

GENESYS

GENERIC Embedded SYSTEM Platform
[FP7/2007-2013] n°213322



WORKPACKAGE 5 ROBUSTNESS, DIAGNOSIS AND MAINTENANCE



STARTING POINT

Increasing system diversity and complexity augment the likelihood of design faults, imprecise specifications, and accidental operational faults. Transients and permanent hardware faults are expected to increasingly affect the future HW manufacturing technologies.

APPROACH

1. Analysis of cross-domain and domain specific requirements and constraints for robustness & diagnosis, through interaction with WP1 & WP2.
2. Proposal of robustness & diagnosis services based on the requirements analysis and best state of the art proposals analysis.
3. Assessment and validation of the proposed mechanisms with respect to the requirements and constraints of WP1 & WP2

BENEFITS

The presence of a layer dedicated to the robustness, diagnosis and maintenance services will be very useful to increase the productivity of implementing service-critical, safety-critical and real-time applications.

WP CONTEXT

WP5 should analyze and respond to specific requirements and constraints formulated by WP1 and WP2 devoted to the industrial and consumer application domains. An exploratory prototype will help to demonstrate the feasibility of the proposed services.

WORKPACKAGE PARTNERS

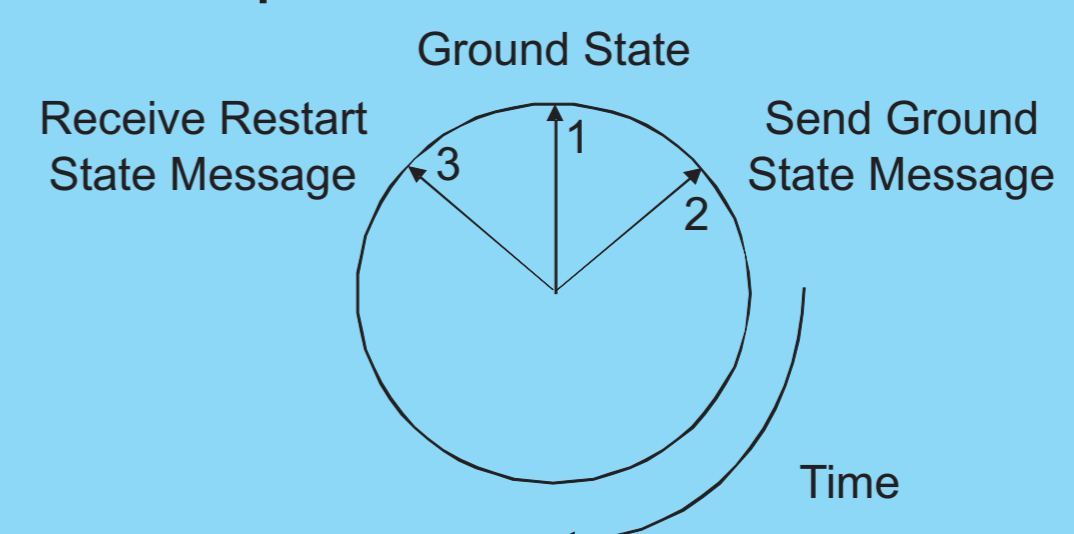
- Commissariat à l'Énergie Atomique (CEA)
- Technical University Darmstadt (TUD)
- TTTech Computertechnik AG (TTTech)
- Vytautas Magnus University (VMU Kaunas)
- Infineon (IFX)
- STMicroelectronics (STM-I)
- Vienna University of Technology (TUV)

OBJECTIVES

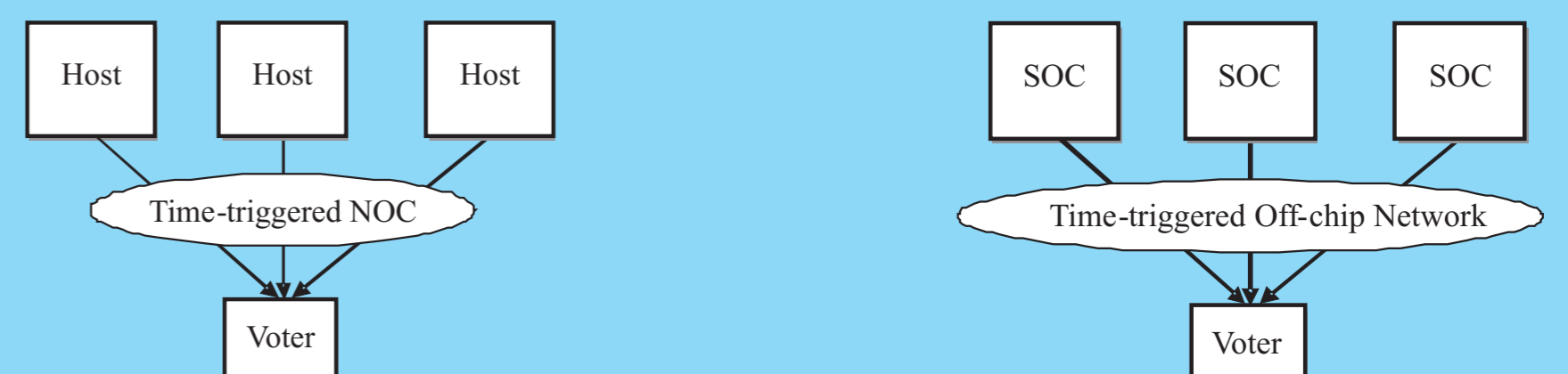
Define architecture services to allow building highly reliable, predictable and very complex systems out of non robust devices and subsystems for service-critical, safety-critical and real-time applications in variable and unforeseen environments.

CURRENT STATUS

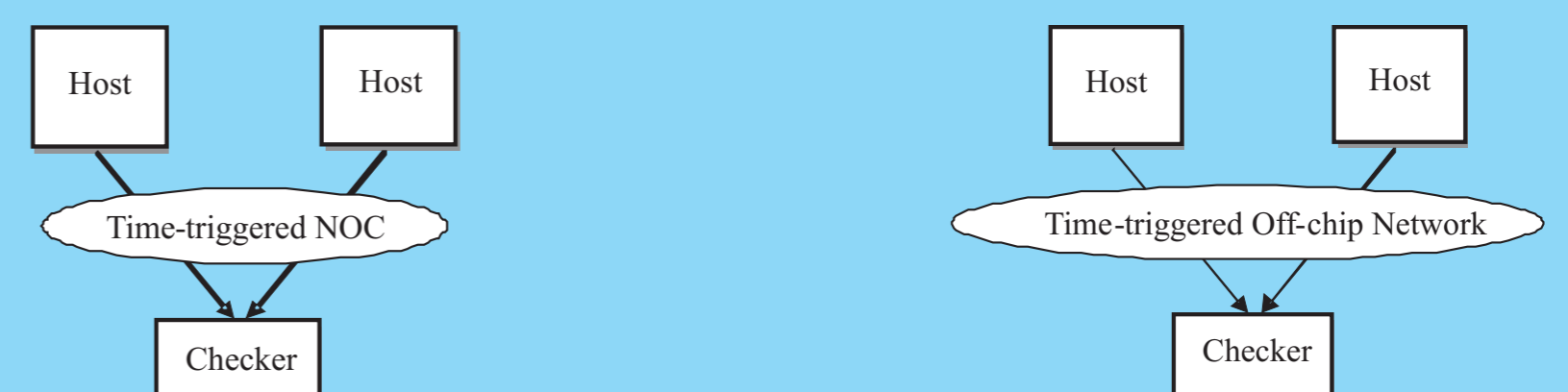
- Periodic State Externalization Service: A job can periodically disseminate data objects, like simple variables or complex structures.



- State Restoration Service: Allows the initialization with an arbitrary restoration state of a component affected by a transient fault.
- Memory Bit Error Detection/Correction Service: Several reliability classes used to protect data against soft and hard errors based on error detecting and/or correcting codes.
- Periodic Voting Service: Increases the fault tolerance of a system via error masking



- Periodic Checking Service: Allows error detection in a system with modular redundancy.



- Program flow monitoring: Enables control (program) flow checking (monitoring). AUTOSAR provides temporal program flow monitoring.
- Protected Channels Service: Several reliability classes to be used for channel protection.
- Logging Service: Enables individual components to record events of interest and send them to dedicated components.