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**FP7 SCARLETT
IMG4 & SME meeting**

Brussels, 16 January 2007

SCARLETT = SCAlable & Reconfigurable ELectronics plaTforms and Tools

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Targeted budget (total cost) : 50 M€

Targeted number of partners : 30

Starting date : jan-08; duration : 4 years

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✈ To develop, evaluate and validate a new generation of scalable and reconfigurable on-board electronics platforms together with associated process and tools, which must :

- Be flexible and capable of being rapidly adapted to all aircraft types and all existing and new aircraft functions

- Increase the availability of these functions (including fault tolerance) and adapt to a strongly reduced development lead time

- Allow robust and safe configuration and reconfiguration management to enable benefits of new technologies, particularly COTS

- Structure the platforms and its development process to go towards a seamless technology migration

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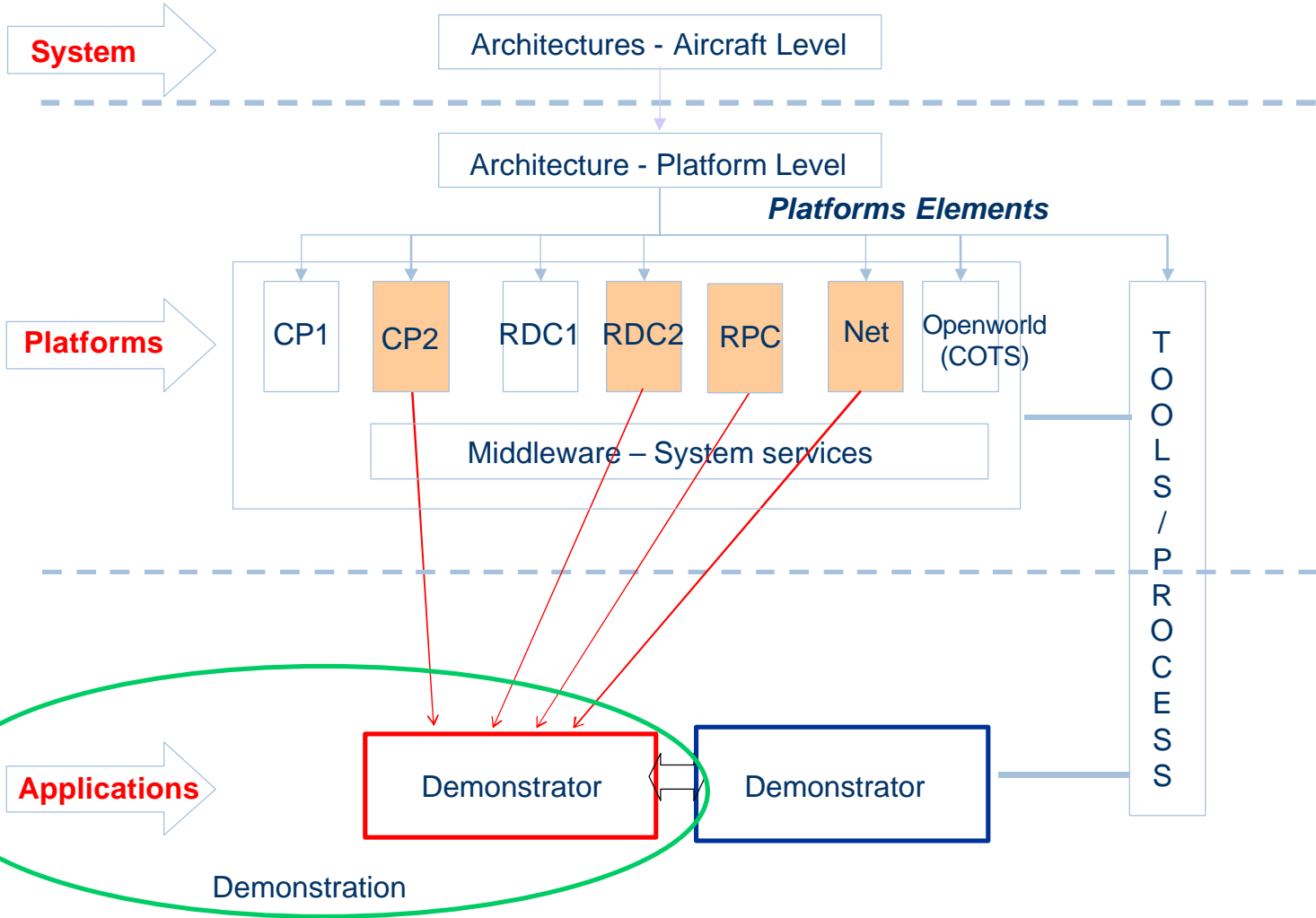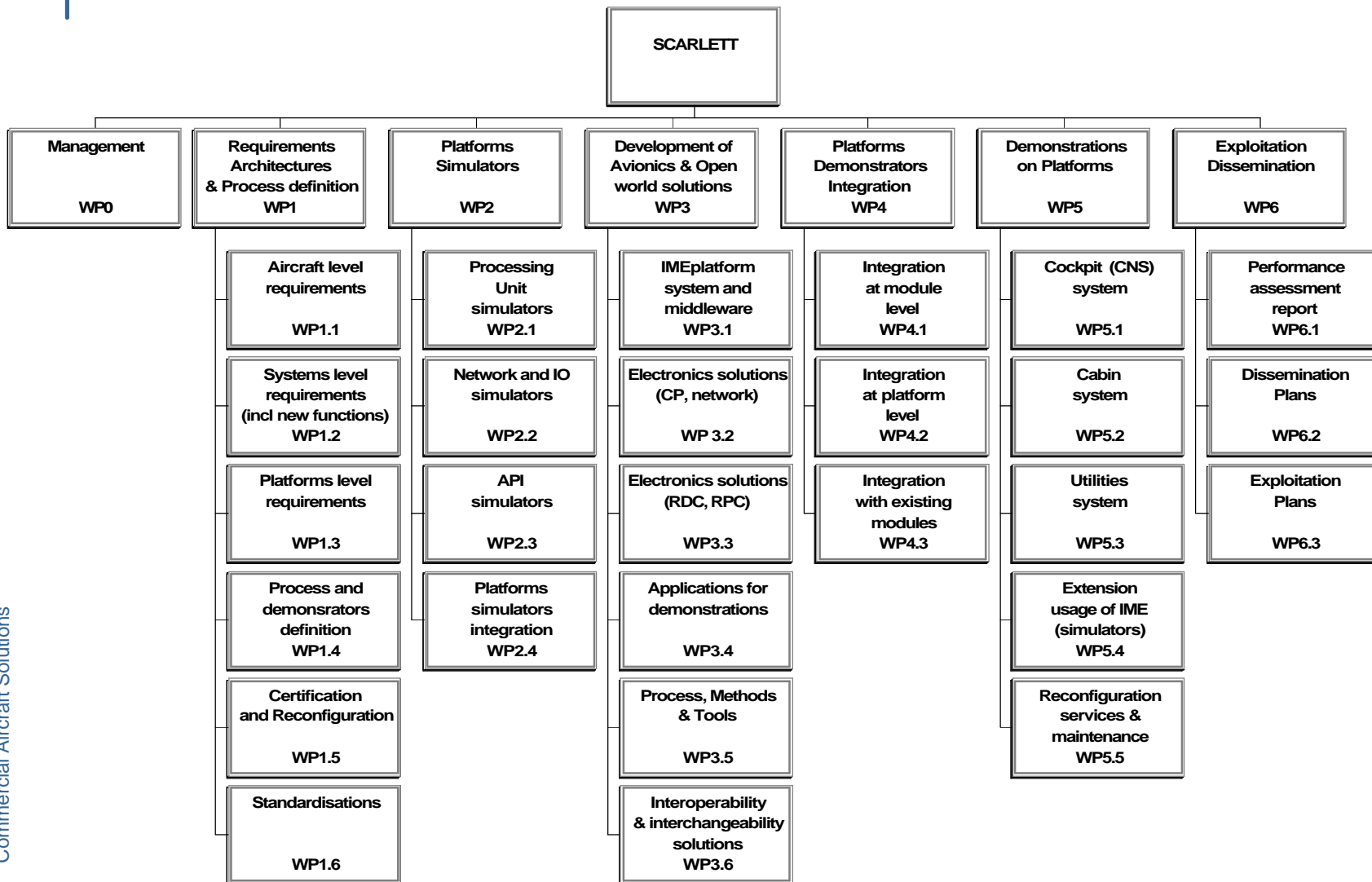
Evolution towards Scalability
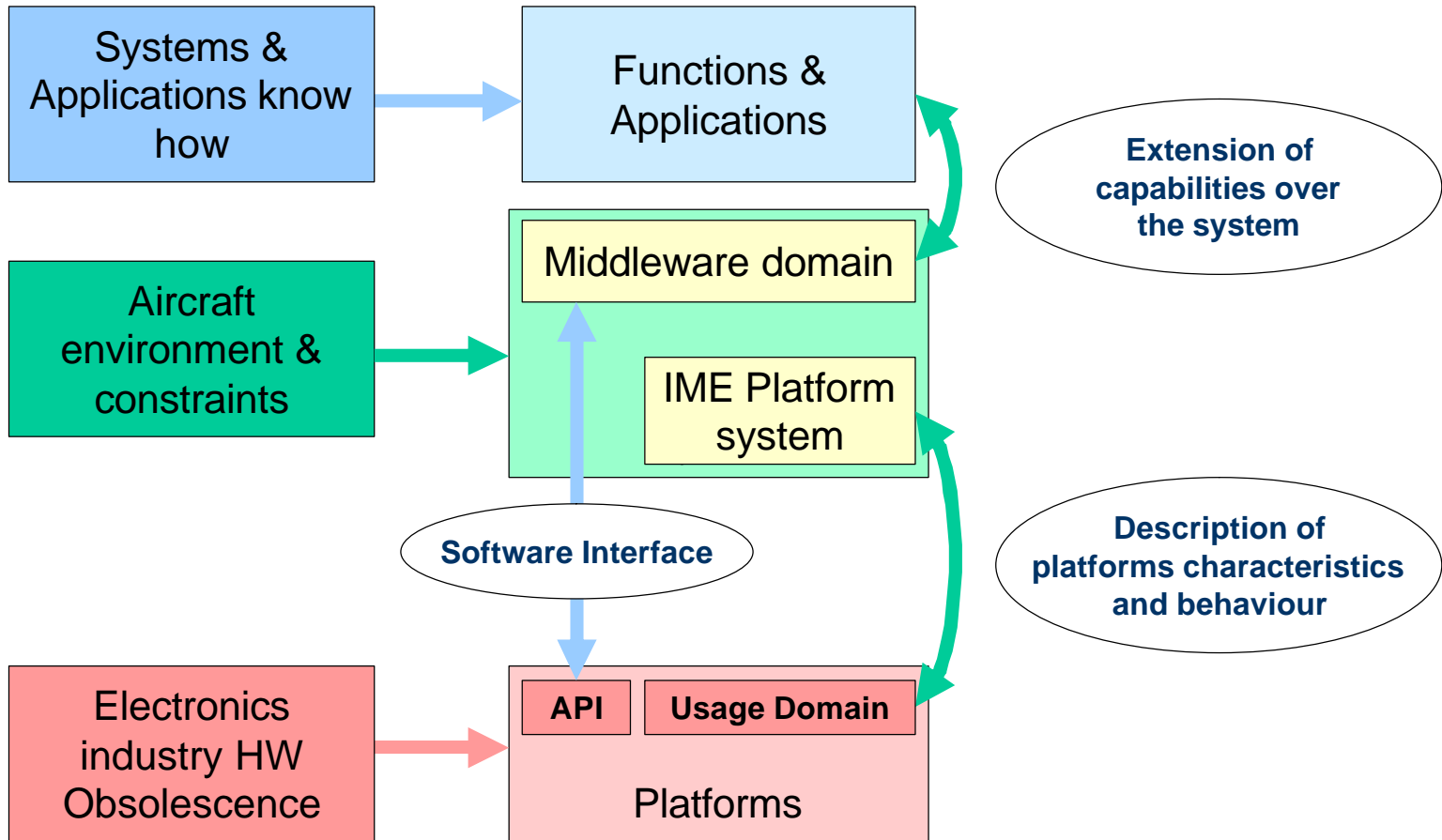
- Demonstration made for 3 aircraft system domains, selected for their specific constraints on the electronics platforms and for transversal platforms issues

- « System Domain »
  - ***Utilities:*** *Landing Gear => Short Latency*
  - ***Cockpit:*** *Communication / Navigation / Surveillance applications=> High Data Sharing*
  - ***Cabin:*** *Cabin Pressure Control => IO Intensive System*

- « Platforms issues » evaluation
  - *Platforms reconfiguration services & maintenance: => Avionics & Open world*

Including associated Tools and Health monitoring for each domain

Based on Large, Regional and Business jet aircraft requirements

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SCARLETT

Management	Requirements Architectures & Process definition	Platforms Simulators	Development of Avionics & Open world solutions	Platforms Demonstrators Integration	Demonstrations on Platforms	Exploitation Dissemination
WP0	**WP1**	**WP2**	**WP3**	**WP4**	**WP5**	**WP6**

	Aircraft level requirements **WP1.1**	Processing Unit simulators **WP2.1**	IMEplatform system and middleware **WP3.1**	Integration at module level **WP4.1**	Cockpit (CNS) system **WP5.1**	Performance assessment report **WP6.1**
	Systems level requirements (incl new functions) **WP1.2**	Network and IO simulators **WP2.2**	Electronics solutions (CP, network) **WP 3.2**	Integration at platform level **WP4.2**	Cabin system **WP5.2**	Dissemination Plans **WP6.2**
	Platforms level requirements **WP1.3**	API simulators **WP2.3**	Electronics solutions (RDC, RPC) **WP3.3**	Integration with existing modules **WP4.3**	Utilities system **WP5.3**	Exploitation Plans **WP6.3**
	Process and demonsrators definition **WP1.4**	Platforms simulators integration **WP2.4**	Applications for demonstrations **WP3.4**		Extension usage of IME (simulators) **WP5.4**	
	Certification and Reconfiguration **WP1.5**		Process, Methods & Tools **WP3.5**		Reconfiguration services & maintenance **WP5.5**	
	Standardisations **WP1.6**		Interoperability & interchangeability solutions **WP3.6**			

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- **WP1 : Requirement architectures & process definition**
  - Requirement at aircraft level :
    - System interoperability, platform perimeter (A/C systems)
    - Definition of simulation
    - Reconfiguration
    - Scalability
    - Requirement on platforms at A/C level
    - Aircraft platform architecture validation
    - For both Large, Regional and Business jet aircraft
  - Requirement at system level :
    - Enlarge IME perimeter
    - Trade-off potential reconfigurability solutions for each A/C system
    - System architecture and system requirement
    - Applications requirement
  - Requirement at platform level :
    - Requirement for platform reconfiguration services
    - Requirement for platform and modules (CPM, RPC, RDC, PCM, Network) and components and networks
    - For both Avionics and Open world

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- **WP1 : Requirement architectures & process definition (cont'd)**
  - **Process & demonstrators definition**
    - Generic reconfigurable platform process definition
    - Definition of simulators objective & content, and organization (schedule, actors, test plan)
    - Definition of demonstrators objective & content, and organization (schedule, actors, test plan)
    - Requirement on platform tools

  - **Certification and Reconfiguration**
    - Analysis of all issues related to Certification and Reconfiguration mechanisms
    - Analysis of issues relative to new COTS technologies

  - **Standardisations**
    - Standardisations of
      - API configuration
      - Reconfiguration mechanisms
      - Others.

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- **WP2 : Platforms simulators**
  - Models and simulators for
    - Processing unit
    - Network and distributed IO, including RDC
    - RPC (Remote Power Controller)
    - API

  - Integration of the platforms simulators
    - Instantiation of simulator for each domain

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- **WP3 : Development of Avionics & Open world solutions**
  - IME platform system and middleware
    - Development of services
      - Platform level services
      - Module level services
  - Electronics solutions
    - Development of key components : CP, RDC, RPC, Network*
    - Adaptation of COTS technologies
  - Applications for demonstrations :
    - Development of applications for the demonstrations per domain
    - Using process, methods and tools proposed in SCARLETT
  - Process, methods and tools
    - Configuration, debug and load process, method and tool set
  - Interoperability & interchangeability solutions
    - Definition of the key features associated to Interoperability & interchangeability of IME platforms components (including packaging)

  * : minimize development of new communication busses to support reconfiguration capabilities

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- **WP4 : Platforms demonstrators integration**
  - Integration at module level
    - Based of electronics solutions (WP3)
    - Integration with components and platforms services at module level

  - Integration at platform level
    - Integration of the different types of modules and platform services
    - Validation of platforms services (incl. reconfiguration mechanisms)

  - Integration with existing modules
    - Based on existing CPIOM / RDC modules
    - Integration of platforms services associated to new module configuration

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- **WP5 : Demonstrations on platforms (simulators & demonstrators)**
  - **Cockpit (CNS) system**
    - Integration of CNS applications on the platforms : simulator and demonstrator
    - Evaluation of typical criteria (scalability, etc)

  - **Same for other domains : Cabin system and Utilities system**

  - **Extension usage of IME**
    - Limited to simulators demonstration
    - Using the simulators developed in WP2 to assess with representative applications : or the IME perimeter extension and/or the benefits of reconfiguration for these applications
    - Only for selected applications

  - **Reconfiguration services and maintenance**
    - Evaluation of reconfiguration mechanisms and all associated services
      - At simulator level for reconfiguration services
      - At evaluator level for «avionics » reconfiguration services
    - Evaluation of maintenance of the platform (health monitoring, detection, reporting)

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- **WP6 : Exploitation & dissemination**
  - Performance assessment report
    - evaluation of the project results compared to initial objectives

  - Dissemination plan
    - forum, website, publications

  - Exploitation plan
    - definition of Intellectual Properties

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✈ **Thales**

✈ **Airbus France**

✈ **Airbus Germany**

✈ **Airbus UK**

✈ **Diehl Aerospace**

✈ **Smiths Aerospace**

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Technologies to be provided by SMEs

- Reconfiguration mechanisms

- Fault tolerant, health management

- Diagnostics and prognostics on components

- Simulation and model for components : modules, API, network

- Middleware services development

- Tools and process

- Embedded systems

- COTS technologies and integration

- Software development of applications for demonstration

- …

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- SMEs not yet identified

- Target : between 5 and 10 SMEs

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