Fraunhofer Einrichtung
Systeme der
Kommunikationstechnik

Status report
Requirements for HLTD

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Common parts of test descriptions (1)

In general, already existing test descriptions consist of the following parts:

- **Test description title:**
  A short title which describe the purpose of a test description
- **Test description identifier:**
  An unique ID for a test description which can be used in order to reference test descriptions in other documents or specifications:
- **References:**
  The reference section of a test description summarizes all relevant specifications, e.g test objectives.
- **Test architecture:**
  A test architecture specifies the logical configuration of a test system and a SUT.
- **Test pre-conditions:**
  The test pre-conditions section contains a list of instructions or requirements which have to be executed or fulfilled before the test execution.

Common parts of test descriptions (2)

- **Test sequence:**
  Specify atomic test actions in a sequential order. A distinction is made between stim
  actions applied to a SUT and actions used to observe the behavior of a SUT.
- **Optional parts:**
  Test descriptions can also specify timer actions and test data contents. Usually, these
  two optional parts are combined with test sequences.

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General objectives for HLTDs

- **Test architecture:**
  A functionality to specify test architectures of test descriptions shall be supported by HLTDs.
- **Support of concurrency:**
  HLTDs should support the description of concurrent test behaviour.
- **Minimal set of predefined actions:**
  Only a small set of test actions should be supported by HLTDs. In addition, the specification of user-definable test actions should be possible.
- **Test data and values:**
  HLTDs should support the ability to specify test data and concrete values optionally.
- **Independent presentation formats:**
  Graphical as well as textual representation formats should be supported by HLTDs.
- **Well-defined format:**
  The format of test descriptions specified at a high level of abstraction should be well defined in order to reduce ambiguity and to facilitate computerized processing.

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Definitions for HLTDs

- **Test architecture:**
  Specification of logical configuration aspects of a test description or a group of test descriptions. In particular, a test architecture represents different entities, including their logical links, involved in test descriptions.
- **Entity**:
  Is a logical building block used to define test architectures of test descriptions.
- **Test entity:**
  Is a single entity which represents a thread of sequential test behavior. The presence of multiple test entities within a test architecture implies that concurrent test behavior is possible.
- **SUT entity:**
  Is a single entity which represents a part of the SUT.

General requirements for HLTDs (1)

- **Title or identifier:**
  A unique identifier or title which can be used to reference the associated test description other specifications or documents.
- **Summary:**
  The summary should uniquely identify the aspect of the base specification being tested.
- **References:**
  Reference to textual documents, e.g. a standard, where the functionality to be tested is specified.
- **Test purpose:**
  A reference or inline specification of the test purpose. When the test purpose is specified inline, a structured notation, e.g. TPLan, should be used.
- **Test selection criteria:**
  The criteria, for instance PICS, to be fulfilled in order to select a test for execution.

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General requirements for HLTDs (2)

- **Relevance / Bindingness:**
  An optional tag which indicates the relevance of a test case. The relevance can be mandatory, optional or conditional.
- **Mechanisms for structuring:**
  It should be possible to arrange multiple test descriptions in groups or suites.

Test architecture requirements

- Test Entities should be used in order to represent concurrent test behaviour
- SUT Entities represent the SUT or one of its parts
- Test Entities should be connected among each other only by using static communication links.
- Synchronization between Test Entities should be supported by an dedicated Test action.
- Each Entity should provide a interface which can be used to establish logical communication links to other Entities.
- Entities should support multiple connections to other Entities

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Requirements for behaviour specification

- A test interaction which is used to stimulate a SUT entity, or in particular situation anoth entity, should be supported.
- On the level of HLTDS, no distinction should be made between sending messages or invoking methods.
- The distinction between different types of communication (message- and procedure-bas shall be expressed in the data specification part.
- A test interaction should be provided in order to observe the behaviour of the SUT.
- It should be possible to specify user-definable test actions.
- Test actions of HLTDs should be associated with information about the initiating and receiving entity.
- Concepts for expressing absolute and relative time should be supported by HLTDs.
- Timing constraints should be specified as part of a test action.

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Test data related requirements

- It should be possible to specify values mainly for those parts of a message which are of interest.
- Such values can be concrete, for instance “field=10”, or consist of constraints to be met e.g. “field>=10”