



# Protocol endpoints

## Element Software

NetApp  
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# Protocol endpoints

Protocol endpoints are access points used by a host to address storage on a cluster running NetApp Element software. Protocol endpoints cannot be deleted or modified by a user, are not associated with an account, and cannot be added to a volume access group.

A cluster running Element software automatically creates one protocol endpoint per storage node in the cluster. For example, a six-node storage cluster has six protocol endpoints that are mapped to each ESXi host. Protocol endpoints are dynamically managed by Element software and are created, moved, or removed as needed without any intervention. Protocol endpoints are the target for multi-pathing and act as an I/O proxy for subsidiary LUNs. Each protocol endpoint consumes an available SCSI address, just like a standard iSCSI target. Protocol endpoints appear as a single-block (512-byte) storage device in the vSphere client, but this storage device is not available to be formatted or used as storage.

iSCSI is the only supported protocol. Fibre Channel protocol is not supported.

## Protocol endpoints details

The Protocol Endpoints page on the VVols tab provides protocol endpoint information.

- **Primary Provider ID**

The ID of the primary protocol endpoint provider.

- **Secondary Provider ID**

The ID of the secondary protocol endpoint provider.

- **Protocol Endpoint ID**

The UUID of the protocol endpoint.

- **Protocol Endpoint State**

The status of the protocol endpoint. Possible values are as follows:

- Active: The protocol endpoint is in use.
- Start: The protocol endpoint is starting.
- Failover: The protocol endpoint has failed over.
- Reserved: The protocol endpoint is reserved.

- **Provider Type**

The type of the protocol endpoint's provider. Possible values are as follows:

- Primary
- Secondary

- **SCSI NAA Device ID**

The globally unique SCSI device identifier for the protocol endpoint in NAA IEEE Registered Extended

Format.

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