

# NetApp SolidFire Return to Factory Install (RTFI) Configuration Guide

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# Table of Contents

<b>Introduction</b> .....	<b>1</b>
<b>Deployment and Installation Options</b> .....	<b>2</b>
<b>RTFI Process Overview</b> .....	<b>3</b>
<b>Performing the RTFI Process</b> .....	<b>4</b>
<b>RTFI Options Menu</b> .....	<b>5</b>
Uploading Logs .....	5
Using the Support Tunnel .....	6
<b>Contacting NetApp SolidFire Active Support</b> .....	<b>7</b>

# Introduction

NetApp SolidFire storage systems use the Return To Factory Install (RTFI) process to write a software image to a new node or restore a node to its factory original state. The RTFI process securely erases all existing data and configurations (if any) and installs an unconfigured Element OS image. The RTFI process is available for all SolidFire nodes and can also be used on pre-validated hardware configurations that offer Element X support.

SolidFire systems use one RTFI process for all Element OS installations. This includes internal manual installations performed by developers, automatic installations by automated test framework, field installations by service engineers and customers, and installations performed by various integrators and partners. The same RTFI process is used on all SolidFire nodes and nodes that support Element X, regardless of the chassis or node type in use, to automatically fix any issues.

The intended audience for this guide is integrators who install, configure, use, or troubleshoot storage-related issues.

- **Linux:** You have some background with Linux systems.
- **Networking:** You have a familiarity with server networking and networked storage, including IP addresses, netmasks, and gateways.

**CAUTION:** The RTFI process is data destructive and securely erases all data and configuration details from the node and installs a new operating system. Ensure that the node used for the RTFI process is not active as part of a cluster.

## Deployment and Installation Options

The RTFI process uses a bootable, installable media with a completely self-contained, minimalistic Linux OS to deploy Element OS on a node. You can download the RTFI ISO image specific to your Element OS version from the NetApp SolidFire support [FTP site](#).

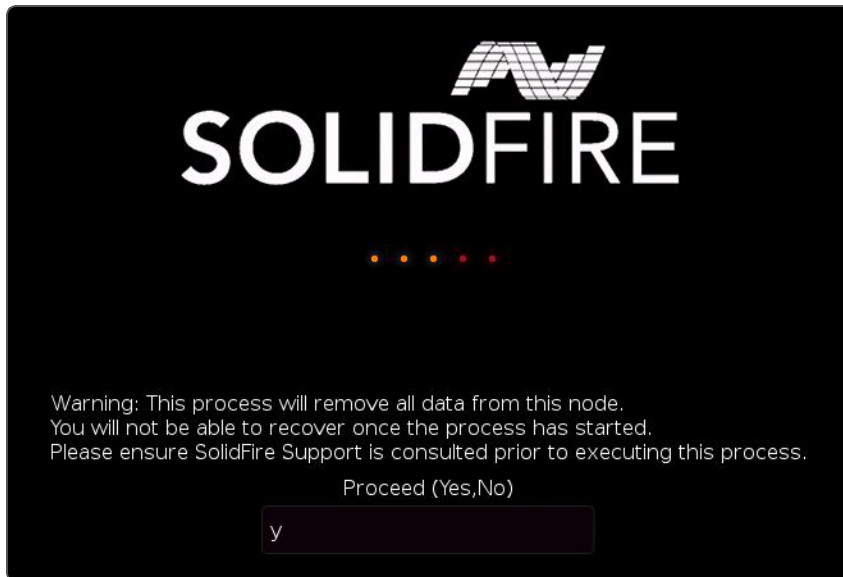
Once you have downloaded the RTFI ISO image, you can deploy it according to one of the following commonly used methods:

- Physical USB key: You can write a bootable Element OS ISO to a USB key using a tool such as [UNetbootin](#). Insert the USB key with the ISO into the node and boot from the USB key.
- Virtual media via iDRAC: You can use iDRAC (or its equivalent) to dynamically attach to the ISO located on your client system. The ISO is made available to the host OS as a virtual drive (CD/DVD).
- Network boot via PXE/TFTP/FTP: Instead of manually unpacking an ISO image, you can use `autoofs` to automatically extract an image when the RTFI process requests it. This deployment mechanism requires more initial setup but allows for proper automation and scalability of installation.

## RTFI Process Overview

You can begin the Return To Factory Install (RTFI) process by interacting with the node through text console prompts that appear before the system boots.

**CAUTION:** The RTFI process is data destructive and securely erases all data and configuration details from the node and installs a new operating system. Ensure that the node used for the RTFI process is not active as part of a cluster.



The RTFI process performs the following high-level operations:

1. Starts the installation after user confirmation and validates the image.
2. Unlocks all drives on a node.
3. Validates and flashes firmware.
4. Checks hardware.
5. Tests hardware.
6. Securely erases all selected drives.
7. Partitions root drive and creates file systems.
8. Mounts and unpacks image.
9. Configures host name, networking (DHCP), default cluster configuration, and GRUB bootloader.
10. Stops all services, collects logs, and reboots.

To configure your node once the RTFI process has successfully completed, see the *NetApp SolidFire Element OS User Guide*. Once a node has successfully completed the RTFI process, it transitions to the *available* (unconfigured) state by default.

# Performing the RTFI Process

Follow these steps to restore the Element OS software on your SolidFire node or alternative node that supports Element X.

## Prerequisites

- Access to a console for the SolidFire node or alternative node with Element X support.
- The node on which you will perform the RTFI process is powered up and connected to a network.
- The node on which you will perform the RTFI process is not part of an active cluster.
- Access to bootable installation media that contains the image of the relevant Element OS version for your configuration.
- Contact NetApp SolidFire Support at [ng-SF-Support@netapp.com](mailto:ng-SF-Support@netapp.com) if you have any concerns before performing the RTFI process.

## Procedure

1. Boot the node from the bootable installation media that contains the Element OS image for your configuration.

**NOTE:** If you are booting from a USB key, the node may automatically boot from the USB key with no intervention. If it does not, reboot the node and perform the following steps at the beginning of the boot sequence:

1. When prompted, press **F11** early in the boot process to open the Boot Manager.
2. Once the Boot Manager appears, select the **BIOS Boot Menu** option (on some systems, this may be called **One-shot BIOS Boot Menu**).
3. Select the **Disk connected to back USB** option from the menu.

2. Start the RTFI process from the console.

The RTFI image Element OS name and version number appears.

3. At the initial prompt, you are notified that the process will remove all data from the node and that data is not recoverable once the process has begun. Type **Yes** to begin.

**CAUTION:** All data and configuration details will be permanently erased from the node once the process is initiated. If you elect not to proceed, you will be directed to the RTFI Options Menu. See [RTFI Options Menu](#).

**NOTE:** If you want to watch the console during the RTFI process, you can press the **ALT+F8** keys to toggle to the verbose mode console. Press **ALT+F7** to return to the primary GUI.

4. Type **no** when prompted to perform extensive hardware tests unless you have a reason to suspect hardware failure or are directed to perform the tests by NetApp SolidFire support.

A message indicates that the RTFI process has finished. The system powers off.

5. Remove all bootable installation media, if necessary, after the node powers off.

The node is now ready to be powered on and configured. See the *NetApp SolidFire Element Setup Guide* for the configuration procedure for a storage node.

If you encountered an error message during the RTFI process, see [RTFI Options Menu](#).

## RTFI Options Menu

The following options menu appears if the RTFI process is unsuccessful or if you elect not to proceed at the initial RTFI process prompt.



**NOTE:** Contact NetApp SolidFire Support before using any of the following command options.

Option	Description
Reboot	Exits the RTFI process and reboots the node in its current state. No cleanup is performed.
PowerOff	Gracefully powers off the node in its current state. No cleanup is performed.
Exit	Exits the RTFI process and opens a command prompt.
UploadLogs	Collects all logs on the system and uploads a single consolidated log archive to a specified URL.
OpenSupportTunnel	Opens a reverse SSH connection with <i>sfsupport.solidfire.com</i> .
CloseSupportTunnel	Closes the reverse SSH connection with the remote support server.
ShowSupportTunnel	Displays information about the support tunnel connection.
Init	Restarts the RTFI process without rebooting the node.

## Uploading Logs

Collect all logs on the system and upload them to a specified URL according to the following procedure.

### Procedure

1. Type **UploadLogs** at the RTFI options menu prompt.
2. Enter the remote directory information.
  - a. Type a URL that includes the protocol. For example: `ftp://`, `scp://`, `http://`, or `https://`.
  - b. (Optional) Add an embedded user name and password. For example: `scp://user:password@URLaddress.com`.

**NOTE:** For a full range of syntax options, see the [cURL](#) user manual.



The log file is uploaded and saved to the specified directory as a .tbz2 archive.

## Using the Support Tunnel

Open and close a reverse SSH connection with NetApp SolidFire Support according to the following procedure.

### Prerequisites

Contact NetApp SolidFire Support for a user name, password, and port.

### Procedure

1. Type `OpenSupportTunnel` at the RTFI options menu prompt.
2. When prompted, enter the user name, password, and port provided by NetApp SolidFire Support.
3. After successful connection with the server, the process identifier (PID), user name, host name, and port used by the connection are displayed in the terminal. Press any key to return to the RTFI options menu.
4. After the session is complete, type `CloseSupportTunnel` to close the connection with the NetApp SolidFire support server and end remote access.

## Contacting NetApp SolidFire Active Support

If you have any questions or comments about NetApp SolidFire documents or products in general, contact NetApp SolidFire [support](#) or email [ng-SF-Support@netapp.com](mailto:ng-SF-Support@netapp.com).



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