

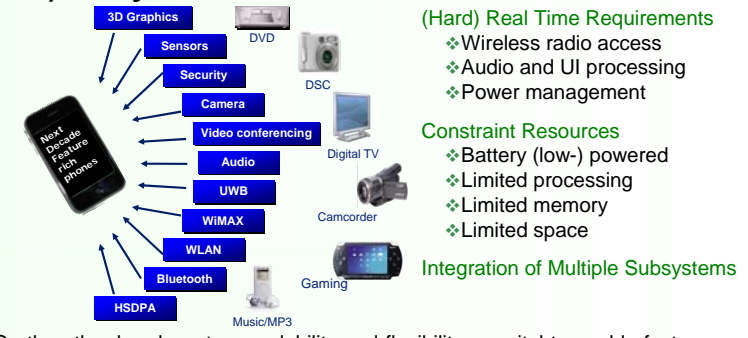
# ICT-eMuCo: An innovative Solution for Future Smart Phones

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## Introduction

With the recent advances in wireless networks and the exponential growth in the usage of multimedia applications, multi-core platforms point to be the solution of feature-rich phones to deliver the performance comparable to today's computer system.

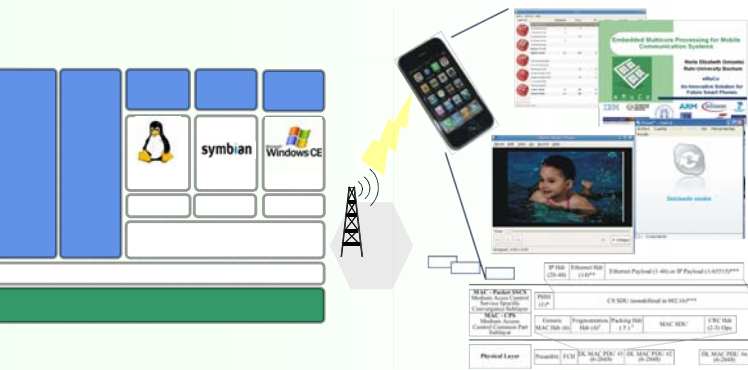


- (Hard) Real Time Requirements
- ❖ Wireless radio access
  - ❖ Audio and UI processing
  - ❖ Power management
- Constraint Resources
- ❖ Battery (low-) powered
  - ❖ Limited processing
  - ❖ Limited memory
  - ❖ Limited space
- Integration of Multiple Subsystems

On the other hand, system scalability and flexibility are vital to enable fast time-to-market and allow manufacturers and service providers to be competitive. Use of virtualization techniques and software development to scalable parallel hardware architectures are inevitable outcome to face the migration to multi-core platforms on mobile devices.

## Virtualization on Mobiles

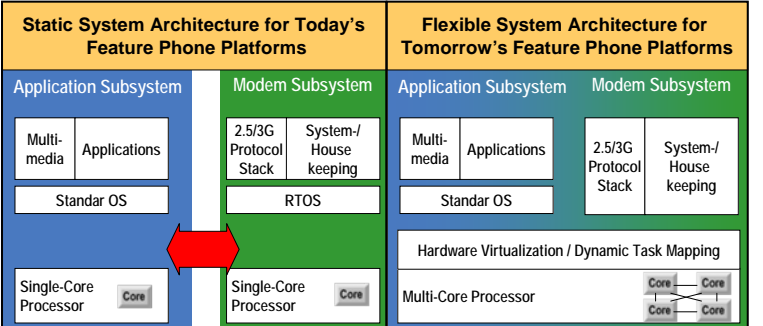
Virtualization enables the co-existence of several protocol stacks into the modem subsystem together with a pluggable Rich-OS based applications subsystem.



## Software Challenges

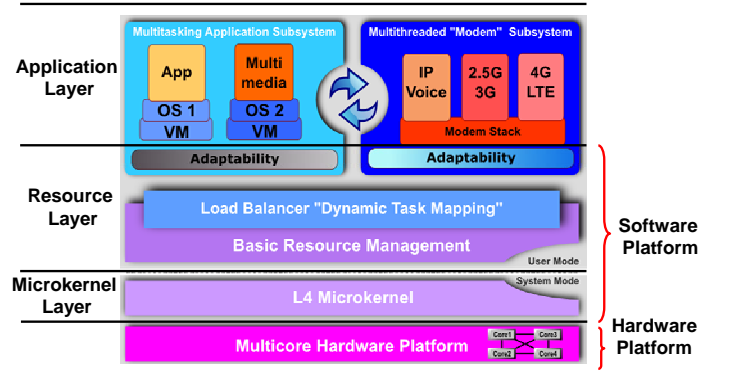
Adding software to a mobile phone to exploit the enormous performance gain provided by multi-cores as can be seen in today's PCs creates several challenges.

- ❖ Seamless and secure integration of diverse software environments
- ❖ Concurrent and parallel execution of applications and control signals
- ❖ Multiple cores will only provide more speed when used with multi-threaded software
- ❖ Assurance of the expected user experience



## eMuCo Solution

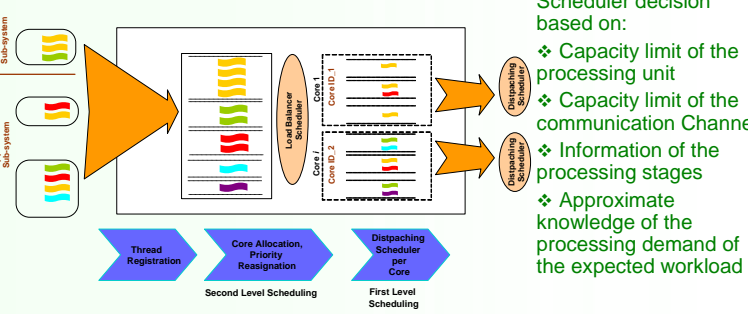
eMuCo - Flexible System Architecture for Future Mobile Devices



- ❖ The microkernel is a minimal computer operating system kernel, which only provides a basic set of kernel functionality
- ❖ The resource layer contains all the necessary software services to run applications including a virtualization layer through para-virtualization techniques.
- ❖ The application layer is the consumer of the services.

## Load Balancer for Mobiles

The traditional multiplexing of physical processing units by time slices through virtual machines or virtual processors used in today's PCs is not enough to exploit the limited resources of a mobile phone. A load balancer becomes an issue



## Conclusions

The eMuCo mobile platform offers full portability to the user's applications by virtualization techniques and standardized interfaces (e.g. POSIX). It gives to the user's application developers the flexibility and scalability necessary to enable fast time-to-market. The limit of the exploitation capabilities of the mobile multi-core platform will be given by the application developer's imagination and the scheduling policy of the load balancer.