

CompTIA A+ Core 1 Exam 220-1101

# Lesson 8



## Supporting Mobile Devices

# Objectives

- Set up mobile devices and peripherals
- Configure mobile device apps
- Install and configure laptop hardware
- Troubleshoot mobile device issues

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# Topic 8A

## Set Up Mobile Devices and Peripherals

# Mobile Display Types

- Liquid crystal displays (LCD)/Thin Film Transistor (TFT)
  - Twisted nematic (TN)—Fast response times
  - In-plane switching (IPS)—Better viewing angles and best overall quality
  - Vertical alignment (VA)—Best contrast ratio
- LED backlights
- Cold cathode fluorescent (CCFL) bulb and inverter backlights
- Organic LED (OLED) displays
  - No separate backlight and can use flexible plastics

# Mobile Display Components

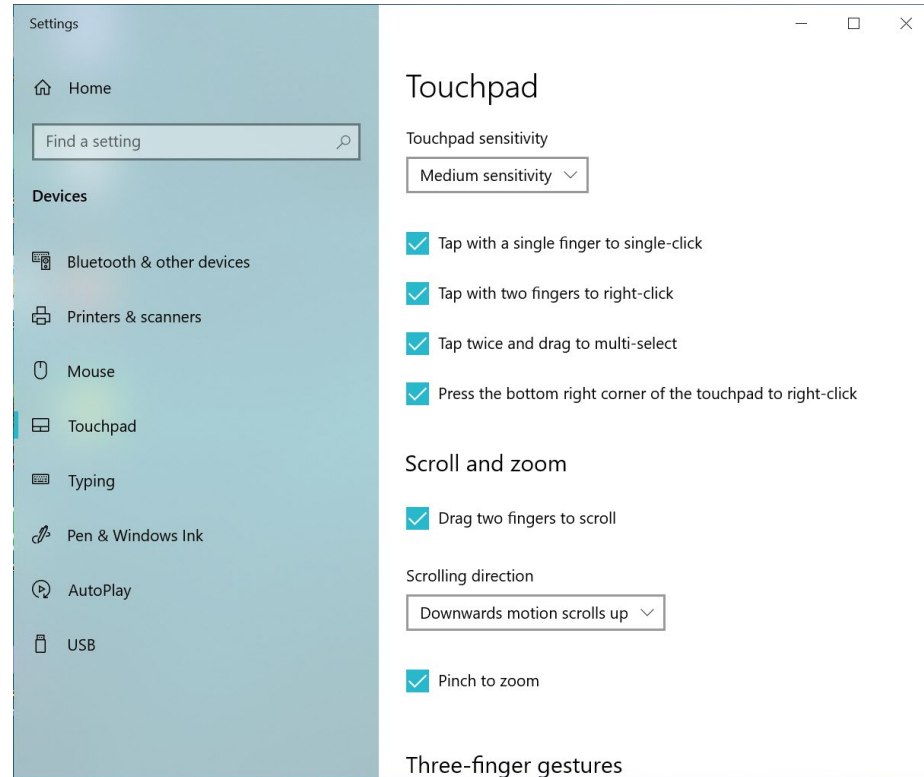


*Image © 123RF.com*

- Digitizer functions
  - Converts analog touch events to digital input
  - Multitouch and gesture support
- Glass layer and screen protectors
- Rotating and removable screens
  - Accelerometers and gyroscopes
  - Keyboard covers for hybrid laptop/tablets

# Mobile Device Accessories

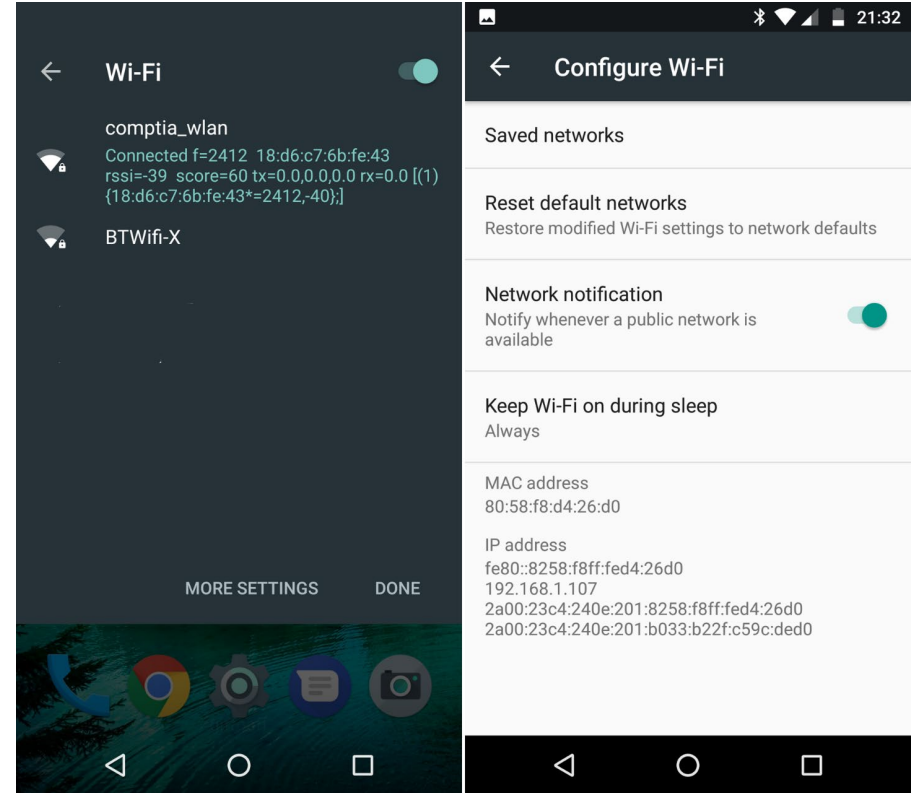
- Touchpads, trackpads, and drawing pads
- Touch pens
  - Use instead of fingers to operate touchscreen
  - Drawing/annotating with compatible apps
- Microphone, speakers, and camera/webcam
  - Placement of built-in devices
  - Connectors for peripheral devices



*Screenshot courtesy of Microsoft*

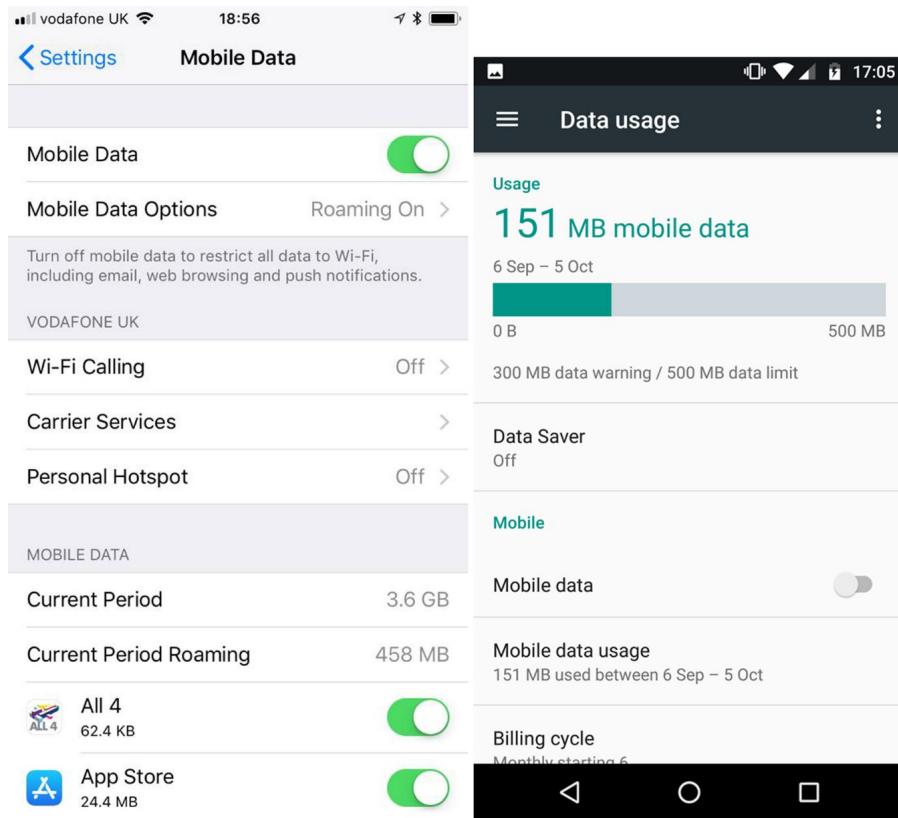
# Wi-Fi Networking

- Enabling and disabling
  - Airplane mode
- Antenna connector/placement



*Screenshot courtesy of Android platform, a trademark of Google LLC*

# Cellular Data Networking



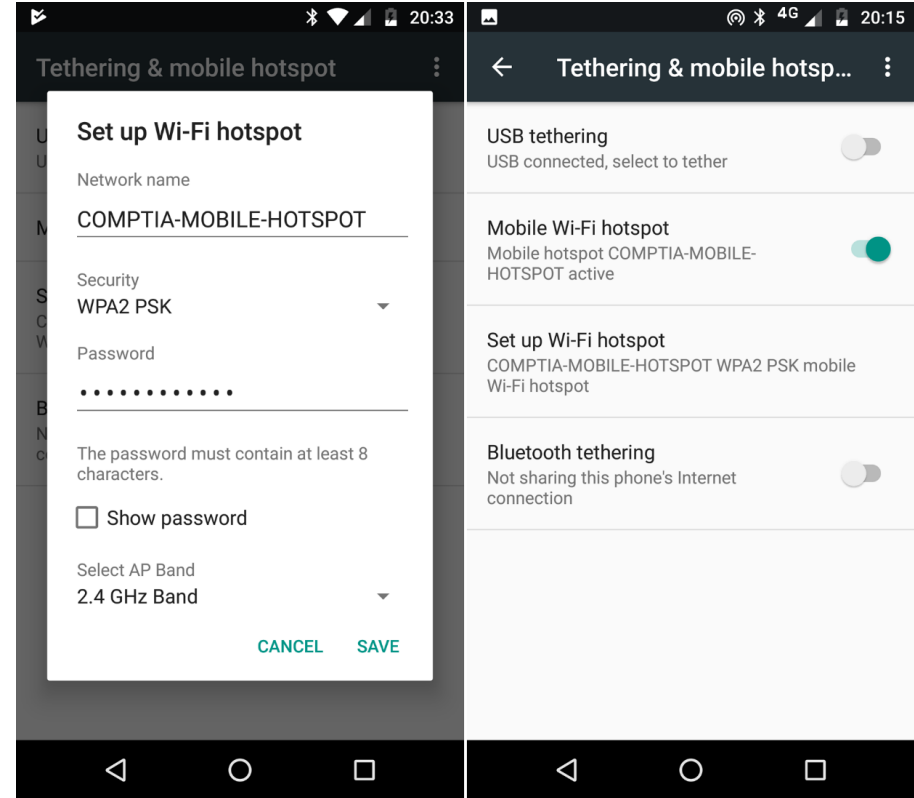
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- Global System for Mobile Communications (GSM)
  - Subscriber identity module (SIM)
- Code-division Multiple Access (CDMA)
  - Preferred roaming list (PRL) updates
- Cellular networking data indicators
  - G/E or 1X (50-400 Kbps)
  - 3G (3 Mbps) and H/H+ (42 Mbps)
  - 4G and 4G+ (20-90 Mbps)
  - 5G (50-300 Mbps)



# Mobile Hotspots and Tethering

- Hotspot
  - Configure soft access point to share mobile device's data connection with nearby computers
- Tethering
  - Share data connection with computer connected via USB/Bluetooth

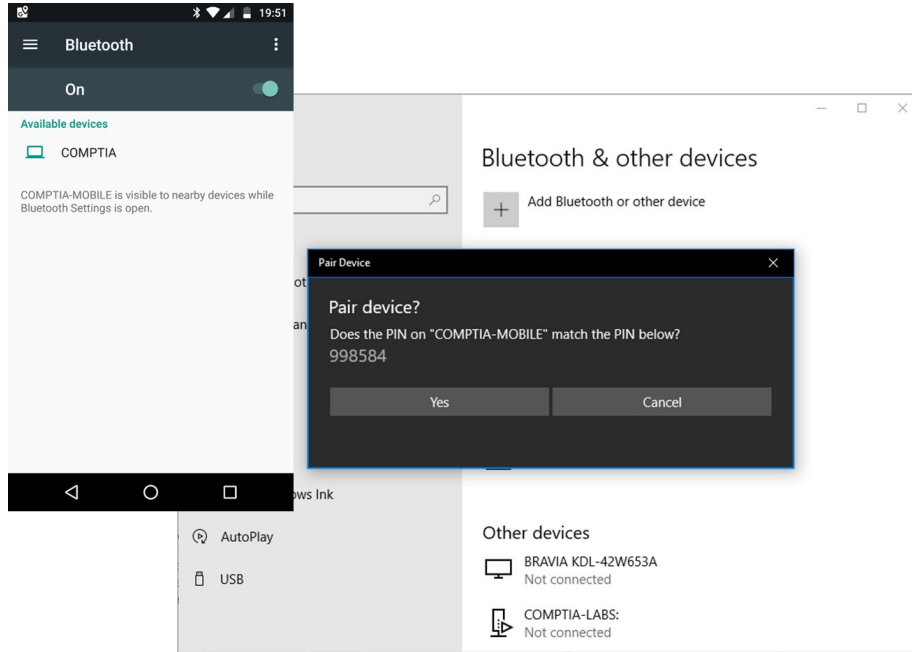


*Screenshot courtesy of Android platform, a trademark of Google LLC*

# Mobile Device Wired Connection Methods

- Laptop ports
- Smartphone and tablets
  - USB-C for modern devices
  - microUSB/miniUSB for legacy devices
  - Lightning for Apple devices
- Serial interfaces
  - Universal asynchronous receiver transmitter (UART)
  - Serial data over USB/Bluetooth

# Bluetooth Wireless Connections



- Enable/disable Bluetooth
- Enable pairing
  - Use configuration page to make device discoverable and find a device for pairing
  - Enter the PIN code
- Test connectivity

# Near Field Communication Wireless Connections

- Use mobile device as payment card
  - Wallet apps
- Pair/configure connectivity between devices



*Image © 123RF.com*

# Port Replicators and Docking Stations



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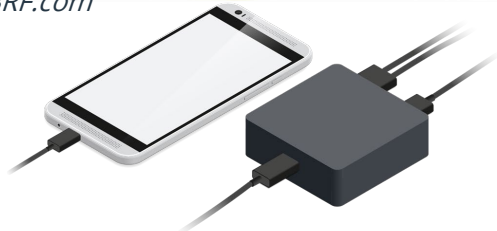


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- Port replicator
  - Provision additional wired ports for laptops
- Docking station
  - Port replicator plus support for removable drives and adapter cards
- Smartphone and tablet docks
  - Connect peripheral devices and use as a desktop

## **Review Activity: Mobile Devices and Peripherals**

- Mobile Display Types, Display Components, and Device Accessories
- Wi-Fi and Cellular Data Networking
- Mobile Hotspots and Tethering
- Mobile Device Wired Connection Methods
- Bluetooth Wireless Connections
- Near-Field Communication Wireless Connections
- Port Replicators and Docking Stations

## Lab Activity

- Virtual Workbench Lab: Configure Laptop Dock and External Peripherals

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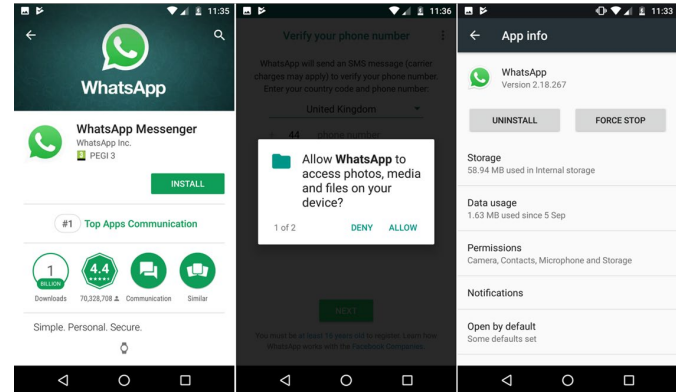
# Topic 8B

## Configure Mobile Device Apps



# Mobile Apps

- iOS apps
  - App Store
  - Developer tools
- Android apps
  - Google Play
  - Third-party stores
- Permissions



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# Account Setup



*Screenshot reprinted with permission from Apple Inc.*

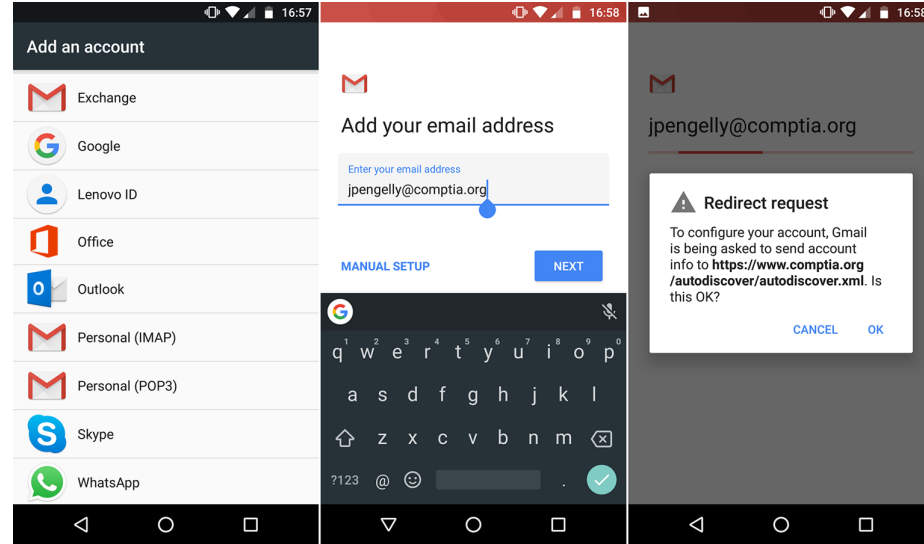
- Single user devices
  - Primary owner account created to manage device and app store
- Multiple app accounts for digital identities
  - Microsoft 365
  - Google Workspace
  - iCloud

# Types of Data to Synchronize

- Contacts
  - Synchronization between devices versus synchronization between apps/services
- Calendar
- Mail
- Pictures, music, video, and documents
  - Sharing and version control
- Apps
  - Store synchronizes to all devices operated by the same account
- Passwords

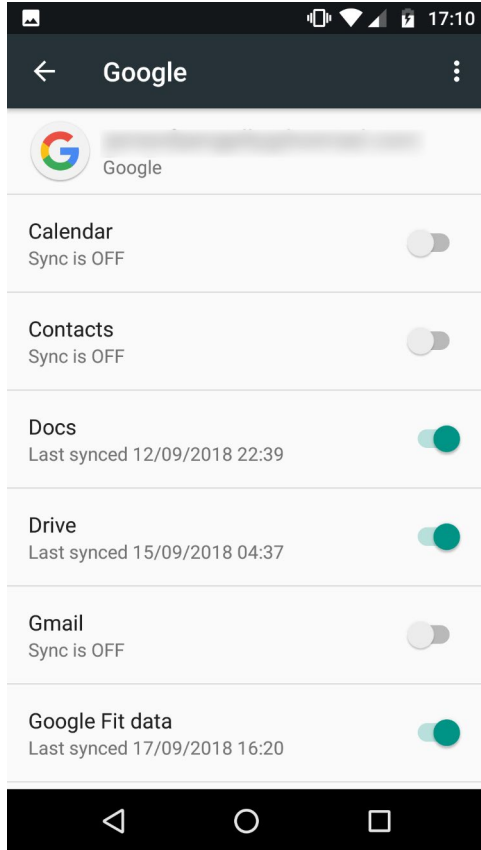
# Email Configuration Options

- Commercial provider email configuration
  - Autodiscover settings
- Corporate and ISP email configuration
  - Autodiscover or manually configure Exchange email server connection
  - Manually configure SMTP and POP3/IMAP servers
  - Server address, connection security, and default or custom port



*Screenshot courtesy of Android platform, a trademark of Google LLC*

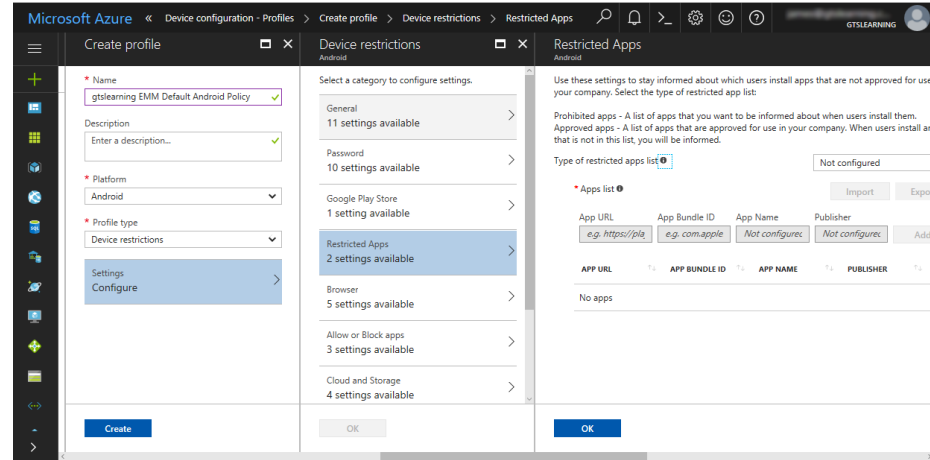
# Synchronization Methods



- Synchronization via cloud accounts
  - Select which data to synchronize for each app
  - Data caps
    - Storage limits for accounts
    - Transfer limits for cellular data
- Synchronization to PCs
  - Bluetooth/Wi-Fi/USB file transfer
- Synchronizing to automobiles

# Enterprise Mobility Management

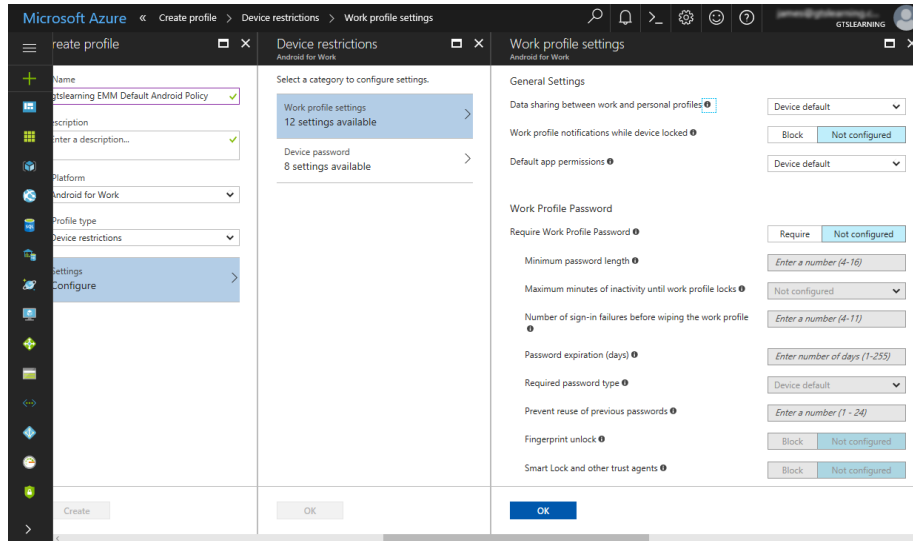
- Mobile device management (MDM)
  - Authentication policies
  - Control device features (webcam/microphone)
  - Remote device reset/data wipe
- Mobile application management (MAM)
  - Establish protected container to run corporate apps
  - Enterprise app developer programs and distribution channels



*Screenshot courtesy of Microsoft*

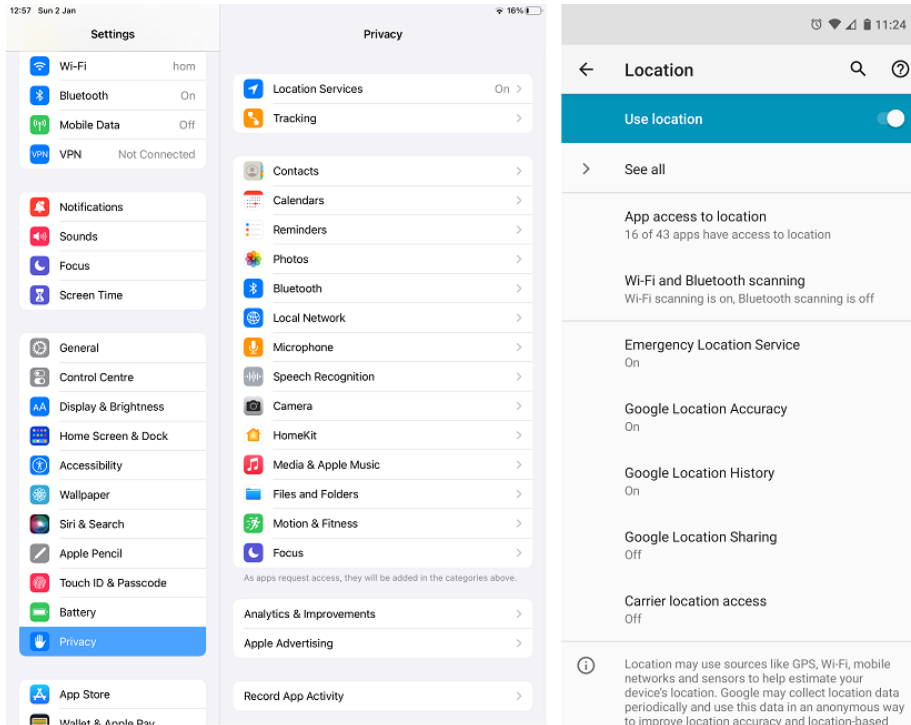
# Two-factor Authentication

- Mobile device access control
  - Screen lock via password, PIN, swipe pattern, fingerprint/facial scan
- Secondary authentication to corporate workspace
  - Two-factor authentication and verification
  - Report and verify sign-in via second device or account



*Screenshot courtesy of Microsoft*

# Location Services



*Screenshots reprinted with permission from Apple Inc., courtesy of Android platform, a trademark of Google LLC*

- Geolocation
  - Identify/estimate device position on Earth
- Location service mechanisms
  - Global Positioning System (GPS)
    - Triangulate via orbital satellites
  - Indoor Positioning System (IPS)
    - Triangulate to cellular and Wi-Fi radio sources
- Enable/disable and privacy options



## Review Activity: Mobile Device Apps

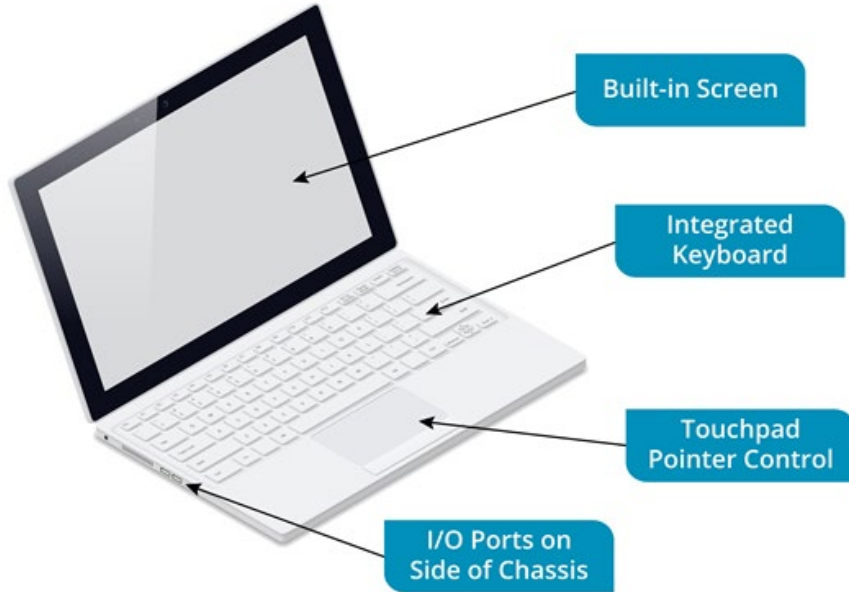
- Mobile Apps
- Account Setup
- Types of Data to Synchronize
- Email Configuration Options
- Synchronization Methods
- Enterprise Mobility Management
- Two-factor Authentication
- Location Services

## Lesson 8

# Topic 8C

## Install and Configure Laptop Hardware

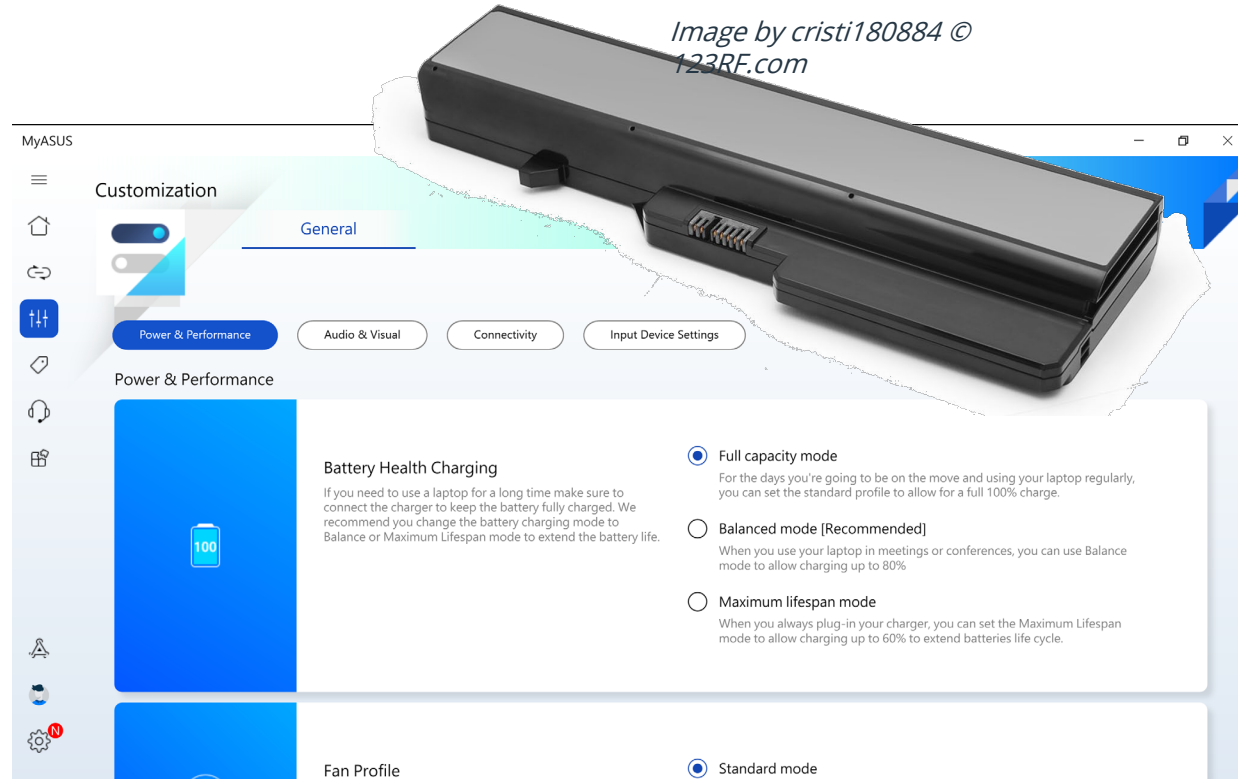
# Laptop Disassembly Processes



- Hand tools and parts
  - Screw types and locations
  - Internal data cable connections and orientation
  - Anti-static protection
- Form factors and plastics/frames
  - Consult documentation/web resources

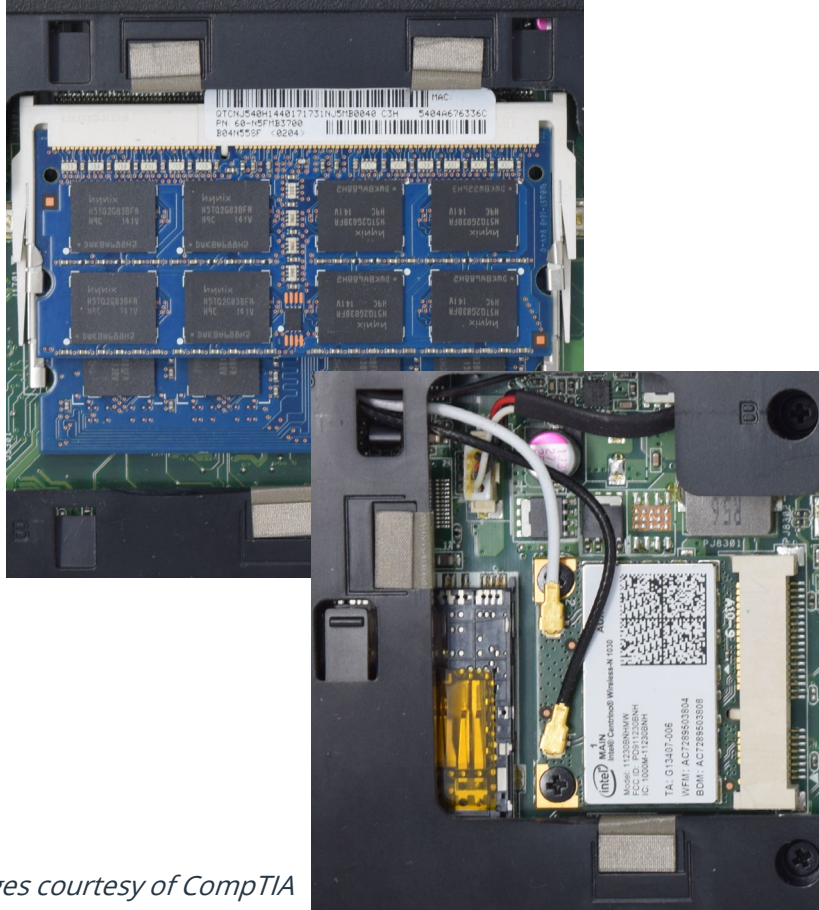
# Battery Replacement

- AC adapters
- Battery power
  - Lithium ion (Li-ion)
  - Cell size
  - Battery release
  - Proper charging
  - Storage



*Screenshot used with permission from ASUSTek Computer Inc.*

# RAM and Adapter Replacement



- Upgrading RAM modules
  - SODIMM system memory slots
- Upgrading adapter cards
  - Mini PCIe, mSATA, and M.2 adapter card slots
  - Radio antenna connectors

# Disk Upgrades and Replacement

- Disk upgrade types
  - Migration—Apply system image from HDD to new SSD
  - Replacement—Make backup and then restore to new OS installation on new SSD
  - Additional drive
- Laptop drive connectors
  - SATA 2.5" form factor
    - Thin and ultrathin form factors
  - mSATA
  - M.2



# Keyboard and Security Component Replacement

- Keyboard and touchpad replacement
  - Data connector ribbon cable
- Key replacement
- Biometric security components
  - Fingerprint scanner
- Near field scanner
  - Data and antenna connection

## Review Activity: Laptop Hardware

- Laptop Disassembly Process
- Battery Replacement
- RAM and Adapter Replacement
- Disk Upgrades and Replacement
- Keyboard and Security Component Replacement



## Lab Activity

- Virtual Workbench Lab: Add Expansion SSD in a Laptop
- Virtual Workbench Lab: Update Laptop RAM

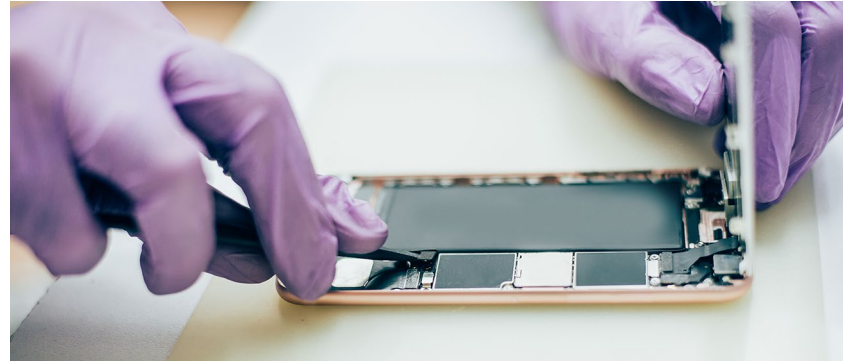
## Lesson 8

# Topic 8D

## Troubleshoot Mobile Device Issues

# Power and Battery Issues

- Poor battery health
  - Battery retains less charge
  - Severely decreased runtime
- Improper charging
  - Risks from leaving battery charger unattended
  - Battery management software to optimize charging routines
- Swollen battery
  - Safe disposal



# Hardware Failure Issues

- Overheating
  - Over-utilization, screen brightness, use of torch/camera
- Liquid damage
  - Ingress Protection (IP) rating
  - Device will not power on, black display, display artifacts
  - Recovering from immersion
- Physically damaged ports
  - Peripherals do not work
  - Battery charging does not work

# Screen and Calibration Issues

- Laptop display
  - Isolate internal display versus external display issue
  - Isolate internal display issue to panel or backlight/inverter
- Broken screen issues
  - Cracks/shatter damage
- Digitizer issues
  - Dirt/grease/liquid damage
  - Soft reset device
- Cursor drift/touch calibration issues

# Connectivity Issues

- Poor or no connectivity
  - Check radios are enabled
  - Check data and antenna connections after servicing
  - Check for weak batteries in peripherals
  - Cycle power on the device
- Intermittent connectivity
  - Test connection at close range and different orientations/hand positions
  - Use analyzers to measure signal strength



Screenshot used with permission from M2Catalyst, LLC

# Malware Issues

- Snooping/data collection causing high resource utilization and battery drain
- Data exfiltration causes unexpected data cap breaches
- Unauthorized use of microphone and camera

## Review Activity: Mobile Device Issues

- Power and Battery Issues
- Hardware Failure Issues
- Screen and Calibration Issues
- Connectivity Issues
- Malware Issues



## Lab Activity

- Virtual Workbench Lab: Replace Laptop Non-user Removable Battery

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## Summary