Inline expressions in protocol test specification

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Telecommunication software is a rapidly growing area of software engineering. In the focus of the telecommunication software is the communication protocol. One of the most critical point of the protocol life cycle is the conformance testing and therefore the test specification, too.

The test specification is a set of test cases examining the functionality of a tested system. For these purpose special test languages are developed, standardization organizations and industrial companies support the TTCN. The new version of TTCN contains many new features including special expressions to specify communication and flow control mechanisms.

Some of these new features are represented using Test Sequence Chart (TSC). A TSC represents the flow of test events between test component instances, port instances and environment. The behavioral program statements cover sequential, alternative, interleaved, default behavior and the return statement.

The new behavior operators called inline expressions are used to specify protocol tests. Two test specifications of an up-to-date protocol used in the wireless world will be introduced. One specification is based on the earlier TTCN version, the other on infix expressions. The two methods will be compared and evaluated from the point of view of conformance testing.

One of the most important layer of the WAP protocol is the Wireless Transaction Protocol (WTP) which is defined to provide the services necessary for interactive "browsing" (request/response) applications. This means that the Wireless Transaction Protocol is very representative from point of view of alternative and other operators. For data segmentation, the alternative behavior of the client in situation of packet loss will be presented using both test specifications, the TTCN-1 and TSC infix expressions. The comparison shows the benefits and disadvantages of the inline operators.