An Introduction to the Operating Systems of the IoT

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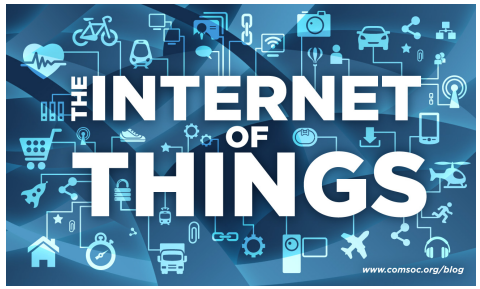
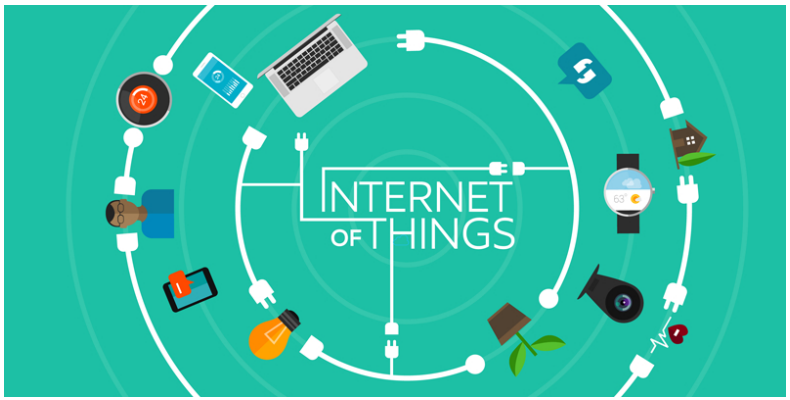
What is IoT...

The Internet of Things (IoT) is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.



Open Source Operating Systems for the IoT

- FreeRTOS
- RIOT
- Contiki
- TinyOS
- OpenWSN
- Embedded Linux



FreeRTOS

- FreeRTOS is designed to be small and simple.
- The kernel itself consists of only three or four C files.
- It provides methods for multiple threads or tasks, mutexes, semaphores and software timers.
- Key features are very small memory footprint, low overhead, and very fast execution.

RIOT

- RIOT is a real-time multi-threading operating system.
- RIOT is based on design objectives including:
  - Energy-Efficiency
  - Reliability
  - Real-Time Capabilities
  - Small Memory Footprint
  - Modularity
  - Uniform API Access
    independent of the underlying hardware
    (this API offers partial POSIX compliance)

Contiki

- Contiki is an open source operating system for networked, memory-constrained systems
- Contiki provides three network mechanisms:
  - The uIP stack, which provides IPv4 networking,
  - The uIPv6 stack, which provides IPv6 networking,
  - The Rime stack, which is a set of custom lightweight networking protocols designed specifically for low-power wireless networks.

Questions?