

Digital Twin

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Discussion

A Digital Twin provides a digital representation of a referent whose relevant state, behavior, [Configuration](#), and lifecycle characteristics are represented through controlled data.

The referent may be a physical asset, software component, process, system, or other identifiable subject. The relationship between the referent and its Digital Twin supports observation, simulation, comparison, prediction, synchronization, or controlled interaction according to the applicable purpose and requirements.

The DIDO Reference Architecture describes a Digital Twin in terms of a real-world item, a software representation, and the data linking the two. It also identifies simulation, predictive modeling, state monitoring, and response to observed state as Digital Twin uses. [\[DTE9\]](#), Appendix A, *Digital Twin*.

Within DIDO Solutions architectures, the concept is generalized so that the referent may be physical, virtual, logical, or software-defined.

Definition

a digital representation of an identifiable referent whose applicable state, behavior, configuration, or lifecycle characteristics are related to the referent through controlled data

Source

- [\[DTE9\]](#), Appendix A, *Digital Twin*
- DIDO Solutions normalization of the DIDO Reference Architecture concept for physical, virtual, logical, and software-defined referents

Note

A Digital Twin does not require representation of every characteristic of its referent. The applicable purpose, requirements, or Configuration identify the characteristics participating in the twin relationship.

A Digital Twin does not imply bidirectional control. Observation, synchronization, simulation, comparison, and control are distinct capabilities requiring explicit architectural treatment.

The data relating a Digital Twin to its referent forms part of the twin relationship. Communication mechanisms transport this data but do not, by themselves, establish its semantic meaning, authority,

or required fidelity.

Example

A Digital Twin of a deployed service represents selected Configuration, operational state, observed inputs and outputs, resource conditions, and behavior for comparison with expected or simulated behavior.

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