

# Serviços de Rede 1 – **Lesson 4 - Practices**

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Instituto Politécnico de Coimbra

Departamento de Engenharia Informática



## Exercise 1 - Configure the simulation environment

# Exercise 1

- Establish a VPN connection to access ISEC resources.
- Copy the images of the virtual machines and the VirtualBox installer.
- Install VirtualBox.
- Start up with VirtualBox.
- Import images from Windows 2012 Server and Windows 10.
- Change the name of the machines in VirtualBox to:
  - Windows2012r2 for “Server”.
  - Windows 10 for “Client”.
- Adjust some parameters (RAM, Disk, etc.) to increase the performance of virtual models. This "adjustment" is dependent on the characteristics of the host machine (ie your PC).

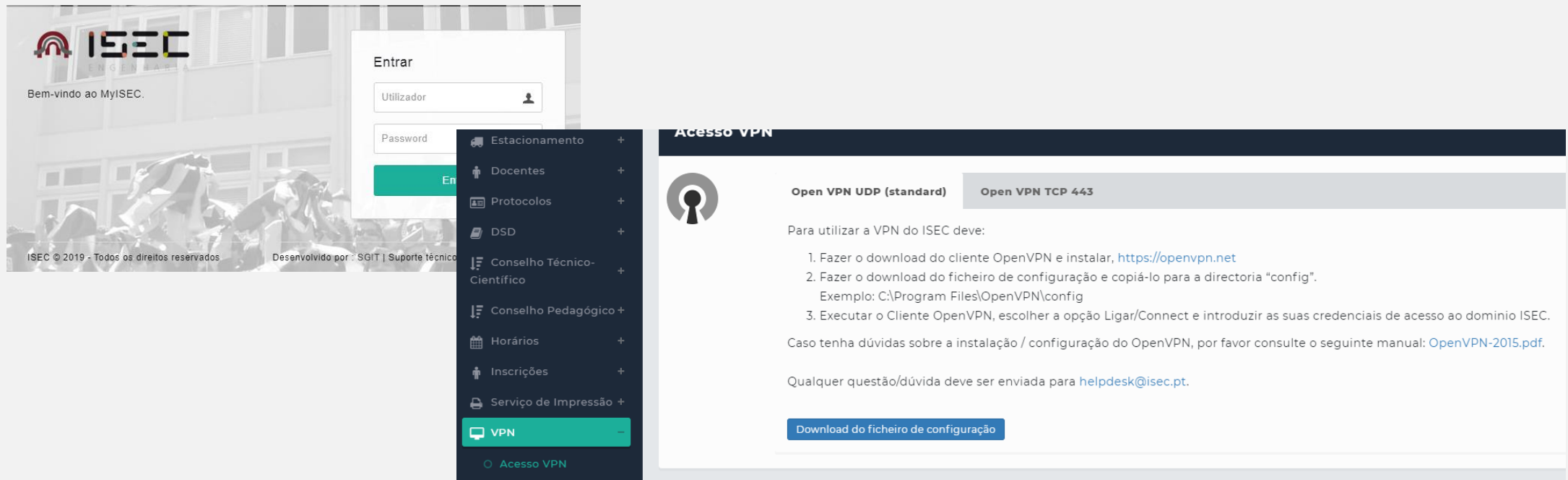
How To

# Configure the simulation environment

- To access machine images and because you are on a remote basis, you must access ISEC's VPN. My.isec.pt has an explanation of how to do this.
- The concept of VPN arose from the need to use unreliable communication networks (therefore not secure: the Internet) for the transmission of private data in a secure way.
- The connection is made through the creation of an encrypted tunnel over the public communications network to ensure mechanisms of security and confidentiality of information.
- ISEC uses the openVPN solution that you will have to install on your computer.

# Configure the simulation environment

- Access my.isec.pt



The image shows two screenshots of the my.isec.pt website. The left screenshot displays the login page with the ISEC logo, a welcome message, and a sidebar menu. The right screenshot shows the VPN access page with instructions for using the VPN.

**Entrar**

Utilizador

Password

**Entrar**

**VPN**

**Acesso VPN**

**Open VPN UDP (standard)** **Open VPN TCP 443**

Para utilizar a VPN do ISEC deve:

1. Fazer o download do cliente OpenVPN e instalar, <https://openvpn.net>
2. Fazer o download do ficheiro de configuração e copiá-lo para a directoria "config".  
Exemplo: C:\Program Files\OpenVPN\config
3. Executar o Cliente OpenVPN, escolher a opção Ligar/Connect e introduzir as suas credenciais de acesso ao domínio ISEC.

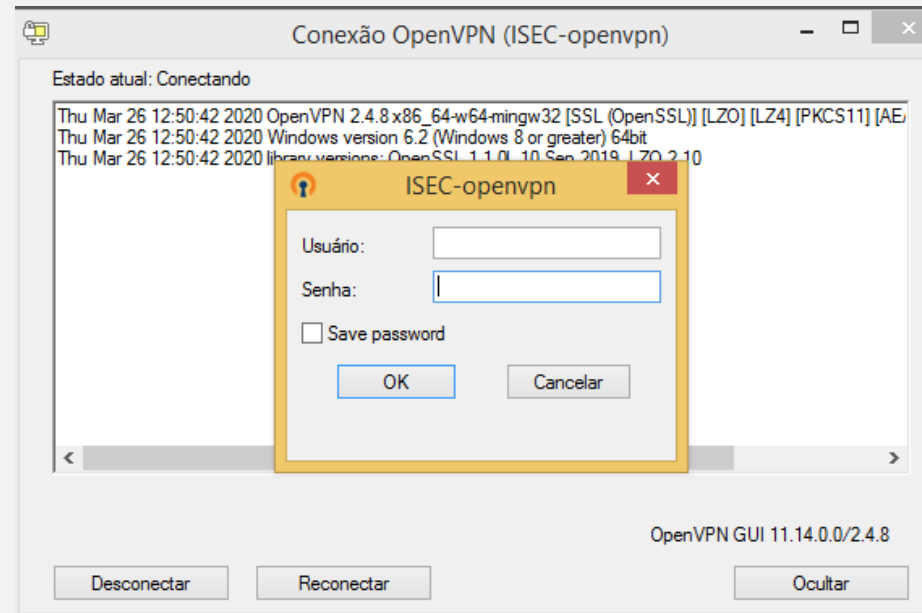
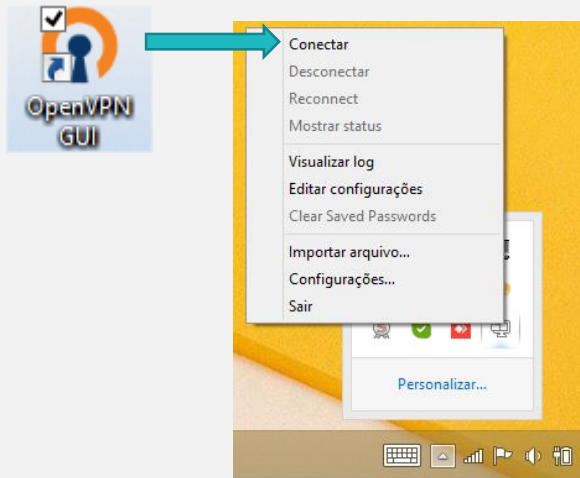
Caso tenha dúvidas sobre a instalação / configuração do OpenVPN, por favor consulte o seguinte manual: [OpenVPN-2015.pdf](#).

Qualquer questão/dúvida deve ser enviada para [helpdesk@isec.pt](mailto:helpdesk@isec.pt).

**Download do ficheiro de configuração**

# Configure the simulation environment

- To access the internal resources of ISEC you will need to connect the VPN.



# Configure the simulation environment

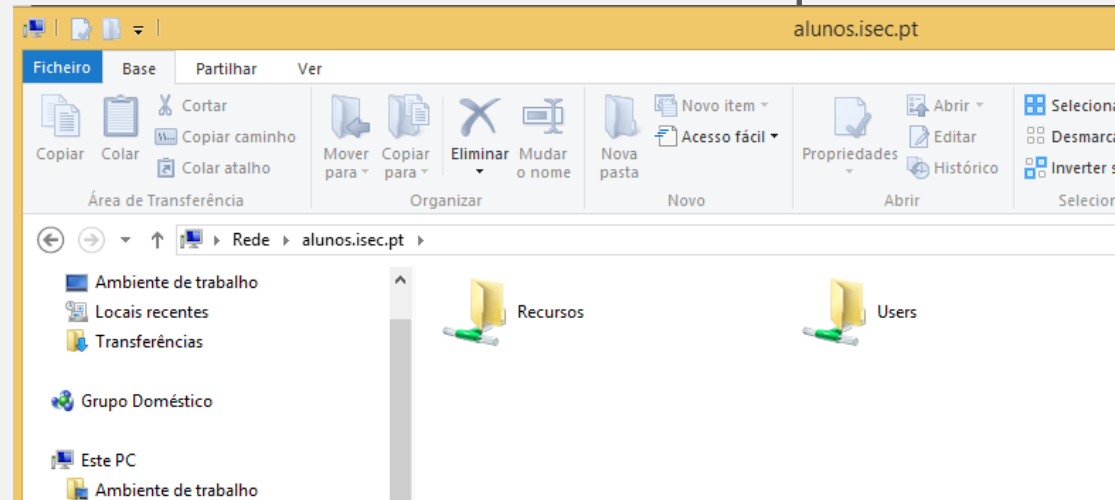
- Open for example the Windows explorer and type:

**\\ alunos.isec.pt**

- If you are asked to authenticate, be sure to put your domain information before your username:

**isec \ username**

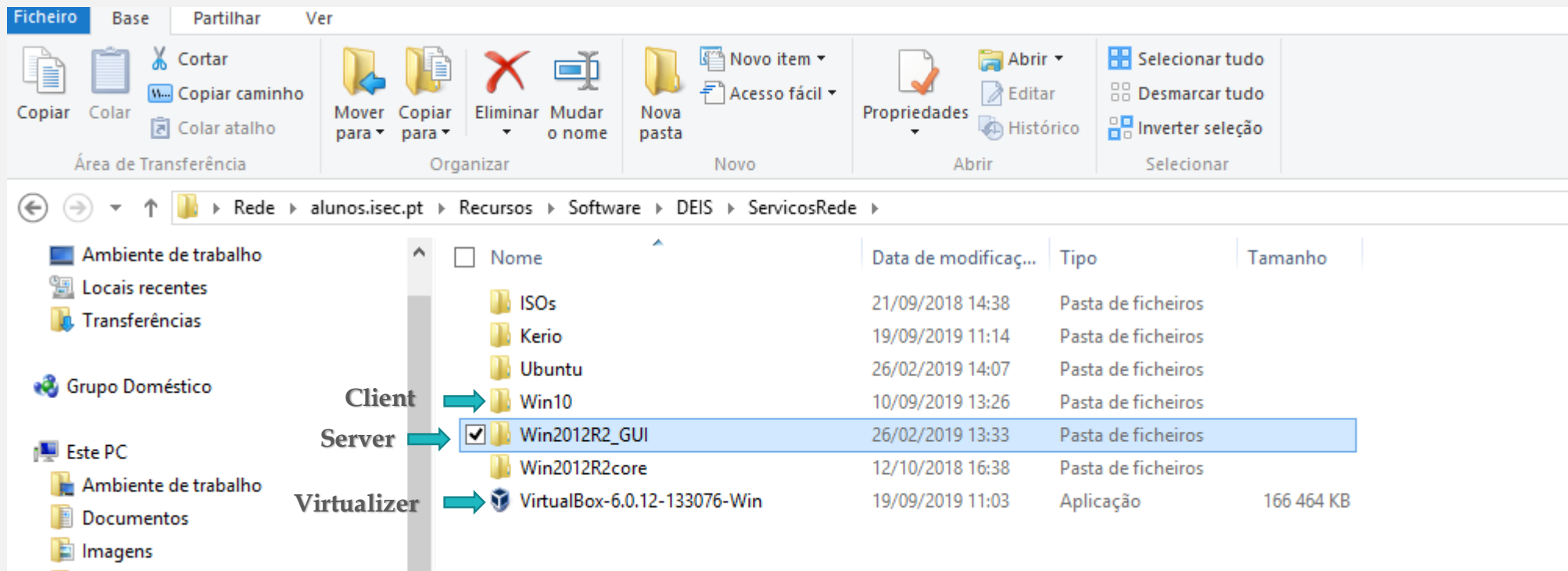
- When accessing, you should have a window equal to





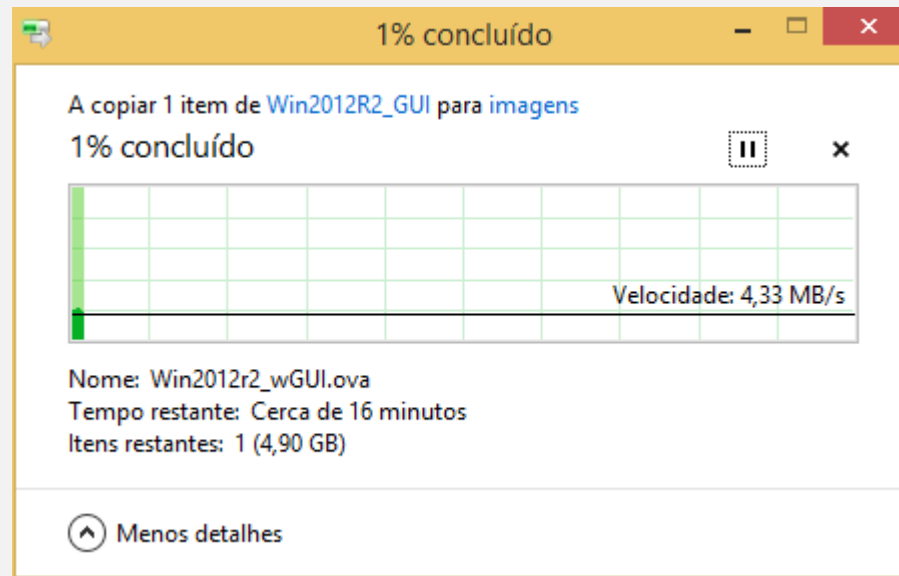
# Configure the simulation environment

- The virtual machines and VirtualBox are at:  
[\Recursos\Software\DEIS\ServicosRede](#)



# Configure the simulation environment

- Copy the folders and files indicated on the previous slide to your physical machine.
- Due to the volume of information, you should do it individually and not all at once.

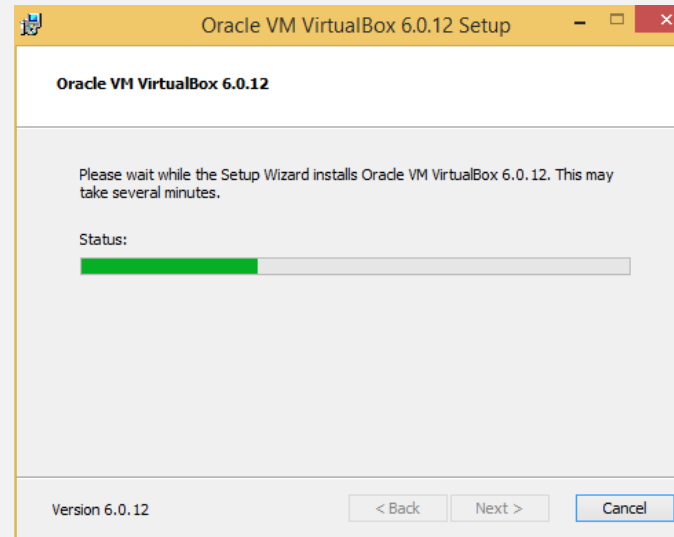
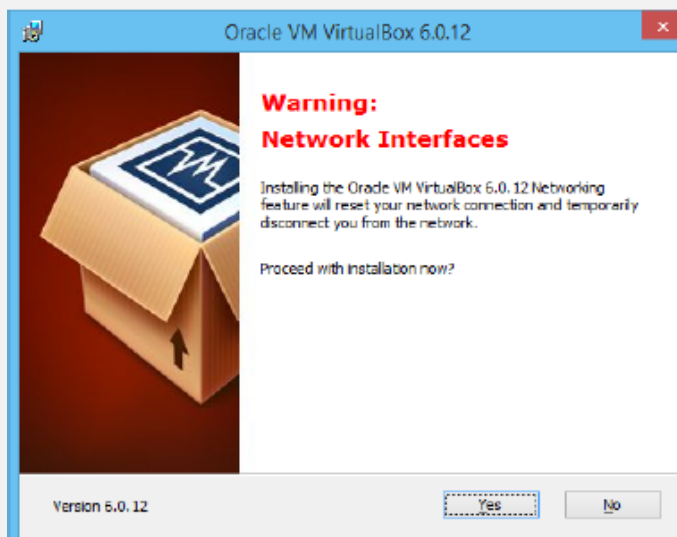
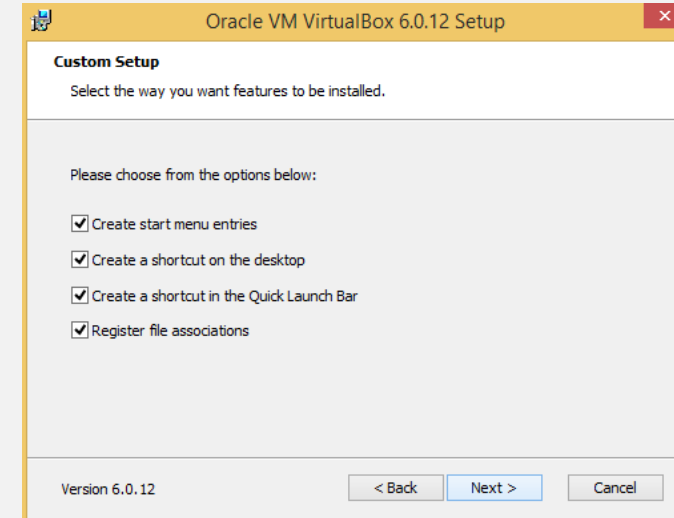
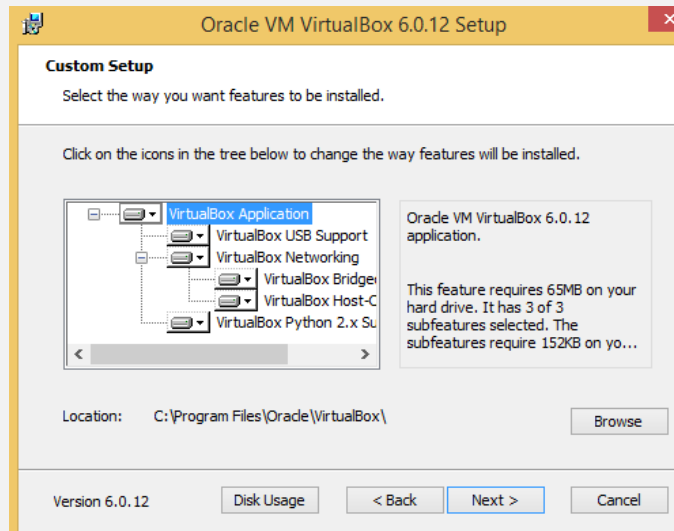


# Configure the simulation environment

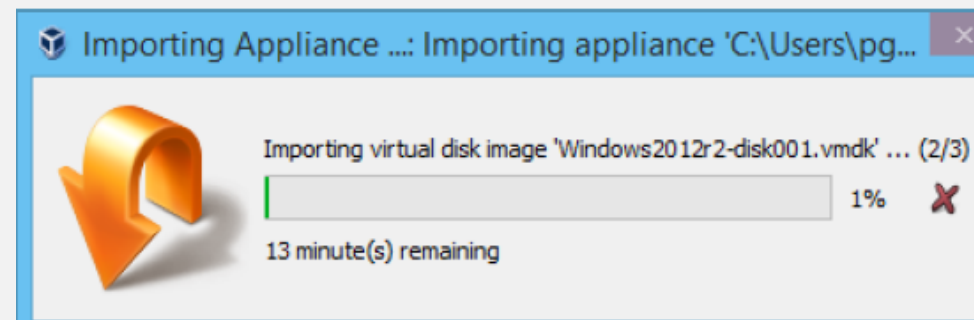
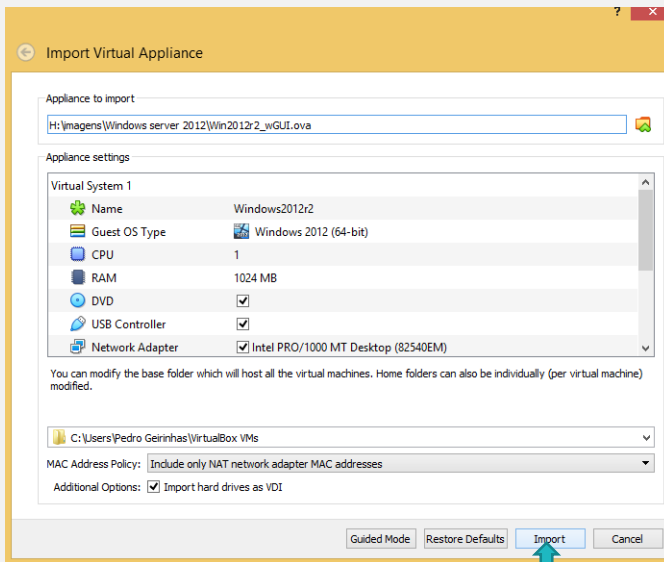
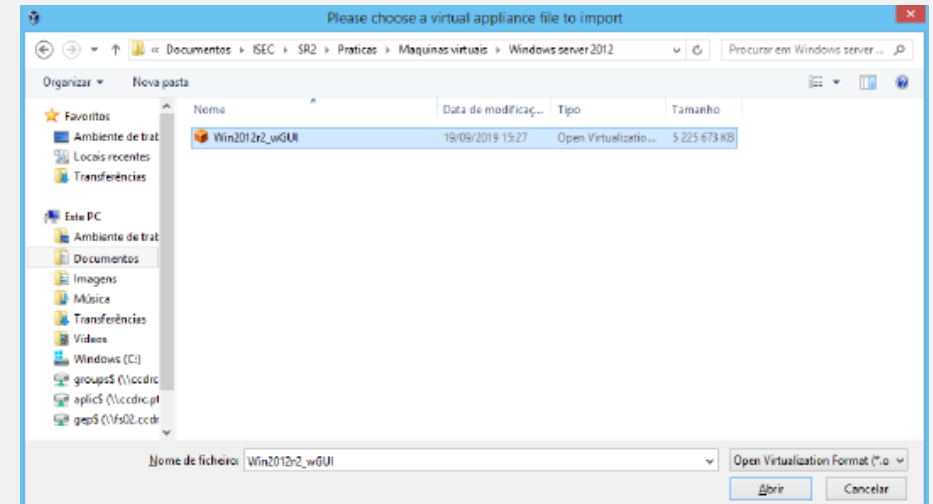
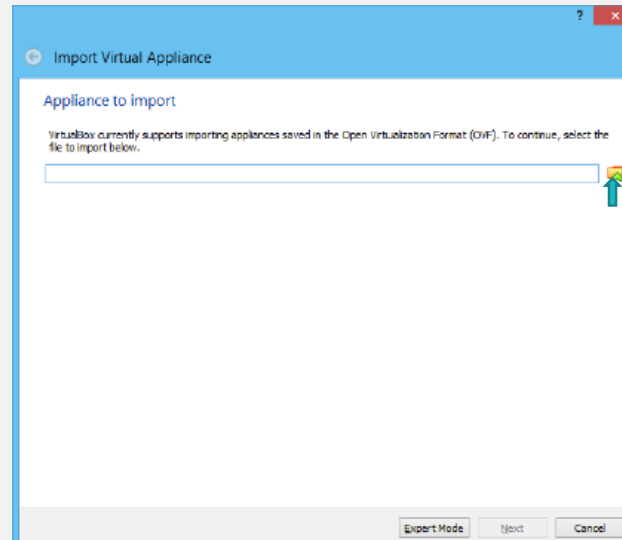
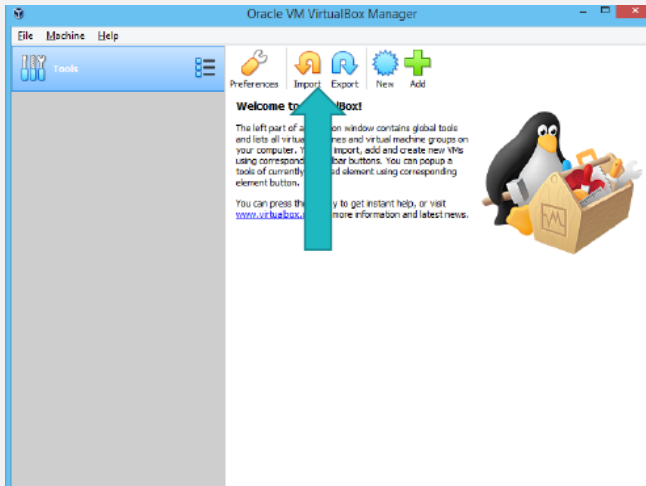
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- You should save OVA files whenever you need a “clean machine” to be able to re-create or import it.
- Copy and install Oracle VM VirtualBox. The images were made for version 6.0.12 of VirtualBox so this must be the version you should use..
- **Note: The Virtual Box will be used in the images and exercises, so it is advisable to use this tool and not another program.**

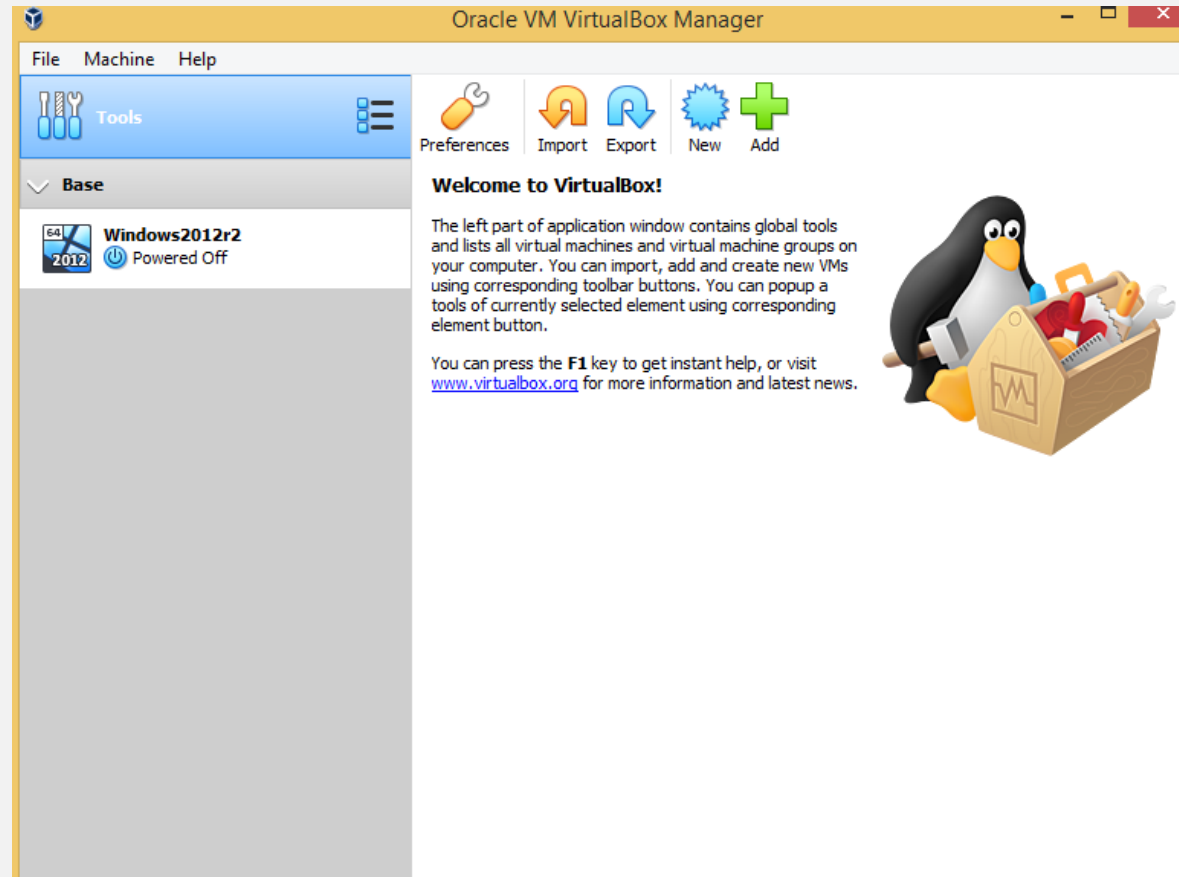
# Installing VirtualBox



# Importing Virtual Machines

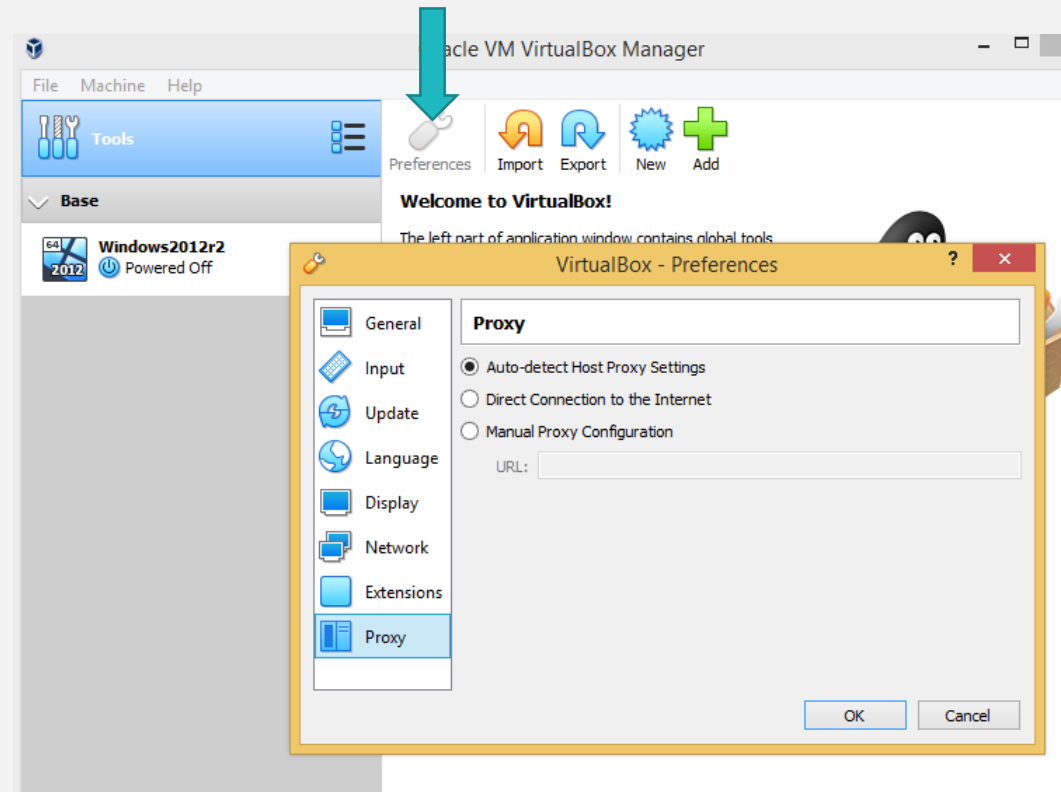
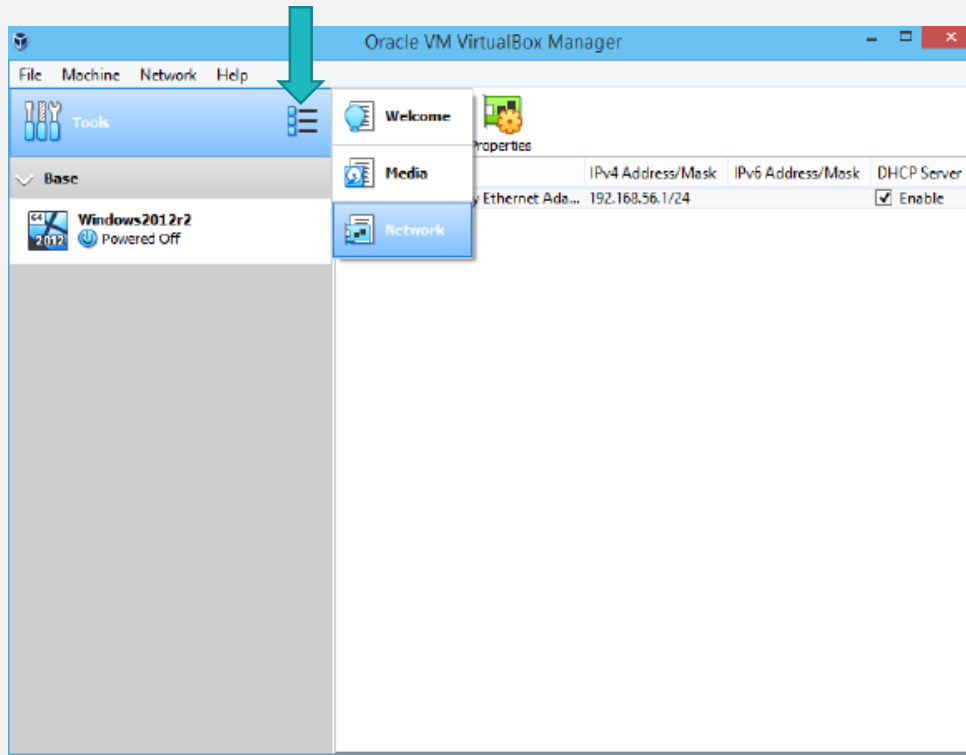


# Virtual Box



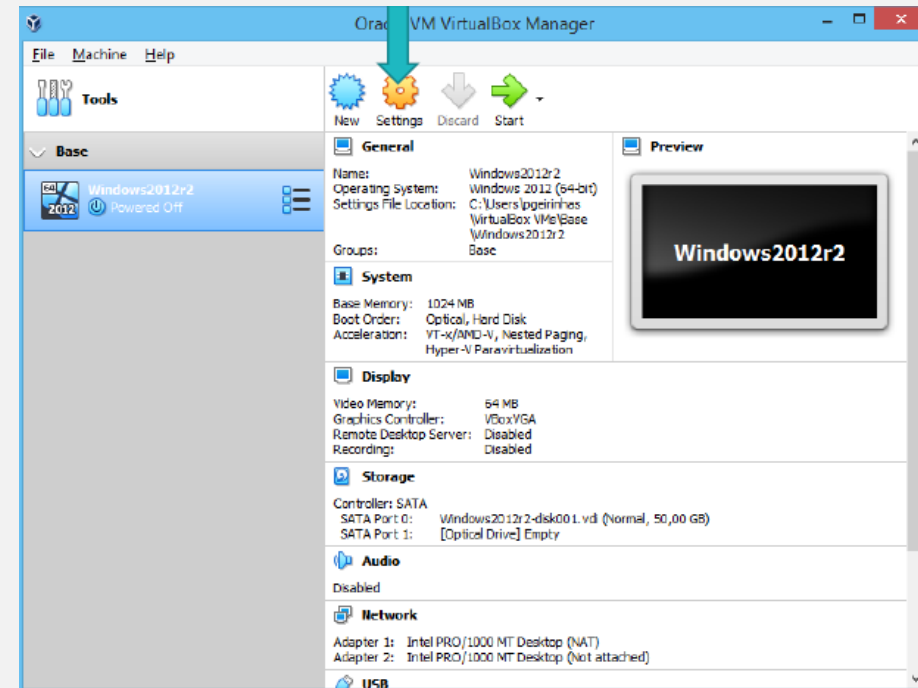
# Virtual Box

- You can manage VirtualBox options:



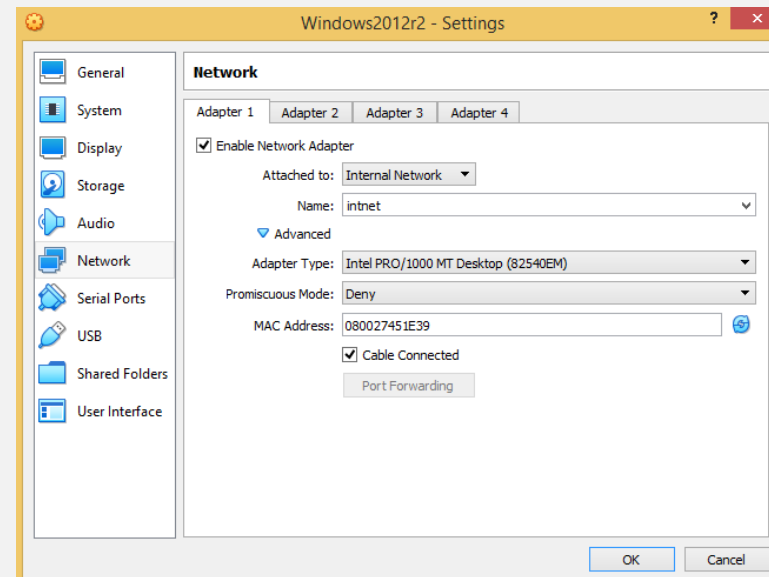
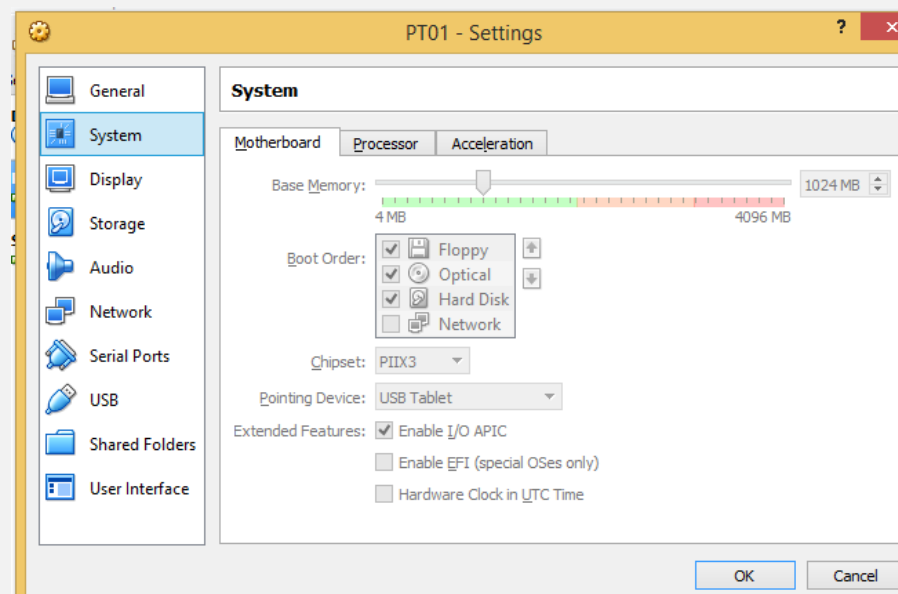
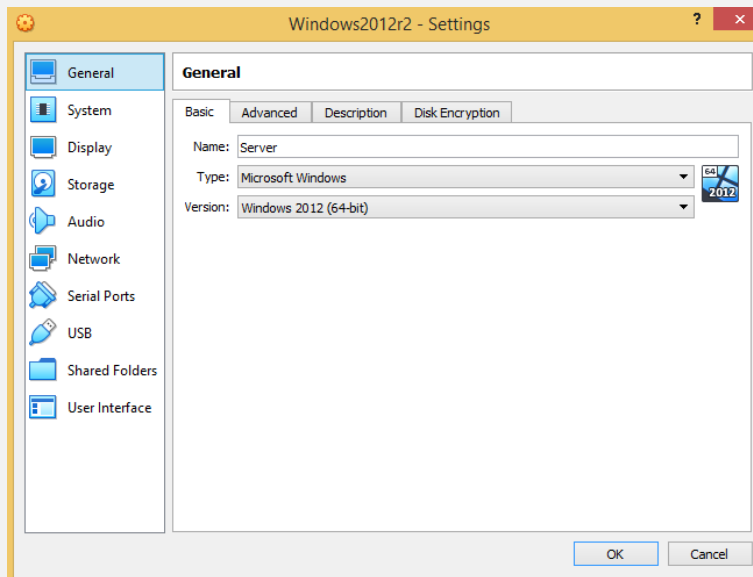
# Virtual Box

- You can manage your virtual machine settings. For example:
  - **General:** the name of the machine.
  - **System:** RAM and CPU.
  - **Storage:** HardDisk (virtual) and CD / DVD
  - **Network:** Network interfaces.
  - **Shared Folder:** allows you to configure a folder to share information between the physical and the virtual machine.



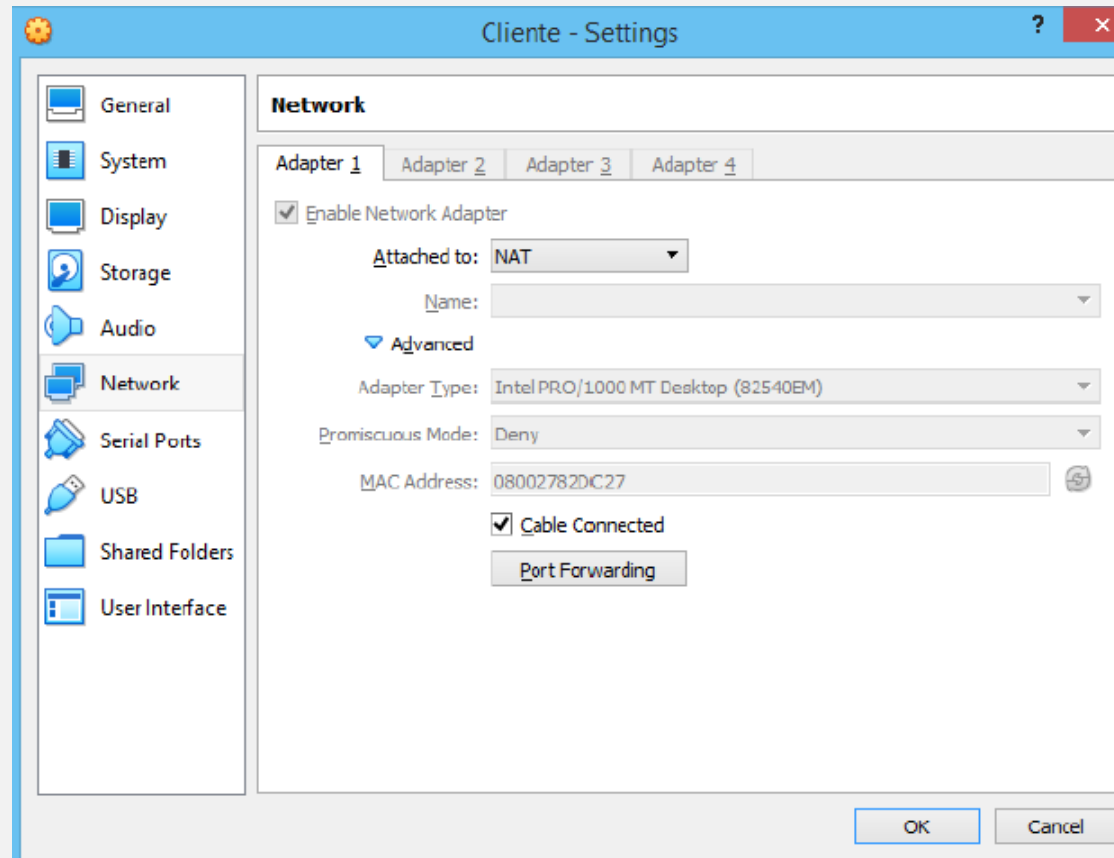


# Virtual Box



# Virtual Box

- You can change the type of network or add other adapters to your virtual machine:



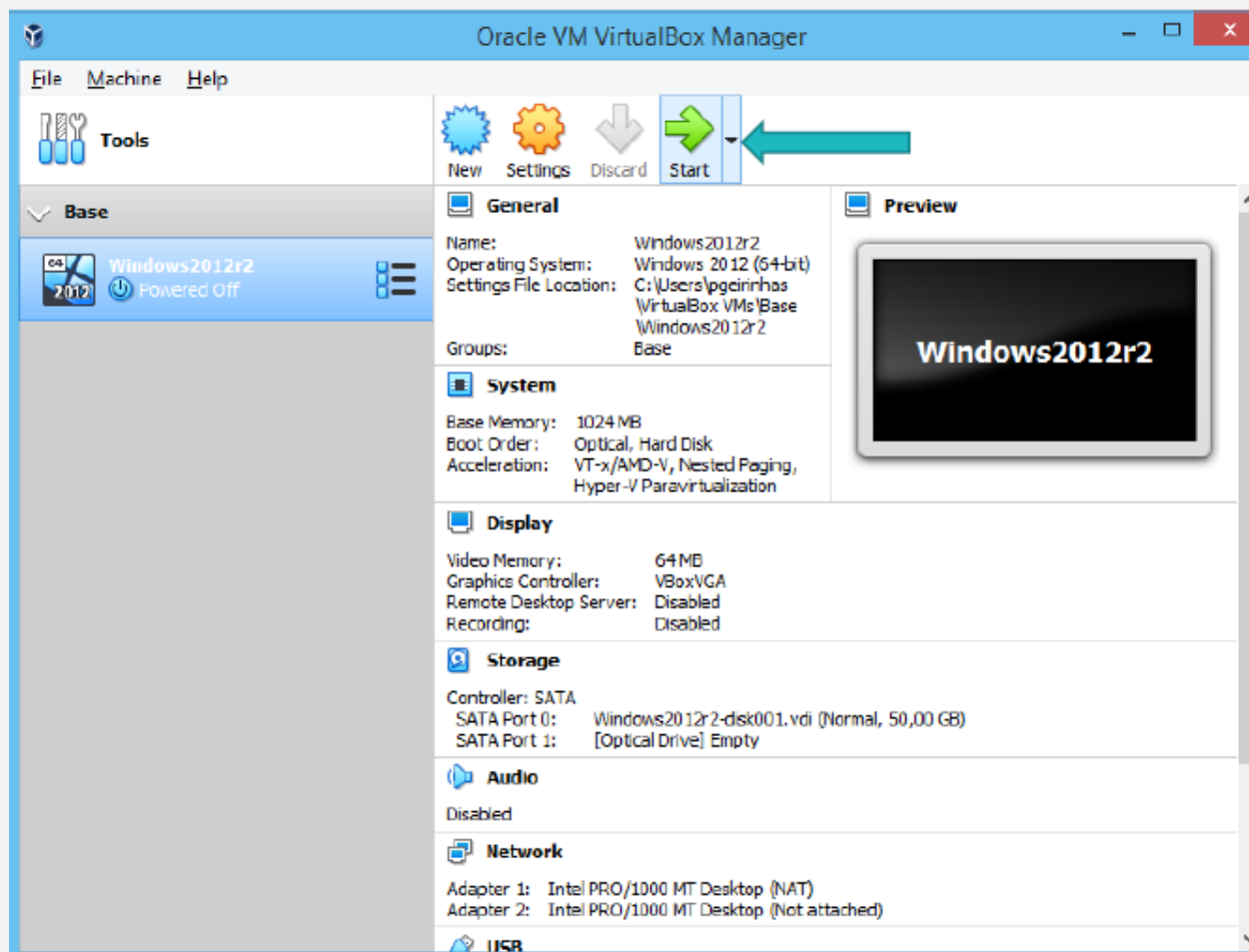
## Exercise 2 - Change some machine parameters, services and events

## Exercise 2

- Start with Windows Server 2012. Make your initial configuration.
- The password for the administrator user is 1qazZAZ!
- Change the Windows Server 2012 machine name to ServSR1.
- See the services that are running on your server.
- What is the status of the Workstaion service? Restart this service.
- See windows system events. Review the most recent ones.
- Delete the “Application”, “Security” and “System” events.
- See how your server is performing.
- See how your server's hardware resources are being used.

How To

# Start with a machine



# Server - Initial configuration

## Settings

Country or region	Portugal ▼
App language	Portuguese (Portugal) ▼
Keyboard layout	Portuguese ▼

Next

POR

## ← Settings

Please read the license terms.

### MICROSOFT SOFTWARE LICENSE TERMS

#### MICROSOFT WINDOWS SERVER 2012 R2 STANDARD

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft:

- updates,
- supplements,
- Internet-based services, and
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**By using the software, you accept these terms. If you do not accept them, do not use the software.**

**Instead, return it to the retailer for a refund or credit.** If you cannot obtain a refund there, contact Microsoft or the Microsoft affiliate serving your country for information about Microsoft's refund policies. See [www.microsoft.com/worldwide](http://www.microsoft.com/worldwide). In the United States and Canada, call (800) MICROSOFT or see [www.microsoft.com/info/nareturns.htm](http://www.microsoft.com/info/nareturns.htm).

**As described below, using some features also operates as your consent to the transmission of certain standard computer information for Internet-based services.**

**EVALUATION USE NOTICE:** If you are using an evaluation version of the software, then the

I accept

POR


# Server - Initial configuration

⬅ Settings

Type a password for the built-in administrator account that you can use to sign in to this computer.

User name

Password

Reenter password  

Press Ctrl+Alt+Delete to sign in.

17:30

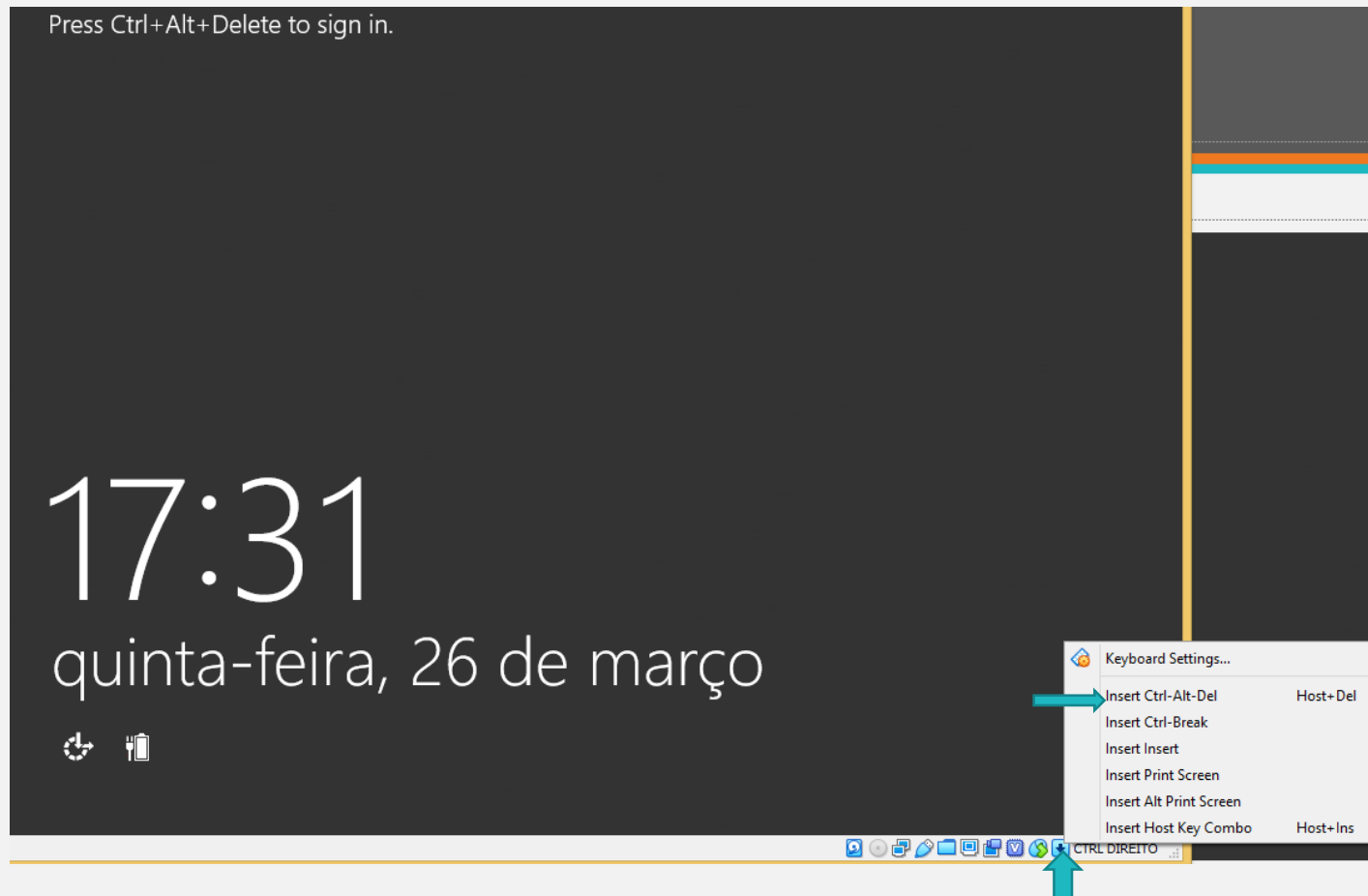
quinta-feira, 26 de março



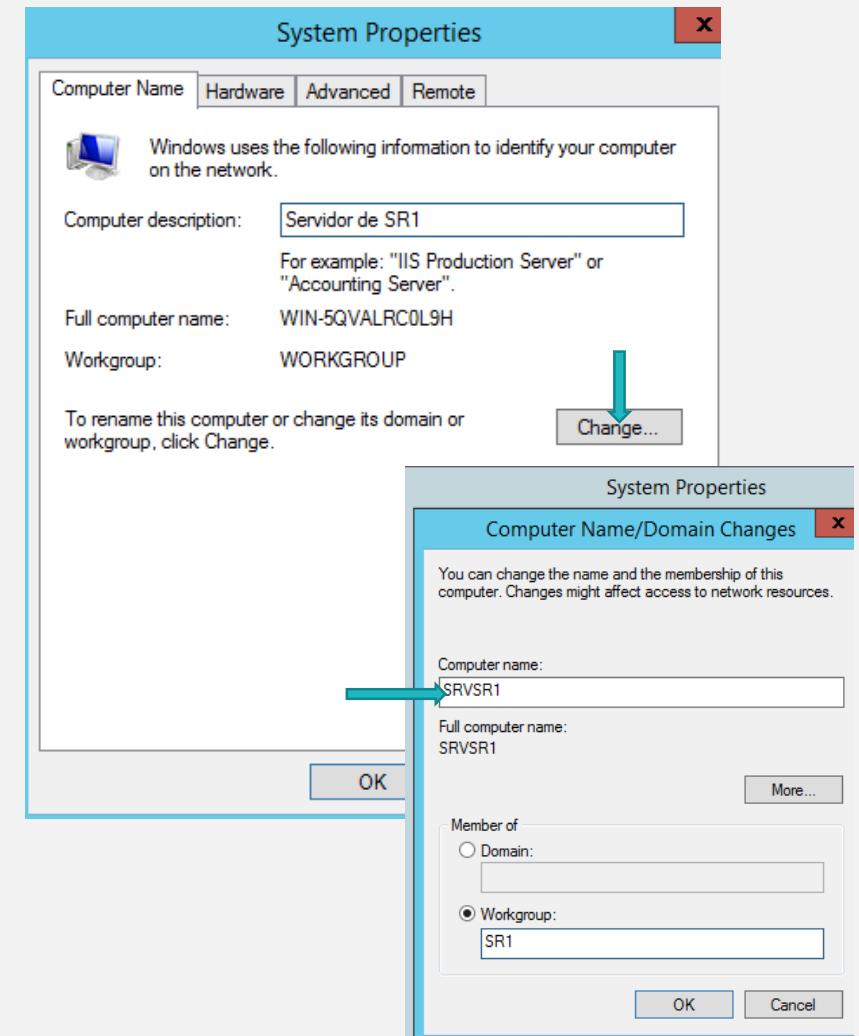
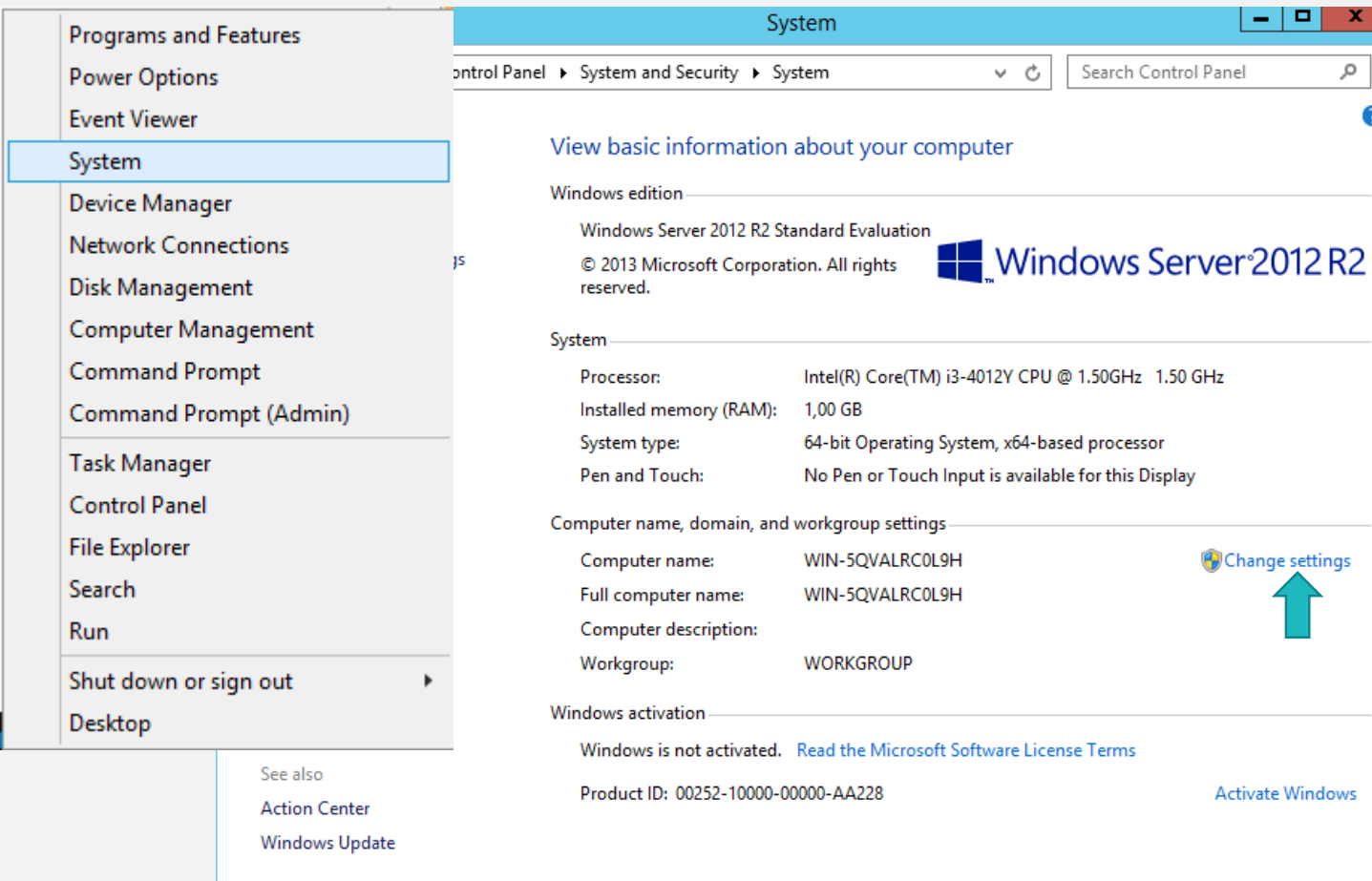


# Server

- Clique com o botão do lado esquerdo do rato:



# Change the name and domain of a server



# Services

The image shows a Windows Services console window and a Workstation Properties dialog box. The Services console is open to 'Services (Local)', displaying a list of services. The 'Workstation Properties (Local Computer)' dialog box is open to the 'General' tab, showing details for the 'LanmanWorkstation' service.

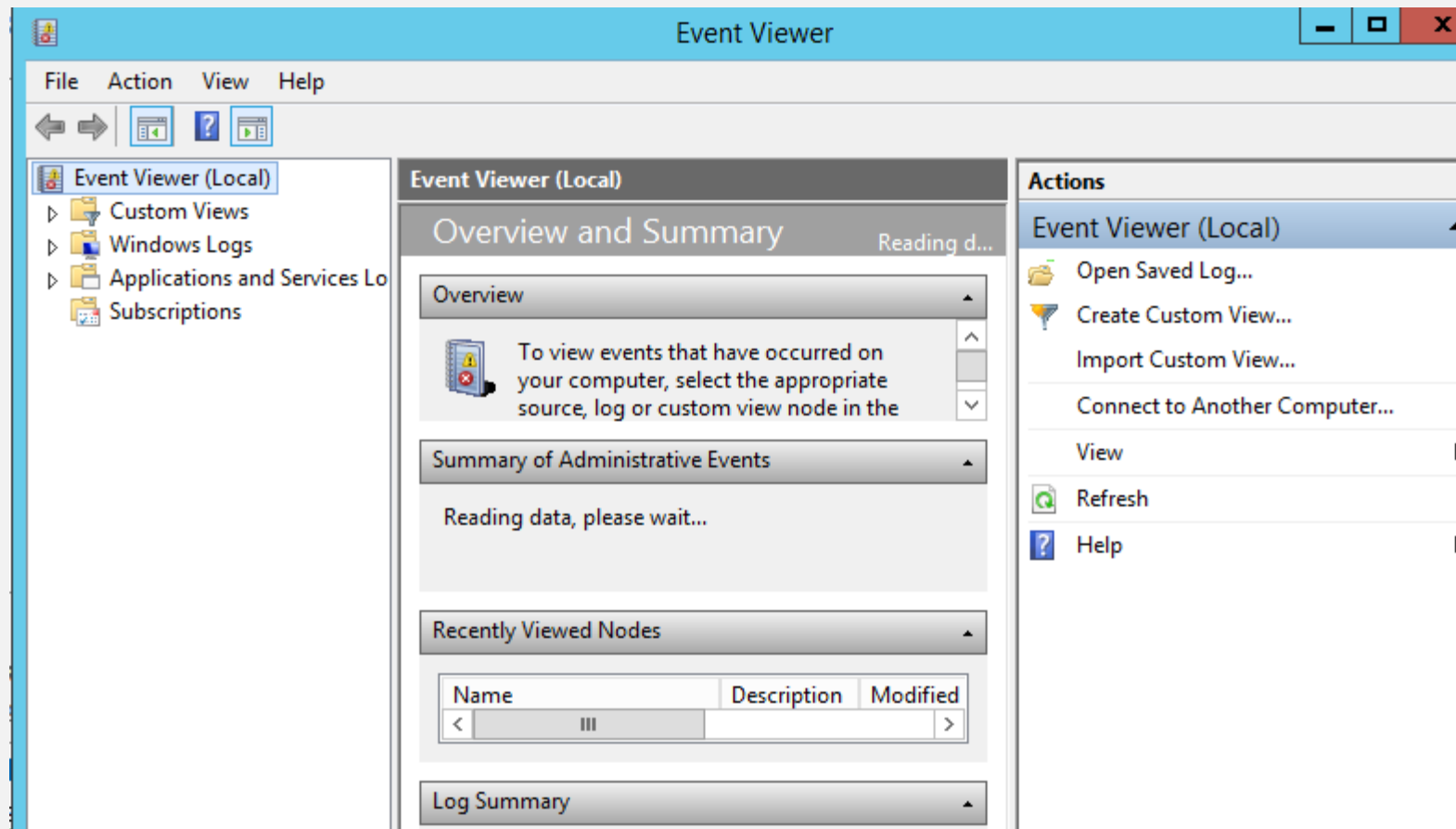
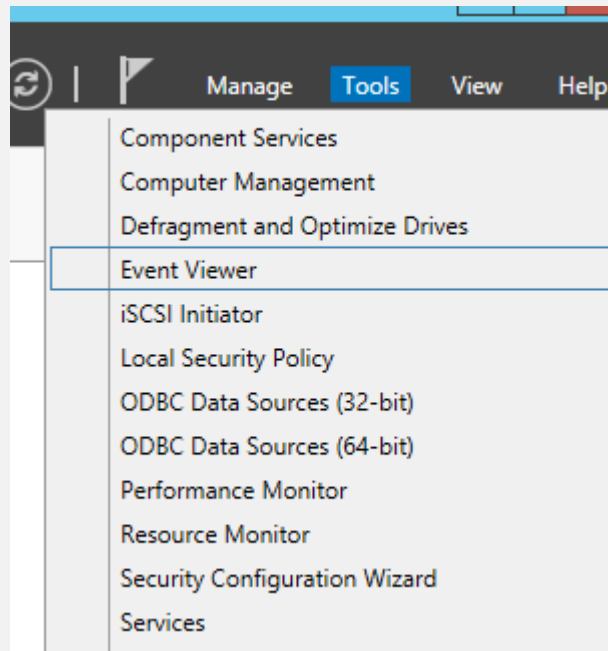
**Services (Local) Console:**

Name	Description	Status
App Readiness	Gets apps re...	M
Application Experience	Processes a...	M
Application Identity	Determines ...	M
Application Information	Facilitates t...	M
Application Layer Gateway ...	Provides su...	M
Application Management	Processes in...	M
AppX Deployment Service (...)	Provides inf...	M
Background Intelligent Tran...	Transfers fil...	M
Background Tasks Infrastru...	Windows in...	Running
Base Filtering Engine	The Base Fil...	Running
Certificate Propagation	Copies user ...	M
CNC K...	The CNC is	M

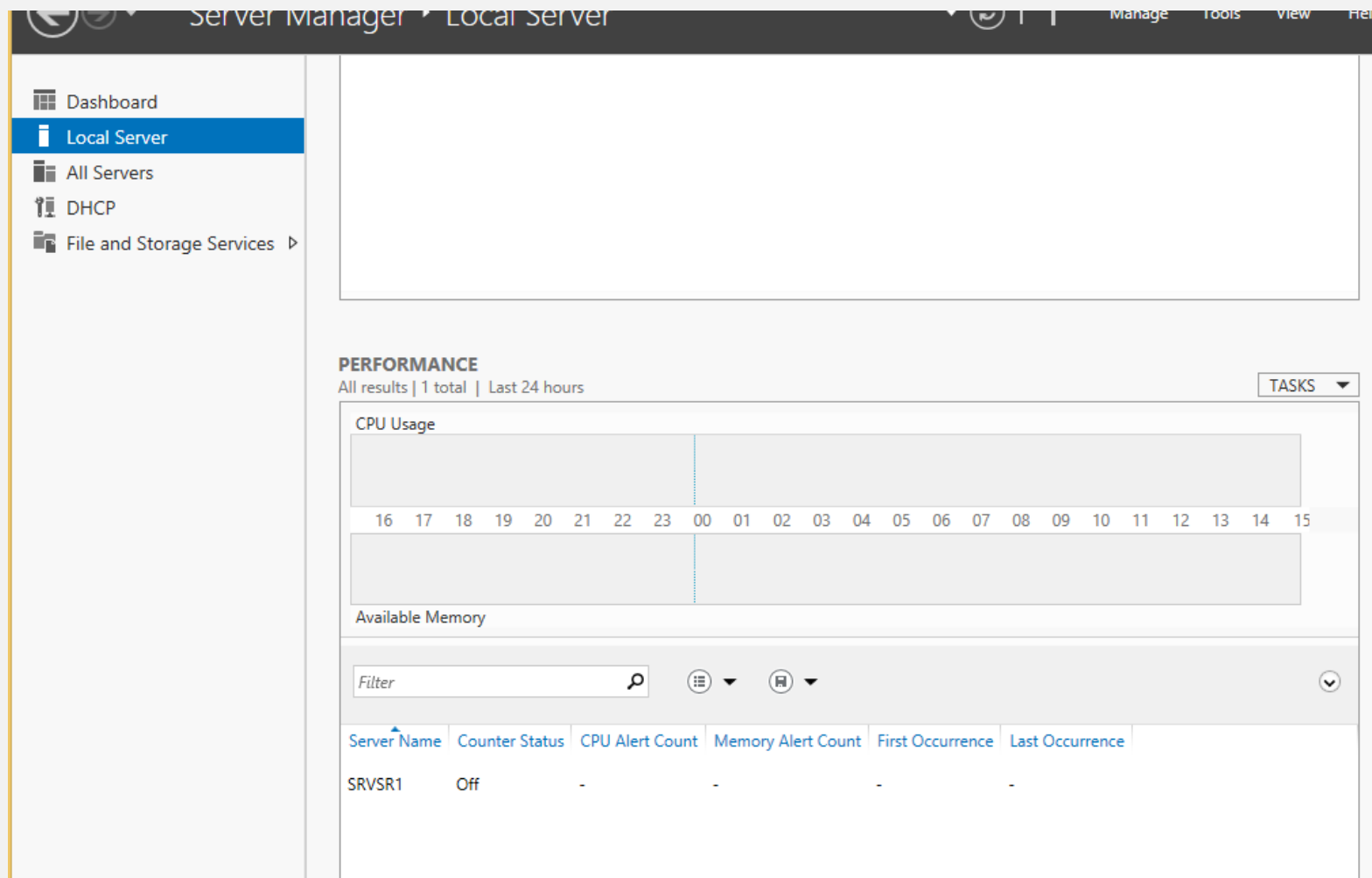
**Workstation Properties (Local Computer) - General Tab:**

- Service name: **LanmanWorkstation**
- Display name: **Workstation**
- Description: **Creates and maintains client network connections to remote servers using the SMB protocol. If this**
- Path to executable: **C:\Windows\System32\svchost.exe -k NetworkService**
- Startup type: **Automatic**
- Service status: **Running**
- Buttons: **Start**, **Stop**, **Pause**, **Resume**
- Start parameters: **[Empty text box]**

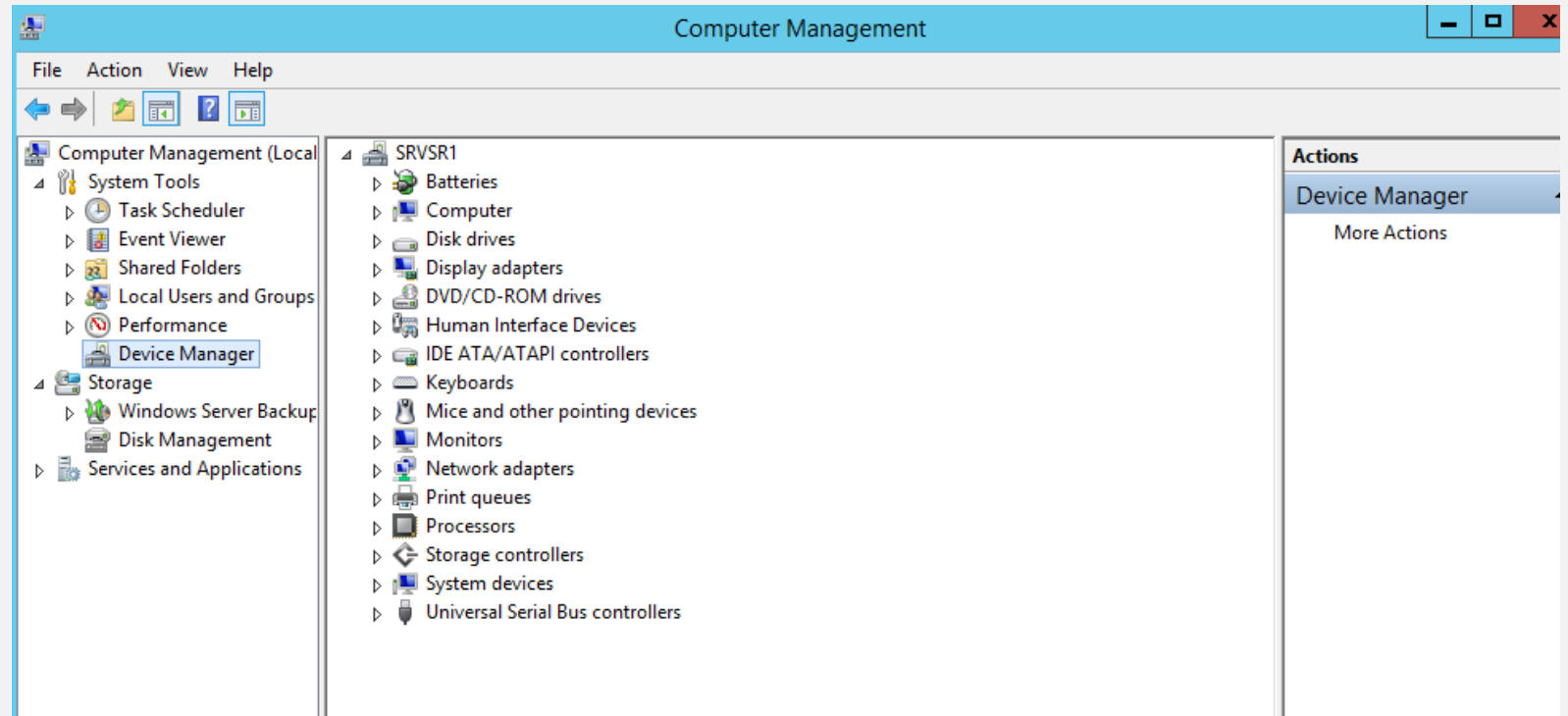
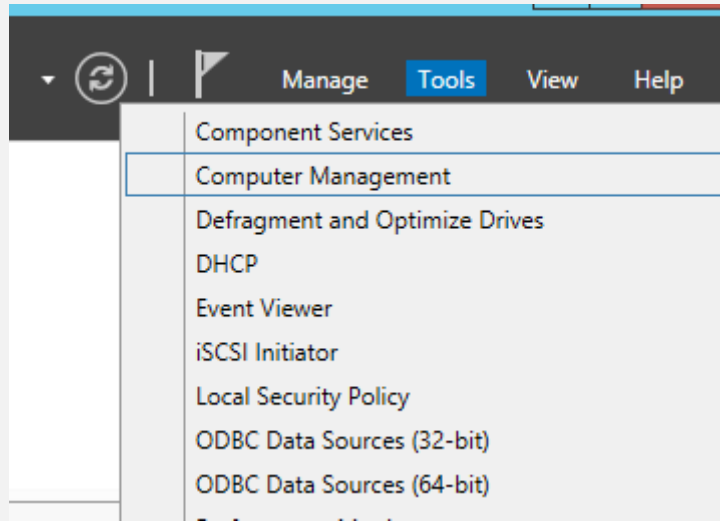
# Events



# Performance



# Device Manager



## Exercise 3 - Creating a network between the server and the client

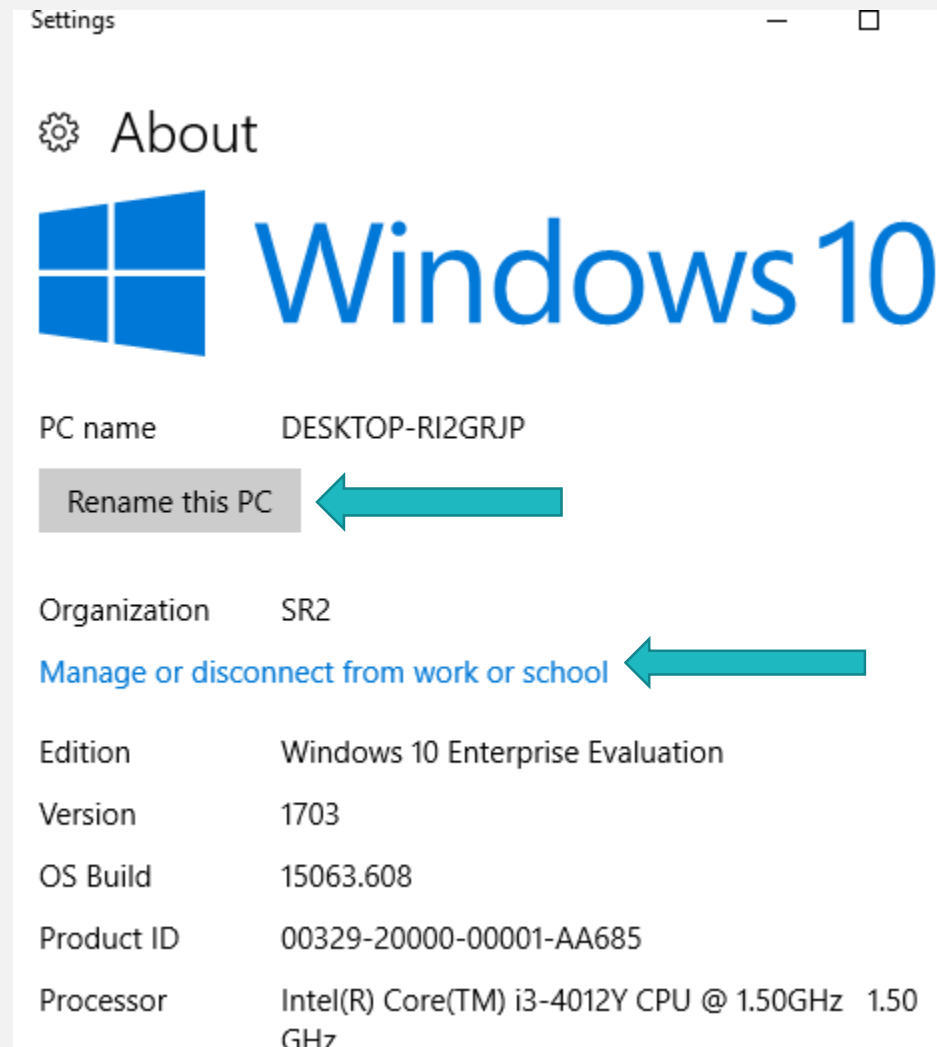
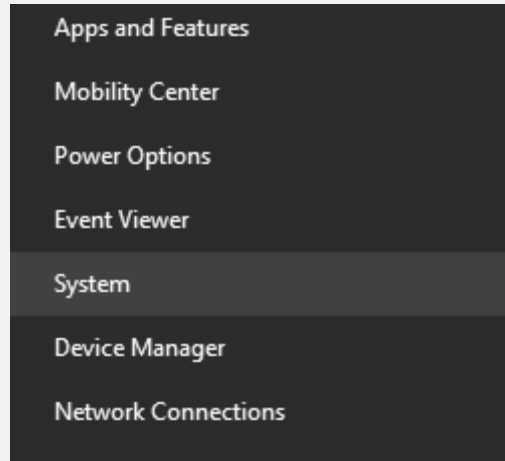
# Exercise 3

- O servidor (Windows server 2012) é o elemento central da empresa SR1 SA. Terá as seguintes definições:
  - Nome - ServSR1
  - Workgroup - SR1
  - Endereço IP - 192.168.20.1 255.255.255.0
  - Default GW - 192.168.20.254
  - Servidor DNS primário - 192.168.20.1
- O posto de trabalho (Windows 10) deverá ter as seguintes definições:
  - Nome - PT01
  - Workgroup - SR1
  - Endereço IP - 192.168.20.50 255.255.255.0
  - Default GW - 192.168.20.254
  - Servidor DNS primário - 192.168.20.1
  - O utilizador por defeito é sr1 com a palavra chave 1qazZAQ!
  - Garanta que esse utilizador tem privilégios de administração.
- After making these changes, ensure that the machines are connected to each other.
- **The network must be internal to the virtualization environment, and there must be no communication with the physical or wireless network in your home.**
- Don't forget to check the status of the two firewalls....

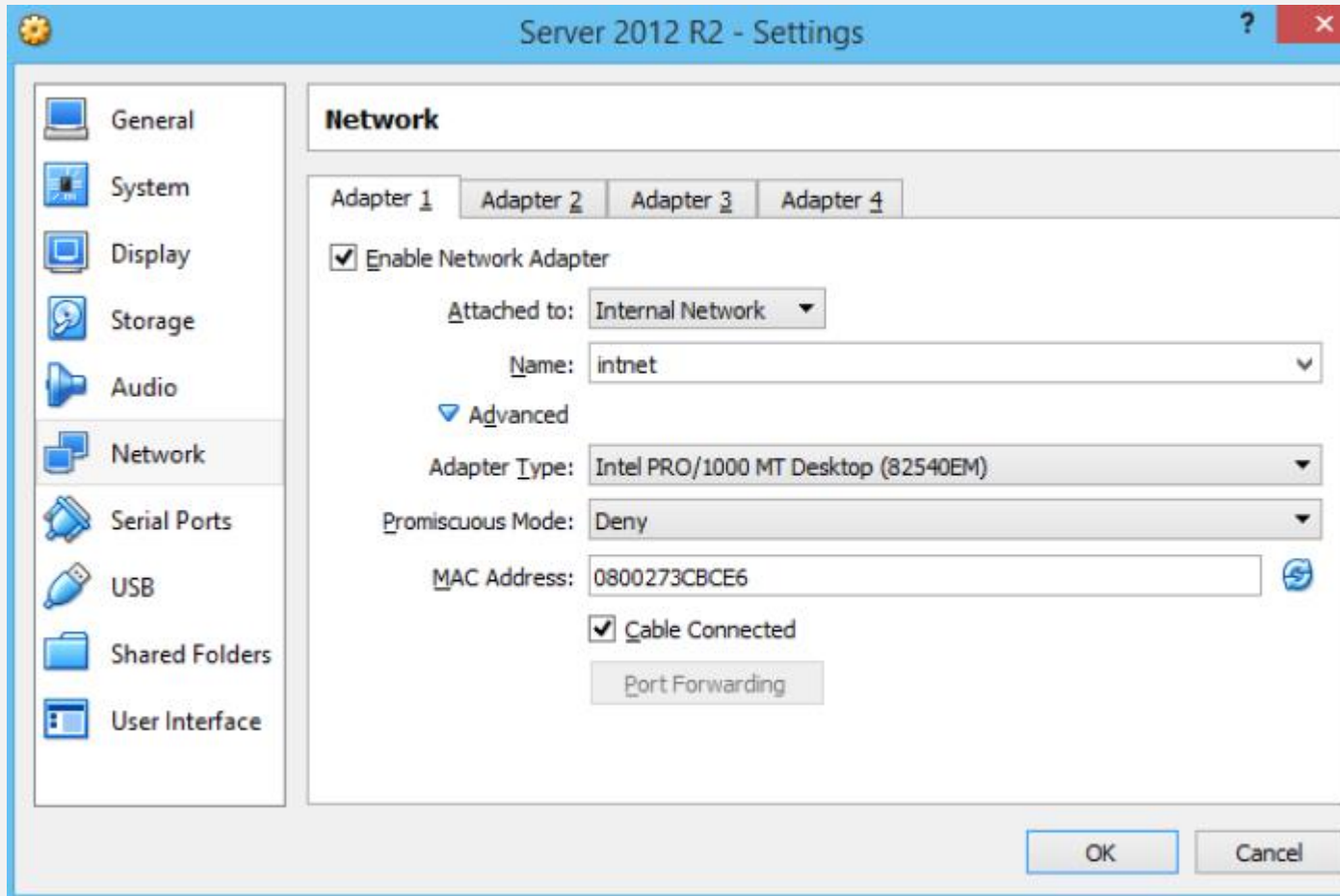


How To

# Alterar o nome e o domínio de uma maquina Windows 10



# Virtual machine network configuration

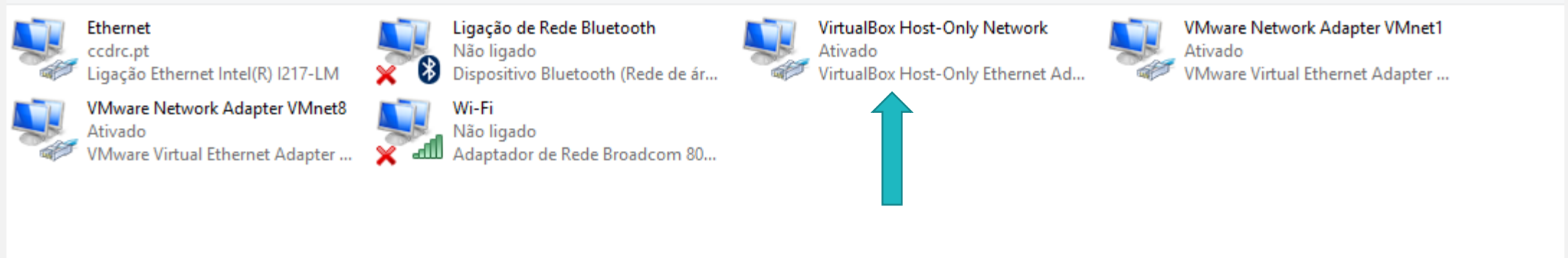


# Virtual machine network configuration

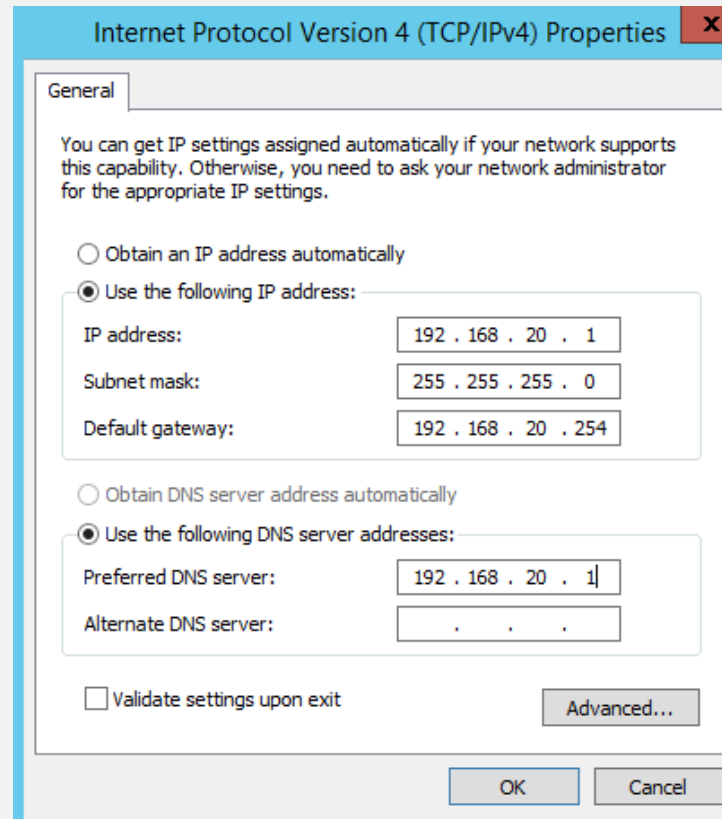
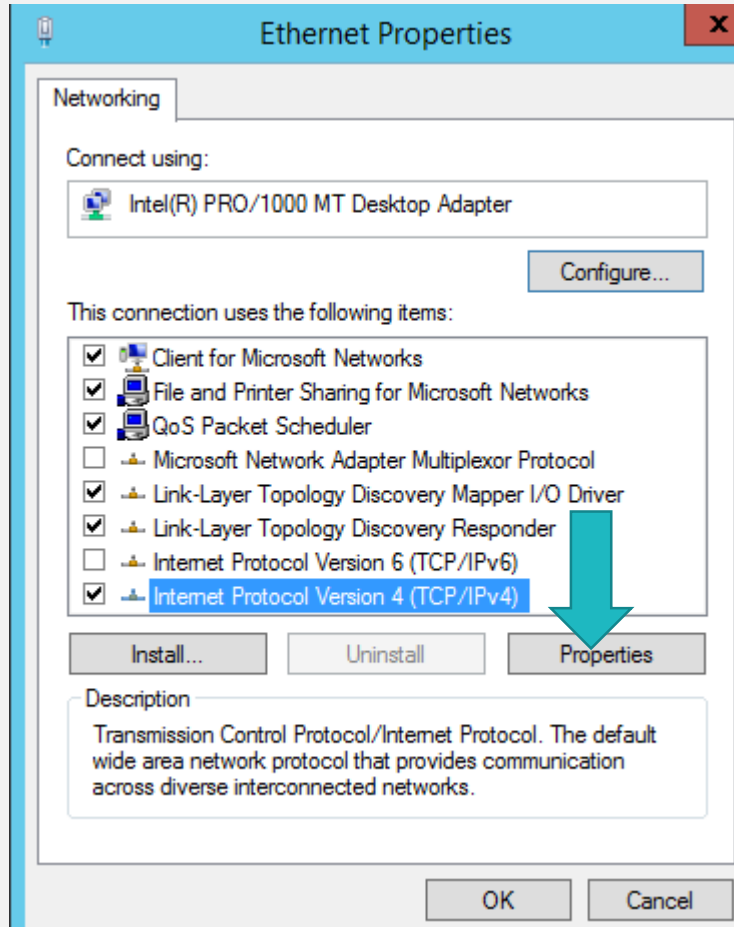
- Virtual Box allows you to configure the virtual machine with four main modes of connection to the network:
  - **nat mode:** the network card accesses the physical network with the same IP address of the host machine as if it were on a NAT network. Used in environments where virtual machines do not provide services, but can access the network.
  - **bridge mode:** the network card accesses the physical network, as if it were a real machine. The VM can even be accessed by other machines in the network. Used in environments where virtual machines provide services or participate in a real network. You must indicate which physical card to use.
  - **internal network mode:** the network card does not have access to the physical network, being visible only to the host machine. Used in isolated test environments where virtual machines do not need to communicate with other environments.
  - **host-only mode:** it's a mixture of the first two modes. The virtual machines communicate with each other and with the host machine, but not with other machines of the local network of this one.

# Virtual machine network configuration

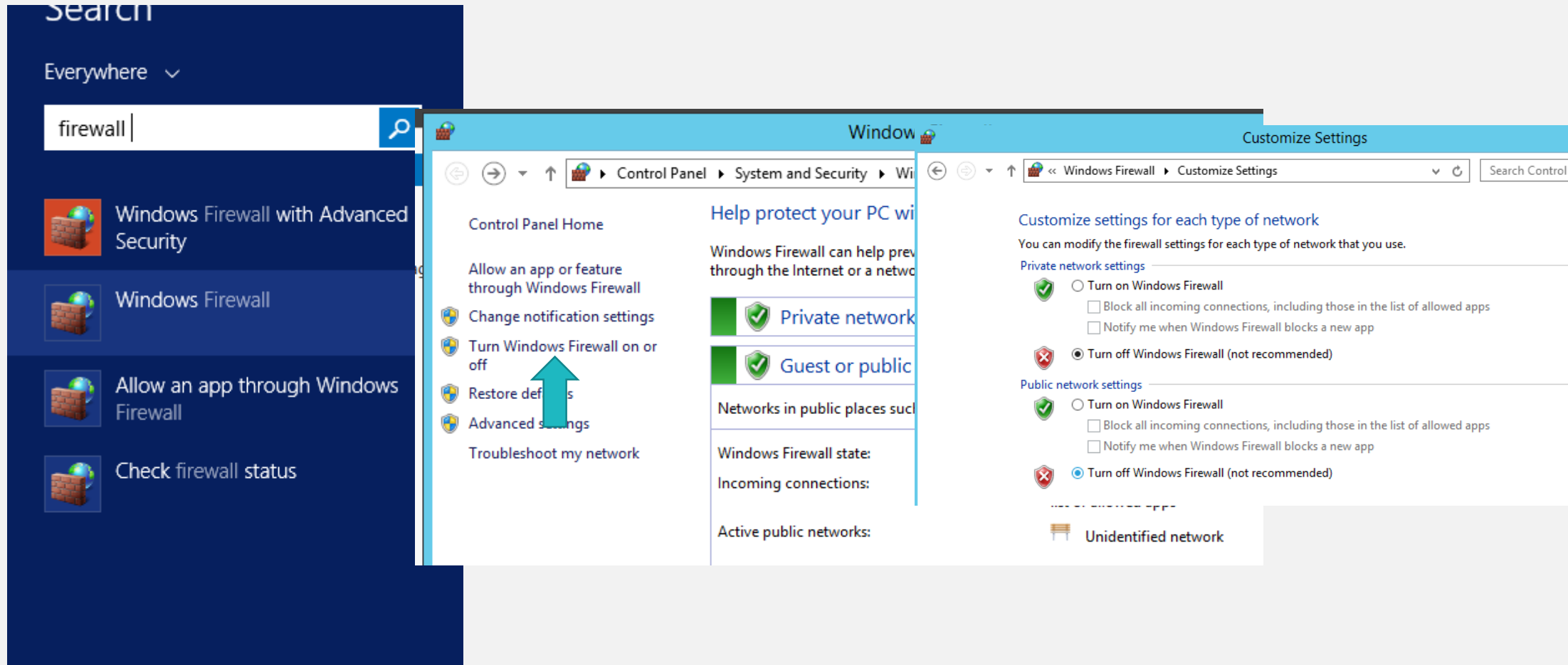
- The host machine has a virtual interface that can be used to communicate over host-only networks.



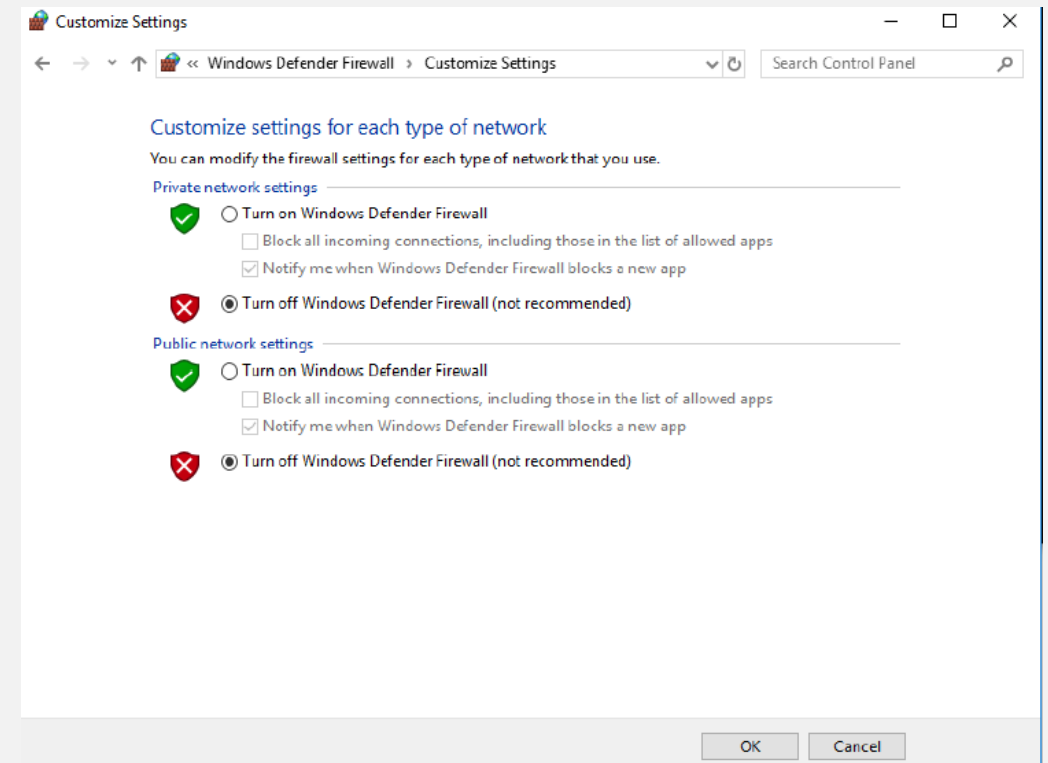
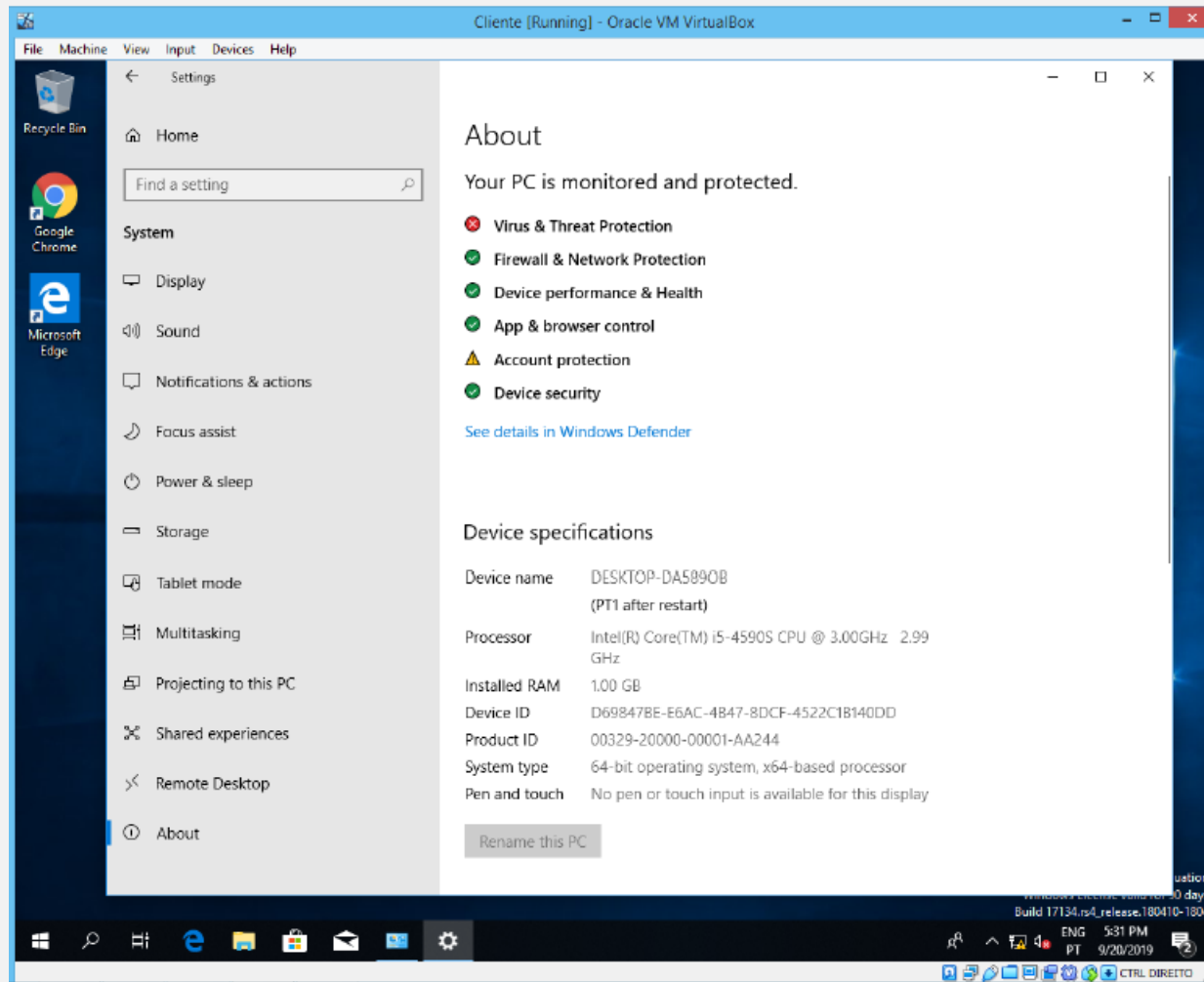
# Change the IP address of a machine Windows 2012



# Firewall - Server

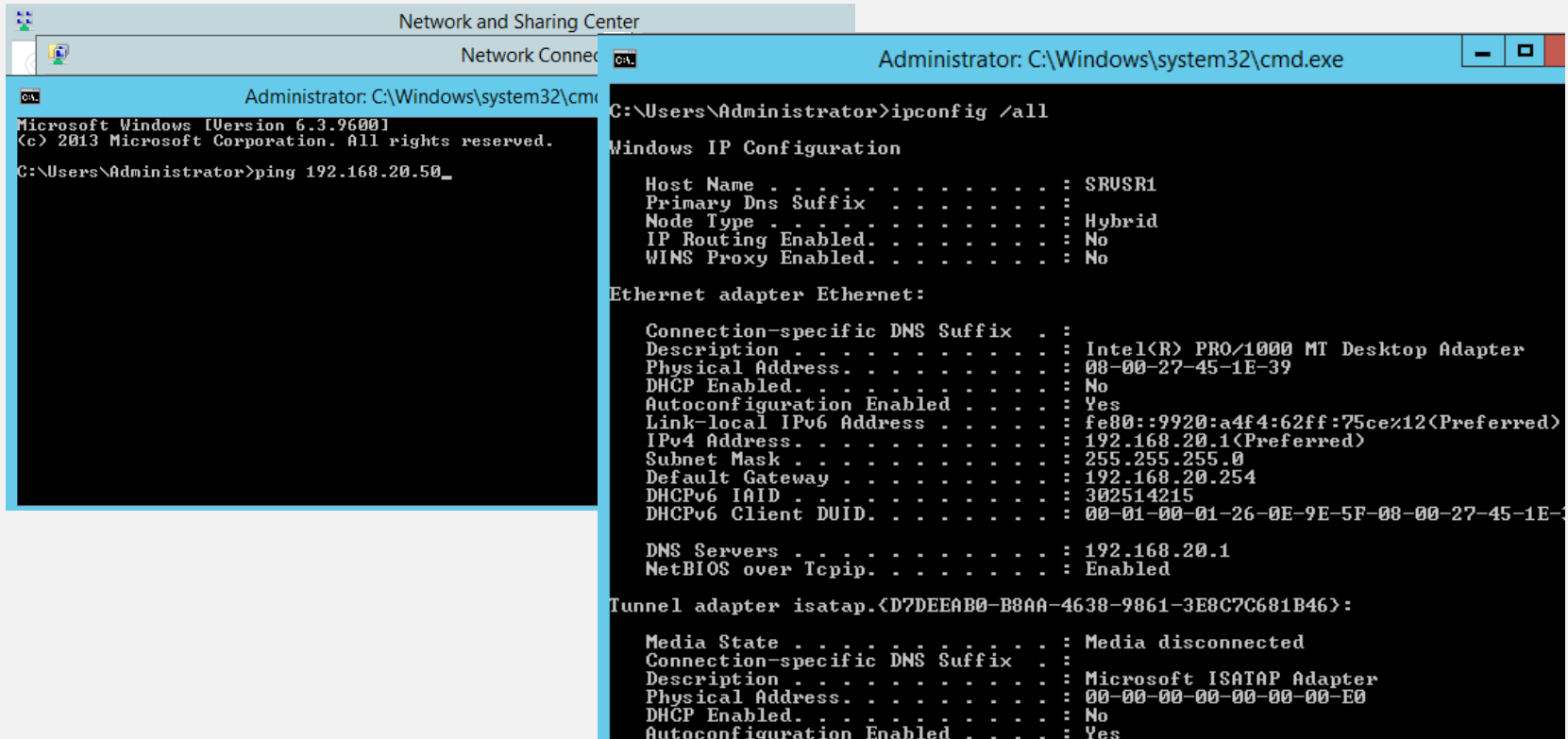
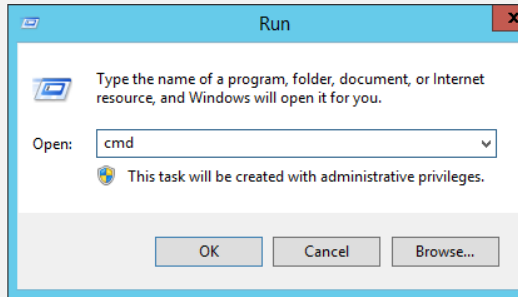


# Firewall - Client





# Diagnosis



## Exercise 4 - Configure the DHCP server

# Exercise 4

- Install the DHCP service on the server.
- It should have the following settings:
  - Network - 192.168.20.0/24
  - Router - 192.168.20.254
  - Domain - sr1.pt
  - DNS:
    - Primary - 192.168.20.1
    - Secondary - 8.8.8.8
  - Dynamic IP Range - 20 to 200
  - Scope Name - LAN
  - NTP Server - 192.168.20.10
- Check the operation of the DHCP service.

## Exercise 4

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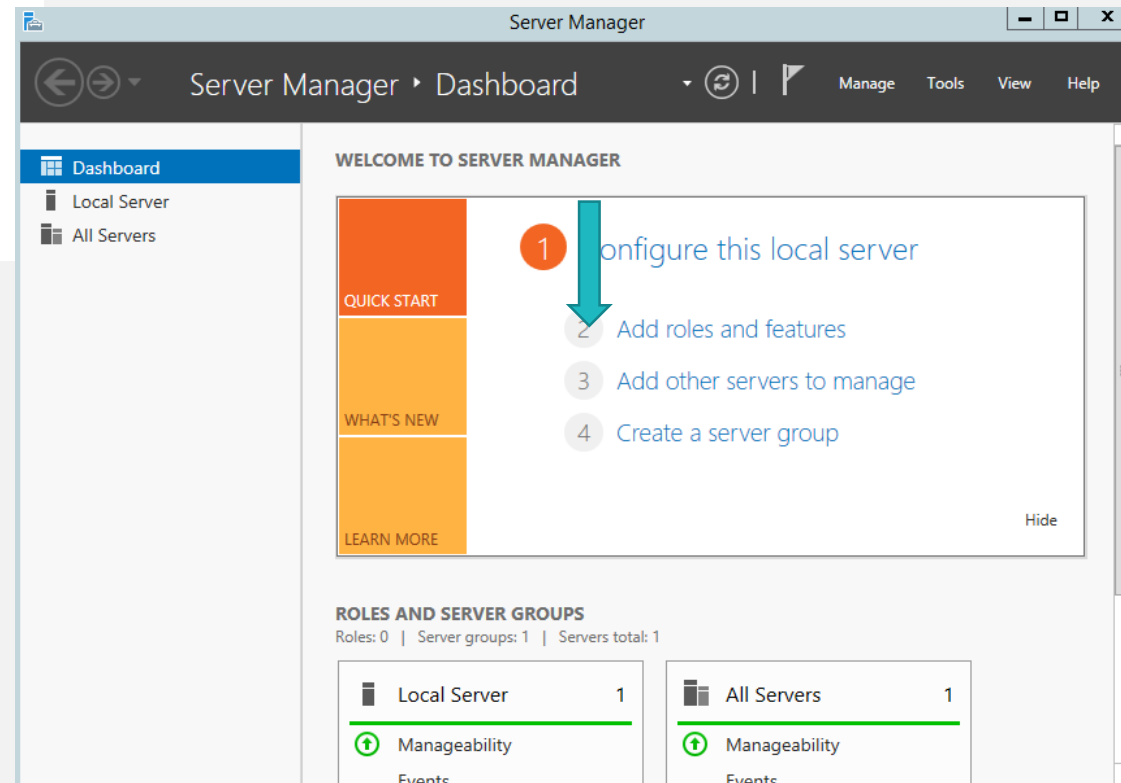
- Put the PC (client) to obtain the IP address by DHCP.
- Test that the DHCP service is assigning the correct IP.
  - Using the ipconfig command.
  - Using the DHCP Service Management Application.
- Ensure that between the Server and the client there is IP connectivity.

How To

# DHCP – Service installation



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# DHCP – Service installation

The image displays three sequential screenshots of the 'Add Roles and Features Wizard' in Windows Server, illustrating the steps to install the DHCP service.

**Screenshot 1: Select installation type**

The wizard is titled 'Add Roles and Features Wizard'. The left sidebar shows the progress: Before You Begin, **Installation Type**, Server Selection, Server Roles, Features, DHCP Server, Confirmation, and Results. The main content area shows two options:

- Role-based or feature-based installation** (selected): Configure a single server by adding roles, role services, and features.
- Remote Desktop Services installation**: Install required role services for Virtual Desktop Infrastructure (VDI) to create or session-based desktop deployment.

Navigation buttons at the bottom: < Previous, Next >

**Screenshot 2: Select server roles**

The wizard is titled 'Add Roles and Features Wizard'. The left sidebar shows the progress: Before You Begin, Installation Type, Server Selection, **Server Roles**, Features, DHCP Server, Confirmation, and Results. The main content area shows a list of roles to install on the selected server (DESTINATION SERVER: smtp.ar2.pt).

Select one or more roles to install on the selected server.

Roles	Description
<input type="checkbox"/> Active Directory Certificate Services	Dynamic Host Configuration Protocol (DHCP) Server enables you to centrally configure, manage, and provide temporary IP addresses and related information for client computers.
<input type="checkbox"/> Active Directory Domain Services	
<input type="checkbox"/> Active Directory Federation Services	
<input type="checkbox"/> Active Directory Lightweight Directory Services	
<input type="checkbox"/> Active Directory Rights Management Services	
<input type="checkbox"/> Application Server	
<input checked="" type="checkbox"/> <b>DHCP Server</b>	
<input type="checkbox"/> DNS Server	
<input type="checkbox"/> Fax Server	
<input type="checkbox"/> File and Storage Services (2 of 12 installed)	
<input type="checkbox"/> Hyper-V	
<input type="checkbox"/> Network Policy and Access Services	
<input checked="" type="checkbox"/> <b>Print and Document Services (1 of 4 installed)</b>	
<input type="checkbox"/> Remote Access	
<input type="checkbox"/> Remote Desktop Services	

Navigation buttons at the bottom: < Previous, **Next >**, Install, Cancel

**Screenshot 3: Confirm installation selections**

The wizard is titled 'Add Roles and Features Wizard'. The left sidebar shows the progress: Before You Begin, Installation Type, Server Selection, Server Roles, Features, DHCP Server, **Confirmation**, and Results. The main content area shows the confirmation step for the selected roles.

To install the following roles, role services, or features on selected server, click Install.

☐ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

DHCP Server

Remote Server Administration Tools

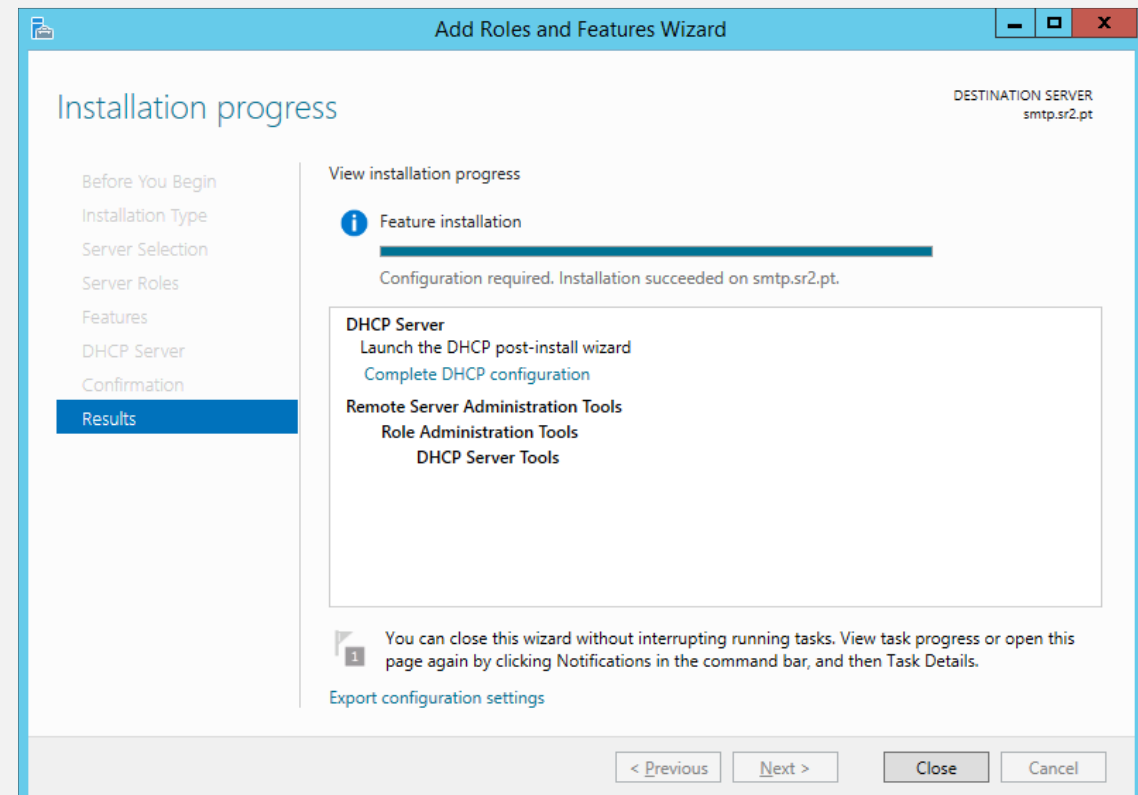
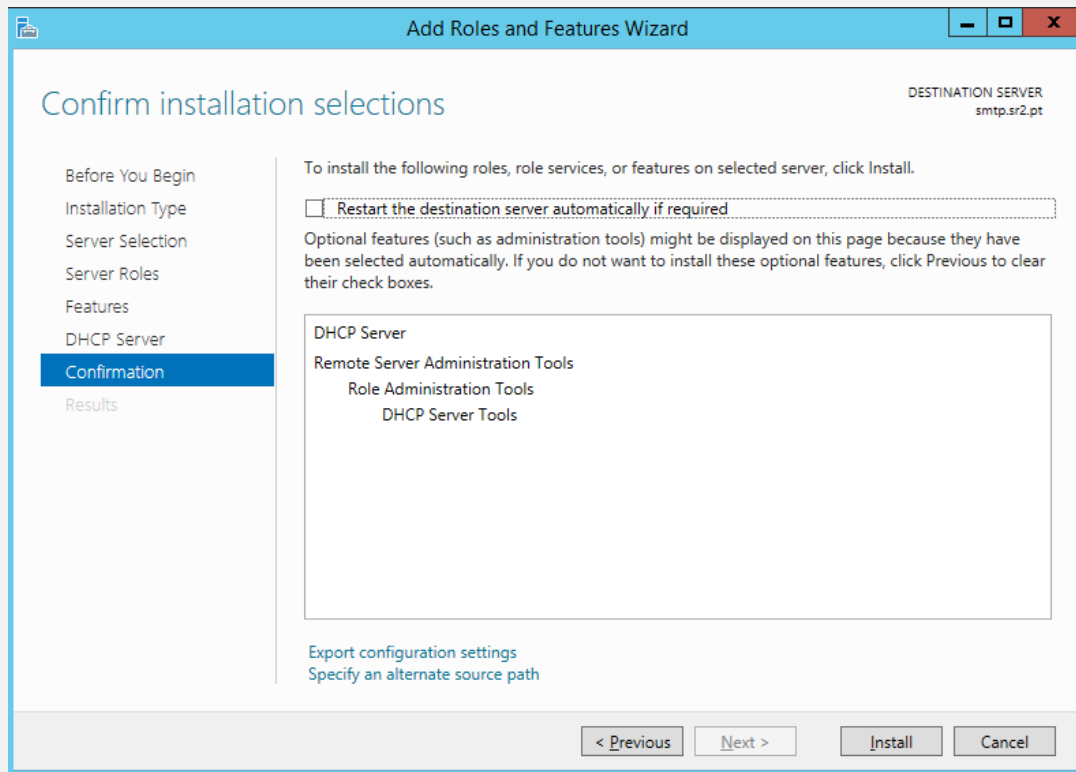
Role Administration Tools

DHCP Server Tools

Export configuration settings  
Specify an alternate source path

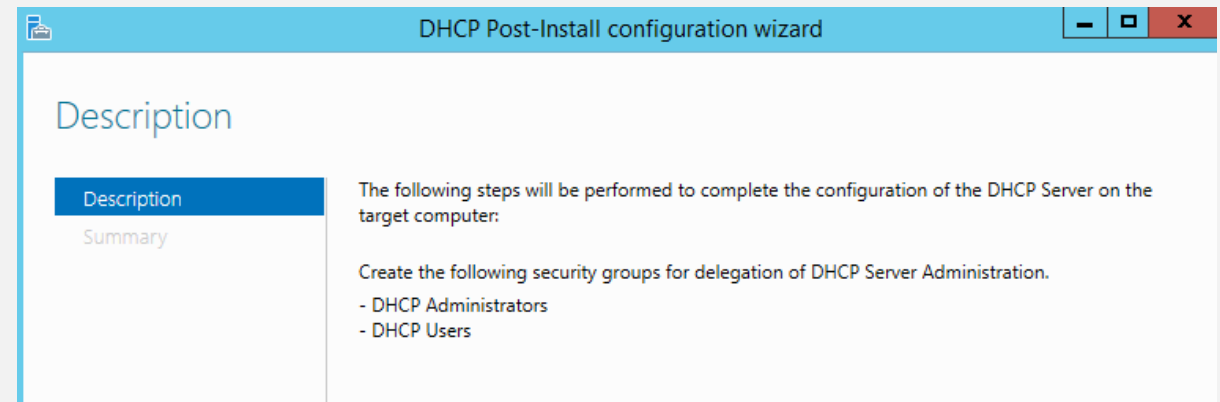
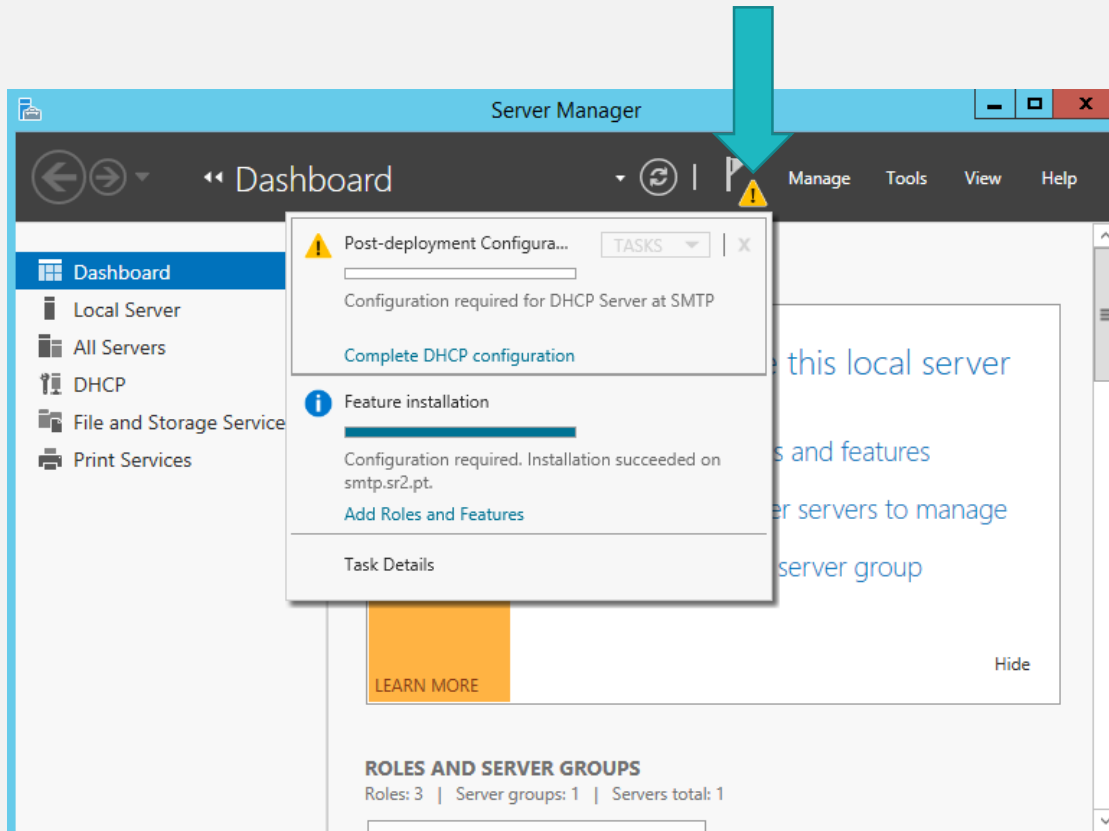
Navigation buttons at the bottom: < Previous, Next >, **Install**, Cancel

# DHCP – Service installation





# DHCP – Service installation



# DHCP – Service installation

Description	
Summary	<p>The status of the post install configuration steps are indicated below:</p> <div><p>Creating security groups ..... Done</p><p>Please restart the DHCP server service on the target computer for the security groups to be effective.</p></div>

< Previous Next > Close Cancel

# DHCP – Service installation

The image shows two side-by-side screenshots from a Windows Server environment.

The left screenshot displays the **Server Manager** console. The **Tools** menu is open, showing various management tools. **DHCP** is highlighted in the list. Below the menu, a table shows the status of the DHCP service:

IPv4 Address	Manageability	La
92.168.20.2	Online - Performance counters not started	12

The right screenshot shows the **DHCP** console. The **File** menu is open, and the **Action** menu is also visible. The **IPv4** scope is selected in the left pane. The main pane displays the **Add a Scope** wizard, which includes the following text:

**Add a Scope**

A scope is a range of IP addresses assigned to computers requesting a dynamic IP address. You must create and configure a scope before dynamic IP addresses can be assigned.

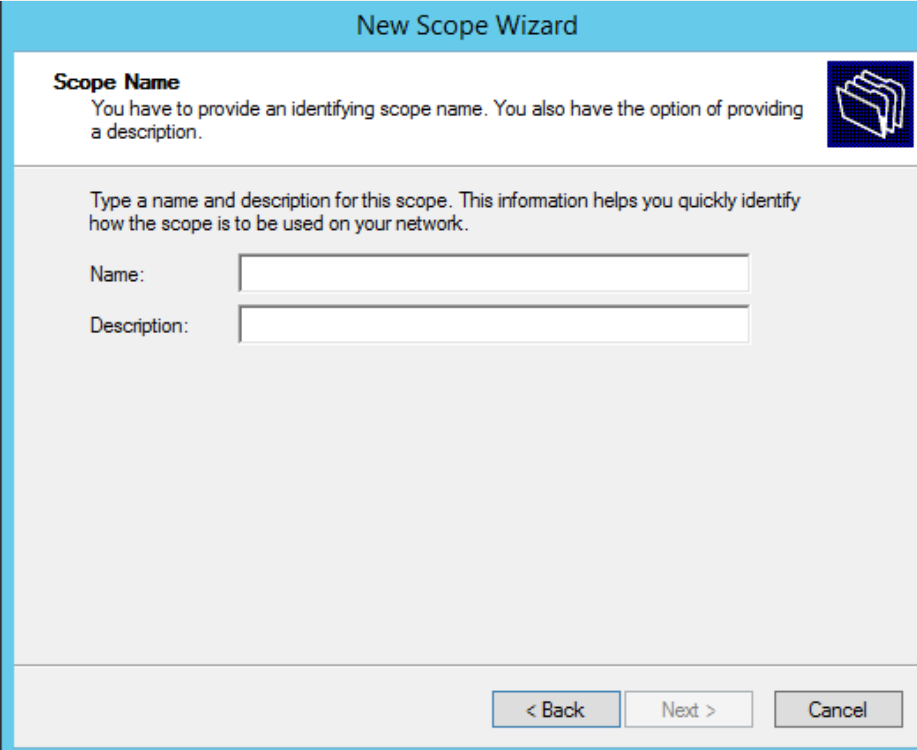
To add a new scope, on the Action menu, click New Scope.

For more information about setting up a DHCP server, see online Help.

The **Actions** pane on the right shows the **IPv4** scope selected, with a **More Actions** link.

# DHCP – Service installation

- **Scope Name:** Name
- **Starting IP Address and Ending IP Address:** Start and end address of the network. You should always place the entire network and then delete what you don't want to assign.
- **Subnet Mask:** Subnet mask used
- **Default Gateway:** default router address
- **Subnet Type:** Choose between Wired (6 days) or Wireless (8 days) to set the length of time the IP address is granted.
- Check the Activate this scope option to enable scope when configuration is complete.



The image shows a 'New Scope Wizard' dialog box. It has a title bar 'New Scope Wizard' and a blue icon of a folder with a document. The main section is titled 'Scope Name' and contains the text: 'You have to provide an identifying scope name. You also have the option of providing a description.' Below this, there is a prompt: 'Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.' There are two input fields: 'Name:' and 'Description:'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

New Scope Wizard

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

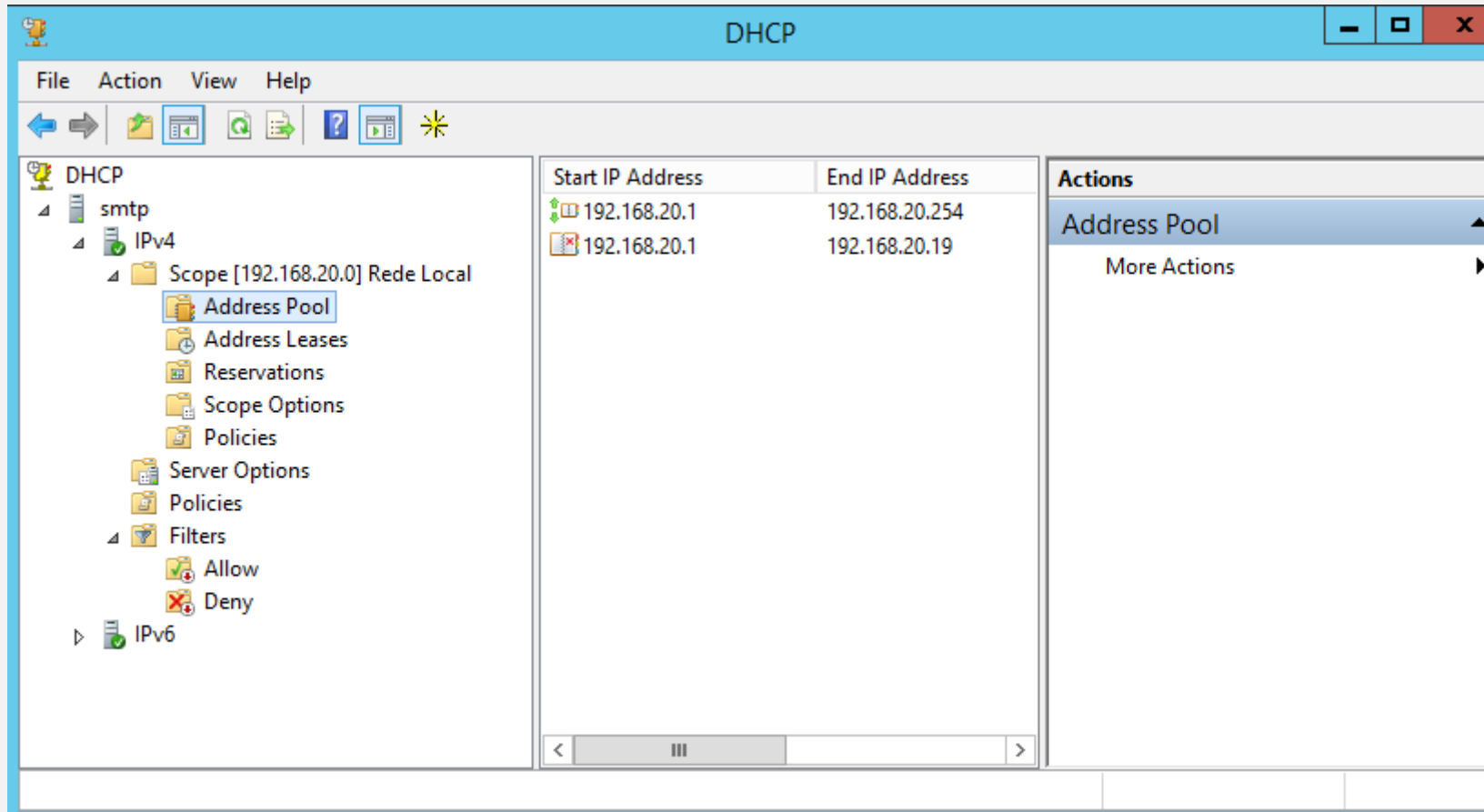
Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

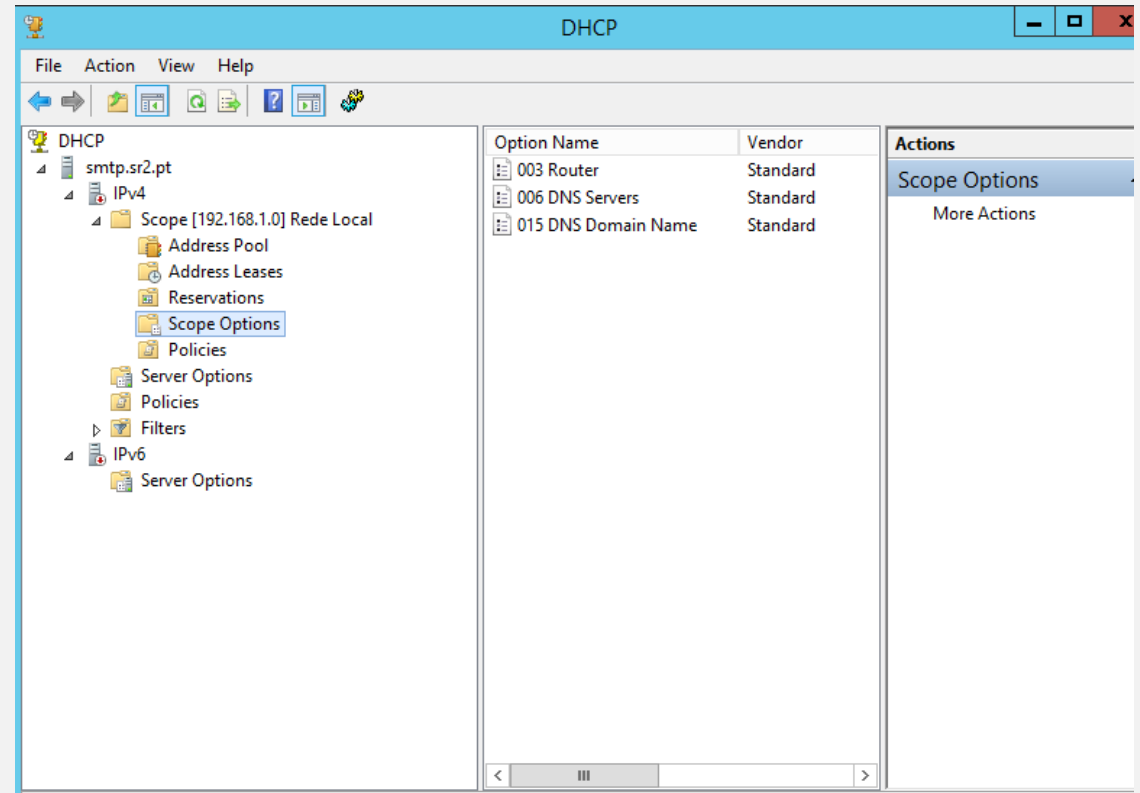
< Back   Next >   Cancel

# DHCP - Verification and configuration of the service.



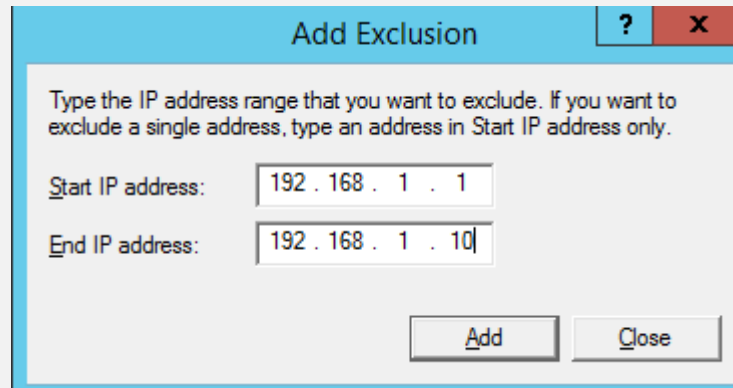
# DHCP - Verification and configuration of the service.

- Going to Server Manager, DHCP Server can check how your server is working.
  - **Address Pool** - indicates the range of addresses.
  - **Address leases** - which machines have the "rented" IPs
  - **Reservations** - Which IPs are reserved
  - **Scope Options** - specific TCP settings for the lease (DNS, Router, etc.)



# DHCP - Add reservations

- A range of IPs
- A specific IP



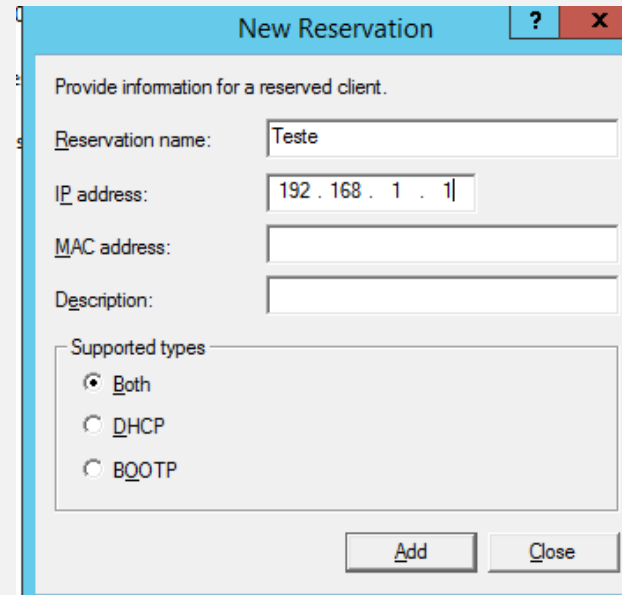
**Add Exclusion** [?] [X]

Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address: 192 . 168 . 1 . 1

End IP address: 192 . 168 . 1 . 10

[Add] [Close]



**New Reservation** [?] [X]

Provide information for a reserved client.

Reservation name: Teste

IP address: 192 . 168 . 1 . 1

MAC address:

Description:

Supported types

☒ Both

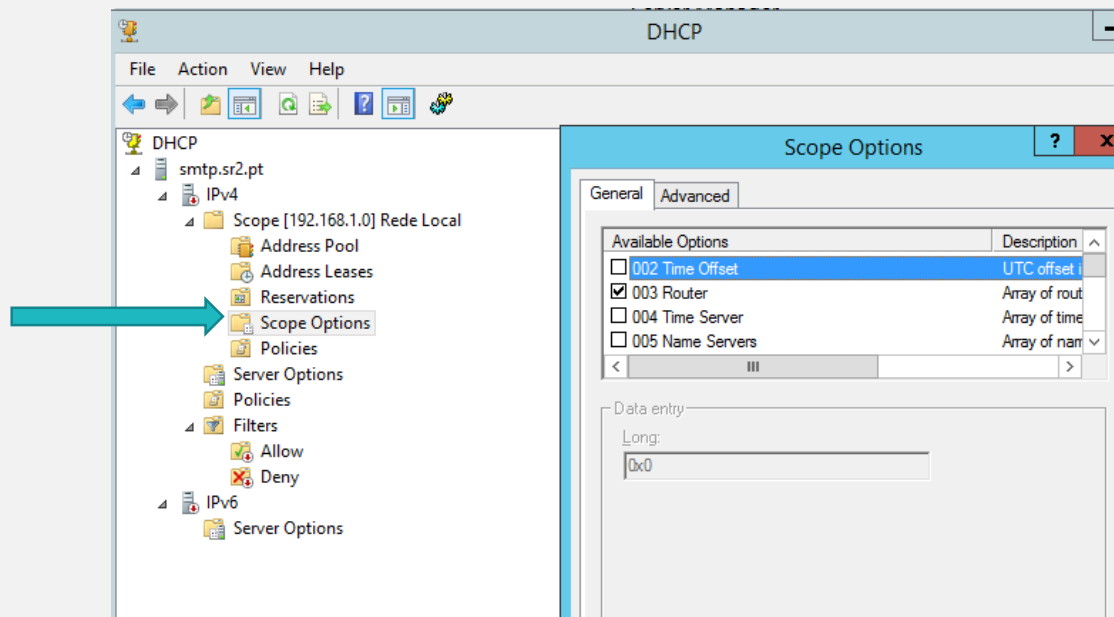
☐ DHCP

☐ BOOTP

[Add] [Close]

# DHCP – *Server Options*

- You can configure TCP options and settings common to all scopes.





# Questions

