

Mobile Device Connectivity

At the end of this episode, I will be able to:

1. Identify mobile device network connection technologies.

Exam Objective: 1.4 - Given a scenario, configure basic mobile-device network connectivity and application support.

Description: In this episode, we journey into the network connection technologies that allow mobile devices stay connected such as the various generation of cellular technologies such as 2G, 3G, 4G and 5G. We will explore Global System for Mobile Communications (GSM), Universal Mobile Telecommunication System (UMTS), Code-division multiple access (CDMA), Bluetooth, the Global Positioning System (GSM), hotspots and more.

- Wireless/cellular data network
 - Enable/disable
 - 2G/2.5G/2.75G
 - GSM uses TDMA
 - General Packet Radio Service (GPRS) (no real increase)
 - Enhanced Data rate for GSM Evolution (EDGE)
 - cdmaOne uses CDMA and PRLs
 - 3G
 - Minimum 144 Kbps transfer rate
 - Universal Mobile Telecommunications System (UMTS) (Europe)
 - CDMA2000 (North America)
 - 4G
 - 100 Mbps
 - First release: WiMAX and LTE
 - Later release: Mobile WiMAX Release 2 and LTE Advanced
 - 5G
 - Up to 50Mbps to 1 Gbps
 - mmWave bands and MIMO increases to 4 Gbps
 - Hotspot
 - Connection sharing
 - Turns a cellular device into an cellular AP
 - Wi-Fi
 - Bluetooth
 - Standards
 - 1.1 - Legacy (First standardization) 1 Mbps

- 2.0 - Bluetooth + EDR (Enhanced Data Rate) 3 Mbps
 - 3.0 - Bluetooth + HS (High speed, 24 Mbps via co allocated Wi-Fi channel)
 - 4.0 - Bluetooth + LE (Low energy implementations, focus begins on IoT)
 - GPS and cellular location services
 - Triangulated satellites (constellation)
 - Uses trilateration to determine location of moving objects
 - Using three distance points
 - Using distance traveled, speed, time traveled
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- Additional Reference Materials

- Bluetooth Special Interest Group: <https://www.bluetooth.com/specifications/>
- U.S. Government GPS website: <https://www.gps.gov/systems/gps/>
- Intel Wi-Fi Protocol and Data Rates:
<https://www.intel.com/content/www/us/en/support/articles/000005725/wireless/legacy-intel-wireless-products.html>
- 2G: <https://en.wikipedia.org/wiki/2G>
- 3G: <https://en.wikipedia.org/wiki/3G>
- 4G: <https://en.wikipedia.org/wiki/4G>
- 5G: <https://en.wikipedia.org/wiki/5G>