

FLEXNets

http://flexnets.upc.edu

FLEXIBLE WIRELESS COMMUNICATIONS SYSTEMS AND NETWORKS

I. Gomez, V. Marojevic, A. Mata, J. Salazar, A. Gelonch

RADIO COMMUNICATIONS RESEARCH GROUP



FLEXNets Initiative

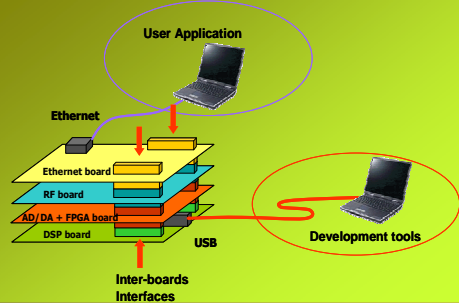
- Open source framework
- Tool for collaborations in Flexible Wireless Communication Networks
- Supports Cognitive Radio systems

Major areas considered:

- ❑ Operating framework: **ALOE project**.
- ❑ HW designs: **FLEXHW project**.
- ❑ Waveforms: **FLEXwave project**.
- ❑ Computing Resource Management: **FLEXCRM project**.

FLEXHW Project

Mezzanine boards, DSK TMS320C6XX

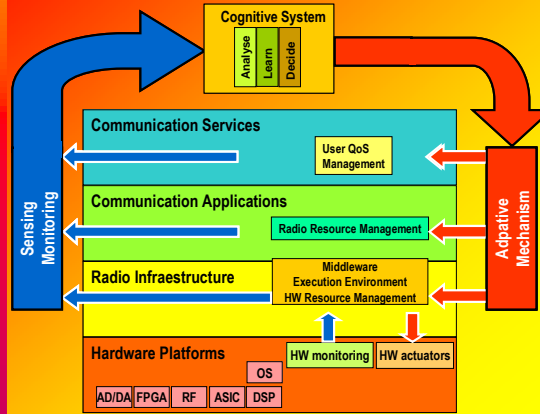


FLEXCRM Project

❑ Complete Computing Resource Management (CRM) framework

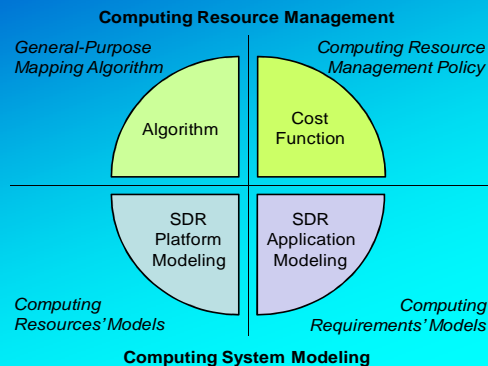
- Heterogeneous multiprocessor platforms
- Waveforms with hard real-time computing requirements

Extended cognitive radio concept



FLEXWaves Project

- ❑ Development of industry standard waveforms
- ❑ Focus on flexibility
- ❑ Processing chains with isolated, well-characterized and flexible components
- ❑ **WIMAX 802.16e and UTRAN** available
- ❑ Developed by master thesis students



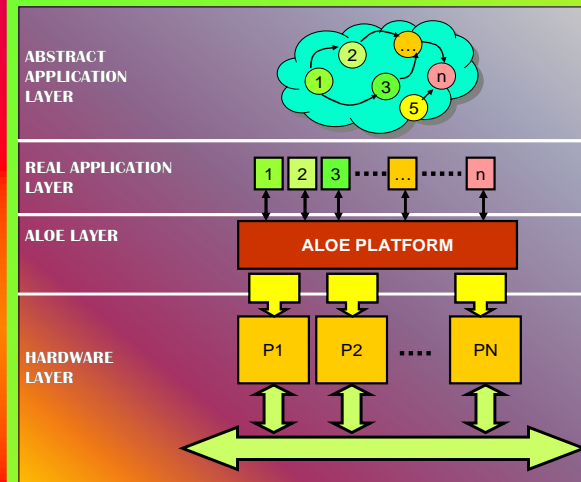
ALOE Project

Abstraction Layer and Operating Environment

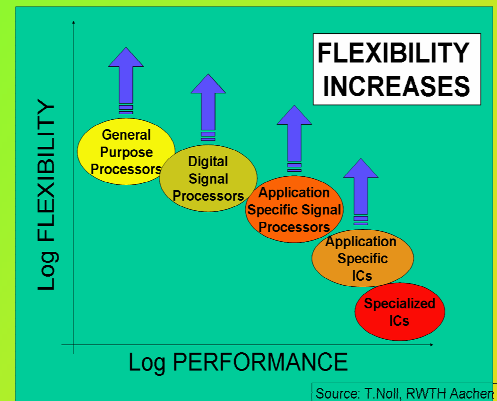
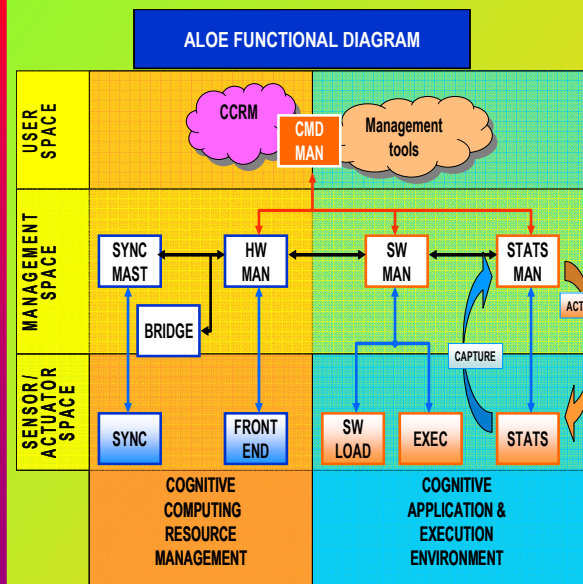
Flexibility:

- ❑ **Design time flexibility**
Development process based on the use of (HW & SW) codesign methodologies and tools
- ❑ **Run time flexibility**
 - Abstraction of processors & platforms for code reuse
 - Distributed programming: location independent interfaces
 - Model for automatic mapping (FlexCRM)

ALOE concept and layers



ALOE Functional Diagram



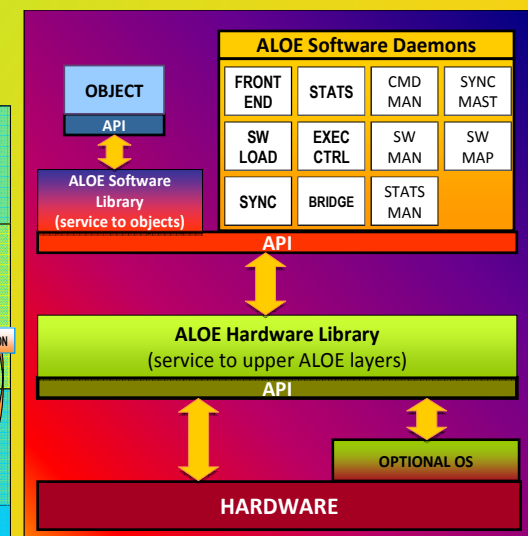
Middleware for distributed computing

- Low overhead
- Specially designed for Flexible Radios
- Scalable
- Portable
- Includes FlexCRM techniques
- Isolates platform from software design

Technology enabler for

- ❑ Cognitive Radio
- ❑ Hardware and software reuse
- ❑ Infrastructure and radio operator separation
- ❑ Rapid radio prototyping

ALOE Architecture



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