Framework
TAF
TestApplication

emlix
embedded linux systems

TAF – Test Application Framework

The emlix TAF - Test Application Framework - is a quality assurance tool for embedded Linux systems that enables development and production-accompanying quality assurance through continual and standardized system, module and integration tests with a high test coverage. Product-specific tests can easily be extended in relation to a defined API. The documentation of the test results takes place automatically and reproducibly.

Efficient Processes for Automated and Documented Quality Assurance

Especially when embedded Linux operating system software is subject to an independent conformity evaluation, the developer is dependent on being able to guarantee a defined and reproducible testing process in order to achieve successful certification. Manual tests are mostly being replaced and employees are being relieved from routine tasks.

With the Test Application Framework emlix has responded to the requirements from numerous projects and has developed a quality assurance tool for embedded Linux board support packages that can optimally adapt to the dynamics of agile development and later component optimization. It enables quality assurance that accompanies development and production using continual and standardized system, module and integration tests with a high test coverage.

Within the framework of development projects, customers have the option to commission TAF setup and test runs. Use of the Test Application Framework by our customers is possible through a subscription contract. Furthermore, the TAF can be used to test externally developed board support packages that have been purchased by the customer.

Features and Benefits

The emlix Test Application Framework offers the following features and additional benefits:

- Flexible, product-specific test setup
- emlix Test Library with hardware-level tests
- Integration of additional product-specific tests
- Standardized, automated test runs (person-independent)
- Clear versioning of the respective test run
- Various possibilities to control the running and the order of tests
- Comparative tests of multiple hardware revisions
- Tests directly on the target or as host tests against the target
- Reproducible archiving of tests and test runs (traceability) on a database
- The results can be taken over by other QA testing tools
- Reproducible generation of test reports
- Secure, distributed use across locations through client/server architecture
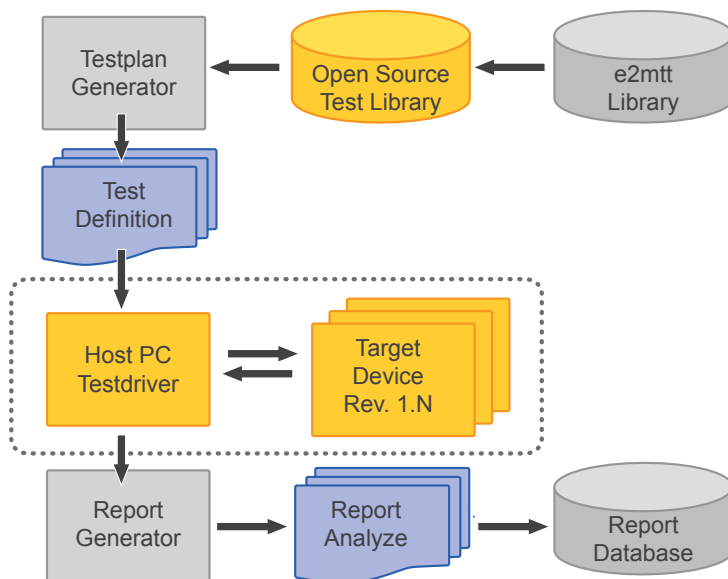

Fig. 1: Selection, implementation and documentation of tests using TAF

- Auditable test management
- Detailed documentation

As a managed hosting solution the TAF offers developers on the customer side full access to all TAF features. The customer's own developer teams can therefore carry out test runs and develop their own additional tests.

The emlix TAF has been used successfully in the framework of development processes, for example according to the requirements of IEC 62304 and the FDA. Specific test and documentation requirements in the automotive and industrial fields are supported.

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Host-Sided Test Cases

With version 1.1 of the emlix Test Application Framework, host-side test cases are now also available for testers. In addition to target-side tests, automated test runs can thereby be carried out from „outside" on the system to be tested.

This could, for example, include functional tests of a web server. Diverse update cycles and the functionality of the utilized boot loader can thus be validated efficiently and reproducibly. With the help of host-side tests, test cases can therefore be automated that were previously only possible through interventions by the tester.

A further advantage of this division results from interaction in complex test cases. This enables, for example, a network benchmark test for a hardware interface to be automated. The actual test thereby runs on the device under test and the necessary counterpart on the testing host.

Review of Embedded Linux Systems

For additional system tests and extended external quality assurance for one's own or externally developed embedded Linux board support packages, emlix offers its customers a TAF-based review. In the context of series validation it is possible to efficiently detect, for example, (un)reported hardware modifications on bought-in modules.

As an external quality review, the TAF review provides valid information for the continual qualification of outsourced products of diverse origin.

Within the framework of a review we offer the following services:

- Analysis of the product and the information made available
- TAF setup and configuration
- Definition of test sets for the product to be tested
- Running of TAF system tests
- Compilation of the test report (TAF report)
- Evaluation of the results
- If needed, continual repetition
- Further review services in agreement with the customer

Following the review, a detailed discussion of the results takes place between the developers, the customer's product managers and experienced emlix engineers.