HW/SW Interface generation for SoC IP Integration Using Standard Bus

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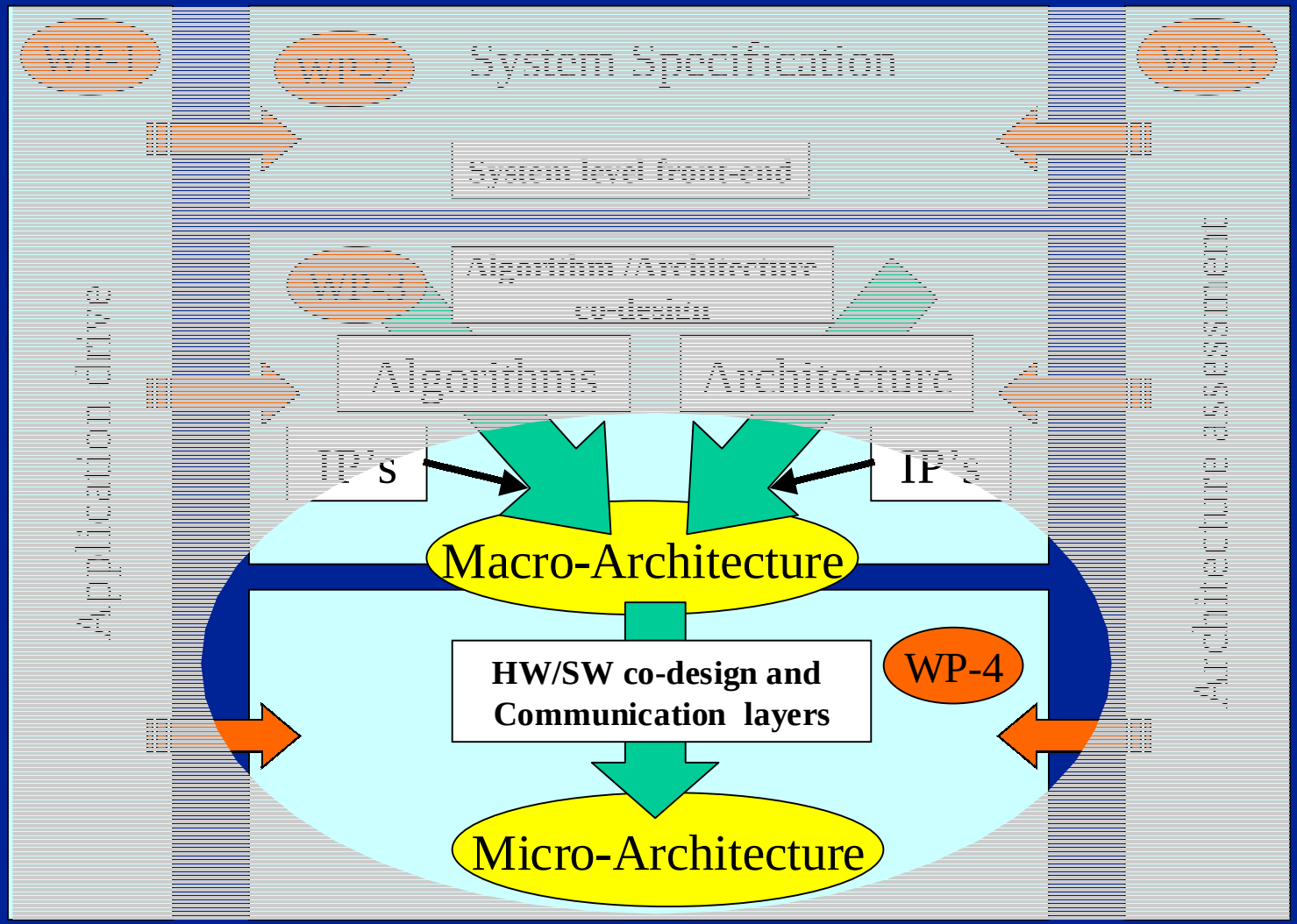
Outline

- Arexsys Task in SpeAC
- IP Reuse for SoC Design Using On Chip Bus (OCB)
- HW/SW Interface Generation
- Tool Development for IP Integration
- Conclusion

Contribution to Work Packages

- **WP - 3 :**
  - Mapping functional specification into a macro-architecture
- **WP - 4 :**
  - Automatic targeting of commercial RTOS
  - IP Integration using On Chip Bus (OCB)
  - HW/SW Interface generation (SW drivers and HW interfaces)
- **WP – 5 :**
  - Co-simulation environment using SystemC

Arexsys task in SpeAC Design Flow



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Problem Statement

Problem:

Create a system-on-a-chip, comprising several million gates, that satisfies rapidly-evolving market requirements for:

- ✓ **Speed**
- ✓ **Power**
- ✓ **Area**
- ✓ **Application Performance**
- ✓ **Time to Market**

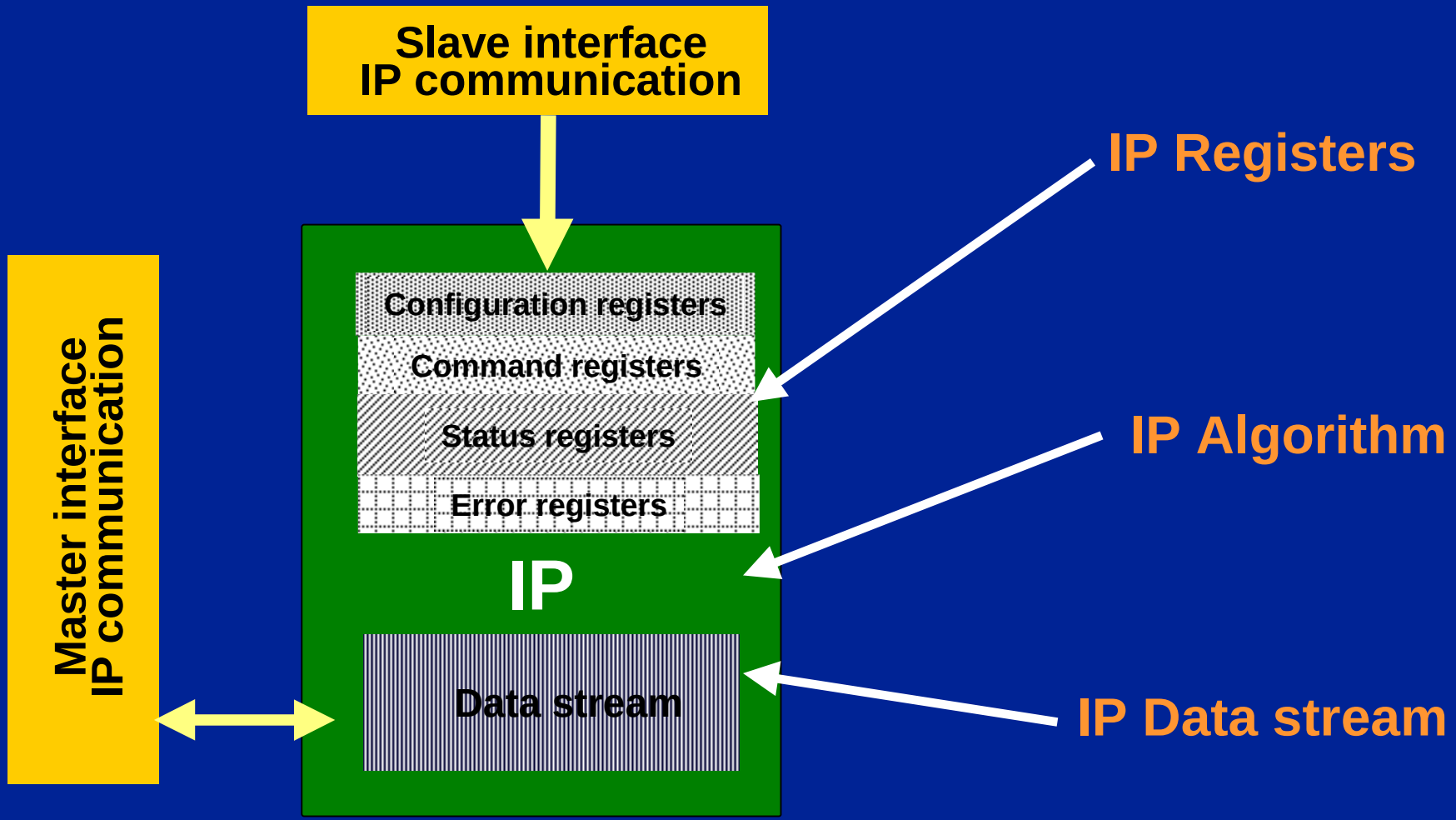
Tools:

- ✓ **System Specification**
- ✓ **Existing IP Cores integration**

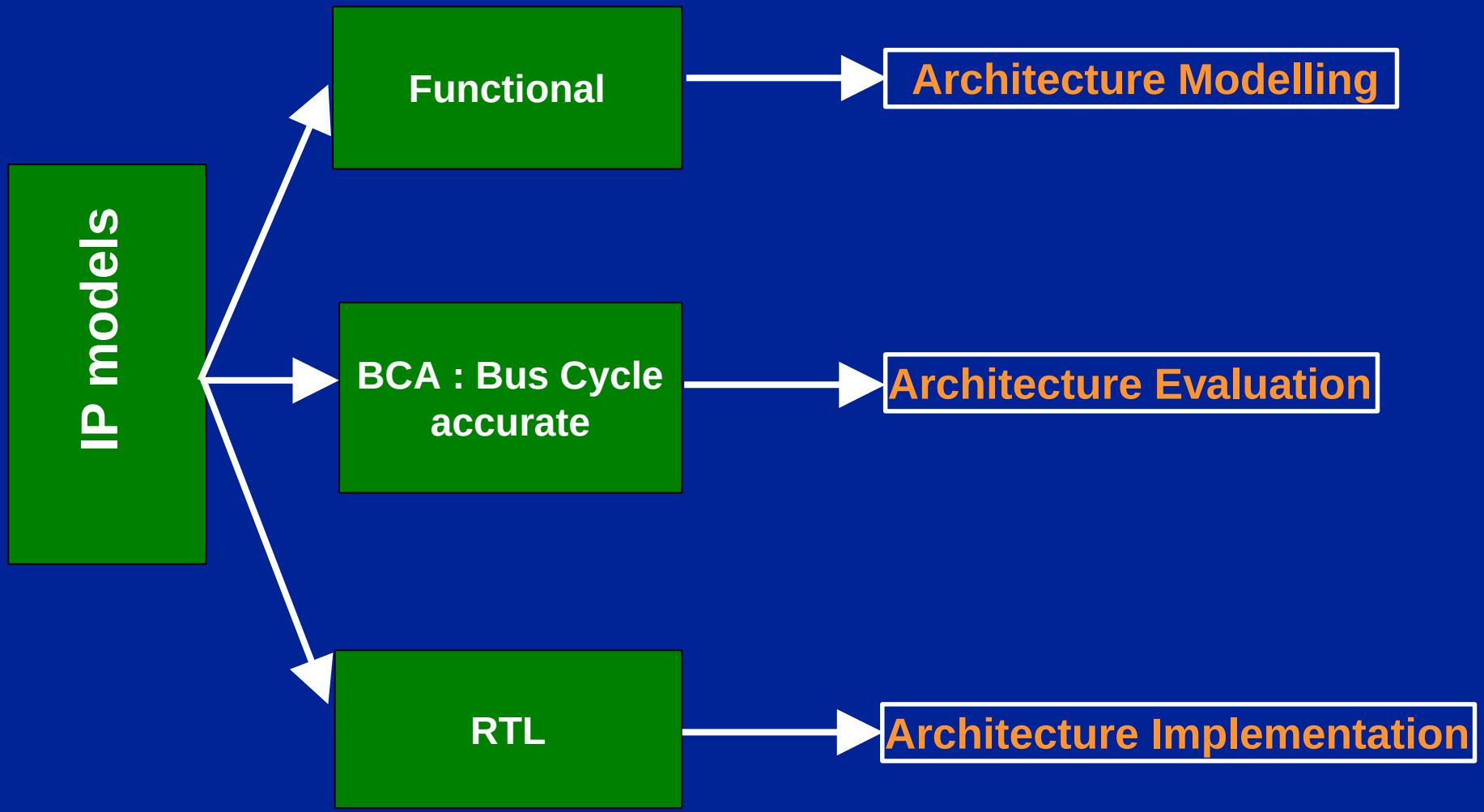
IP Reuse Motivations

- Trends for SoC Design
  - Reusable IP would be extensively used
  - IP integration at different system level design
  - Interconnect IP using on-chip standard bus
  - IP/Bus automatic interface generation
  - Bridging the gap between macro and micro-architecture
- On chip communication architecture key to high performance system
  - Use of standard OCB
- Improve productivity
  - Meet time to market requirements

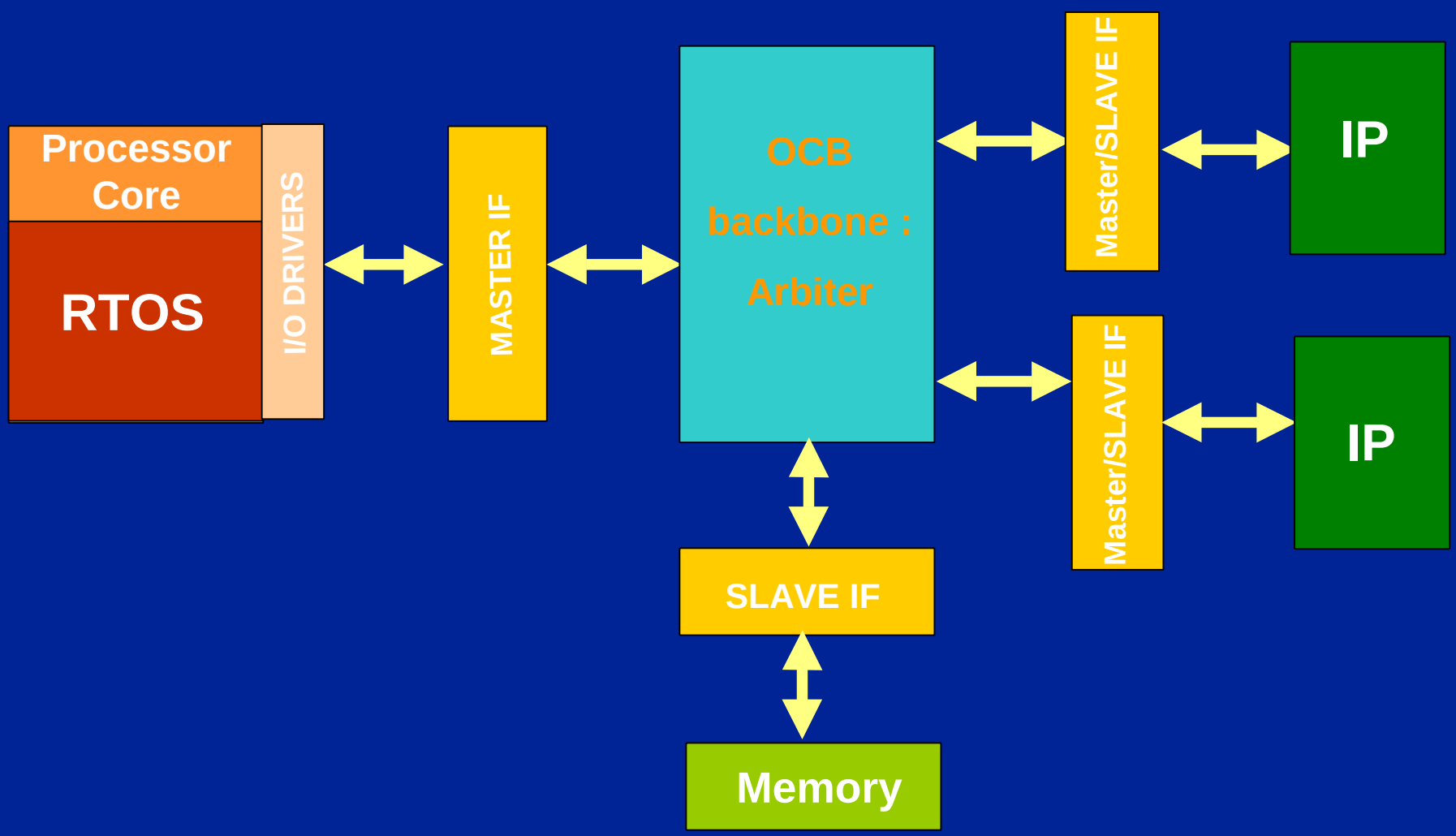
IP Presentation



IP Modeling


IP models
Functional
BCA : Bus Cycle accurate
RTL
Architecture Modelling
Architecture Evaluation
Architecture Implementation

OCB Architecture



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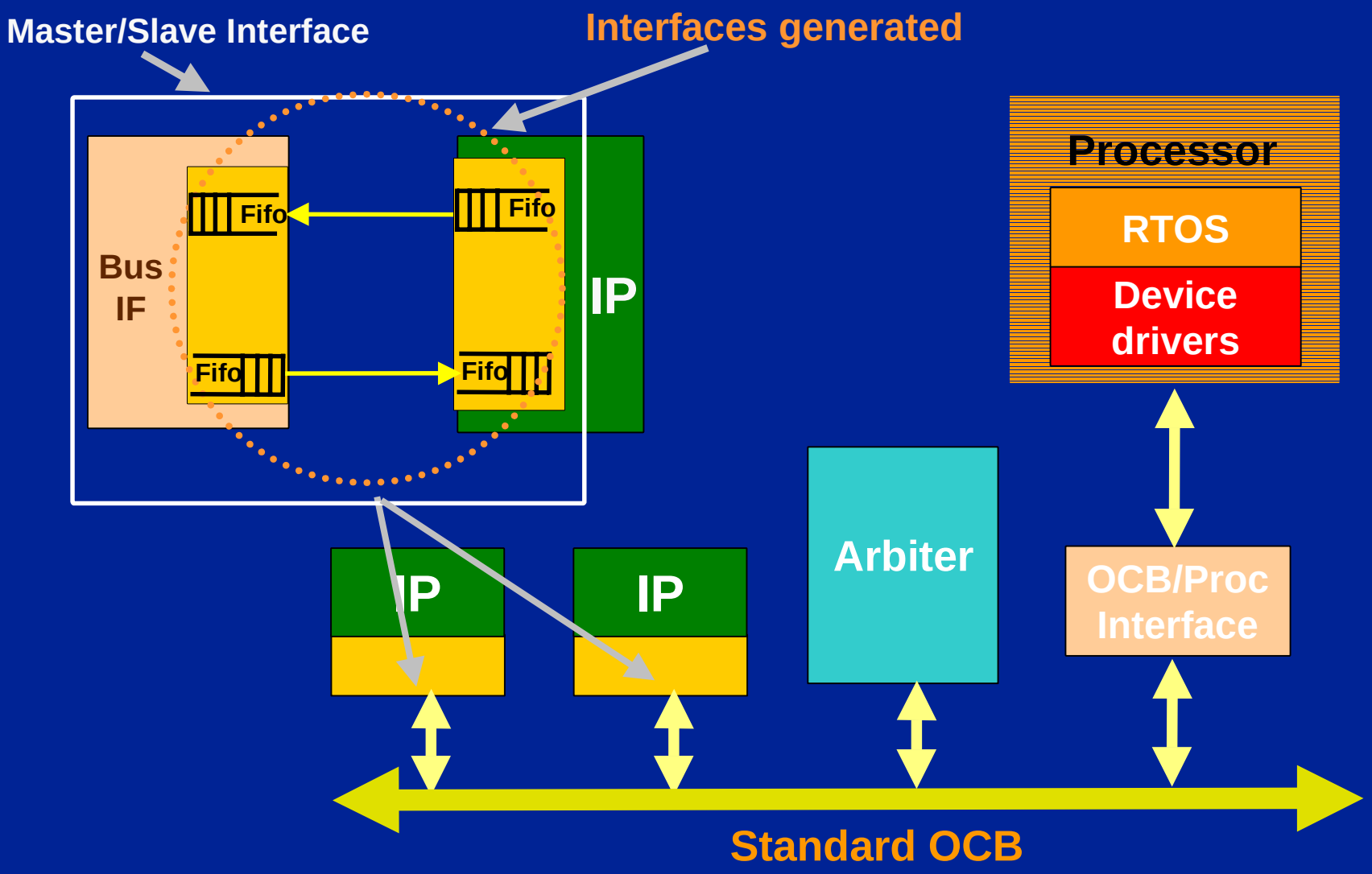
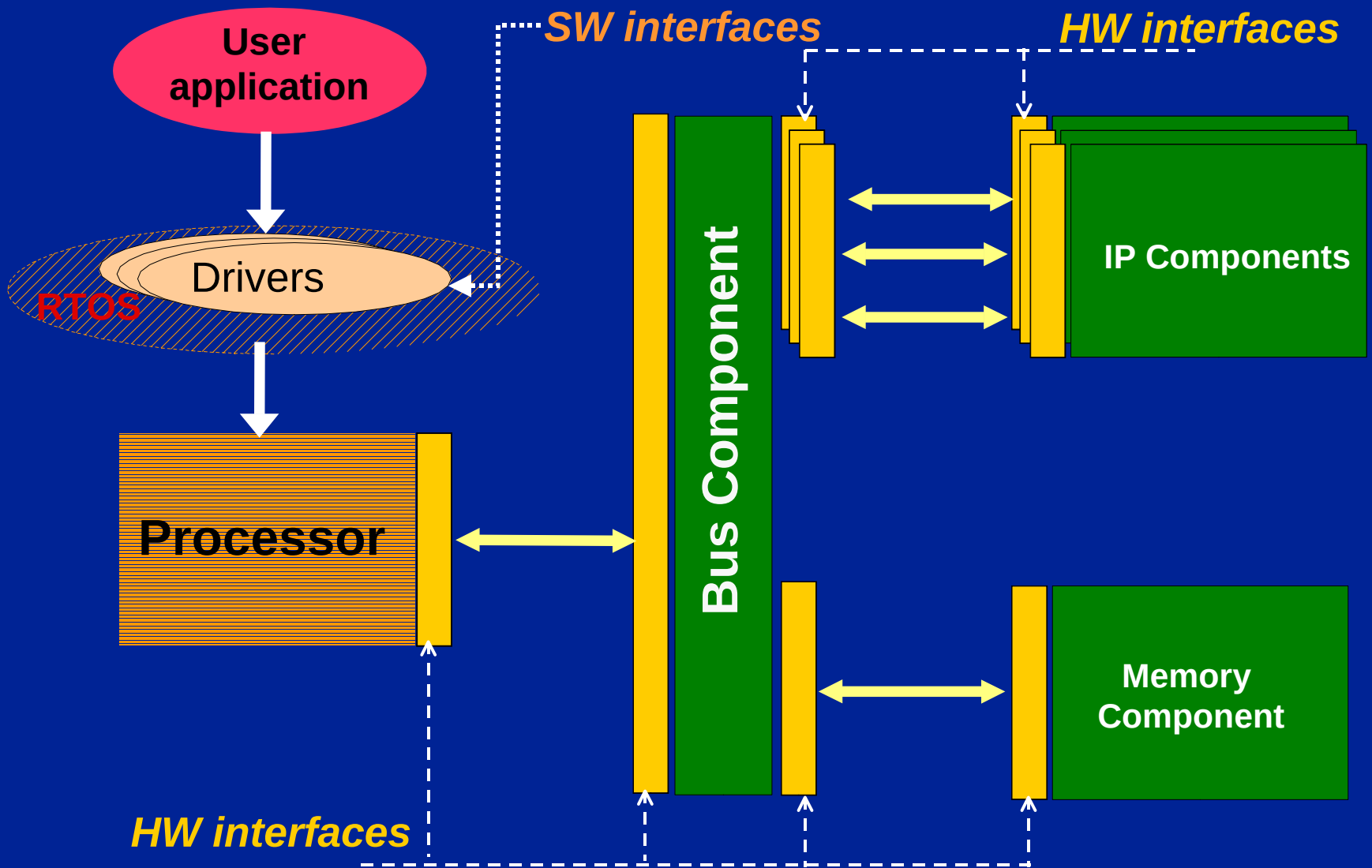
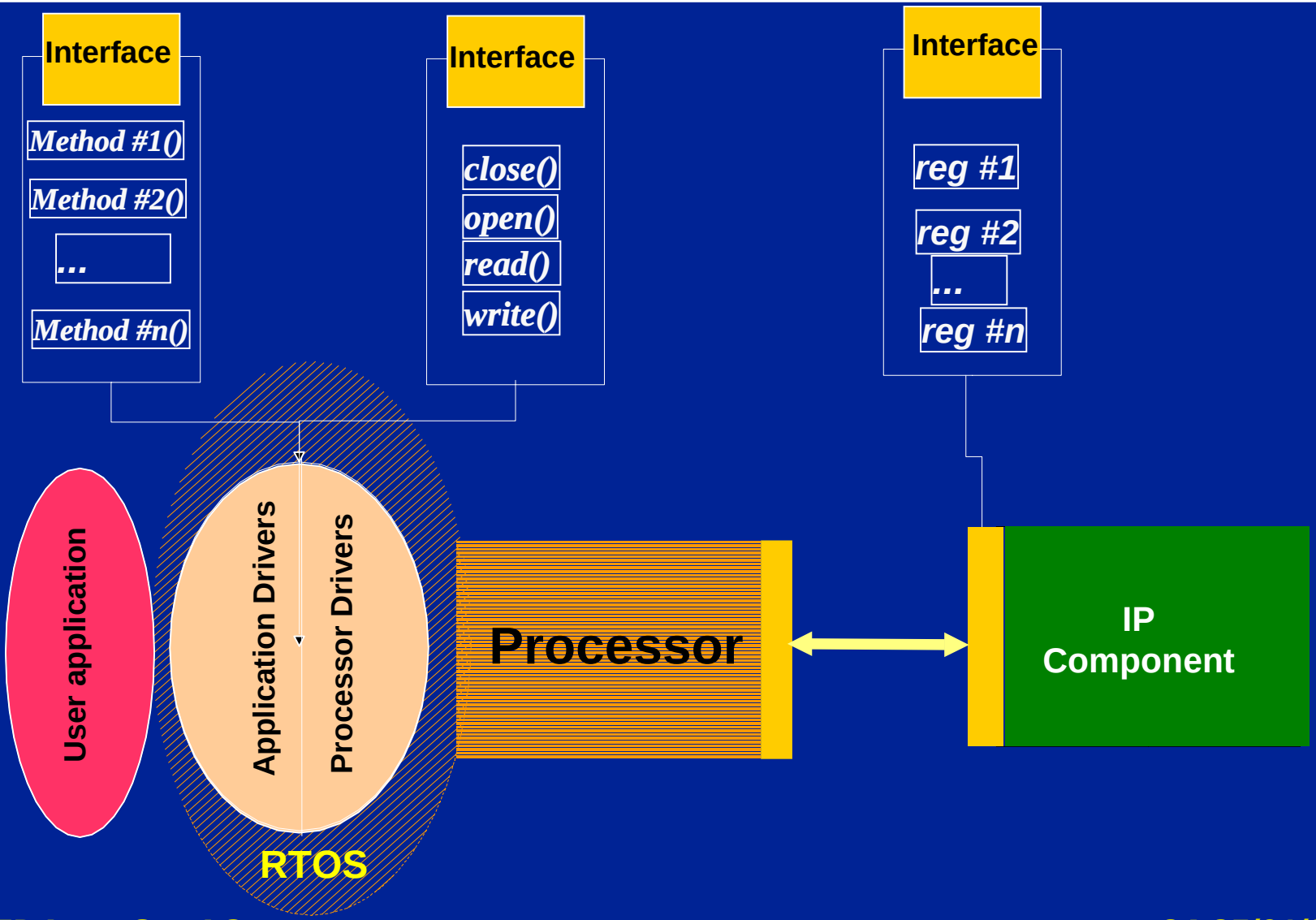
IP HW Interfaces



HW / SW Interfaces Generation Link



IP SW Interfaces



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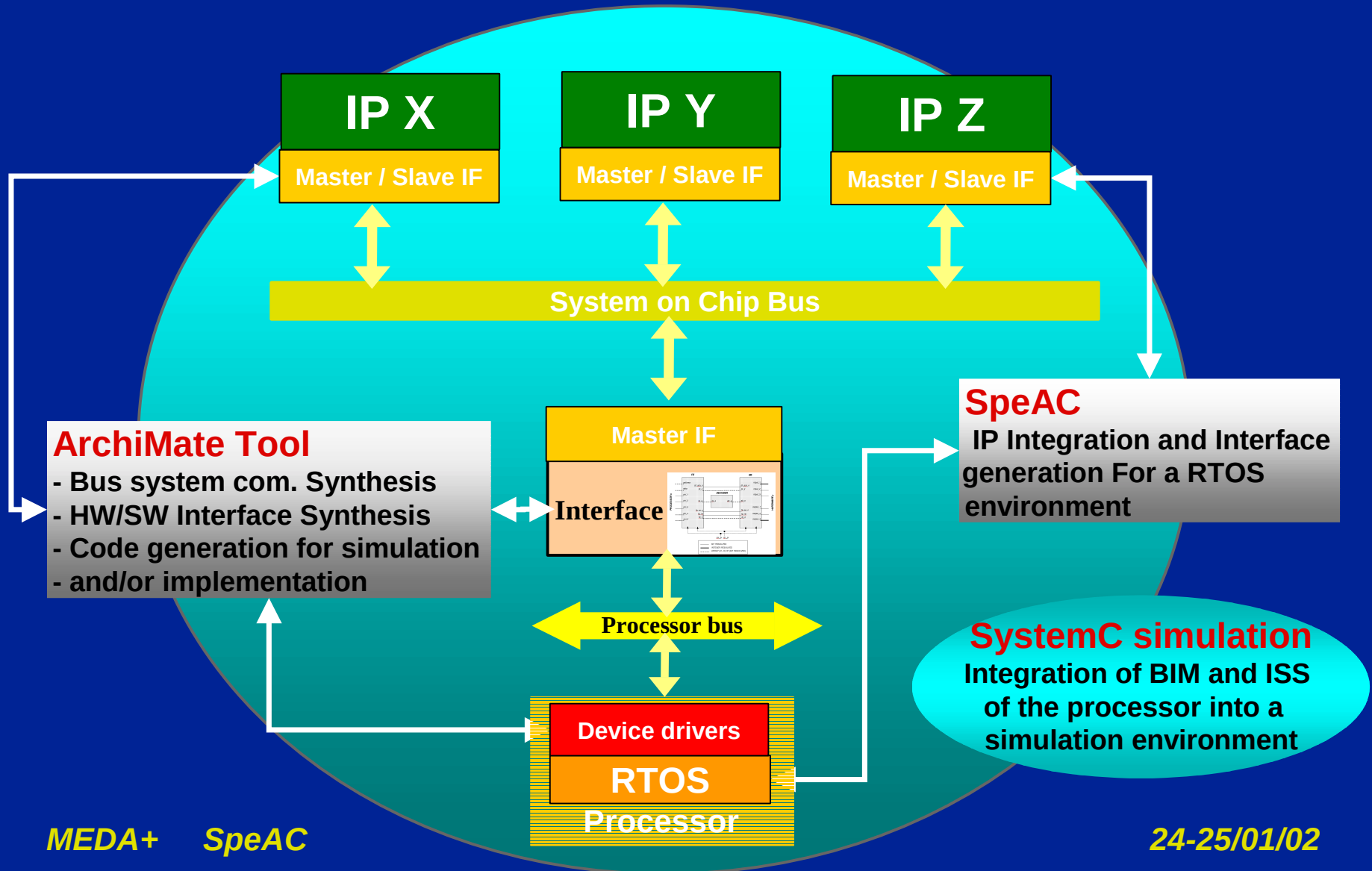
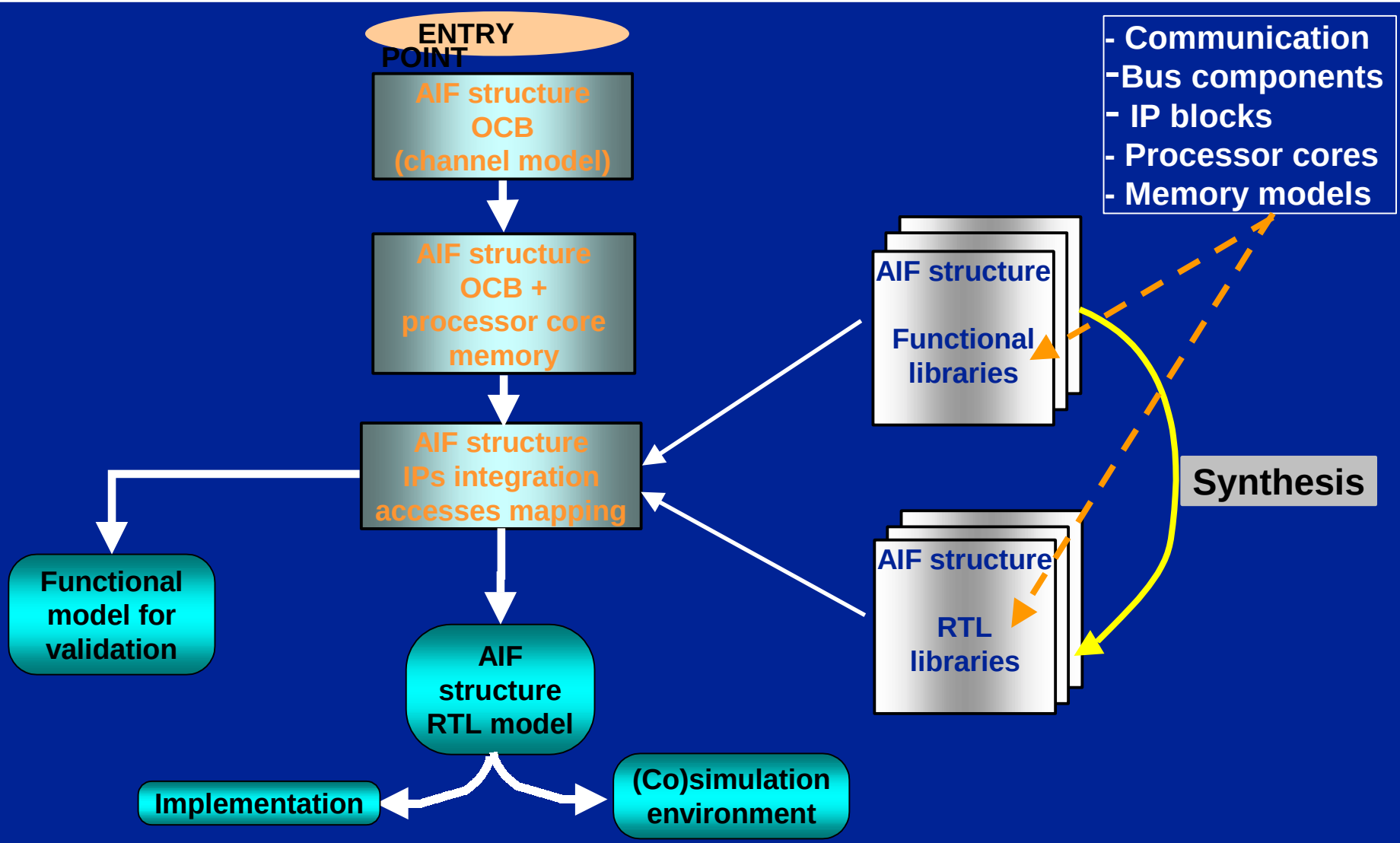
Actions and Development inside SpeAC



IP Integration Flow Tool



Conclusion

- Automatic IP Integration is a key issue to SoC design
- HW/SW Interface generation is mandatory for a high performance on chip communication system
- Speac partnership will strongly contributes to the improvement and the validation of our methodology based on IP integration using OCB
- In spite of the unclear funding situation, considerable progress has been made in our task specification