Thales Alenia Space in Spain offers **full customizable on-board software solutions** to get the most of your Digital Payloads. Software design and development is based on building blocks, maximizing reusability of software components. Real time constraints are captured and a full scheduling analysis is performed. RTEMS, the Real Time Operating System recommended by ESA, is used to implement the RT functionality. Required PUS services are integrated into the solution. Software development and lifecycle follows ECSS rules and recommendations.

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**COMPETITIVE ADVANTAGES**

/// SW & coprocessor FPGA reconfigurable in flight
/// µProcessor fault tolerant execution platform
/// SW component based design to maximize reusability
/// Application specific functionality is fully detached from execution platform
/// Deep knowledge of System-on-Chip platforms for space applications: AT697, GR712
/// Reuse of platform components and low level drivers: watchdog, timer, memory EDAC, etc.
/// Reuse of communication drivers: MIL-STD-1553B, SpaceWire, CAN, SPI, etc.
/// Efficient verification and validation process
/// Fast development cycles
Flexible Software Architecture

The SW architecture identifies the different SW components and their interfaces. The architecture follows a layered structure, where lower layers represent hardware-dependent software and upper layers present the highest level of portability.

RTEMS Integration

RTEMS is the Real-Time Operating System recommended by ESA for space applications. RTEMS provides the necessary resources to implement the real time requirements of the mission: tasks, semaphores, mutex, etc.

Stable Execution Platform

On-Board SW execution platform is based on well-known rad-hard devices, qualified for space applications and widely used in space missions by ESA and other partners. This reduces the development and certification effort and facilitates SW integration, testing and reusability.

Verification and Validation

On-Board Sw is developed following a strict quality process. The verification and validation process guarantees that all requirements have been tested and the solution is delivered to the customer with the required quality and compliance.

EXPERIENCE

- HILINK: Eutelsat Konnect, Eutelsat Konnect VHTS, SES-17, Eutelsat 10B, SPAINSAT NG
- UHF Processor: SPAINSAT NG
- ICU: export Earth observation program, Copernicus CO2M & CIMR
- CMCU-II for H2020 Galileo Next Generation
- CTP: Heterogeneous multicore data processor

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