



# Create a cluster supporting FIPS drives

## Element Software

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# Create a cluster supporting FIPS drives

Security is becoming increasingly critical for the deployment of solutions in many customer environments. Federal Information Processing Standards (FIPS) are standards for computer security and interoperability. FIPS 140-2 certified encryption for data at rest is a component of the overall security solution.

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## Avoid mixing nodes for FIPS drives

To prepare for enabling the FIPS drives feature, you should avoid mixing nodes where some are FIPS drives capable and some are not.

A cluster is considered FIPS drives compliant based on the following conditions:

- All drives are certified as FIPS drives.
- All nodes are FIPS drives nodes.
- Encryption at Rest (EAR) is enabled.
- The FIPS drives feature is enabled. All drives and nodes must be FIPS capable and Encryption at Rest must be enabled in order to enable the FIPS drive feature.

## Enable encryption at rest

You can enable and disable cluster-wide encryption at rest. This feature is not enabled by default. To support FIPS drives, you must enable encryption at rest.

1. In the NetApp Element software UI, click **Cluster > Settings**.
2. Click **Enable Encryption at Rest**.

### Find more information

- [Enable and disable encryption for a cluster](#)
- [SolidFire and Element Software Documentation](#)
- [NetApp Element Plug-in for vCenter Server](#)

## Identify whether nodes are ready for the FIPS drives feature

You should check to see if all nodes in the storage cluster are ready to support FIPS

drives by using the NetApp Element software GetFipsReport API method.

The resulting report shows one of the following statuses:

- None: Node is not capable of supporting the FIPS drives feature.
- Partial: Node is FIPS capable, but not all drives are FIPS drives.
- Ready: Node is FIPS capable and all drives are FIPS drives or no drives are present.

### Steps

1. Using the Element API, check to see if the nodes and drives in the storage cluster are capable of FIPS drives by entering:

```
GetFipsReport
```

2. Review the results, noting any nodes that did not display a status of Ready.
3. For any nodes that did not display a Ready status, check to see if the drive is capable of supporting the FIPS drives feature:

- Using the Element API, enter: `GetHardwareList`
- Note the value of the **DriveEncryptionCapabilityType**. If it is "fips," the hardware can support the FIPS drives feature.

See details about `GetFipsReport` or `ListDriveHardware` in the [Element API Reference](#).

4. If the drive cannot support the FIPS drives feature, replace the hardware with FIPS hardware (either node or drives).

### Find more information

- [SolidFire and Element Software Documentation](#)
- [NetApp Element Plug-in for vCenter Server](#)

## Enable the FIPS drives feature

You can enable the FIPS drives feature by using the NetApp Element software `EnableFeature` API method.

Encryption at Rest must be enabled on the cluster and all nodes and drives must be FIPS capable, as indicated when the `GetFipsReport` displays a Ready status for all nodes.

### Step

1. Using the Element API, enable FIPS on all drives by entering:

```
EnableFeature params: FipsDrives
```

### Find more information

- [Manage storage with the Element API](#)
- [SolidFire and Element Software Documentation](#)

- [NetApp Element Plug-in for vCenter Server](#)

## Check the FIPS drive status

You can check whether the FIPS drives feature is enabled on the cluster by using the NetApp Element software `GetFeatureStatus` API method, which shows whether the FIPS Drives Enabled Status is true or false.

1. Using the Element API, check the FIPS drives feature on the cluster by entering:

```
GetFeatureStatus
```

2. Review the results of the `GetFeatureStatus` API call. If the FIPS Drives enabled value is `True`, the FIPS drives feature is enabled.

```
{ "enabled": true,  
  "feature": "FipsDrives"  
}
```

### Find more information

- [Manage storage with the Element API](#)
- [SolidFire and Element Software Documentation](#)
- [NetApp Element Plug-in for vCenter Server](#)

## Troubleshoot the FIPS drive feature

Using the NetApp Element software UI, you can view alerts for information about cluster faults or errors in the system related to the FIPS drives feature.

1. Using the Element UI, select **Reporting > Alerts**.
2. Look for cluster faults including:
  - FIPS drives mismatched
  - FIPS drives out of compliance
3. For resolution suggestions, see Cluster Fault code information.

### Find more information

- [Cluster fault codes](#)
- [Manage storage with the Element API](#)
- [SolidFire and Element Software Documentation](#)
- [NetApp Element Plug-in for vCenter Server](#)

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