ĐẠI HỌC ĐÀ NẴNG
TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG VIỆT - HÀN
Vietnam - Korea University of Information and Communication Technology

NETWORK ADMINISTRATION

Contents

- Text book
  - MCSA Windows Server 2016 Complete Study Guide
  - MCSA Windows server 2016 – practice tests
  - Mastering Windows server 2016
- Slide
- Practice
- Assessment

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CHAPTER 1

Installing and configuring Windows server 2016

Contents

- Features and advantages of Windows server 2016.
- Planning the Windows server 2016 installation.
- Installing Windows server 2016
- Basic configuring Windows server 2016
- Storage in Windows server 2016 installation

Features and advantages of Windows server 2016

Features and advantages of Windows server 2016

- Microsoft has stated that Windows Server 2016 is “the cloud-ready operating system.” This means that many of the features of Windows Server 2016 are built and evolve around cloud based software and networking.

Features and advantages of Windows server 2016

- ✓ Built-in Security
- ✓ Active Directory Domain Services
- ✓ DNS
- ✓ DHCP
- ✓ Group Policy Objects
- ✓ Hyper-V
- ✓ Failover Clustering
- ✓ File Server Resource Manager
- ✓ Group Policy Objects
- ✓ Nano Server
- ✓ Remote Desktop Services
- ✓ Security Auditing
- ✓ Smart Cards
- ✓ TLS/SSL
- ✓ Windows Deployment Services
- ✓ Windows PowerShell Desired State Configuration
- ✓ Windows Server Backup Feature

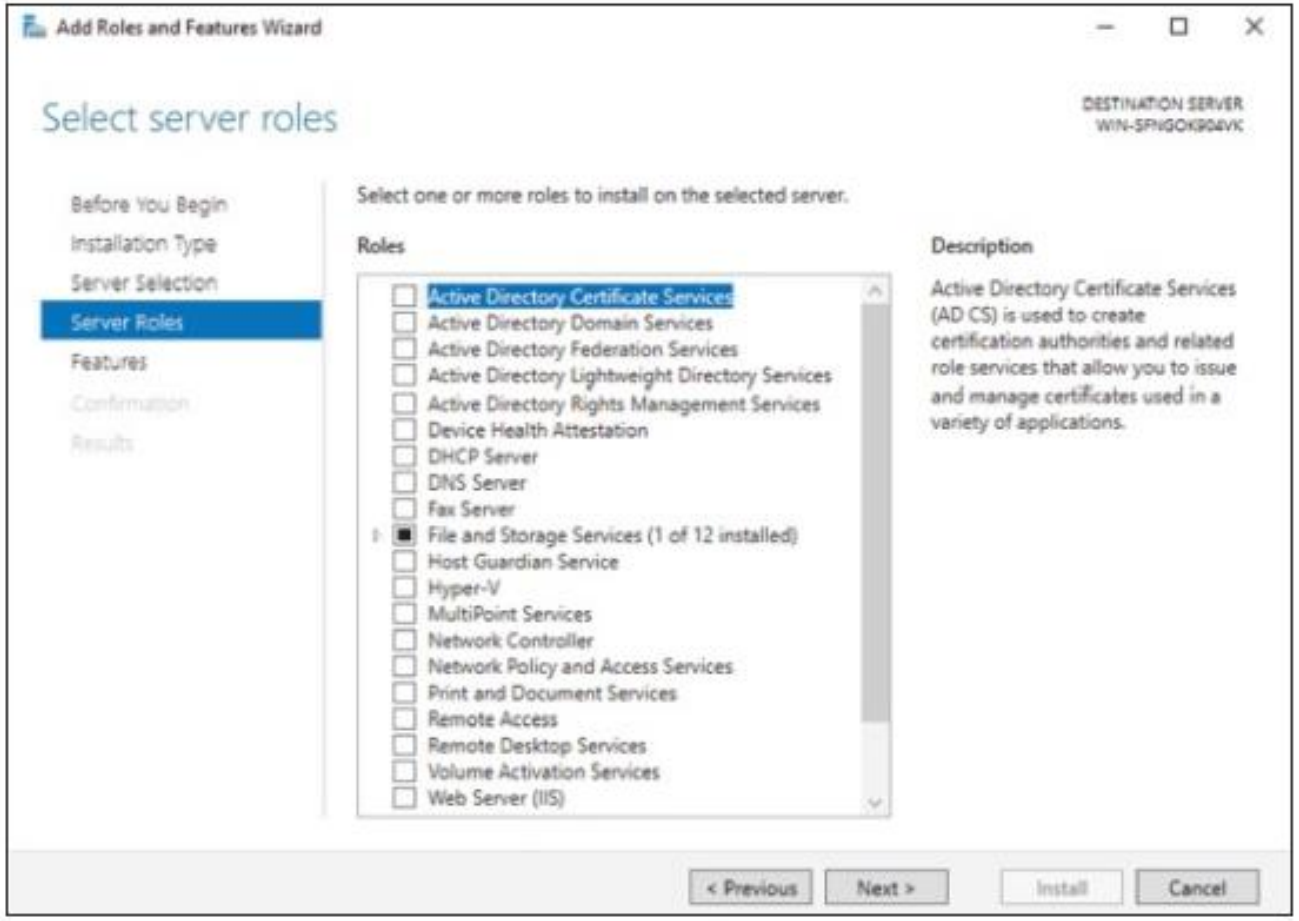
Planning the Windows Server 2016 Installation

Planning the Windows server 2016 installation

- ***Before you install Windows Server 2016, you must first ask yourself these important questions:***
  - What type of server do I need? Will the server be a domain controller? What roles do I need to install on this server?
  - Once you have figured out what you need the server to do, you can make a plan for the installation. So, let's start by looking at some of the server roles and technologies that can be installed on a Windows Server 2016 computer.

Planning the Windows server 2016 installation

➢Server Roles in Windows Server 2016



Planning the Windows server 2016 installation

- **Migrating Roles and Features to Windows Server 2016**
  - Once you decide on which roles and features you are going to install onto your Windows Server 2016 system, then you either have to install those roles and features from scratch or migrate them from a previous version of Windows server.
  - Administrators can migrate this data from an existing server that are running Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, or Windows Server 2016 to a computer that is running Windows Server 2016.

Planning the Windows server 2016 installation

- **To use Windows Server Migration Tools, the feature must be installed on both the source and destination computers. Windows Server Migration Tools installation and preparation can be divided into the following stages**:
  - 1. Installing Windows Server Migration Tools on destination servers that run Windows Server 2016
  - 2. Creating deployment folders on destination servers that run Windows Server 2016 for copying to source servers
  - 3. Copying deployment folders from destination servers to source servers
  - 4. Registering Windows Server Migration Tools on source servers

Planning the Windows server 2016 installation

- **Deciding Which Windows Server 2016 Versions to Use**
  - You may be wondering which version of Windows Server 2016 is best for your organization. After all, Microsoft offers the following six versions of Windows Server 2016
  - **Windows Server 2016 Datacenter**
  - **Windows Server 2016 Standard**
  - **Windows Server 2016 Essentials**
  - **Windows Hyper-V Server 2016**
  - **Windows Storage Server 2016**
  - **Windows MultiPoint Premium 2016 Server**

Planning the Windows server 2016 installation

➢Deciding on the Type of Installation

- Windows Server 2016 (Desktop Experience)
- Windows Server 2016 Server Core
- Windows Server 2016 Nano Server

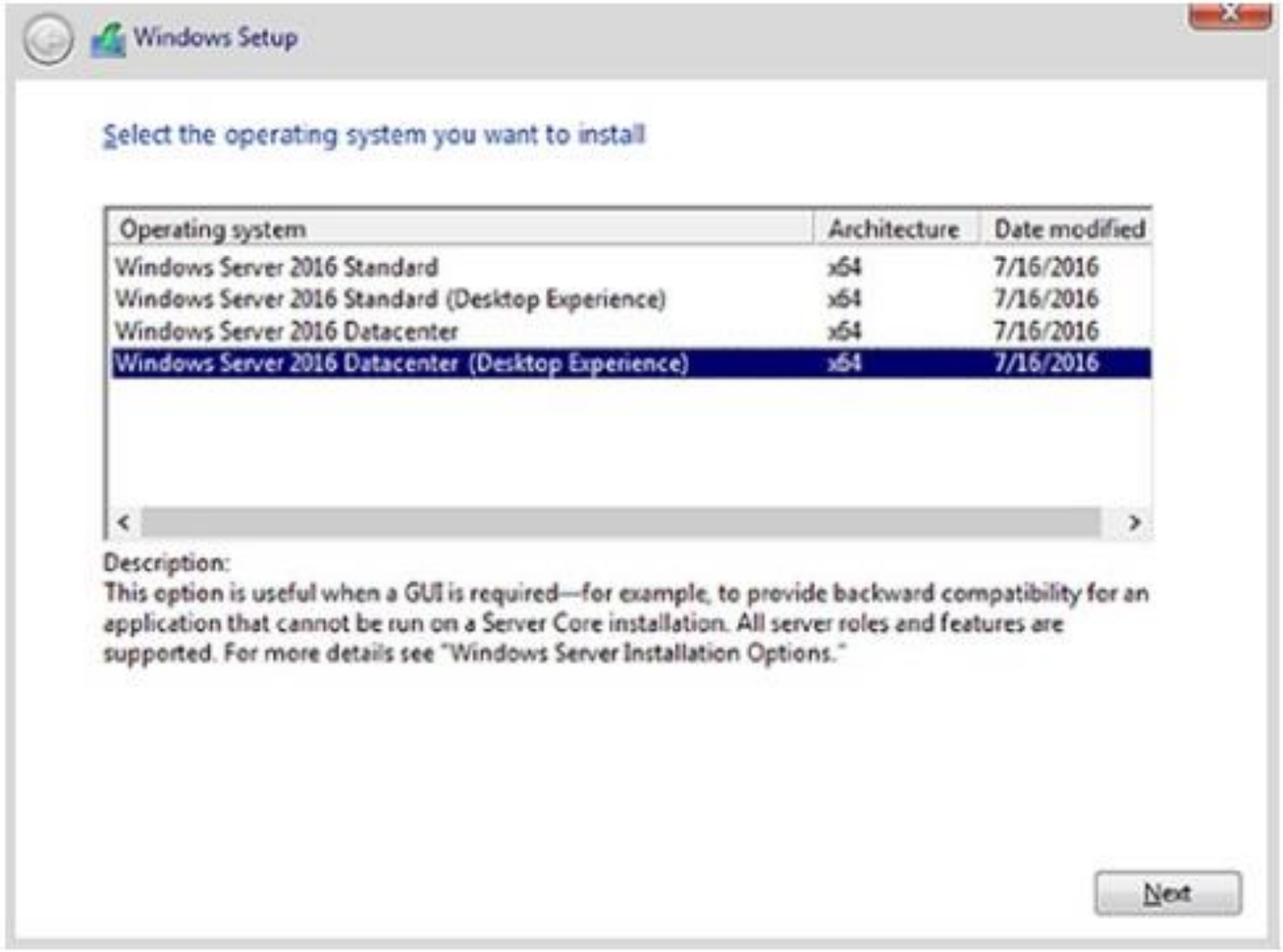
Installing Windows server 2016

Installing Windows server 2016

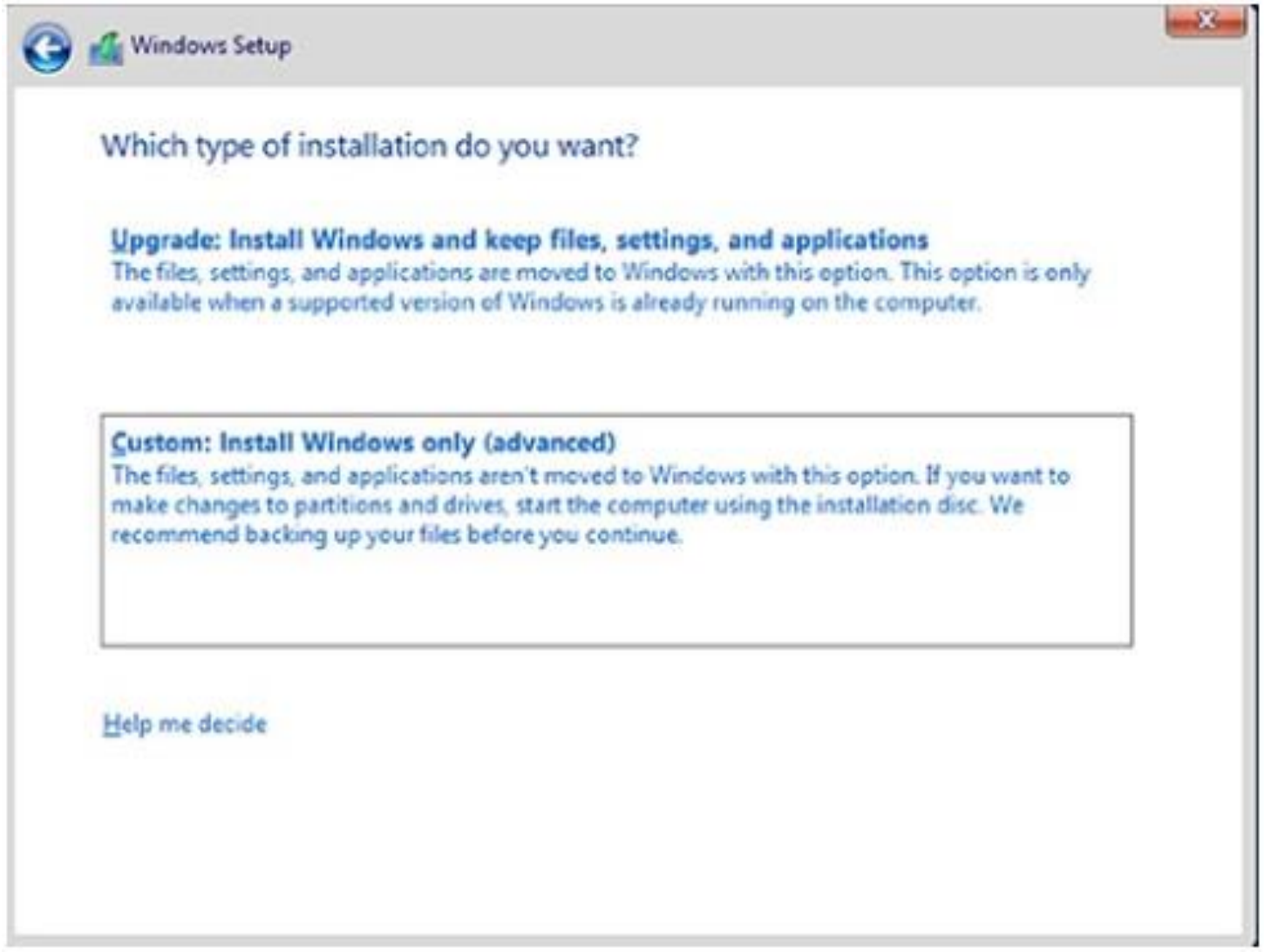
- **Installing Windows Server 2016 Datacenter (Desktop Experience)**
  - Insert the Windows Server 2016 installation DVD, and restart the machine from the installation media.
  - At the first screen, Windows Server 2016 will ask you to configure your language, time and currency, and keyboard. Make your selections, and click Next.

Installing Windows server 2016

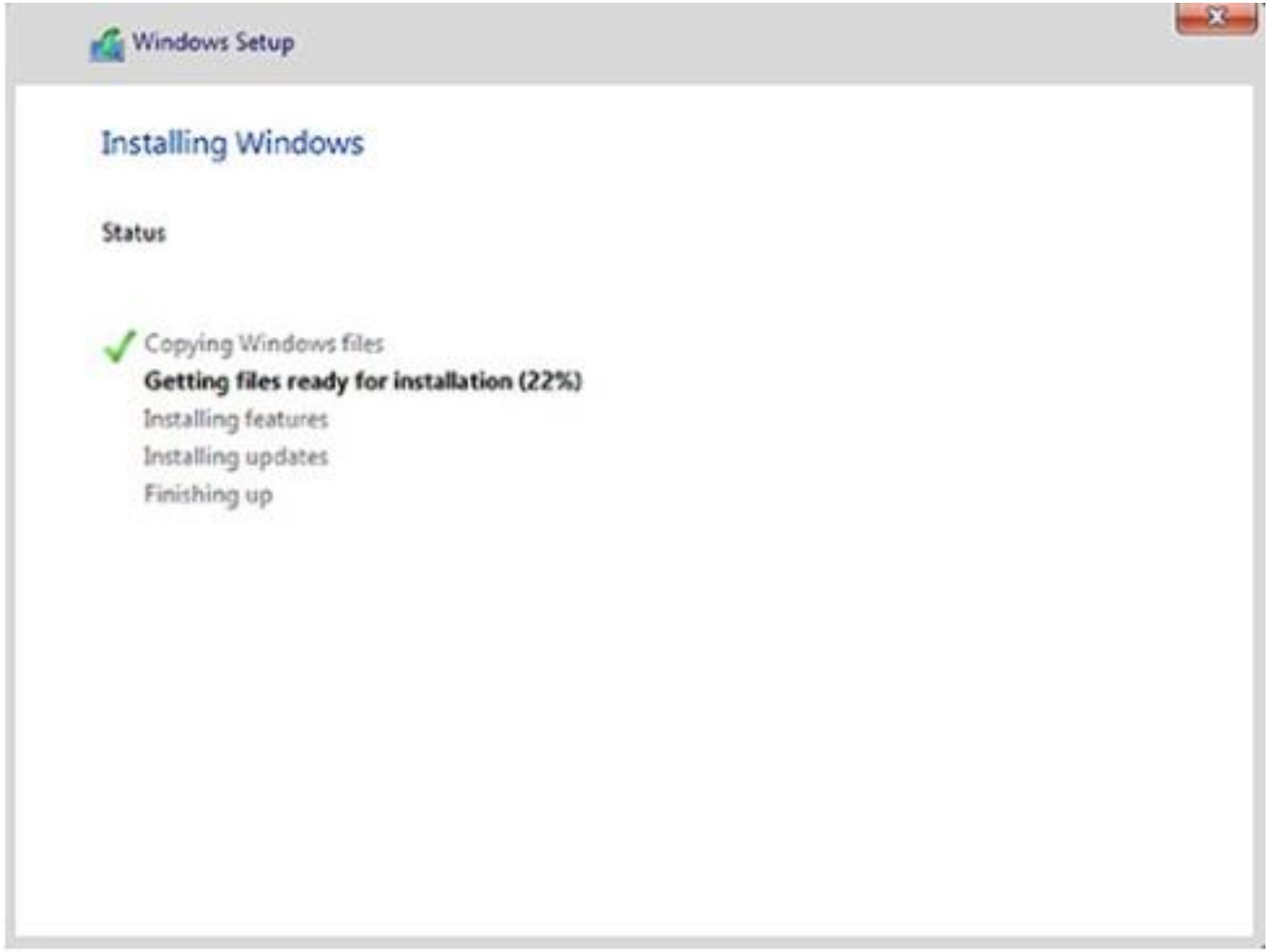
Installing Windows server 2016



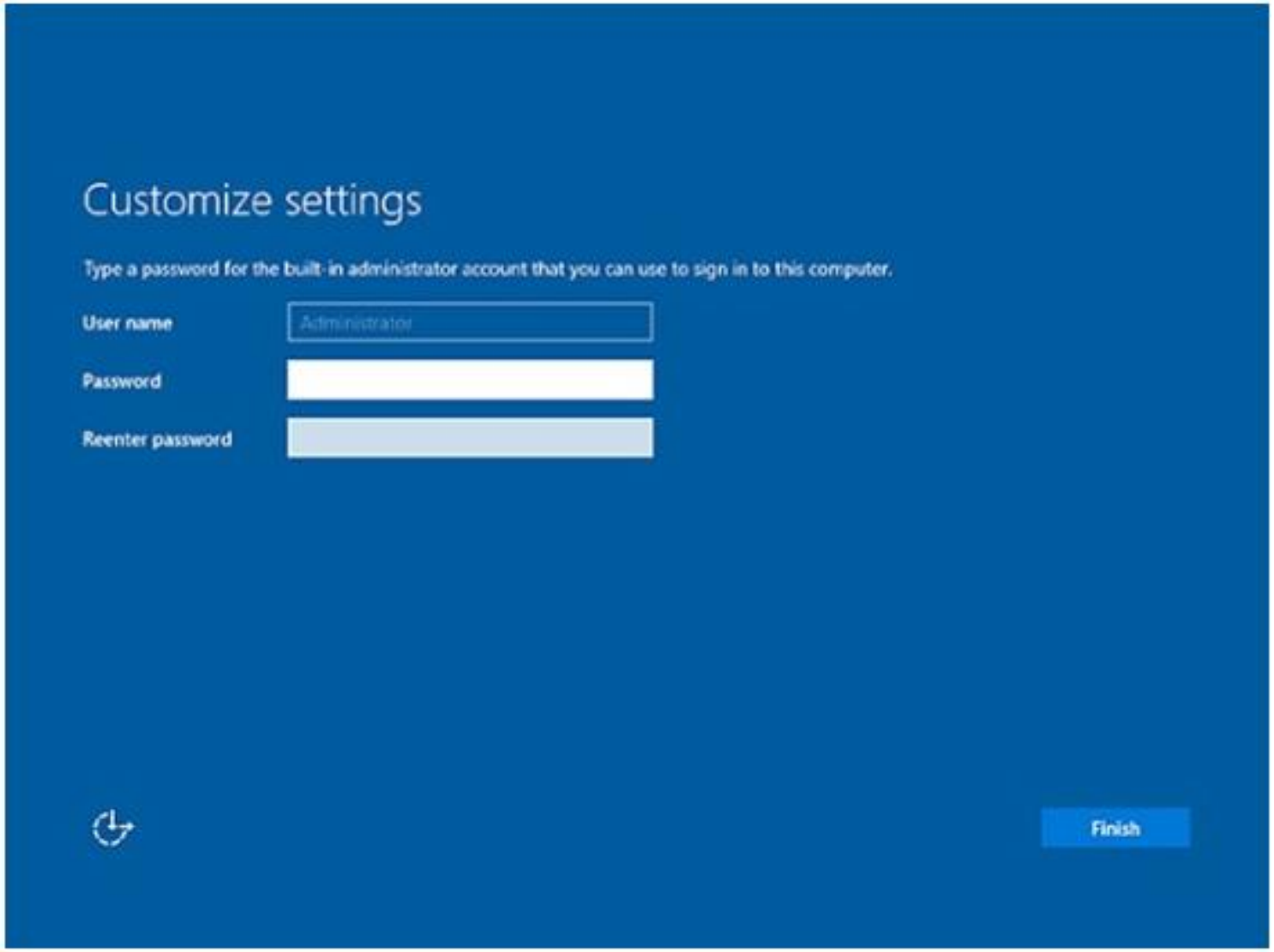
Installing Windows server 2016



Installing Windows server 2016



Installing Windows server 2016



Installing Windows server 2016

Note: After you complete the installation of Windows Server 2016, the next step is activating the operating system.

Basic configuring Windows server 2016

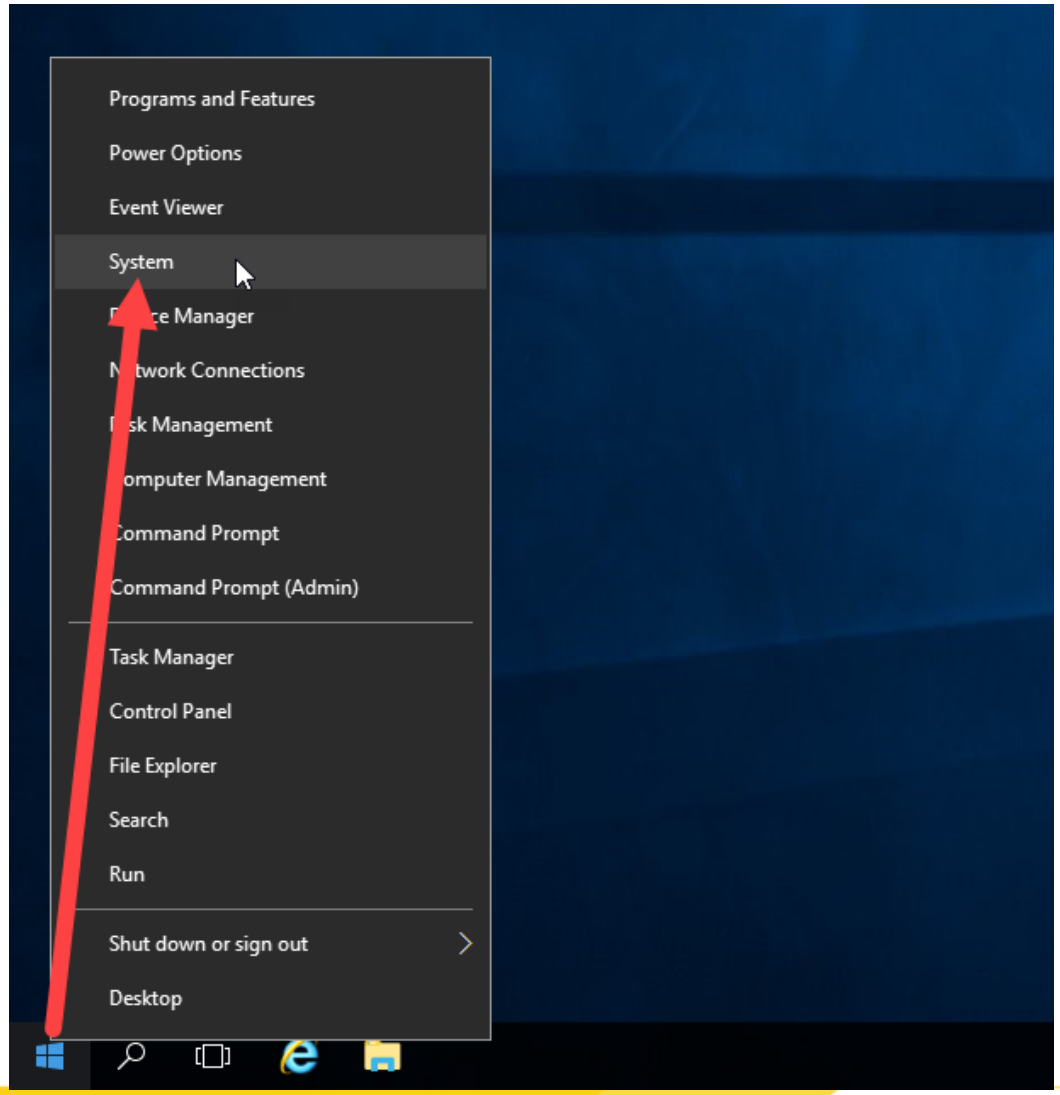
Basic configuring Windows server 2016

- Basic configuring Windows server 2016
  - Rename server
  - Setup time zone settings
  - Configure TCP/IP settings
  - Enable Remote Desktop

Basic configuring Windows server 2016

- **Rename server:** The **Computer Name** is assigned automatically by default, so change it.

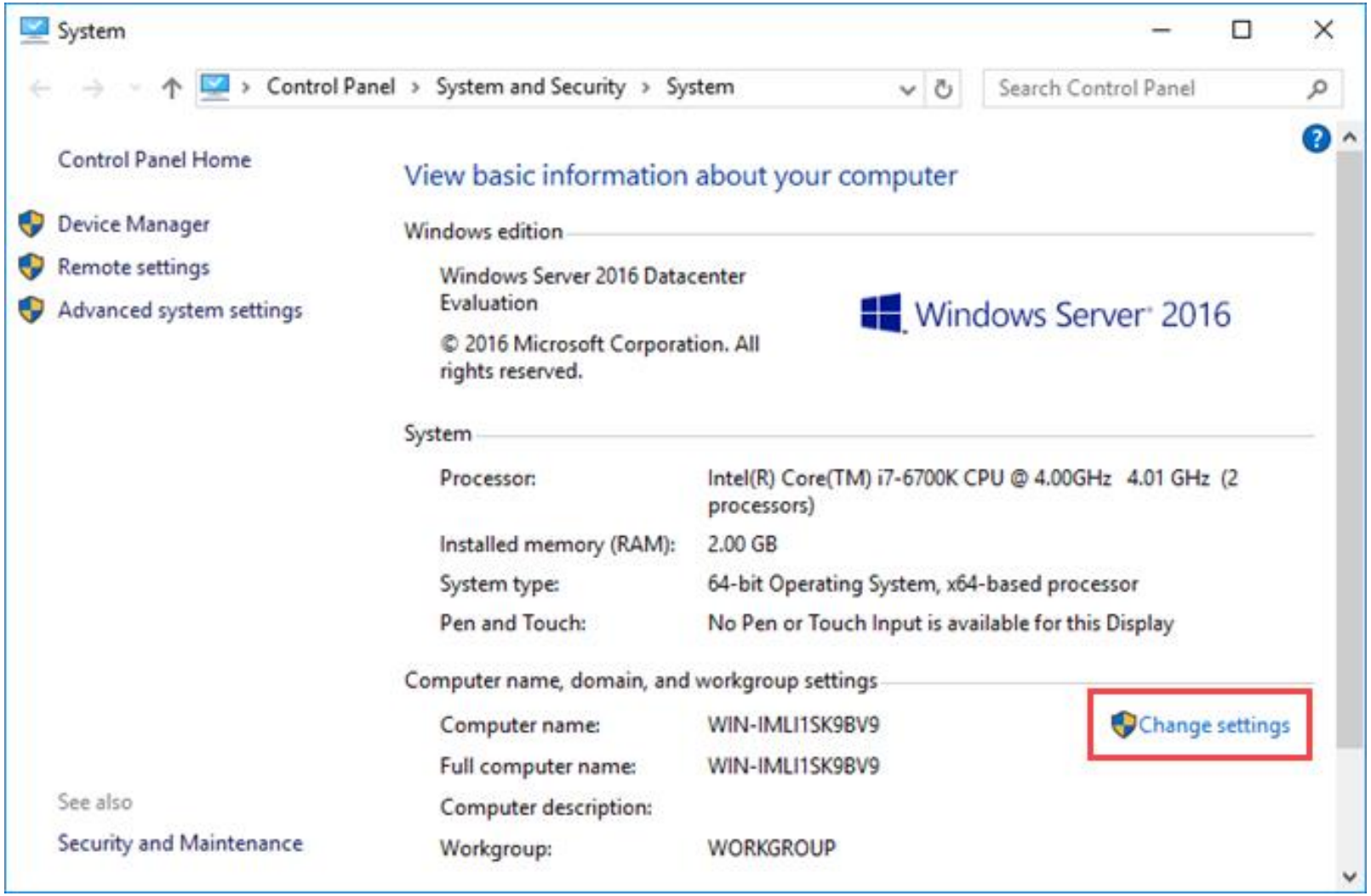
Right-click the Start icon, and then click **System**.



Basic configuring Windows server 2016

- **Rename server:**

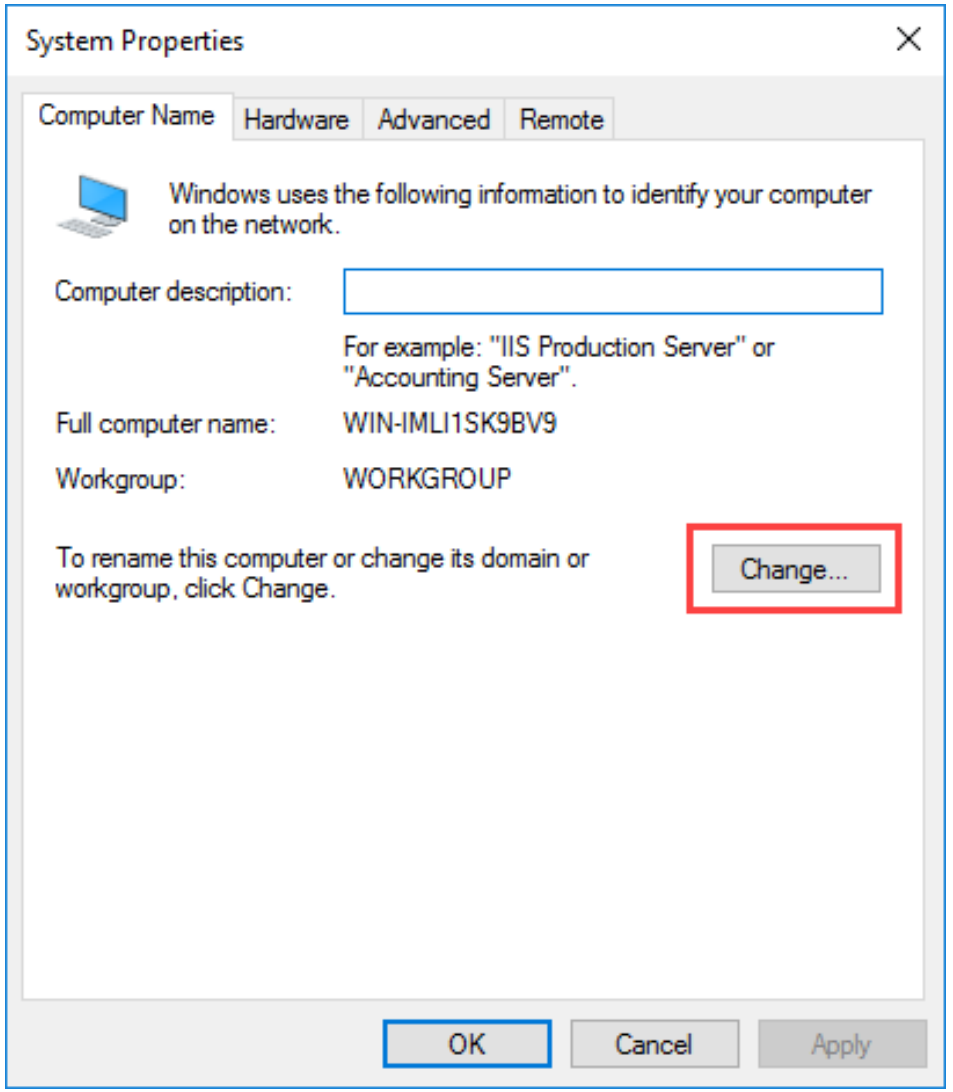
In the new window, click **Change settings**, next to the computer name, as shown in the figure below.



Basic configuring Windows server 2016

- **Rename server:**

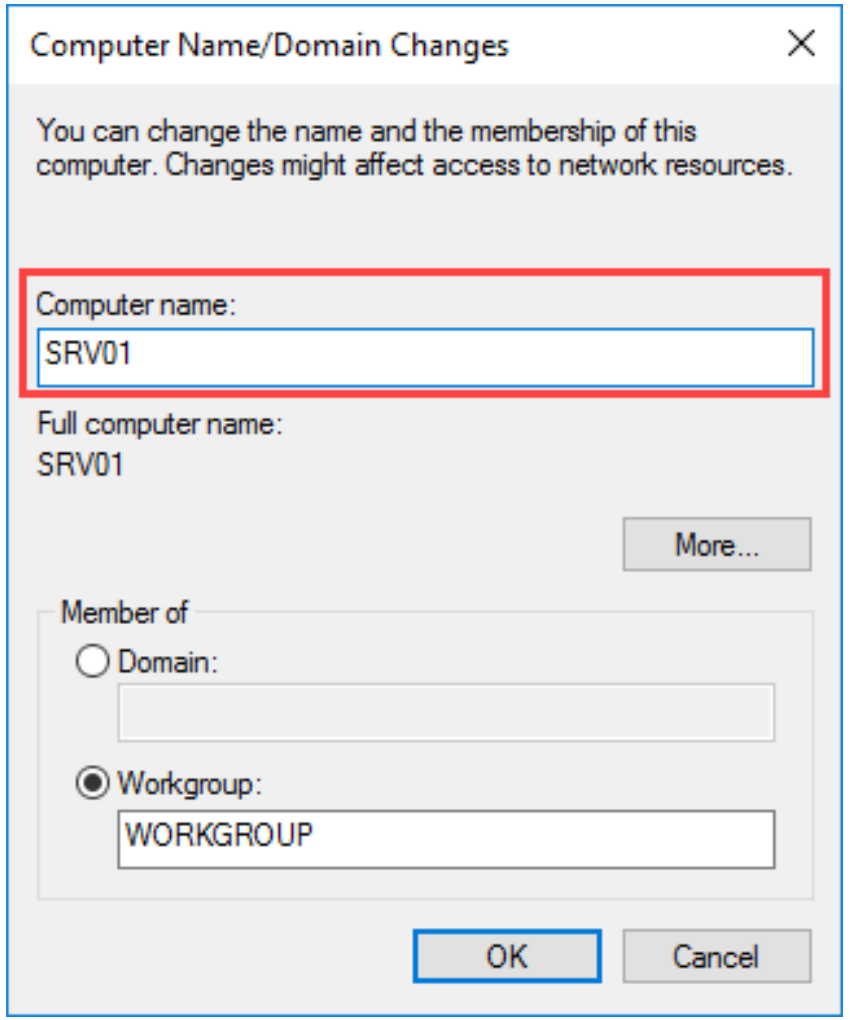
Then click the **Change** button.



Basic configuring Windows server 2016

- **Rename server:**

In the **Computer name** field, type the new computer name you want your server to have and click **OK**.



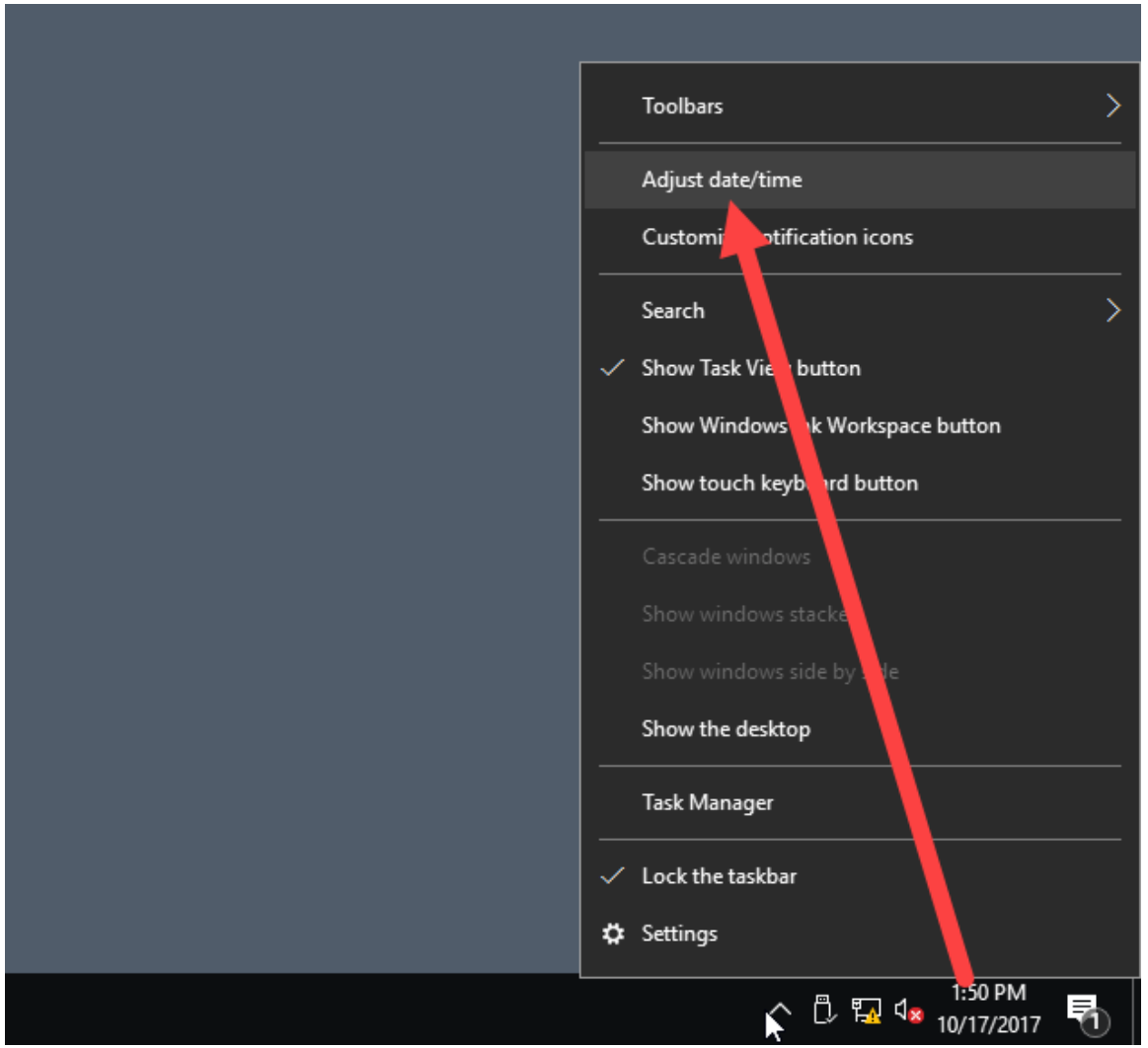
Basic configuring Windows server 2016

Note: To complete the renaming of the server, you will need to restart it. When you close the System properties window, a new window will appear to give you this option.

Basic configuring Windows server 2016

- **Setup time zone settings**

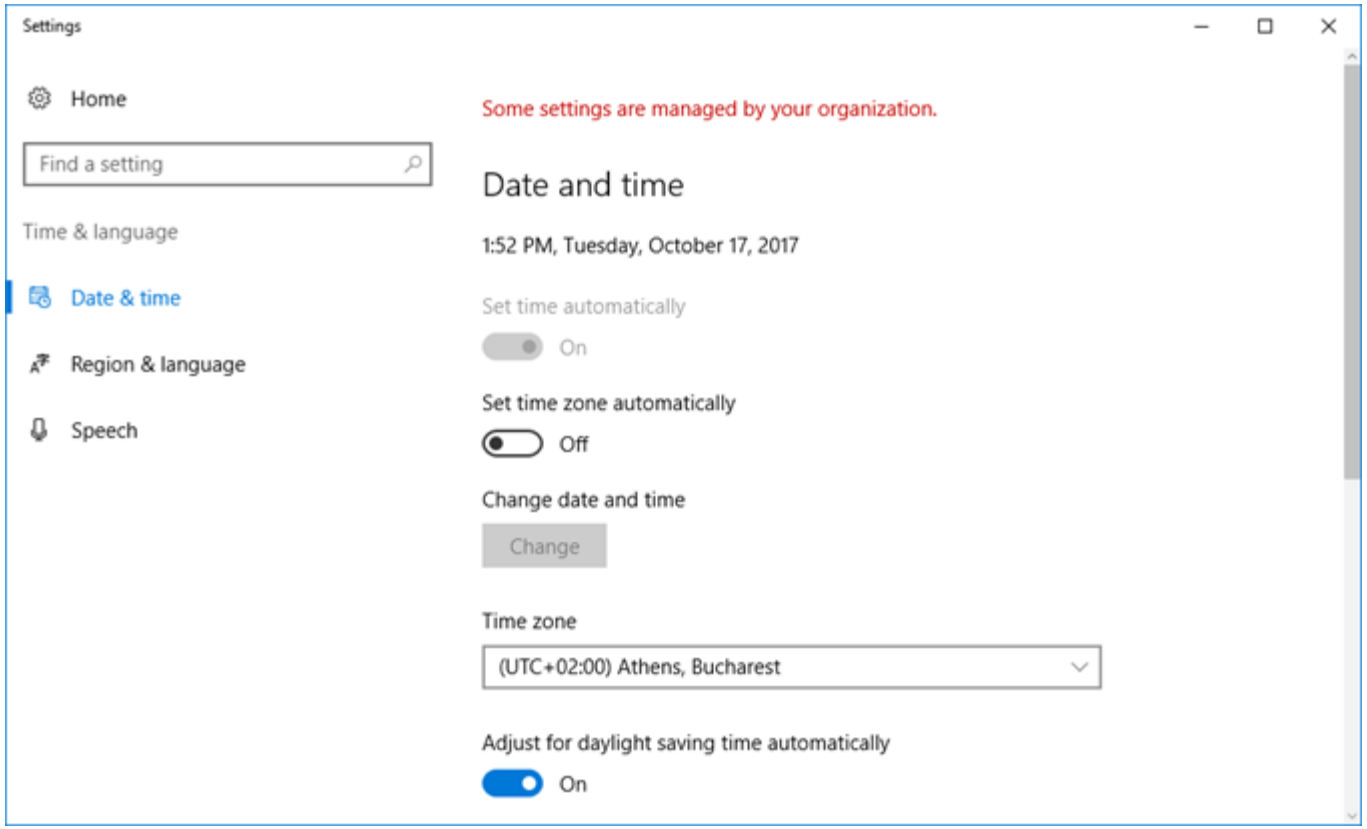
Right-click the time field in the lower right corner and then click the **Adjust date/time** option.



Basic configuring Windows server 2016

- **Setup time zone settings**

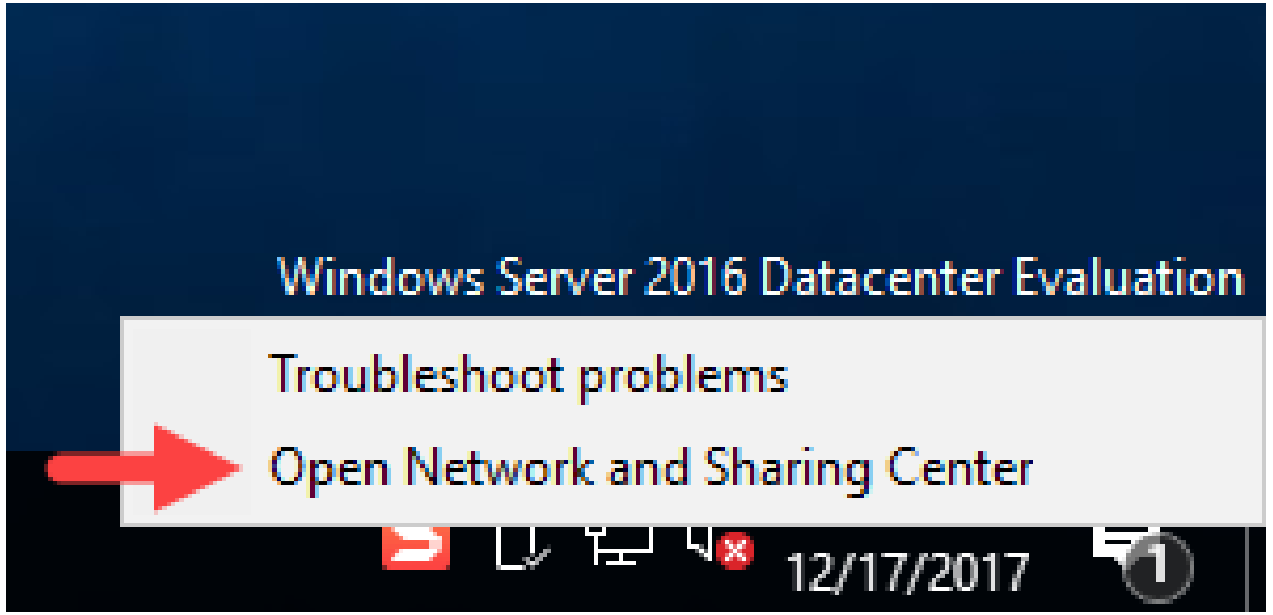
In the settings window, you can change the time, date, and time zones of each Windows Server.



Basic configuring Windows server 2016

- **Configure TCP/IP settings**

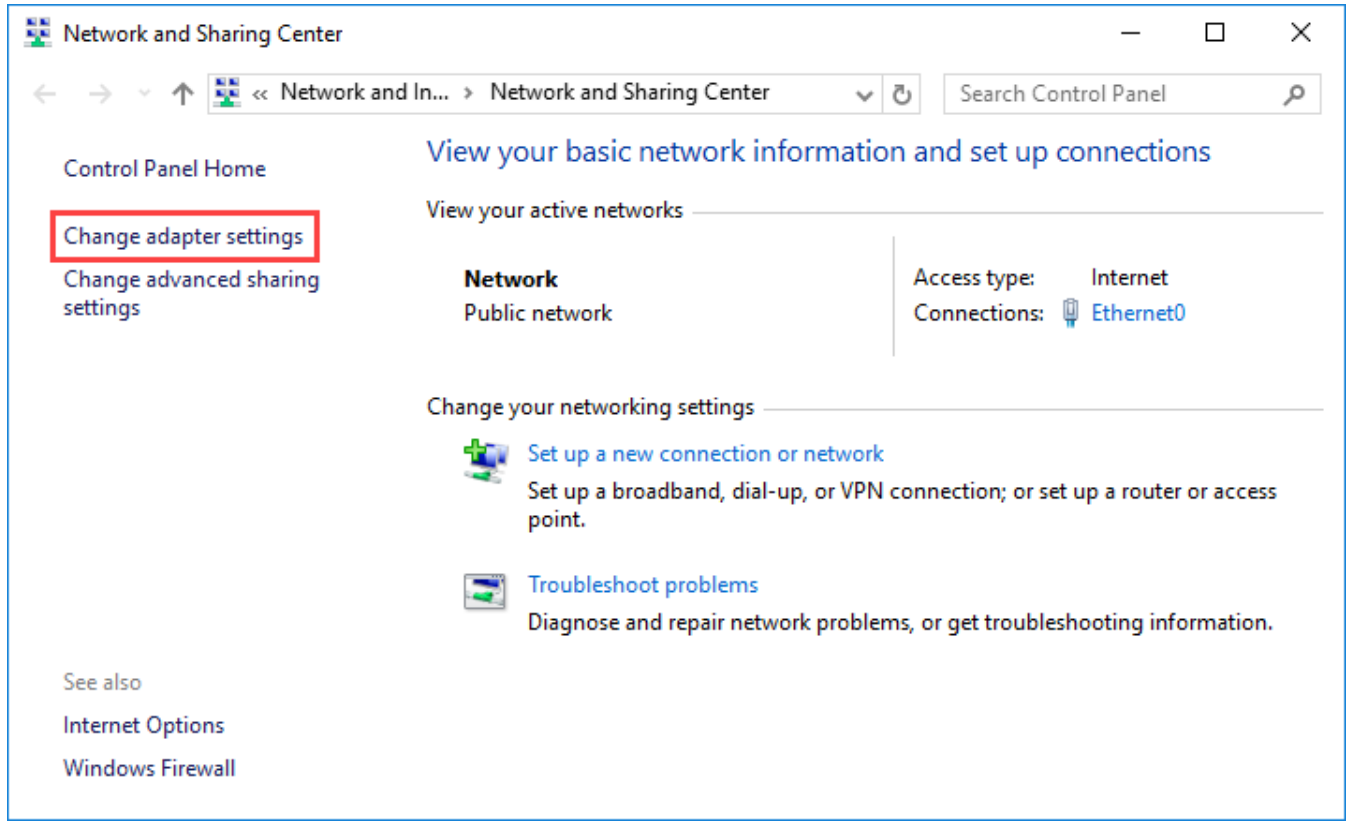
Right-click the network icon in the notification area, and then click **Open Network and Sharing Center**.



Basic configuring Windows server 2016

- **Configure TCP/IP settings**

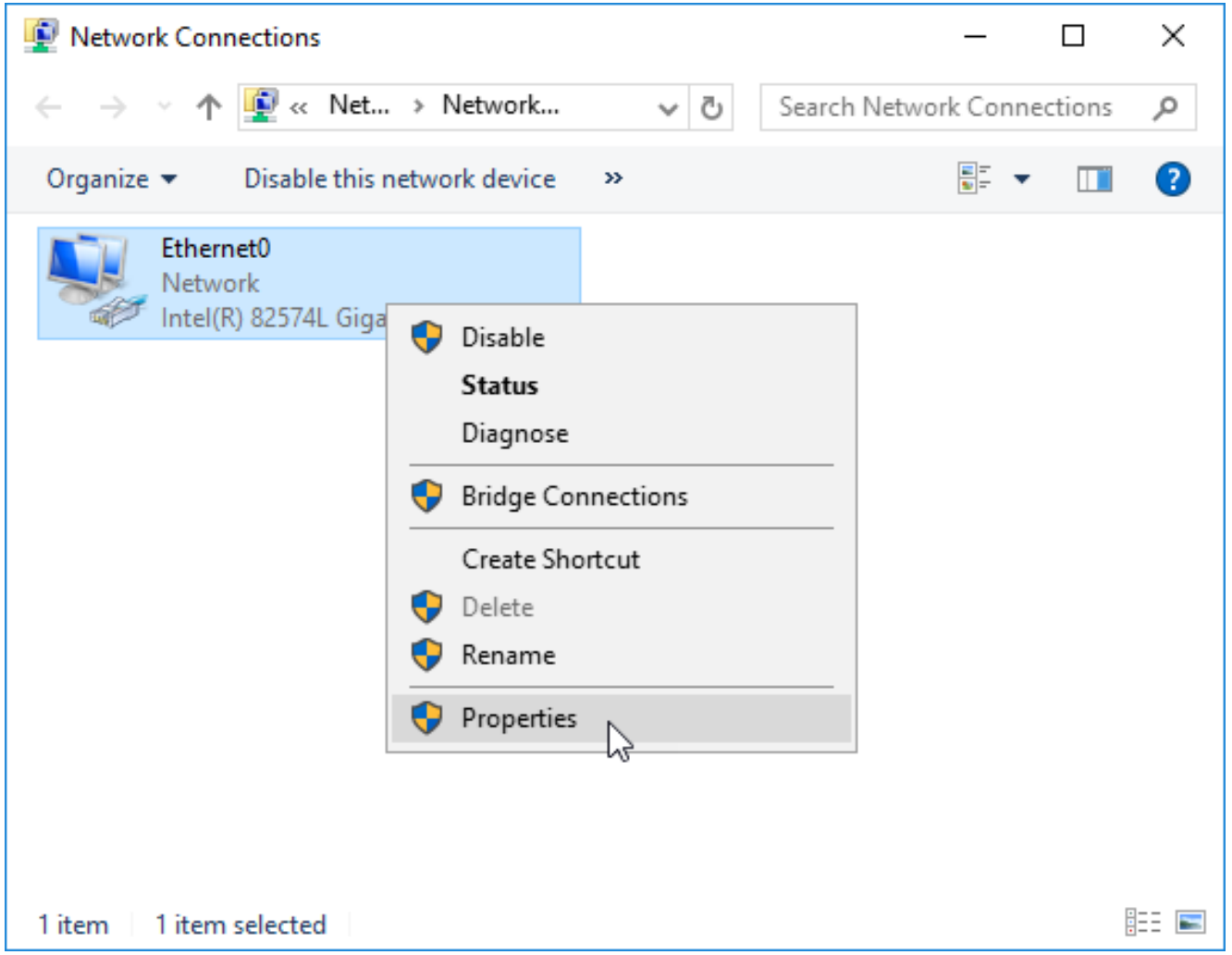
In the window that opens, click **Change adapter settings** to display the available network adapters of the machine.



Basic configuring Windows server 2016

- **Configure TCP/IP settings**

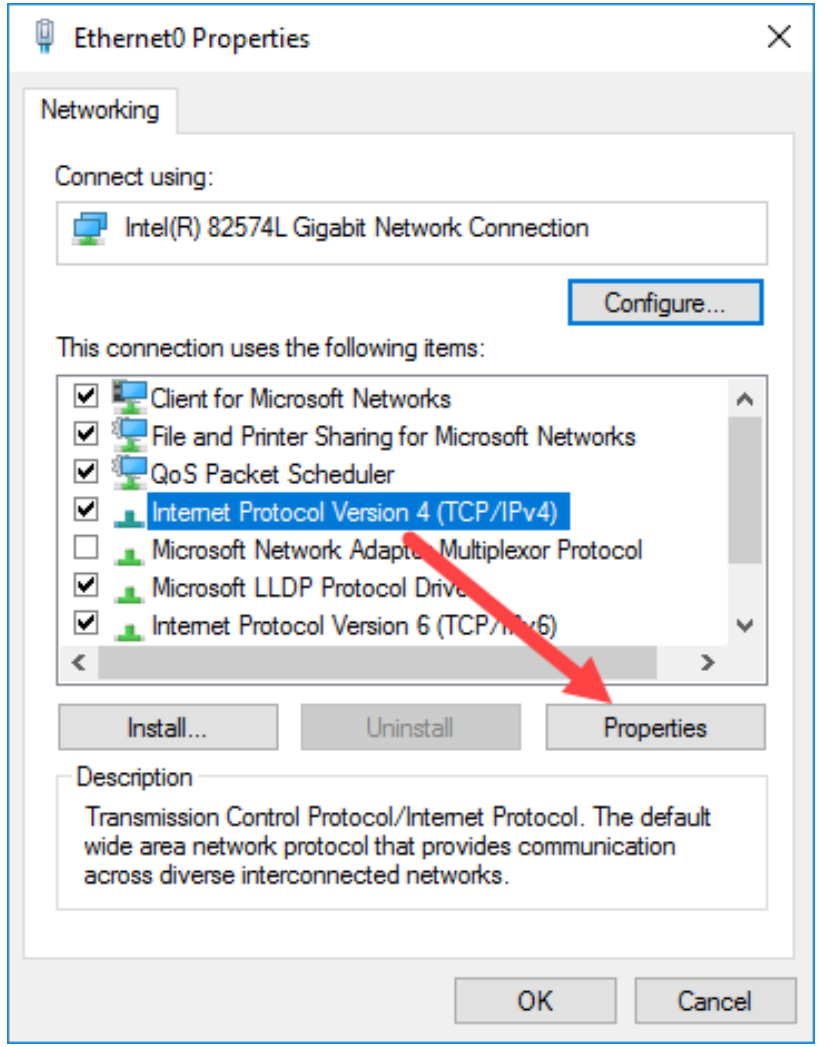
Right-click the adapter you are about to change the IP settings and then click **Properties**.



Basic configuring Windows server 2016

- **Configure TCP/IP settings**

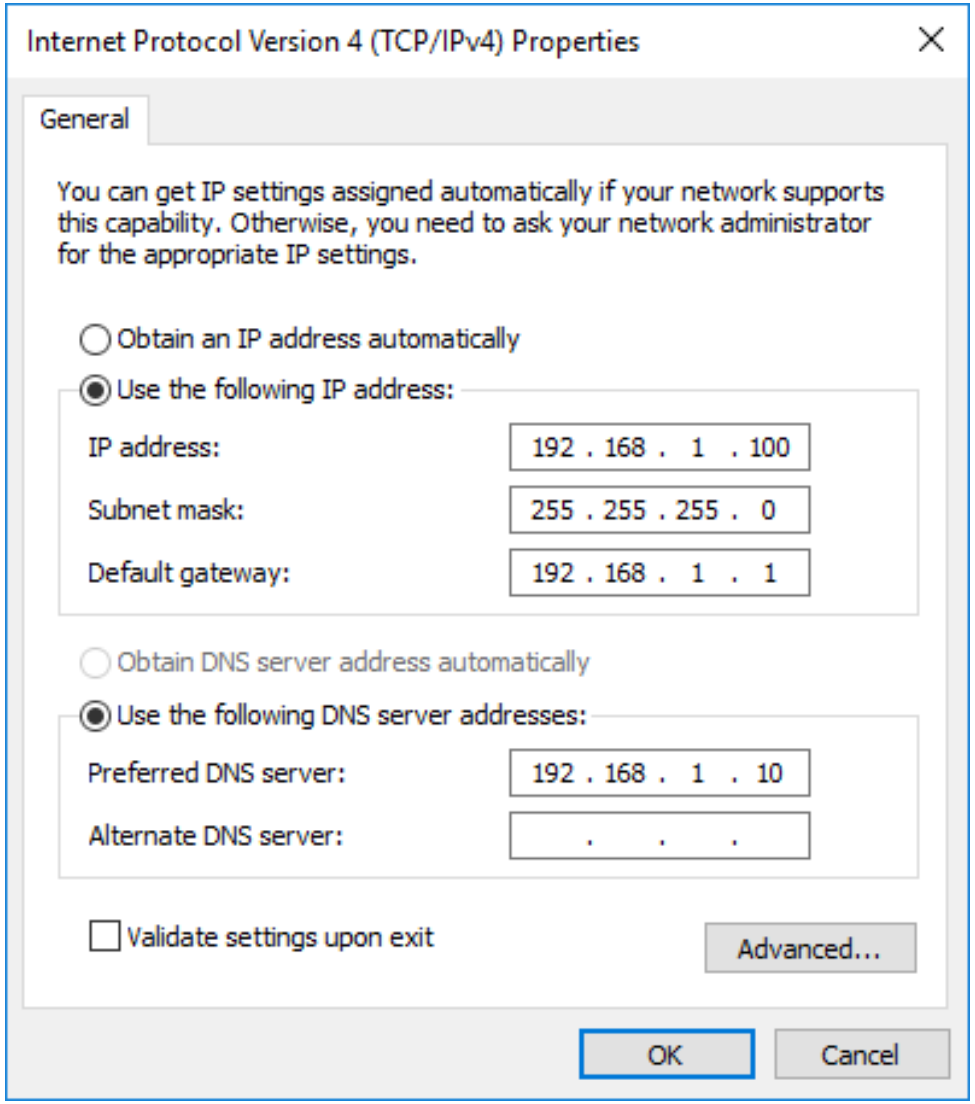
Click **Internet Protocol Version 4 (TCP / IPv4)** and then the **Properties** button.



Basic configuring Windows server 2016

- **Configure TCP/IP settings**

Here, enable *Use the following IP address* and enter the static IP addresses for the server, subnet mask, default gateway and DNS servers.



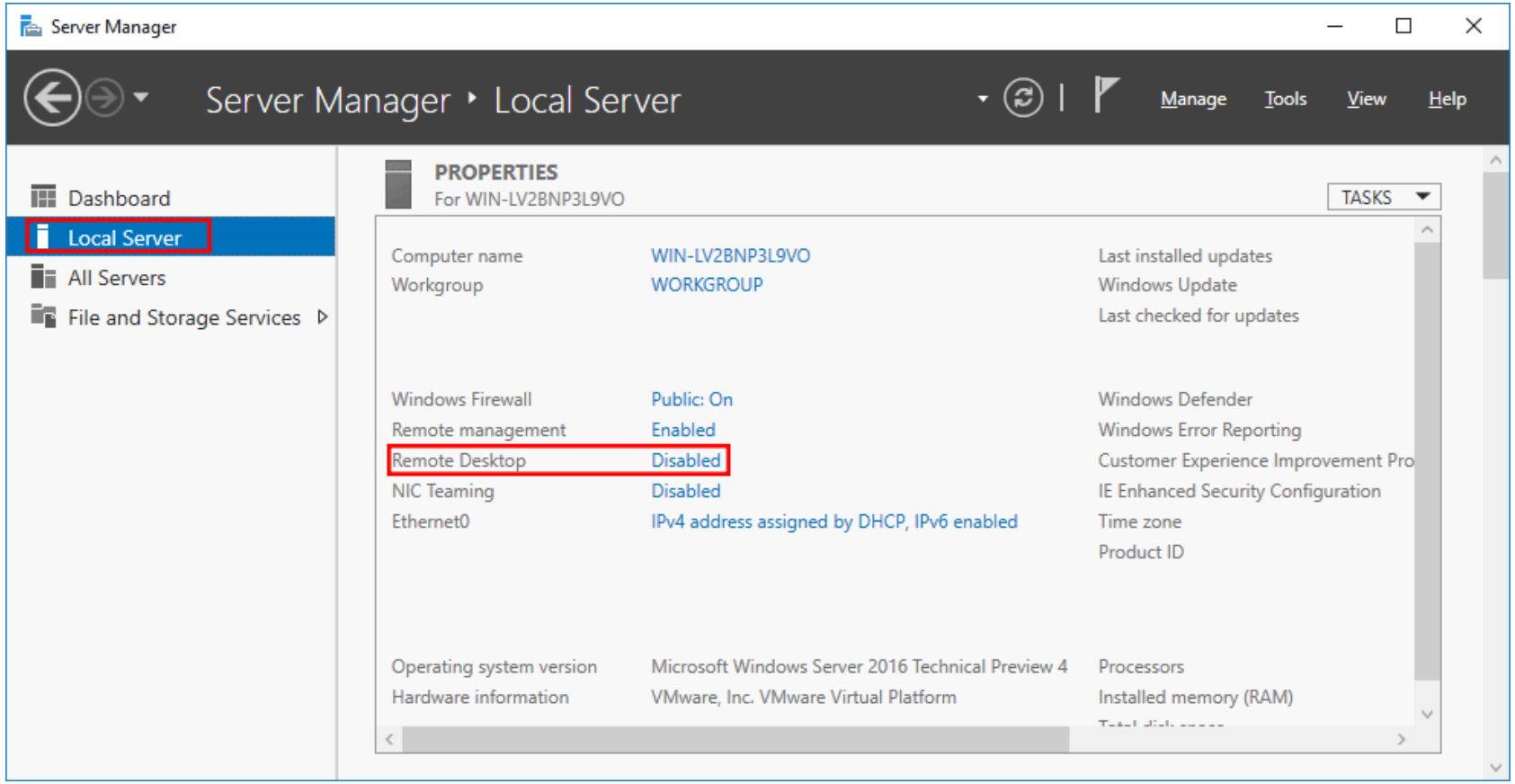
Basic configuring Windows server 2016

- Enable Remote Desktop: By default in Windows Server 2016 remote desktop is disabled.
  - Open Server Manager.
  - By default Server Manager will open when you log in to the GUI, otherwise you can select it from the task bar (Within the Server Manager window, select Local Server from the left hand side. You may need to wait a little for it to detect the current state of your system. You should see that Remote Desktop is listed as Disabled as shown below)

Basic configuring Windows server 2016

- **Enable Remote Desktop:**

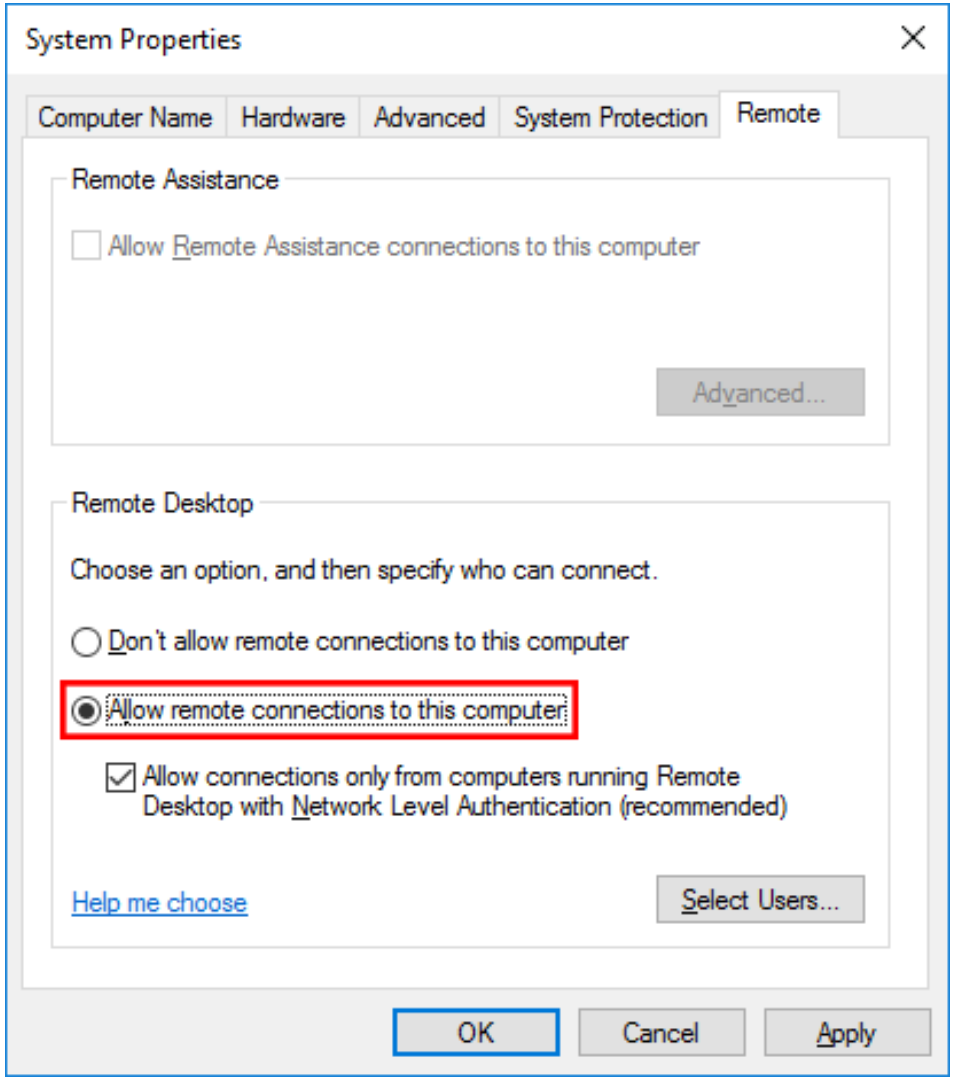
Click on the *Disabled* text which will open the System Properties window in the Remote tab.



Basic configuring Windows server 2016

- **Enable Remote Desktop:**

From the *System Properties* window, select *Allow remote connections to this Computer* as shown below.



Storage in Windows server 2016

Storage in Windows server 2016

- As an IT administrator, you'll need to ask many questions before you start setting up a server. These are all questions you must ask when planning for storage in a Windows Server 2016 server
  - What type of disks should be used?
  - What type of RAID sets should be made?
  - What type of hardware platform should be purchased?

Storage in Windows server 2016

- Managing disks in Windows Server
- Managing volumes in Windows Server
- Configuring permissions
- Configuring disk Quotas

Managing disks in Windows Server

- Selecting a partition table format
- Selecting a disk type
- Selecting a file system
- Implementing ReFS
- Demonstration: Configuring ReFS
- Using .vhd and .vhdx file types
- Selecting a disk type

Selecting a partition table format

MBR

- Standard partition table format since early 1980s
- Supports a maximum of four primary partitions per drive
- Can partition a disk up to 2 TB

GPT

- GPT is the successor of the MBR partition table format
- Supports a maximum of 128 partitions per drive
- Can partition a disk up to 18 exabytes

✓ **Use MBR for disks smaller than 2 TB**

✓ **Use GPT for disks larger than 2 TB**

Selecting a disk type

Basic disks are:

- Disks initialized for basic storage
- The default storage for the Windows operating system

Dynamic disks can:

- Be modified without restarting the Windows system
- Provide several options for configuring volumes

Disk volume requirements include:

- A system volume for hardware-specific files that are required to start the server
- A boot volume for the Windows operating system files

Selecting a file system

When selecting a file system, consider the differences between FAT, NTFS, and ReFS

FAT provides:

- Basic file system
- Partition size limitations
- FAT32 to enable larger disks
- exFAT developed for flash drives

NTFS provides:

- Metadata
- Auditing and journaling
- Security (ACLs and encryption)

ReFS provides:

- Backward compatibility support for NTFS
- Enhanced data verification and error correction
- Support for larger files, directories, and volumes

Implementing ReFS

ReFS has a number of advantages over NTFS:

- Metadata integrity with checksums
- Integrity streams with user data integrity
- Allocation on write transactional model
- Large volume, file, and directory sizes (2^78 bytes with 16 KB cluster size)
- Storage pooling and virtualization
- Data striping for performance and redundancy
- Disk scrubbing for protection against latent disk errors
- Resiliency to corruptions with recovery
- Shared storage pools across machines

Demonstration: Configuring ReFS

In this demonstration, you will see how to:

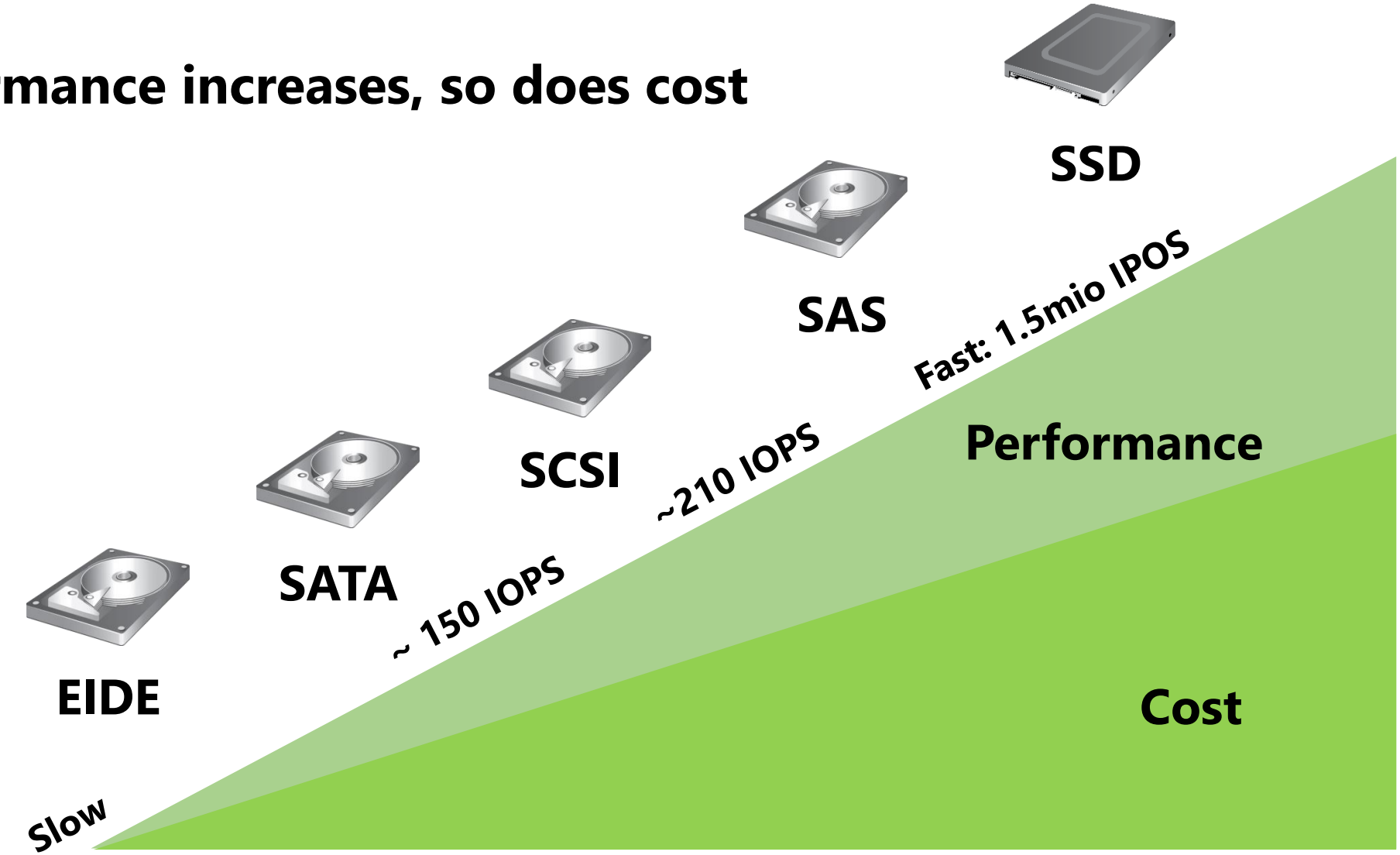
- Retrieve the volume and sector information for an NTFS volume by using the **fsutil** command
- Reformat the NTFS volume as an ReFS volume
- Retrieve the volume and sector information for the ReFS volume by using the **fsutil** command

Using .vhd and .vhdx file types

- Virtual hard disks are files that you can use the same as physical hard disks
- You can:
  - Create and manage virtual hard disks by using Disk Management and Diskpart.exe
  - Configure .vhd or .vhdx files
  - Configure computers to start from the virtual hard disk
  - Transfer virtual hard disks from Hyper-V servers, and start computers from the virtual hard disk
  - Use virtual hard disks as a deployment technology

Selecting a disk type

As performance increases, so does cost



Managing volumes in Windows Server

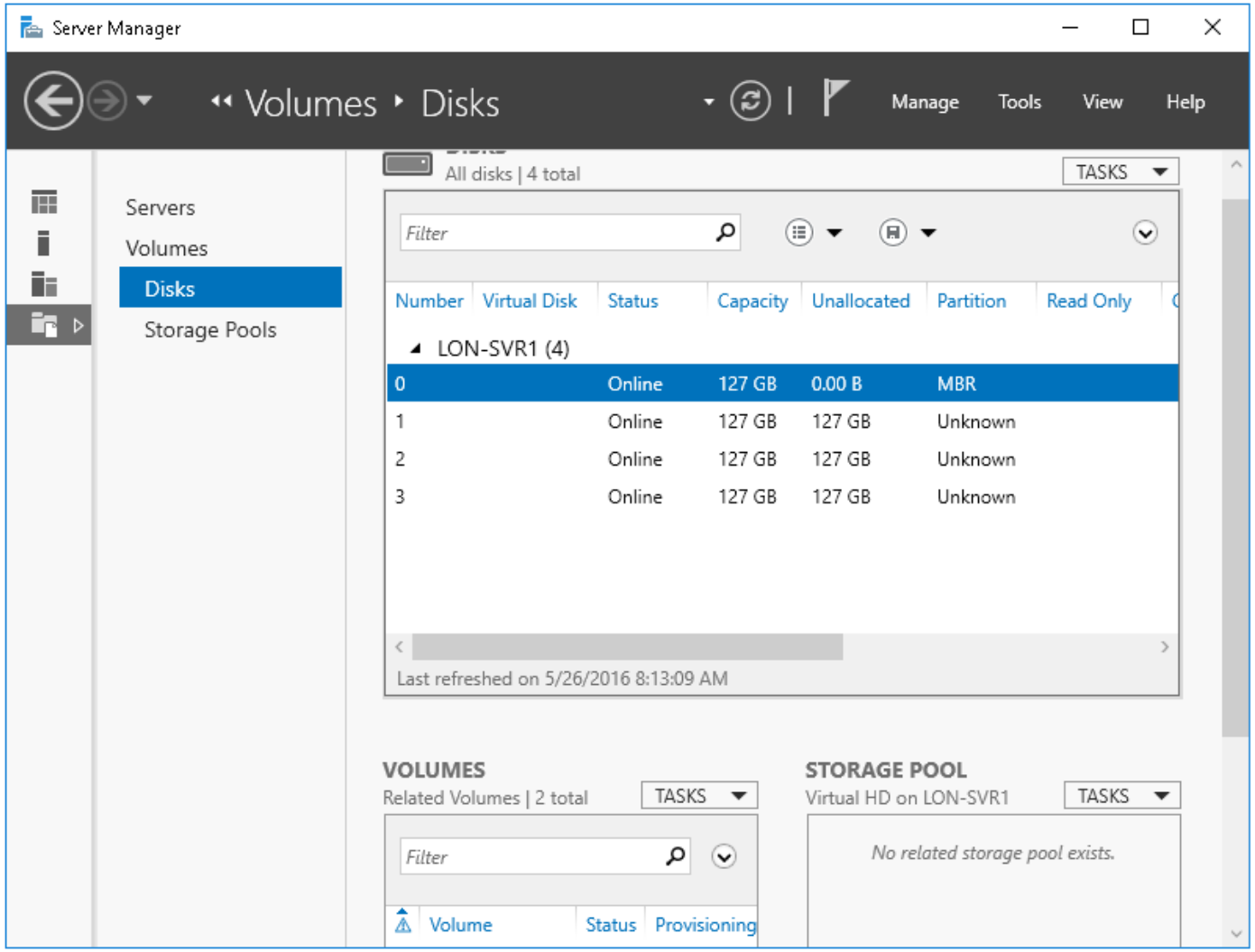
- What are disk volumes?
- Options for managing volumes
- Demonstration: Managing volumes
- Extending and shrinking a volume
- What is RAID?
- RAID levels

What are disk volumes?

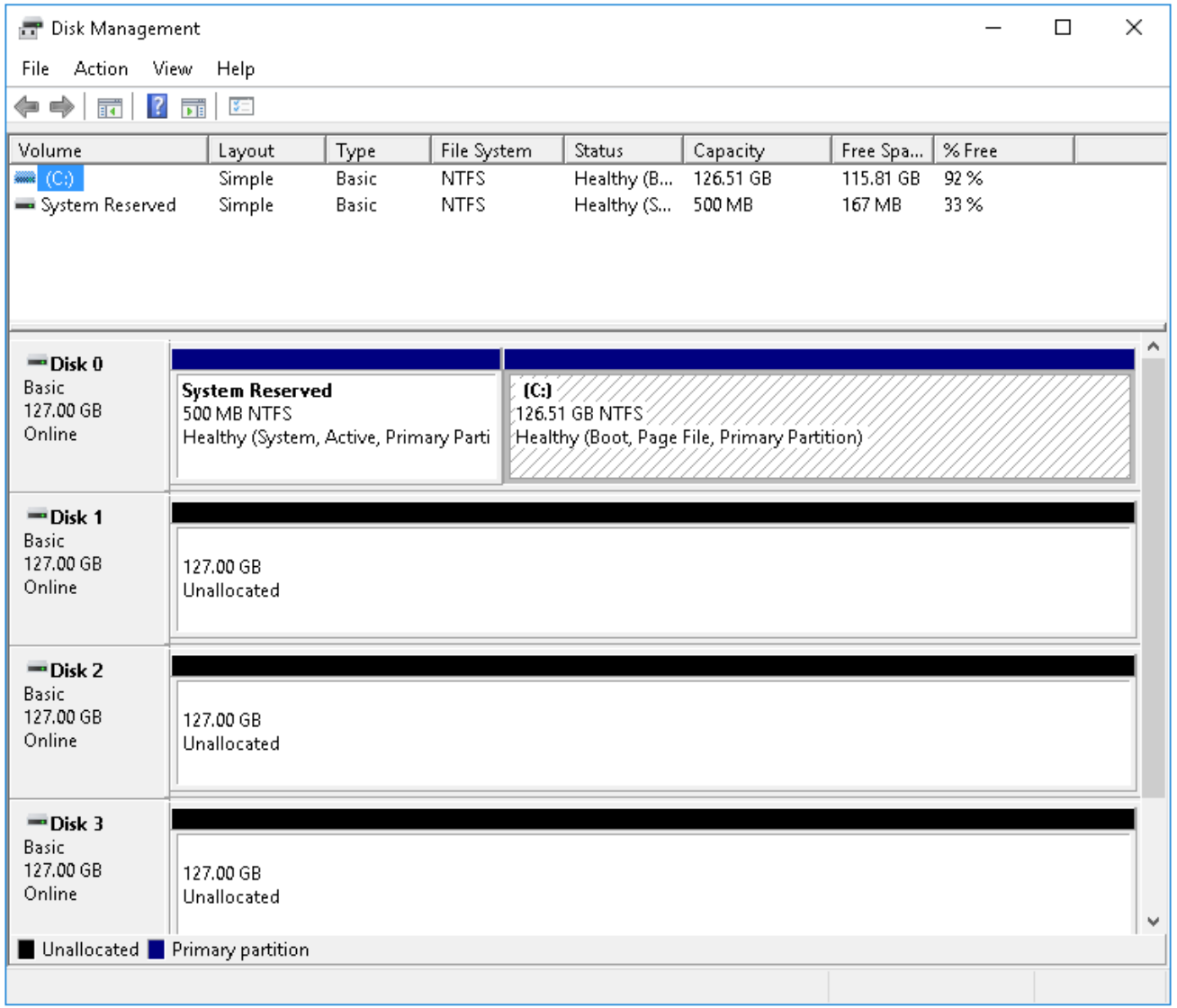
Windows Server 2016 supports the following volume types:

- Simple
- Spanned
- Striped
- Mirrored
- RAID-5

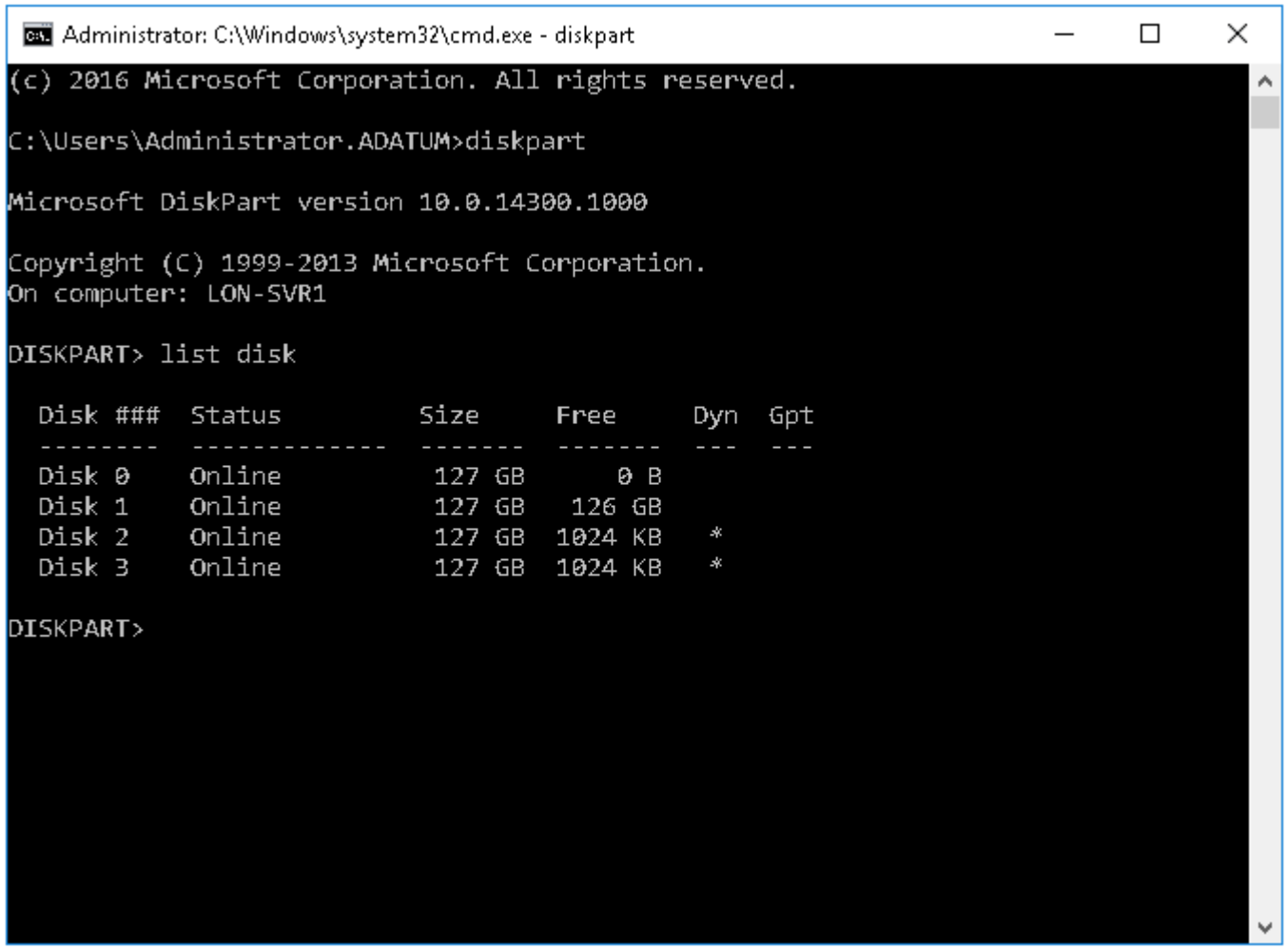
Options for managing volumes



Options for managing volumes



Options for managing volumes



Options for managing volumes

- Get-disk
- Clear-disk
- Initialize-disk
- Get-volume
- Format-volume

Demonstration: Managing volumes

In this demonstration, you will see how to:

- Create a new volume with Diskpart
- Create a mirrored volume

Extending and shrinking a volume

- You can resize volumes with Windows Server 2016
- When you want to resize a disk, consider the following:
  - You can extend or shrink NTFS volumes
  - You can only extend ReFS volumes
  - You cannot resize FAT/FAT32/exFAT volumes
  - You can shrink a volume only up to immovable files
  - You cannot shrink a volume with bad clusters

What is RAID?

RAID:

- Combines multiple disks into a single logical unit to provide fault tolerance and performance
- Provides fault tolerance by using:
  - Disk mirroring
  - Parity information
- Can provide performance benefits by spreading disk I/O across multiple disks
- Can be configured using several different levels
- Should not replace server backups

RAID levels

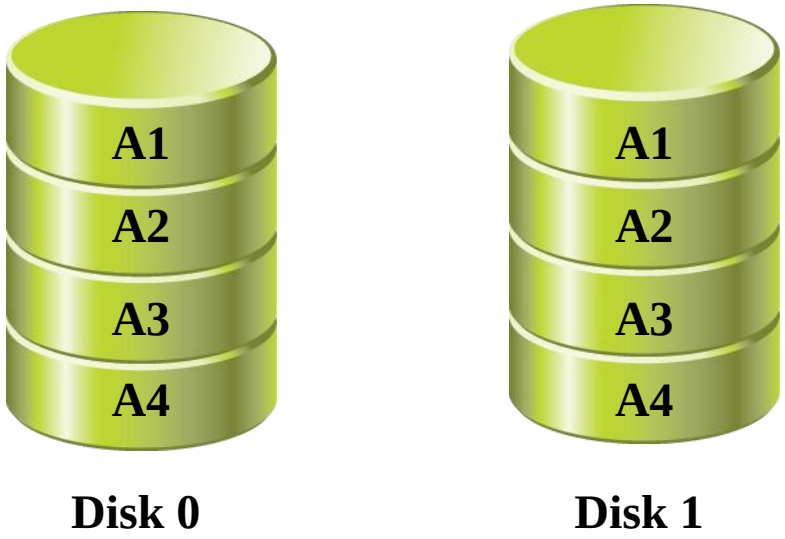
RAID 0

Striped set without parity or mirroring

RAID levels

RAID 1

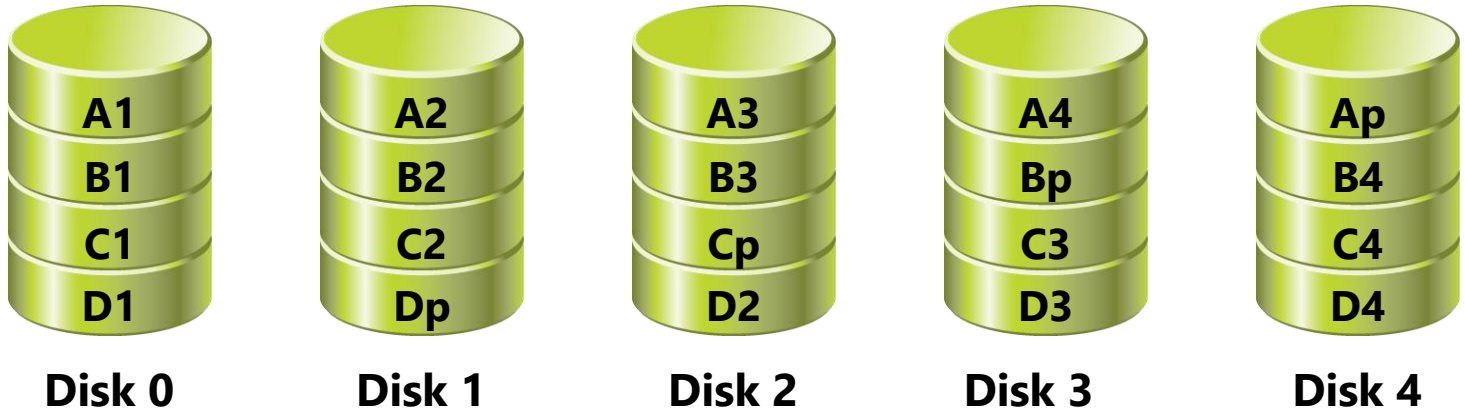
Mirrored drives



RAID levels

RAID 5

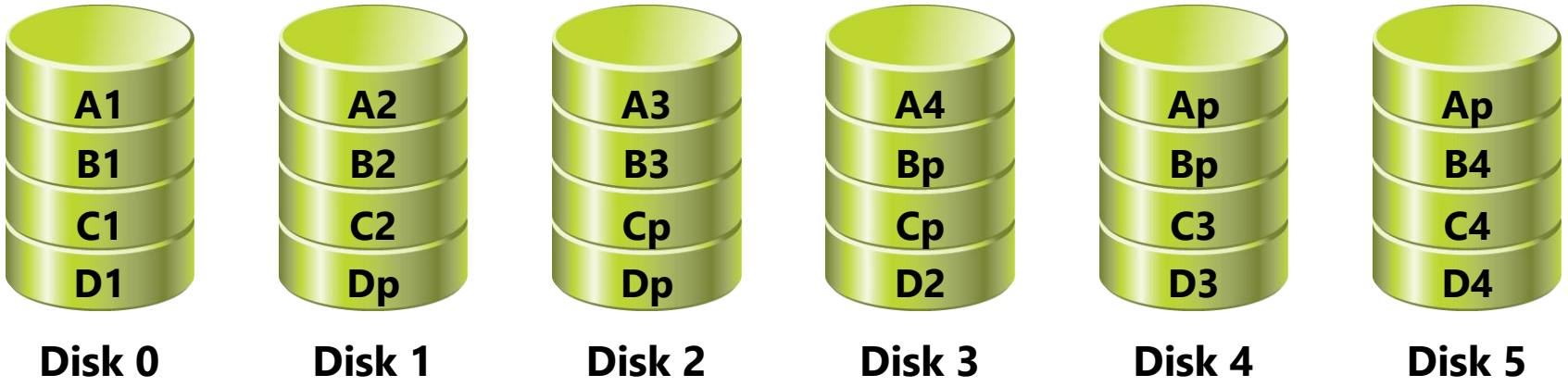
Block level striped set with parity distributed across all disks



RAID levels

RAID 6

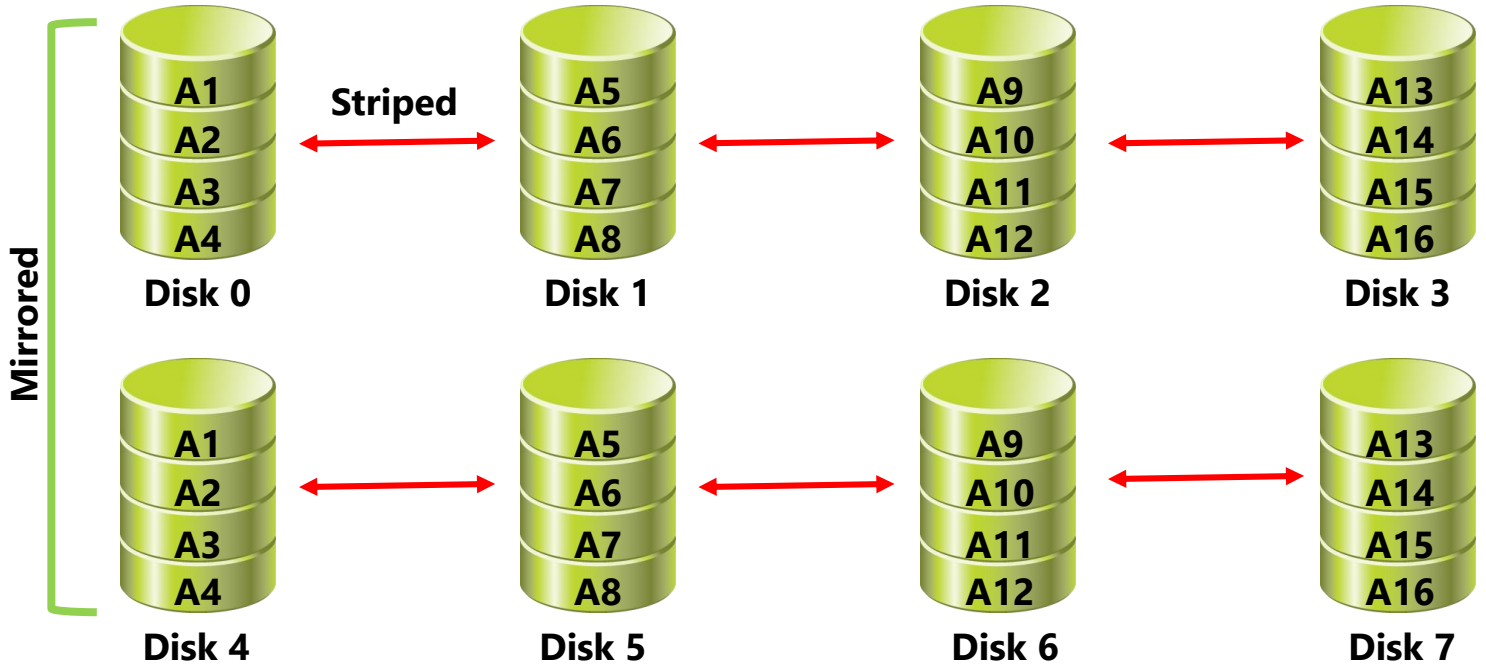
Block level striped set with parity distributed across all disks



RAID levels

RAID 1 + 0

Each pair of disks is mirrored, then the mirrored disks are striped



Q&A