Serviços de Rede 1 –

Lesson 4 - Practices

2018-2019

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).

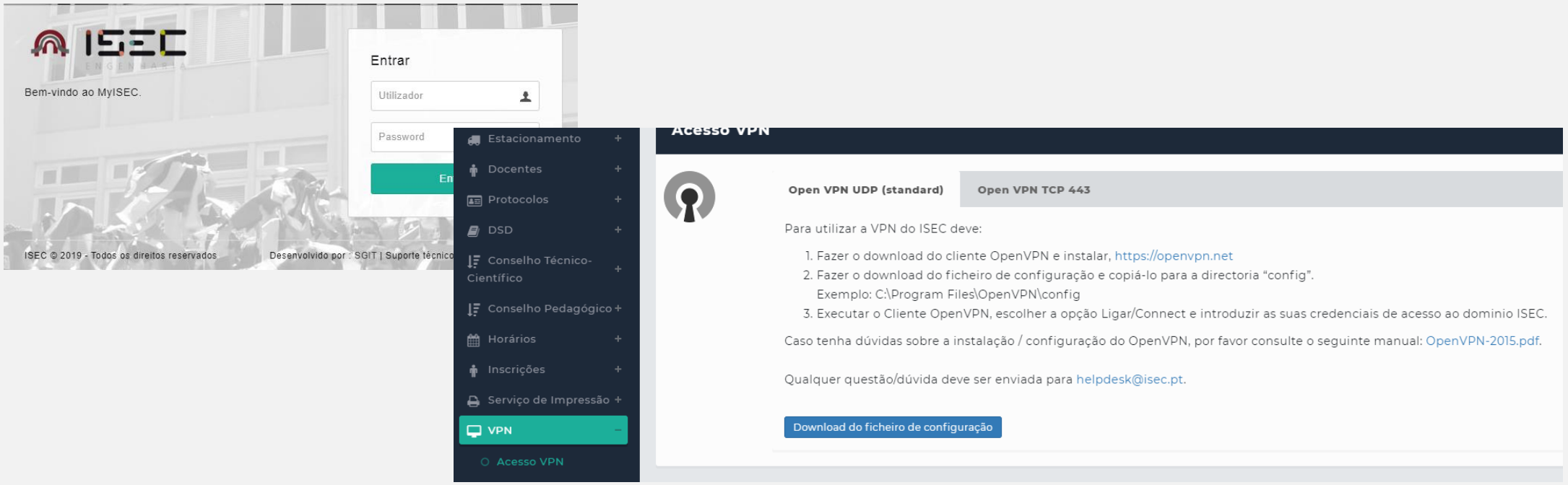
How To

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.

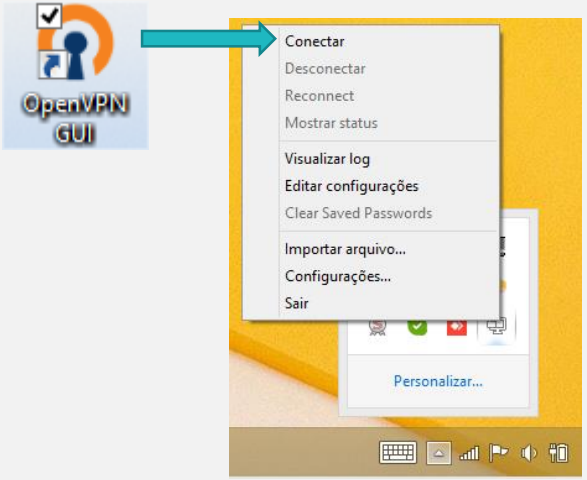
Configure the simulation environment

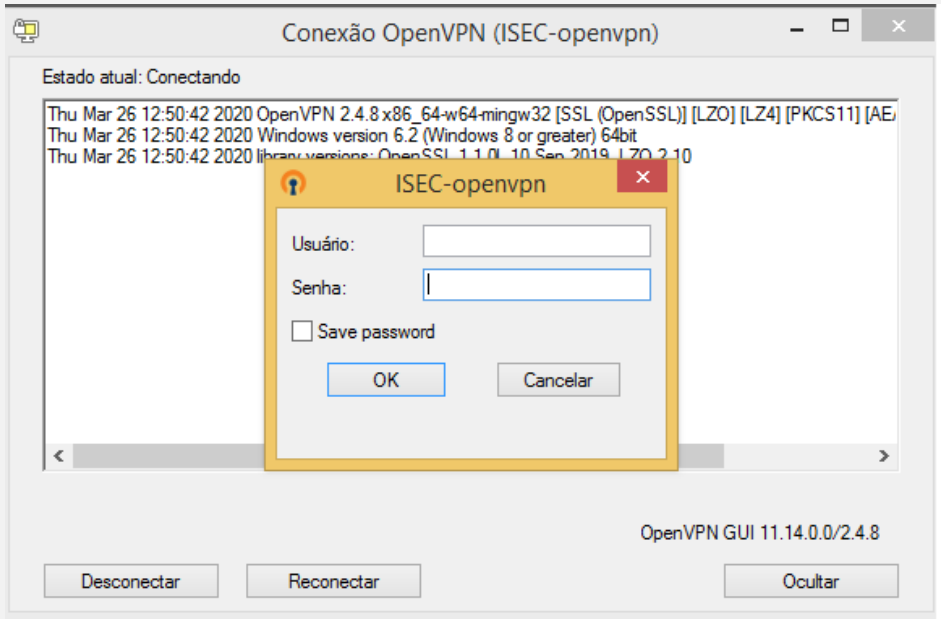
- Access my.isec.pt



Configure the simulation environment

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





Configure the simulation environment

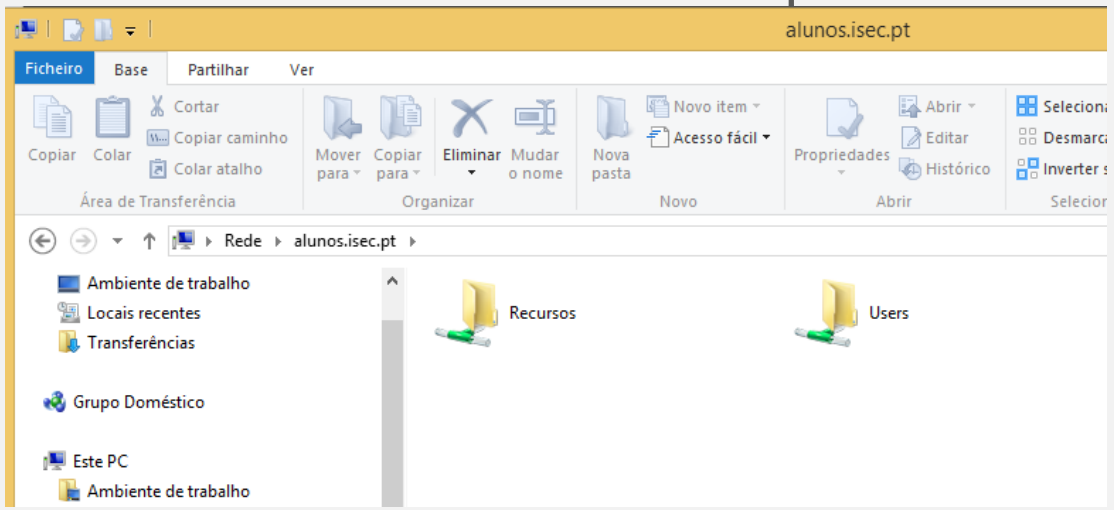
- Open for example the Windows explorer and type:

\\ alunos.isec.pt

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

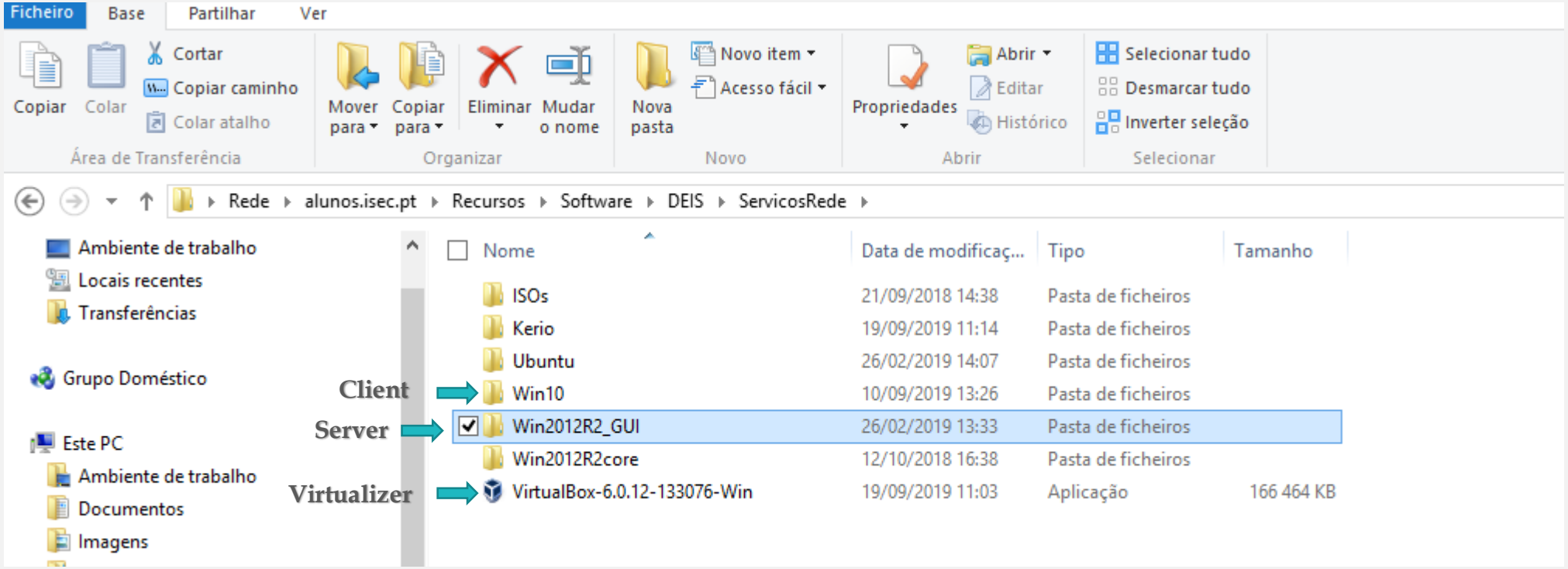
isec \ username

- When accessing, you should have a window equal to



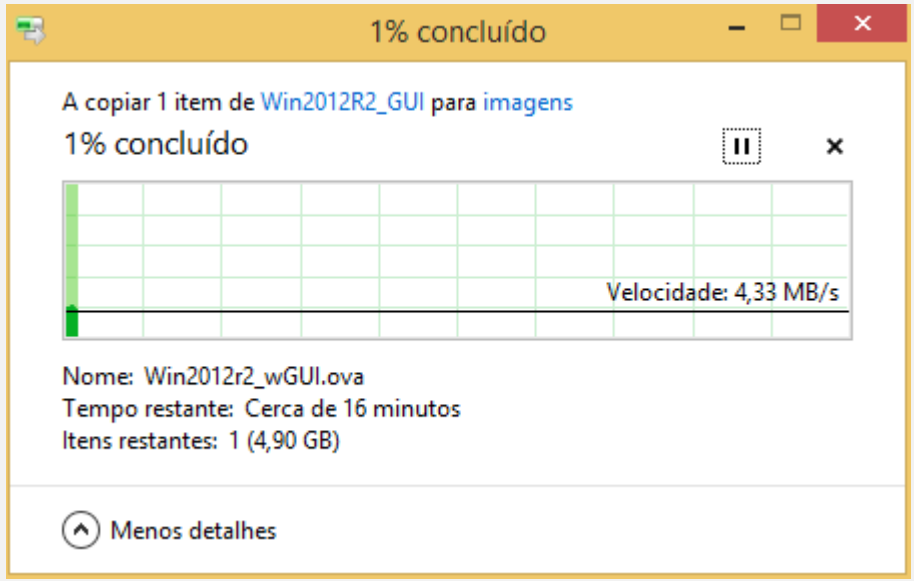
Configure the simulation environment

- 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.



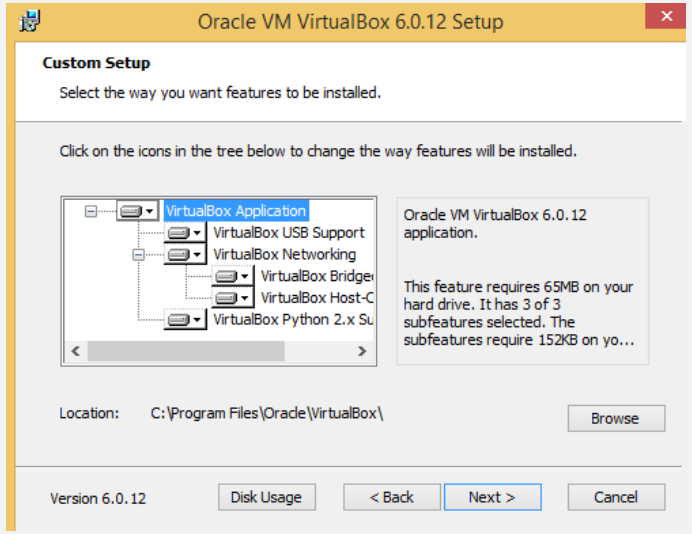
Configure the simulation environment

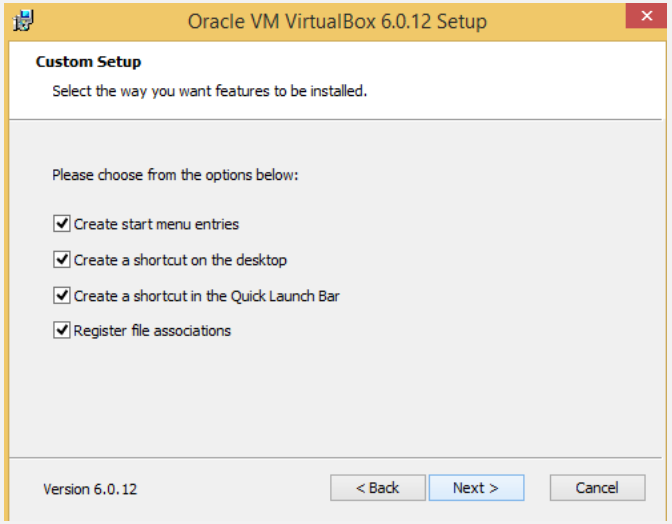
- You should save OVA files whenever you need a “clean machine” to be able to re-create or import it.

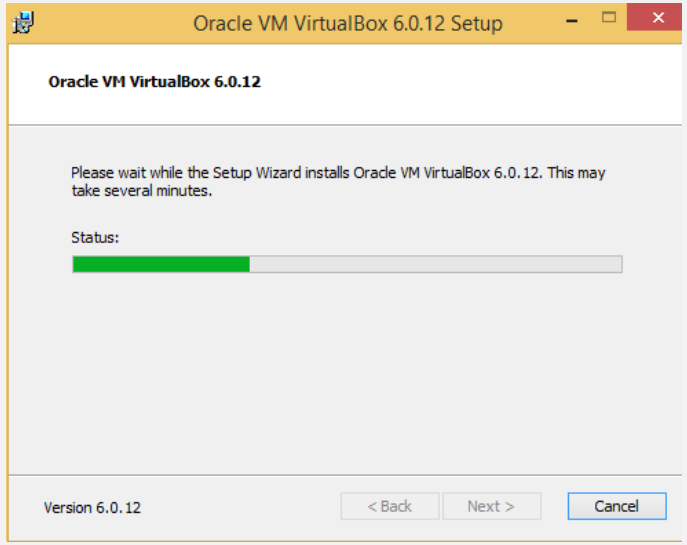
- Copy and install Oracle VM VirtualBox. The images were made for version 6.0.12 of VirtualBox so this must be the version you should use..

- **Note: The Virtual Box will be used in the images and exercises, so it is advisable to use this tool and not another program.**

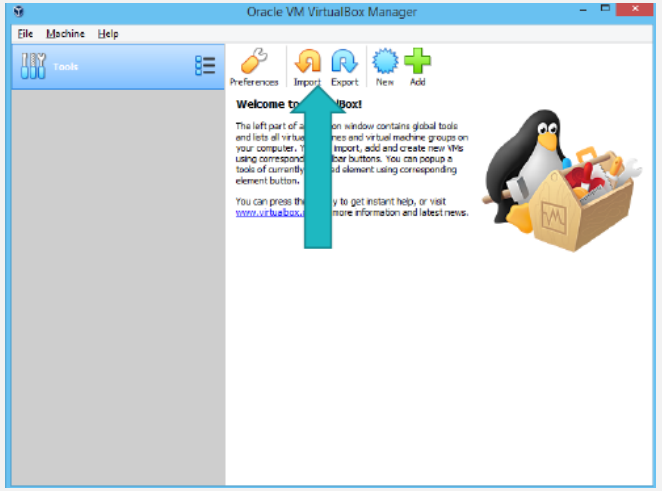
Installing VirtualBox

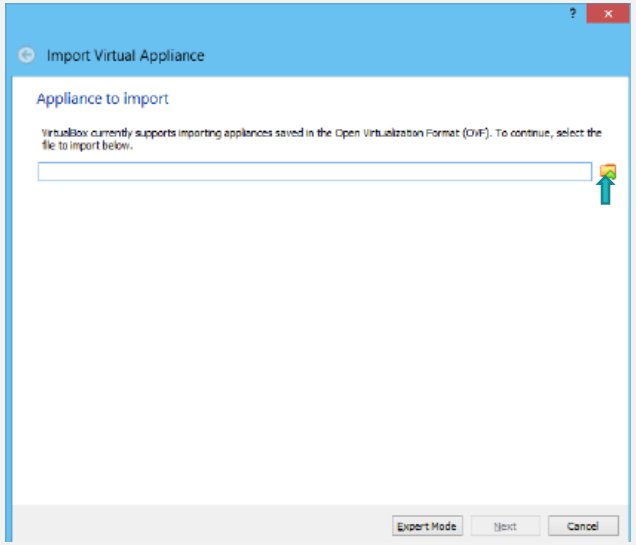


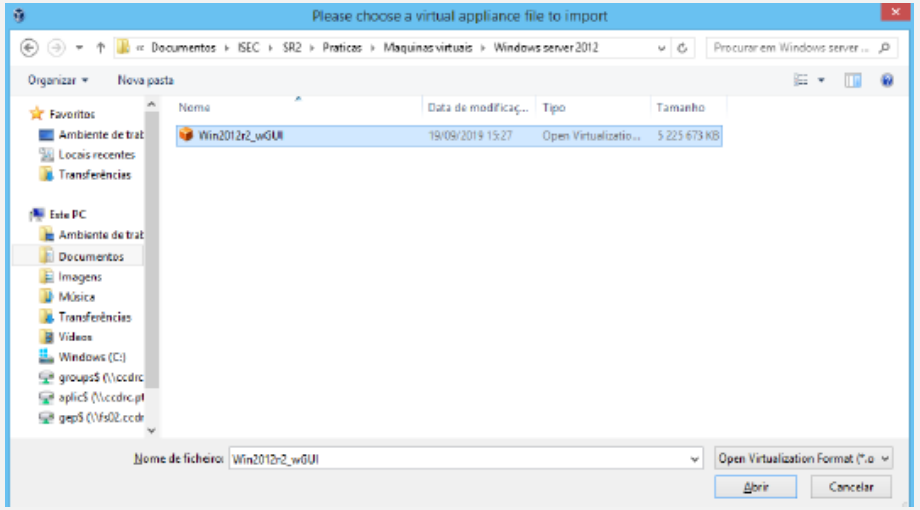


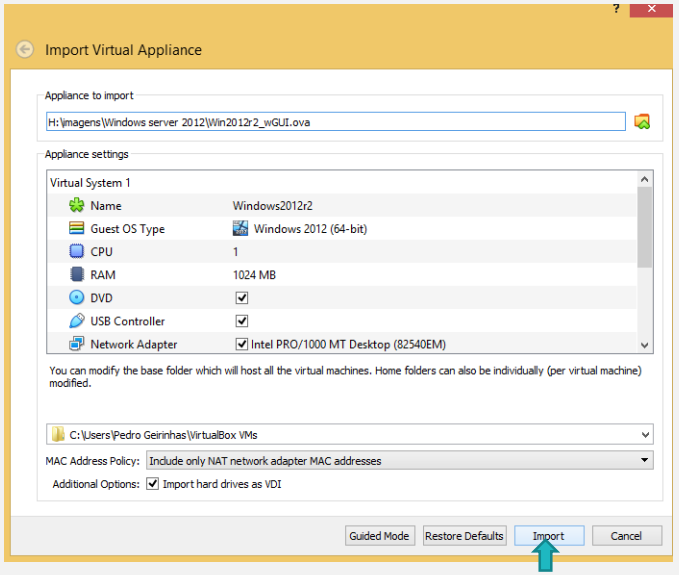


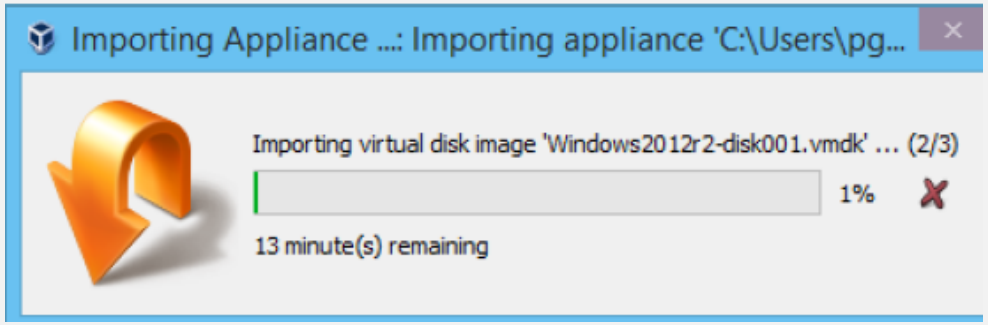
Importing Virtual Machines



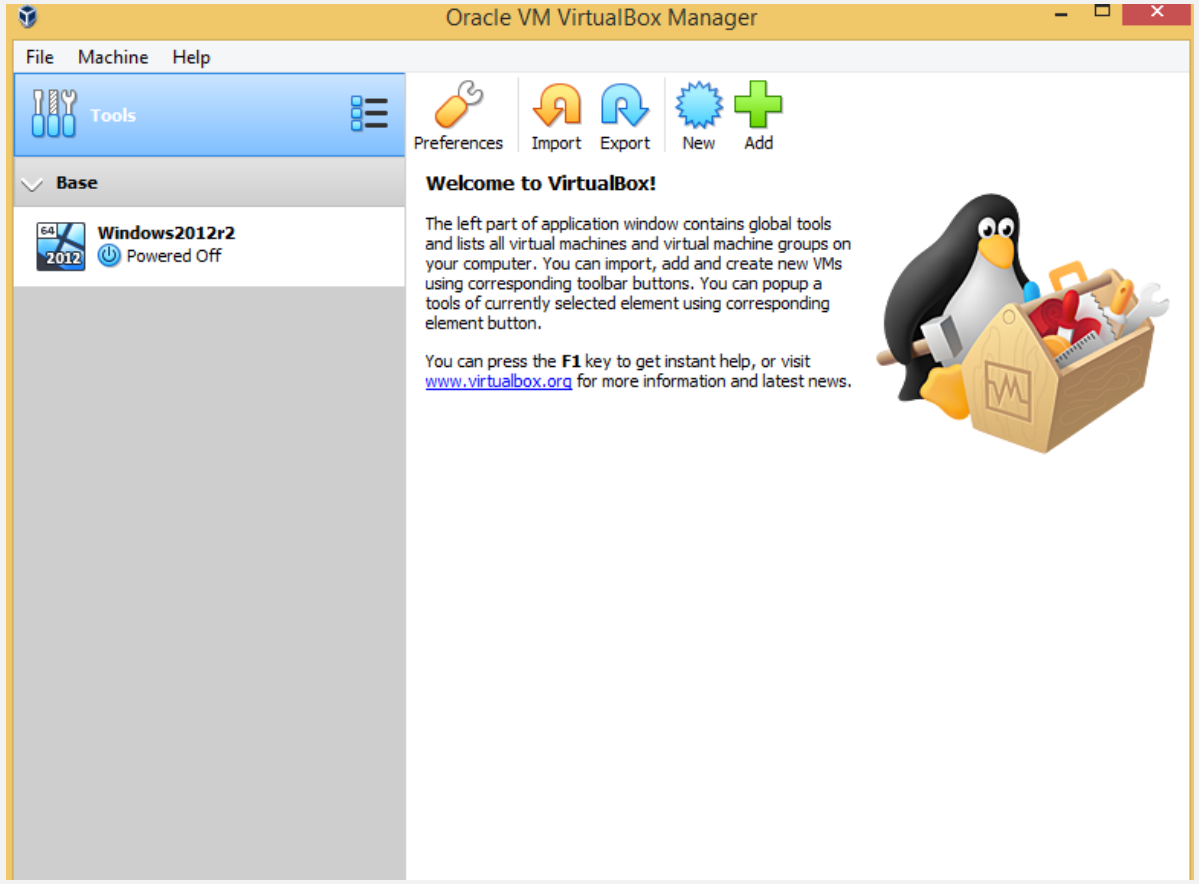






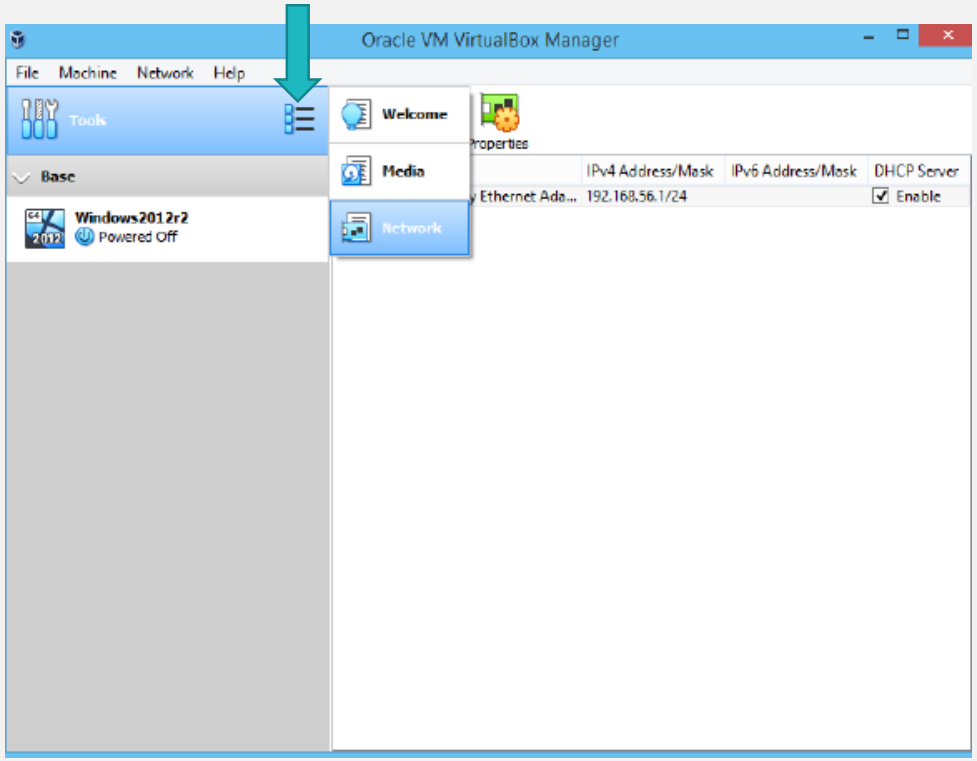


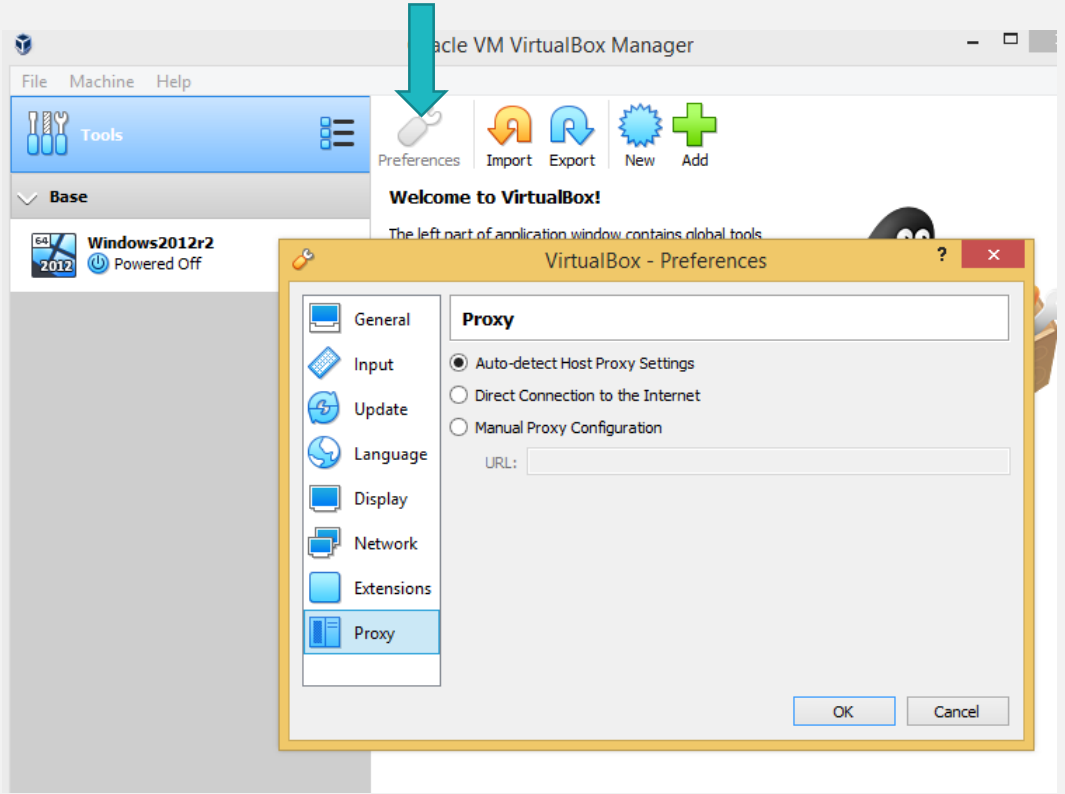
Virtual Box


Oracle VM VirtualBox Manager
File
Machine
Help
Tools
Preferences
Import
Export
New
Add
Base
Windows2012r2
Powered Off
Welcome to VirtualBox!
The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.
You can press the F1 key to get instant help, or visit www.virtualbox.org for more information and latest news.

Virtual Box

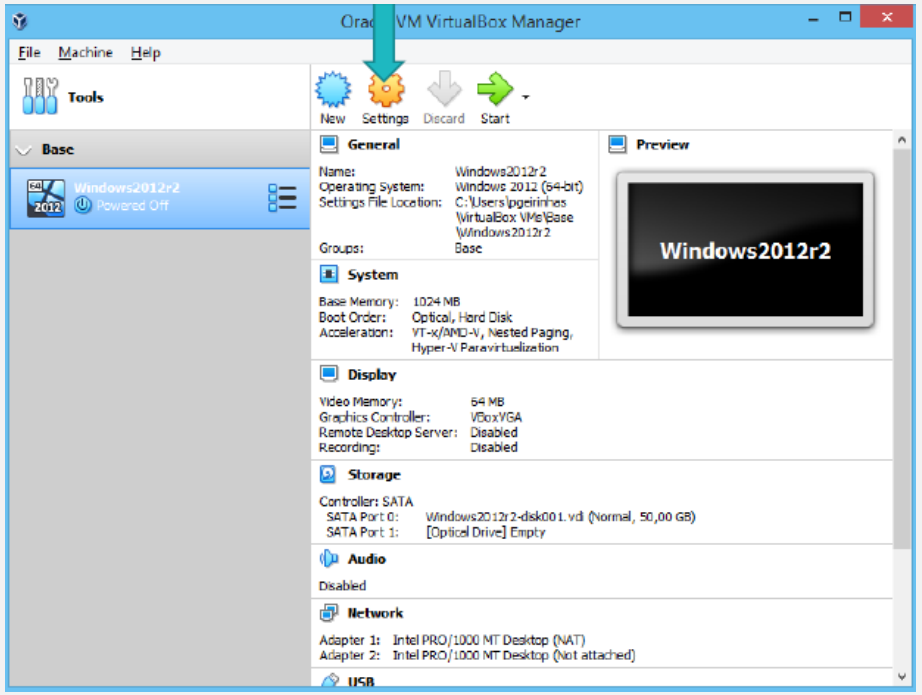
- You can manage VirtualBox options:



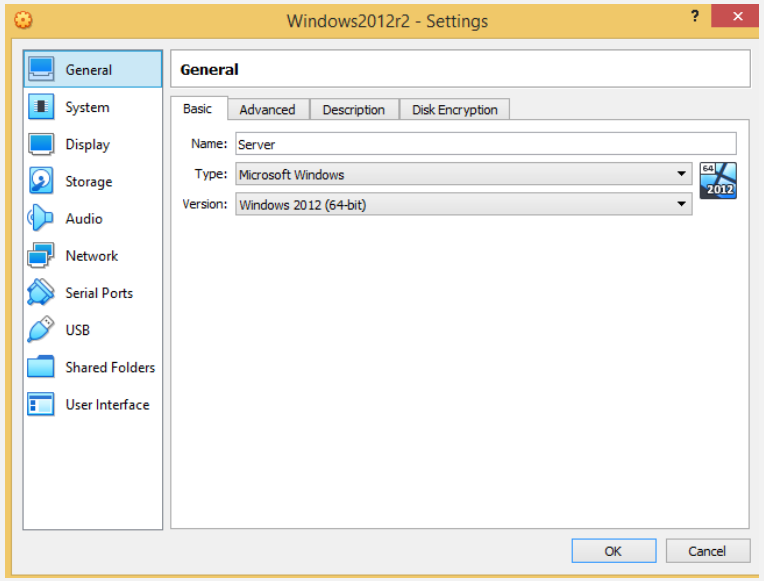


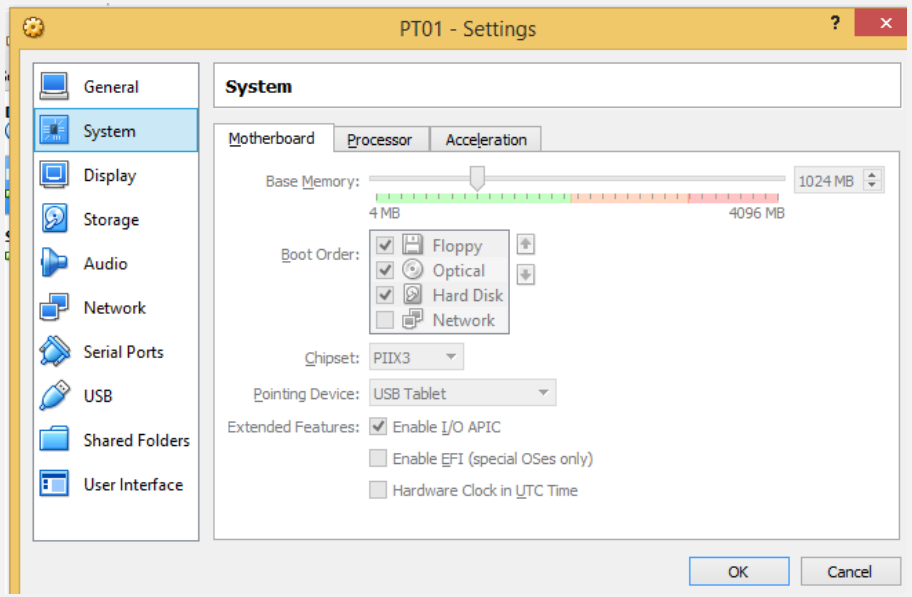
Virtual Box

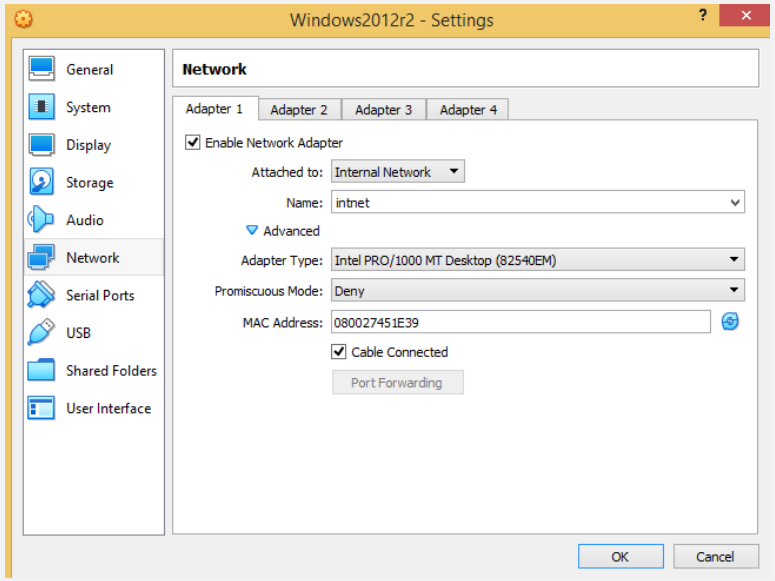
- You can manage your virtual machine settings. For example:
  - **General**: the name of the machine.
  - **System:** RAM and CPU.
  - **Storage:** HardDisk (virtual) and CD / DVD
  - **Network:** Network interfaces.
  - **Shared Folder:** allows you to configure a folder to share information between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



Virtual Box

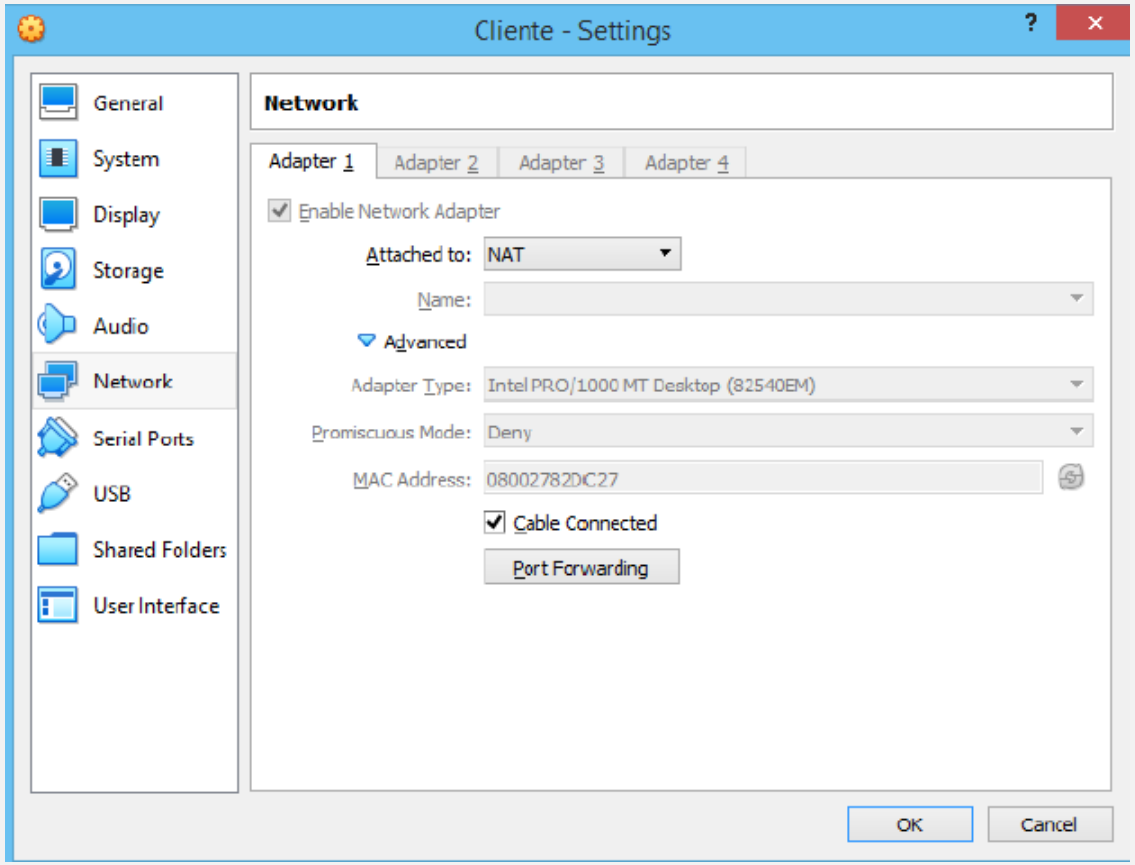

Windows2012r2 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
General
Basic
Advanced
Description
Disk Encryption
Name: Server
Type: Microsoft Windows
Version: Windows 2012 (64-bit)
OK
Cancel


PT01 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
System
Motherboard
Processor
Acceleration
Base Memory: 1024 MB
4 MB
4096 MB
Boot Order:
Floppy
Optical
Hard Disk
Network
Chipset: PIIX3
Pointing Device: USB Tablet
Extended Features: Enable I/O APIC
Enable EFI (special OSes only)
Hardware Clock in UTC Time
OK
Cancel


Windows2012r2 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to: Internal Network
Name: intnet
Advanced
Adapter Type: Intel PRO/1000 MT Desktop (82540EM)
Promiscuous Mode: Deny
MAC Address: 080027451E39
Cable Connected
Port Forwarding
OK
Cancel

Virtual Box

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



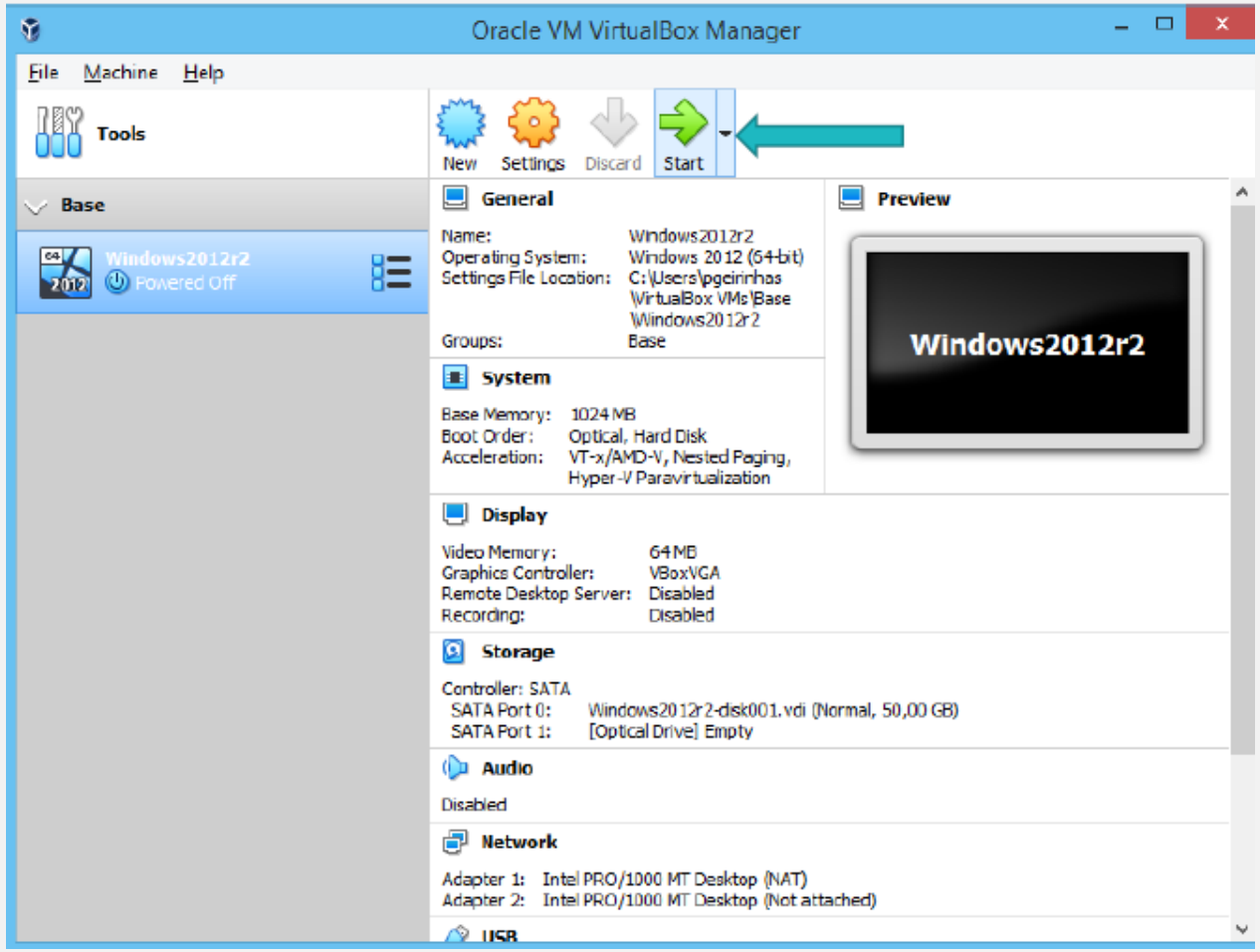
Exercise 2 - Change some machine parameters, services and events

Exercise 2

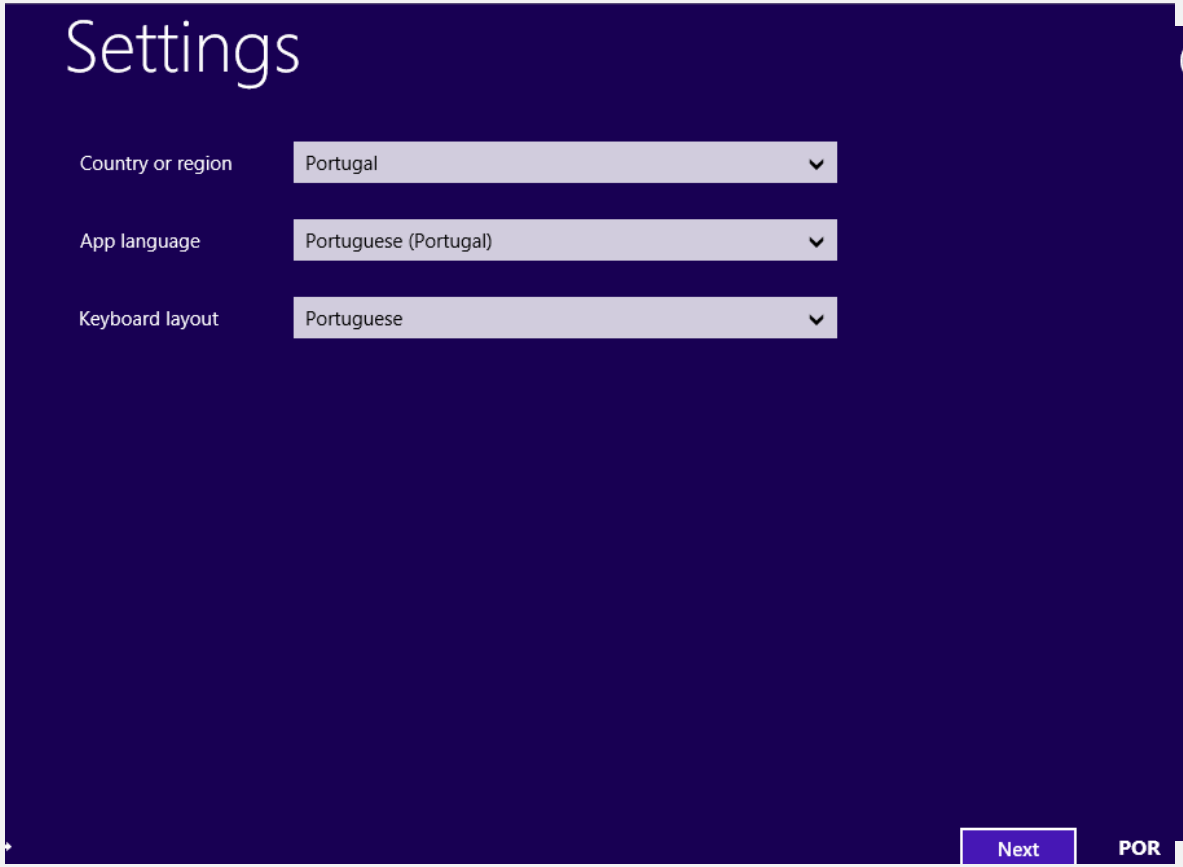
- Start with Windows Server 2012. Make your initial configuration.
- The password for the administrator user is 1qazZAQ!
- Change the Windows Server 2012 machine name to ServSR1.
- See the services that are running on your server.
- What is the status of the Workstaion service? Restart this service.
- 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.

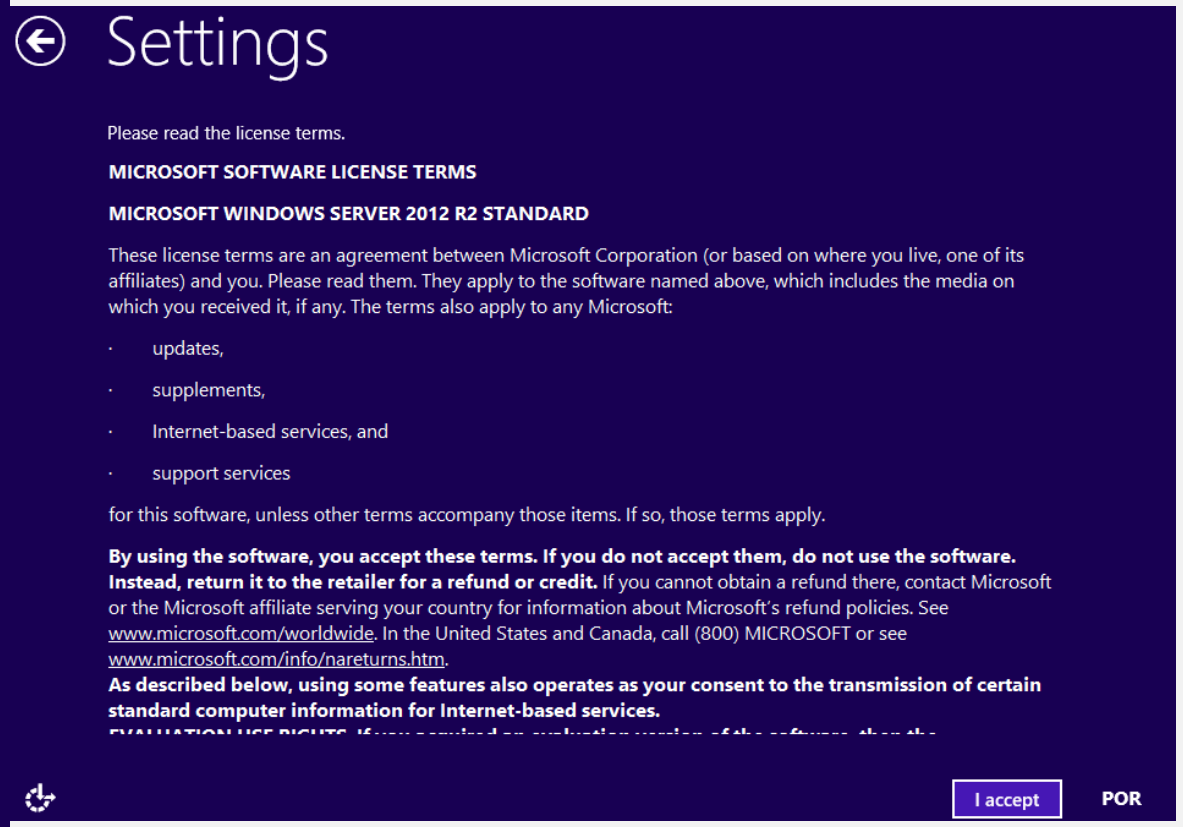
How To

Start with a machine

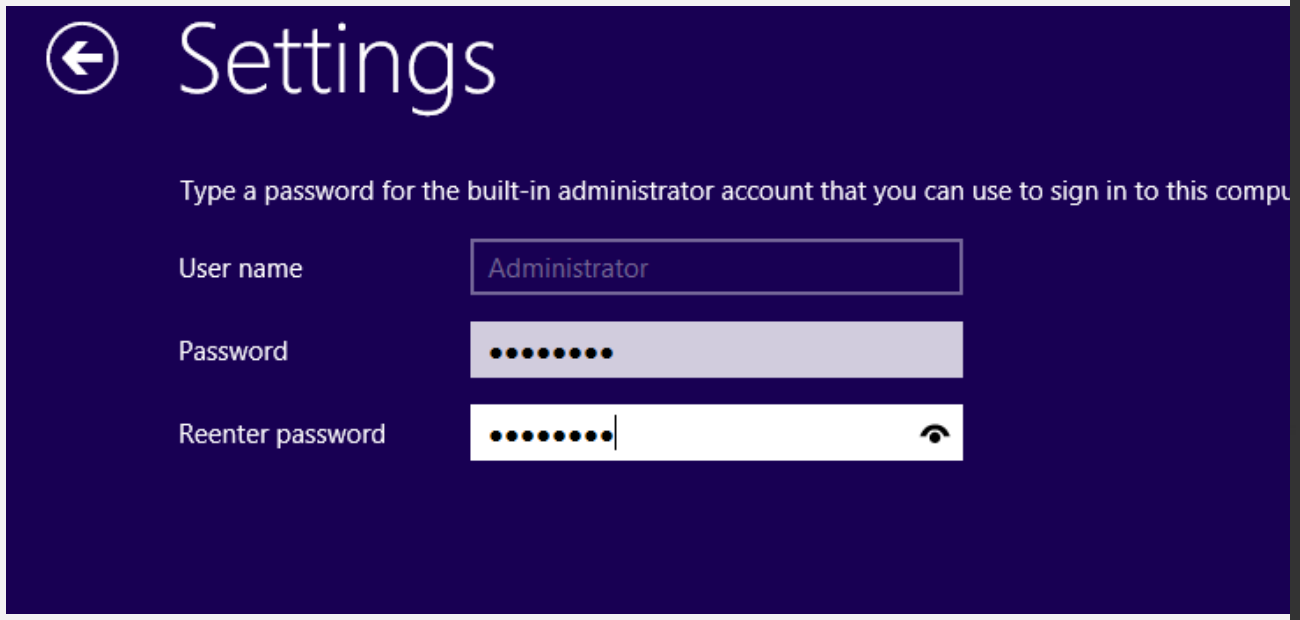


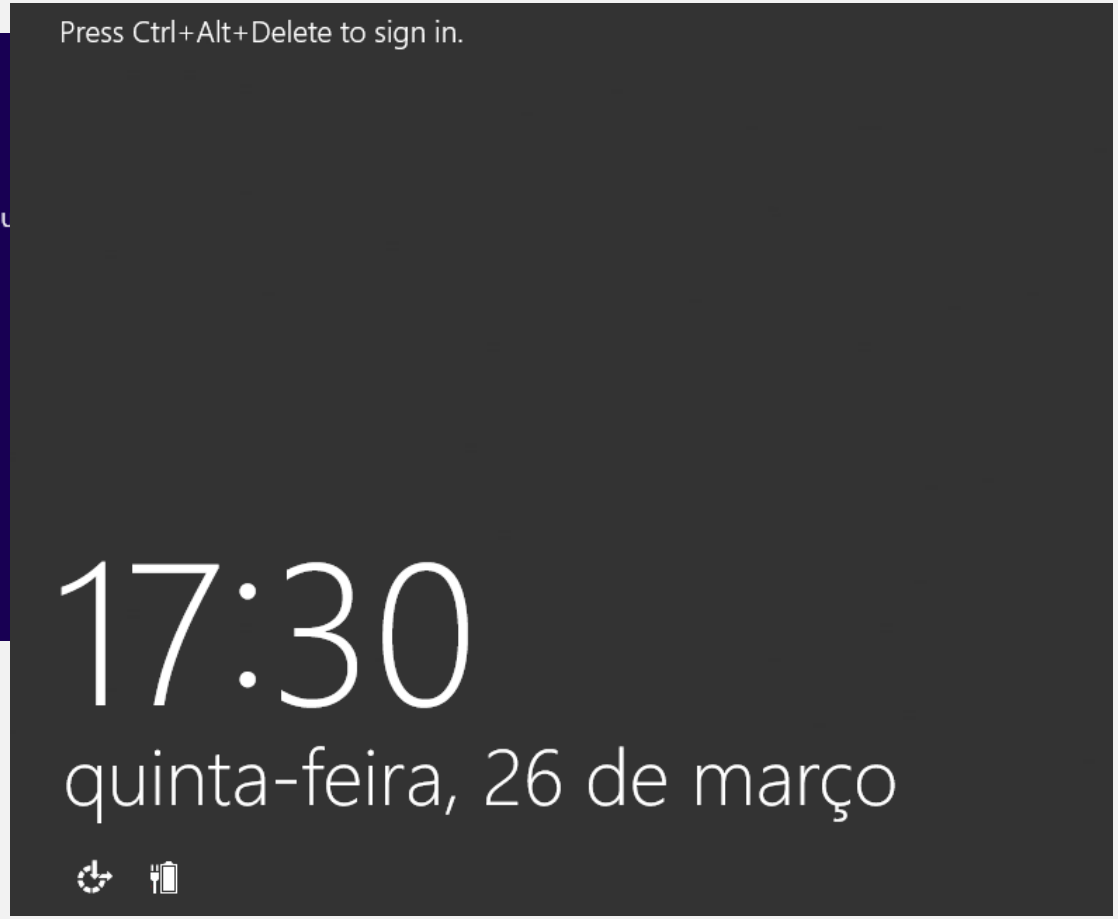
Server - Initial configuration





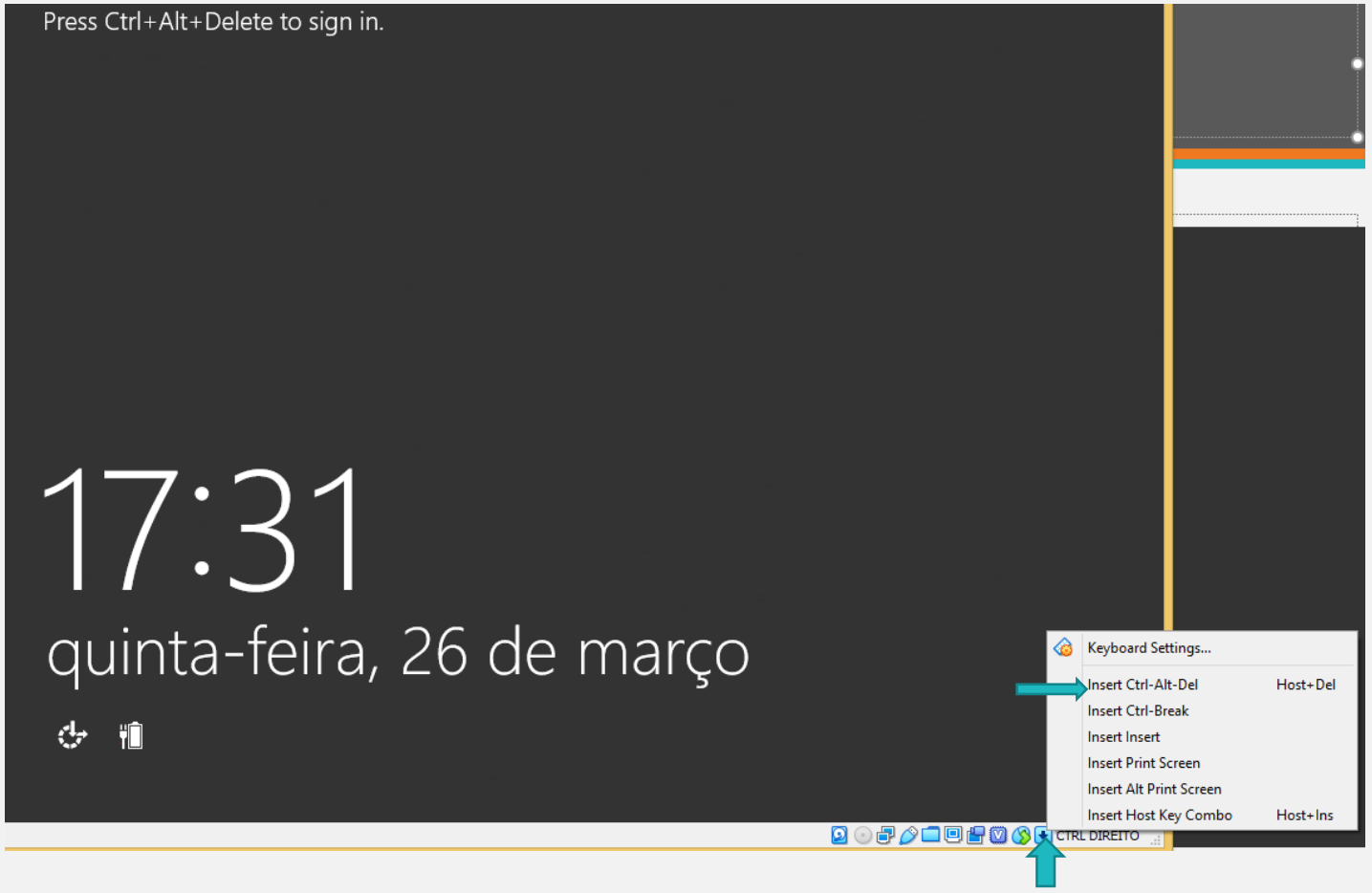
Server - Initial configuration



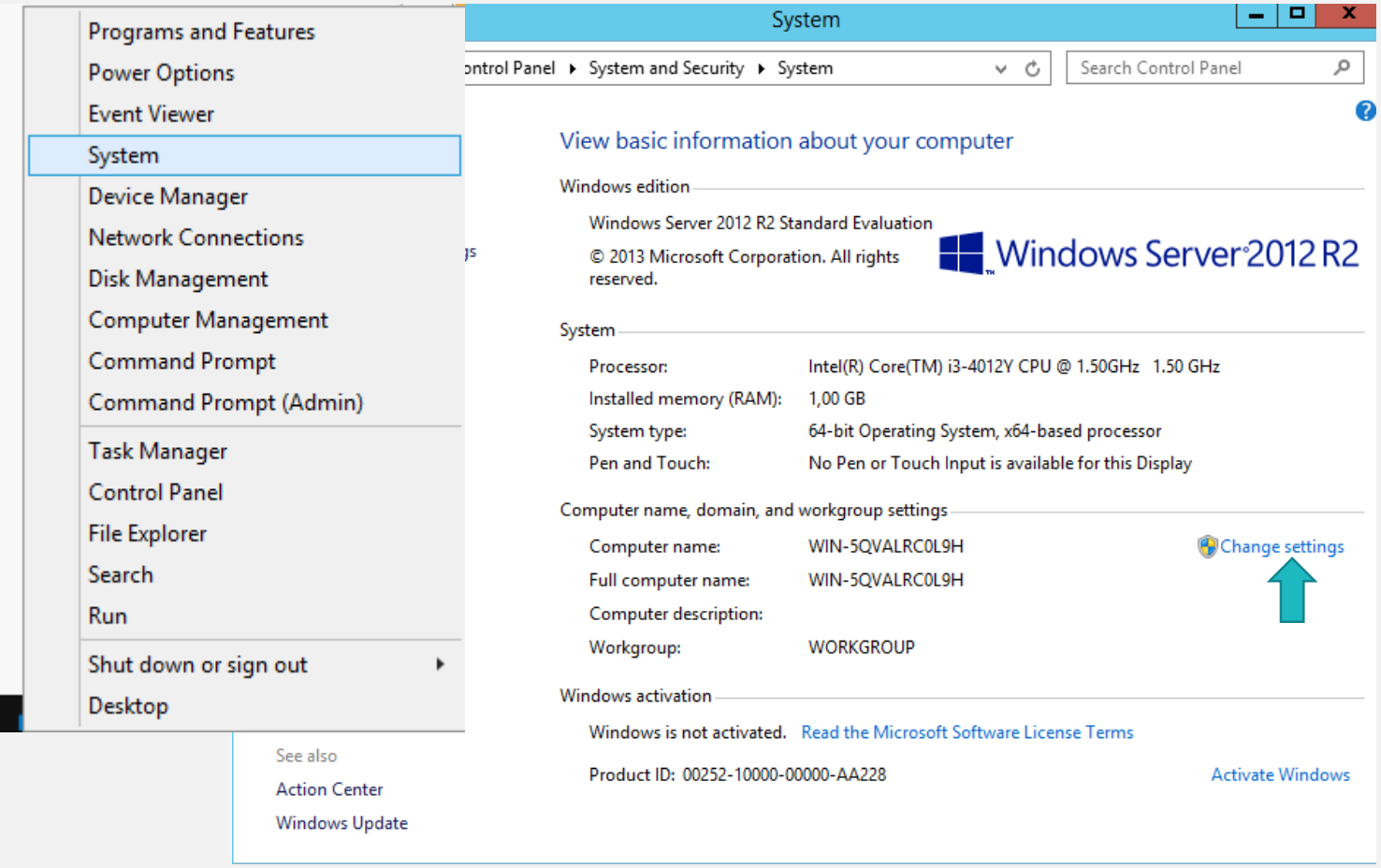


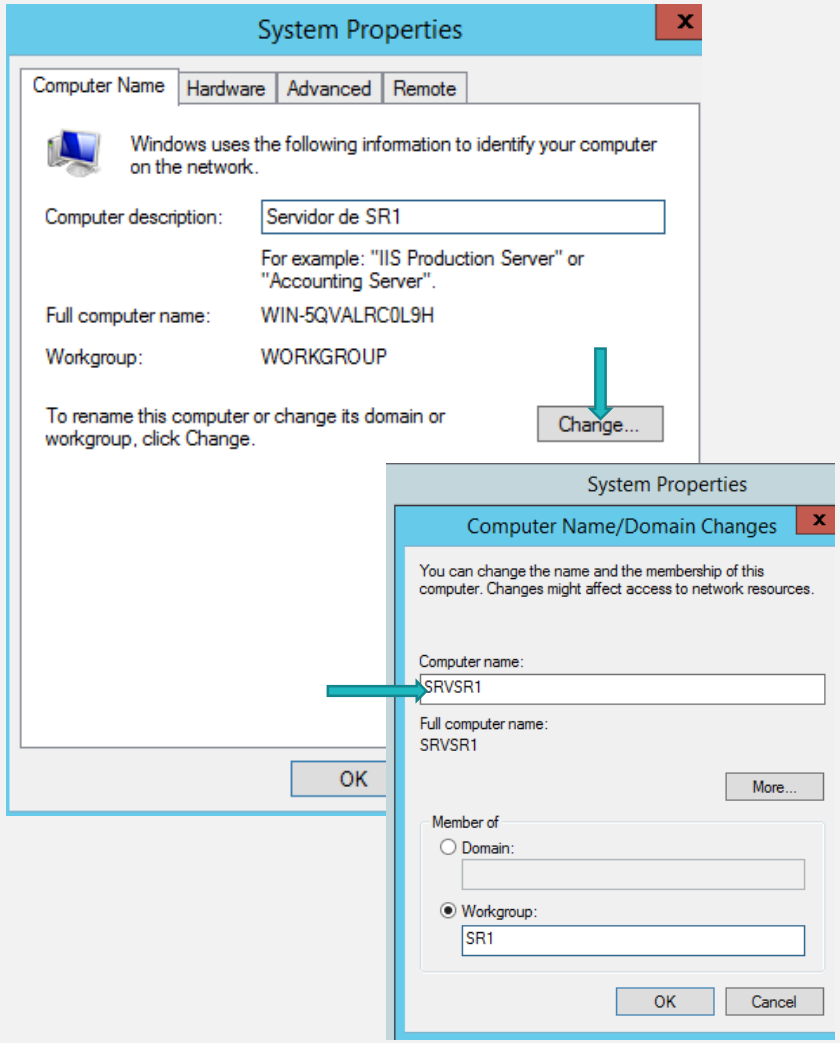
Server

- Clique com o botão do lado esquerdo do rato:

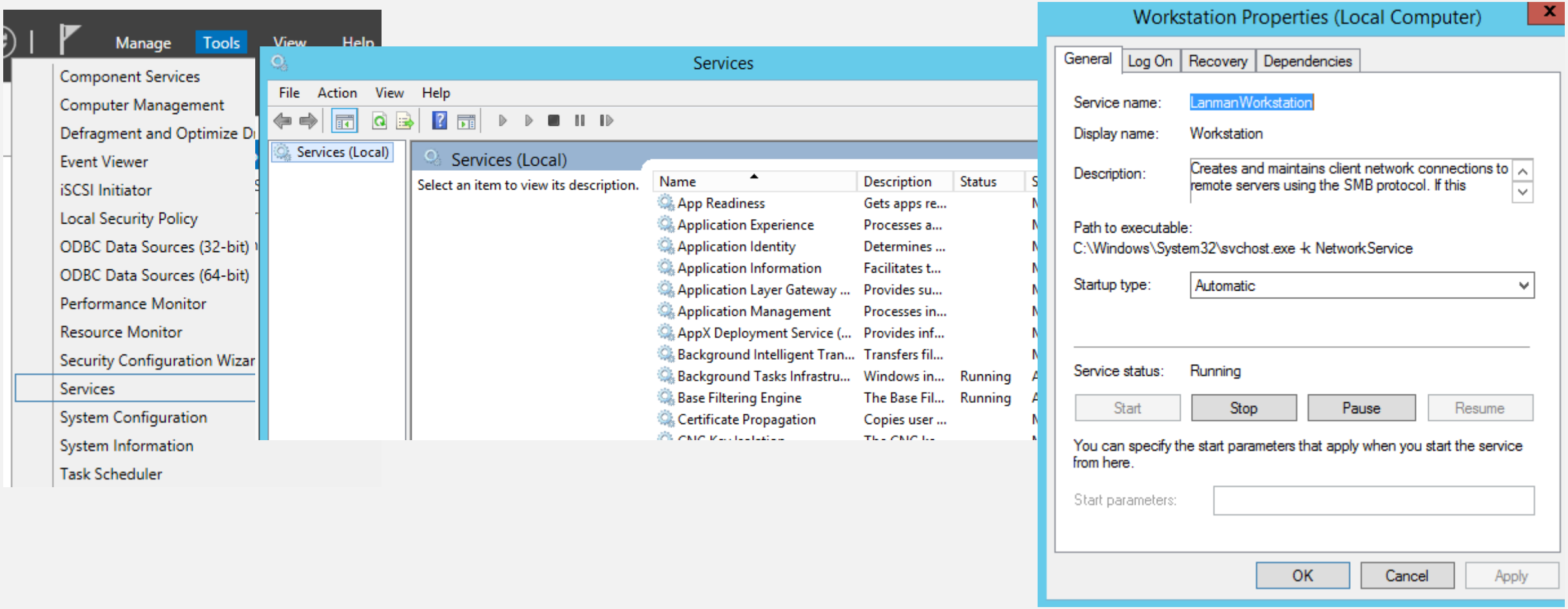


Change the name and domain of a server

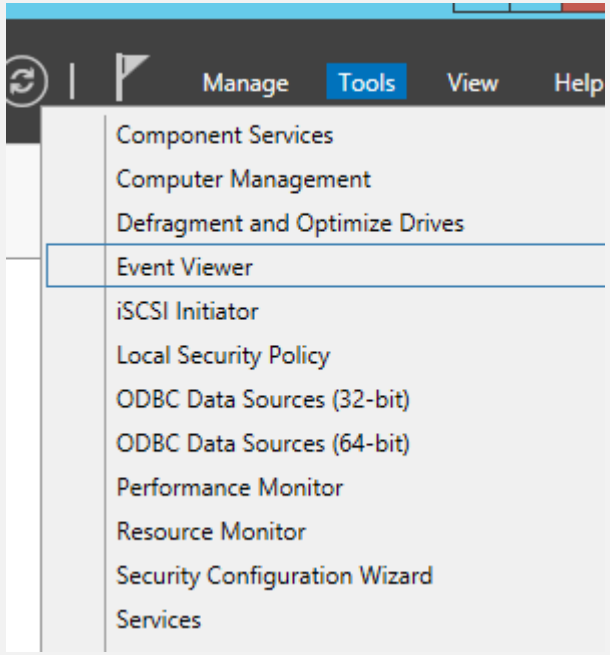


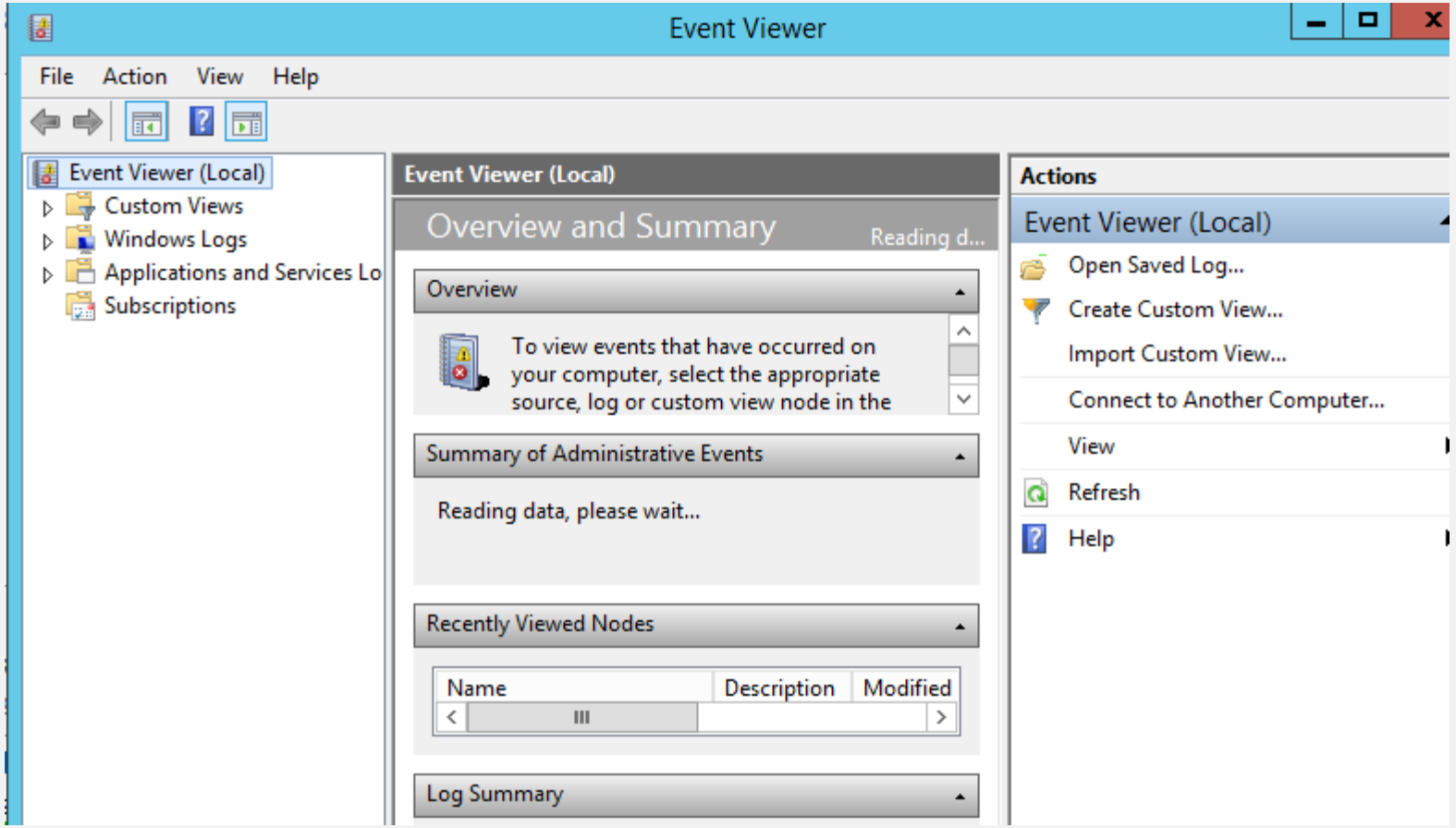


Services

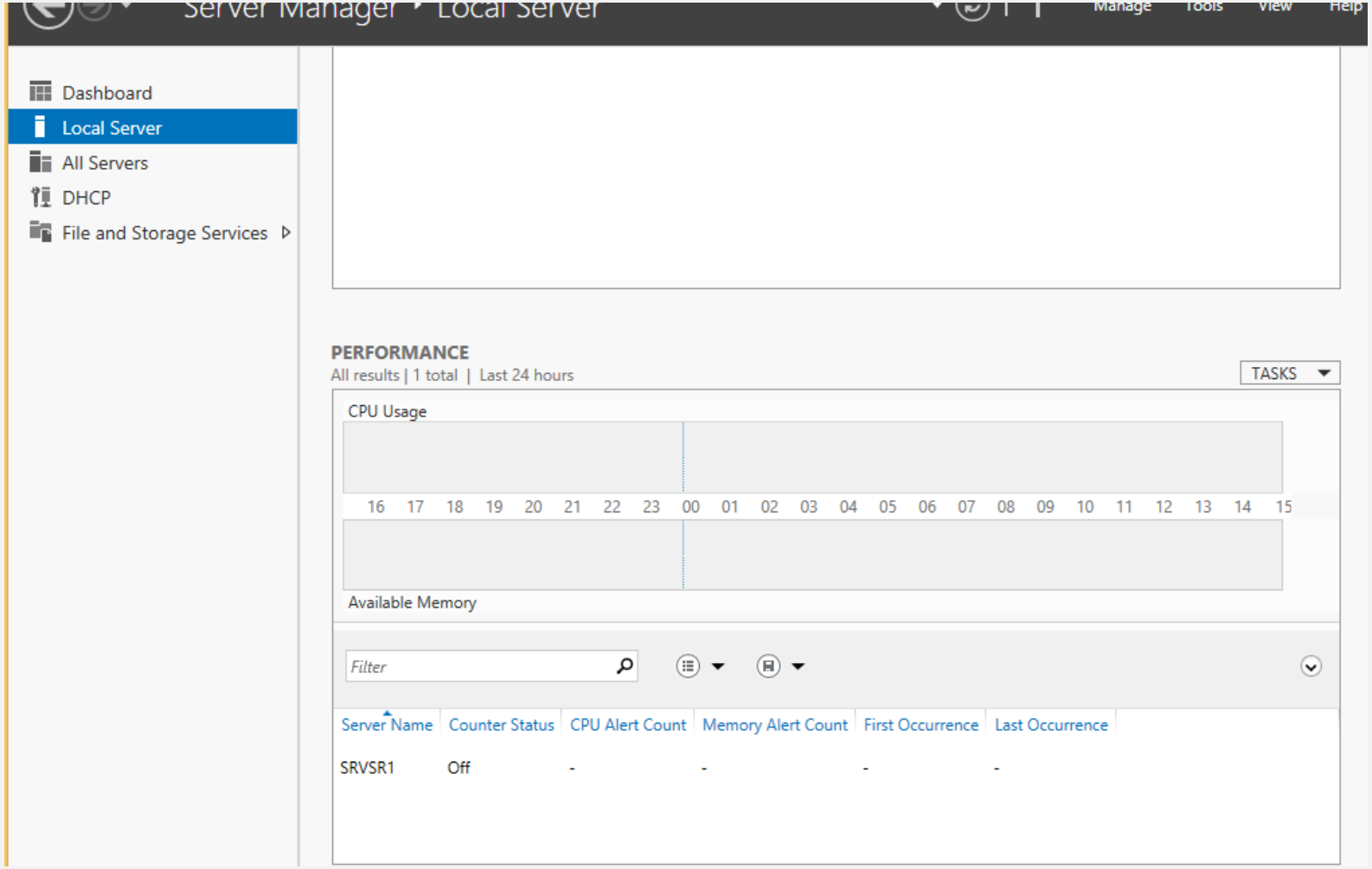

Manage
Tools
View
Help
Component Services
Computer Management
Defragment and Optimize D
Event Viewer
iSCSI Initiator
Local Security Policy
ODBC Data Sources (32-bit)
ODBC Data Sources (64-bit)
Performance Monitor
Resource Monitor
Security Configuration Wizar
Services
System Configuration
System Information
Task Scheduler
Services
File
Action
View
Help
Services (Local)
Services (Local)
Select an item to view its description.
Name
Description
Status
App Readiness
Gets apps re...
Application Experience
Processes a...
Application Identity
Determines ...
Application Information
Facilitates t...
Application Layer Gateway ...
Provides su...
Application Management
Processes in...
AppX Deployment Service (...
Provides inf...
Background Intelligent Tran...
Transfers fil...
Background Tasks Infrastru...
Windows in...
Running
Base Filtering Engine
The Base Fil...
Running
Certificate Propagation
Copies user ...
Workstation Properties (Local Computer)
General
Log On
Recovery
Dependencies
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
Start
Stop
Pause
Resume
You can specify the start parameters that apply when you start the service from here.
Start parameters:
OK
Cancel
Apply

Events

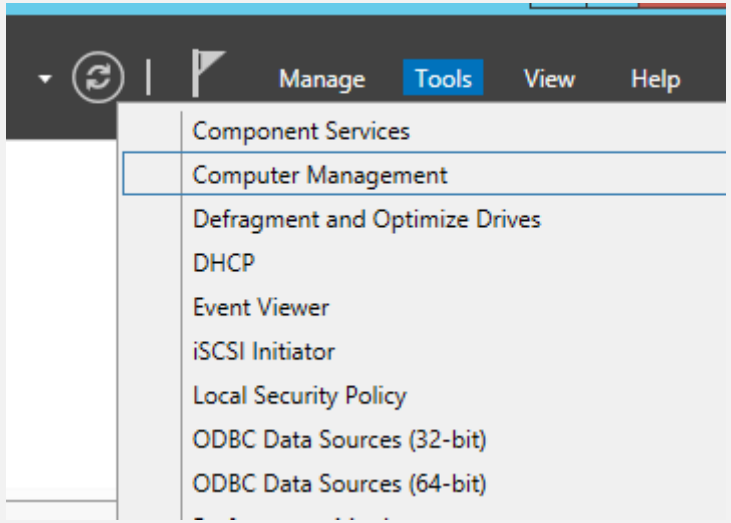

Manage
Tools
View
Help
Component Services
Computer Management
Defragment and Optimize Drives
Event Viewer
iSCSI Initiator
Local Security Policy
ODBC Data Sources (32-bit)
ODBC Data Sources (64-bit)
Performance Monitor
Resource Monitor
Security Configuration Wizard
Services

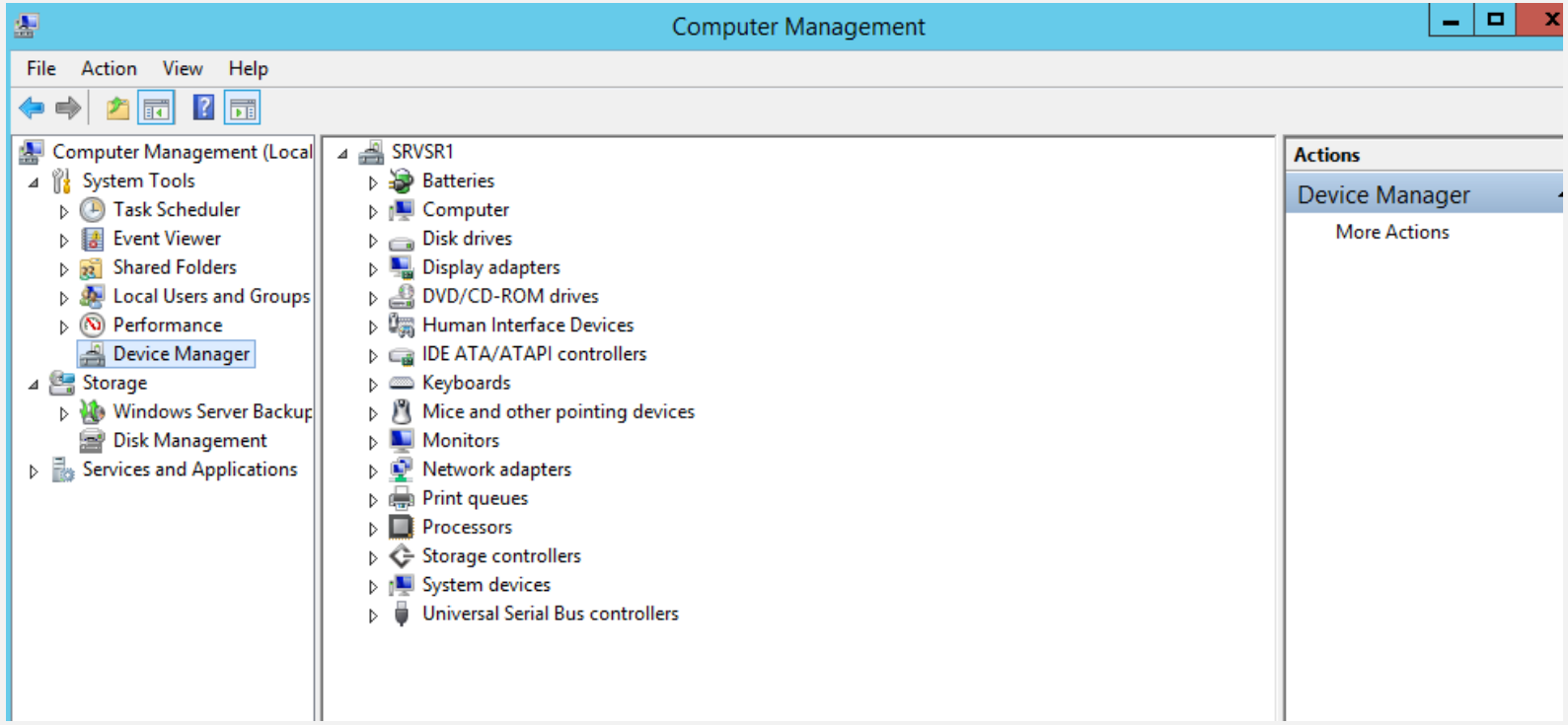

Event Viewer
File
Action
View
Help
Event Viewer (Local)
Custom Views
Windows Logs
Applications and Services Lo
Subscriptions
Event Viewer (Local)
Overview and Summary
Reading d...
Overview
To view events that have occurred on your computer, select the appropriate source, log or custom view node in the
Summary of Administrative Events
Reading data, please wait...
Recently Viewed Nodes
Name
Description
Modified
Log Summary
Actions
Event Viewer (Local)
Open Saved Log...
Create Custom View...
Import Custom View...
Connect to Another Computer...
View
Refresh
Help

Performance



Device Manager





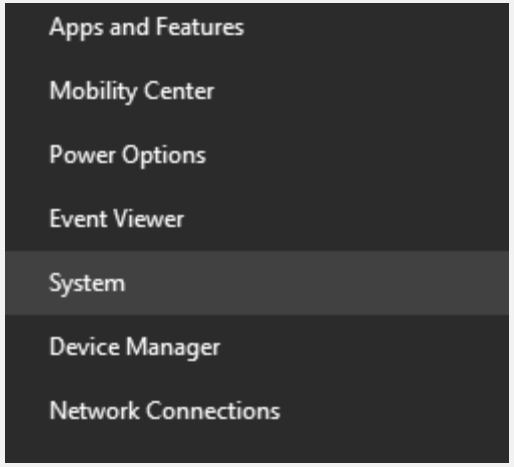
Exercise 3 - Creating a network between the server and the client

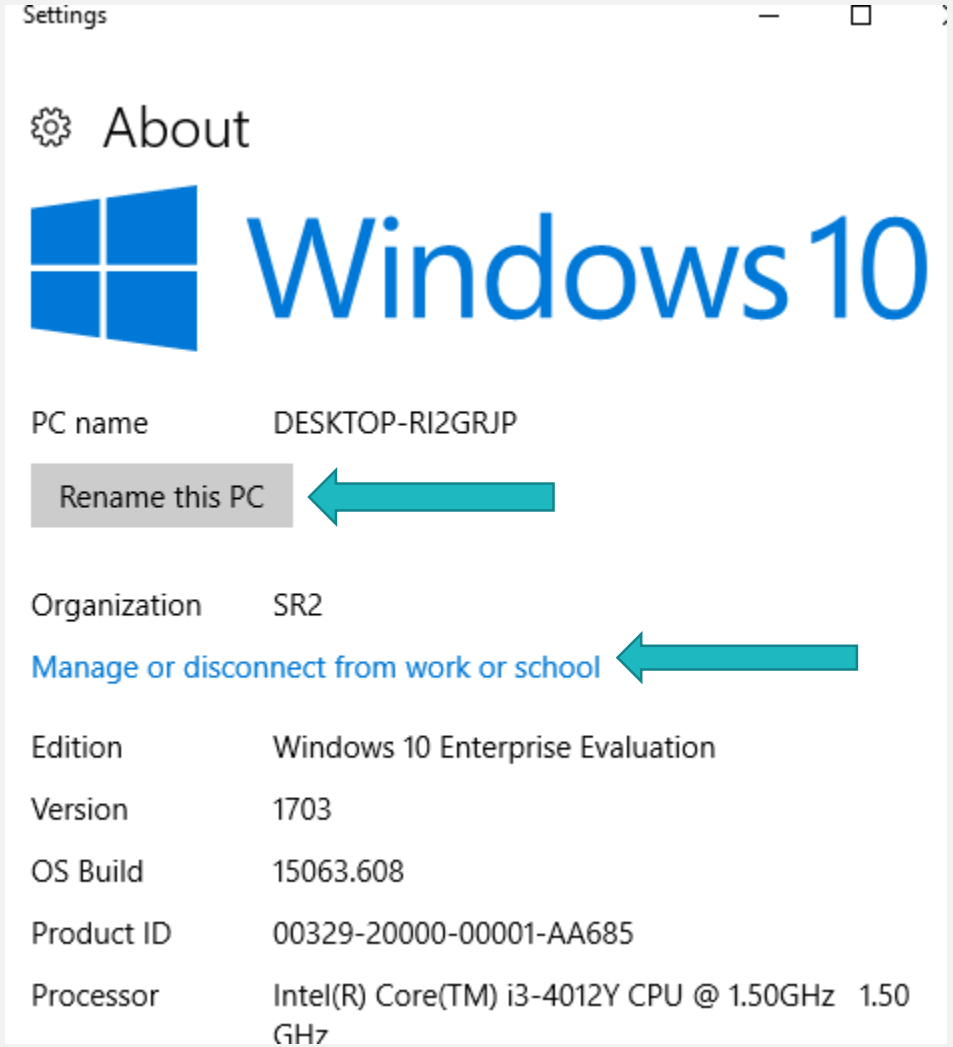
Exercise 3

- 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….

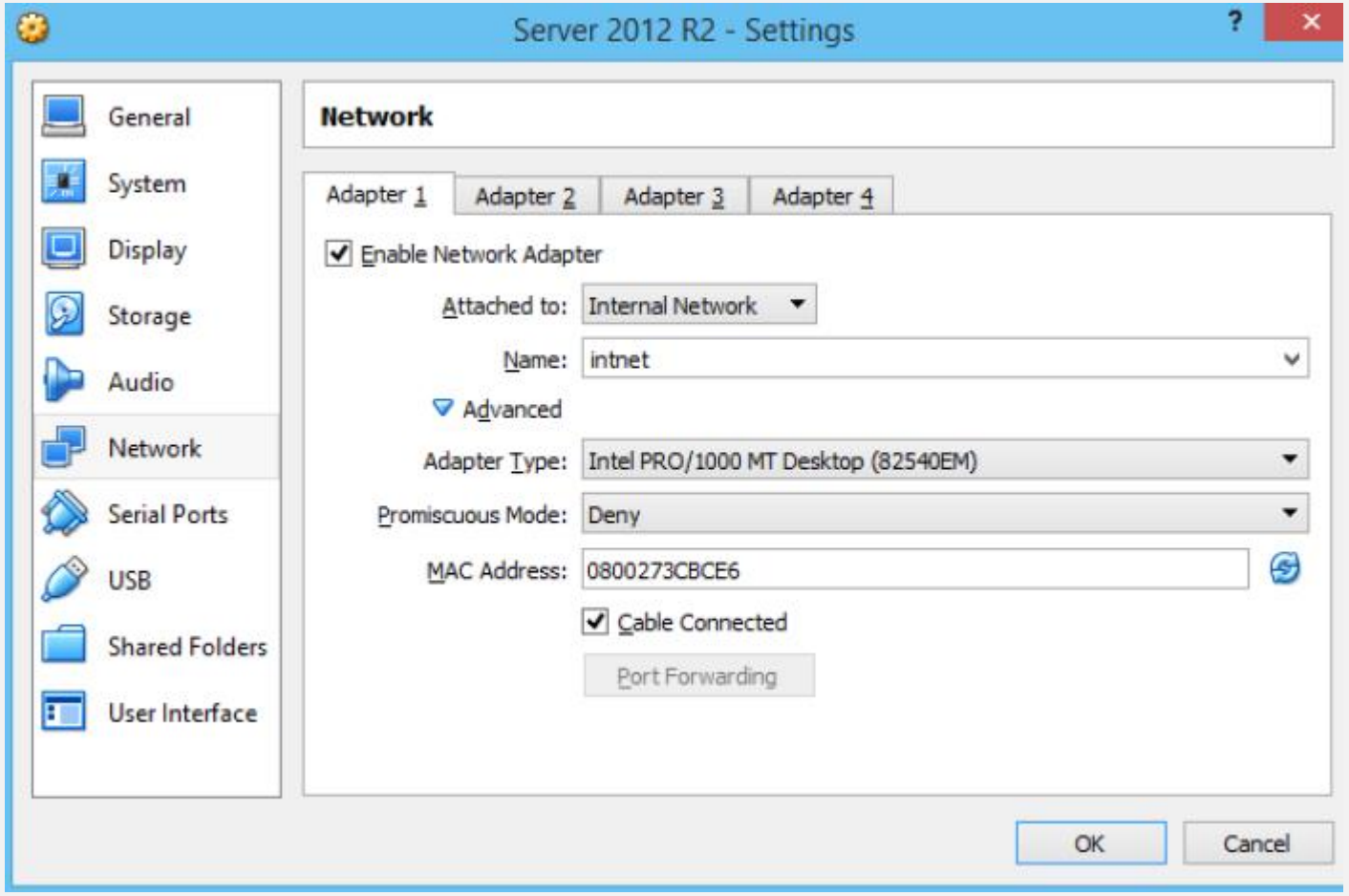
How To

Alterar o nome e o domínio de uma maquina Windows 10





Virtual machine network configuration

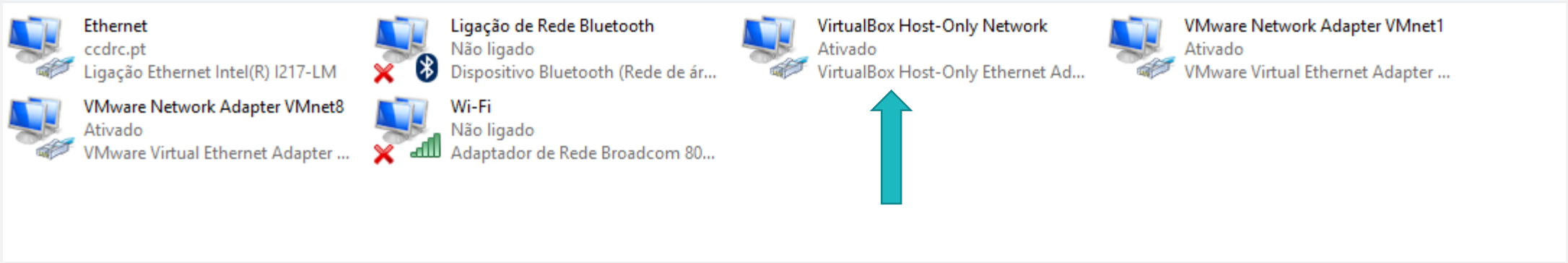


Virtual machine network configuration

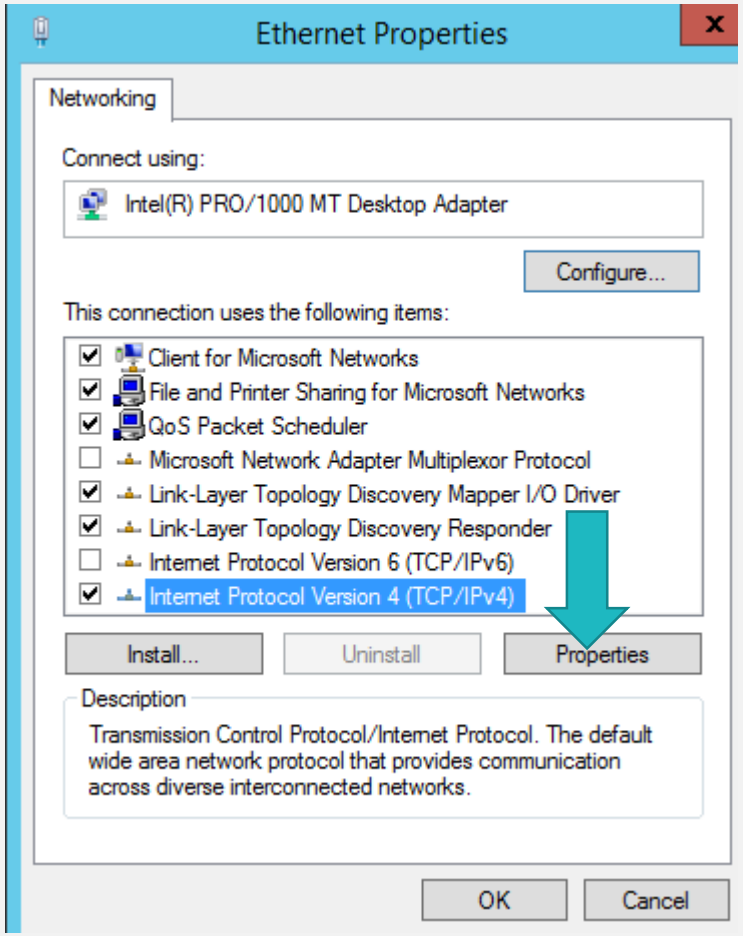
- Virtual Box allows you to configure the virtual machine with four main modes of connection to the network:
  - **nat mode**: the network card accesses the physical network with the same IP address of the host machine as if it were on a NAT network. Used in environments where virtual machines do not 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.

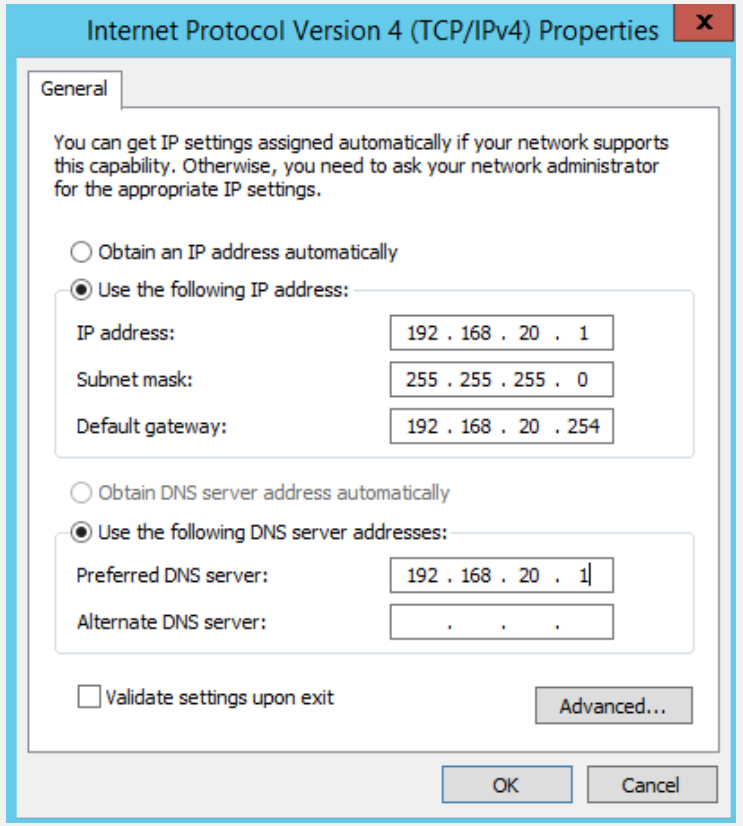
Virtual machine network configuration

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

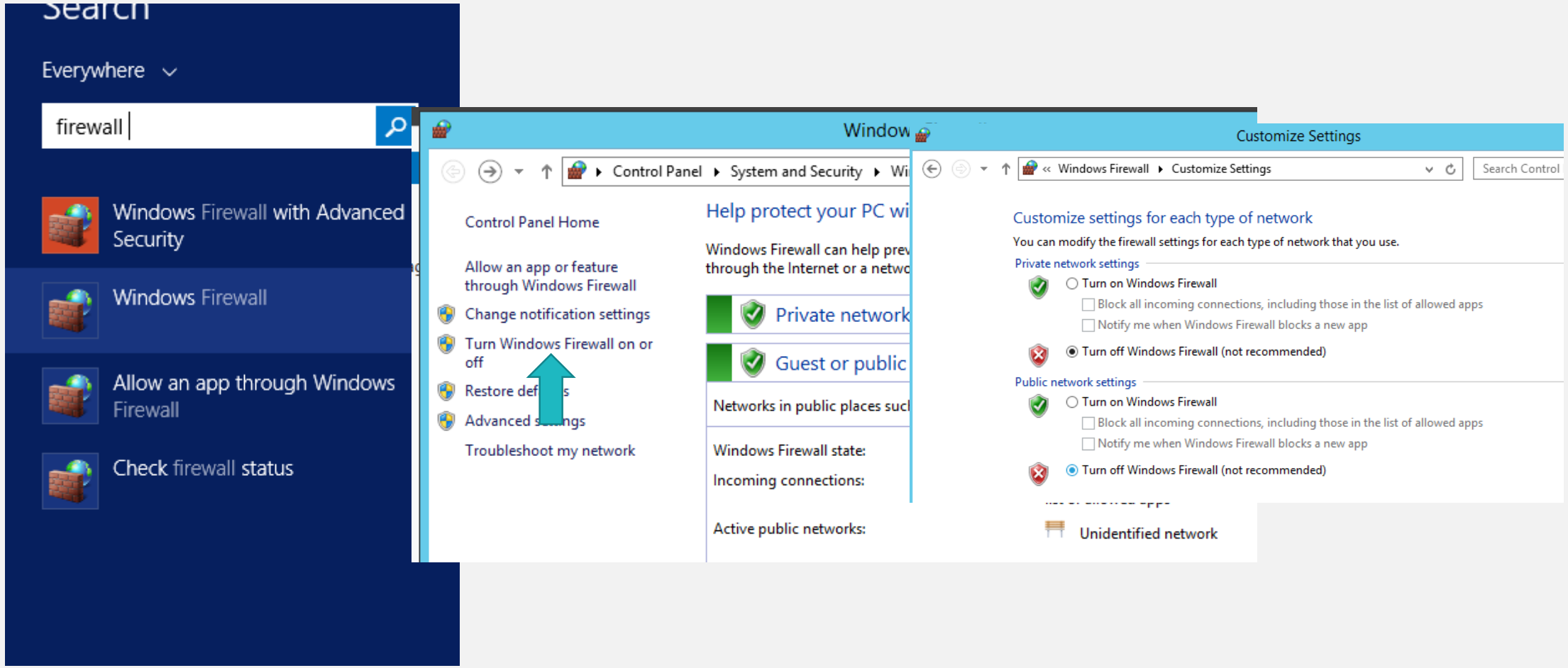


Change the IP address of a machine Windows 2012

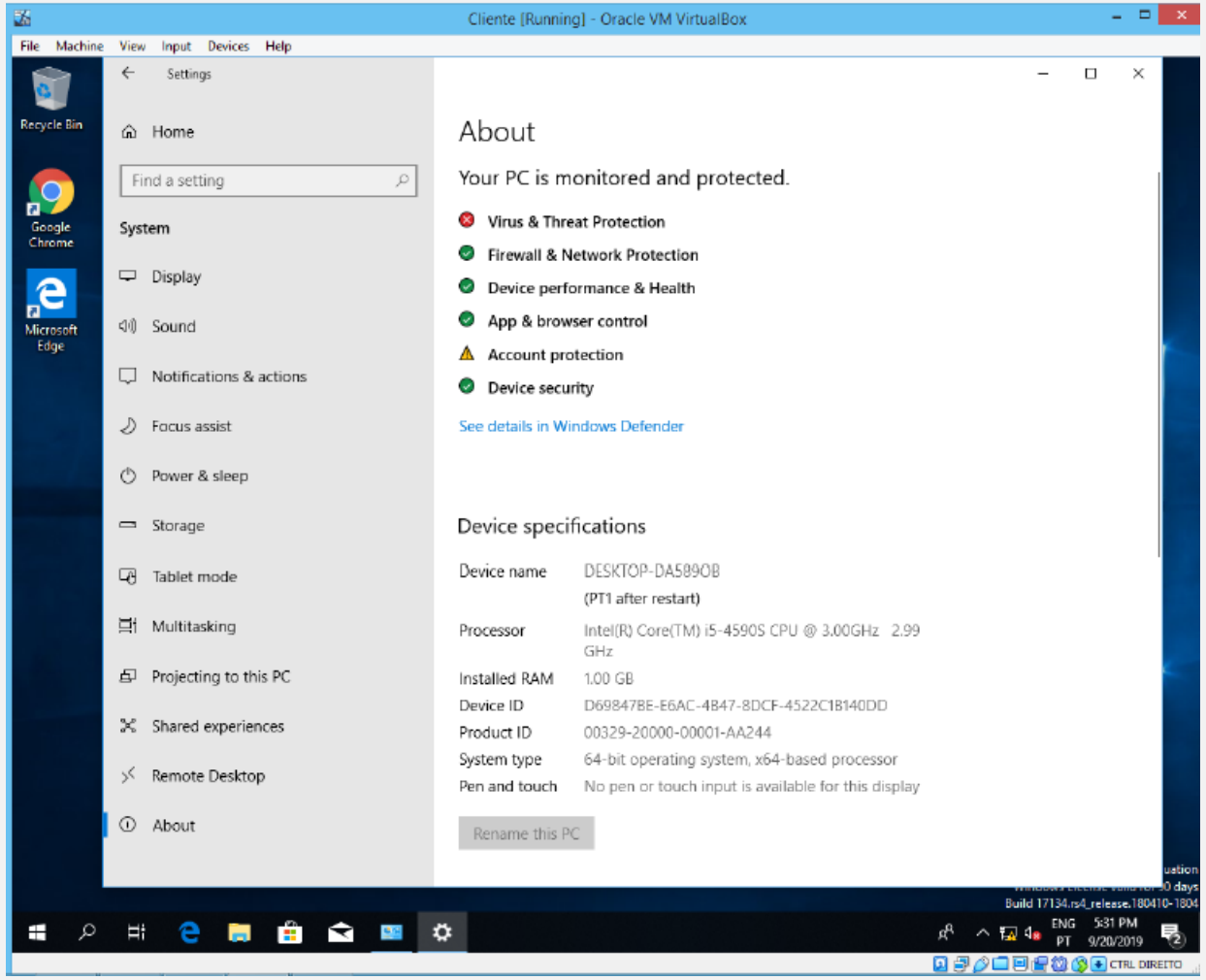


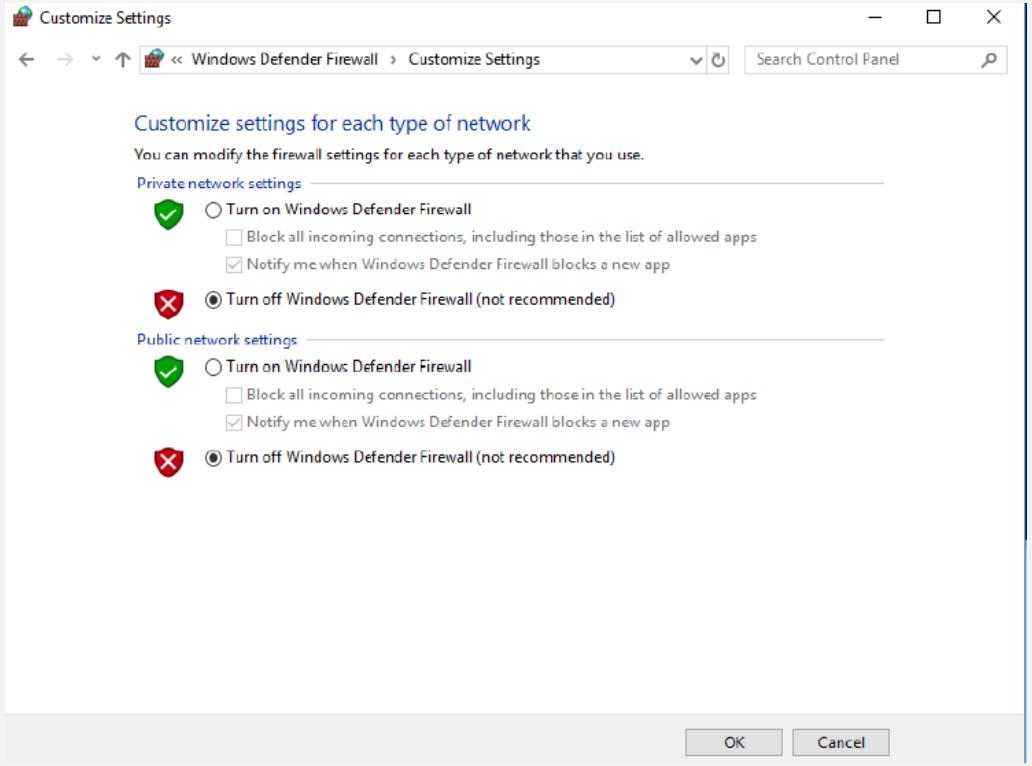


Firewall - Server

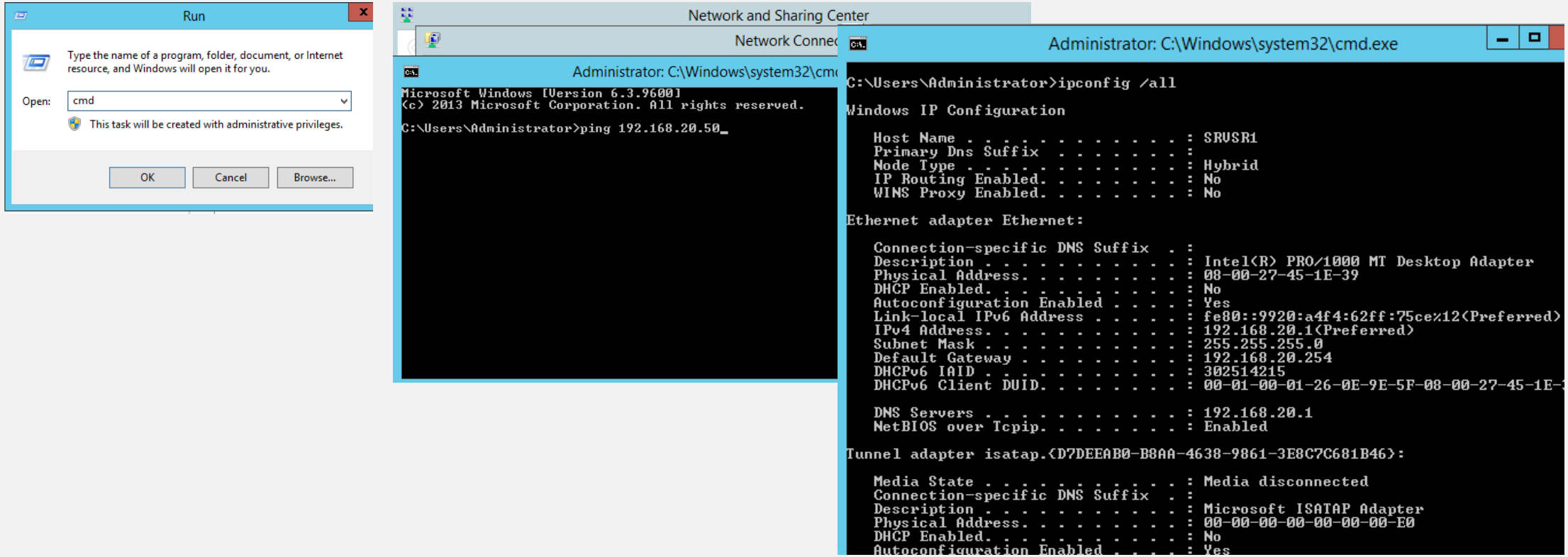


Firewall - Client





Diagnosis


Run
Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:
cmd
This task will be created with administrative privileges.
OK
Cancel
Browse...
Network and Sharing Center
Network Connec
Administrator: C:\Windows\system32\cmd
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.
C:\Users\Administrator>ping 192.168.20.50
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>ipconfig /all
Windows IP Configuration
Host Name . . . . . : SRVSR1
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
Ethernet adapter Ethernet:
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
Physical Address. . . . . : 08-00-27-45-1E-39
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::9920:a4f4:62ff:75ce%12(Preferred)
IPv4 Address. . . . . : 192.168.20.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.20.254
DHCPv6 IAID . . . . . : 302514215
DHCPv6 Client DUID. . . . . : 00-01-00-01-26-0E-9E-5F-08-00-27-45-1E-
DNS Servers . . . . . : 192.168.20.1
NetBIOS over Tcpip. . . . . : Enabled
Tunnel adapter isatap.{D7DEEAB0-B8AA-4638-9861-3E8C7C681B46}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft ISATAP Adapter
Physical Address. . . . . : 00-00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes

Exercise 4 - Configure the DHCP server

Exercise 4

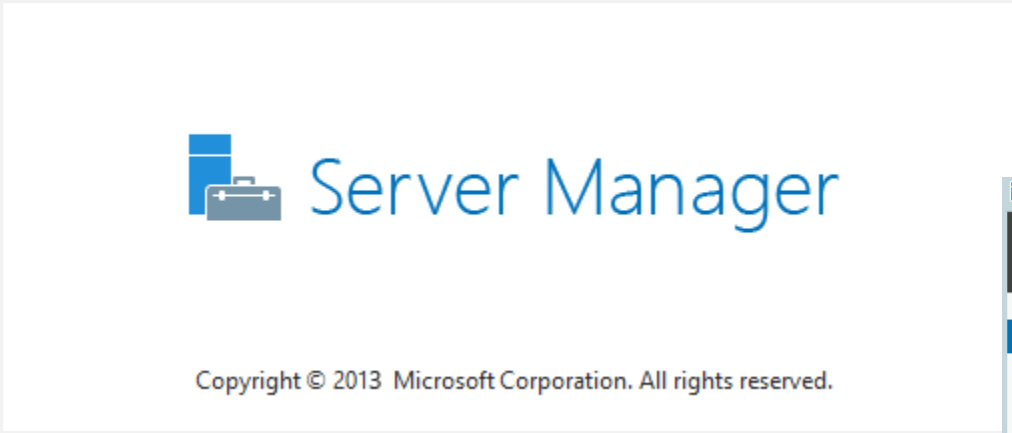
- Install the DHCP service on the server.
- It should have the following settings:
  - Network - 192.168.20.0/24
  - Router - 192.168.20.254
  - Domain - sr1.pt
  - DNS:
    - Primary - 192.168.20.1
    - Secondary - 8.8.8.8
  - Dynamic IP Range - 20 to 200
  - Scope Name - LAN
  - NTP Server - 192.168.20.10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

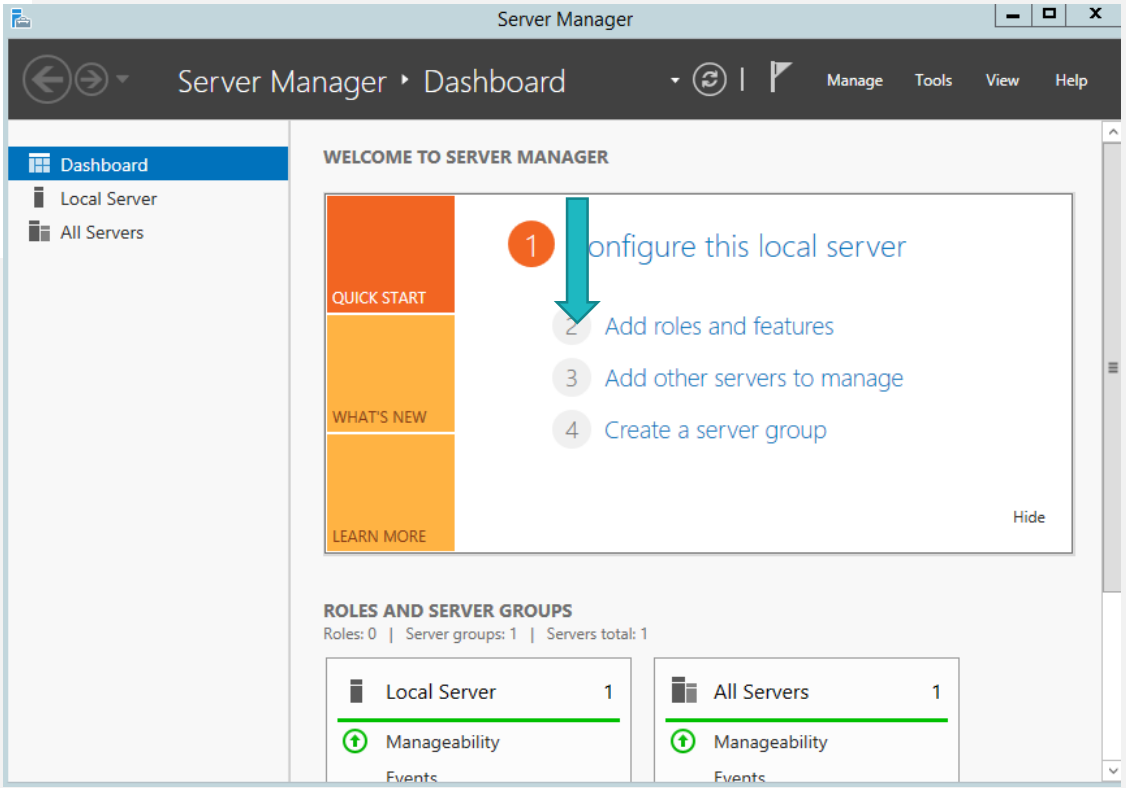
Exercise 4

- 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.

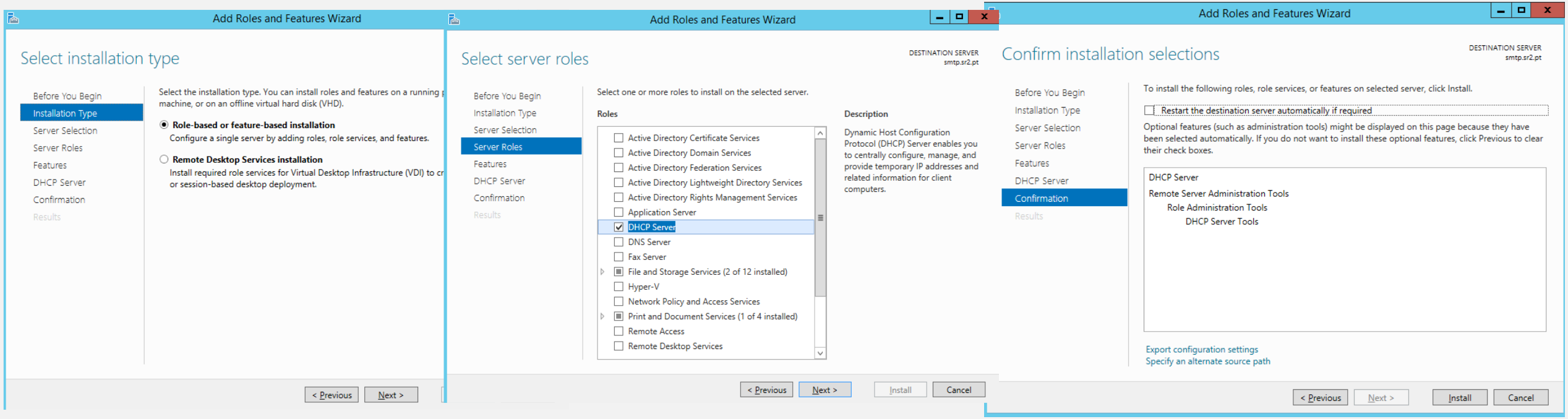
How To

DHCP – Service installation

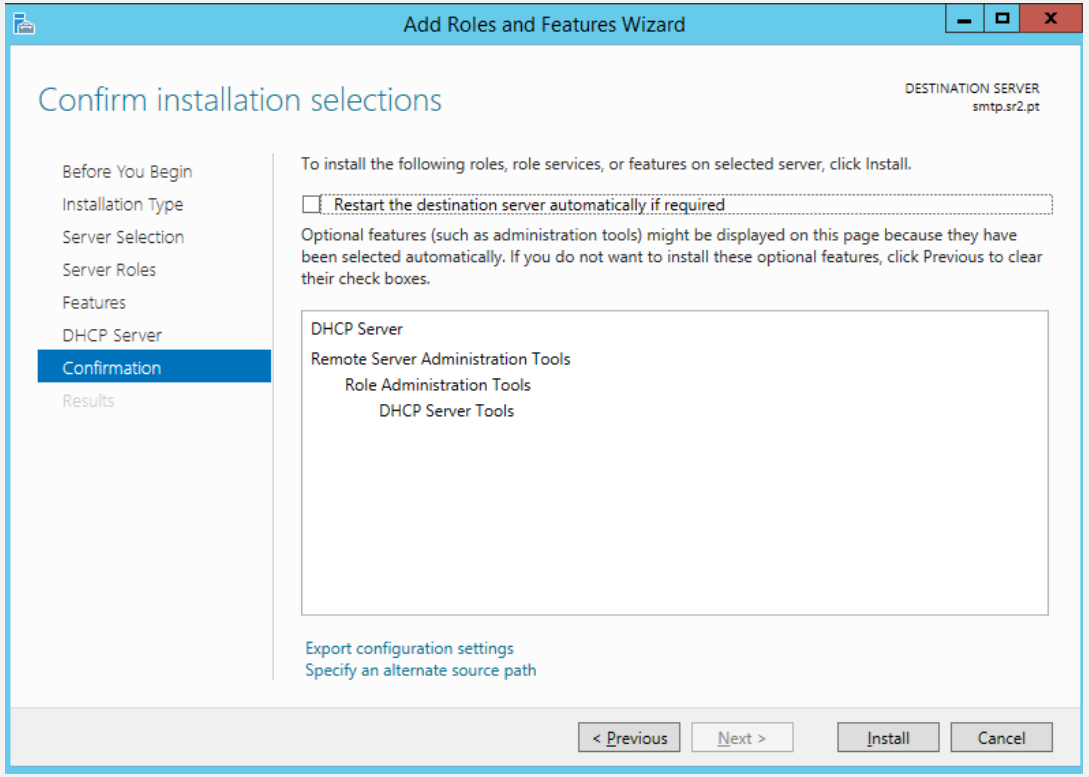


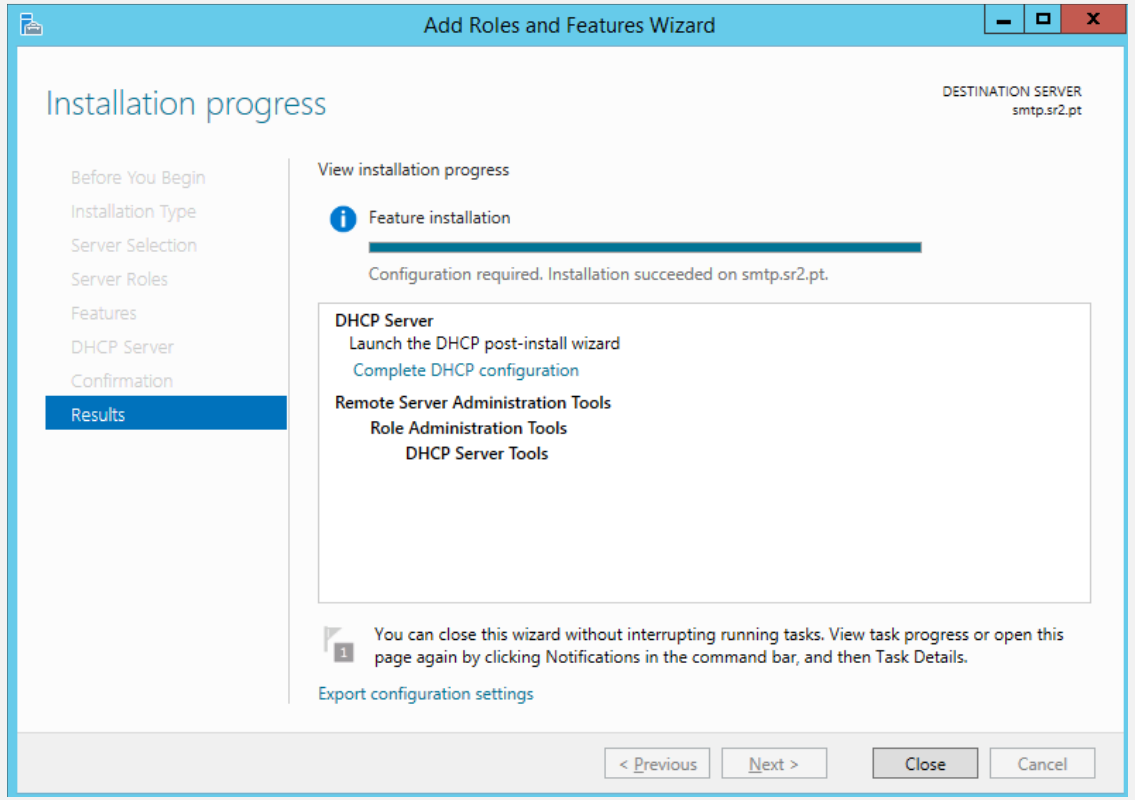


DHCP – Service installation

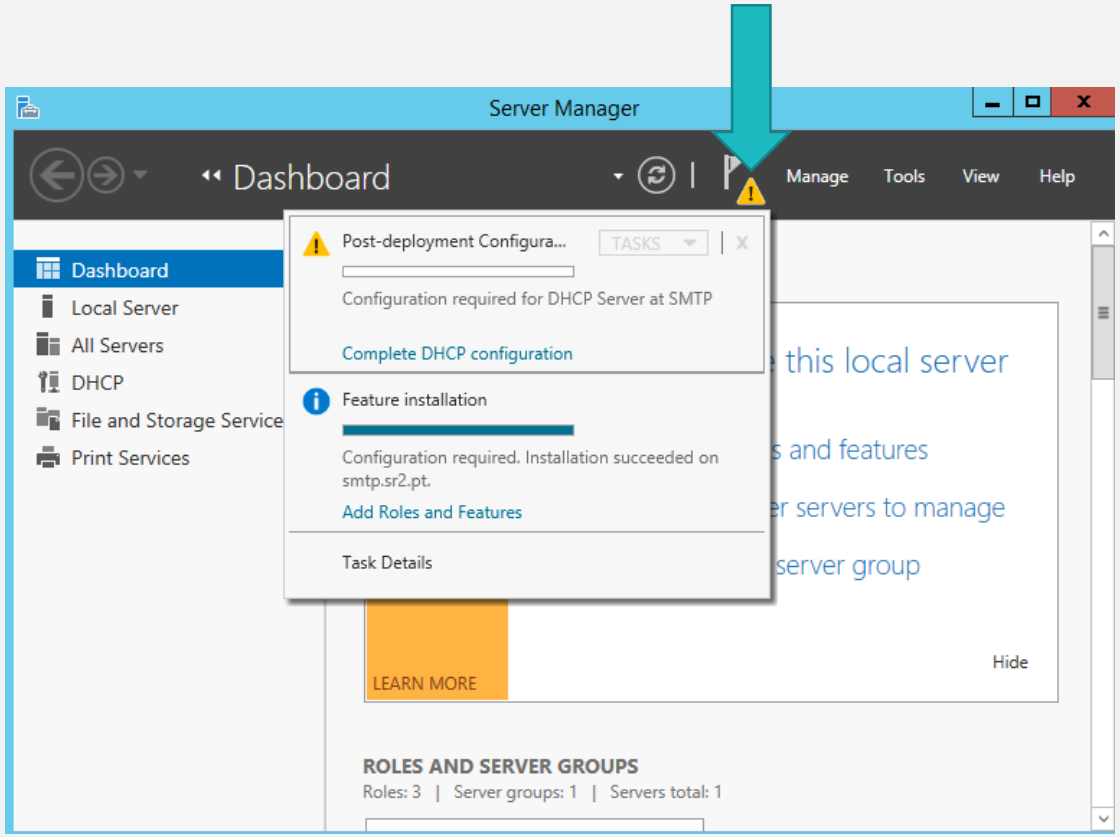


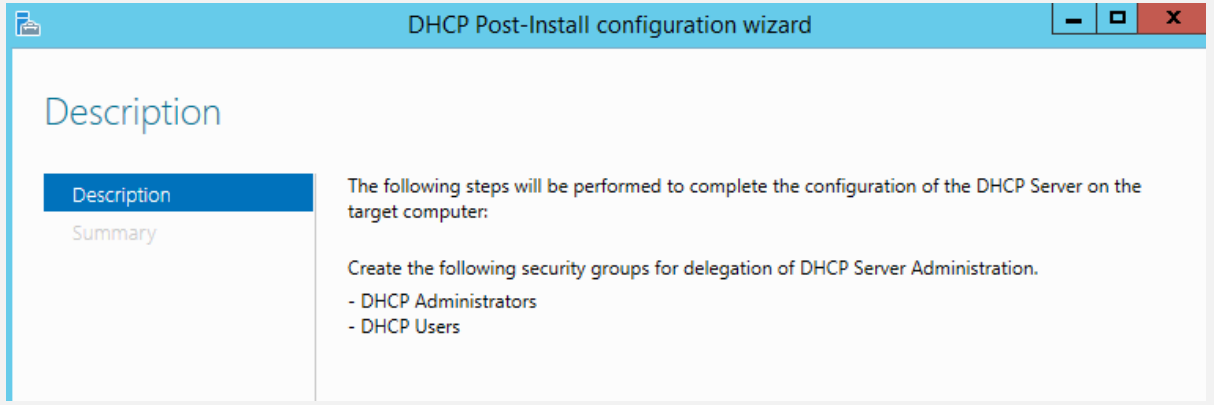
DHCP – Service installation



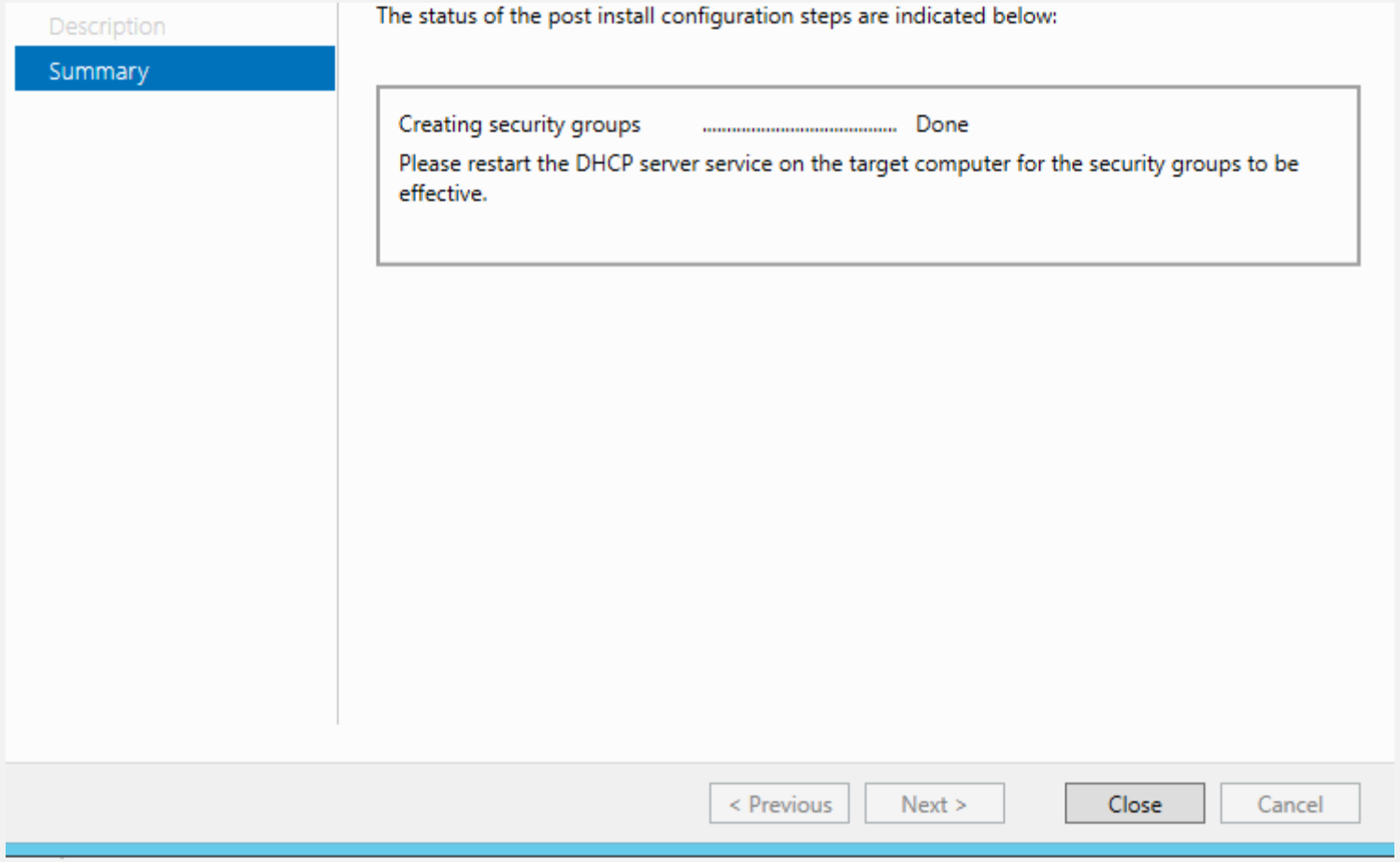


DHCP – Service installation

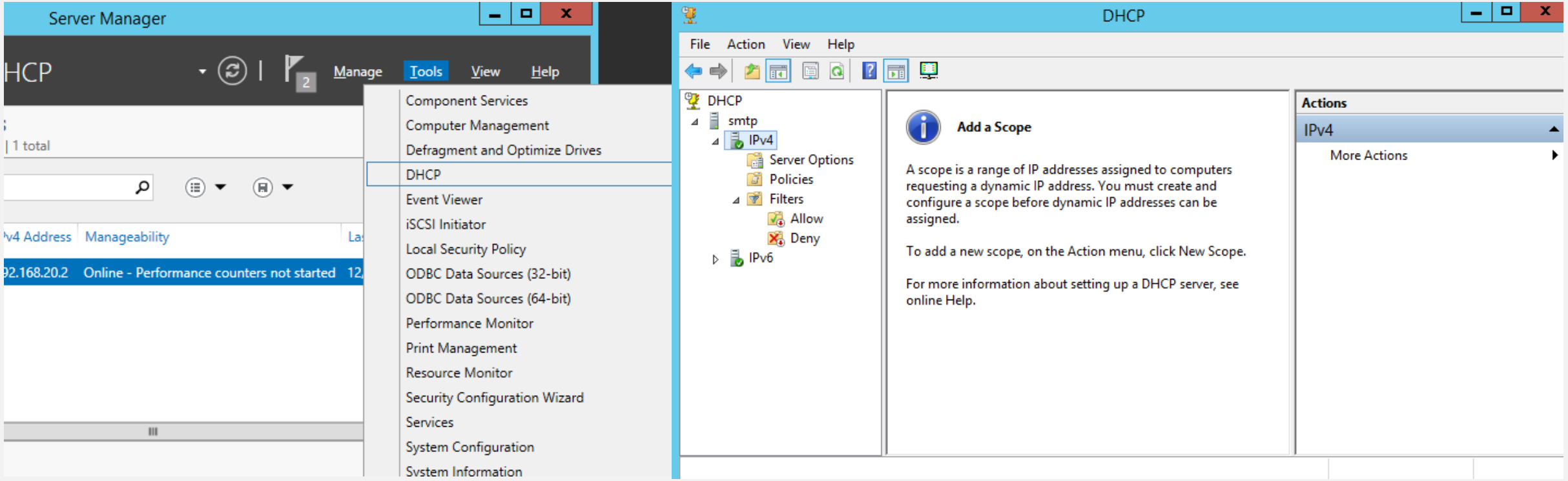




DHCP – Service installation

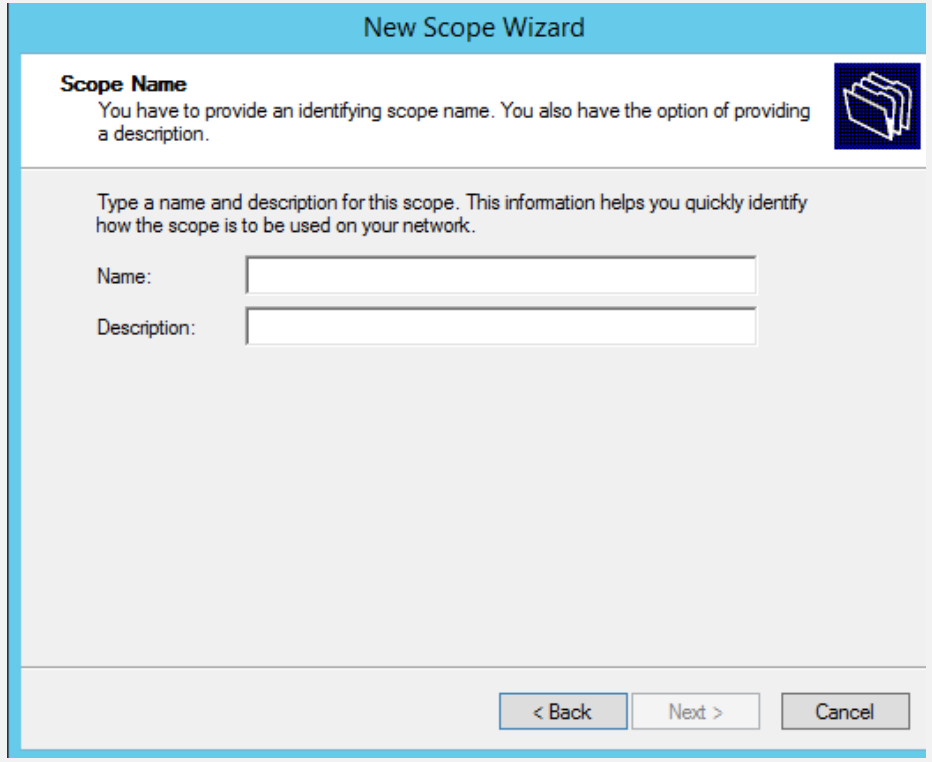


DHCP – Service installation

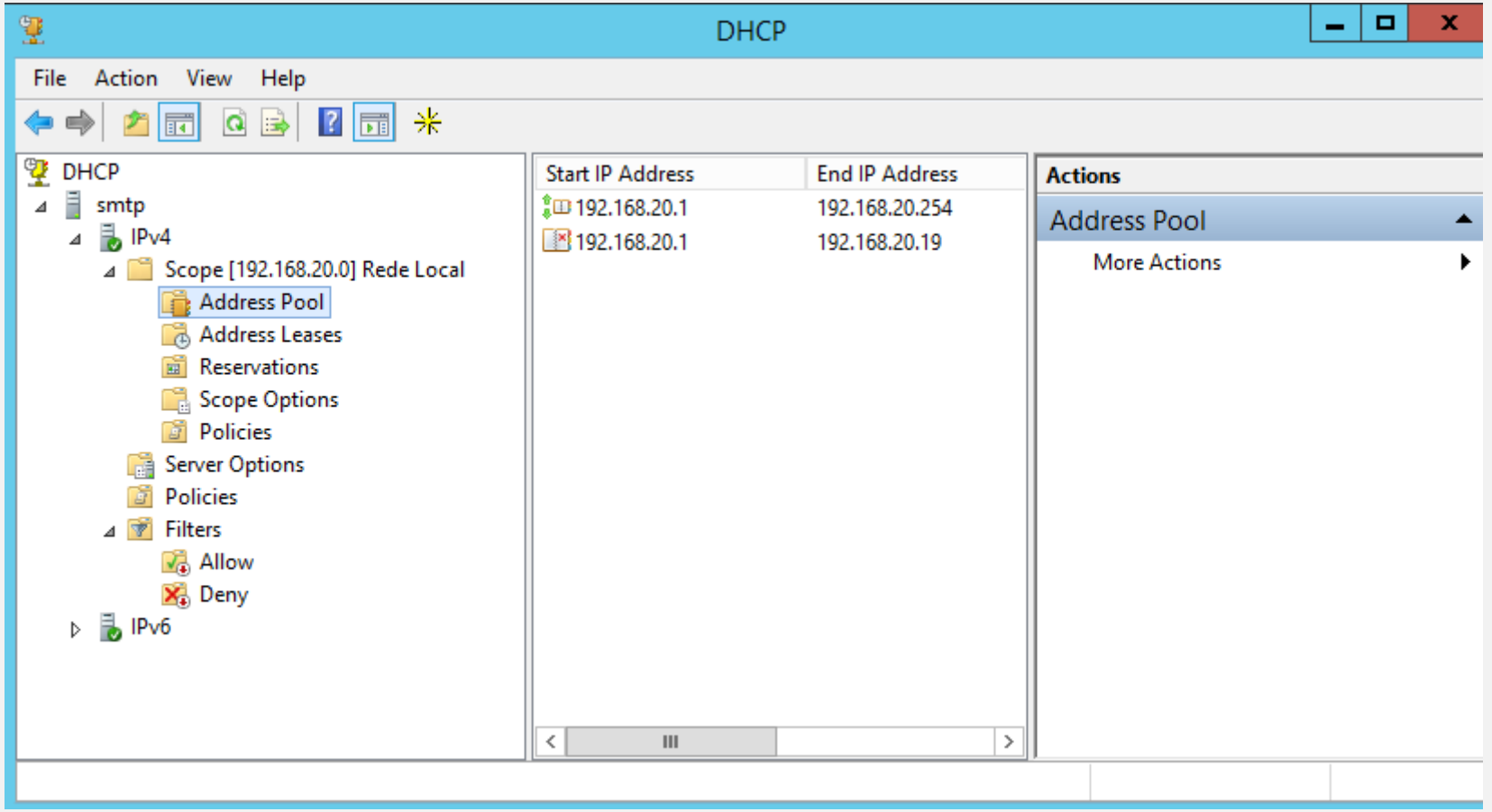


DHCP – Service installation

- **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.

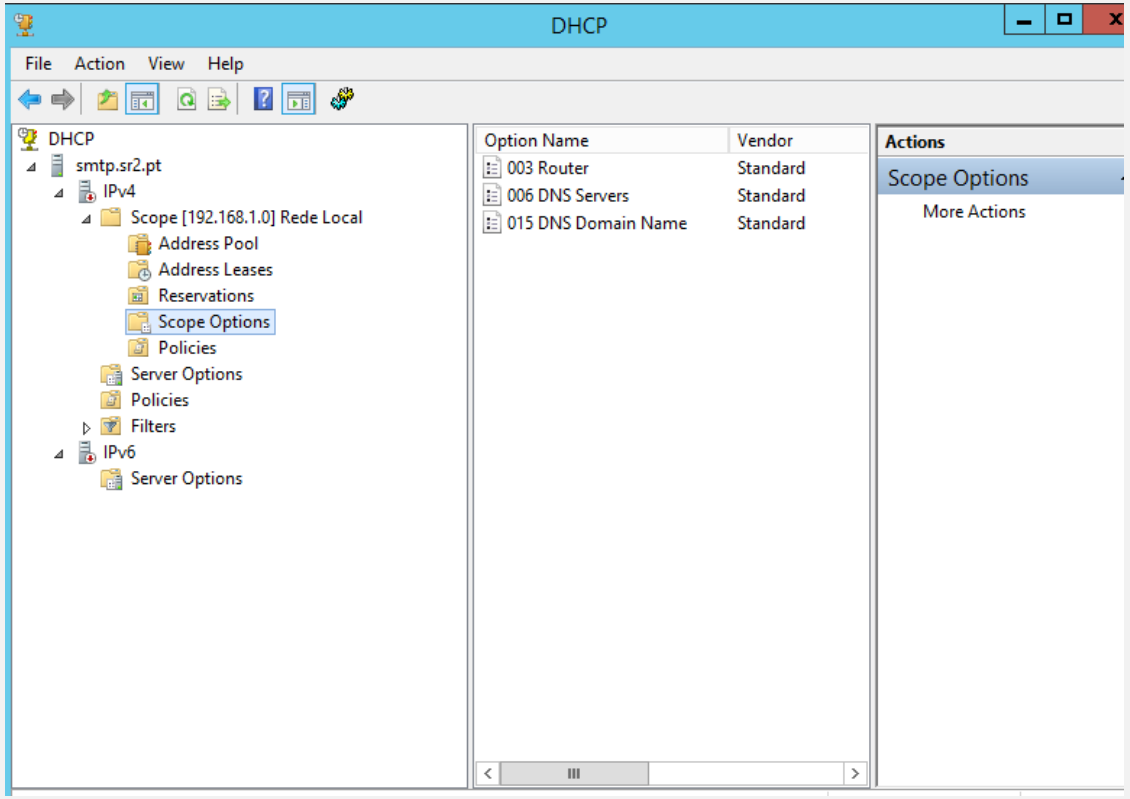


DHCP - Verification and configuration of the service.



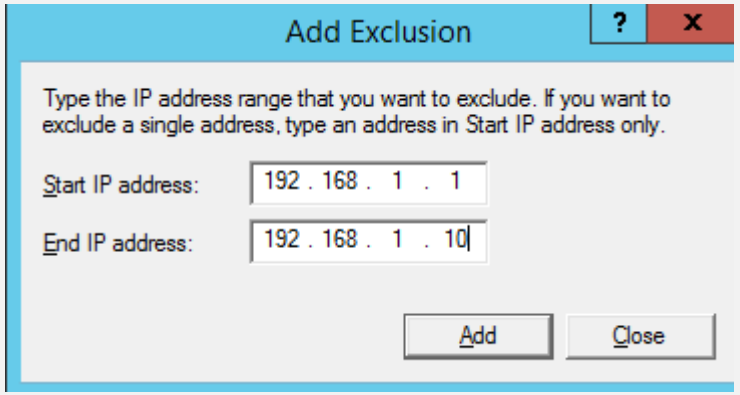
DHCP - Verification and configuration of the service.

- 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.)

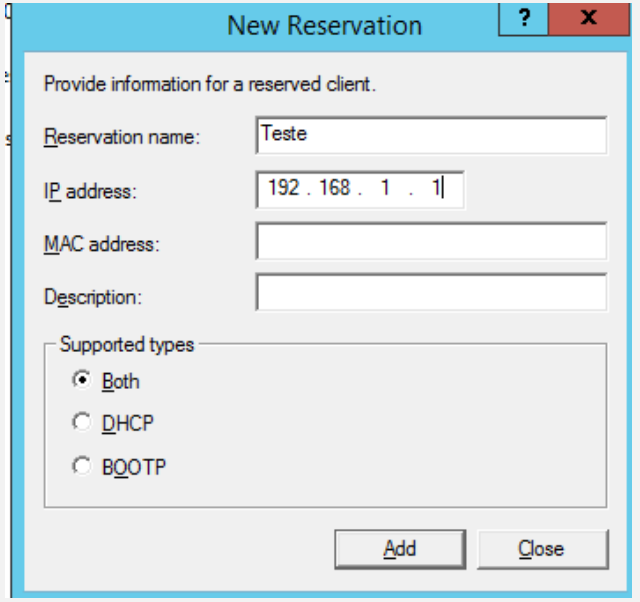


DHCP - Add reservations

- A range of IPs

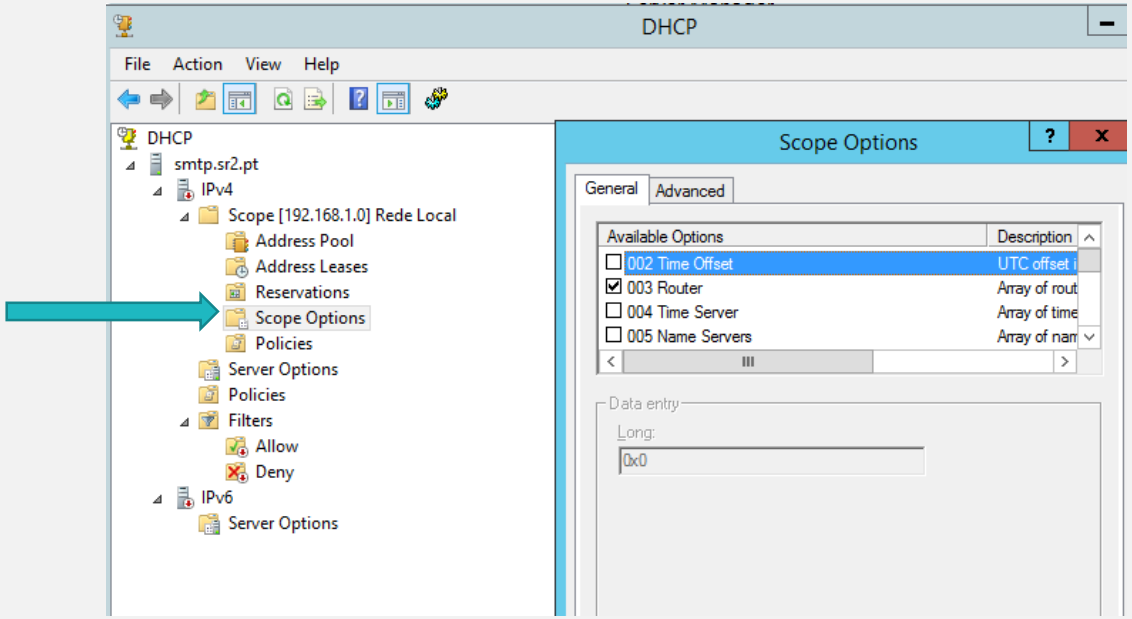


- A specific IP



DHCP – *Server Options*

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



Questions