



Create a cluster supporting FIPS drives

Element Software

NetApp
June 10, 2024

Table of Contents

- Create a cluster supporting FIPS drives 1
 - Avoid mixing nodes for FIPS drives 1
 - Enable encryption at rest 1
 - Identify whether nodes are ready for the FIPS drives feature 1
 - Enable the FIPS drives feature 2
 - Check the FIPS drive status 3
 - Troubleshoot the FIPS drive feature 3

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.

- [Avoid mixing nodes for FIPS drives](#)
- [Enable encryption at rest](#)
- [Identify whether nodes are ready for the FIPS drives feature](#)
- [Enable the FIPS drives feature](#)
- [Check the FIPS drive status](#)
- [Troubleshoot the FIPS drive feature](#)

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](#)

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.