

TWIN-010 — Control Twin Interaction

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TWIN-010 is a non-leaf requirement group governing interactions among [Twin Realizations](#) and between a Twin Realization and another entity participating in a [Twin Relationship](#).

A Twin Relationship does not, by itself, grant a Twin Realization authority to modify another Twin Realization, a corresponding [Node](#), or another [Resource](#).

Interaction control establishes which interactions are permitted, the permitted direction of those interactions, and the authority required for interactions that change state.

Communication connectivity, DDS discovery, Topic matching, [Quality of Service](#) compatibility, or possession of a technically usable interface does not establish permission to perform an interaction.

Conformance is assessed against the individual leaf requirements listed below. TWIN-010 does not establish a separate conformance obligation.

Requirements

Requirement ID	Requirement Title	Purpose
TWIN-010a	Identify Permitted Twin Interactions	Identify the interactions permitted for a Twin Relationship.
TWIN-010b	Specify Twin Interaction Direction	Specify the permitted direction of each configured interaction.
TWIN-010c	Require Authorization for State-Changing Interactions	Require authorization for permitted interactions that change the state of a Twin Realization, Node, or Resource.
TWIN-010d	Prevent Unauthorized State-Changing Interactions	Prevent execution of state-changing interactions that lack authorization.
TWIN-010e	Reject Prohibited Twin Interactions	Reject interactions that are not permitted by the governing Configuration.

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Source

- [\[DTE1\] U.S. Patent Application US20220237111A1](#), virtual and physical Twin Node concepts, modification of Twin Nodes, comparison of results, and validation
- [\[DTE2\] Non-Traditional BAA Submission](#), Digital Twin concepts, monitoring, scenario testing, integration, and Twin Nodes Selection
- [\[DTE9\] Distributed Immutable Data Object Reference Architecture \(DIDO-RA\)](#), Digital Twin, distributed data, DDS publish-subscribe, and Quality of Service concepts

Rationale

A [Twin Relationship](#) establishes a semantic relationship among one or more [Twin Realizations](#). That relationship may support observation, information exchange, synchronization, simulation, or other interactions.

The existence of a Twin Relationship does not imply that every participating entity may initiate every possible interaction. In particular, the ability to observe or receive information from another entity does not imply authority to change that entity's state.

Explicit interaction control separates semantic relationships and communication capabilities from authorization to act.

Interaction direction also requires explicit control. A relationship may permit information to flow from one entity to another without permitting the reverse interaction, or it may permit different interactions in each direction.

State-changing interactions require stronger control because they can alter the conditions under which Test Execution, synchronization, comparison, or Validation occurs.

Technical connectivity, middleware discovery, Topic matching, API availability, or compatible Quality of Service characteristics do not override the interaction permissions established by the governing [Configuration](#).

Applies To

- [DIDO-TE](#)
- [Twin Identity](#)
- [Twin Relationship](#)
- [Twin Realization](#)
- [Node](#)
- [Resource](#)
- [Configuration](#)
- [Data Source](#)
- [Communication Parameter](#)
- [Quality of Service](#)
- [DDS](#)
- [Test Definition](#)

- [Test Execution](#)

Traceability

- [C.3.3 Twin Node Requirements](#)
- [TWIN-010a — Identify Permitted Twin Interactions](#)
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ConOps Relationship

This requirement group supports controlled interaction among Twin Realizations and other entities participating in testing.

The governing Configuration establishes permitted interactions and their direction before those interactions occur. State-changing interactions additionally require authorization before execution.

Interaction control applies independently of the communication mechanism used to realize the interaction.

Delivery Phase

TBD

Requirement Status

Draft

Notes for Editors

TWIN-010 is a non-leaf requirement group and does not contain an independent normative Statement or Verification section.

The explicit child links under Contents remain while the subordinate requirement pages are being created and reviewed. After all child pages exist, you may remove the explicit links because the indexmenu automatically discovers them.

Do not infer authority to modify a corresponding Node, Twin Realization, or Resource from the existence of a Twin Relationship.

Do not infer interaction permission from technical connectivity, DDS discovery, Topic matching, API availability, or Quality of Service compatibility.

TWIN-010 governs permission and control of interaction. Communication Configuration remains governed by TWIN-003e, Quality of Service Configuration by TWIN-003f, synchronization by TWIN-006, and general Security requirements by C.4.

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