

# *ARTIST2 – Year 1 Review*

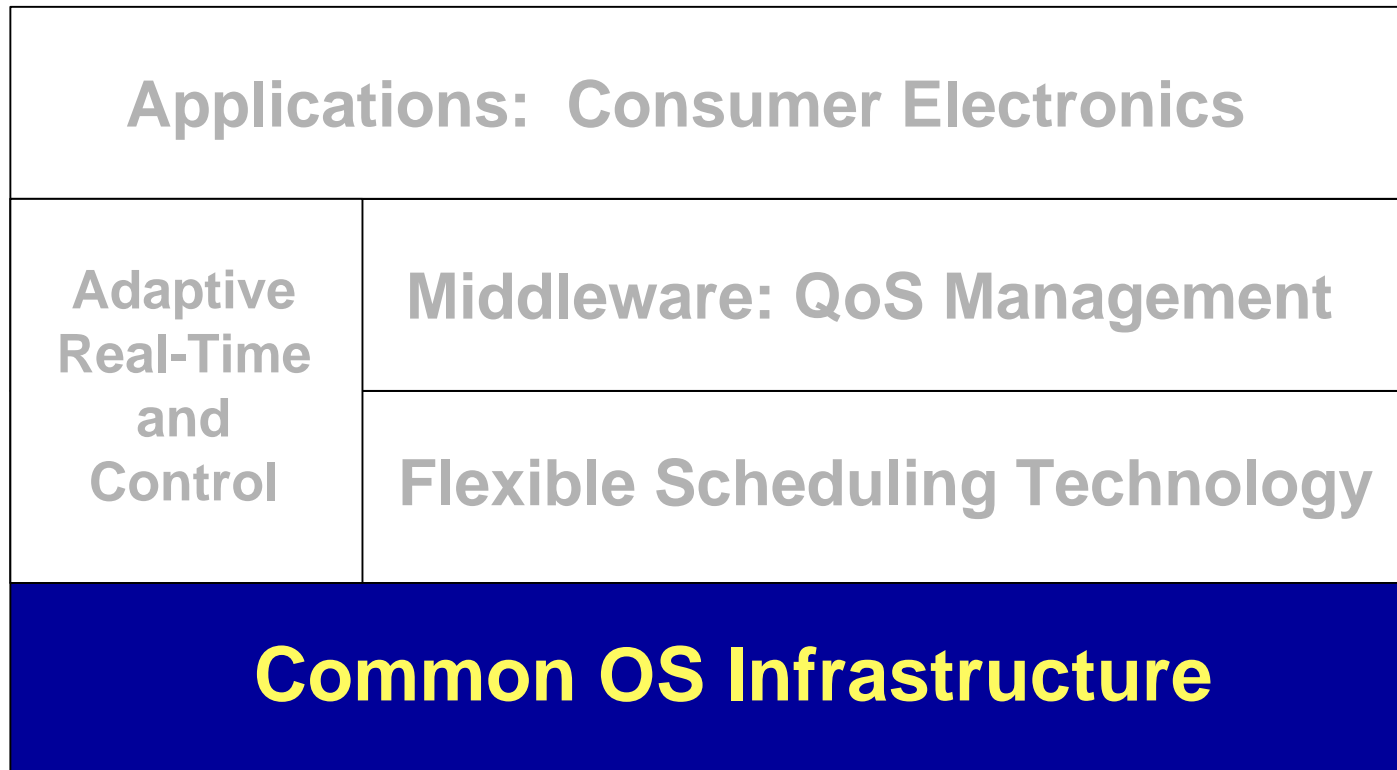
*Grenoble, October 3rd-4th, 2005*

*Platform*

A Common Infrastructure for Adaptive  
Real-time Systems

*Activity leader : Giorgio Buttazzo (Univ. of Pavia)*

# Overview of the activities of the ART cluster



# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Objectives

- Provide a shared OS platform for experimenting new real-time software technologies on real applications:
  - novel scheduling algorithms
  - resource management techniques
  - energy-aware policies
  - overload handling techniques for robustness and predictability
- Show how to extend current OSs and nets to support RT appl<sup>s</sup> with highly dynamic behavior. Impact on standards (POSIX, OSEK, ...)
- Speed up the process of transferring research results to industry

# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Approach

1. Select a flexible, open-source RT kernel  $\Rightarrow$  **Shark**
2. Personnel training
  - Kernel architecture
  - Kernel interface
  - Programming new kernel components
3. Kernel installation on partner sites
  - Solving architecture issues
  - Drivers adaptation
4. Support partners in the development of RT applications

# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Why Shark?

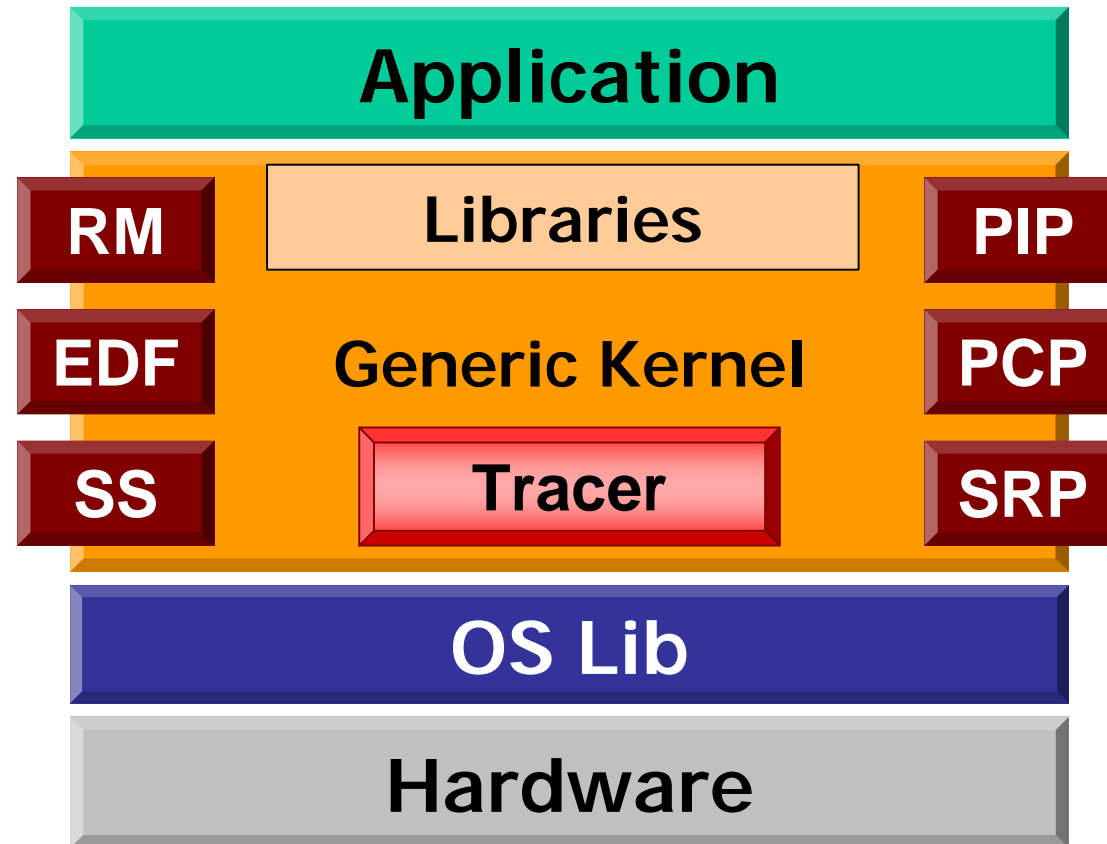


- SHaRK is an open source RT kernel developed at the Scuola Superiore Sant'Anna of Pisa, Italy [P](#) know how of kernel internals
- Main features:
  - modular structure for scheduling and resource management
  - RT-POSIX interface
  - device drivers for the most common hardware
  - advanced time handling

# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Shark architecture



# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Achievements in Year 1

#### Personnel Training

- Web site for distributing the kernel
- Documentation upgraded and made available on the web
- Sample applications made available on the web
- Forum for helping the users in the installation and development
- Shark Workshop in Pisa, Feb. 28 – Mar. 4, 2005

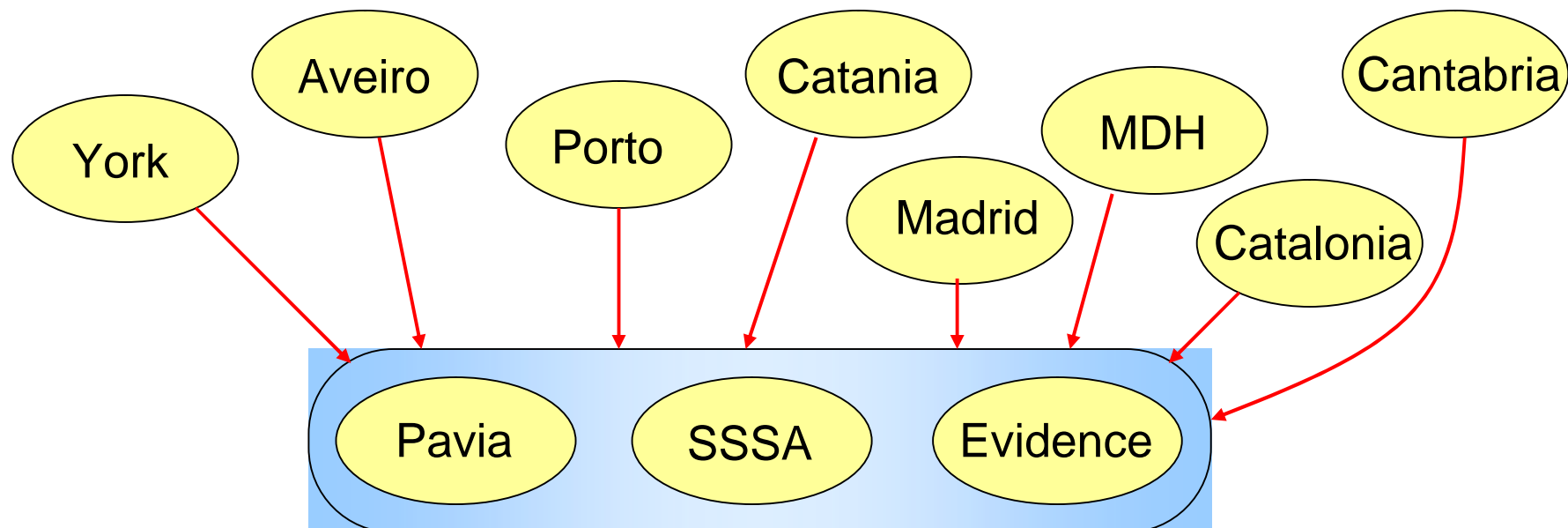
# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Achievements in Year 1

**Shark Workshop**

Pisa, Feb. 28 – Mar. 4, 2005



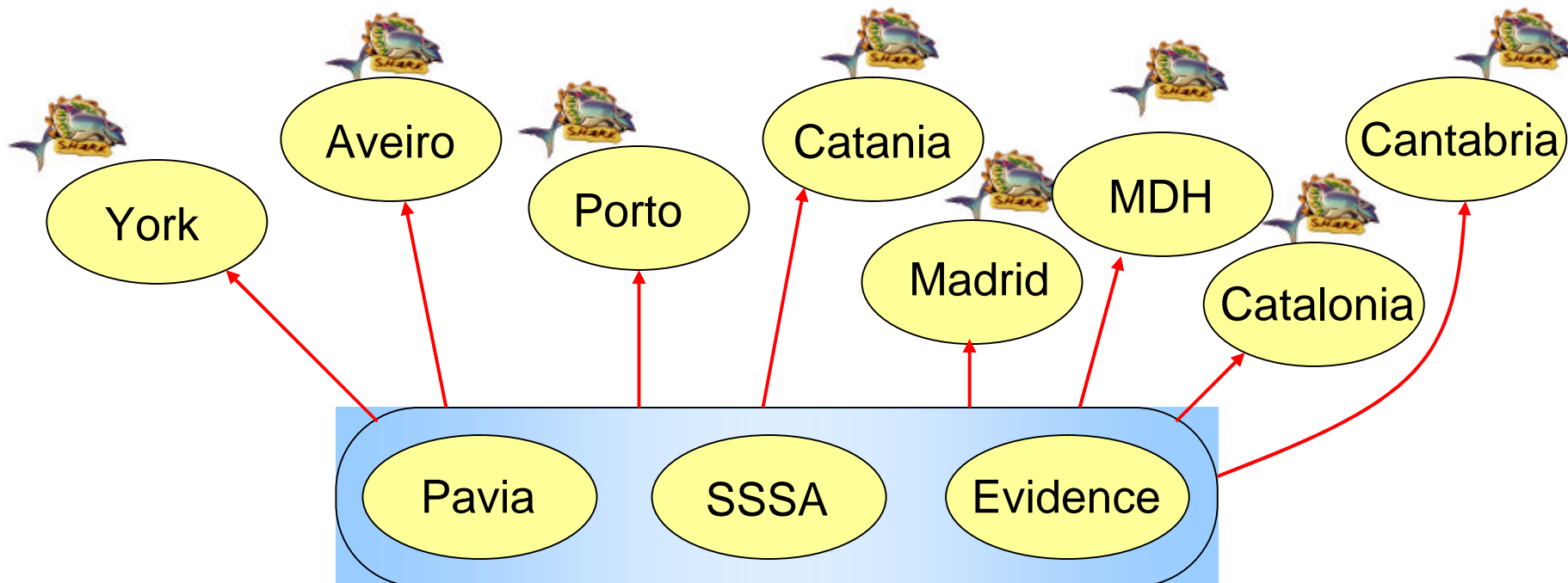


# Activity 1: JPIA Platforms

A Common Infrastructure for Adaptive RT Systems

## Achievements in Year 1

### Kernel Installation

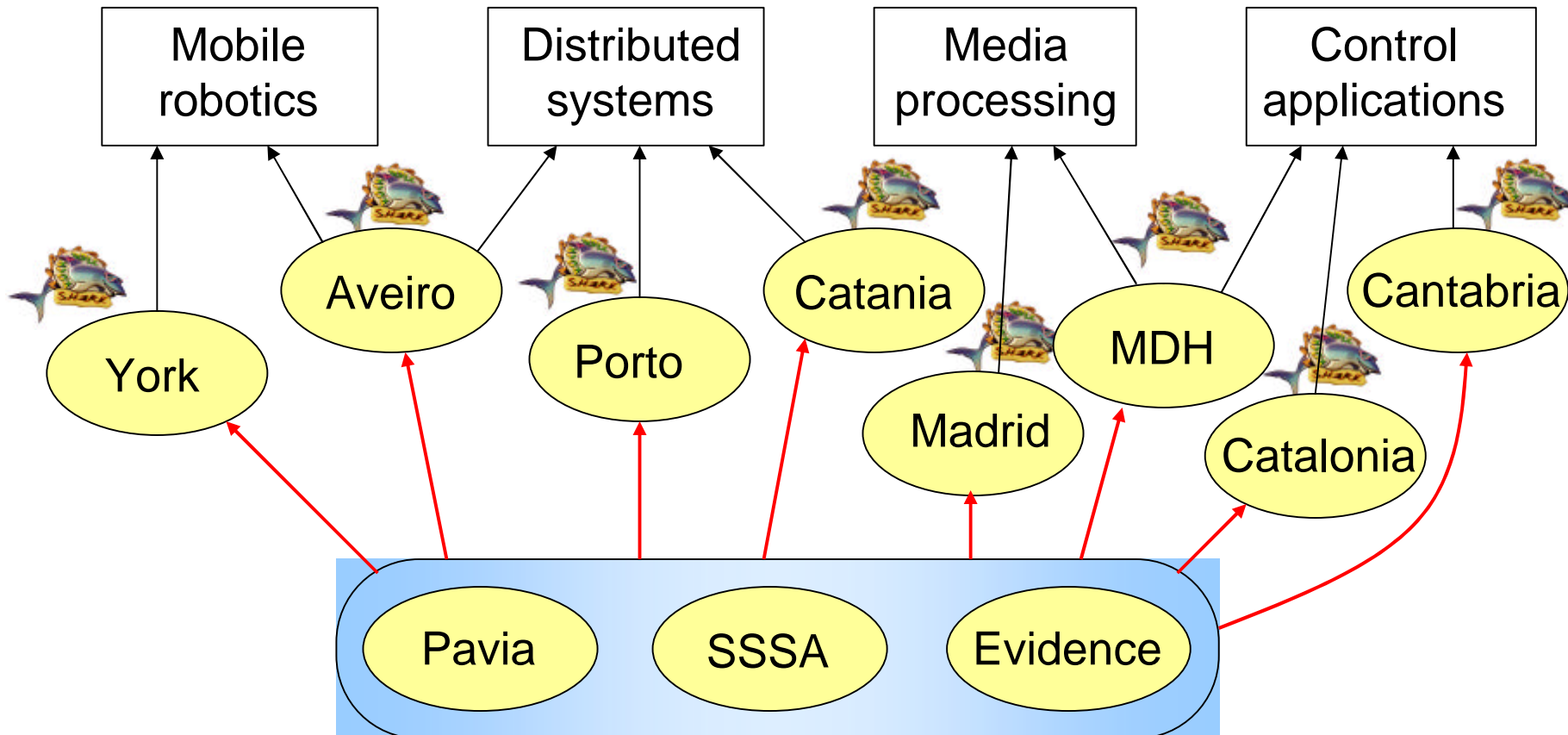


# Activity 1: JPIA Platforms

A Common Infrastructure for Adaptive RT Systems

**Plan for the next 18 months**

## Support for applications



# Activity 1: JPIA Platforms

## A Common Infrastructure for Adaptive RT Systems

### Plan for the next 18 months

#### **Sharing RT software:** Repository of RT algorithms

- Integrate existing work (scheduling algorithms, feasibility analysis, communication protocols, concurrency control policies, etc.) into a common infrastructure.
- Integrate energy-aware algorithms into the Shark kernel
- Simplify access to research products, having the unique possibility of performing new experiments to validate and compare several methodologies developed in the community.
- This is a crucial condition for building excellence within the ARTIST2 Network.