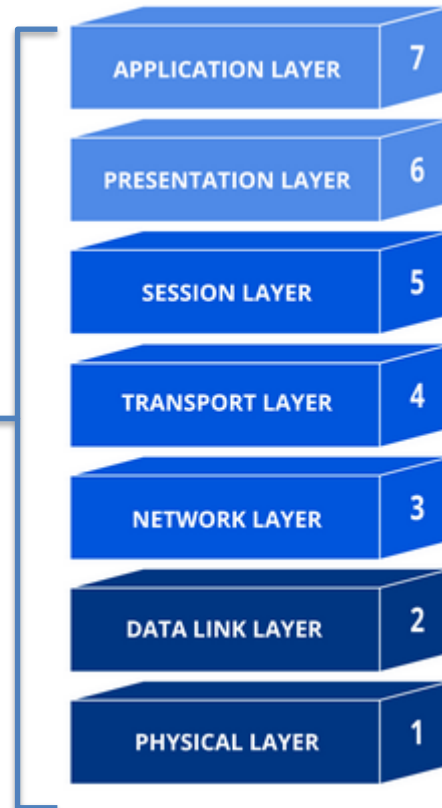


# Embedded Board



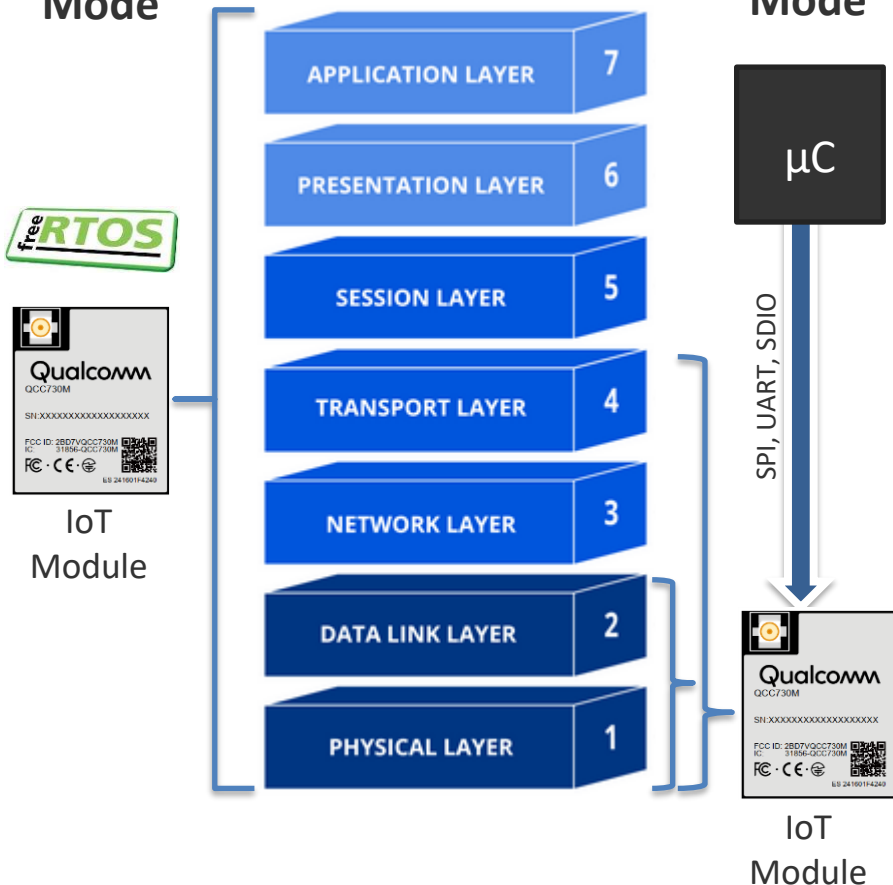
Embedded Board



- An **Embedded Board** is based on a WiFi **SoC** or **SOM** that integrates one or multiple application CPUs and high speed interfaces like Ethernet, USB, PCIe, SDIO, etc.
- But in comparison to a SOM, an Embedded Board is equipped additionally with all electronical components and mechanical connectors required for a final system solution
- Often equipped with miniPCIe and M.2 slots to enable expansion with WiFi and cellular radio modules
- Usable as reference design for evaluation & development of a certain chip set or as final product for Routers and APs

# IoT Module

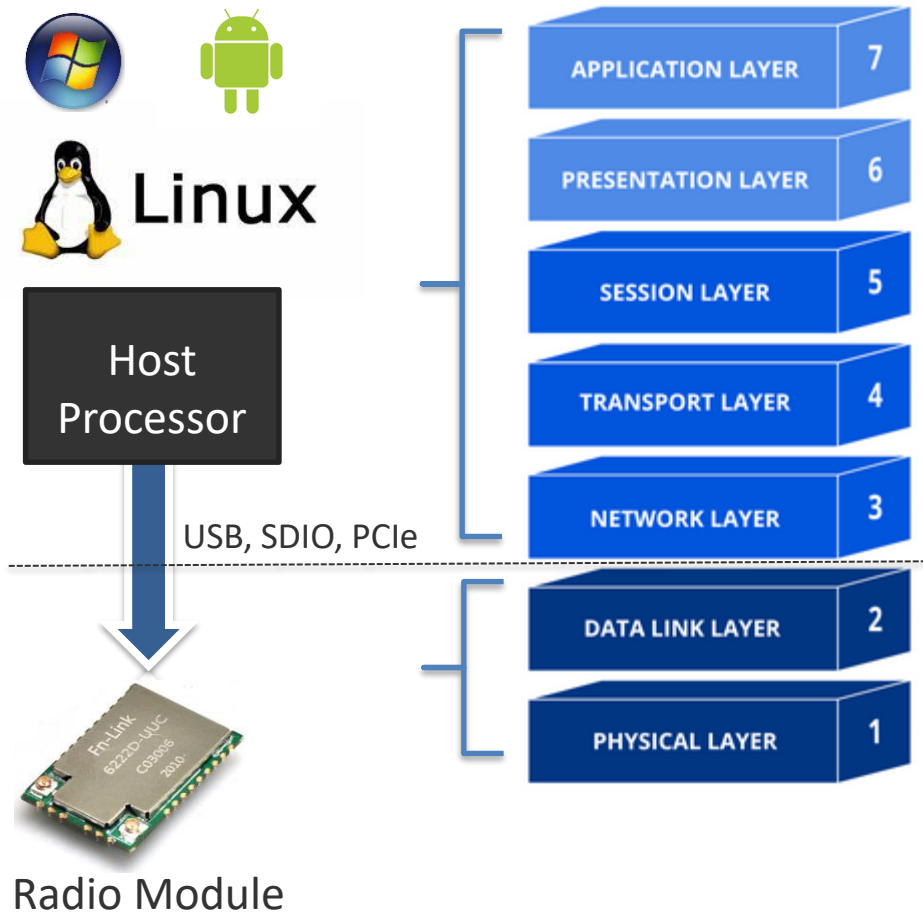
## Hostless Mode



## Hosted Mode

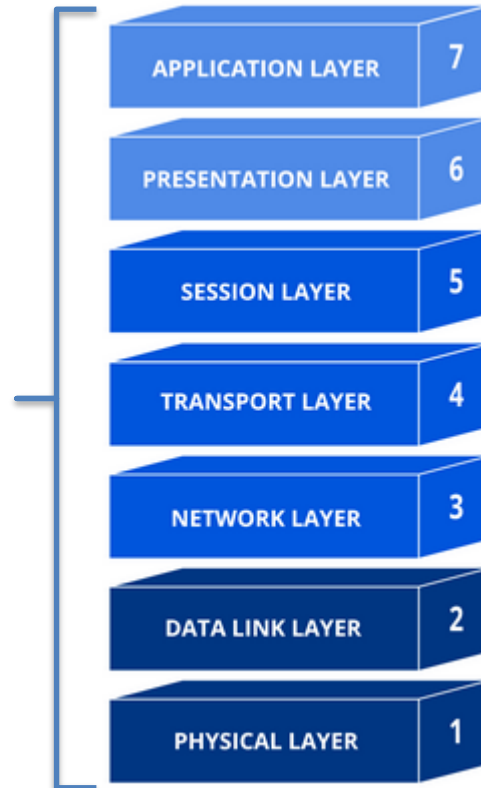
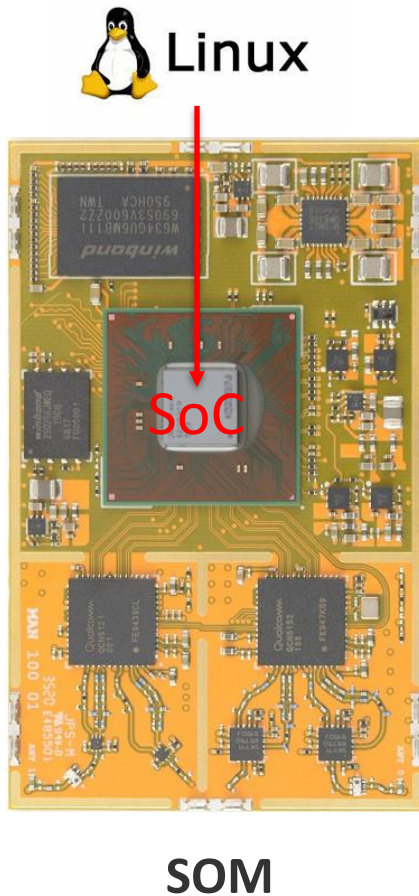
- IoT modules are mostly used as standalone solution but compared to SOMs they have much less CPU power, memory footprint, size and are optimized for low power applications (often battery driven)
- The integrated WiFi SoCs are based on 32 bit  $\mu$ C CPUs like Cortex-M or RISC-V running with  $\mu$ C typical OSs e.g. freeRTOS (no Linux)
- Use cases are **Hostless Mode** (main use case) and **Hosted Mode** (as WiFi modem) via low speed interfaces SPI, UART and SDIO. In case of Hosted Mode the TCP/IP stack can run on the  $\mu$ C or IoT module
- Are intended only for client applications with low data rates (but with Soft AP support)
- Provide many  $\mu$ C typical interfaces: ADC, DAC, PWM, UART, SPI, I2C, GPIOs, etc.

# Radio Module



- **Radio** Modules require always a **Linux**, Windows or Android based Host Processor
- Typical Interfaces are USB, SDIO and PCIe  
Remark: For low speed interfaces like UART and SPI please refer to IoT
- Layers 3-7 are running on the Host Processor
- Layers 1 and 2 are covered by the radio module, which acts only as WiFi modem
- Available for Client (with Soft AP support) & Full Access Point applications
- Many Radios support also Bluetooth (Combo Radio)

# SOM (System on Module)



- A SOM is based on a WiFi **SoC** that integrates one or multiple application CPUs and high speed interfaces e.g. Ethernet, USB, PCIe
- No external intelligence (CPUs) and memory required (stand alone solution)
- SOM supports also low speed interfaces e.g. UART, SPI, I2C and many GPIOs, but doesn't have  $\mu$ C typical interfaces like IoT modules (ADC, DAC, etc.)
- The complete protocol stack and application are running with **Linux**
- Support always Full Access Point with high data rates