

ENV-005k — Observe Distributed Interactions

[Go to ENV-005 — Emulate Distributed Systems](#)

Statement

The [DIDO-TE](#) SHALL observe the distributed interactions specified by the applicable [Test Definition](#).

Derived From

- [ENV-005 — Emulate Distributed Systems](#)
- [ENV-005b — Emulate Participating Nodes](#)
- [ENV-005c — Emulate Communication Behaviour](#)
- [ENV-005f — Emulate Node Failures](#)
- [ENV-005g — Emulate Communication Failures](#)
- [ENV-005h — Emulate Network Partitions](#)
- [ENV-005i — Emulate Membership and Topology Changes](#)
- [ENV-005j — Emulate Recovery Behaviour](#)
- [\[DTE5\] DIDO-TE Requirements Register](#), source requirement identifier and obligation to be assigned
- [\[DTE6\] Structured Information Processing Reference Architecture \(SIP-RA\)](#)
- [\[DTE7\] Federated Data Interpretation Systems Reference Architecture \(FDIS-RA\)](#)

Rationale

A distributed-system assessment depends on observations collected from multiple participating [Nodes](#), communication paths, services, and Test Resources.

Relevant interactions include discovery, connection, request and response, publication and subscription, message transmission and receipt, acknowledgement, coordination, state replication, leadership changes, membership changes, failure detection, recovery, and termination.

Observations from a single Node may provide an incomplete or misleading account of a distributed interaction. The DIDO-TE therefore correlates observations across participating elements while preserving their identities, sources, times, sequence information, and relationship to the applicable Test Execution.

Observation must not alter the distributed behaviour under assessment beyond the interference limits specified by the Test Definition.

Applies To

- [Test Environment](#)

- [Test Definition](#)
- [Test Execution](#)
- [Test Object](#)
- [Node](#)
- [Test Resource](#)
- [Configuration](#)
- [Constraint](#)
- [Evidence](#)

Verification

Verification confirms that:

- The applicable Test Definition identifies each distributed interaction subject to observation.
- Each specified distributed interaction has a unique identity.
- The Test Definition identifies each participating Node, Test Resource, service, interface, and communication path associated with the interaction.
- The Test Definition specifies the events, messages, state transitions, measurements, conditions, and outcomes subject to observation.
- The Test Definition specifies the required observation points and observation sources.
- The Test Definition specifies the required timestamps, sequence information, identifiers, correlation values, and contextual information.
- The Test Definition specifies the required observation period, sampling criteria, resolution, accuracy, completeness, and permitted interference.
- The DIDO-TE establishes each required observation point before Test Execution.
- The DIDO-TE confirms that each observation point is operational before the applicable interaction begins.
- The DIDO-TE observes each specified interaction throughout its applicable period.
- Each observation identifies its source, affected Node or resource, applicable interface or communication path, and observation time.
- The DIDO-TE preserves available message, event, transaction, session, correlation, and causality identifiers.
- The DIDO-TE correlates observations from multiple Nodes, resources, services, and communication paths.
- The DIDO-TE distinguishes observed system interactions from actions introduced by the DIDO-TE.
- The DIDO-TE identifies missing, duplicate, conflicting, incomplete, late, or uncorrelated observations.
- The DIDO-TE identifies a required observation point that becomes unavailable during Test Execution.
- The DIDO-TE preserves the original observation values and records any normalisation, enrichment, ordering, or correlation applied to them.
- The DIDO-TE measures or assesses observation interference against the limits specified by the Test Definition.
- The DIDO-TE records distributed interactions, observation sources, timestamps, sequence information, correlation information, observed values, processing history, observation gaps, and detected deviations as [Evidence](#).
- The DIDO-TE maintains [Traceability](#) among each distributed interaction, participating element, observation, Test Definition, Test Execution, Evidence, and [Test Results](#).

- A missing, incomplete, inaccurate, incorrectly correlated, excessively intrusive, unsupported, or untraceable mandatory observation constitutes nonconformance with this requirement.

Verification includes:

- Inspection of the distributed interactions identified by the Test Definition
- Inspection of participating elements, observation points, observation sources, identifiers, timing criteria, and correlation criteria
- Confirmation that each required observation point operates before the applicable interaction begins
- Observation of interactions across multiple Nodes, services, Test Resources, and communication paths
- Comparison of observations collected at the sending and receiving sides of a communication path
- Correlation of requests and responses, publications and receptions, or other related interactions
- Observation of interactions during a Node failure, communication failure, network partition, topology change, or recovery, as applicable
- A negative assessment with a missing, duplicated, delayed, conflicting, or uncorrelated observation
- A negative assessment with an unavailable observation point
- Confirmation that original observations remain distinguishable from normalised, enriched, ordered, or correlated records
- Measurement or assessment of observation interference
- Confirmation that the DIDO-TE detects and records each observation deviation
- Inspection of distributed-interaction Evidence and Traceability records
- Confirmation that each mandatory observation deviation produces a nonconformance result

Referenced By

- [ENV-005l — Record Distributed-System Emulation](#)
- [ENV-005m — Validate Emulation Fidelity](#)

Related Architecture Sections

- Add links to the architecture sections governing observability, distributed interactions, observation points, event correlation, time synchronisation, Evidence collection, and Traceability.

Delivery Phase

Assign the applicable delivery phase.

Requirement Status

Draft

Statement Reference

Use the following syntax to reference this requirement's Statement section from another DokuWiki page:

```
{{section>dido:03-dido-te:99-annexes:annex-c-requirements:02-test-environment-requirements:env-005-emulate-distributed-systems:env-005k-observe-distributed-interactions#Statement&noheader&nofooter&noeditbtn}}
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