Sequence Step

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Discussion

A Sequence Step is an element of a Test Sequence that references a Sequenced Test Object and defines occurrence-specific information and permitted progression.

A Test Sequence is a specialization of Sequence. Each Sequence Step identifies one position within the ordering or directed progression established by the Test Sequence.

A Sequence Step references one Sequenced Test Object, such as a:

- Test Set
- Test Case
- Test Step
- Test Executable

A Sequence Step can identify:

- Its identity
- Its name
- Its description
- Its position within the Test Sequence
- Its referenced Sequenced Test Object
- Its applicable Test Argument Values
- Its applicable Expected Results
- Its applicable Test Items
- Its applicable Starting Conditions
- Its applicable Timing Conditions
- Its required prior conditions
- Its completion condition
- Its failure condition
- Its timeout
- Its permitted following Sequence Steps
- Its progression conditions
- Its alternative progression
- Its error-handling progression
- Its applicable Governance Policies
- Its Provenance
- Its Traceability

A Sequence Step can supply occurrence-specific Test Argument Values to the referenced Sequenced Test Object.

A Sequence Step can also identify one or more permitted following Sequence Steps. Progression can depend on:

- Completion of the current Sequence Step
- A Test Result
- A Verdict
- A measured value
- An observed event
- A state
- A timeout
- An error
- Another defined progression condition

The Sequence Step defines permitted progression. The applicable Execution Path identifies the progression that actually occurs during Test Execution.

Definition

element of a Test Sequence that references a Sequenced Test Object and defines occurrence-specific information and permitted progression

Source

Adapted from:

- OMG Test Information Interchange Format (TestIF), Version 1.0 Beta 3, Section 7.3.4, SequenceStep
- Sequence
- Test Sequence
- Sequenced Test Object
- Test Argument Value
- Execution Path
- DIDO Reference Implementation Conceptual Model
- DIDO-TE draft Requirements Register

OMG TestIF defines SequenceStep as a directed-graph node contained within a TestSequence. The SequenceStep references the SequencedTestObject represented at that position and identifies the SequenceSteps that can follow it.

OMG TestIF also permits a SequenceStep to provide ArgumentValues for the input variables of its referenced SequencedTestObject.

This definition preserves those characteristics while:

- Defining Sequence Step as an element of a Test Sequence
- Relating Test Sequence to the general concept of Sequence
- Separating permitted progression from the Execution Path that actually occurs
- Remaining independent of a particular graph-storage or implementation technology

Note

A Sequence Step differs from a Sequence:

- A Sequence defines an ordered or directed arrangement of elements and the progression relationships among them
- A Sequence Step is one element within a Test Sequence

A Sequence Step differs from a Test Sequence:

- A Test Sequence defines the overall ordering and permitted progression
- A Sequence Step identifies one position and defined occurrence within that progression

A Sequence Step differs from a Test Step:

- A Test Step specifies a reusable test action or Validation
- A Sequence Step identifies an occurrence of a Sequenced Test Object within a Test Sequence

A Sequence Step can reference a Test Step, but the Sequence Step and Test Step remain separate TestIF objects.

The same Test Step can occur at multiple positions within one Test Sequence. Each occurrence uses a separate Sequence Step.

A Sequence Step differs from a Sequenced Test Object:

- A Sequenced Test Object defines reusable test content
- A Sequence Step identifies how that content participates at one position within a Test Sequence

The same Sequenced Test Object can participate in:

- Multiple Test Sequences
- Multiple positions within one Test Sequence
- Multiple branches within one Test Sequence
- Multiple Test Runs

Each Sequence Step can provide different:

- Test Argument Values
- Expected Results
- Starting Conditions
- Timing Conditions
- Progression conditions
- Error-handling progression
- Other occurrence-specific information

A Sequence Step does not copy or redefine the referenced Sequenced Test Object. It supplies or references the information needed to use that object at a particular position.

A Sequence Step differs from an Execution Path:

- A Sequence Step defines a potential occurrence and permitted progression within a Test

Sequence
- An Execution Path identifies which Sequence Steps occurred and how progression actually proceeded during Test Execution

A Sequence Step can remain unperformed when:

- Test Execution follows another conditional branch
- A preceding Sequence Step fails
- A timeout causes error-handling progression
- Test Execution terminates before reaching the Sequence Step
- An authorized Actor cancels the Test Run

Multiple initial Sequence Steps can define parallel starting paths.

Multiple following Sequence Steps can define:

- Parallel progression
- Conditional progression
- Alternative progression
- Error-handling progression

The Test Sequence provides sufficient progression information to distinguish parallel progression from conditional or alternative progression.

A Test Result can reference both:

- The Sequenced Test Object whose performance produced the outcome
- The Sequence Step that identifies the particular occurrence of that Sequenced Test Object

This dual reference distinguishes Test Results produced by separate occurrences of the same Sequenced Test Object.

Example

A reusable Test Step submits a proposed transaction to a Node.

A Test Sequence contains three Sequence Steps that reference the same Test Step:

- Sequence Step `SS-01` supplies the Endpoint and identity of Node A
- Sequence Step `SS-02` supplies the Endpoint and identity of Node B
- Sequence Step `SS-03` supplies the Endpoint and identity of Node C

Each Sequence Step supplies occurrence-specific Test Argument Values while reusing the same Test Step.

During Test Execution, the Test Run records:

- Whether each Sequence Step occurred
- The Test Argument Values used for each occurrence
- The Starting Conditions applicable to each occurrence

- The Timing Conditions applicable to each occurrence
- The start time and completion time of each occurrence
- The Test Result produced by each occurrence
- The Verdict assigned to each Test Result
- The Execution Path followed
- The supporting Evidence

Although all three Sequence Steps reference the same Test Step, each Test Result remains traceable to the particular Node and Sequence Step that produced it.
