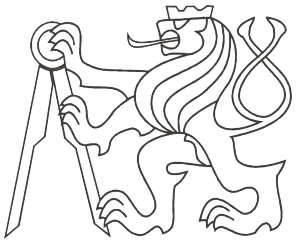
KONTAKT 2011



Porting of resource reservation framework to RTEMS executive

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Porting of resource reservation framework to RTEMS executive

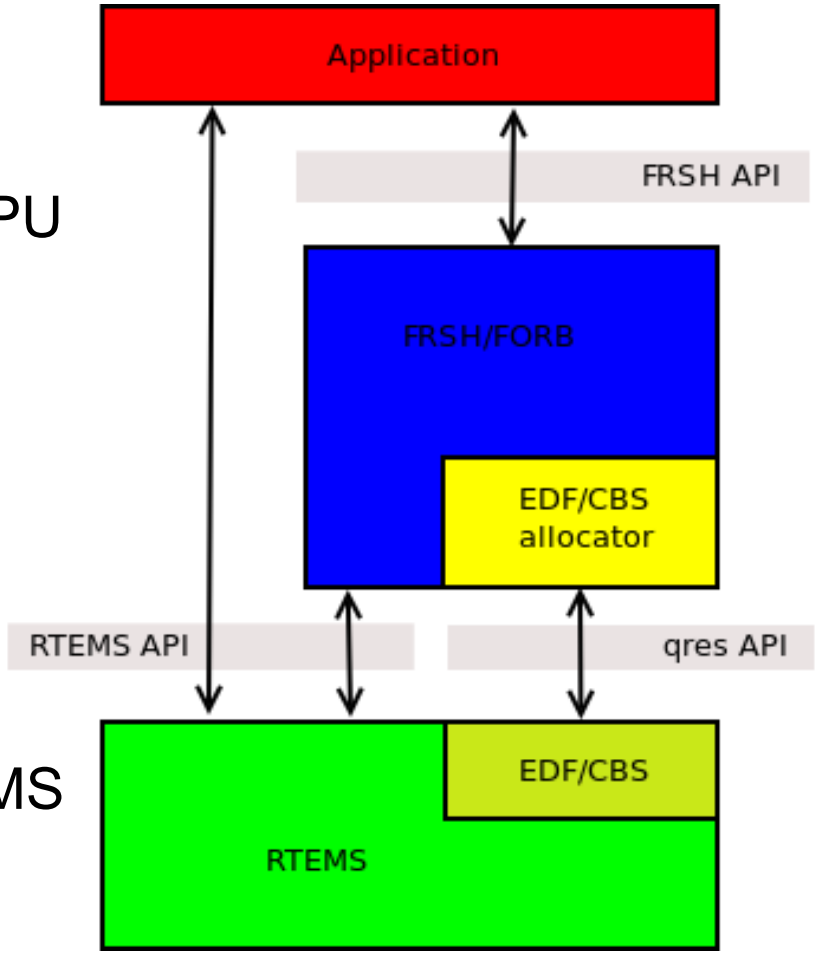
- FRESCOR resource reservation framework
  - Contract based reservation of shared resources
    - CPU, LAN, disk, ...
  - Distributed systems
    - Computation power sharing among multiple computers
  - Easier development
    - Fast, easy and modular development of applications

- RTEMS operating system
  - Hard real-time capabilities
  - Embedded

Porting of resource reservation framework to RTEMS executive

My task:

- Refactoring of the framework
- Design and implementation of CPU scheduling algorithm for RTEMS
  - EDF: Earliest Deadline First
    - Optimal schedule
  - CBS: Constant Bandwidth Server
    - Reservation of CPU time
    - Independence of running tasks
- Integration of FRESCOR + RTEMS



Porting of resource reservation framework to RTEMS executive

Yet another school project?

- Active communication with international experts in order to find optimal design approach.
  - Italy, USA
- Aim for a real practical use of the FRESCOR + RTEMS joint.
- The thesis is being supported by Google Summer of Code.

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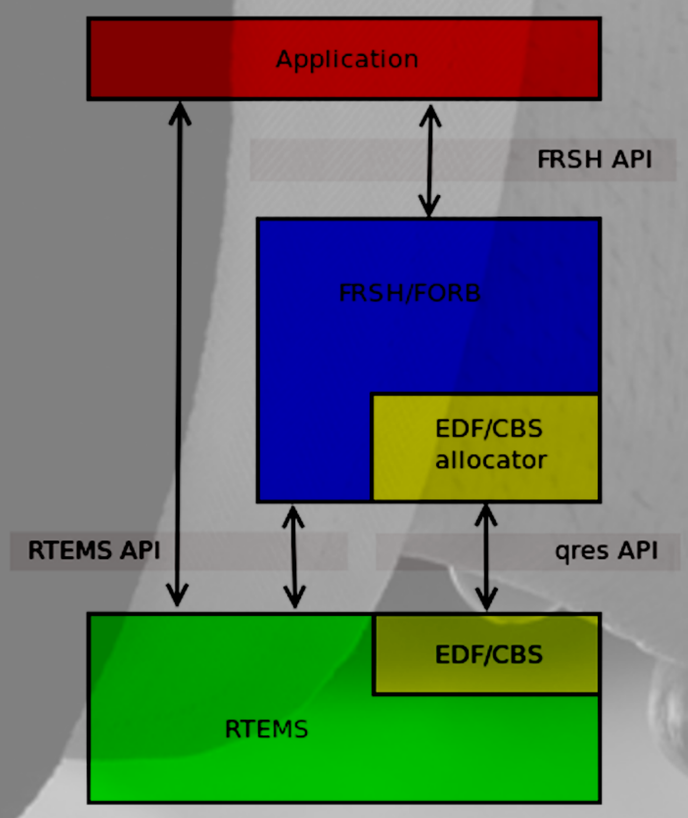
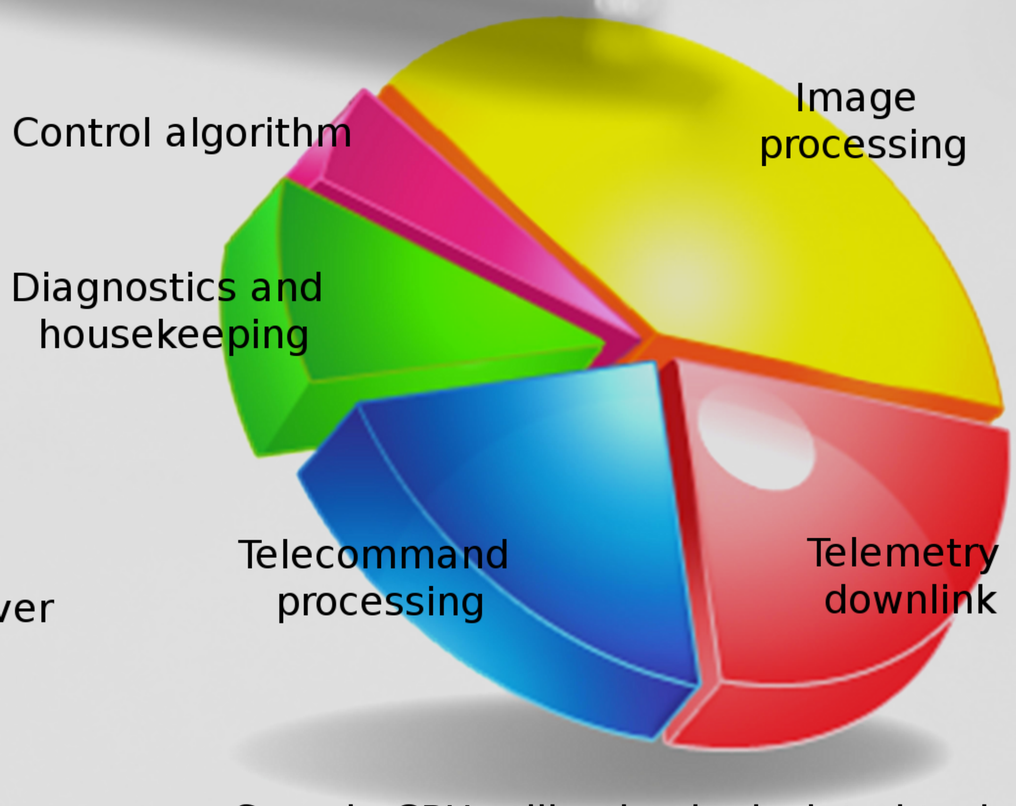
The FRSH/FORB resource reservation framework enables to real-time distributed applications easier development approach in terms of time-to-market and modularity.



RTEMS is a hard-real time operating system providing applications with a top timing precision and reliability.

Aim of this thesis is porting of the framework from current Linux platform onto RTEMS operating system.

Resource Reservation approach is a key strategy when trying to ensure a proper and independent execution of each application of a set sharing common resources (CPU, LAN, disk, ...).



Sample CPU utilization by isolated tasks.
In case of one's failure, the rest is not affected.

Contribution of the thesis:

- Refactoring of the current version of FRSH/FORB.
- Design and implementation of Earliest Deadline First scheduling algorithm.
- Design and implementation of RTEMS Constant Bandwidth server atop of EDF yielding an isolation property to applications.
- Integrating all the mentioned parts of work together.