

CompTIA A+ Core 2 Exam 220-1102

# Lesson 13



## Installing and Troubleshooting Operating Systems

# Objectives

- Perform OS installations and upgrades
- Install and configure applications
- Troubleshoot Windows OS problems

## Lesson 13

# Topic 13A

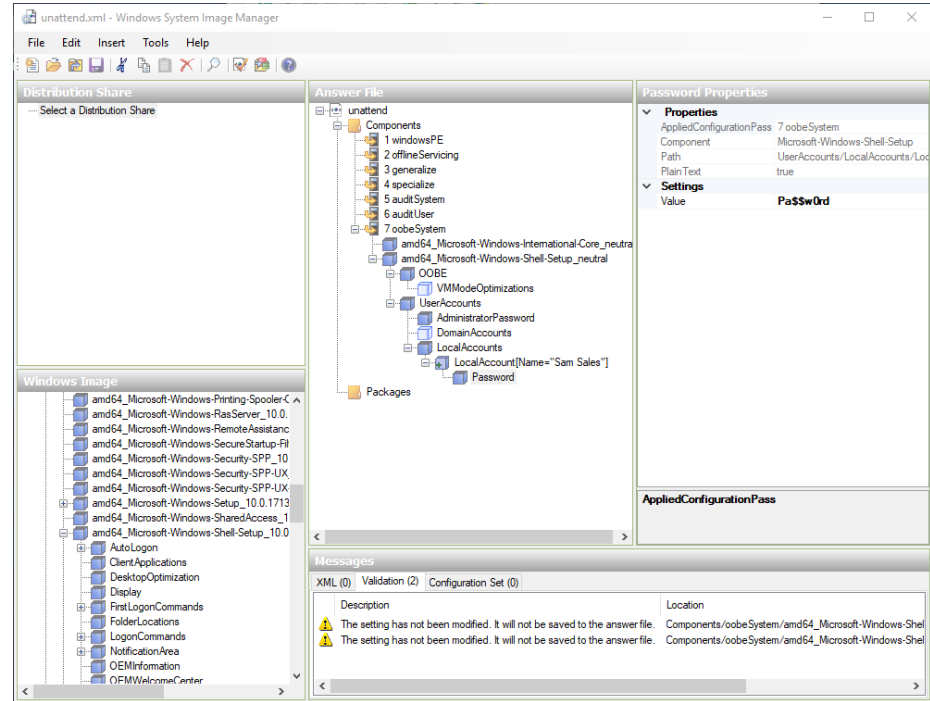
## Perform OS Installations and Upgrades

# Installation and Upgrade Considerations

- Attended installations
- Clean install versus in-place upgrade
- Upgrade considerations
  - Hardware compatibility
  - Application and driver support/backward compatibility
  - Backup files and user preferences
  - Obtain third-party drivers
- Feature updates

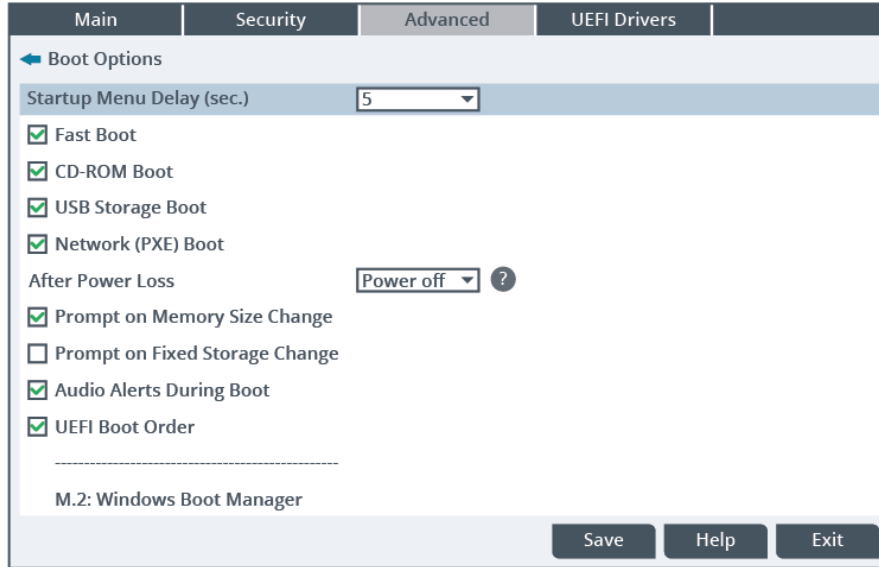
# Unattended Installations

- Answer file
- Image deployment



*Screenshot courtesy of Microsoft*

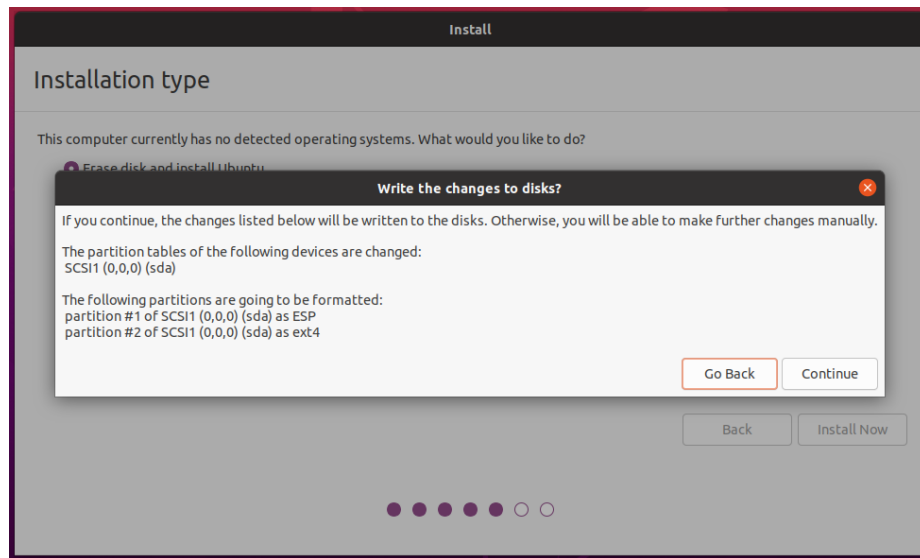
# Boot Methods



- Boot device priority
- Optical media
- USB/external
  - Solid-state/flash drives
- Network
  - Preboot eXecution Environment (PXE)
  - Dynamic Host Configuration Protocol (DHCP) server
  - Remote installation server
- Internet-based
- Internal hard drive (partition)

# Disk Configuration

- Partitioning style
  - Master boot record (MBR)
  - Primary versus extended partitions
  - Active partition
  - Globally unique identifier (GUID) partition table (GPT)
- Drive format
  - File system choices



# Repair Installation

- Recovery partition
  - OEM factory reset
  - Boot from internal recovery partition
- Reset Windows
  - Refresh versus complete reset



## **Review Activity: OS Installations and Upgrades**

- Installation and Upgrade Considerations
- Unattended Installations
- Boot Methods
- Disk Configuration
- Repair Installation

## Lab Activity

- Assisted Lab: Perform Windows 10 Installation
  - Complete Windows setup and configure an account password
- Assisted Lab: Perform Ubuntu Linux Installation
  - Use a product disc to install Ubuntu Linux

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# Topic 13B

## Install and Configure Applications

# System Requirements for Applications

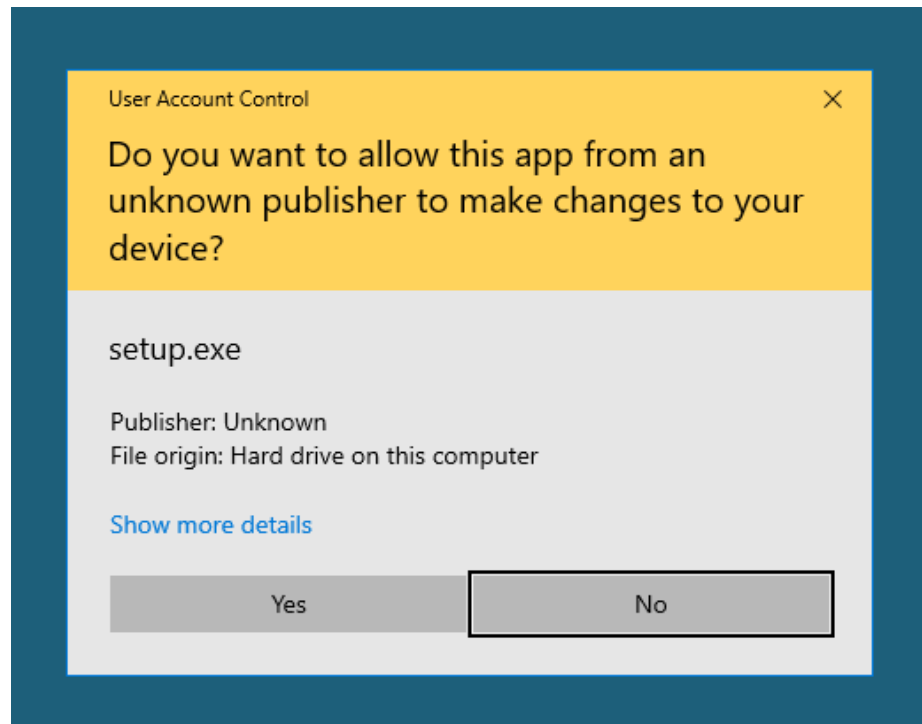
- Central Processing Unit, system memory, and storage requirements
  - 32-bit versus 64-bit dependent application requirements
  - Speed/cores
  - Features (hardware-assisted virtualization, Trusted Platform Module, ...)
  - RAM requirements
  - Disk free space requirements
- Dedicated graphics card requirements
  - Integrated CPU or chipset adapter versus dedicated add-in card
  - Video RAM requirements
- External hardware token requirements

# OS Requirements for Applications

- Application to OS compatibility
  - Windows/macOS version
  - Linux distribution
- 32-bit versus 64-bit OS

# Distribution Methods

- Installers for desktop applications
  - Windows EXE and MSI installers
  - macOS DMG and PGK installers
  - Linux APT (DEB) and YUM (RPM) package managers and formats
- Physical media versus downloadable
  - Source/integrity validation
- ISO mountable



*Screenshot courtesy of Microsoft*

# Other Considerations

- Shadow IT and impact to business
  - Licensing/compliance
  - User training and education
  - Increased support requirements
- Impact to operation
  - Deployment and support tools
- Impact to device and network
  - Resource consumption/use of background services
  - Risks from faulty applications
  - Bandwidth usage

## **Review Activity: Install and Configure Applications**

- System Requirements for Applications
- OS Requirements for Applications
- Distribution Methods
- Other Considerations



## Lab Activity

- Assisted Lab: Install and Configure an Application
  - Install an office productivity suite with custom options

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# Topic 13C

## Troubleshoot Windows OS Problems

# Boot Process

- Firmware-controlled
  - Power on self test (POST)
  - Boot device priority
- Boot manager
  - Boot Configuration Database (BCD)
  - Legacy BIOS/MBR versus EFI/GPT
- Windows load
  - Kernel and drivers
  - Services and winlogon

# Boot Recovery Tools (Slide 1 of 2)

## Startup Settings

Press a number to choose from the options below:

Use number keys or functions keys F1-F9.

- 1) Enable debugging
- 2) Enable boot logging
- 3) Enable low-resolution video
- 4) Enable Safe Mode
- 5) Enable Safe Mode with Networking
- 6) Enable Safe Mode with Command Prompt
- 7) Disable driver signature enforcement
- 8) Disable early launch anti-malware protection
- 9) Disable automatic restart after failure

Press F10 for more options

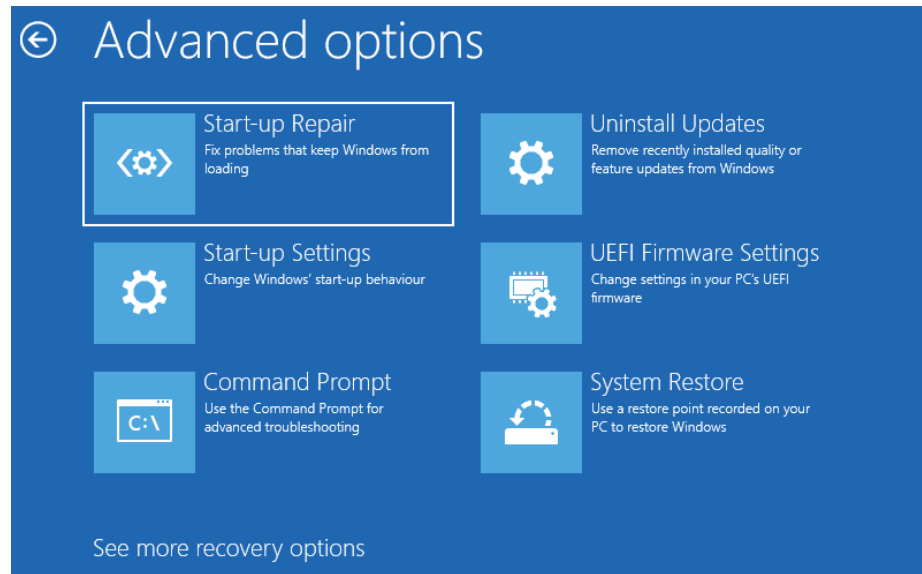
Press Enter to return to your operating system

- Advanced boot options
  - F8 from BIOS boot
  - SHIFT-click Restart from power icon with UEFI boot
- Safe Mode

*Screenshot courtesy of Microsoft*

# Boot Recovery Tools (Slide 2 of 2)

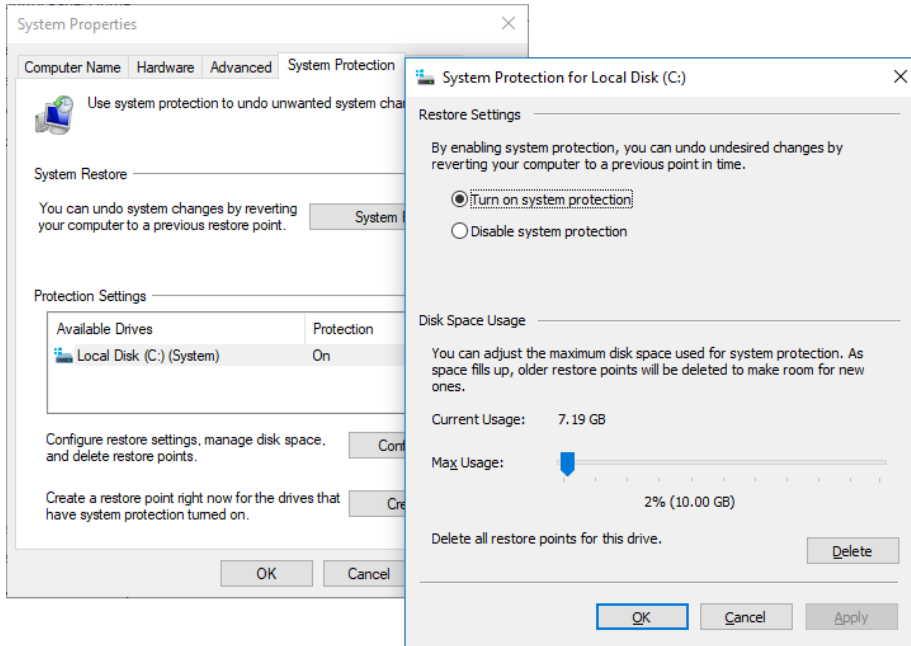
- Windows Recovery Environment (WinRE)
- Creating recovery partition or startup disk
- Startup repair
- Options for reinstalling
- WinRE command prompt



*Screenshot courtesy of Microsoft*

# System Restore

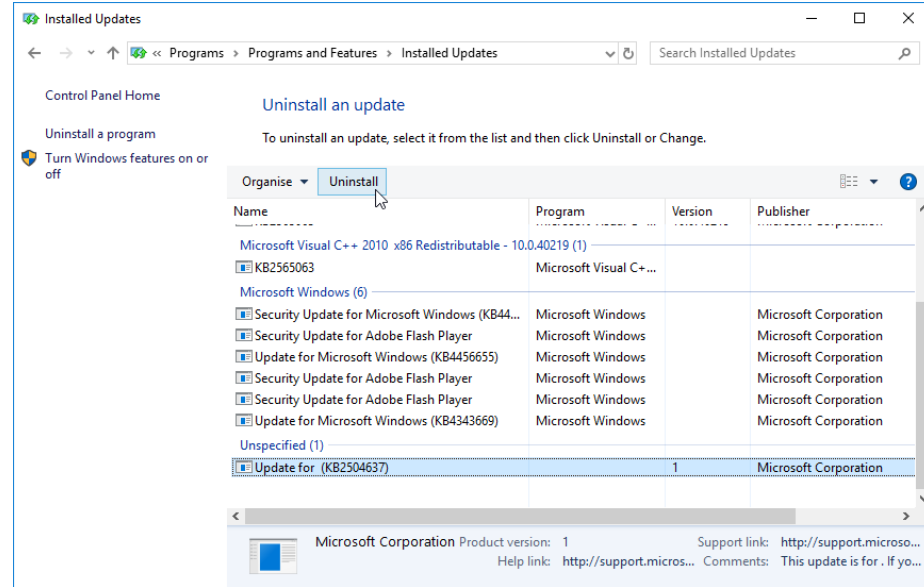
- Configuring system protection
- Using System Restore



*Screenshot courtesy of Microsoft*

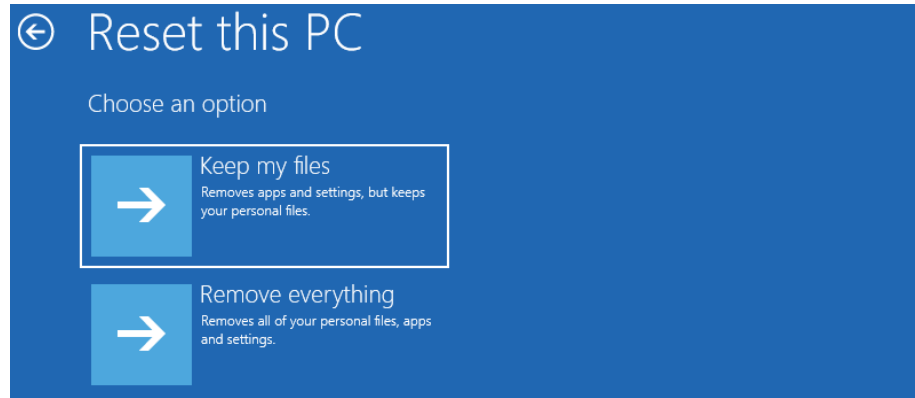
# Update and Driver Roll Back

- Roll back Windows updates
- Roll back driver version



*Screenshot courtesy of Microsoft*

# System Repair, Reinstall, and Reimage



*Screenshot courtesy of Microsoft*

- Recovery image
  - Creating a system image
  - System image recovery option
- Reinstalling Windows
  - Reset this PC
  - Keep my files versus Remove everything



# Troubleshoot Boot Issues

- Failure to boot/invalid boot disk
  - Check physical connections and boot device priority
- No OS found
  - Use Startup repair or WinRE command prompt
- Graphical interface fails to load/black screen
  - Check boot options (msconfig)
  - Check for disk activity/completion of Windows updates
  - Run sfc to verify system files

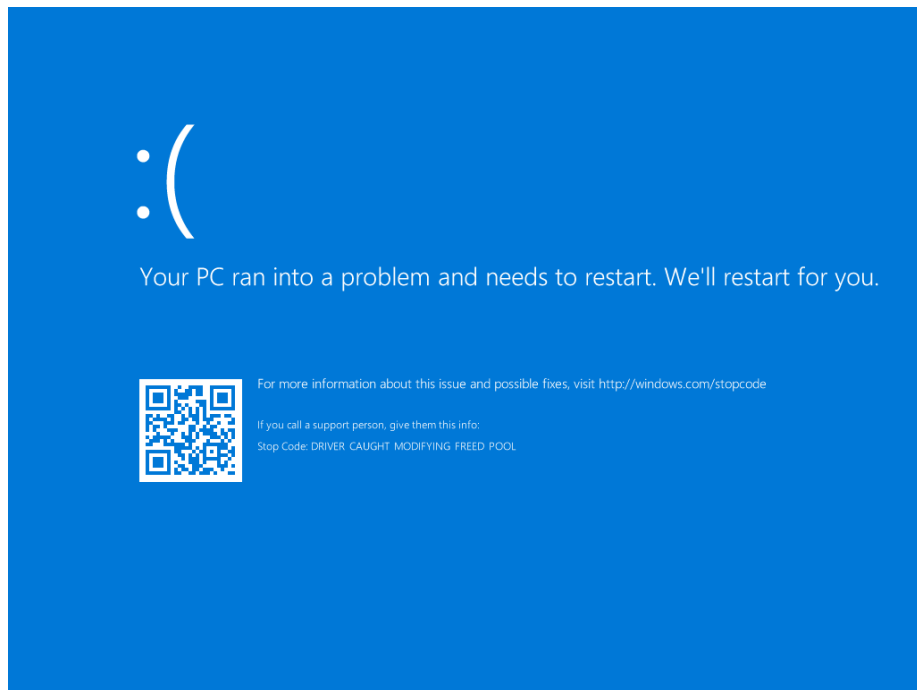
# Troubleshoot Profile Issues

- Slow profile load
  - Pre-/post login
  - Verbose status messaging
- Rebuild Windows profiles

# Troubleshoot Performance Issues

- Sluggish performance diagnosis
  - Task Manager/Resource/Performance Monitor
  - Reboot
  - Low memory or disk space
- Common troubleshooting steps
  - Apply updates and defragment hard disk
  - Verify requirements and add resources
  - Disable startup items and unnecessary services
  - Check security issues and scanner performance
  - Test for power management issues

# Troubleshoot System Fault Issues



*Screenshot courtesy of Microsoft*

- Common symptoms
  - Frequent shutdowns/system instability
  - Blue screen of death (BSOD)
- Troubleshooting steps
  - System restore or update/driver rollback
  - Hardware diagnostics, Windows memory diagnostics and sfc
  - Research error
- USB issues
  - Power and selective suspend faults
  - USB controller resource warnings

# Troubleshoot Application and Service Fault Issues

- Applications crashing
  - Recover files and unsaved data
  - Research event logs
  - Uninstall/reinstall/update applications
- Services not starting
  - Restart services
  - Check dependencies and permissions
- Time drift
  - Failure of authentication, backup, and other date/time sensitive services
  - Synchronize to consistent time source

## Review Activity: Windows OS Problems

- Boot Process
- Boot Recovery Tools and System Restore
- Update and Driver Roll Back
- System Repair, Reinstall, and Reimage
- Troubleshoot Boot and Profile Issues
- Troubleshoot System Fault Issues
- Troubleshoot Application and Service Fault Issues

## Lab Activity

- Assisted Lab: Troubleshoot Systems and Services
  - Troubleshoot issues with a pair of Windows computers
- Assisted Lab: Troubleshoot a Windows OS Issue
  - Troubleshoot an issue with a Windows computer that will not boot

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## Summary