

NOD-001e — Define Node Resource Requirements

[Go to NOD-001 — Define a Node](#)

Statement

The [DIDO-TE](#) SHALL define the resource requirements 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 consumes computing, storage, communication, timing, device, software, and environmental resources while performing its assigned role. The quantity, characteristics, availability, and allocation of these resources affect whether the Node starts, executes, communicates, responds within specified limits, and produces valid results.

A Node resource requirement identifies the resource characteristics needed during each applicable lifecycle state. It also identifies minimum, nominal, maximum, exclusive, shared, persistent, and temporary resource conditions.

Explicit resource requirements permit the DIDO-TE to provision suitable Test Environments, impose controlled resource limits, reproduce execution conditions, detect resource exhaustion, and distinguish resource-related effects from Node behaviour.

Applies To

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

Verification

Verification confirms that:

- Each Node resource requirement has a unique identity.
- The Node Definition identifies the purpose of each required resource.
- The Node Definition identifies each resource requirement as mandatory, conditional, or optional.
- The Node Definition identifies the applicable computing, memory, storage, network, device, timing, software, operating-system, middleware, and external-service resources.
- The Node Definition specifies the required resource type, quantity, capacity, performance, quality, location, and availability.
- The Node Definition specifies the minimum, nominal, and maximum values applicable to each controlled resource.
- The Node Definition identifies each resource as dedicated, exclusive, shared, reserved, limited, persistent, or temporary when the distinction affects Node behaviour.
- The Node Definition identifies the Node role, function, interface, or lifecycle state requiring each resource.
- The Node Definition identifies resource requirements applicable during provisioning, configuration, initialisation, execution, observation, shutdown, recovery, reset, and restoration.
- The Node Definition identifies resource-allocation priorities, quotas, reservations, affinities, and isolation constraints.
- The Node Definition identifies permissible resource variability and the applicable ranges or tolerances.
- The Node Definition identifies resource scaling conditions and limits.
- The Node Definition identifies expected Node behaviour when a required resource becomes constrained, degraded, exhausted, unavailable, or restored.
- The Node Definition identifies the observations required to measure resource allocation, availability, consumption, contention, exhaustion, and release.
- The Node Definition identifies the resource conditions material to interpreting Test Results.
- The Node Definition identifies resources requiring release, cleanup, or restoration after Node execution.
- The DIDO-TE verifies the availability and suitability of each mandatory resource before the applicable Node lifecycle activity.
- The DIDO-TE detects a missing, insufficient, incompatible, unavailable, or incorrectly allocated mandatory resource.
- The DIDO-TE records the resources allocated to and consumed by each Node during the applicable Test Execution.
- The DIDO-TE distinguishes a resource-related deviation from a failure or nonconformance of the Node.
- The DIDO-TE maintains [Traceability](#) among each resource requirement, allocated Test Resource, Node Definition, Test Environment, Test Definition, Test Execution, resource observation, and resulting Evidence.
- An undefined, unavailable, insufficient, incompatible, uncontrolled, or untraceable mandatory resource constitutes nonconformance with this requirement.

Verification includes:

- Inspection of each Node resource requirement
- Inspection of resource types, quantities, capacities, limits, lifecycle applicability, and allocation

constraints

- Comparison of required resources with the resources available in the Test Environment
- Confirmation that mandatory, conditional, and optional resource requirements remain distinguishable
- Confirmation that resource tolerances and permitted variability are specified
- Execution with the nominal resource allocation
- Execution with the specified minimum resource allocation
- Execution at an applicable maximum resource limit
- A negative assessment involving an unavailable mandatory resource
- A negative assessment involving an insufficient or incompatible resource
- Controlled reduction or exhaustion of an applicable resource
- Confirmation that the DIDO-TE detects resource contention and exhaustion
- Confirmation that the DIDO-TE distinguishes resource-related effects from Node behaviour
- Inspection of resource-allocation, consumption, release, Evidence, and Traceability records

Referenced By

- [NOD-002d — Allocate Node Resources](#)

Related Architecture Sections

- Add links to the architecture sections governing Test Resources, resource allocation, resource control, Node provisioning, Test Environment configuration, 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-001-define-a-node:nod-001e-define-node-resource-requirements#Statement&noheader&nofooter&noeditbtn}}
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