

NOD-001f — Define Node Lifecycle Behaviour

[Go to NOD-001 — Define a Node](#)

Statement

The [DIDO-TE](#) SHALL define the lifecycle behaviour of each [Node](#) within the applicable [Test Environment](#).

Derived From

- [NOD-001 — Define a Node](#)
- [\[DTE5\] 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 Node passes through identifiable states from creation or provisioning through initialisation, execution, suspension, recovery, termination, reset, and removal. Its lifecycle behaviour determines which activities and interactions remain valid in each state and how the Node responds to lifecycle commands, failures, and environmental changes.

A lifecycle definition identifies the permitted states, transitions, initiating events, preconditions, postconditions, time constraints, failure responses, and resulting observations. It provides the basis for controlling the Node and determining whether a lifecycle operation completed successfully.

Explicit lifecycle behaviour permits the DIDO-TE to coordinate multiple Nodes, establish a known initial state, exercise state-dependent behaviour, detect invalid transitions, recover from failures, and reproduce Test Executions.

Applies To

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

Verification

Verification confirms that:

- The Node Definition identifies each permitted lifecycle state.
- Each lifecycle state has a unique identity.
- The Node Definition defines the meaning and observable characteristics of each lifecycle state.
- The Node Definition identifies the initial state of the Node.
- The Node Definition identifies each permitted lifecycle transition.
- Each lifecycle transition identifies its source state and destination state.
- Each lifecycle transition identifies its initiating command, event, condition, or failure.
- Each lifecycle transition identifies its preconditions and postconditions.
- Each lifecycle transition identifies the required inputs, resources, interfaces, dependencies, and permissions.
- Each lifecycle transition identifies its expected outputs, state changes, and observable effects.
- The Node Definition identifies the transitions applicable to provisioning, configuration, initialisation, startup, readiness, execution, suspension, resumption, shutdown, termination, recovery, reset, restoration, and removal.
- The Node Definition identifies prohibited lifecycle transitions.
- The Node Definition identifies the Node response to an invalid or out-of-sequence lifecycle command.
- The Node Definition identifies applicable transition timing, timeout, retry, and completion criteria.
- The Node Definition identifies lifecycle operations that complete synchronously or asynchronously.
- The Node Definition identifies intermediate or transitional states material to lifecycle control.
- The Node Definition identifies lifecycle states in which each interface, function, resource, or interaction remains available.
- The Node Definition identifies the behaviour required when a transition fails or remains incomplete.
- The Node Definition identifies recovery, rollback, retry, forced-termination, and safe-state behaviour.
- The Node Definition identifies the persistence or disposal of Node state across each lifecycle transition.
- The Node Definition identifies the lifecycle observations and records required to determine the Node's actual state.
- The Node Definition identifies the lifecycle conditions material to interpreting Test Results.
- The DIDO-TE determines the actual lifecycle state of the Node before issuing a lifecycle command.
- The DIDO-TE detects an invalid, failed, incomplete, out-of-sequence, or timed-out lifecycle transition.
- The DIDO-TE records each requested and observed lifecycle transition during the applicable Test Execution.
- The DIDO-TE maintains [Traceability](#) among each lifecycle state, transition, initiating event, Node Definition, Test Definition, Test Execution, observation, exception, and resulting Evidence.
- An undefined, ambiguous, invalid, uncontrolled, unobservable, or untraceable mandatory lifecycle behaviour constitutes nonconformance with this requirement.

Verification includes:

- Inspection of the defined lifecycle states and transitions
- Inspection of transition triggers, preconditions, postconditions, timing, and completion criteria
- Confirmation that the initial state and terminal states are identified
- Confirmation that state-dependent interfaces and functions are identified
- Exercise of each mandatory lifecycle transition
- Exercise of applicable asynchronous and intermediate transitions
- A negative assessment involving an invalid lifecycle transition
- A negative assessment involving an out-of-sequence lifecycle command
- A negative assessment involving a failed or timed-out transition
- Confirmation of the specified retry, recovery, rollback, or safe-state behaviour
- Confirmation that the actual lifecycle state remains observable
- Inspection of lifecycle-command, state-transition, exception, Evidence, and Traceability records

Referenced By

- [NOD-002f — Establish the Node Initial State](#)

Related Architecture Sections

- Add links to the architecture sections governing Node lifecycle control, Node execution, initial-state management, recovery, reset, observation, and Evidence.

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:03-node-requirements:nod-001f-define-a-node:nod-001f-define-node-lifecycle-behaviour#Statement&noheader&nofooter&noeditbtn}}
```

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