



# **Network architecture**

## **ONTAP 9**

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# Table of Contents

- Network architecture ..... 1
  - Network architecture overview ..... 1
  - Logical ports ..... 1
  - Support for industry-standard network technologies ..... 2

# Network architecture

## Network architecture overview

The network architecture for an ONTAP datacenter implementation typically consists of a cluster interconnect, a management network for cluster administration, and a data network. NICs (network interface cards) provide physical ports for Ethernet connections. HBAs (host bus adapters) provide physical ports for FC connections.



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## Logical ports

In addition to the physical ports provided on each node, you can use *logical ports* to manage network traffic. Logical ports are interface groups or VLANs.

### Interface groups

*Interface groups* combine multiple physical ports into a single logical “trunk port.” You might want to create an interface group consisting of ports from NICs in different PCI slots to ensure against a slot failure bringing down business-critical traffic.

An interface group can be single-mode, multimode, or dynamic multimode. Each mode offers differing levels of fault tolerance. You can use either type of multimode interface group to load-balance network traffic.

### VLANs

VLANs separate traffic from a network port (which could be an interface group) into logical segments defined on a switch port basis, rather than on physical boundaries. The *end-stations* belonging to a VLAN are related

by function or application.

You might group end-stations by department, such as Engineering and Marketing, or by project, such as release1 and release2. Because physical proximity of the end-stations is irrelevant in a VLAN, the end-stations can be geographically remote.



*You can use VLANs to segregate traffic by department.*

## Support for industry-standard network technologies

ONTAP supports all major industry-standard network technologies. Key technologies include IPspaces, DNS load balancing, and SNMP traps.

Broadcast domains, failover groups, and subnets are described in [NAS path failover](#).

### IPspaces

You can use an *IPspace* to create a distinct IP address space for each virtual data server in a cluster. Doing so enables clients in administratively separate network domains to access cluster data while using overlapping IP addresses from the same IP address subnet range.

A service provider, for example, could configure different IPspaces for tenants using the same IP addresses to access a cluster.

## DNS load balancing

You can use *DNS load balancing* to distribute user network traffic across available ports. A DNS server dynamically selects a network interface for traffic based on the number of clients that are mounted on the interface.

## SNMP traps

You can use *SNMP traps* to check periodically for operational thresholds or failures. SNMP traps capture system monitoring information sent asynchronously from an SNMP agent to an SNMP manager.

### ***FIPS compliance***

ONTAP is compliant with the Federal Information Processing Standards (FIPS) 140-2 for all SSL connections. You can turn on and off SSL FIPS mode, set SSL protocols globally, and turn off any weak ciphers such as RC4.

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