

TWIN-003 — Configure a Twin Relationship

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TWIN-003 is a non-leaf requirement group governing the [Configuration](#) of the relationship between a [Twin Identity](#), its associated [Twin Realizations](#), and the information used to represent the twin.

The Configuration identifies the characteristics represented by the twin, the information exchanged or observed, eligible information sources, communication characteristics, synchronization parameters, and the criteria governing correspondence between Twin Realizations.

A Twin Relationship Configuration establishes the semantic and operational conditions under which a Twin Realization participates in distributed verification and testing. Communication technologies, including [DDS](#), may realize portions of this Configuration but do not independently establish the semantic relationship among the participating Twin Realizations.

A Twin Realization may receive compatible information from more than one publisher or other information source. The applicable Configuration identifies which sources are eligible and the conditions governing their use. DDS discovery, Topic matching, or Quality of Service matching does not, by itself, establish the semantic authority of a source.

Conformance is assessed against the individual leaf requirements listed below. TWIN-003 does not establish a separate conformance obligation.

Requirements

Requirement ID	Requirement Title	Purpose
TWIN-003a	Identify Represented Twin Characteristics	Identify the state, behavior, Configuration, communication, or other characteristics represented by the twin relationship.
TWIN-003b	Configure Twin Data Mappings	Define the correspondence between information associated with the Twin Realizations.
TWIN-003c	Identify Eligible Twin Data Sources	Identify the information sources permitted to contribute data to the twin relationship.
TWIN-003d	Configure Twin Source Selection	Define the criteria used when more than one eligible source provides applicable information.
TWIN-003e	Configure Twin Communication Parameters	Define communication parameters applicable to information exchanged within the twin relationship.
TWIN-003f	Configure Twin Quality of Service	Define applicable Quality of Service characteristics for the twin relationship.
TWIN-003g	Configure Twin Synchronization Parameters	Define the parameters governing synchronization among Twin Realizations.
TWIN-003h	Configure Twin Fidelity Criteria	Define the criteria used to determine the required correspondence between Twin Realizations.

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Source

- [\[DTE1\] U.S. Patent Application US20220237111A1](#), virtual and physical Twin Node concepts, shared Twin Node identity, modification of Twin Nodes, and comparison of resulting behavior
- [\[DTE2\] Non-Traditional BAA Submission](#), Digital Twin concepts and F17, *Twin Nodes Selection*
- [\[DTE9\] Distributed Immutable Data Object Reference Architecture \(DIDO-RA\)](#), Appendix A, *Digital Twin*, DDS publish-subscribe concepts, and DDS Quality of Service concepts

Rationale

A [Twin Identity](#) establishes which logical twin is represented, and an association identifies the [Twin Realizations](#) participating in that identity. These relationships do not, by themselves, specify which characteristics or information participate in the twin relationship.

The Twin Relationship Configuration establishes the information and operational parameters required to interpret, observe, synchronize, simulate, select, and compare Twin Realizations consistently.

Separating semantic Configuration from the communication mechanism prevents DDS discovery, Topic matching, Quality of Service matching, network addressing, or another implementation mechanism from silently determining the meaning or authority of a Twin Relationship.

This separation also permits the [DIDO-TE](#) to support multiple eligible publishers or information sources while retaining explicit control over which sources and data participate in a particular Twin Relationship.

Applies To

- [DIDO-TE](#)
- [Twin Identity](#)

- [Twin Identifier](#)
- [Twin Realization](#)
- [Twin Realization Identifier](#)
- [Twin Realization Type](#)
- [Twin Node](#)
- [Configuration](#)
- [DDS](#)
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Traceability

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ConOps Relationship

This requirement group supports ConOps activities that configure a Twin Relationship before a Twin Realization is selected, observed, synchronized, simulated, or used in a Test Execution.

Delivery Phase

TBD

Requirement Status

Draft

Notes for Editors

TWIN-003 is a non-leaf requirement group and does not contain an independent normative Statement or Verification section.

The explicit links under Contents remain while the subordinate requirement pages are being created and reviewed. After all child pages exist, the explicit links may be removed because the `indexmenu`

automatically discovers them.

Keep the requirements in this group technology-independent. DDS Topics, publishers, subscribers, DataWriters, DataReaders, and Quality of Service policies may realize portions of the Twin Relationship Configuration but do not define the semantic Twin Relationship by themselves.

Do not treat the receipt of technically compatible data as evidence that the source is semantically eligible or authoritative for the Twin Relationship.

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