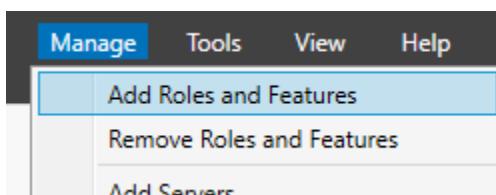




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In this lecture we are going to create a Domain Controller by installing the Active Directory Domain Services (AD DS) role. Remember that any server running the AD DS role is considered a domain controller. We are going to add this role to our server and create a new domain called “itflee.com”. This is the name of my website and if you would like you can create any domain name you want. You won’t break any “real” websites since there are no internet DNS servers pointing to the domain that we are about to create. Finally, once we add the AD DS role we will promote the server as a Domain Controller.

You should already know how to install a server role on the server you are currently logged in to but I am going to cover the steps again. Open Server Manager and select Manage > Add Roles and Features



On the Installation Type Screen leave the default option “Role-based or feature-based...” checkbox checked and click next.

Before You Begin
Installation Type
Server Selection
Server Roles

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

Role-based or feature-based installation
Configure a single server by adding roles, role services, and features.

On the Server Selection screen choose the server we built earlier called “ITFDC01” and click next.

Name	IP Address	Operating System
ITFDC01	10.0.2.15,192.1...	Microsoft Windows Server 2016 Datacenter Evaluation

In the server roles list choose the “Active Directory Domain Services” role **Active Directory Domain Services**. You will see a popup window stating you cannot install AD DS unless certain role services or features are also installed:

You cannot install Active Directory Domain Services unless the following role services or features are also installed.

- [Tools] Group Policy Management
- Remote Server Administration Tools
 - Role Administration Tools
 - AD DS and AD LDS Tools
 - Active Directory module for Windows PowerShell
 - AD DS Tools
 - [Tools] Active Directory Administrative Center
 - [Tools] AD DS Snap-Ins and Command-Line Tools



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Click the Add Features button and then click Next to proceed to the Features screen. We do not need any additional features as all the required features were already added. Again click Next. Now you will be brought to the AD DS screen. It tells us that we will also need install the DNS role if we do not already have it set up.

Add Roles and Features Wizard

Active Directory Domain Services

DESTINATION SERVER
ITFDC01

Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results

Active Directory Domain Services (AD DS) stores information about users, computers, and other devices on the network. AD DS helps administrators securely manage this information and facilitates resource sharing and collaboration between users.

Things to note:

- To help ensure that users can still log on to the network in the case of a server outage, install a minimum of two domain controllers for a domain.
- AD DS requires a DNS server to be installed on the network. If you do not have a DNS server installed, you will be prompted to install the DNS Server role on this machine.

Azure Active Directory, a separate online service, can provide simplified identity and access management, security reporting, single sign-on to cloud and on-premises web apps.
[Learn more about Azure Active Directory](#)
[Configure Office 365 with Azure Active Directory Connect](#)

< Previous Next > Install Cancel

Click Next and continue on to the Confirmation screen. Here we can see the roles and features we are about to install. Click Install and wait for the installation to finish. Once the installation is complete you will have post-deployment configuration steps to complete as well:



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The screenshot shows the Windows Server Add Roles and Features Wizard. On the left, there's a navigation pane with steps: 1. Start, 2. Add roles and features, and 3. Add other servers to manage. The main area displays a 'Post-deployment Configuration' step. It includes a warning icon and the text: 'Configuration required for Active Directory Domain Services at ITFDC01'. Below this is a link 'Promote this server to a domain controller'. Another section shows 'Feature installation' with a progress bar indicating success: 'Configuration required. Installation succeeded on ITFDC01.' At the bottom is a 'Add Roles and Features' button.

Click the notification flag next to manage and choose “Promote this server to a domain controller”. The AD DS configuration wizard will appear giving us three options:

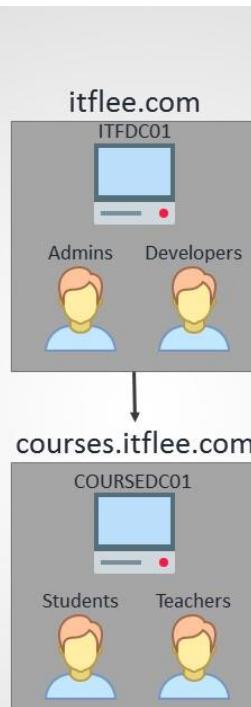
The screenshot shows the 'Deployment Configuration' step of the AD DS Configuration Wizard. On the left, a sidebar lists: Domain Controller Options, Additional Options, Paths, Review Options, Prerequisites Check, Installation, and Results. The main panel has two sections: 'Select the deployment operation' with three radio button options ('Add a domain controller to an existing domain' is selected), and 'Specify the domain information for this operation' with a 'Domain:' field containing 'itflee.com' and a 'Select...' button.

The first option, “Add a Domain Controller to an existing domain” is for adding additional domain controllers to a domain you have already created. This option is not suitable for us now because we have not created a domain yet.

The second option, “Add a new domain to an existing forest” is for adding child (also called sub) domains. Let me explain. We are going to create a domain called `itflee.com`. If that domain already existed we could create a sub (or child) domain called `courses.itflee.com`. In theory we could setup this sub domain called `courses.itflee.com` simply to separate our students and teachers from the administrators who reside in the domain `itflee.com`.



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You could configure this sub domain so that Admins from the **itflee.com** domain can reach into the **courses.itflee.com** domain, but students and teachers could not reach back to the resources in the **itflee.com** domain. Again this is not an appropriate option for us because the **itflee.com** domain does not yet exist.

The third option is to “Add a new forest”. This allows us to create and specify a new domain. Choose this option and specify a root domain name.

Add a new forest

Specify the domain information for this operation

Root domain name:

I am going to enter **itflee.com** and click next. It will take a second before the Domain Controller Options screen will appear to just be patient while it processes. The first two options Forest Functional Level and Domain Functional Level specify which operating system the DC will use. You need to specify the OS you are using (in this case it is Windows Server 2016).

There is a bug with the latest version of Server 2016 where the developers did not configure this screen to show the latest version as “Server 2016” but instead show it as the “Windows Server Technical Preview” so I have to choose this option.



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Select functional level of the new forest and root domain

Forest functional level:

Windows Server Technical Preview ▾

Domain functional level:

Windows Server Technical Preview ▾

Make sure the Domain name System (DNS) server checkbox is checked. If you remember, when we installed the AD DS role it said that we had to install this in order for the DC to function properly. The Global Catalog option means that the server will list all active directory objects. This is a requirement for a primary domain controller or when we are creating a new domain forest.

Specify domain controller capabilities

Domain Name System (DNS) server

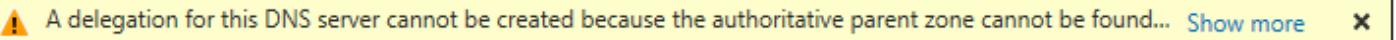
Global Catalog (GC)

Read only domain controller (RODC)

If you choose the Read Only Domain Controller option, then the domain controller will not be able to make changes to the domain. We will want to make changes to our domain so do not check this checkbox. Type in a DSRM password and make sure that you either write it down or memorize it.

The DSRM (Directory Services Restore Mode) password allows an administrator to take an instance of AD offline for reasons like maintenance or troubleshooting. This is not a commonly used password but you will want to keep “just in case”. Click next to proceed on to the DNS options.

On the DNS Options screen you will see a warning about the DNS delegation.

 A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found... [Show more](#) 

This warning means that people on the internet will not be able to resolve local DNS names on your local DNS server (names like itflee.com or ITFDC01 etc). This is fine because we don't want people on the internet to be able to access our server for security reasons. Click next and proceed on to the Additional Options.

The NetBIOS domain name is populated for us as ITFLEE. The NetBIOS name is an abbreviate of the Fully Qualified Domain Name (FQDN) which is itflee.com. I am going to leave this at the default of ITFLEE and click continue.

Verify the NetBIOS name assigned to the domain and change it if necessary

The NetBIOS domain name:

ITFLEE

On the Paths screen we can see the default paths chosen for the folders that are required by AD DS. If you would like to choose an alternate drive you can do so by clicking the “...” button  and choosing the alternate path. I recommend that you leave them at the default setting and click next.



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Specify the location of the AD DS database, log files, and SYSVOL

Database folder:

C:\Windows\NTDS



Log files folder:

C:\Windows\NTDS



SYSVOL folder:

C:\Windows\SYSVOL



We are brought to the Review Options screen where we can see all of the options we have chosen so far. If you would like you can click the “View script” button [View script](#) and you will be presented with a powershell script that you can save in order to later execute and quickly complete the wizard with the same settings we just used. Close the powershell script and click next.

Now we are brought to the “Prerequisites Check” window. The wizard is going to go verify that the server is ready to be promoted as a DC. This will take a few minutes before it is ready so just be patient wait for it to complete the checks. Once the checks complete at the top you will see that all prerequisite checks have passed:

All prerequisite checks passed successfully. Click 'Install' to begin installation.

[Show more](#)



If you have errors, you can address the errors (Google is your friend) and click the rerun prerequisite checks text:

Prerequisites need to be validated before Active Directory Domain Services is installed on this computer

[Rerun prerequisites check](#)

Under the view results window we can see there are various warnings. None of these are critical but it is worth reading through them. We can see that the first one is a security setting stating that anything with cryptography not compatible with Windows NT 4.0 will be blocked. This is not an issue for us because we are not using old servers or old technology.

The second is in regards to our first networking adapter not having a static IP address. This is because the first adapter is connected to our NAT adapter and will not be used for our local domain. This can be ignored.

The third warning is about the DNS delegation. Again we do not care if people on the internet can resolve our DNS records within our network.



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[View results](#)

Windows Server 2016 domain controllers have a default for the security setting named "Allow cryptography algorithms compatible with Windows NT 4.0" that prevents weaker cryptography algorithms when establishing security channel sessions.

For more information about this setting, see Knowledge Base article 942564 (<http://go.microsoft.com/fwlink/?LinkId=104751>).

This computer has at least one physical network adapter that does not have static IP address(es) assigned to its IP Properties. If both IPv4 and IPv6 are enabled for a network adapter, both IPv4 and IPv6 static IP addresses should be assigned to both IPv4 and IPv6 Properties of the physical network adapter. Such static IP address(es) assignment should be done to all the physical network adapters for reliable Domain Name System.

If you click Install, the server automatically reboots at the end of the promotion operation.

Click the install button and wait for the installation to complete and the server to reboot. This can take a good while depending on the speed of your server so you will need to be patient while it works. I am going to speed up this video so you don't need to sit and watch the entire installation.

Once the installation completes and the server reboots, press **ctrl+alt+del** to log in. The first thing you will notice is the NetBIOS name of our domain precedes the user account we are logging into (in this case, "ITFLEE\Administrator"). This is in the format of [Domain Name]\[Domain Username].



If we had multiple domain names we could specify a different domain name by typing the name of the domain we want to use followed by a backslash and the name of the user account you want to log into. Type in the password you used to create the administrator account when you installed the server and log in. Under the server manager you will see the new server roles of AD DS and DNS.



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ROLES AND SERVER GROUPS

Roles: 3 | Server groups: 1 | Servers total: 1

 AD DS	1
 Manageability	1
Events	
Services	
Performance	
BPA results	
 DNS	1
 Manageability	1
Events	
Services	
Performance	
BPA results	

We have successfully built a Domain Controller. Great job on that and I will see you in the next lecture!