

Distributed Environment

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Discussion

A Distributed Environment is an [Infrastructure Environment](#) whose components, resources, services, or operational functions span multiple networked [Nodes](#) or locations.

The distribution can involve:

- Compute resources
- Storage resources
- Network resources
- Software components
- Services
- Data
- Processing
- Management functions
- Operational responsibilities

The participating Nodes or locations cooperate to provide the behavior of the environment.

A Distributed Environment can span multiple:

- Geographic locations
- Data centers
- Cloud regions
- Edge locations
- Network zones
- [Deployment Targets](#)
- [Security Domains](#)
- Connected, disconnected, or intermittently connected network segments

A Distributed Environment differs from a [Distributed System](#):

- A Distributed Environment describes the infrastructure, resources, services, and operational context distributed across Nodes or locations
- A Distributed System describes coordinated system behavior allocated across multiple networked Nodes

A Distributed Environment can host one or more Centralized Systems, Distributed Systems, or combinations of both.

A Distributed Environment also differs from a [Distributed Network Topology](#):

- A Distributed Environment describes the complete operational environment
- A Distributed Network Topology describes the arrangement and interconnection of its network Nodes

A Distributed Environment can operate under **Centralized Management** even though its resources and functions remain distributed.

Definition

infrastructure environment whose components, resources, services, or operational functions span multiple networked **Nodes** or locations

Source

- DIDO Reference Architecture, Network Topology Taxonomy
- Dido Solutions, Inc. and Jackrabbit Consulting, Inc.

Note

A Distributed Environment does not require:

- Every Node to perform the same function
- Every Node to hold the same data
- Direct communication between every pair of Nodes
- Equal authority among Nodes
- One specific network topology
- One specific management model

The governing architecture determines:

- Node roles
- Resource allocation
- Service placement
- Data placement
- Communication paths
- Management authority
- Security boundaries
- Failure-handling behavior
- Connectivity requirements

Physical separation alone does not establish a Distributed Environment. The separated components, resources, services, or operational functions form one environment through defined relationships and coordinated operation.

The term does not prescribe cloud computing, peer-to-peer communication, consensus algorithms, distributed ledgers, containers, virtual machines, or a particular network protocol.

Example

An Infrastructure Environment contains compute resources in two data centers, storage resources in a cloud region, and validation services at an edge location.

The resources and services cooperate as one managed environment. [Crucible](#) performs Centralized Management of the Distributed Environment while its infrastructure remains distributed across the participating locations.

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