

Further components Internal simulators

- Standard and comfort card reader
- Simulator of the new Identity Card
- ISO 7816 Card Simulator

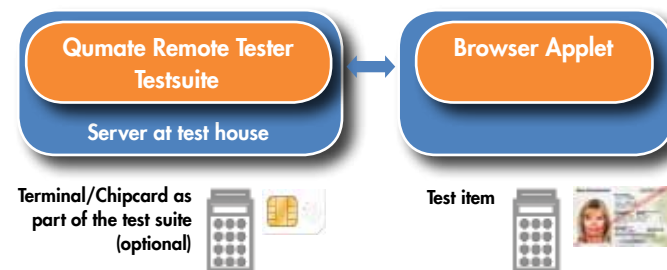
Remote Tester

With Remote Tester, testing establishments have the possibility of putting their test suite online. Chip card manufacturers can thus test their probands online without the item to be tested having to be submitted to the test suite vendor.

The connection to the test item e.g. chip card or emulator is made via a remote terminal.

This means that the parallel operation of one or more test items via remote terminals, as well as chip cards and terminals as an integral element of the test suite is possible.

Remote Tester was realised as a client-server solution. The test suite is on a server and is controlled remotely using an Internet browser.



Interfaces

Qumate features many interfaces with which the test system can be expanded. At the moment, the following interfaces are available and this list is successively added to by achelos or expanded at the request of customers:

Interfaces to external simulators

- Compron CLT One
- Java Card Simulator from the Oracle/Sun Java Card
- Development Kit

Connectable terminals

- As many as required, e.g. with PC/SC or CT-API interface
- Several terminals concurrently

Database Interface

- e.g. MySQL or Oracle for central project storage

Interface to an external defect tracking system

- e.g. Jira for the transmission of the automatically-generated bug reports

Qumate – Testmanagement Toolsuite

Qumate Characteristics

Qumate is the innovative achelos Java solution for the quality protection of chip card systems and applications. It is based upon the integrated development environment Eclipse and therefore provides a modular architecture with flexible scalability in the form of plugins.

Qumate offers a cross-project view which focuses on the business use case as well as the technical solution. It facilitates the testing of complex systems with several concurrently-connected terminals, chip cards and simulators. With the aid of a database such as MySQL or Oracle, project data can be centrally stored. The administration of various test suite runs with various probands at various time points is possible. Qumate offers many internal simulators, as well as connection facilities for external simulators and "genuine" chip cards and terminals.

Qumate can transmit automatically-generated bug reports to an external defect tracking system such as e.g. Jira. The bug report also indicates responsibility.

Qumate provides the facility of online testing. Thus a chip card issuer can have remote control of the test suite offered by a provider.

The central components are depicted in Qumate Workbench in the form of clearly-arranged Eclipse perspectives. The views can also be adapted flexibly at any time. Thus individual tools from the Toolbox can be made be visible and used at any position.

Requirement Manager

In Requirement Manager, requirements in the form of (business) cases, business requirements and system requirements can be defined and depicted in a clearly-arranged hierarchic structure. Likewise, test cases can be specified and assigned to the requirements in the hierarchic structure. Beyond the hierarchic structure, further dependencies between requirements and test cases can be stipulated.

Requirement Manager contains a validator with comprehensive validation rules that support the user in describing the requirements completely and without errors.

The test case specification is provided in plain text and is subdivided into recondition, execution and post condition. Apart from that, there are also supporting input masks. Documents such as a requirement catalogue or a test specification can be generated from the hierarchic structure. In this way, the scope – i.e. which attributes should be incorporated in the documentation – can be freely selected. Using Document Generator, many various output formats can be generated incl. HTML, PDF, Microsoft Word (DOC), RTF, Open Office (ODT) and the special Qumate Document Model.

From the defined requirements and test cases, a test system frame can be produced automatically, as well as a Java file for every test case. The test suite can then be executed and formed in Test Framework.

Requirement Manager indicates the test status for each test case in the hierarchic structure that was generated in the test runs of the Test Framework (✓✗). The degree of fulfilment of the requirements is also presented in accordance with the defined dependencies.

components and functionality

Qumate Workbench

Application Designer

Application Designer allows the generation and depiction of a smart card application in the form of an object system with an MF as root, several DF levels, EFs as well as key and password objects. Using a special access rule editor, access rules can be input simply and conveniently. Additionally, higher level card information and parameters that are not saved in the object system – such as the ICCSN or the ATR – can be defined.

The card image is saved with all attributes in XML format and can be used in the test cases implemented.

Likewise, it is possible to prepare the card image by specific cards for card initialisation and personalisation. In the case of the eGK health card, this corresponds to D3 file generation. Thus Qumate supports the initialising and personalising of cards in a convenient way.

An image specification can be generated from the image specification. As in all cases of document generation, the various output formats of the Document Generator are supported. Application Designer also has an interface for Crypto Toolbox to use keys directly. Conversely, the keys generated by Crypto Toolbox can be imported into the key objects.

Test Framework

Test Framework serves for test case implementation, performing tests and the reporting of test results. Instead of a proprietary script language, the test cases are implemented on an object-oriented basis with Java as high-level language. In this way, all Java resources of the Eclipse development environment can be used. The files generated by Requirement Manager serve as a base for the programming of the test cases. The test case specification in the form of comments provides simple traceability and maintainability. The objects and attributes predefined by Application Designer simplify test case preparation. Test Framework can select from many supplied (internal) simulators and connectable (external) simulators, as well as physical existing chip cards and terminals. In this way, the operation and concurrent testing of several card or terminals/simulators is possible.

It is also in Test Framework that the actual test is performed. Using procedural lists, regression tests can be performed efficiently. By means of test status depiction, (🟢🔴) a rapid overview of the project is possible. Apart from that, Test Framework allows performance measurement to be carried out. Testing establishments have the possibility of putting their test suite online using Remote Tester. Thus a chip card manufacturer can use the services of a testing establishment without having to be onsite.

Test Framework supports comprehensive reporting and logging. During test case development, it is possible to use the logger. Whichever events are logged is fully configurable. The reporting function is used for acceptance procedures and approvals and generates clearly-arranged acceptance documents. Also in this case, all output formats of the Document Generator can be selected.

Document Generator

With Document Generator, Qumate provides a versatile component for the convenient generation of documents. Document Generator supports many document formats incl. HTML, PDF, Microsoft Word (DOC), RTF, Open Office (ODT) and the proprietary Qumate Document Model. All Qumate components use Document Generator for the preparation of test evaluation, reports, requirement catalogues, test specifications etc.

Project Controller

Project Controller is the tool for the project manager to administrate test projects and supports parallel testing by a team of several employees using several computers. The partial results of parallel test suite cases can be summarised to provide a full result. The test runs from various probands as well as various version statuses of the test runs can be administered in a clearly-arranged manner.

Project Controller offers many functions for test evaluation:

- Statistical evaluation and the depiction of partial results and full result
- Determining and depicting the test coverage and degree of fulfilment
- Depiction in the form of diagrams, tables or in the hierarchic structure of the project
- Facilitation of effective project controlling
- Convenience of document production using Document Generator

Project Controller is presently still under development and will probably be available 2012.

Toolbox

Qumate offers a comprehensive collection of tools that support test case developers in the test suite and is of equal assistance in other areas of chip card development projects.

The APDU Toolbox serves for direct communication with a chip card at APDU level.

Crypto Toolbox offers cryptographic functions including key generation for RSA, ECC, AES and 3DES, as well as for all conventional hash processes and CRC. By means of an export function, the keys generated can be handed over to the key objects of the Application Designer.

Further tools are summarised in the General Toolbox:

- Evaluation and generation of ATR and PPS
- Visualisation of TLV objects
- Calculator and converter for long integer numbers
- Generation of good quality random numbers

