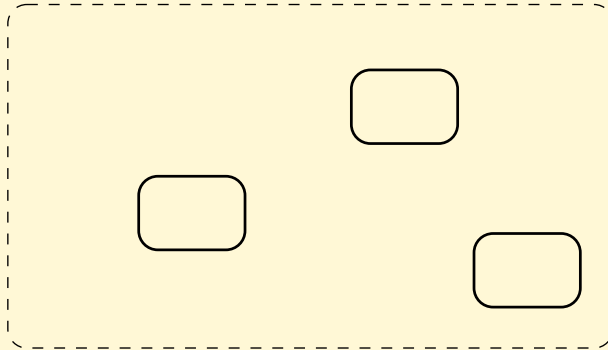# μ*Kernels vs Dual Kernels*

Advanced Operating Systems
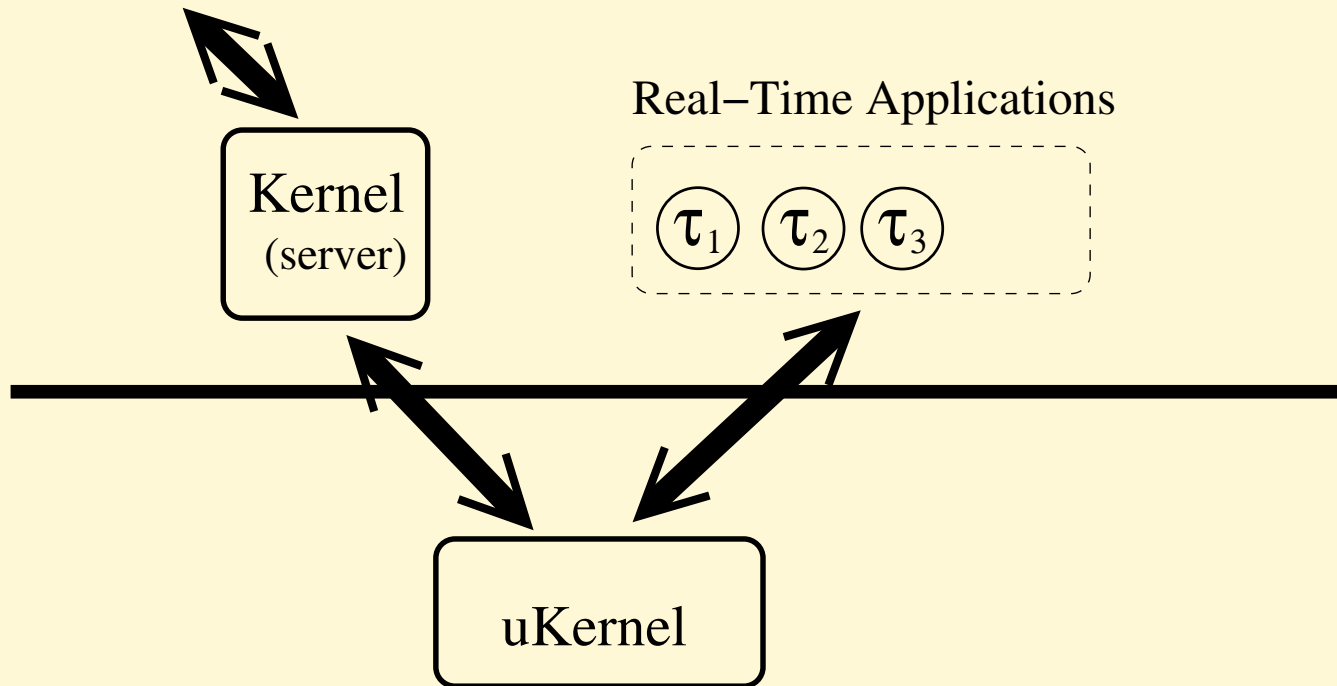
Luca Abeni

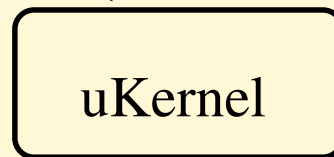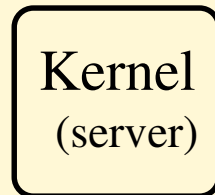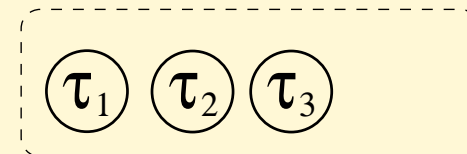luca.abeni@santannapisa.it

Using HLP

- Both the μkernel and the dual kernel approach are based on using the Highest Locking Priority protocol to reduce latency

    - Strong distinction between real-time tasks and non real-time tasks
    - Real-time tasks cannot use kernel functionalities!!!

- In μkernel systems, real-time tasks execute in user space
- In dual kernel systems, real-time tasks are kernel modules (based on a small real-time executive!)

μKernel-Based System

Dual Kernel System

Non Real–Time Applications

Real–Time Applications

τ_1 τ_2 τ_3

Kernel

Real–Time Executive