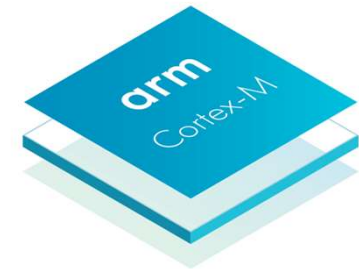
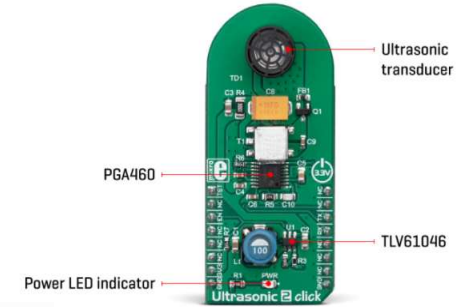
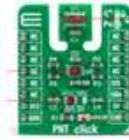
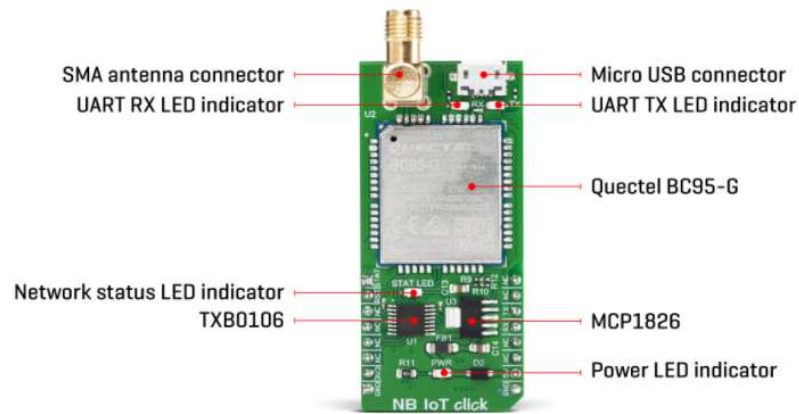
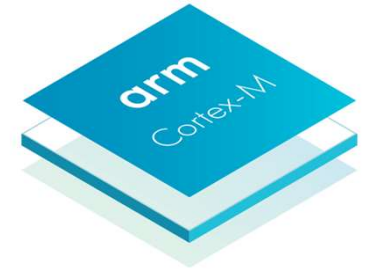




Σχεδιασμός Ενσωματωμένων Συστημάτων FreeRTOS-AZURE-IOT

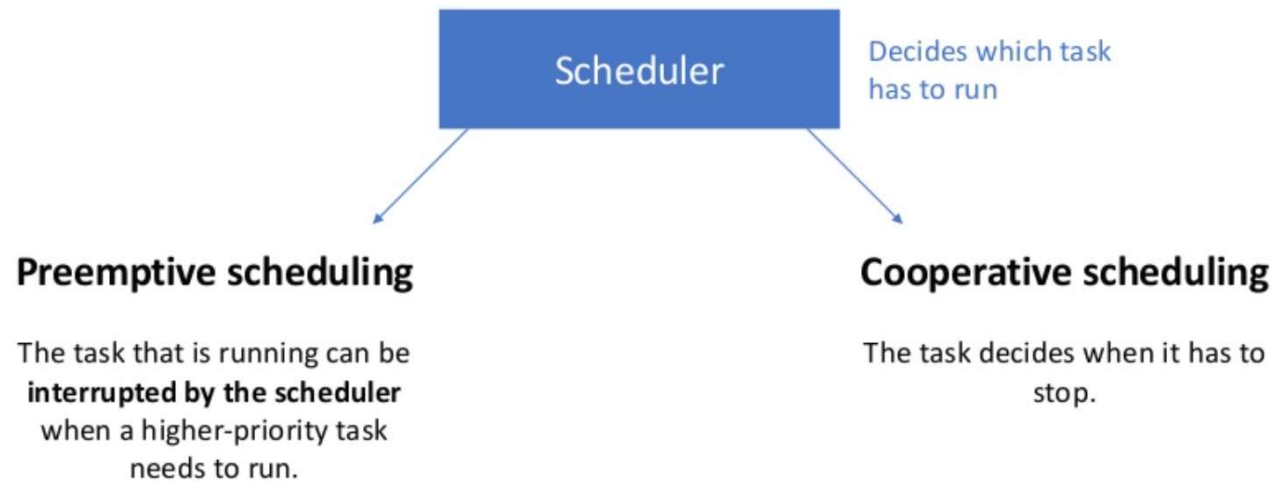
Maliganis Nikos



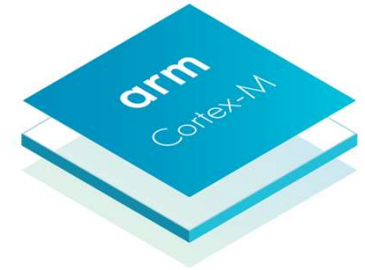


What is a real-time operating system?

Multitasking



Preemptive scheduling is what we need for a real-time system.



Multitasking in FreeRTOS

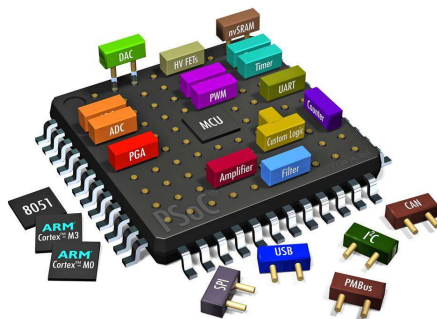
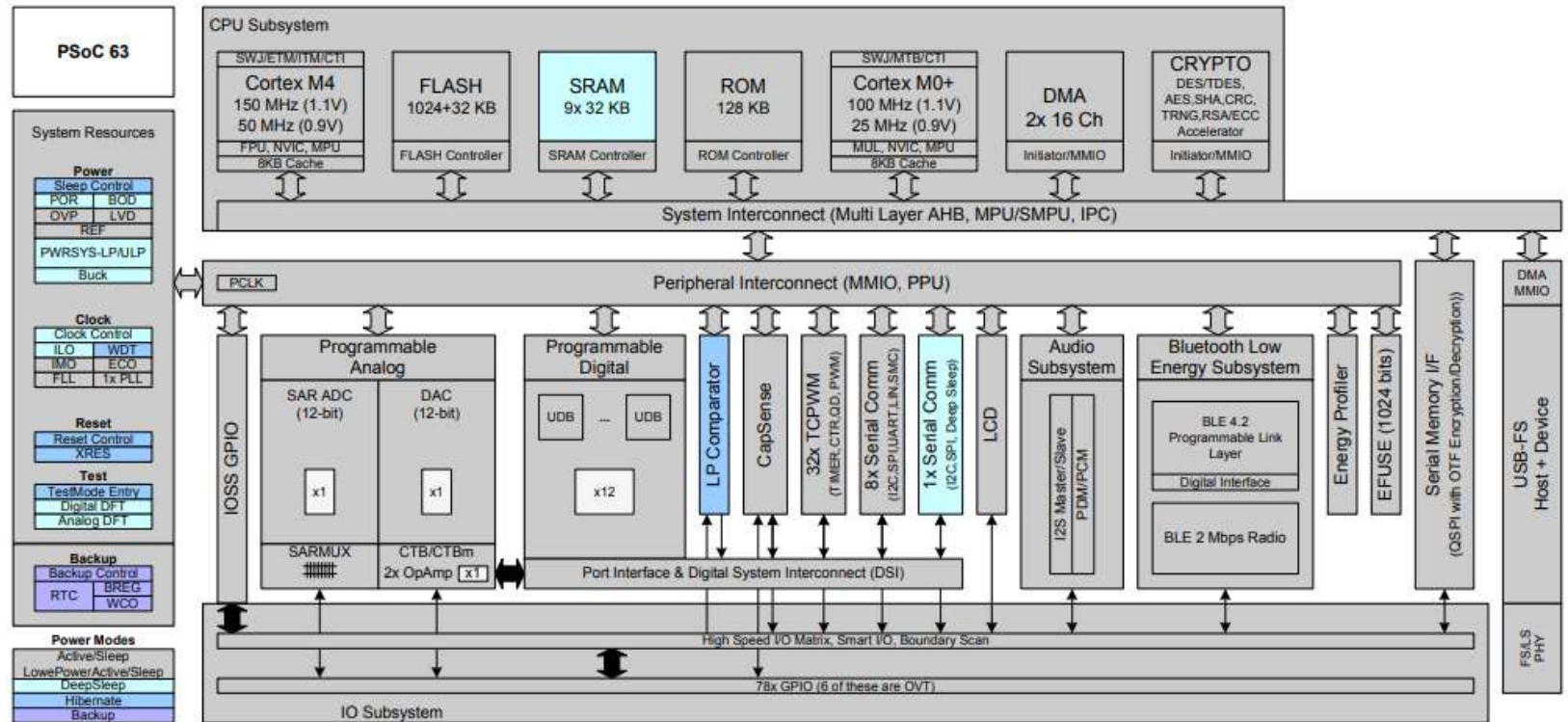
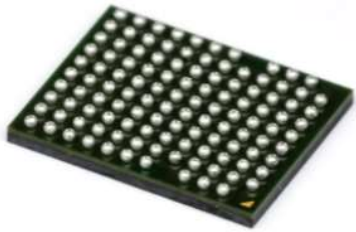
Different possibilities for scheduling the tasks on FreeRTOS:

Round-Robin scheduling

- Every task has the **same priority**.
- Every task is given a **fixed time to execute**.
- When time is over, the current task is **preempted** and the next ready task executes.

Fixed Priority scheduling

- A **priority level** is given to every created task.
- The **highest priority** task executes, but is given a fixed time period.
- When time is over, the current task is **preempted** and the next highest priority ready task executes.



QSPI Interface

Programmable Digital

Programmable Analog

Cryptography Accelerators

Capacitive Sensing

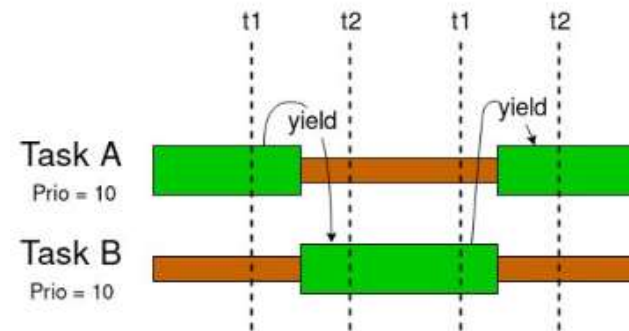
Energy Profiler

Security Built into Platform Architecture

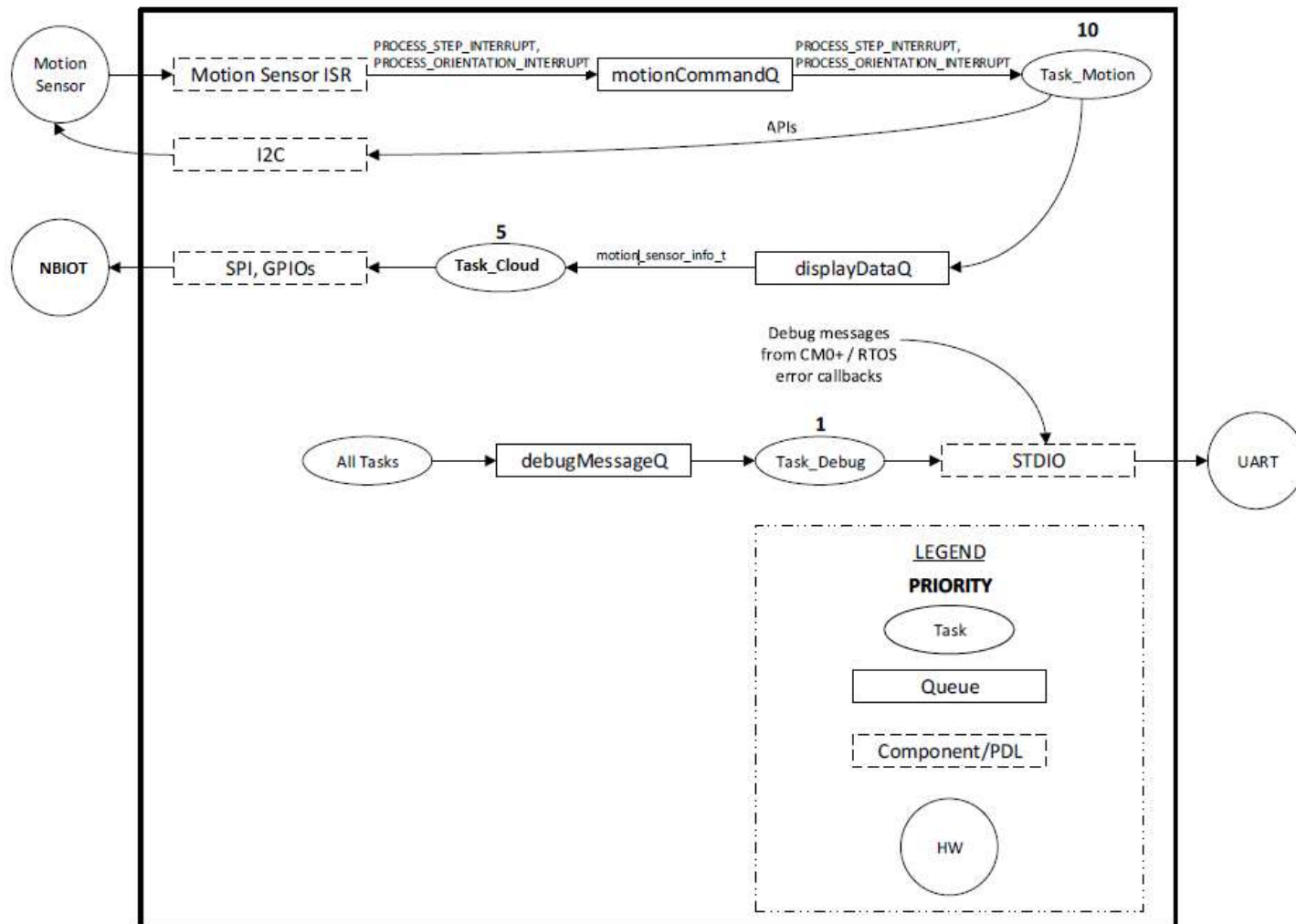
Round-robin scheduling - Preemptive scheduling VS Cooperative Scheduling

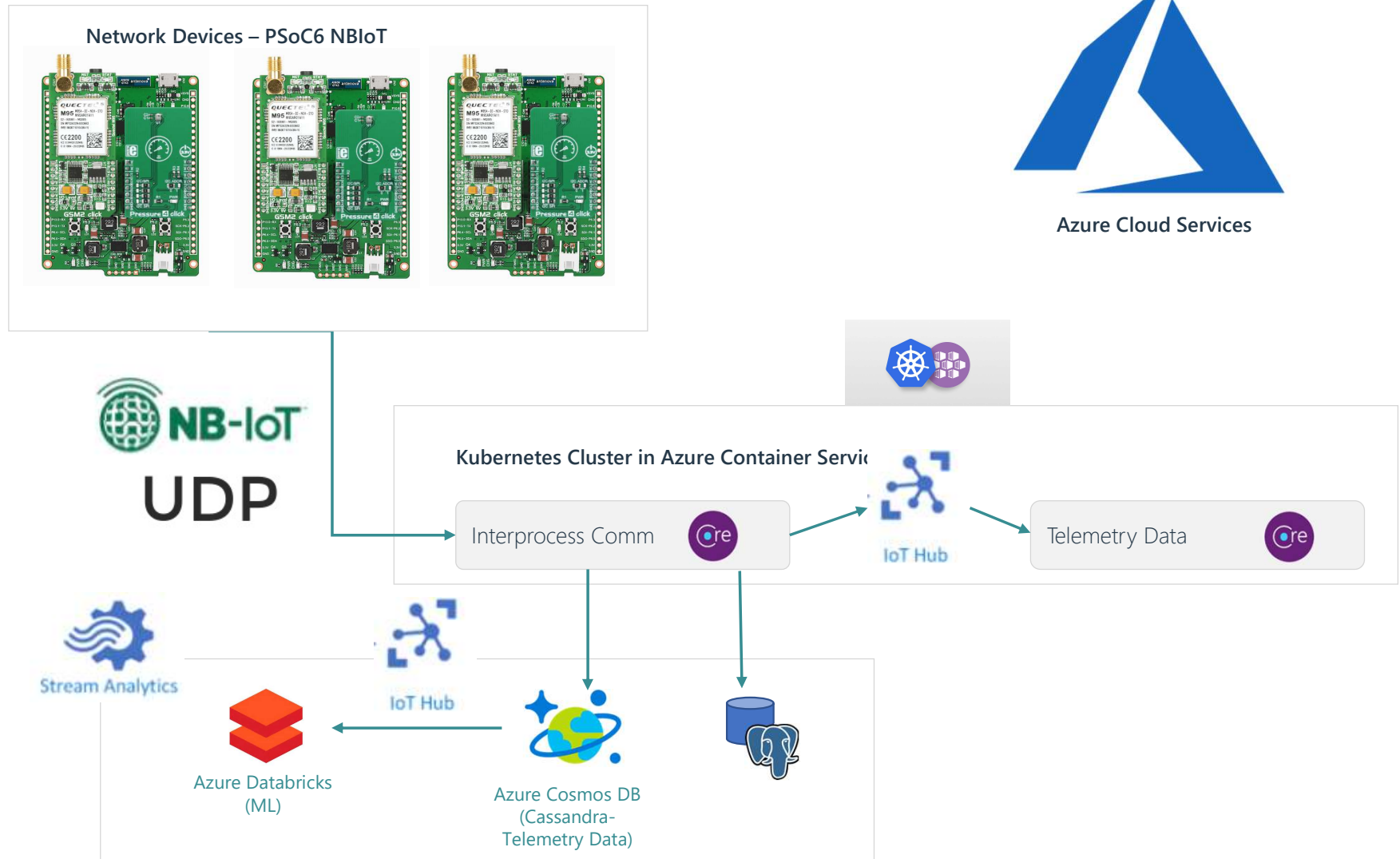
A/A	Task 1 – Εκτέλεση	Task 2 – Εκτέλεση	Task 3 – Εκτέλεση
	ms	ms	ms
M0p RRC	Median: 127 Max: 132 Min: 112	Median: 117 Max: 121 Min: 102	Median: 1801 Max: 2212 Min: 1555
M4 COSH	Median: 111 Max: 112 Min: 106	Median: 105 Max: 111 Min: 101	Median: 1611 Max: 1912 Min: 1125

- Task 1: Μέτρηση θερμοκρασίας
- Task 2: Μέτρηση proximity
- Task 3. Χτίσιμο και αποστολή πακέτου



Firmware Flowchart





Thank you!

