- Filename: eccouncil-ceh31250-v12-18-1-1-iot-basics.md
- Show Name: CEHv12 (312-50)
- Topic Name: Mobile Platform, IoT, and OT Hacking - IoT and OT Hacking
- Episode Name: IoT Basics
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IoT Basics

Objectives:

- Define IoT
  - "The process of connecting everyday objects and systems to networks in order to make them globally available and interactive." - Daniel Miessler
  - Consumer IoT
  - Industrial IoT (IIoT)
    - https://danielmiessler.com/blog/the-differences-and-similarities-between-iot-and-ics-security/
- IoT Components
  - The IoT "THING"
    - Sensor
    - Camera
  - IoT Gateway
    - Connects IoT Devices to...
      - each other
      - end-user
      - cloud/internet
    - https://www.dell.com/en-us/work/shop/gateways-embedded-computing/sf/edge-gateway
  - Cloud Server
    - Stores and/or Processes IoT Data
  - Remote Apps
    - End-user control panel/dashboard
- IoT Architecture
  - Edge Technology
    - IoT Hardware Components
  - Access Gateway
    - Inter-technology communication devices
  - Internet Layer
    - IP-based communication
  - Middleware
    - Services that run in the background of application layer software
  - Application Layer
    - Provides end-user operation and interaction
- IoT Deployment Areas
  - Commercial/Industrial
  - Consumer
  - Heathcare
  - Transportation
  - Energy
  - Military/Law Enforcement

    - IT

- Common IoT Technologies and Protocols
    - Communication
        - Wi-Fi
        - Zigbee
        - RFID
        - LTE-Advanced (medium-range)
        - Low-Power Wide Area Networking (LPWAN) (Long-Range)
        - Sigfox (long range)
        - Ethernet (wired)
    - Operating Systems for IoT
        - ARM mbed OS
            - https://os.mbed.com/mbed-os/
        - Win10 IoT
            - https://learn.microsoft.com/en-us/windows/iot-core/windows-iot
        - Contiki
            - https://www.contiki-ng.org/
        - Ubuntu Core
            - https://ubuntu.com/core
- Communication Models
    - Device-to-Device
    - Device-to-Cloud
        - Devices --> App Service Provider
    - Device-to-Gateway
        - Devices --> IoT Gateway --> App Service Provider
    - Back-End Data-Sharing
        - Device --> App Service Provider1 --> App Service Provider2/3/4/etc
- IoT Security Challenges
    - Weak or no intrinsic security
        - Weak authentication
        - Poor access control implementation
        - Vulnerable web apps
        - Clear-text communications
        - Buffer Overflows (RCE)
    - Support could be lacking or non-existent
    - Device theft