

MIDDLEWARE MADE EASY

Future test platforms will be based on smart and modular middleware to fulfill customer needs over the entire product lifetime

Testing has always been one of the most important activities in the aircraft product lifecycle, ensuring safe operation and quality of service. During the development lifecycle, testing includes activities pertaining to integration, validation and verification.

The higher the complexity of aircraft systems, the more effort has to be spent on testing and the higher the demands on the test systems.

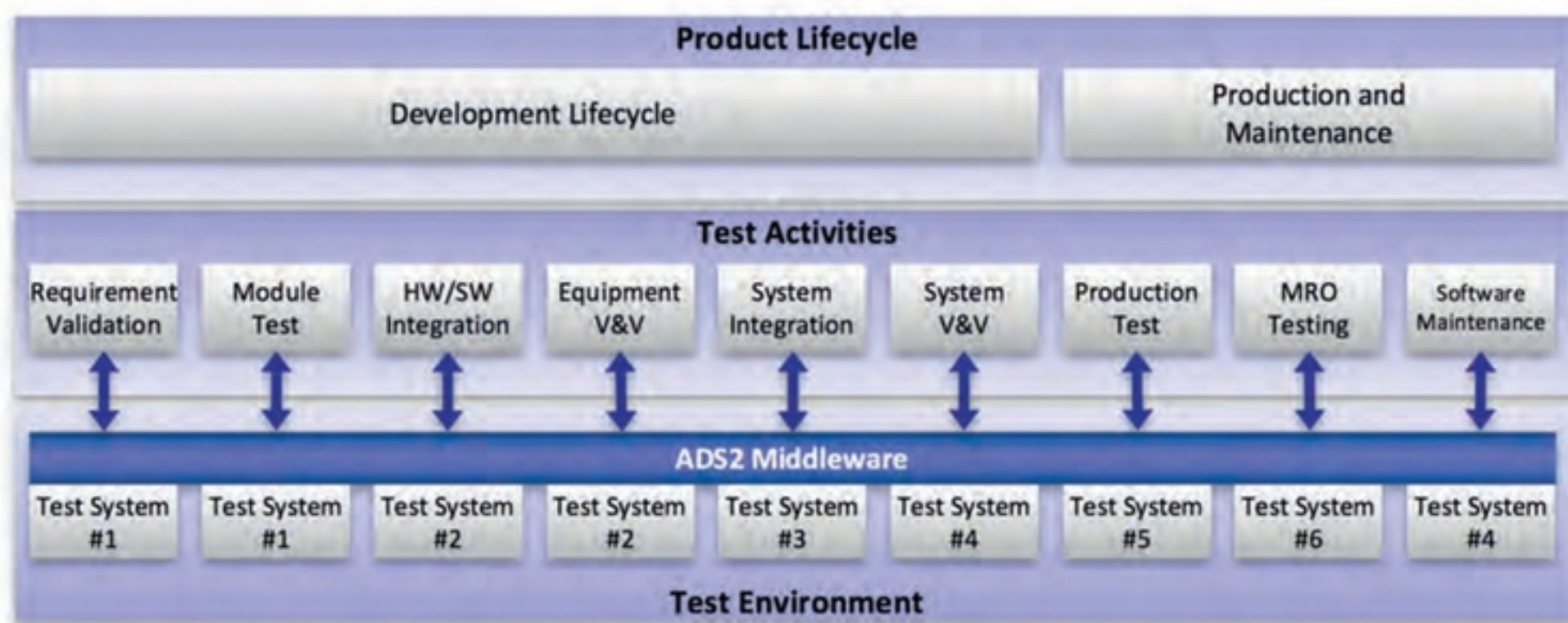
Today's test systems are required to support short cycle times down to a few 100 microseconds for hardware/software integration or functional equipment validation and verification of modern airborne controllers. On the other hand, test systems with the capability to run test sessions with more than a million process variables are needed for aircraft system integration.

Therefore, the aircraft or system manufacturer has to procure test systems for the specific test purposes, often from various suppliers and with different operating philosophies. This results in increased need for staff training or extra work caused by incompatibility, e.g. duplicated creation of test cases for different test system software.

These conflicting demands on the test system software are further aggravated by the continuous expansion of testing caused by model-based systems engineering or virtual testing with a large number of different kinds of simulations and hardware emulations in virtual machines.

Aircraft or system manufacturers have a chance to mitigate these problems by using portable, modular, configurable middleware for their test systems that supports hardware abstraction, test automation and documentation of model, software, equipment and system tests with continuous traceability from the requirements to the test results.

TechSAT decided to provide a new version of the ADS2 test system software that is rigorously implemented as middleware and



tailored to operate the various test systems over the entire product lifetime.

The modular structure of the ADS2 middleware with easy portability to new test systems supports typical applications, such as hardware-in-the-loop (HIL), model-in-the-loop (MIL), software-in-the-loop (SIL) and processor-in-the-loop (PIL) tests during the development phase. Also supported are test systems for later production and maintenance purposes.

The open ADS2 data and control interface is based on process variables and allows customer-specific extension or use of test systems without recompilation of the test system software or test session. These open runtime data interfaces – as well as the file-based configuration and data exchange mechanisms with a flexible and extendable format – allow broad tool support with deep process integration.

A major feature for fast and agile support of engineering activities is the flexible mapping and relocation of test session components and I/O to computing resources during runtime -for test session optimization.

With the new driver development kit (DDK) of the upcoming ADS2 release, TechSAT is opening its middleware for customer-specific or third-party hardware

// The ADS2 test system software is middleware supporting various test systems for the lifetime of the product

integration by the user. Therefore, development and integration of drivers and simulations are eased by an ADS2 feature to terminate, restart and debug components during runtime.

The ADS2 middleware is continuously being extended to allow for integration of test systems from different vendors and to support future standards like virtual hybrid testing next generation (VHTNG). Health monitoring and inventory management are features to support maintenance and test system availability. A future extension, depending on customer needs, may be the graphical analysis of session traffic on and between computing resources for optimization of test or virtualization environments with numerous simulations.

With the merger of TechSAT and Nexeya, the best technology of both worlds – with well-proven and much-valued test capabilities and services – will be combined on a common technology platform that will be available to all TechSAT customers. \

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