

Resource Consumption

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Discussion

Resource Consumption is an [Evaluation Characteristic](#) concerning the amount of one or more [Resources](#) used by a subject while performing specified activities under specified conditions.

Resource Consumption can apply to:

- A [Candidate Solution](#)
- A [Distributed System](#)
- A [Node](#)
- A [Node Set](#)
- A service
- A software component
- A hardware component
- A process
- A [Test Run](#)
- Another subject using Resources

Resources subject to measurement can include:

- Processor capacity
- Memory
- Storage
- Network capacity
- Energy
- Execution Facilities
- Deployment Targets
- Operational Resources
- Human effort
- Time
- Another Resource established by the [Acceptance Criteria](#)

Resource Consumption can identify:

- The evaluated subject
- The measured Resource
- The specified activity
- The applicable workload
- The applicable [Test Environment](#)
- The applicable [Configuration](#)
- The measurement starting event
- The measurement completion event
- The measurement interval
- The measurement method

- The measurement unit
- The required measurement precision
- The permitted exclusions
- The permitted tolerance
- The applicable normalization method
- The applicable reference value
- The applicable DIDO [Baseline](#)
- The applicable [Validation Criteria](#)
- The applicable Acceptance Criteria
- Its [Evidence](#)
- Its [Provenance](#)
- Its [Traceability](#)

Resource Consumption can be expressed as:

- Total Resource use
- Average Resource use
- Minimum Resource use
- Maximum Resource use
- Resource use per operation
- Resource use per transaction
- Resource use per unit of time
- Resource use per Test Run
- Resource use per User
- Resource use per Node
- Resource use per unit of completed work
- Another normalized or aggregate value

Definition

[Evaluation Characteristic](#) concerning the amount of one or more [Resources](#) used by a subject while performing specified activities under specified conditions

Source

Adapted from:

- [ISO/IEC 25010:2023, Systems and software Quality Requirements and Evaluation \(SQuaRE\) — Product quality model](#)
- [ISO/IEC 25023:2016, Systems and software Quality Requirements and Evaluation \(SQuaRE\) — Measurement of system and software product quality](#)
- [Evaluation Characteristic](#)
- [Resource](#)
- [Performance Efficiency](#)
- DIDO Reference Implementation Conceptual Model
- DIDO-TE draft Requirements Register

ISO/IEC 25010 includes resource utilization within its product-quality model, and ISO/IEC 25023 provides related system and software-product quality measures.

This definition introduces Resource Consumption as a general DIDO Evaluation Characteristic for recording and comparing measured Resource use.

Note

Resource Consumption differs from [Resource](#):

- A Resource is an asset available for use
- Resource Consumption identifies the amount of a Resource used

Resource Consumption differs from Resource allocation:

- Resource allocation identifies the amount of a Resource made available
- Resource Consumption identifies the amount actually used

A subject can consume less than its allocated Resources.

Resource Consumption differs from [Performance Efficiency](#):

- Resource Consumption identifies the amount of Resources used
- Performance Efficiency relates performance to Resource use under specified conditions

Lower Resource Consumption does not necessarily indicate greater Performance Efficiency if the subject also completes less work or provides lower performance.

Resource Consumption must identify the measured Resource. A requirement stating only that a subject **shall minimize Resource Consumption** is not objectively verifiable.

The applicable Acceptance Criteria should identify:

- The Resource measured
- The activity performed
- The workload
- The measurement conditions
- The measurement interval
- The measurement unit
- The required precision
- The permitted exclusions
- The normalization method
- The applicable comparison rule

Specialized Resource Consumption characteristics can include:

- Storage Consumption
- Energy Consumption
- Processor Consumption
- Memory Consumption
- Network Consumption

A specialized Resource Consumption characteristic should retain Traceability to Resource Consumption.

Example

DIDO-TE evaluates three Candidate Solutions using the same Test Definition, Test Environment, Configuration, and transaction workload.

For each Candidate Solution, DIDO-TE measures:

- Processor time
- Memory use
- Storage use
- Network traffic
- Energy use

DIDO-TE records total, average, maximum, and per-transaction Resource Consumption.

The comparative evaluation uses the normalized measurements to identify differences among the Candidate Solutions.

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