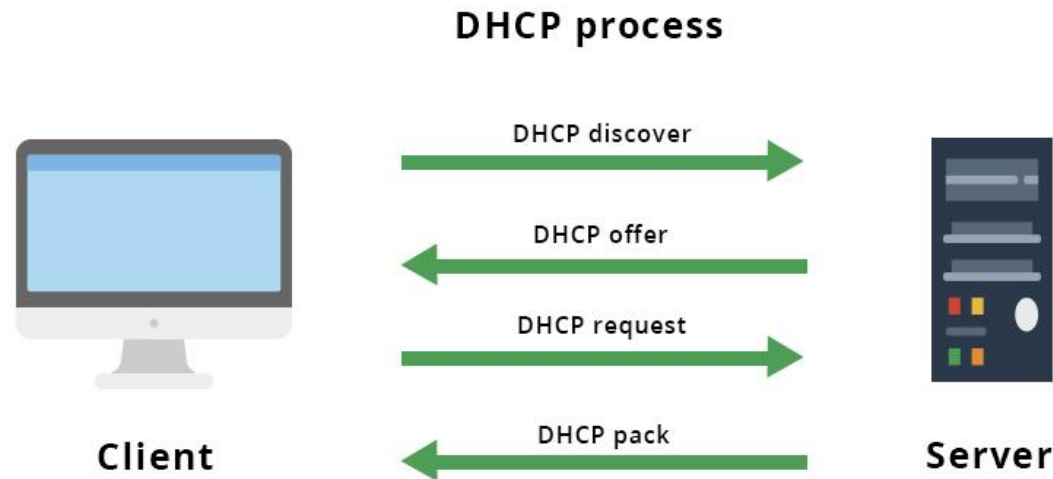


Informatika, 2. maila

# **Dynamic Host Configuration Protocol (DHCP)**

# Dynamic Host Configuration Protocol (DHCP)

- DHCPren eginkizun nagusia sareko gailuei IP helbideak, azpisare-maskarak, gateway-ak eta sareko beste konfigurazio-ezarpenak automatikoki esleitzea da.
- Sarearen administrazioa errazten du eta gailuak eskuzko konfiguraziorik gabe sarera konekta daitezkeela bermatzen du.



# Dynamic Host Configuration Protocol (DHCP)

## DHCP-ren garrantzia Active Directory-n:

- **Kontrol zentralizatua**
  - DHCP Active Directory-rekin integratzeak IP helbidearen esleipenen eta sareko konfigurazio-ezarpenen kudeaketa zentralizatua ahalbidetzen du. Honek tamaina ezberdineko sareak kudeatzea errazten du, erakunde konfigurazioen koherentzia bermatuz.
- **Segurtasuna**
  - DHCP zerbitzariak autorizatzen ditu. Baimenik gabeko DHCP zerbitzariak IP helbideak ez esleitzeko.
- **Akatsen tolerantzia (Fault Tolerance)**
  - Active Directory-k DHCP zerbitzuen akatsen tolerantzia eskaintzen lagun dezake, zerbitzari batek huts egiten badu DHCP zerbitzari anitz konfiguratzeko aukera emanez.

# Dynamic Host Configuration Protocol (DHCP)

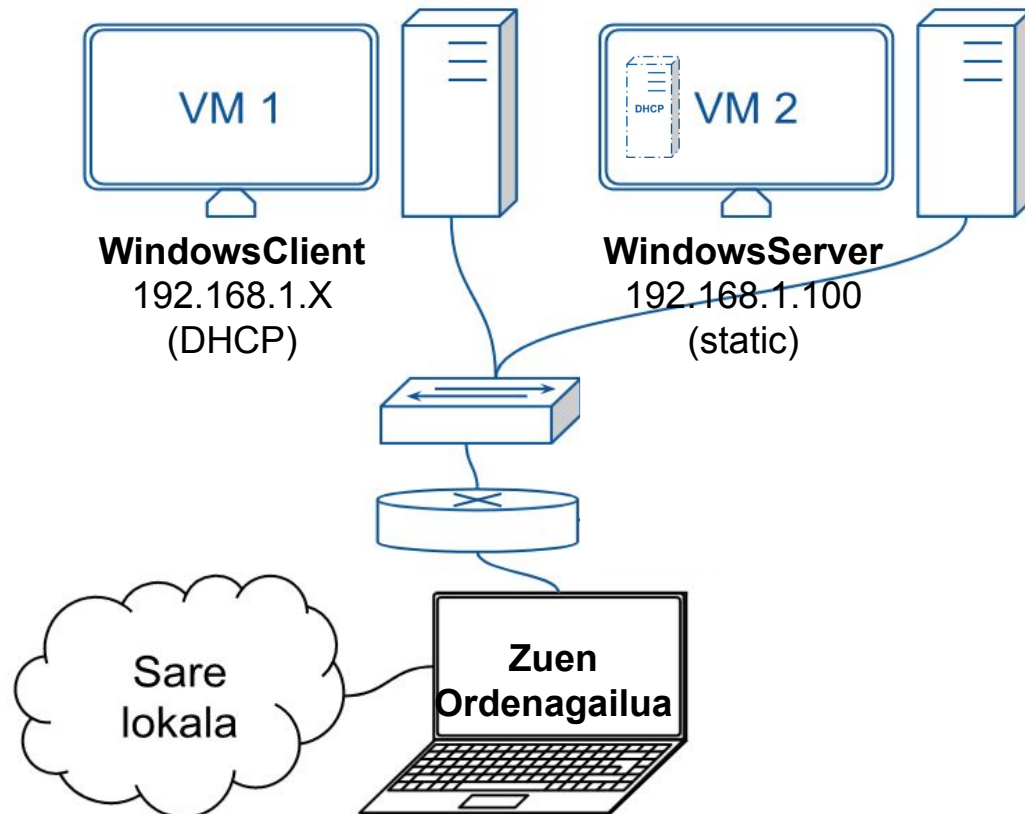
## DHCP-ren oinarrizko kontzeptuak:

- **DHCP Server**
  - DHCP zerbitzua exekutatzen duen eta bezeroei IP helbideak esleitzen dituen zerbitzaria.
- **DHCP Client**
  - DHCP zerbitzari bati IP helbidea eskatzen dion sareko edozein gailu.
- **DHCP Scope**
  - DHCP zerbitzari batek bezeroei esleitzeko konfiguratuta dagoen IP helbide sorta bat.
- **DHCP Lease**
  - Bezero bati DHCP zerbitzari batek esleitutako IP helbidea erabiltzeko baimena ematen duen denbora.
- **DHCP Authorization**
  - DHCP zerbitzari bati Active Directory domeinu baten barruan IP helbideak esleitzeko baimena emateko prozesua.

# Dynamic Host Configuration Protocol (DHCP)

## Ariketa honetan lortu nahi duguna:

- Konfigurazio berrian, Windows zerbitzarian konfiguratuko dugun DHCP zerbitzaria erabiliko dugu.
  - Bezeroari (WindowsClient) automatikoki konfiguratuko zaio sare txartela.



# Dynamic Host Configuration Protocol (DHCP)

- Snapshot bat sortu DHCP konfiguratzen hasi baino lehen!

HAU BEHARREZKOA DA

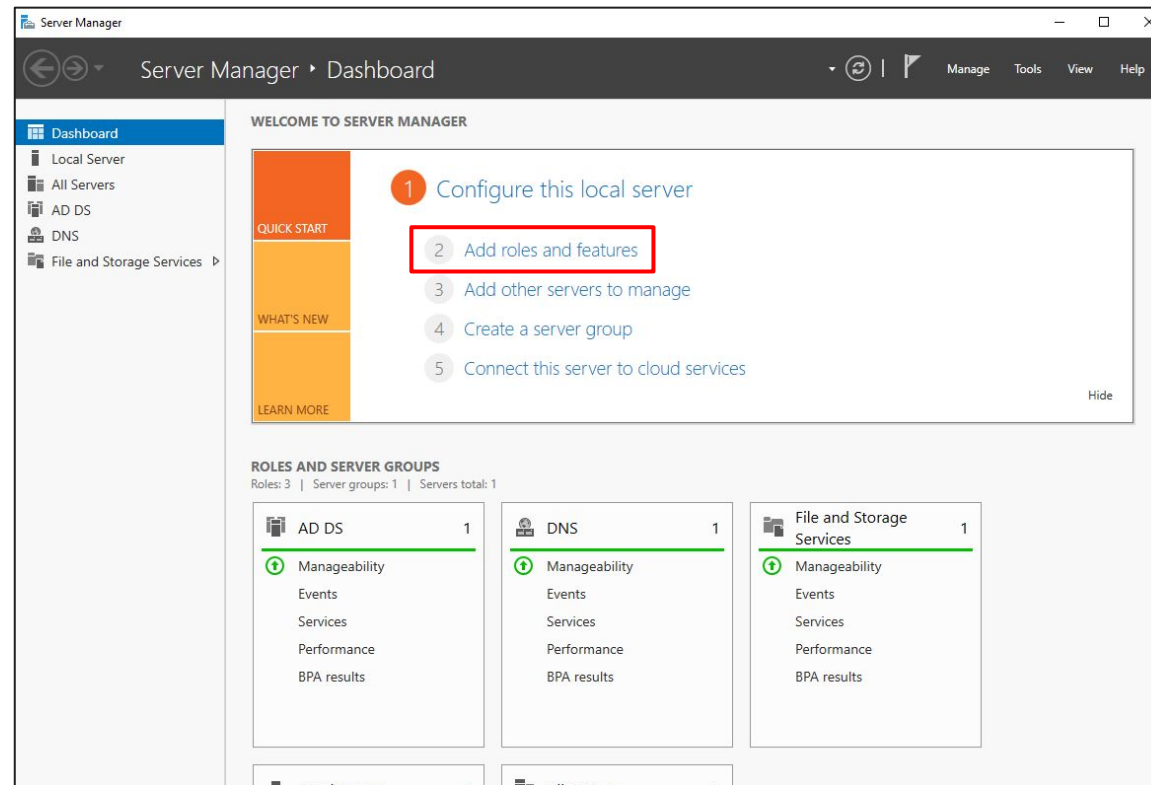


1

## **DHCP instalazioa**

# DHCP - Instalazioa (GUI)

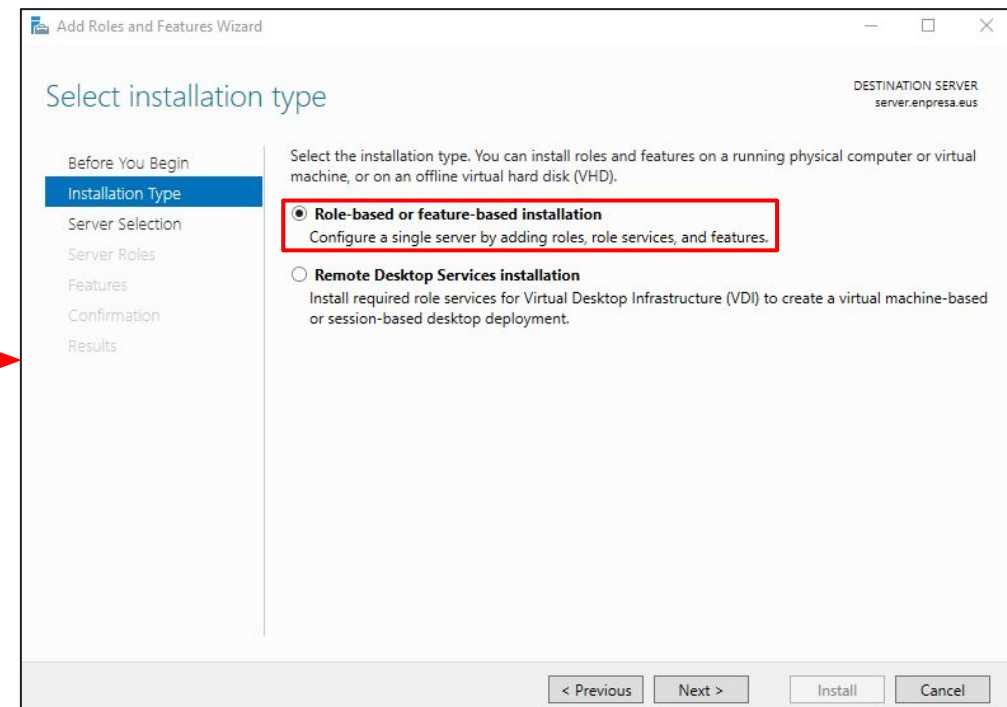
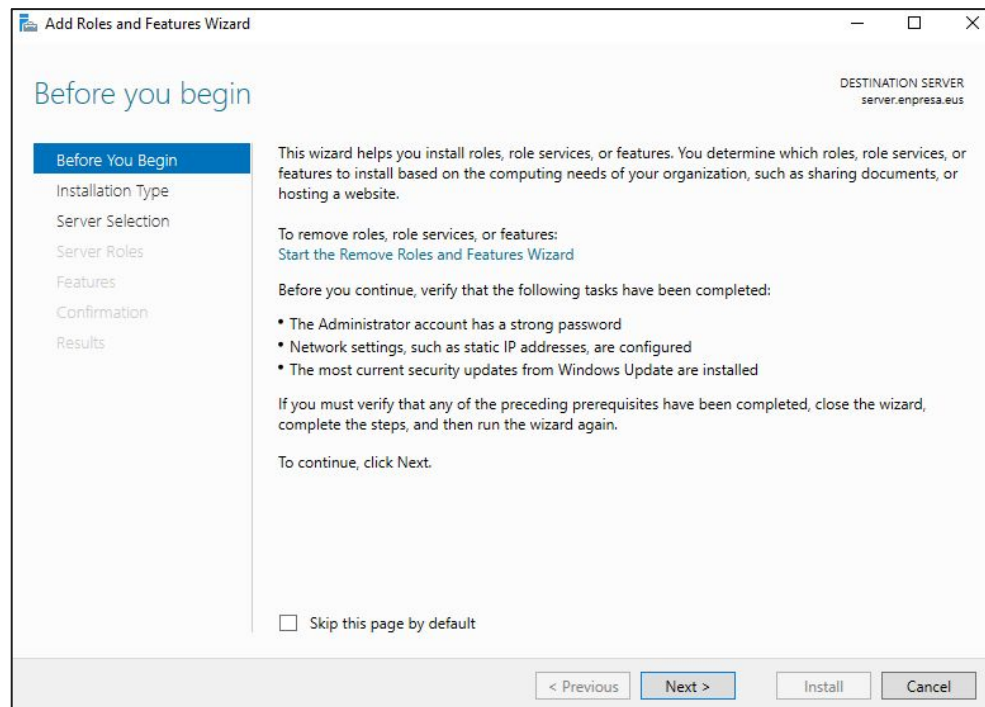
- Instalazioa egiteko, DHCP zerbitzariaren rola instalatu behar da:
  - Honetarako, Server Manager aplikazioan, “Add roles and features” aukeratuko dugu.





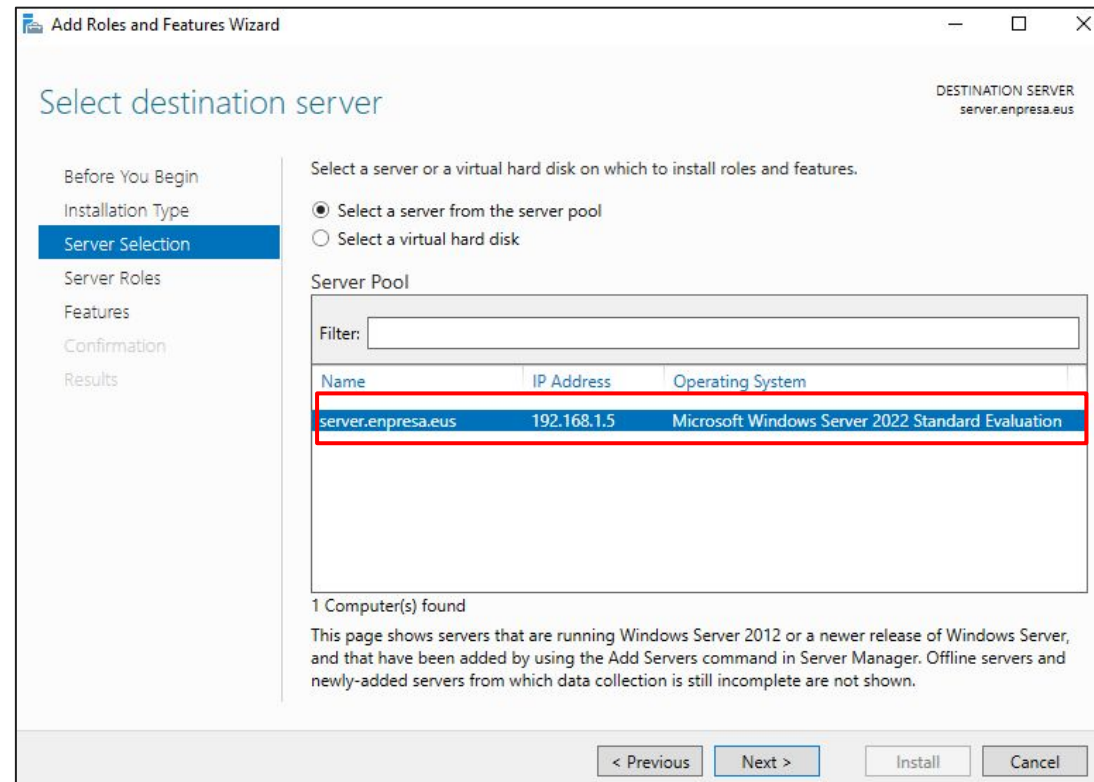
# DHCP - Instalazioa (GUI)

- DHCP zerbitzariaren rola instalatzen:



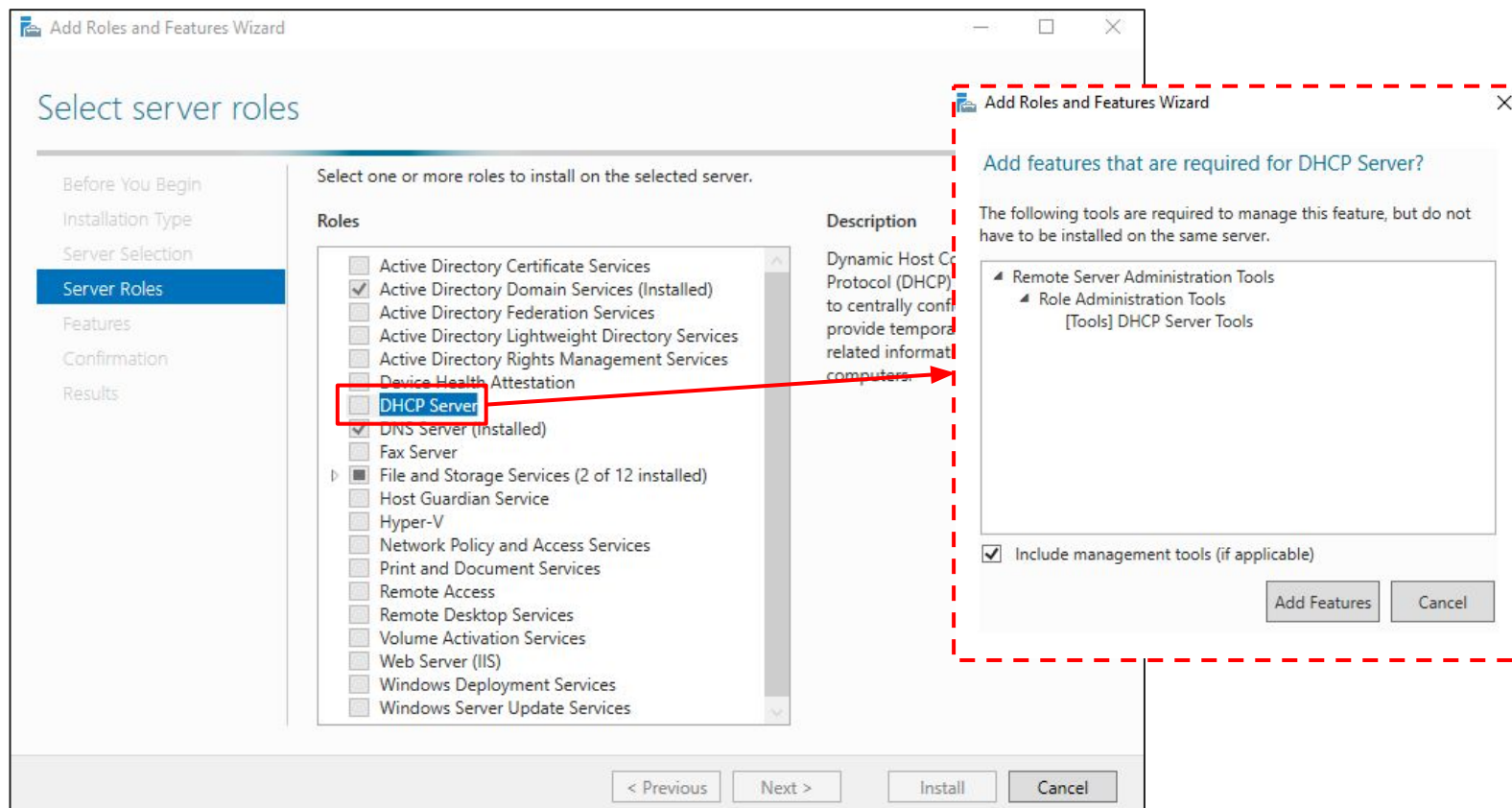
# DHCP - Instalazioa (GUI)

- **DHCP zerbitzariaren rola instalatzen:**
  - DHCP instalatu nahi den zerbitzaria aukeratu.



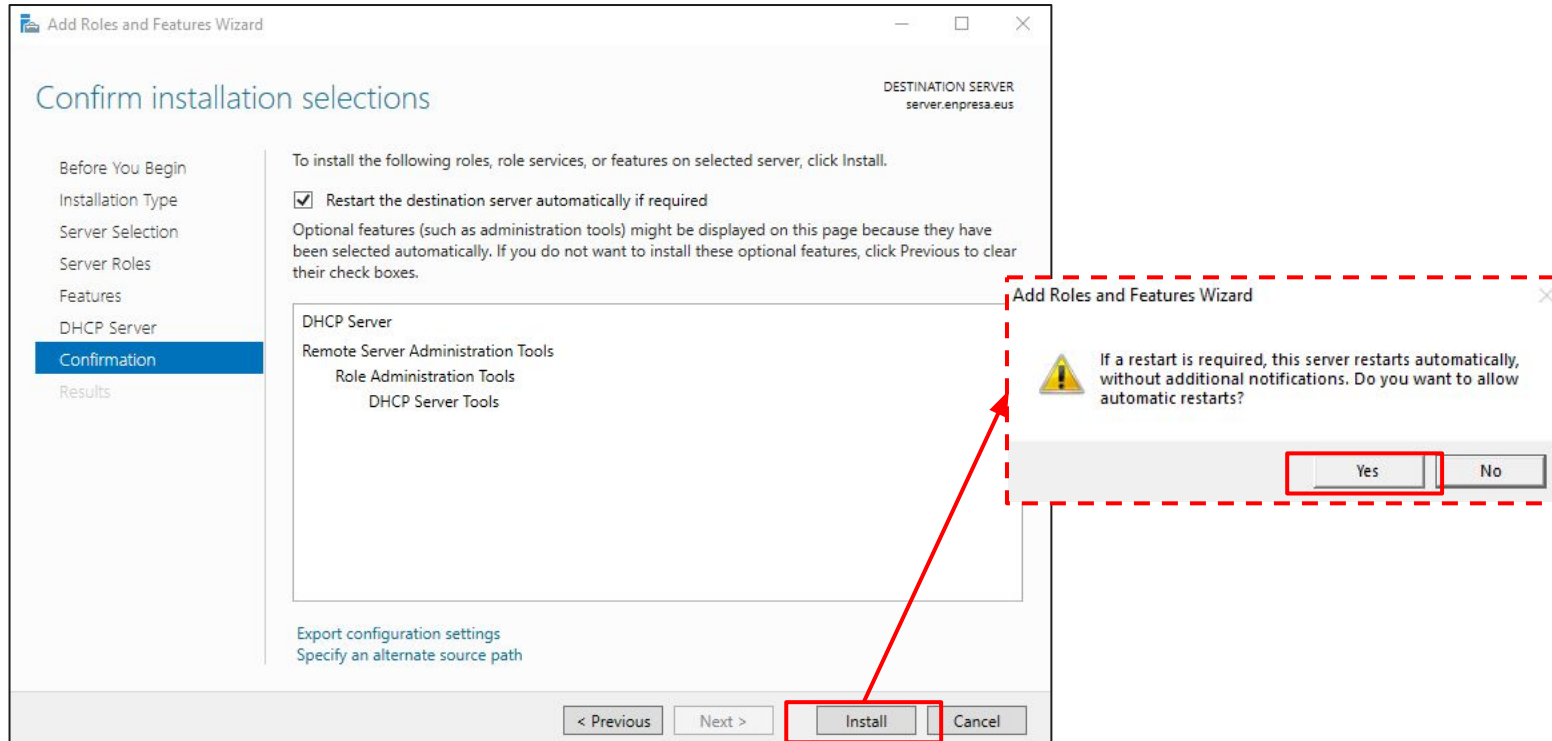
# DHCP - Instalazioa (GUI)

- DHCP zerbitzariaren rola instalatzen:
  - DHCP zerbitzari rola aukeratu eta haren ezaugarriak gehitu.



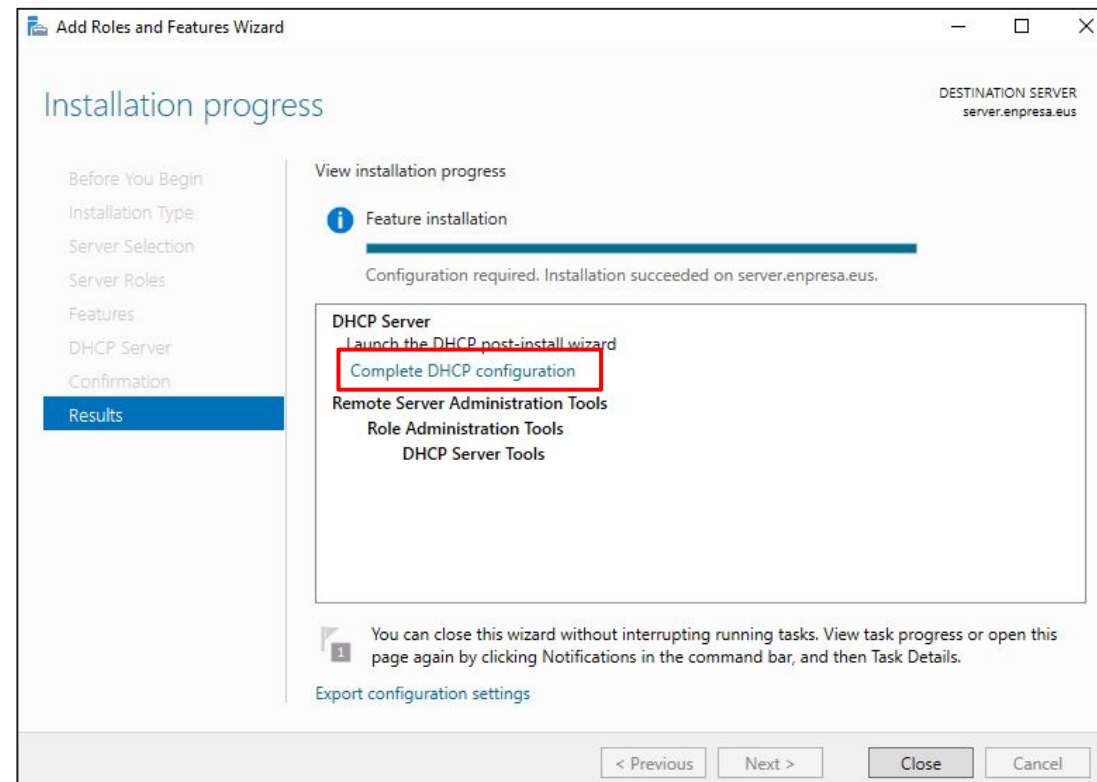
# DHCP - Instalazioa (GUI)

- DHCP zerbitzariaren rola instalatzen:
  - Aukeratutakoa instalatu.



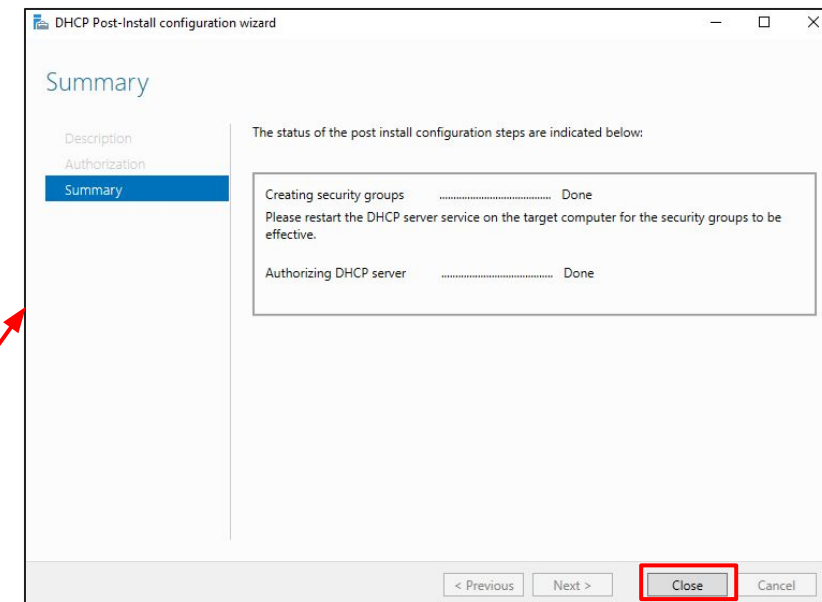
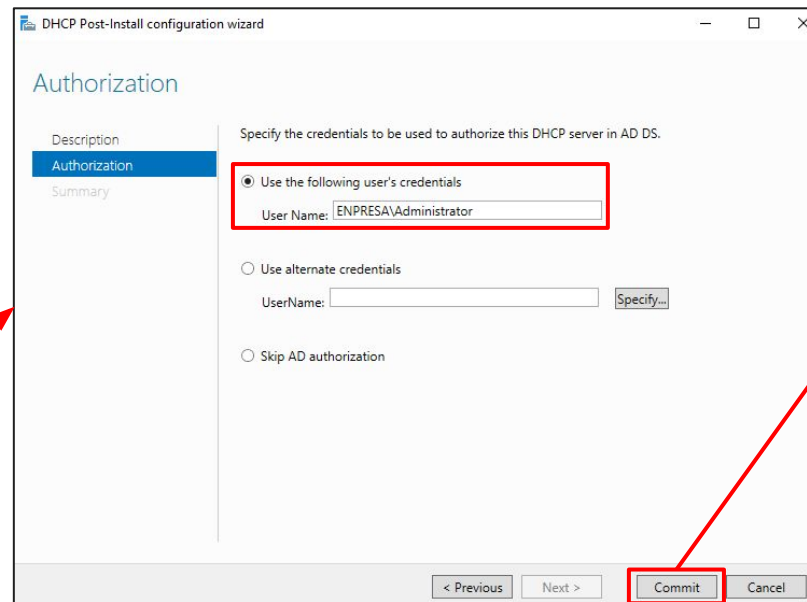
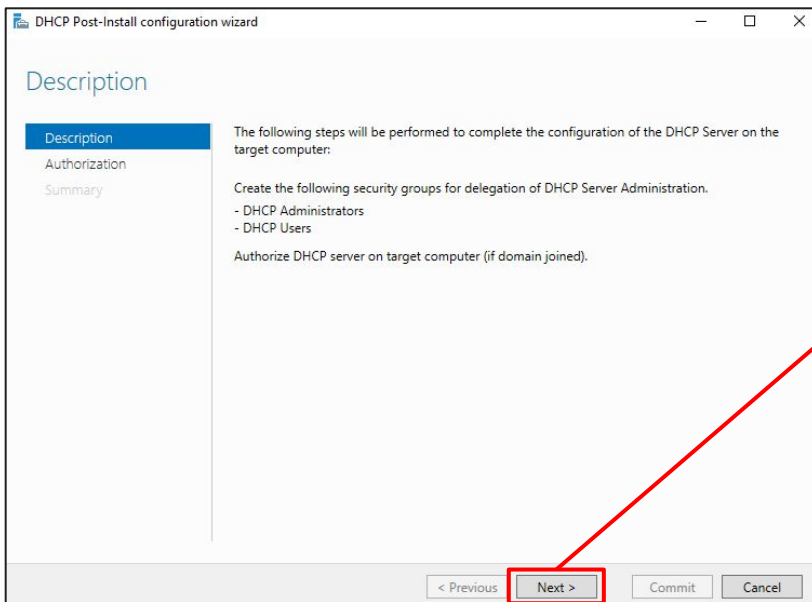
# DHCP - Instalazioa (GUI)

- **DHCP zerbitzariaren rola instalatzen:**
  - Instalazioa amaitzean, DHCP konfigurazioa bete behar dela adieraziko da.
    - Bertan, DHCP Active Directory-an baimentzeko erabiliko den erabiltzailea adierazi behar da.



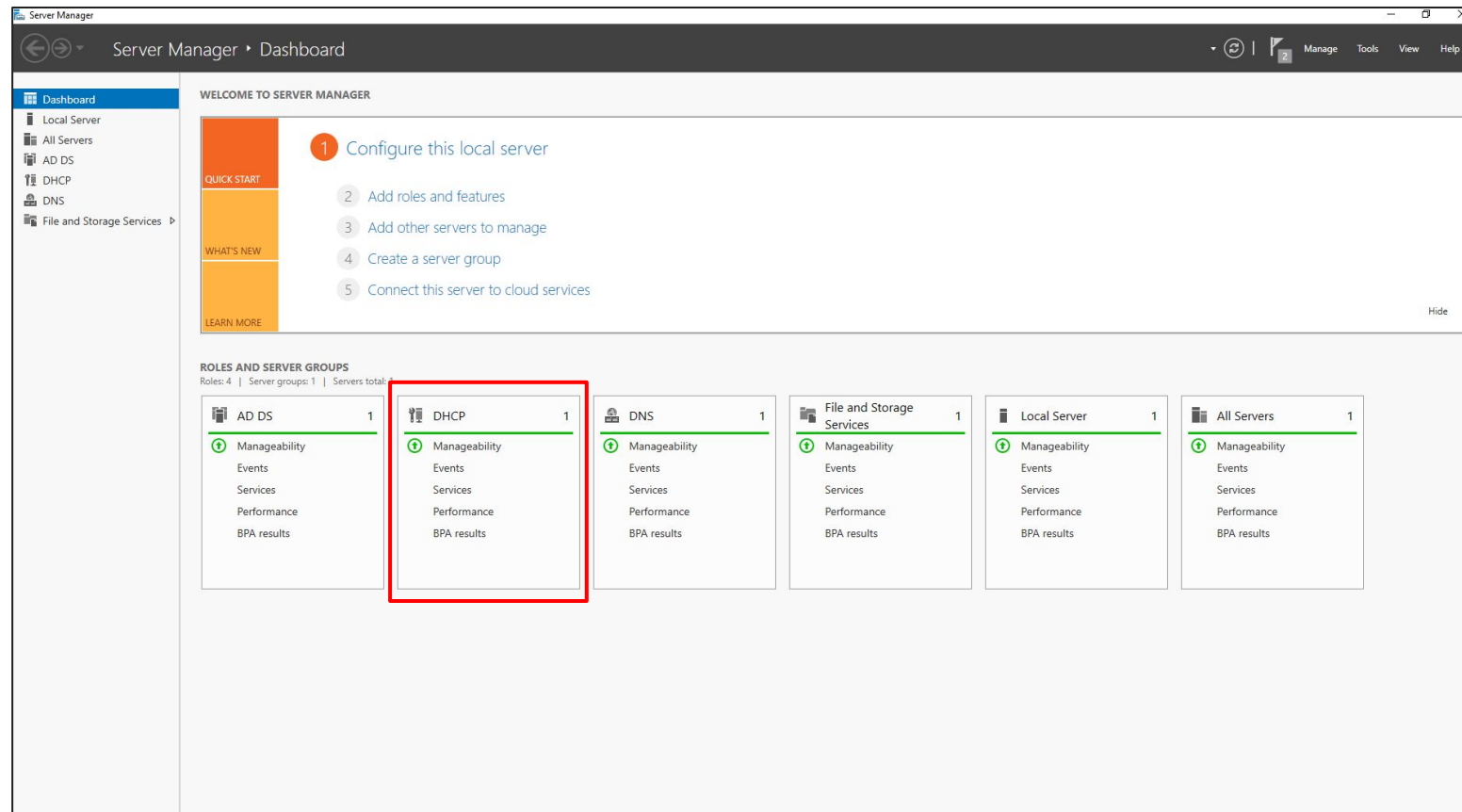
# DHCP - Instalazioa (GUI)

- **DHCP zerbitzariaren rola instalatzen:**
  - Instalazioa amaitzean, DHCP konfigurazioa bete behar dela adieraziko da.
    - Bertan, DHCP Active Directory-an baimentzeko erabiliko den erabiltzailea adierazi behar da.



# DHCP - Instalazioa (GUI)

- **DHCP zerbitzariaren rola instalatzen:**
  - Instalazio-prozesua amaitzean, beste rol bat agertuko da zerbitzariaren administratzailearen panelean.



# DHCP - Instalazioa (PowerShell)

```
# Install the DHCP Server role
Install-WindowsFeature -Name DHCP -IncludeManagementTools

# Verify that the DHCP role is installed
Get-WindowsFeature -Name DHCP
```

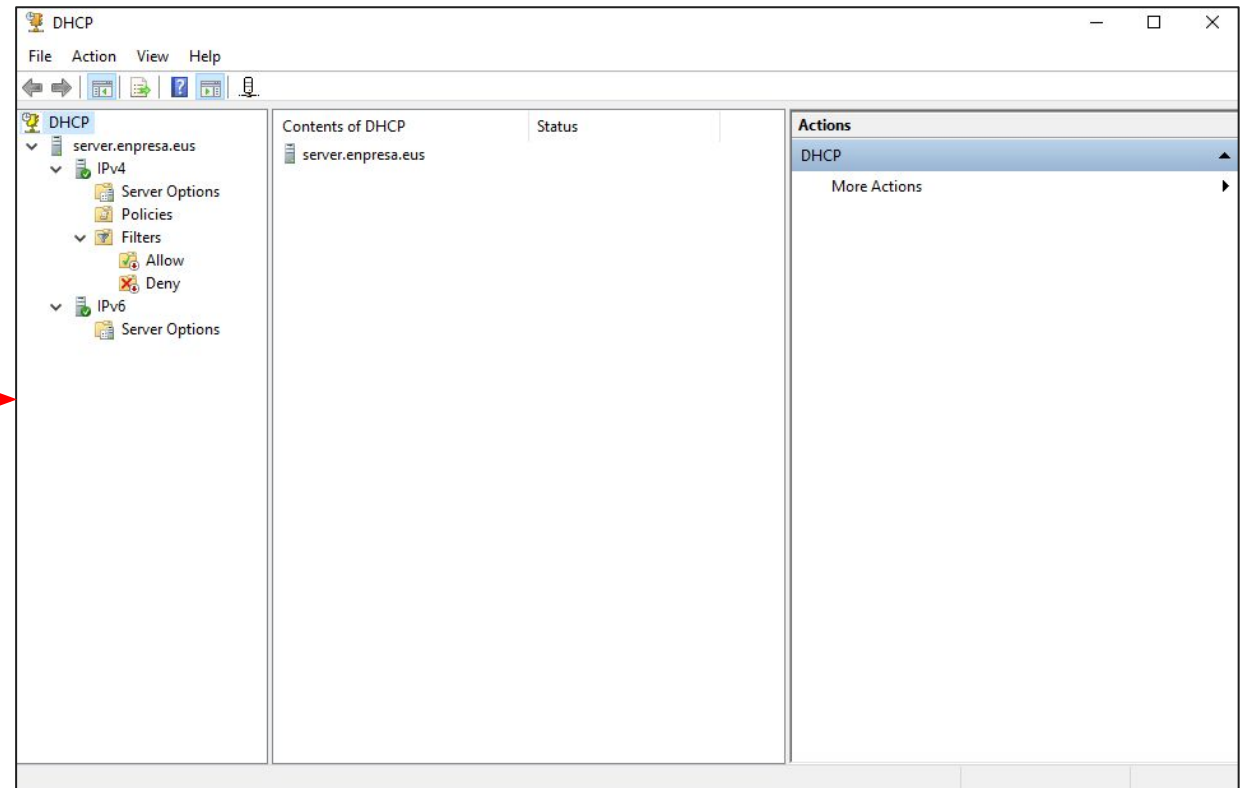
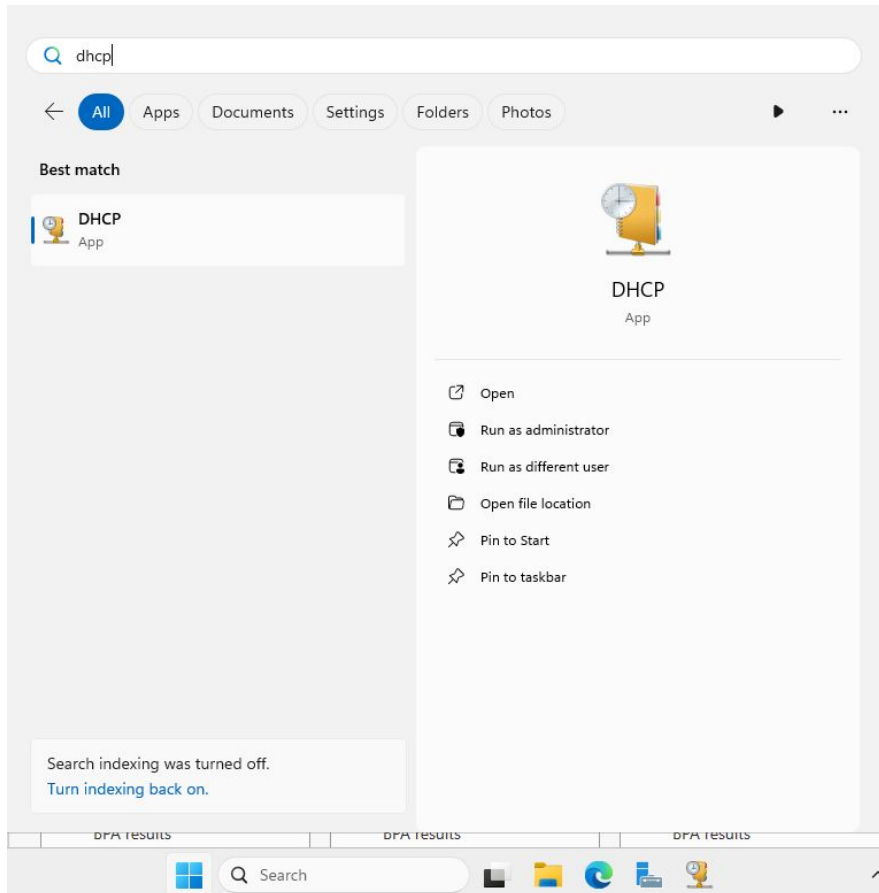


**2**

## **DHCP konfigurazioa**

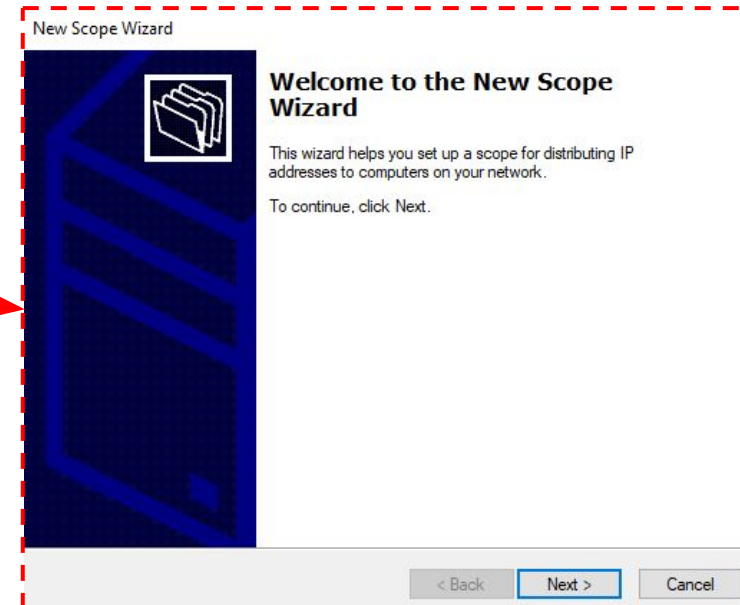
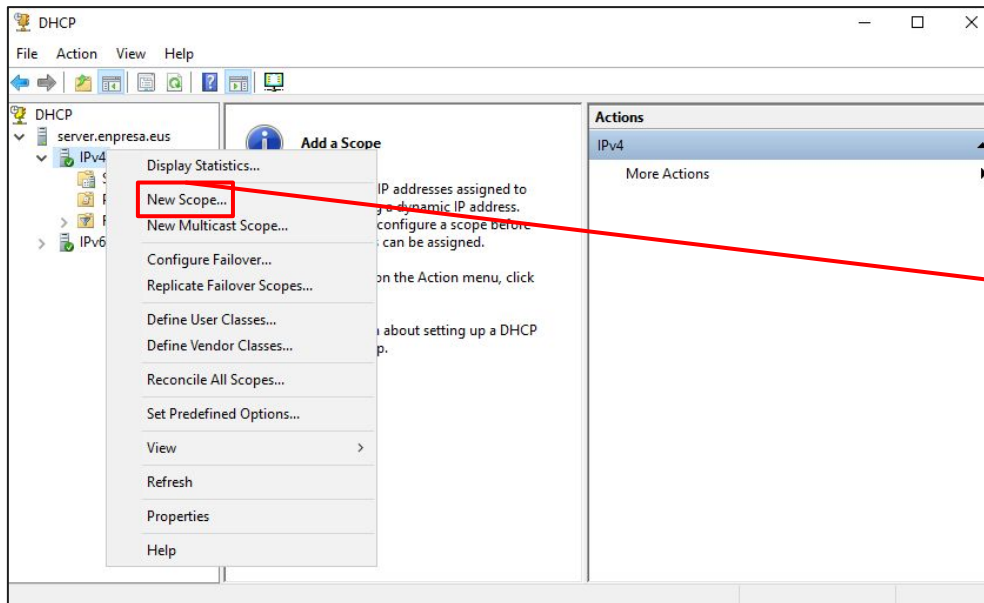
# DHCP - Konfigurazioa (GUI)

- Behin DHCP zerbitzaria instalatuta, konfigurazioa “DHCP” izeneko aplikazio grafiko batekin egiten da:



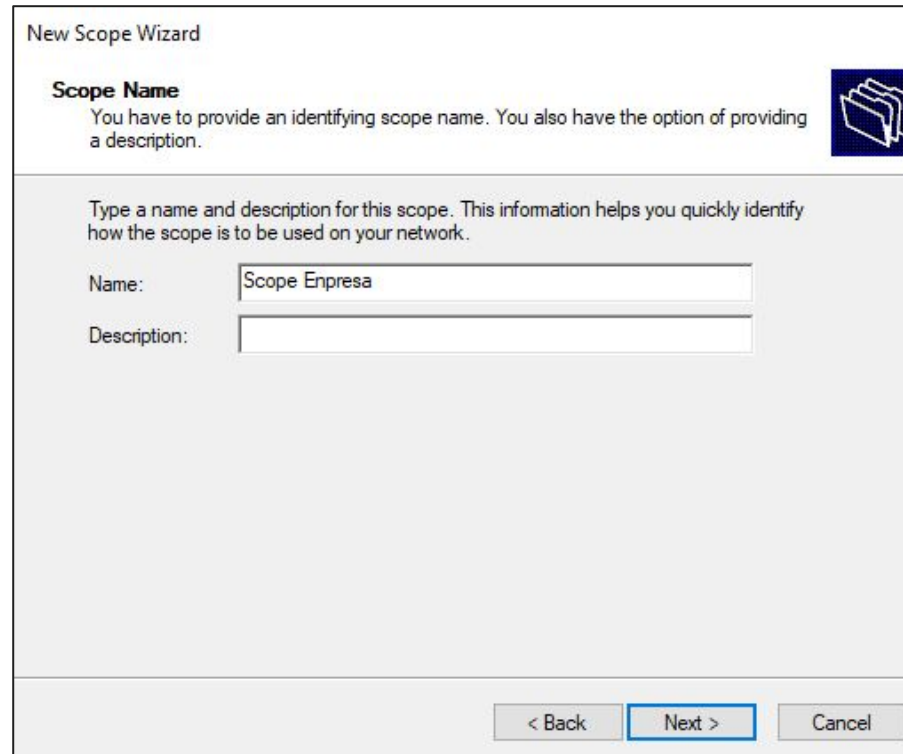
# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:



# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - Izen bat eman scope-ari



New Scope Wizard

**Scope Name**  
You have to provide an identifying scope name. You also have the option of providing a description.

Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

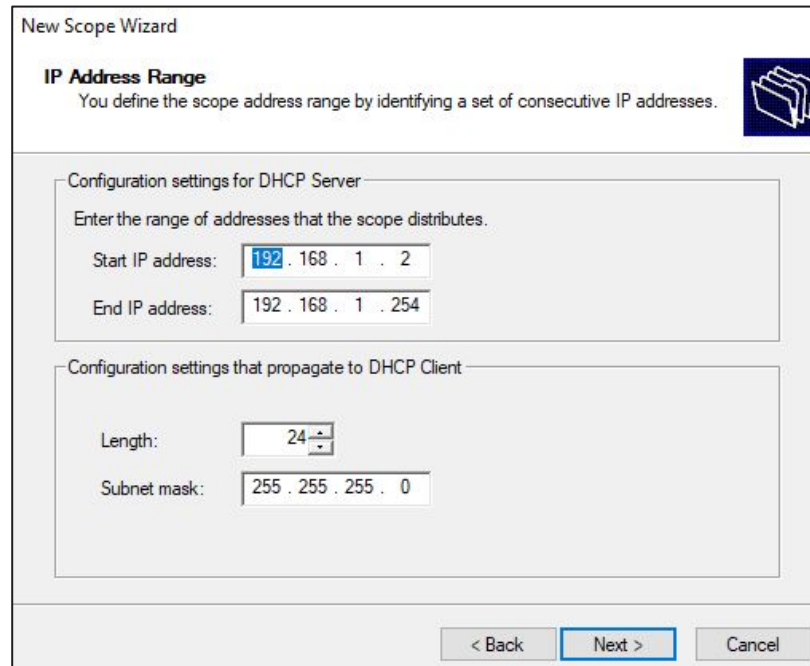
Name:

Description:

< Back   Next >   Cancel

# DHCP - Konfigurazioa (GUI)

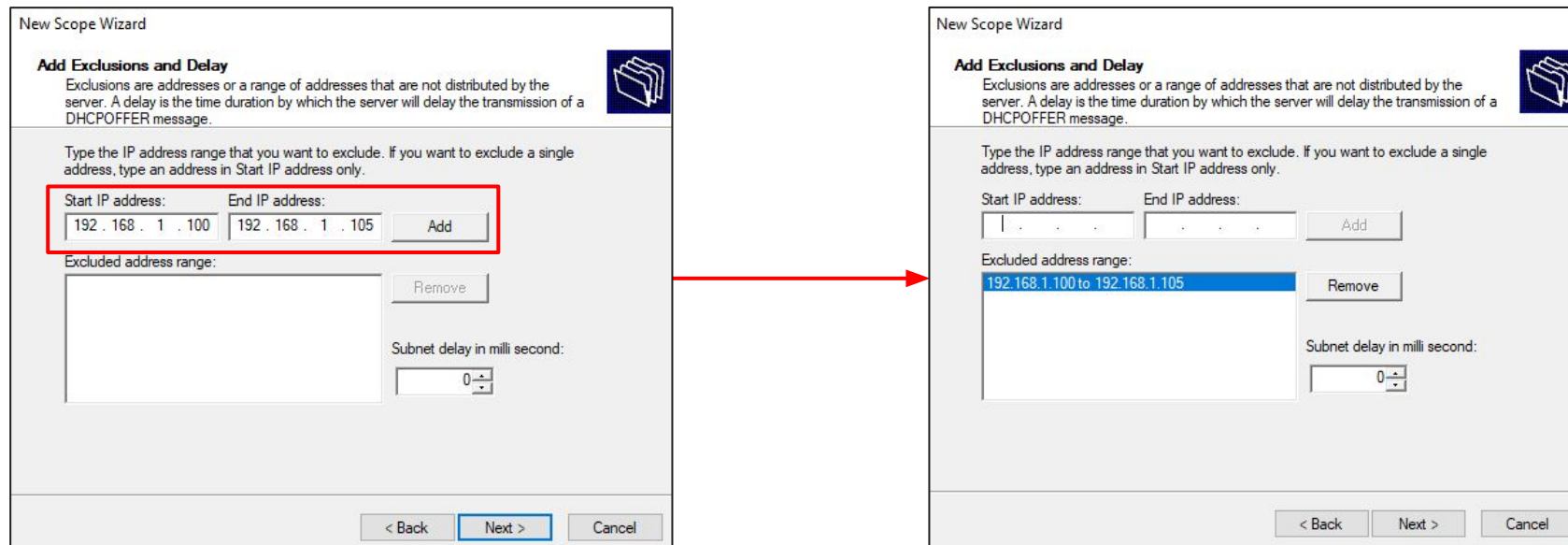
- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - Zerbitzariak banatuko dituen IP helbideak konfiguratu.
  - 192.168.1.0/24 sarea erabiliko dugu.
  - Lehenengo IP helbidea 192.168.1.1 kanpoan utzuko dugu, gateway-a da eta.
    - Gailuek erabiliko dituzten IP helbideak 192.168.1.2 → 192.168.1.254



The screenshot shows the 'New Scope Wizard' window. The title bar says 'New Scope Wizard'. Below the title bar, there is a section titled 'IP Address Range' with a subtext: 'You define the scope address range by identifying a set of consecutive IP addresses.' To the right of this text is a folder icon. Below this, there is a section titled 'Configuration settings for DHCP Server' with a subtext: 'Enter the range of addresses that the scope distributes.' This section contains two input fields: 'Start IP address:' with the value '192 . 168 . 1 . 2' and 'End IP address:' with the value '192 . 168 . 1 . 254'. Below this, there is a section titled 'Configuration settings that propagate to DHCP Client'. This section contains two input fields: 'Length:' with the value '24' and 'Subnet mask:' with the value '255 . 255 . 255 . 0'. At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a blue border.

# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - Esleipenetik kanpo geratuko diren IP helbideak gehitu.
  - Gure kasuan, zerbitzariak 192.168.1.100 IP estatikoa dauka.
  - DHCP zerbitzariari, 192.168.1.100-192.168.1.105 IP helbideak ez esleitzeko esango diogu.



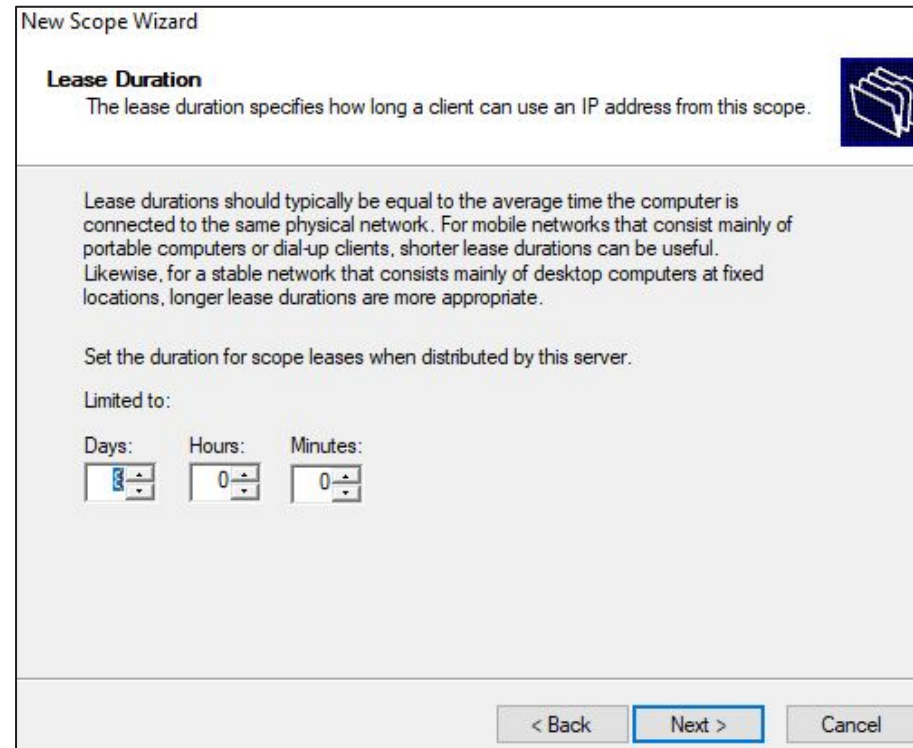
The image shows two screenshots of the 'New Scope Wizard' GUI, illustrating the process of adding an excluded IP range. A red arrow points from the first screenshot to the second.

**Left Screenshot:** The 'Add Exclusions and Delay' step. The 'Start IP address' field contains '192.168.1.100' and the 'End IP address' field contains '192.168.1.105'. The 'Add' button is highlighted with a red box. The 'Excluded address range' list is empty.

**Right Screenshot:** The same step, but the 'Add' button is disabled. The 'Excluded address range' list now contains the range '192.168.1.100 to 192.168.1.105', which is highlighted in blue. The 'Remove' button is visible next to the list.

# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - Adierazi esleipenak zenbatero berrituko dituen.
  - Gure kasuan defektuzko 8 egun utziko dugu. Honekin, gailu bat sarera konektatzean, esleitutako IP helbidea 8 egunetarako erreserbatuta egongo da gailuarentzat.



New Scope Wizard

**Lease Duration**  
The lease duration specifies how long a client can use an IP address from this scope.

Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

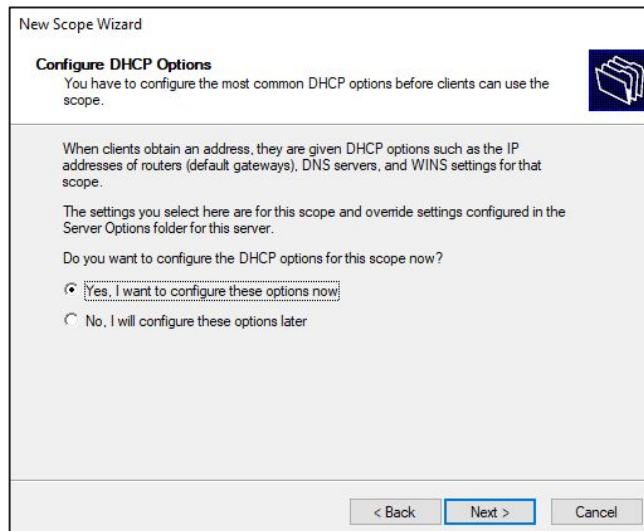
Limited to:

Days:  Hours:  Minutes:

< Back Next > Cancel

# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - DHCP zerbitzariak esleituko duen gateway-a konfiguratu.
  - Gure kasuan, 192.168.1.1 da.



New Scope Wizard

**Configure DHCP Options**  
You have to configure the most common DHCP options before clients can use the scope.

When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

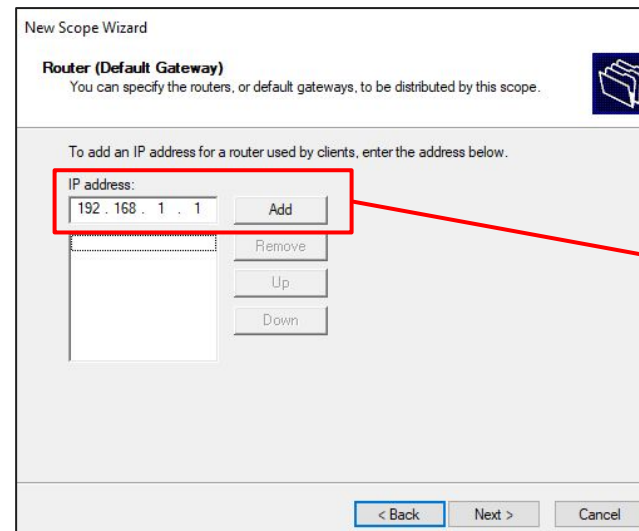
The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

☒ Yes, I want to configure these options now

☐ No, I will configure these options later

< Back Next > Cancel



New Scope Wizard

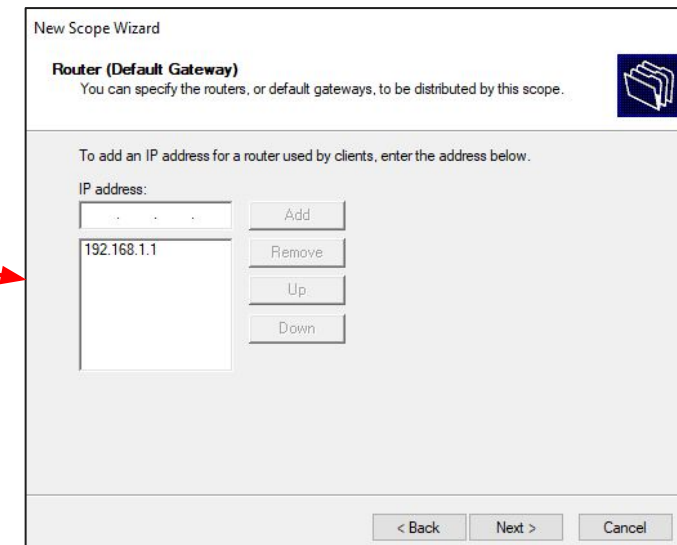
**Router (Default Gateway)**  
You can specify the routers, or default gateways, to be distributed by this scope.

To add an IP address for a router used by clients, enter the address below.

IP address:  
192.168.1.1 Add

Remove Up Down

< Back Next > Cancel



New Scope Wizard

**Router (Default Gateway)**  
You can specify the routers, or default gateways, to be distributed by this scope.

To add an IP address for a router used by clients, enter the address below.

IP address:  
192.168.1.1 Add

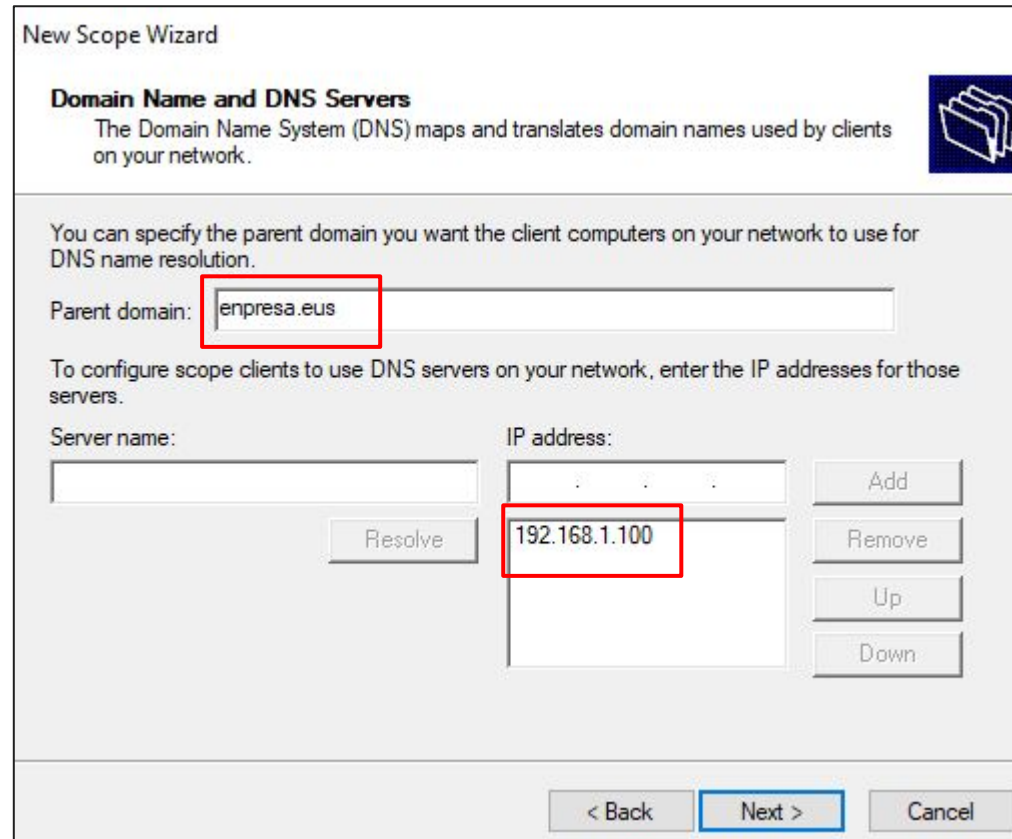
Remove Up Down

< Back Next > Cancel



# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - DHCP zerbitzariak esleituko duen DNS helbidea konfiguratu.
  - Gure kasuan, 192.168.1.100 da, Active Directory zerbitzaria.
  - Konfigurazioa dagoen bezala utziko dugu.



New Scope Wizard

**Domain Name and DNS Servers**  
The Domain Name System (DNS) maps and translates domain names used by clients on your network.

You can specify the parent domain you want the client computers on your network to use for DNS name resolution.

Parent domain:

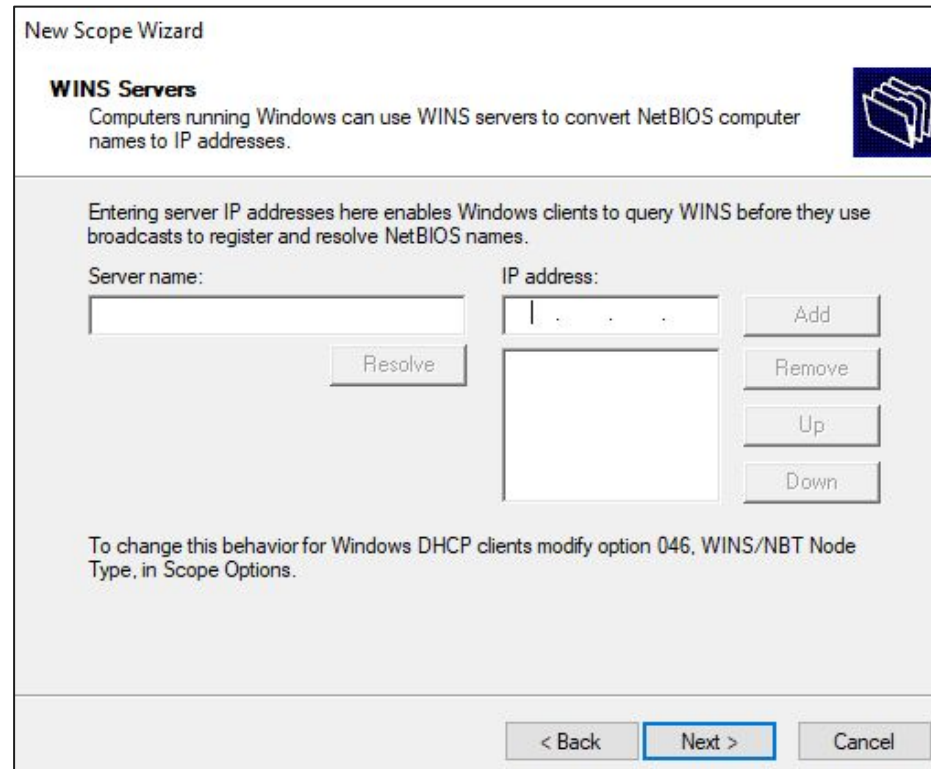
To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.

Server name:	IP address:	
<input type="text"/>	<input type="text" value="192.168.1.100"/>	<input type="button" value="Add"/>
<input type="button" value="Resolve"/>		<input type="button" value="Remove"/>
		<input type="button" value="Up"/>
		<input type="button" value="Down"/>

< Back **Next >** Cancel

# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - WINS ez da konfiguratzen.
  - NetBIOSerako izenen zerbitzaria. IP – NetBIOS izen erlazioak gordetzen ditu.
  - Sistema zaharrekin bateragarri egiteko erabiltzen da



The image shows a screenshot of the 'New Scope Wizard' window in Windows Server, specifically the 'WINS Servers' step. The window title is 'New Scope Wizard'. The section is titled 'WINS Servers' with a folder icon. Below the title, it says 'Computers running Windows can use WINS servers to convert NetBIOS computer names to IP addresses.' The main area contains instructions: 'Entering server IP addresses here enables Windows clients to query WINS before they use broadcasts to register and resolve NetBIOS names.' There are two input fields: 'Server name:' and 'IP address:'. The 'IP address:' field has a dropdown menu showing '1 . . .'. To the right of the 'IP address:' field are four buttons: 'Add', 'Remove', 'Up', and 'Down'. Below the 'Server name:' field is a 'Resolve' button. At the bottom of the window, there is a note: 'To change this behavior for Windows DHCP clients modify option 046, WINS/NBT Node Type, in Scope Options.' The bottom navigation bar has three buttons: '< Back', 'Next >', and 'Cancel'.

New Scope Wizard

**WINS Servers**  
Computers running Windows can use WINS servers to convert NetBIOS computer names to IP addresses.

Entering server IP addresses here enables Windows clients to query WINS before they use broadcasts to register and resolve NetBIOS names.

Server name:

IP address:

Buttons: Add, Remove, Up, Down

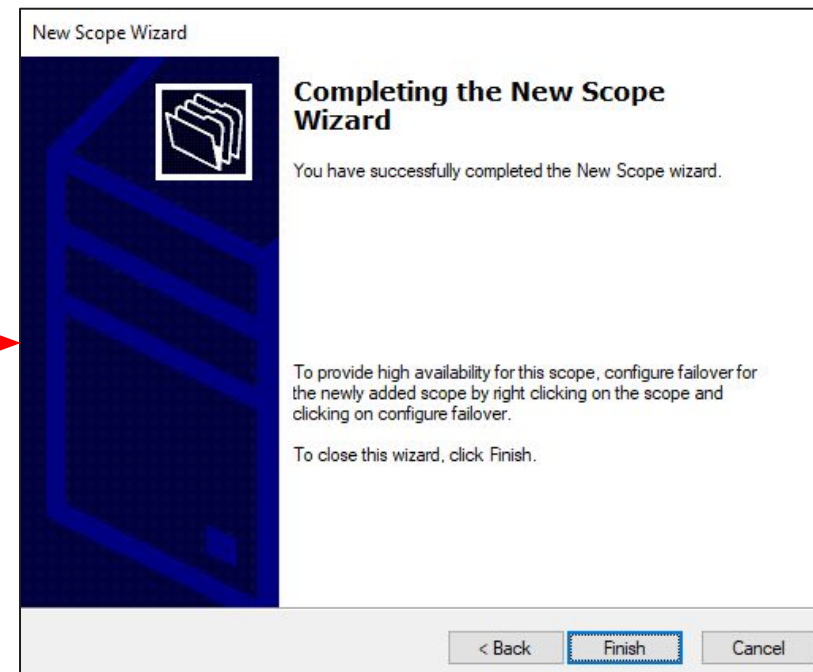
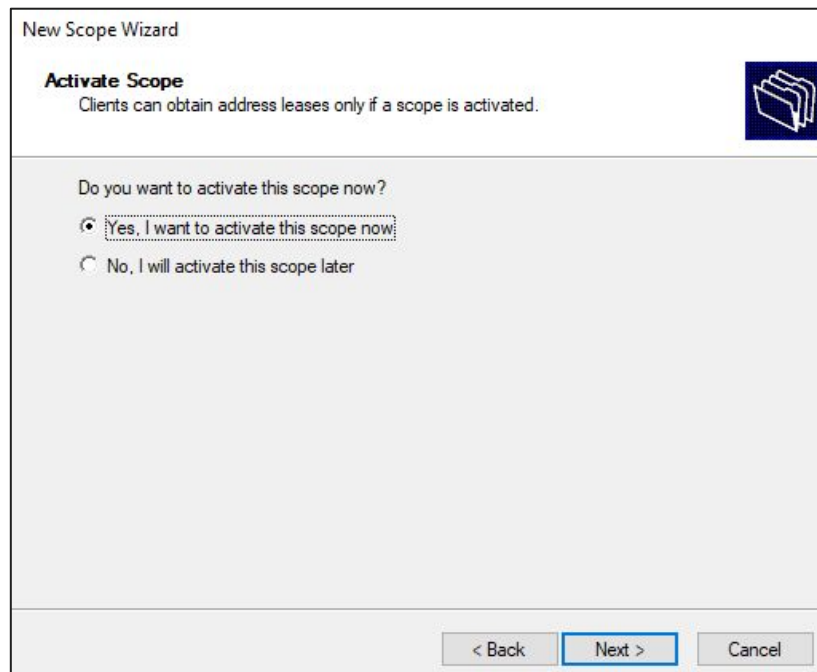
Resolve

To change this behavior for Windows DHCP clients modify option 046, WINS/NBT Node Type, in Scope Options.

< Back Next > Cancel

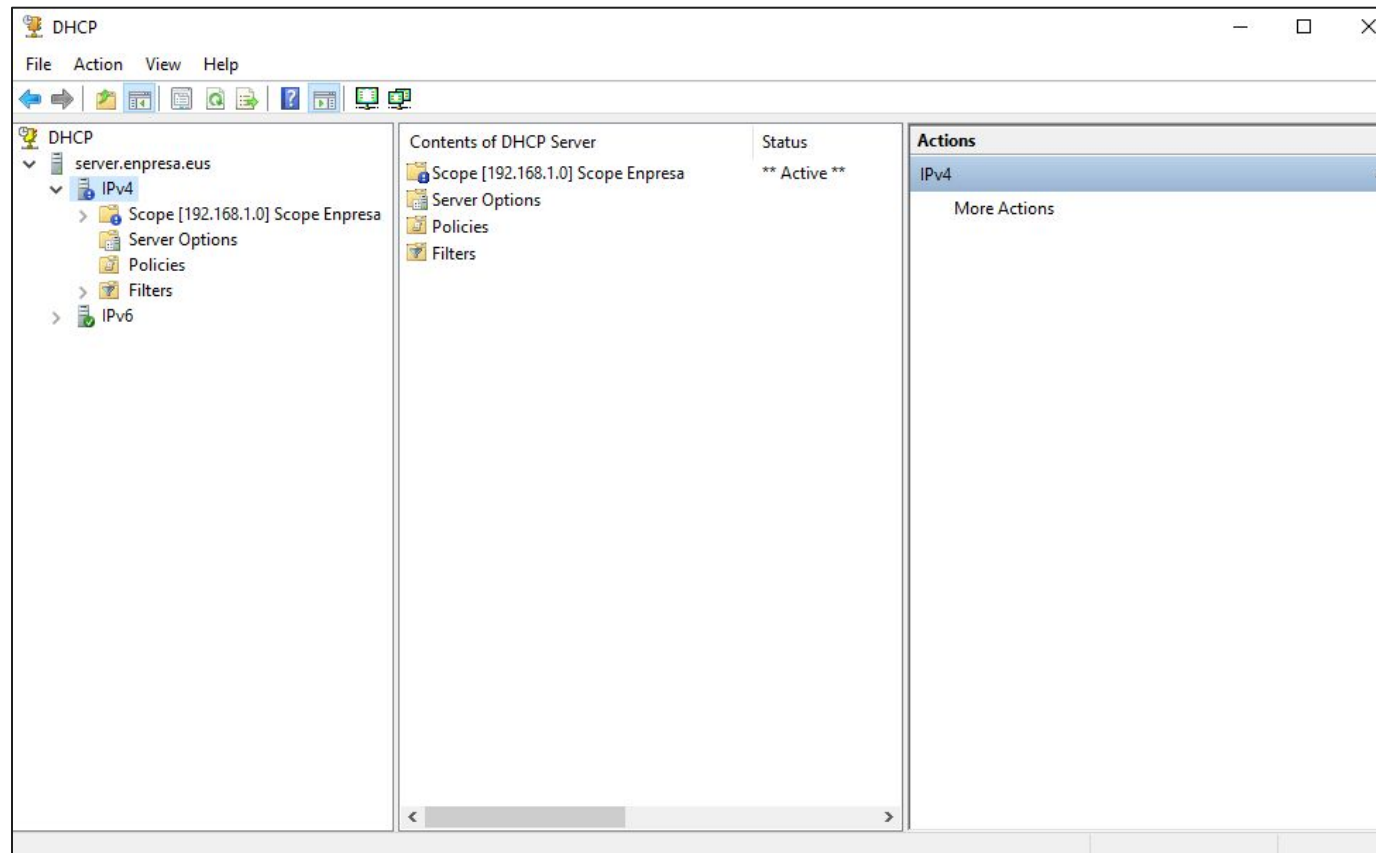
# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - Scope-a aktibatu, funtzionatzen hasteko.



# DHCP - Konfigurazioa (GUI)

- DHCP-a martxan jartzeko, “Scope” berri bat sortu behar da:
  - DHCP aplikazioan, scope berri bat sortu dela bistaratuko da, eta bere egoera “Active” bezala ikusi daiteke.



# DHCP - Konfigurazioa (PowerShell)

```
# List DHCP scopes
Get-DhcpServerv4Scope

# Add a new DHCP scope
Add-DhcpServerv4Scope -Name "Scope Enpresa" -StartRange "192.168.1.2" -EndRange "192.168.1.254" -SubnetMask
"255.255.255.0" -State Active -Description "Primary IPv4 Scope"

# Delete DHCP scope
Remove-DhcpServerv4Scope -ScopeId "192.168.1.0" -Force

# Add IP exclusion range
Add-DhcpServerv4ExclusionRange -ScopeId "192.168.1.0" -StartRange "192.168.1.100" -EndRange "192.168.1.105"

# Set the default gateway for the scope
Set-DhcpServerv4OptionValue -ScopeId "192.168.1.0" -Router "192.168.1.1"

# Set DNS server for the scope
Set-DhcpServerv4OptionValue -ScopeId "192.168.1.0" -DnsServer "192.168.1.100"

# Set the lease duration for the scope
Set-DhcpServerv4Scope -ScopeId "192.168.1.0" -LeaseDuration "8.00:00:00" # 8 days

# Authorize the DHCP server in Active Directory
Add-DhcpServerInDC -DnsName "Server" -IpAddress "192.168.1.100"
```

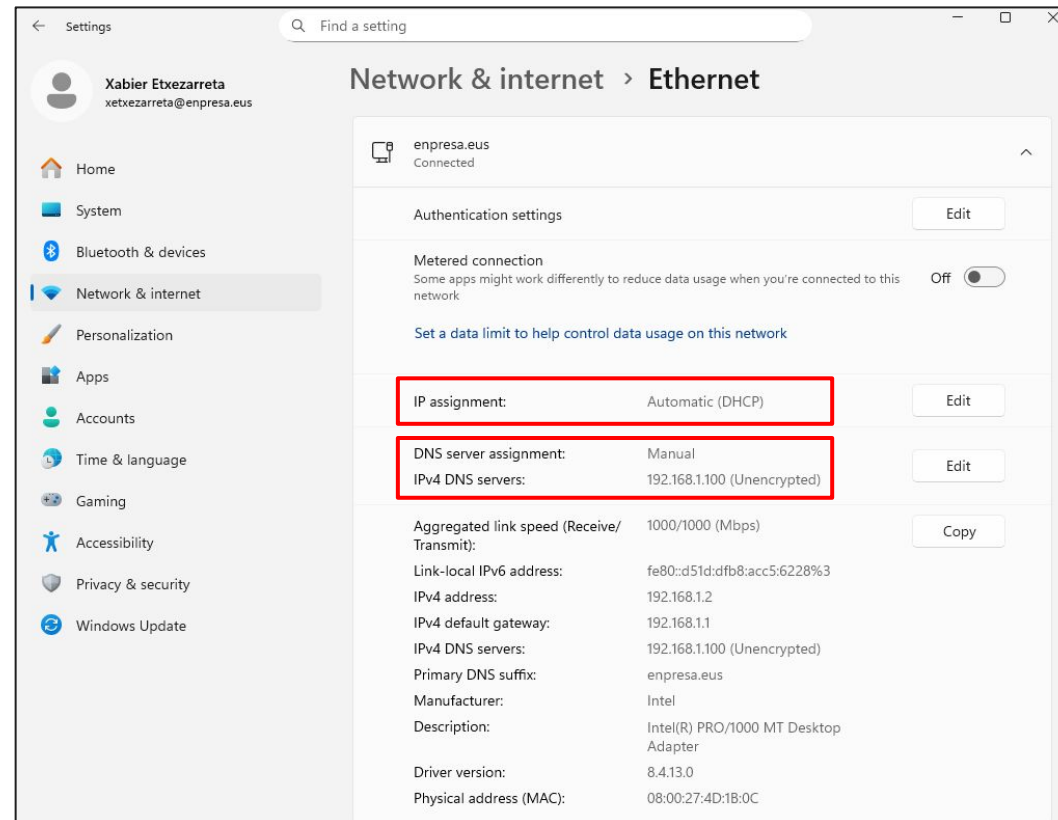
**3**

## **DHCP egiaztapena**

# DHCP - Egiaztapena

## 1. Sare txartelaren konfigurazioa DHCP modura aldatu.

- **DNS zerbitzaria estatikoki mantendu 192.168.1.100 (badaezpada)**



# DHCP - Egiaztapena

## 2. Erabiltzailearen makina birtuala hasi eta IP helbidea automatikoki esleitzen zaion konprobatuko dugu:

- Informazio berfina `ipconfig /all` eginda agertzen da.
- Gainera, DHCP zerbitzaria 192.168.1.100 dela (gure zerbitzariko IP-a).

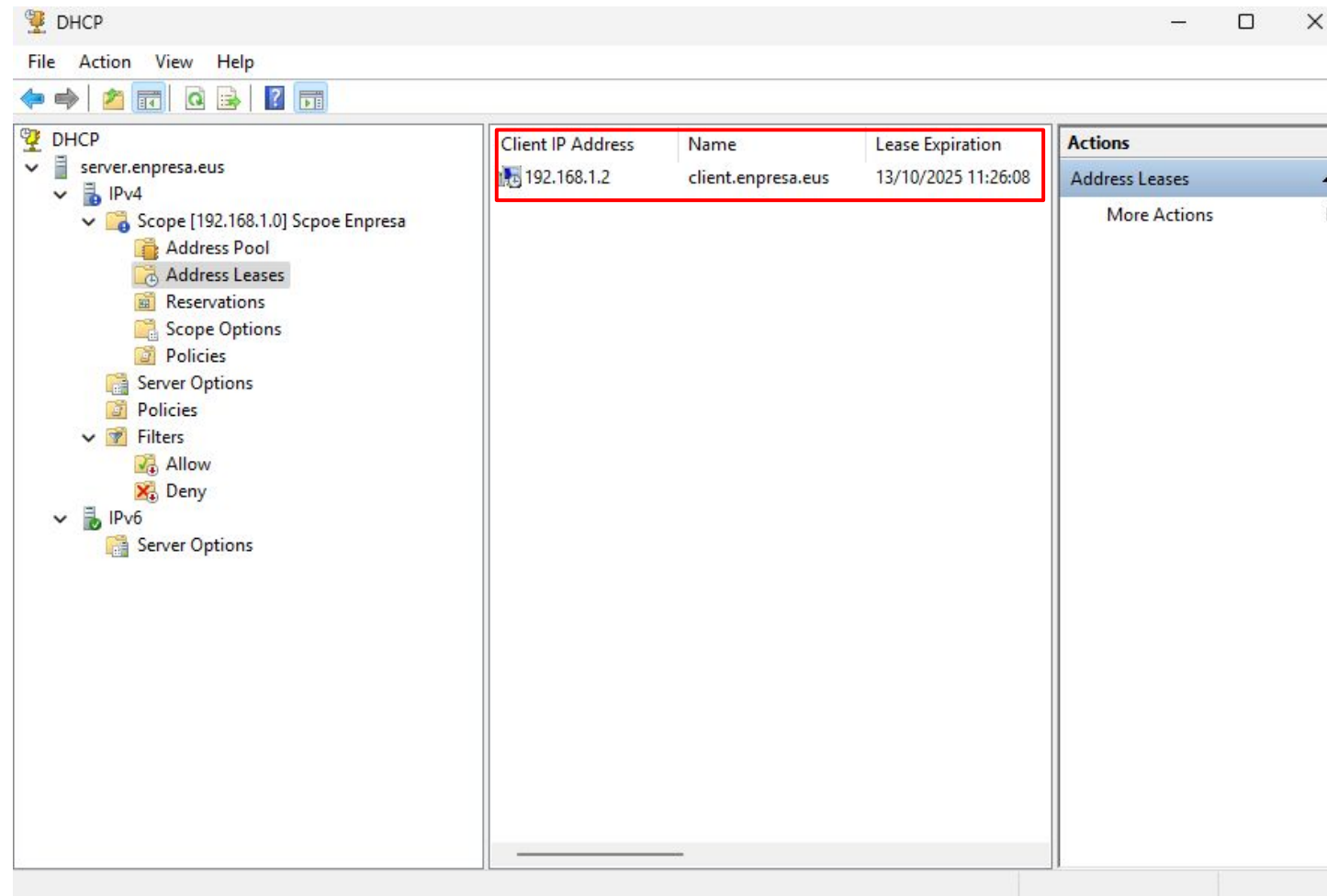
```
Ethernet adapter Ethernet:

Connection-specific DNS Suffix  . : enpresa.eus
Description . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
Physical Address. . . . . : 08-00-27-4D-1B-0C
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::d51d:dfb8:acc5:6228%3(Preferred)
IPv4 Address. . . . . : 192.168.1.2(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Sunday, October 5, 2025 11:25:58 AM
Lease Expires . . . . . : Monday, October 13, 2025 11:25:56 AM
Default Gateway . . . . . : 192.168.1.1
DHCP Server . . . . . : 192.168.1.100
DHCPv6 IAID . . . . . : 235405351
DHCPv6 Client DUID. . . . . : 00-01-00-01-30-55-D7-F9-08-00-27-4D-1B-0C
DNS Servers . . . . . : 192.168.1.100
NetBIOS over Tcpip. . . . . : Enabled
```



# DHCP - Egiaztapena

3. Behin IP helbidea erabiltzaileari esleituta, zerbitzariko DHCP aplikazioan ordenagailua eta esleitutako IP helbidea agertu beharko litzateke:



# DHCP - Egiaztapena

Arazoak edukitzean, bi komando daude probatzeko:

- `ipconfig /release`
- `ipconfig /renew`

Lehenengoa, DHCP-ak asignatutako IP helbidea libratzeko da.

Bigarrena, DHCP zerbitzariari IP helbide berri bat eskatzeko

**Arazoa ez bada konpontzen, ordenagailu guztia berbiarazi (makina birtualak bakarrik ez, zuen ordenagailua ere).**

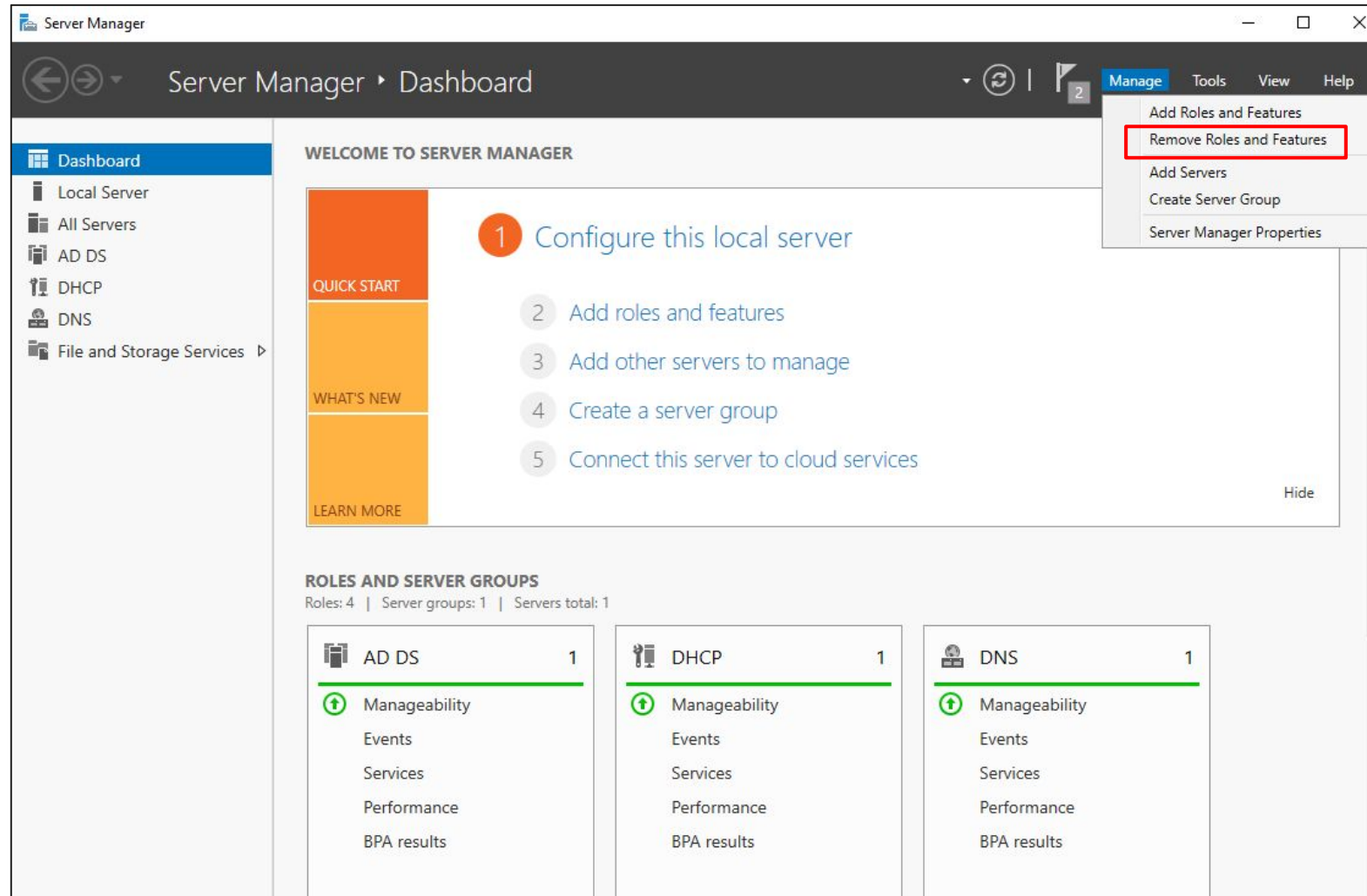
4

## **DHCP desinstalatzen**

(arazoak izaten badituzue  
bakarrik)

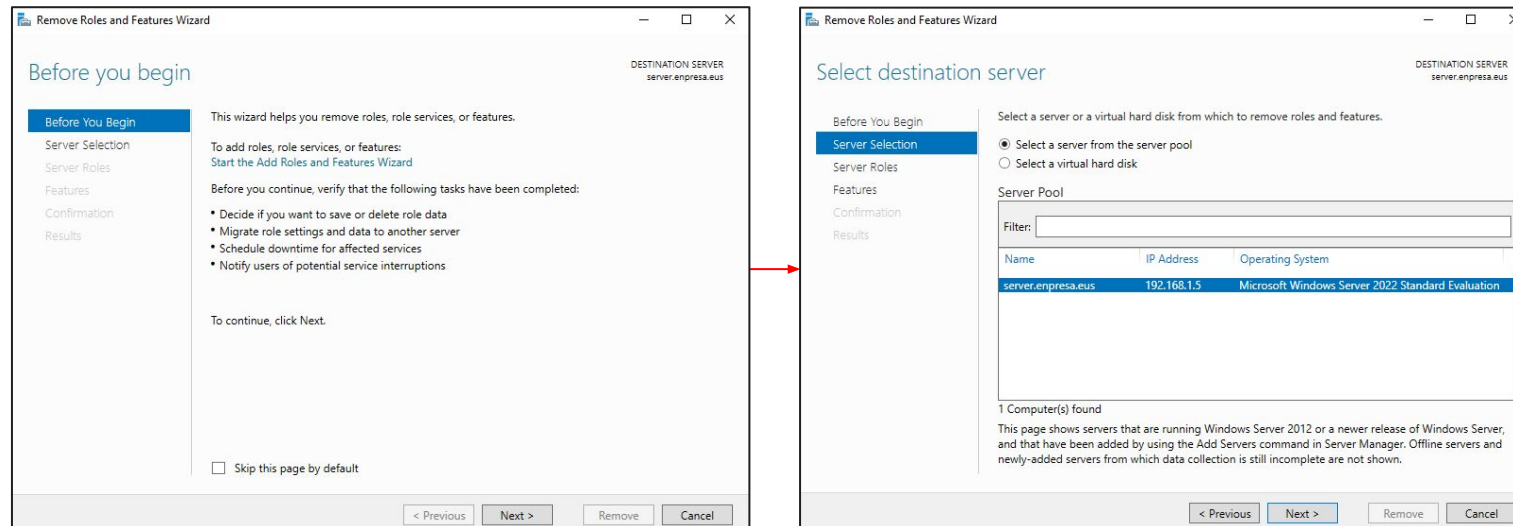
# DHCP - Desinstalatzen (GUI)

VirtualBox-eko DHCP zerbitzaria desinstalatuko dugu:



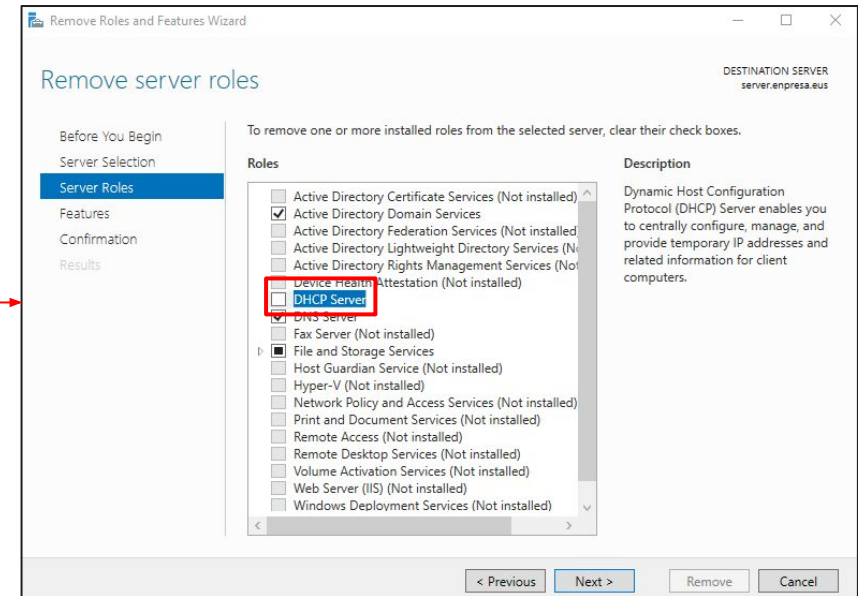
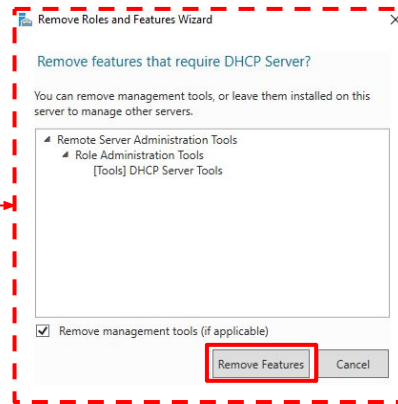
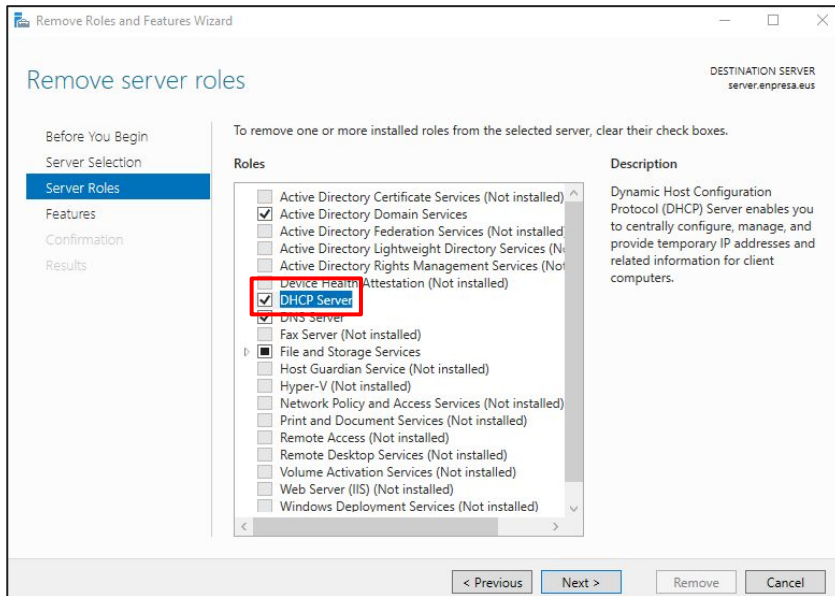
# DHCP - Desinstalatzen (GUI)

VirtualBox-eko DHCP zerbitzaria desinstalatuko dugu:



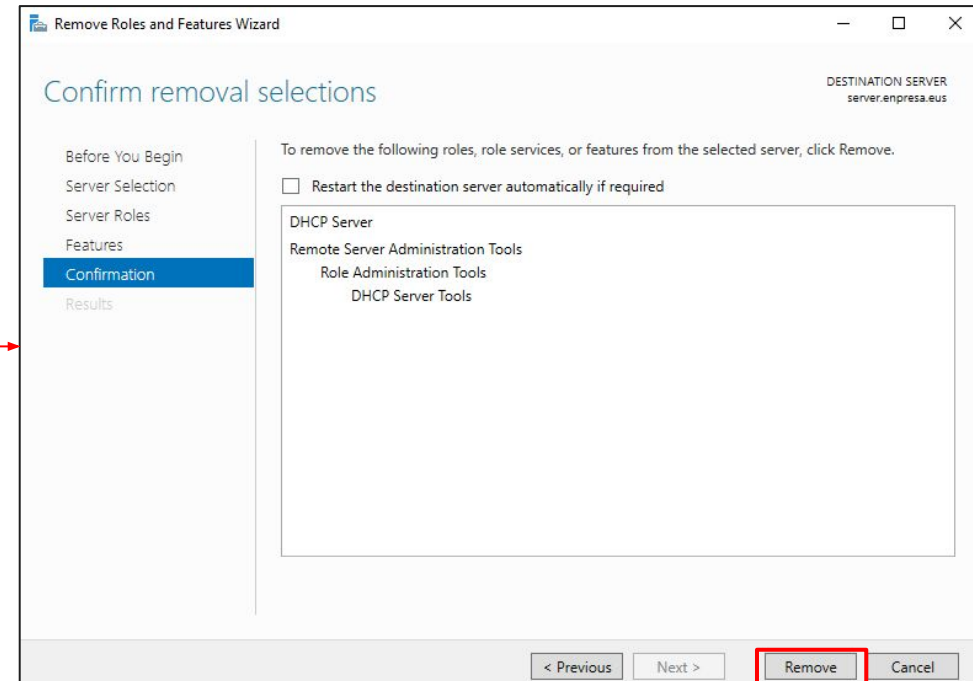
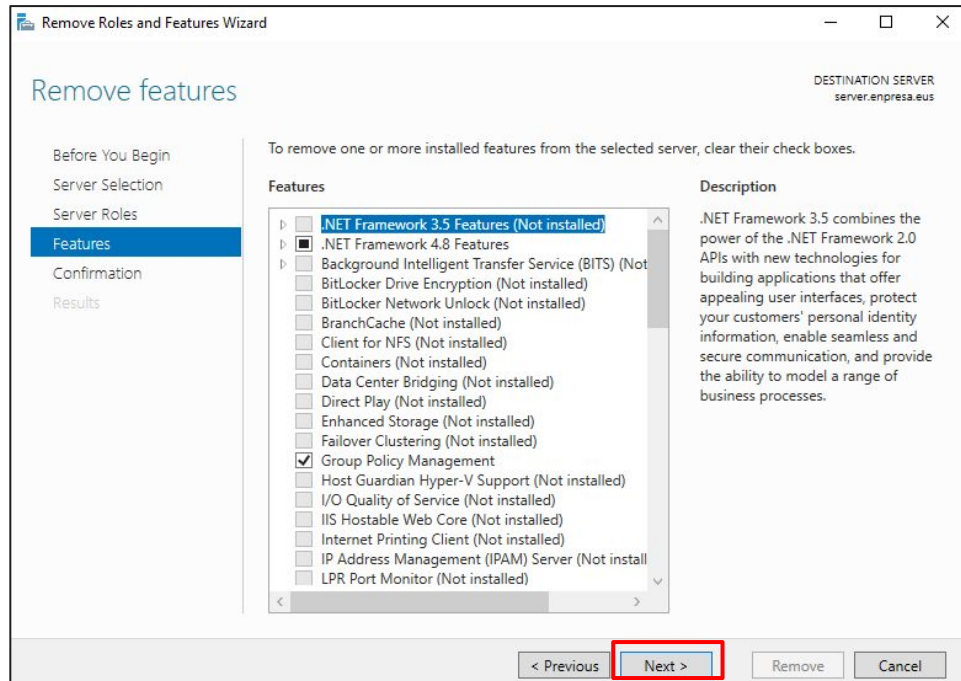
# DHCP - Desinstalatzen (GUI)

VirtualBox-eko DHCP zerbitzaria desinstalatuko dugu:



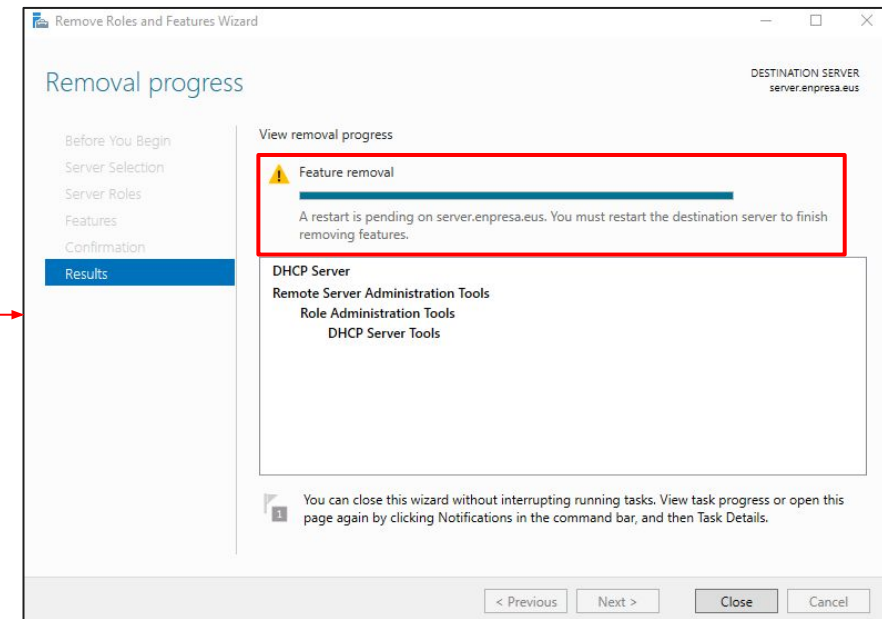
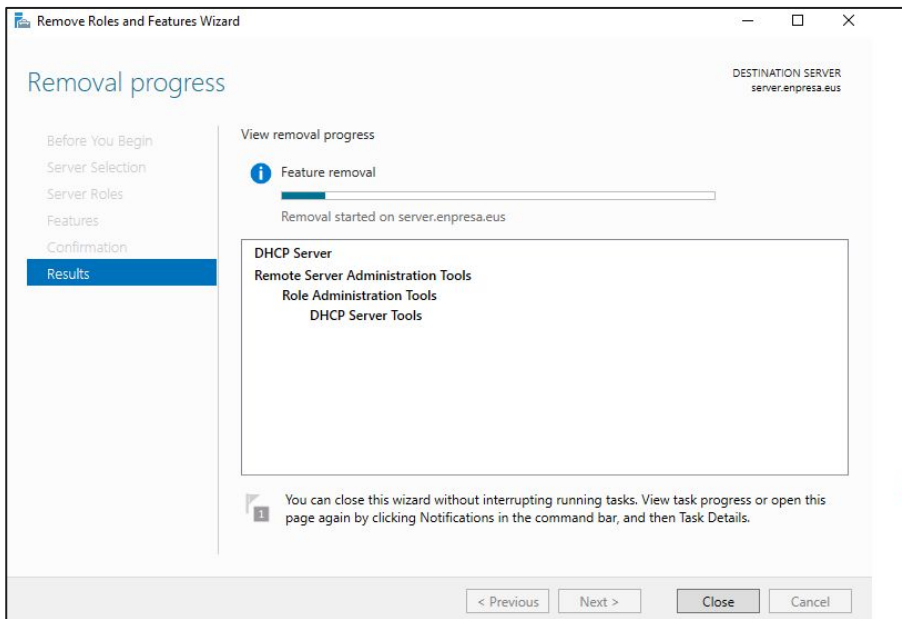
# DHCP - Desinstalatzen (GUI)

VirtualBox-eko DHCP zerbitzaria desinstalatuko dugu:



# DHCP - Desinstalatzen (GUI)

VirtualBox-eko DHCP zerbitzaria desinstalatuko dugu:

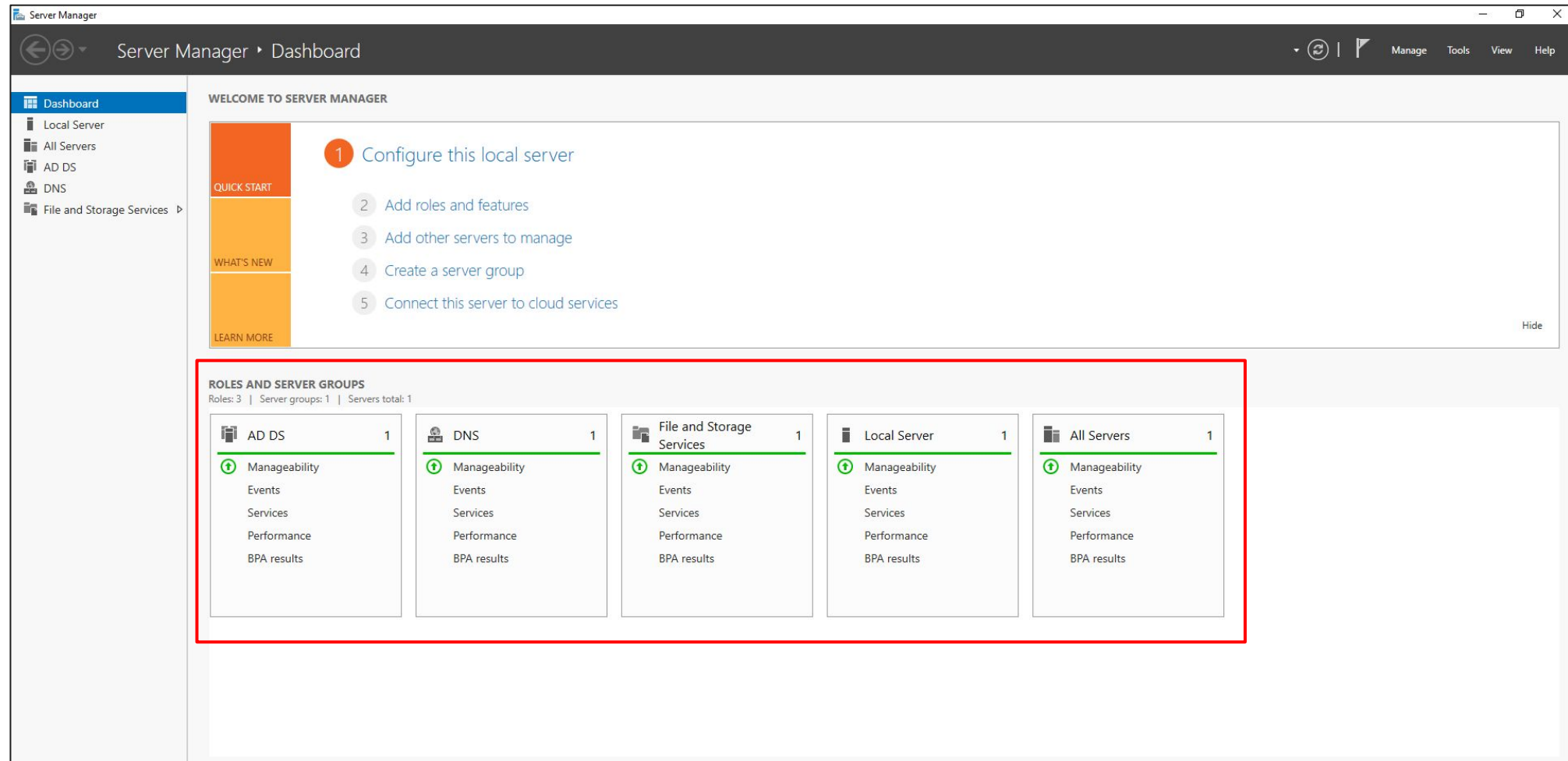


BERBIARAZI



# DHCP - Desinstalatzen (GUI)

VirtualBox-eko DHCP zerbitzaria desinstalatuko dugu:



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