

Chapter 11

Installing and Upgrading
Operating Systems

Episode 11.01

Episode **Windows 10 Editions and Features**
title:

Objective: There are important differences between Windows 10 Home, Pro, Pro for Workstations, and Enterprise. This episode reviews the versions and feature differences.

Lower 3rds

OBJ Windows 10 in S mode.

OBJ Windows 10 Home.

OBJ Windows 10 Pro.

OBJ Windows 10 Pro for Workstations.

OBJ Windows 10 Enterprise.

Lower 3rds

As a IT technician your job will include installing a Windows OS.

A 1 GHz single-core CPU

2 GBs of RAM

32 GBs of data storage

Lower 3rds

Support for DirectX 9 graphics

And a monitor with a minimum display of a 800 pixels by 600 pixels

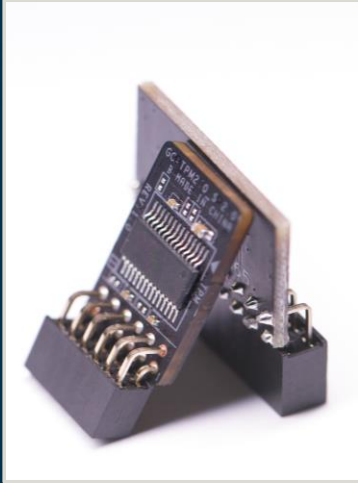
Device Encryption

OBJ Drive Encryption (BitLocker)

Lower 3rds

- 4:57 - Objective term - Random-access memory (RAM) support limitations
- 5:05 - Objective term - Domain access vs. workgroup
- 5:17 - Objective term - Availability of Remote Desktop Protocol (RDP)
- 5:32 - Objective term - gpedit.msc
- 5:33 - Objective term - Group Policy/updates

TPM 2.0 module



What TPM does is provide additional security for the computer. When it's enabled, each time the computer boots up, TPM issues an unlock code to the OS.

Episode 11.02

Episode **Windows 11 Editions and Features**
title:

Objective: There are important differences between Windows 11 Home, Pro, Pro for Workstations, and Enterprise. This episode reviews the versions and feature differences.

Lower 3rds

Windows 11 has Home, Pro, Pro for Workstations, Enterprise, and Mixed Reality editions.

Windows 11's minimum hardware requirements exceed those of Windows 10.

Windows 11 needs internet connectivity, TPM 2.0, and secure boot.

Lower 3rds

Secure Boot ensures a computer boots with approved software.

TPM provides additional security for the boot process.

Windows sets minimum RAM at 4GBs for Windows 11.

Lower 3rds

A 64-bit 1 GHz dual-core CPU

4 GBs of RAM

64 GBs of data storage

Support for DirectX 12 compatible graphics

Lower 3rds

A 9-inch or larger display monitor

TPM 2.0

Secure boot.

BitLocker encrypts entire storage drive protecting data on the drive.

Lower 3rds

Home edition – 128 GB

Pro edition – 2 TB

Pro for Workstations – 6 TB

Enterprise – 2 TB.

Windows 11 Editions

Editions

Home

Pro

Pro for Workstations

Enterprise

Mixed Reality



Hardware Requirements

64-bit, 1 GHz dual-core CPU

4 GB RAM

64 GB storage

DirectX 12 graphics,

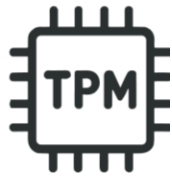
9" display

TPM 2.0

Secure Boot required



Secure
boot



TPM

Windows 11 Needs

Internet required during setup and some updates

Windows 11 setup “requires” TPM 2.0 and Secure Boot

Systems must support UEFI with these features enabled

Secure Boot

Prevents unapproved software from running during startup

Verifies digital signatures of boot components

Must be enabled in UEFI/BIOS settings

TPM 2.0 Sec Module

TPM = Trusted Platform Module

Validates the system before Windows loads

Provides unique unlock code at boot; blocks tampered setup

Minimum RAM for Windows 11

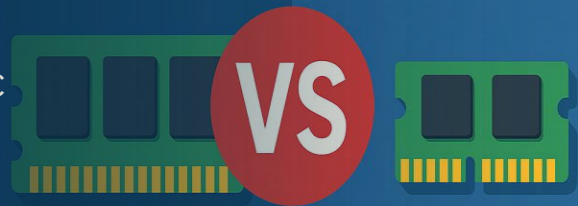
Windows 11 requires 4 GB RAM minimum

Windows 10 required only 2 GB RAM

Not meeting this spec prevents installation

**4 GB
RAM**

**2 GB
RAM**



Bitlocker

Encrypts the entire drive for full data protection

Protects data in case of device loss or theft

Only available on Pro and higher editions

Episode 11.03

Episode **Boot from Everything**
title:

Objective: A PC can only boot from a bootable drive. A mass storage device with a working OS installed on it is one kind of bootable drive. But what if there's no OS installed, or the installation is broken? No problem! Just pop in a bootable device such as the OS installation media, or a bootable diagnostic toolkit. If you don't have one, you can make your own with a spare optical disc or thumb drive, an ISO image file of the bootable media, and a program to burn the ISO file to your media.

Lower 3rds

Universal Serial Bus (USB)

Network

Solid-state/flash drives

Internet-based

External/hot-swappable drive

Internal hard drive (partition)

Multiboot

Lower 3rds

SSD or solid-state or flash drives can be initialized as boot drives or be cloned from an existing boot drive

Episode 11.04

Episode **Installing and Upgrading Windows**
title: **10**

Objective: There's more than one way to install Windows and a good tech understands all of them. Additionally, it's important to perform a few pre-installation tasks to make sure your system will work with your desired version of Windows.

Lower 3rds

OBJ - Clean install

OBJ - Upgrade

OBJ - Image deployment

OBJ - Remote network installation

OBJ - Zero-touch Installation (ZTI)

OBJ - Repair installation

OBJ - Other considerations

OBJ - Third-party drivers

Process for installing Windows OS

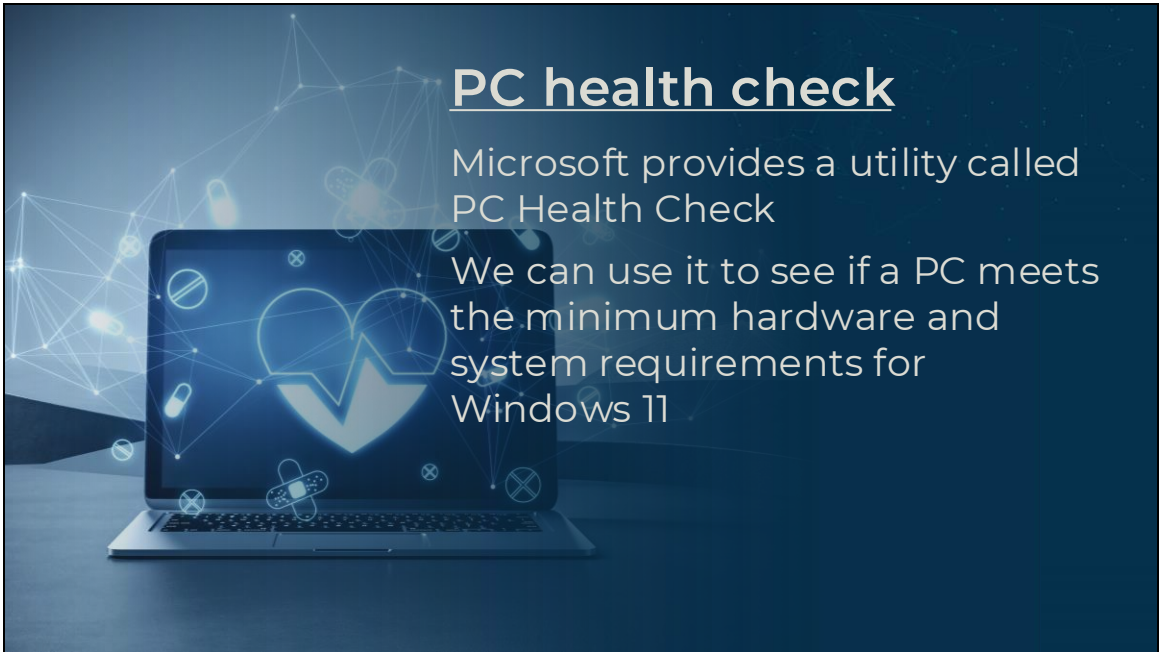
process for upgrading Windows 10 to Windows 11

PC Health Check that we can use to see if a PC meets the minimum hardware and system requirements for Windows 11

PC health check

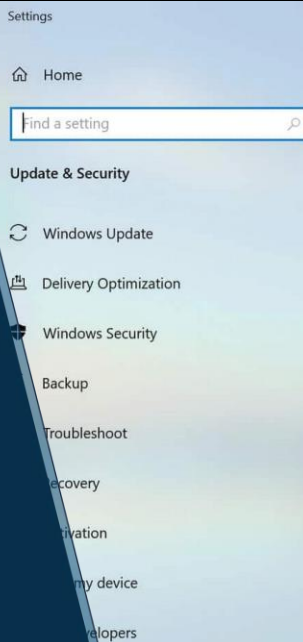
Microsoft provides a utility called PC Health Check

We can use it to see if a PC meets the minimum hardware and system requirements for Windows 11



Upgrade

Use the Windows Update options of the Settings app to start the upgrade process to Windows 11



Windows Update

Upgrade to Windows 11 is ready
—and it's free!

Get the latest version of Windows, with
[a new look, new features, and enhanced security.](#)

Note: Some Windows 10 features aren't
available in Windows 11. Certain apps and
features may have additional requirements.
[Check device specifications](#)

[Download and install](#)

[Stay on Windows 10 for now](#)



Updates available

Last checked: Today, 8:29 am

2022-01 Update for Windows 10 Version 21H2 for x64-based
Systems (KB4023057)

Status: Pending install

Lower 3rds

The process for installing the Windows OS

Upgrading Windows 10 to Windows 11

PC Health Check is used to see if a PC meets the minimum hardware and system requirements for Windows

Lower 3rds

Remote installation is a process that installs, upgrades, or updates software across a network.

Zero-touch installation (ZTI) allows for the deployment of systems without in-person attendants.

Lower 3rds

A repair install is a type of installation that retains the folders, files, settings, and applications while replacing or installing problem or missing DLLs, system files or configurations.

Third-party drivers can remain on the system after the hardware or software is removed.

Lower 3rds

Image deployment - take an exact copy of a storage device and send it to networked PCs

Upgrade

Use the Windows Update options of the Settings app to start the upgrade process to Windows 11

Settings

Home

Find a setting

Update & Security

Windows Update

Delivery Optimization

Windows Security

Backup

Troubleshoot

Recovery

Activation

My device

Developers

Windows Update

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Note: Some Windows 10 features aren't
available in Windows 11. Certain apps and
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Download and install

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What to do once installation completes?

Verify it using the Winver tool





Remote Network installation

Process that installs, upgrades, or updates software across a network



Zero-touch Installation (ZTI)

Allows for the configuration and deployment of systems without in-person attendants



Repair/recovery install

Retains the folders, files, settings, and applications while replacing the problem



Third-party drivers

Remain on the system after the hardware does a repair install



Remote Network installation

Process that installs, upgrades, or updates software across a network

Remote installation

Centralized, standardized, and secure software management and control





Zero-touch Installation (ZTI)

Allows for the configuration and deployment of systems without in-person attendants

Zero-touch Installation

Configure remote devices, with the specific protocols, operating system, applications, and settings from a centralized location





Repair/recovery install

Retains the folders, files, settings, and applications while replacing the problem

Repair / Recovery install

Replacing or installing problem or missing DLLs, system files or configurations





Third-party drivers

Remain on the system after the hardware does a repair install

Third-party drivers

Enable the hardware or software to communicate with the operating system and other devices

They can cause installation problems for Windows versions

Episode 11.05

Episode **Post-Installation Tasks**
title:

Objective: N/A

Episode 11.06

Episode **Installing and Updating Linux**
title:

Objective: Linux is a fantastic open-source and free operating system that anyone can download and use. Let's discover how to install and update this wonderful OS.

Lower 3rds

Linux Distributions = Configured for Specific Purposes

File Permissions Define Linux Access Control

Ownership = User or Group Assigned to File/Folder

su & sudo = Run Commands with Elevated Privileges

apt & dnf = Linux Package Managers

Linux Config Files Customize System Behavior

Lower 3rds

Common File Commands: ls, ls -l, pwd, mv, cp, rm

Ownership & Permissions Commands: chmod, chown

System Search & Check: grep, find, fsck

mount = Attach Filesystems

/etc/passwd = Stores User Account Data

/etc/shadow = Stores Encrypted Passwords

/etc/hosts = Maps Hostnames to IPs

Lower 3rds

/etc/fstab = Filesystem Mount Configurations

/etc/resolv.conf = DNS Resolver Settings

Package Management

- apt (Debian/Ubuntu) manages install, update, remove
- dnf (Fedora/Red Hat/CentOS) does the same
- Packages = apps + libraries + tools
- Supports system functions and features

Informational Commands

- top → real-time processes
- ps → active processes
- du → disk usage
- df → free space

Networking Commands

- ip → manage interfaces
- ping → test reachability
- curl → data transfer
- dig → DNS info
- traceroute → packet path

Text Editors and Configuration Files

- nano → simple text editor
- vim → advanced editor
- /etc/passwd → user accounts
- /etc/shadow → passwords
- /etc/hosts → local names
- /etc/fstab → storage mounts
- /etc/resolv.conf → DNS

OS Components and Root

- systemd → manages services
- kernel → core OS bridge
- bootloader (GRUB) → will load the kernel
- root account → highest privilege

Practice and Troubleshooting Tips

- Practice on Linux or a VM
- Try editing config files
- Test commands hands-on
- Remember for A+ exam

Episode 11.07

Episode **Upgrading macOS**
title:

Objective: Upgrading macOS is simple. Follow along with Mike Smyer in this episode to find out how to upgrade to the newest version of macOS.

Lower 3rds

- OBJ - Updates/patches
- OBJ - macOS + Sequoia version 15.4.1
- OBJ macOS installer
- EULA
- About this Mac
- "About this Mac" - details the Mac's hardware and software
- Sometimes releases have bugs you want to avoid
- 1:51 - Objective term - Be sure to check before upgrading as it can introduce incompatibilities or bugs

End User License Agreement (EULA)

- Don't pirate
- Only install/run on Mac hardware
- Etc



TERMS OF USE

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MacOS Sequoia version

