

Thales experience return in IMA A380

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Thanks to IMA, separation between Application Software and executing platform is clearly defined and ARINC653 is confirmed as the avionics standard Application Programming Interface. Some IMA concepts were applied in the B777, which flew for the first time in 1995, but the full application was done in A380, which flew for the first time in 2005. Technical standards and Guidance material are available to the IMA stakeholders. An "IMA module" can be adapted to various avionics system and applications via programmable configuration. Configuration is defined by parameters described in configuration tables loaded inside the module. The "IMA module" and the configuration process have been designed to support the following properties:

- Configurability, i.e., the capability to support the implementation of various systems, possibly embedding several applications. This adaptation is achieved by configuration parameters organized into Configuration Tables (CT).
- Partitioning, i.e., the capability to segregate multiple partitions hosted on a module. This property, ensured by various architectural means and mechanisms.
- Formal definition of the module's Usage Domain (UD), i.e., the capability to capture and express all limits, rules and constraints related to its configuration and usage

Three main actors involved in the IMA concept:

- The Module Supplier (MS), which qualifies its "IMA module" with respect to a guaranteed set of resources, functions, protections and performances, and within a specified Usage Domain,
- The Module Integrator (MI), which qualifies the configuration of the module with respect to the resources requested for the function and Usage Domain rules,
- The Function Suppliers (FS), which qualifies their functions with a qualified configuration on a qualified module with respect to Usage Domain rules.

The Configuration Tables (CT) are set up by the Function Supplier and the Module Integrator, depending on the class of the parameter. They are loaded along with the application software, for one part, and as an independent load, for the other part. These CT conveys most of the data exchanged between the actors involved in the industrial scheme (MI, and FS). During the workshop, the presentation will focus on the following topics:

- Origin of the IMA concept in Avionics
- Impact on the industrial organisation
- Impact on the global qualification process
- Major choice of the Thales implementation
- IMA benefice in Avionics