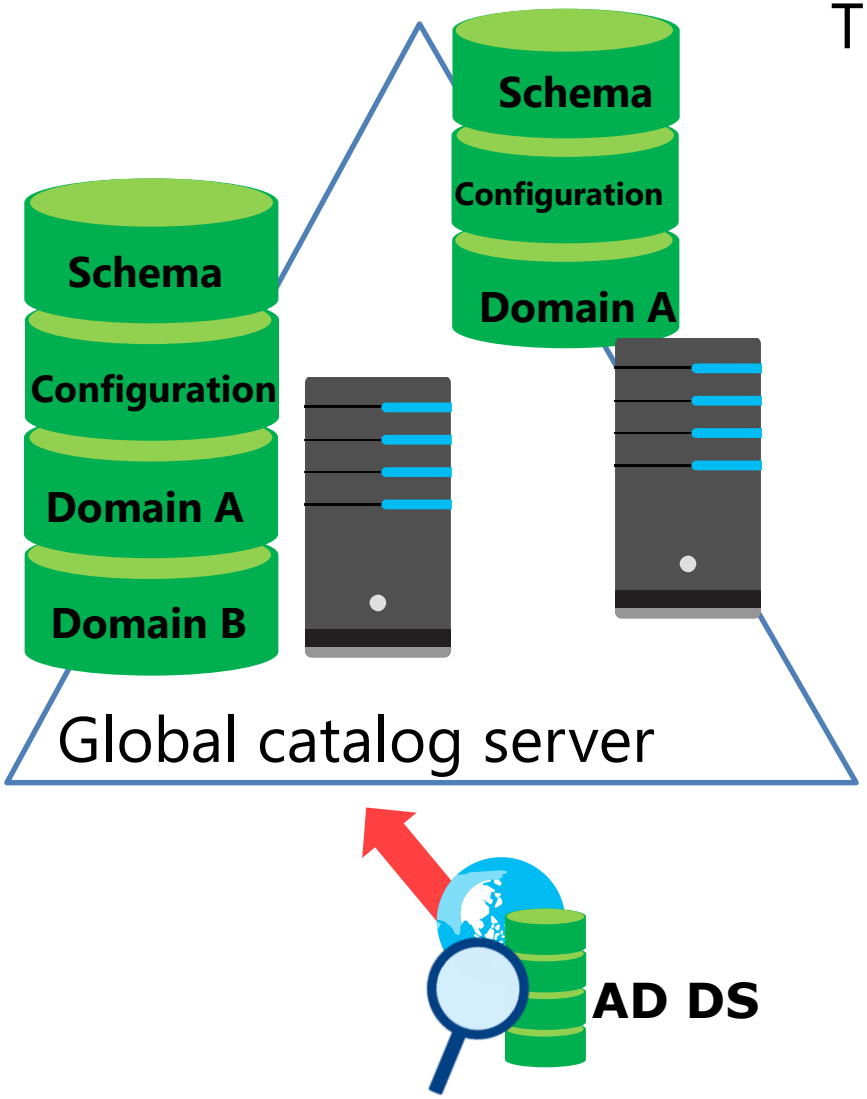
- What is a domain controller?
- What is a global catalog?
- Overview of domain controller SRV records
- Demonstration: Viewing the SRV records in DNS
- AD DS sign-in process
- What are operations masters?
- Transferring and seizing roles

What is a domain controller?

Domain controllers:

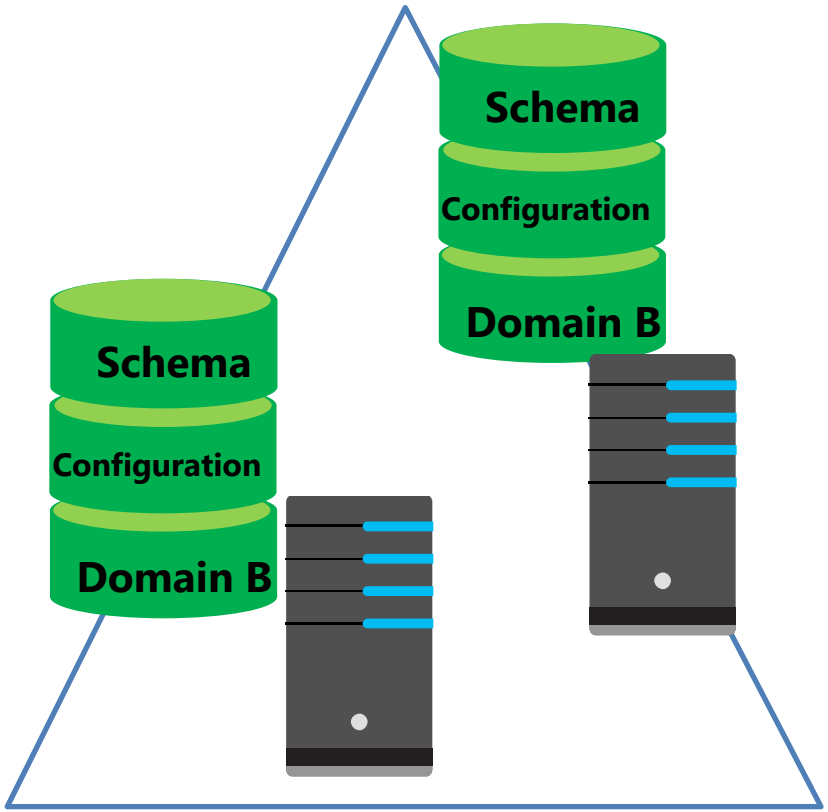
- Are servers that host the AD DS database (**Ntds.dit**) and **SYSVOL**
- Host the Kerberos authentication service and KDC services to perform authentication
- Have best practices for:
  - Availability:
    - Use at least two domain controllers in a domain
  - Security:
    - Use an RODC or BitLocker

What is a global catalog?



The global catalog:

- Hosts a partial attribute set for other domains in the forest
- Supports queries for objects throughout the forest



Overview of domain controller SRV records

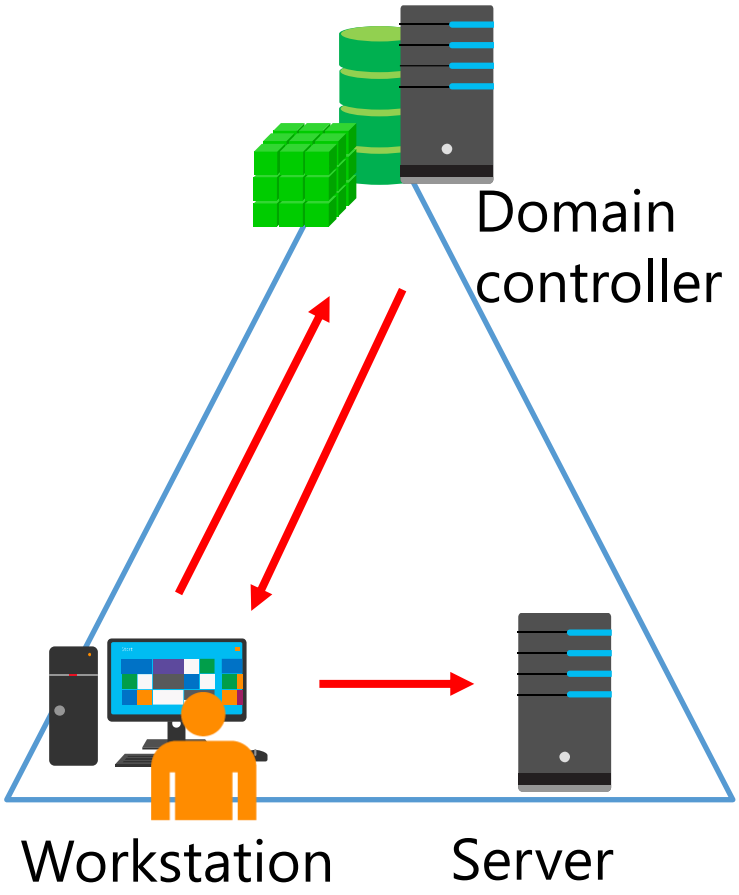
- Clients find domain controllers through DNS lookup
- Domain controllers dynamically register their addresses with DNS
- The results of DNS queries for domain controllers are returned in this order:
  1. A list of domain controllers in the same site as the client
  2. A list of domain controllers in the next closest site, if none are available in the same site
  3. A random list of domain controllers in other sites, if no domain controller is available in the next closest site

Demonstration: Viewing the SRV records in DNS

In this demonstration, you will see how to use DNS Manager to view SRV records

AD DS sign-in process

1. The user account is authenticated to the domain controller
2. The domain controller returns a TGT back to client
3. The client uses the TGT to apply for access to the workstation
4. The domain controller grants access to the workstation
5. The client uses the TGT to apply for access to the server
6. The domain controller returns access to the server



What are operations masters?

- In the multimaster replication model, some operations must be single master operations
- Many terms are used for single master operations in AD DS, including:
  - Operations master (or operations master role)
  - Single master role
  - Flexible single master operations (FSMO)

The five FSMOs	
Forest: • Domain naming master • Schema master	Domain: • RID master • Infrastructure master • PDC emulator master

Transferring and seizing roles

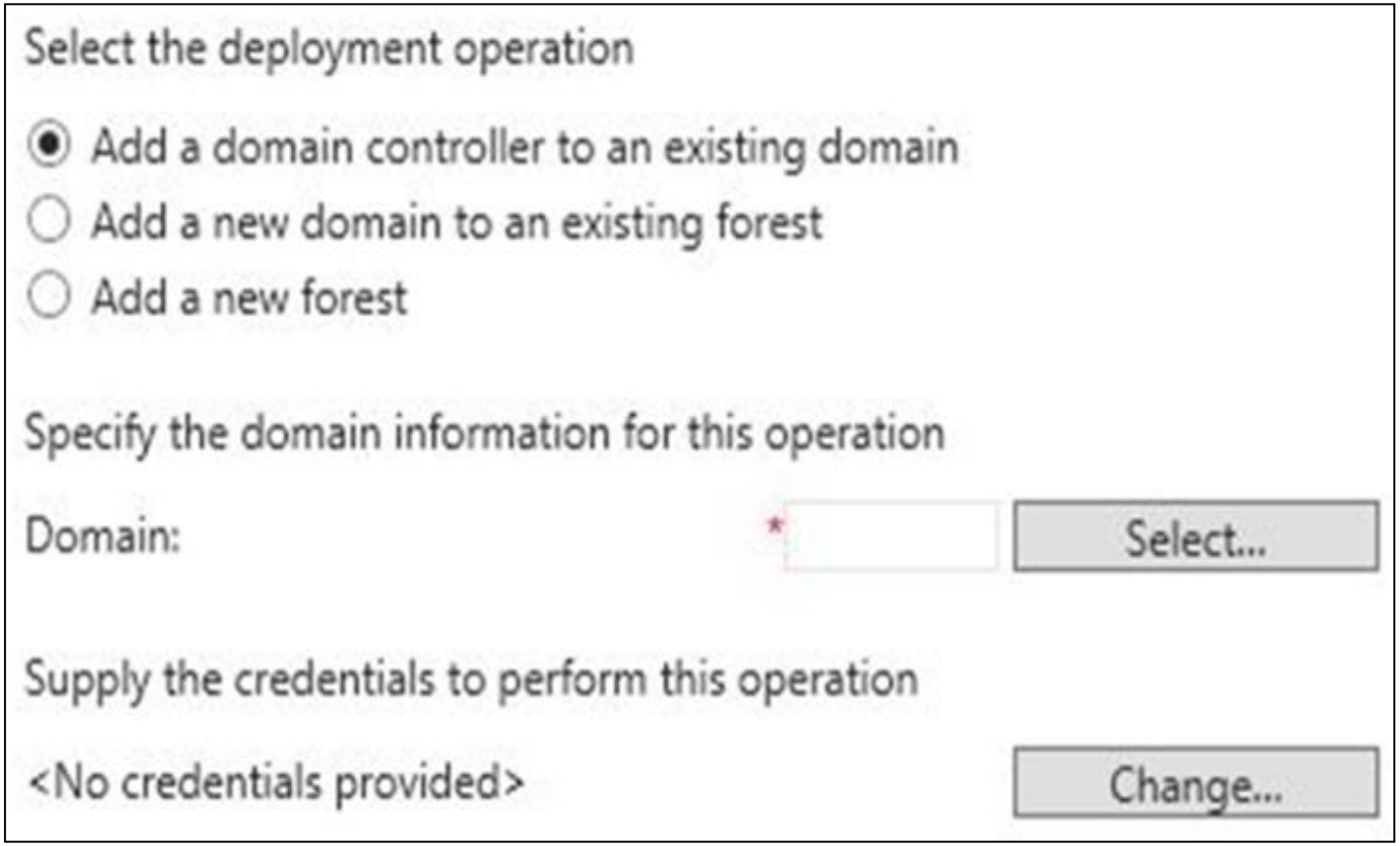
- Transferring is:
  - Planned
  - Done with the latest data
  - Done through snap-ins, Windows PowerShell, or ntdsutil.exe
- Seizing is:
  - Unplanned and a last resort
  - Done with incomplete or out-of-date data
  - Done through Windows PowerShell or ntdsutil.exe

Lesson 3: Deploying a domain controller

- Installing a domain controller from Server Manager
- Installing a domain controller on a Server Core installation of Windows Server 2016
- Upgrading a domain controller
- Installing a domain controller by installing from media
- Cloning domain controllers
- Demonstration: Cloning a domain controller
- Best practices for domain controller virtualization

Installing a domain controller from Server Manager

The **Deployment Configuration** section of the **Active Directory Domain Services Configuration Wizard**



Installing a domain controller on a Server Core installation of Windows Server 2016

- Using Server Manager:
  1. Install the AD DS role
  2. Run the **Active Directory Domain Services Configuration Wizard**
- Using Windows PowerShell:
  1. Install the files by running the command **Install-WindowsFeature AD-Domain-Services**
  2. Install the domain controller role by running the command **Install-ADDSDomainController**

Upgrading a domain controller

You have two options for upgrading AD DS to Windows Server 2016:

- Perform an in-place upgrade from Windows Server 2008 or later to Windows Server 2016:
  - Benefit: Except for the prerequisite checks, all the files and programs stay in place, and no additional work is required
  - Risk: It might leave obsolete files and dynamic-link libraries
- Introduce a new server running Windows Server 2016 into the domain, and then promote it to be a domain controller (this option is usually preferred):
  - Benefit: The new server has no obsolete files and settings
  - Risk: It might require additional work to migrate administrators' files and settings

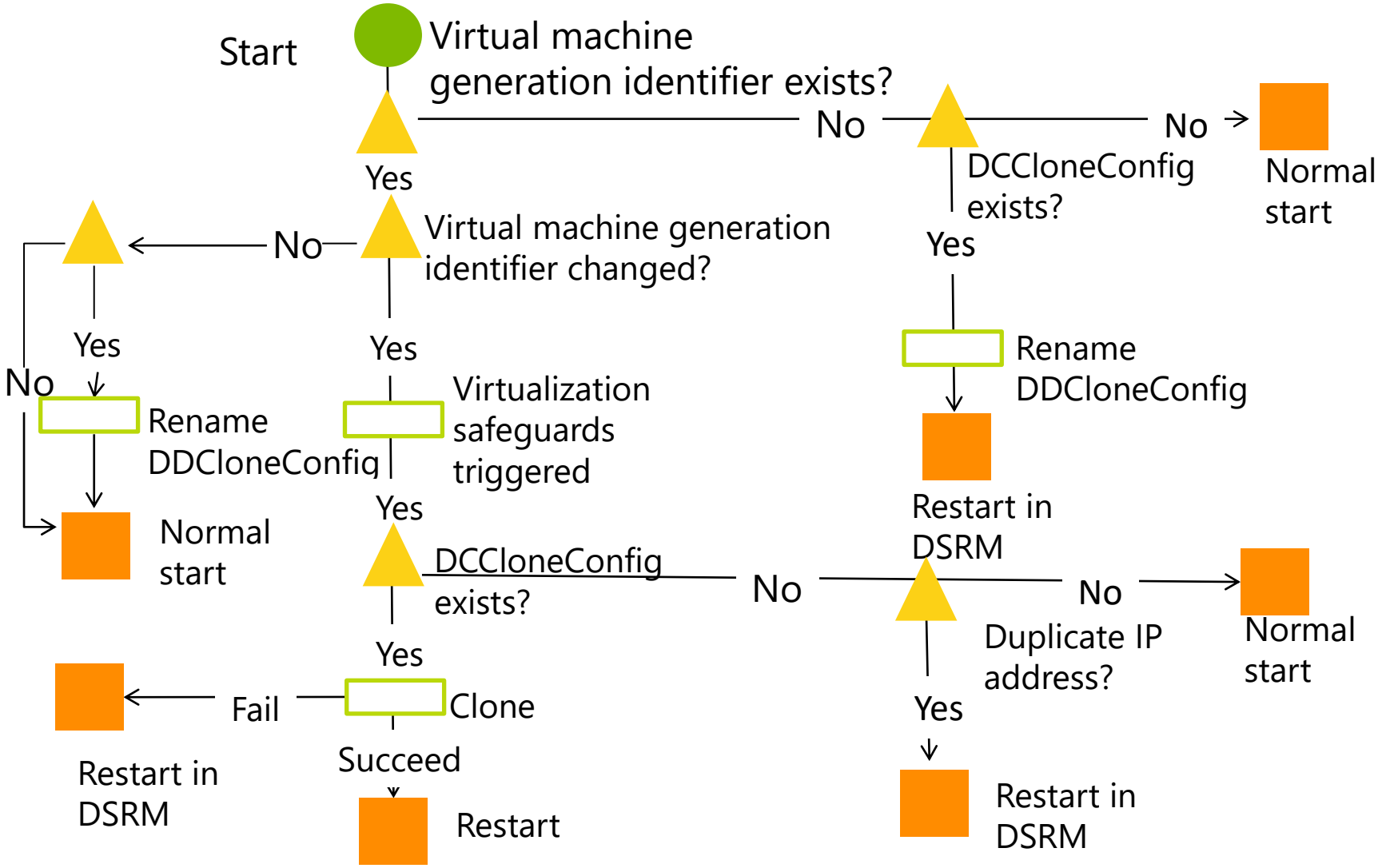
Installing a domain controller by installing from media

The **Install from media** section on the **Additional Options** page of the **Active Directory Domain Services Configuration Wizard**

Cloning domain controllers

- You might clone domain controllers for:
  - Rapid deployment
  - Private clouds
  - Recovery strategies
- To clone a source domain controller:
  - Add the domain controller to the **Cloneable Domain Controllers** group
  - Verify app and service compatibility
  - Create a **DCCloneConfig.xml** file
  - Export it once, and then create as many clones as needed
  - Start the clones

Cloning domain controllers



Demonstration: Cloning a domain controller

In this demonstration, you will see how to:

- Prepare a source domain controller for cloning
- Export the source virtual machine
- Create and start the cloned domain controller

Best practices for domain controller virtualization

- Avoid single points of failure
- Use the time services
- Use virtualization technology with the virtual machine generation identifier feature
- Use Windows Server 2012 or later as virtualization guests
- Avoid or disable checkpoints
- Strive to improve security
- Consider taking advantage of cloning in your deployment or recovery strategy
- Start a maximum number of 10 new clones at the same time
- Consider using virtualization technologies that allow virtual machine guests to move between sites
- Adjust your naming strategy to allow for domain controller clones

Lab: Deploying and administering AD DS

- Exercise 1: Deploying AD DS
- Exercise 2: Deploying domain controllers by performing domain controller cloning
- Exercise 3: Administering AD DS

Logon Information

Virtual machines:	**20742B-LON-DC1** **20742B-LON-SVR1**
User name:	**Adatum\Administrator**
Password:	**Pa55w.rd**

Estimated Time: 45 minutes

Lab Scenario

You are an IT administrator at A. Datum Corporation. The company is expanding its business and has several new locations. The AD DS administration team is currently evaluating the methods available in Windows Server 2016 for a rapid and remote domain controller deployment. Also, the team is looking for a way to automate certain AD DS administrative tasks. The team wants a fast and seamless deployment of new domain controllers for new locations, and it wants to promote servers to domain controllers from a central location.

Module Review and Takeaways

- Review Questions
- Common Issues and Troubleshooting Tips