



## **Avere Quick Start Guide**

Avere Systems, Inc.  
910 River Avenue  
Pittsburgh, PA 15212 USA  
1-412-635-7170  
[www.averesystems.com](http://www.averesystems.com)

Part number 0451-001-0171, Rev G (electronic)  
Part number 0451-001-0191, Rev G (printed)  
2014-Jan-13

## Copyright Information

Copyright © 2009-2013 Avere Systems, Inc. All rights reserved. Specifications subject to change without notice.

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.

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

## Trademark Information

Adobe and Flash are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Apple, Bonjour, and Safari are trademarks of Apple Inc., registered in the U.S. and other countries.

Google and Google Chrome are trademarks of Google Inc.

Intel is a trademark of Intel Corp. in the U.S. and other countries.

Linux is the registered trademark of Linus Torvalds in the U.S. and other countries.

Microsoft, Active Directory, Windows, Windows NT, and Internet Explorer are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Mozilla and Firefox are registered trademarks of the Mozilla Foundation.

NetApp and Data ONTAP are registered trademarks of NetApp, Inc., in the U.S. and other countries.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

VMware is a registered trademark or trademark of VMware, Inc. in the United States and/or other jurisdictions.

For licensing information on the third-party software used by the Avere product, see the *Third-Party Licenses Reference*.

## Table of Contents

Chapter 1. Setup Overview .....	1
1.1. Highlights Used in This Document .....	1
1.2. Environmental Requirements .....	2
1.3. Preparing to Configure a Cluster .....	2
1.4. IP Address Distribution .....	3
Chapter 2. Powering On and Configuring FXT Nodes .....	5
2.1. Configuring the First Node .....	5
2.1.1. Turn on the Node, Verify Network Connectivity, and Log Into the Node .....	5
2.1.2. Create the Cluster .....	6
2.1.3. Log Into the New Cluster and Set the Time Information .....	10
2.1.4. Apply an Export Policy .....	11
2.2. Configuring Other Nodes in the Cluster .....	12
2.3. Configuring High Availability .....	13
2.4. Configuring DNS for the Avere System .....	17
2.5. Other Optional Software Features .....	18
2.6. Verifying the Installation .....	18
2.7. Logging Into the Cluster .....	19
Chapter 3. Allowing Client Access to the Cluster .....	21
3.1. About Cache Policies and Maximum Writeback Delay .....	21
3.2. Setting the Writeback Delay .....	22
Chapter 4. Managing the Avere Cluster .....	23
4.1. Monitoring Conditions and Alerts .....	23
4.1.1. Severity .....	23
4.1.2. Managing Conditions and Alerts .....	24
4.2. Additional Documentation .....	25
4.3. Troubleshooting .....	25
4.4. Contacting Avere Global Services .....	26
Index .....	27



# Chapter 1. Setup Overview

Avere edge filer clusters and software provide a high-performance interface that accelerates client access to one or more network-attached storage (NAS) servers (*core filers*).

Avere NAS optimization consists of the Avere OS software running on one or more FXT Series *nodes* (physical servers); nodes that run together in an Avere configuration are referred to as an *edge filer*, or cluster. The performance of the cluster scales nearly linearly with each node added to the cluster.

Avere OS caches those files being actively accessed and retains those files on high-performance nodes in the cluster, circumventing the operational overhead of sending each read and write request to the core filer's disks. FXT Series nodes are backed by NVRAM to ensure that changed data is eventually written to the core filer even in the event of a system outage. High availability, or *HA*, can be enabled to provide additional protection in the event of a system outage.

This document describes setting up a cluster that includes one or more FXT Series nodes. It assumes that the core filers have already been installed in an equipment rack, as described in the *FXT Series Installation Guide*. The core filer must use NFSv3; Avere OS does not currently support NFSv2 or NFSv4.

The following additional components are required to complete a basic Avere cluster installation:

- Sufficient Ethernet network ports to which to connect the FXT Series nodes. The required number of ports varies depending on the number of FXT Series nodes and whether your network is 1GbE or 10GbE.
- One or more NFSv3 client computers to connect to the Avere cluster.
- A standards-compliant browser that can access the management IP address on the cluster's network. For the following browsers, Avere supports the most three versions: Mozilla Firefox®, Google® Chrome, and Apple Safari®. Microsoft Internet Explorer® versions 8 and higher are supported. The browser must have JavaScript enabled.

If your browser supports the DNS Service Discovery (DNS-SD or Bonjour®) protocol, either through a plug-in, or in the case of Apple Safari, natively, you can use it to discover Avere clusters without needing to know machine names or IP addresses. The browser's workstation must run on the same subnet as the cluster's management interface.

For information on requirements and components for an advanced Avere cluster configuration, refer to the *Daily Operations Guide*.

## 1.1. Highlights Used in This Document



### Important

An **Important** highlight indicates situations that could cause incorrect operation of the Avere OS or node, potentially leading to loss of data.



### Note

A **Note** presents commentary, sidelights, or interesting points of information.

## 1.2. Environmental Requirements

**Table 1.1. Environmental requirements for the FXT Series platform**

Description	Specification
Operating temperature	10° to 35° C (50° to 95° F), sea level
Non-operating temperature	-40° to 70° C (-40° to 158° F)
Operating relative humidity	8% to 90% (noncondensing)
Non-operating relative humidity	5% to 95% (noncondensing)
Operating elevation	0 to 3,048 m (0 to 10,000 ft.)  Ambient temperature is specified at sea level. For altitudes above sea level, derate 1.0° C per 305 m, or 1.8° F per 1,000 ft., above sea level. The maximum derated altitude is 3,048 m or 10,000 ft.

## 1.3. Preparing to Configure a Cluster

The Avere cluster requires the following information for its initial configuration.

Note that the requirements include a management IP, two optional IP addresses, and two sets of IP addresses.

- Administrative password that you want to set for the cluster.
- Name that you want to assign to the cluster.
- Optionally, a prefix for node names; for example, `avere_nas`.
- Optionally, an initial number for node numbering.
- A single IP address for cluster management.
- The netmask for the cluster.
- The default router for the cluster.
- Optional, but strongly recommended: The IP address of a DNS server for the cluster. This is required if the connection to the core filer is not specified as an IP address.
- Optional, but strongly recommended: The name of the DNS domain for the cluster. This is required if the connection to the core filer is not specified as an IP address.
- Optional, but strongly recommended: The name or IP address for either one, or for three or more, NTP servers.
- Whether you want to enable IEEE 802.1AX-2008 link aggregation on the cluster's interfaces.
- If you are enabling link aggregation, whether to use IEEE 802.3ad (LACP) dynamic aggregation.
- The first and last IP addresses in a contiguous range of IP addresses for cluster (internode) communication.

- The name that you want to assign to the cluster's first virtual server (vserver).
- The name or IP address of the cluster's first core filer.



### Note

Avere strongly recommends using the core filer's fully qualified domain name (FQDN); for example, `nas1.example.com`, not `nas1` or `127.98.12.1`, for the following reasons:

- Using an FQDN instead of a shortened name prevents the possibility of name-resolution conflicts.
- Using an FQDN instead of an IP address ensures that all available ports on the core filer are used. Specifying an IP address limits the bandwidth between the core filer and the cluster to the bandwidth of the port on which the IP address is located unless the IP address is a link aggregate.

Specifying an FQDN instead of an IP address requires that you specify a DNS server and domain when configuring the cluster.

- The first and last IP addresses in a contiguous range of IP addresses for client connections to the cluster.

## 1.4. IP Address Distribution

Two ranges of IP addresses are required to configure an FXT cluster, one for cluster communication and one for client communication. The cluster uses these addresses in the following ways:

- Cluster addresses are used to communicate among nodes and with the core filer. A best practice is to allocate one IP address per physical port used for cluster communication on each FXT Series node. The cluster automatically assigns the addresses in the specified range to individual nodes.
- Client-facing addresses are used by clients to access the core filer through the Avere cluster. These addresses are used, for example, in `mount` commands from NFS clients. A best practice is to allocate one IP address per physical port used for client communication on each FXT Series node.

The cluster distributes the client-facing IP addresses across its constituent nodes as evenly as possible. For simplicity, many sites use a single DNS name to assist in the even distribution of requests across the address range. This setup also enables all clients to use the same `mount` command to access the Avere cluster. See Section 2.4, “Configuring DNS for the Avere System” on page 17 for information about configuring DNS to work with an Avere cluster.

The cluster uses a single management IP address to provide access to the Avere Control Panel.





# Chapter 2. Powering On and Configuring FXT Nodes

This section describes powering on the FXT Series nodes and performing initial configuration.

## 2.1. Configuring the First Node

To configure the first node, follow this general procedure:

1. Turn on the power, verify connectivity, and log into the node. (Section 2.1.1, “Turn on the Node, Verify Network Connectivity, and Log Into the Node” on page 5)
2. Either create the cluster from an XML configuration file (if you have one), or by filling in the appropriate fields. (Section 2.1.2, “Create the Cluster” on page 6)
3. Login to the edge filer (the cluster) and set the time information for the cluster. (Section 2.1.3, “Log Into the New Cluster and Set the Time Information” on page 10)
4. If you are using exports to control client access to data through the cluster, apply an export policy. (Section 2.1.4, “Apply an Export Policy” on page 11)

### 2.1.1. Turn on the Node, Verify Network Connectivity, and Log Into the Node



#### Note

If you hear any audible alarms, verify that both power supply units for the FXT Series node are properly connected to a power source, and that they are both fully seated in the node.

➤ To turn on and log into the node:

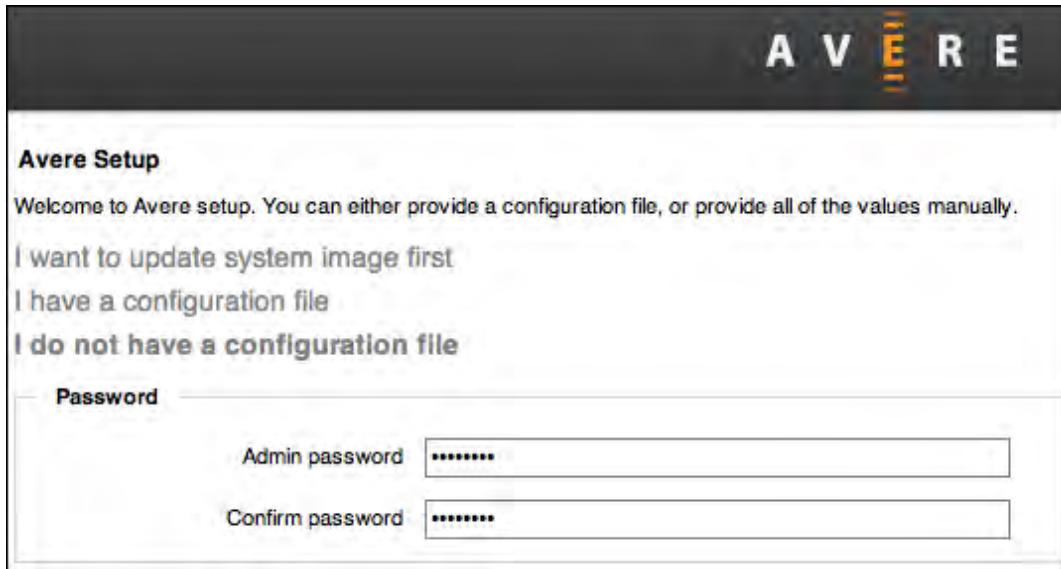
1. Press the node’s power button.
2. Verify network connectivity of the node by checking the link LEDs on the network switch to which you attached it. Refer to the *FXT Series Installation Guide* for more information about the LEDs.
3. Determine the IP address of the node by one of the following methods:
  - If you are using a browser that supports the DNS-SD (Bonjour) protocol, look in the bookmarks for a page called **Avere Cluster Management: Unconfigured Node *node\_name***.
  - If you are not using a browser that supports DNS-SD, obtain the node’s address from your DNS server’s logs.
4. In a Web browser, go to `https://node_IP_address/fxt`, where *node\_IP\_address* is the IP address of the highest-number address defined in the previous step. The Avere Control Panel Login page is displayed.



#### Note

If your browser first prompts you to accept an SSL certificate from the Avere system, accept the certificate.

A page appears, allowing you to create the cluster.

The screenshot shows the 'Avere Setup' web interface. At the top is a dark header with the 'AVERE' logo in white. Below the header, the page title is 'Avere Setup'. A welcome message states: 'Welcome to Avere setup. You can either provide a configuration file, or provide all of the values manually.' There are three radio button options: 'I want to update system image first', 'I have a configuration file', and 'I do not have a configuration file'. The 'I do not have a configuration file' option is selected. Below these options is a 'Password' section with two input fields: 'Admin password' and 'Confirm password', both containing masked characters (dots).

## 2.1.2. Create the Cluster

There are two options for entering cluster settings, depending on whether you have a configuration file.

➤ If you have received an XML file from Avere Global Services with the cluster configuration predefined:

1. Click **I have a configuration file**.
2. In the **Configuration file** field, click **Choose File** and browse to the configuration file's location.
3. Click **Create cluster from config file**. The Avere Control Panel displays the following message:

The FXT node is now creating the cluster. This will take several minutes.  
When the cluster is created, visit [this link](#) to complete the configuration.

The Avere system changes IP addresses to those specified during the configuration process, including the IP address of the management interface.

➤ If you do *not* have the cluster configuration predefined in an XML file:

1. Click **I do not have a configuration file**.

2. Fill in the following fields:

- **Admin password:** Enter an administrative password of your choice for the Avere cluster. The password can be of arbitrary length and can include all ASCII characters that are not control characters.
- **Confirm password:** Reenter the password you entered in the preceding field.
- **Cluster name:** Enter a name for the Avere cluster.



The image shows a 'Cluster Settings' form. It contains three text input fields: 'Cluster name' with the value 'company\_cluster', 'Node Name Prefix (optional)' with the value 'company-', and 'First Node Number (optional)' with the value '001'. Each field has a question mark icon to its left. Below these fields is a checkbox labeled 'Allow unconfigured FXT nodes to join this cluster', which is currently unchecked.

Node names are automatically assigned as each node joins a cluster. The names are generally of the form `nodepartial_UUID`.

➤ To customize the node naming scheme:

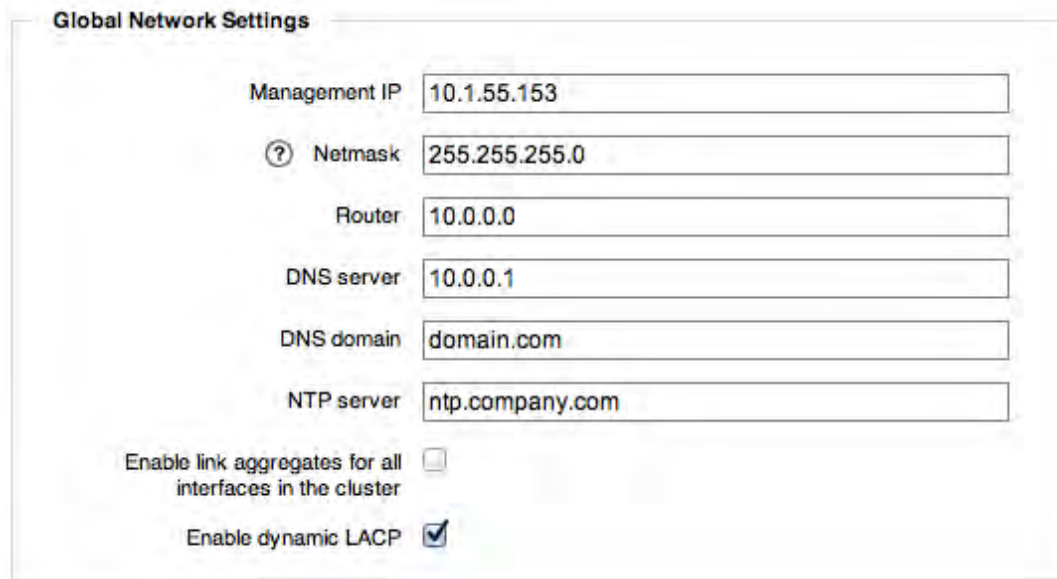
- a. In the **Node Prefix** field, enter a prefix for all nodes. For example, if you want all FXT nodes to be named `tiered_number`, enter `tiered_` in the field.

You can optionally specify trailing pound signs (#) to indicate placeholder digits. For example, if you enter `tiered_###` in the field, nodes are named `tiered_001`, `tiered_002`, `tiered_010`, and so forth, instead of `tiered_1`, `tiered_2`, and `tiered_10`.

- b. In the **First Node Number** field, optionally enter the number for the first node in the cluster. Additional nodes in the cluster are numbered sequentially from the specified number. For example, if you specify 10 as the first node number with the prefix `tiered_###`, nodes are named `tiered_010`, `tiered_011`, `tiered_012`, and so forth.

- **Allow unconfigured FXT nodes to join this cluster:** If you select this checkbox, any unconfigured nodes on the network automatically join the cluster. You can also add nodes manually after the initial creation of the cluster, as described in Section 2.2, “Configuring Other Nodes in the Cluster” on page 12.

- **Management IP:** Enter the IP address of the cluster's management interface. This is the interface through which you access the Avere Control Panel.



The image shows a screenshot of a web form titled "Global Network Settings". The form contains several input fields and two checkboxes. The fields are labeled "Management IP", "Netmask", "Router", "DNS server", "DNS domain", and "NTP server". The values entered in these fields are "10.1.55.153", "255.255.255.0", "10.0.0.0", "10.0.0.1", "domain.com", and "ntp.company.com" respectively. There is a question mark icon next to the "Netmask" label. At the bottom, there are two checkboxes: "Enable link aggregates for all interfaces in the cluster" (unchecked) and "Enable dynamic LACP" (checked).

Field	Value
Management IP	10.1.55.153
Netmask	255.255.255.0
Router	10.0.0.0
DNS server	10.0.0.1
DNS domain	domain.com
NTP server	ntp.company.com

Enable link aggregates for all interfaces in the cluster ☐

Enable dynamic LACP ☒

- **Netmask:** Enter the netmask for the management interface.
- **Router:** Enter the default gateway address.
- **DNS server:** Optionally, enter the IP address of your DNS server.
- **DNS domain:** Optionally, enter the name of your DNS domain.
- **NTP server:** Optionally, enter the name or IP address of an NTP server. Use of NTP is optional but strongly recommended, as discussed in Step 6 on page 10.
- **Enable link aggregates for all interfaces in the cluster:** Select this checkbox if your network uses link aggregation.
- **Enable dynamic LACP:** Select this checkbox if your network uses LACP (*Link Aggregation Control Protocol*) dynamic aggregates. LACP is an Ethernet protocol that allows the bundling of several ports.

- **Cluster IP addresses:** These are the addresses used for cluster (internode) communication as described in Section 1.4, “IP Address Distribution” on page 3. Enter the first IP address in the assigned range in the **First IP** field and the last IP address in the range in the **Last IP** field.

The screenshot shows a configuration window with two main sections. The top section, titled "Cluster IP addresses", contains three input fields: "First IP" with the value "10.12.55.105", "Last IP" with the value "10.12.55.110", and "Number of IPs in Range" with the value "6". The bottom section, titled "Vserver Settings", contains five input fields: "Vserver Type" with a dropdown menu showing "Simple Namespace", "VServer Name", "Core Filer Name/IP", "First Client IP" (with a help icon), and "Last Client IP". Below these fields is a label "Number of IPs in Range" with a hyphen "-" next to it. At the bottom of the window, there is a text note: "CIFS access and high availability (HA) are not configured on this page. You can configure these features after the initial creation of the cluster." and a "Create cluster" button.

- **VServer Type:** The Avere OS vservers/core filer architecture gives you the ability to create a global namespace; that is, client access through a single vserver to the data on multiple core filers.



#### Note

Before implementing a global namespace, it is important to consider the file and directory layout you want to present to clients. Although the namespace can be modified after its creation, this can cause later confusion.

If you are not yet set up to use a global namespace, choose **Simple Namespace** from the drop-down list.

- **VServer Name:** The name for the cluster’s initial virtual server (vserver). Clients access the data on one more core filers by accessing the vserver. If you do not give it a name, it will be called `vserver1`.
- **Core Filer Name/IP:** The network name or IP address of the core filer whose data the vserver is to make available to clients.



#### Important

As noted in Section 1.3, “Preparing to Configure a Cluster” on page 2, it is strongly recommended that you use a fully qualified domain name (FQDN) to specify the core filer.



#### Note

In versions of Avere OS prior to 2.0, you specified a write mode, now known as *caching policy*, when creating the vserver. As of Avere OS 2.0, all vservers are created in read-only

mode, and you can change the caching policy after the vserver's creation. See the *Daily Operations Guide* for information.

- **Client-facing IP addresses:** Enter information for the range of IP addresses that clients will use to access the cluster. Enter the first IP address in the assigned range in the **First IP** field and the last IP address in the assigned range in the **Last IP** field.
3. Click **Create cluster** after you have entered all applicable information. The Avere Control Panel displays the following message:

The FXT node is now creating the cluster. This will take several minutes. When the cluster is created, visit [this link](#) to complete the configuration.

The Avere system changes IP addresses to those specified during the configuration process, including the IP address of the management interface.

### 2.1.3. Log Into the New Cluster and Set the Time Information

➤ To set the time information:

1. After a few minutes, click the link to go to the new management interface.
2. The Avere system generates a new SSL certificate for authentication. If prompted by your browser, accept the new certificate.
3. When the cluster is configured, log back in with the administrative ID **admin** and the password you provided during cluster configuration.
4. From the Avere Control Panel, navigate to the **Settings > Cluster > Administrative Network** page.
5. Select the correct timezone for the cluster from the **Timezone** drop-down list.



#### Important

It is strongly recommended that you use NTP in your cluster. Not using NTP can result in inconsistent timestamps, potentially causing files to appear as if they have gone forward or backward in time.

It is recommended that you use either one NTP server or three or more NTP servers. Using two NTP servers can result in time synchronization failures, inconsistent timestamps, and out-of-order file operations.

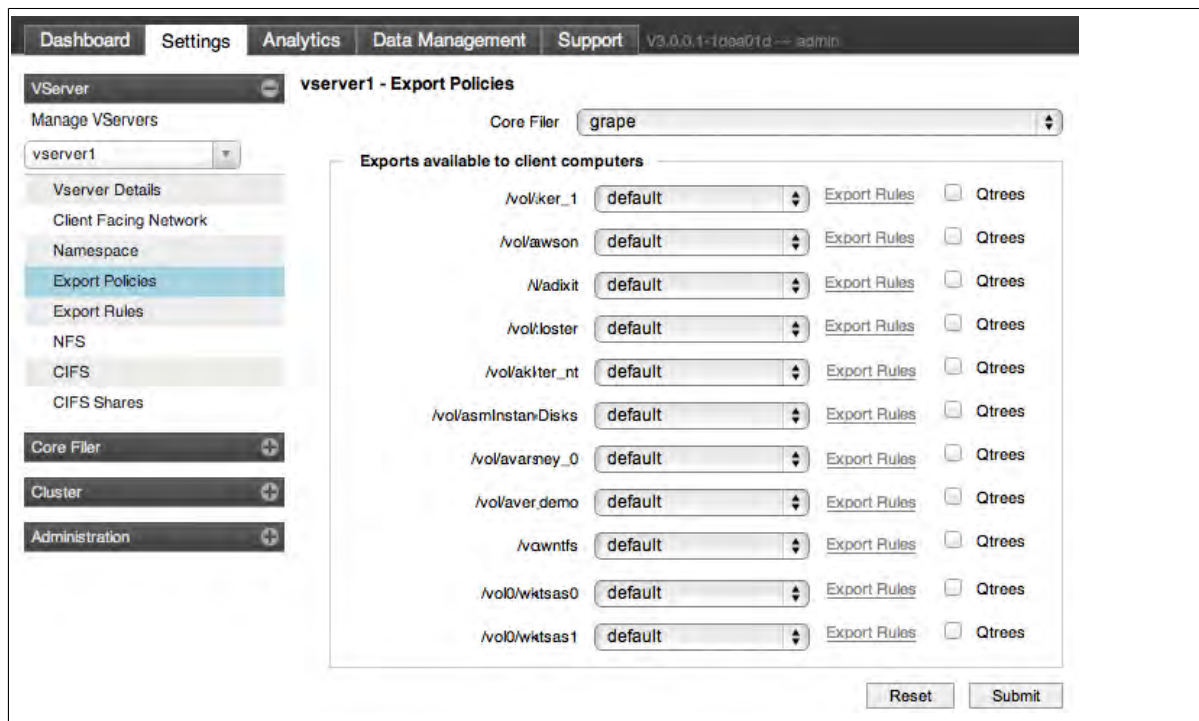
6. Enter one or more NTP servers (DNS names or IP addresses) in the **NTP servers** field. Enter multiple servers as a comma-separated list.
7. If your site uses multicast/broadcast NTP, select the **Use multicast servers** checkbox.
8. If you made any changes, click the **Submit** button.

## 2.1.4. Apply an Export Policy

If you are using exports to control client access to data through the cluster, you will need to apply an export policy.

➤ To apply an export policy:

1. Navigate to the **Settings > VServer > Export Policies** page.
2. Select the vserver that will be exporting the filesystem.
3. Select the core filer that holds the files for the filesystem. The page is populated by the exports available on that core filer.



The screenshot shows the 'VServer - Export Policies' configuration page. The 'Core Filer' is set to 'grape'. The page lists 14 exports available to client computers, each with a drop-down menu for selecting an export policy. The default policy is 'default'. The page also includes a 'Reset' button and a 'Submit' button.

Export Path	Export Policy	Export Rules	Qtrees
/vol/ker_1	default	Export Rules	<input type="checkbox"/>
/vol/awson	default	Export Rules	<input type="checkbox"/>
/vol/dixit	default	Export Rules	<input type="checkbox"/>
/vol/loster	default	Export Rules	<input type="checkbox"/>
/vol/akhter_nt	default	Export Rules	<input type="checkbox"/>
/vol/asminstanDisks	default	Export Rules	<input type="checkbox"/>
/vol/avarney_0	default	Export Rules	<input type="checkbox"/>
/vol/aver_demo	default	Export Rules	<input type="checkbox"/>
/vol/wnts	default	Export Rules	<input type="checkbox"/>
/vol/wktsas0	default	Export Rules	<input type="checkbox"/>
/vol/wktsas1	default	Export Rules	<input type="checkbox"/>

4. For each listed export, select the appropriate export policy from its drop-down list. The default export policy is named **default**; it provides full access to the export.
5. Choose **Submit** to commit any changes.



### Note

You can view the rules in an export policy by clicking the grey **Export Policy** link next to the export. This will take you to the **Export Rules** page for that policy.

➤ To view and manage export policies and rules, navigate to the **Settings > VServers > Export Rules** page.

To display information about an export policy, select it from the **Policy** drop-down list. The Avere Control Panel displays a page with the export policy rules, as described in Section 2.5.1, “Creating or Modifying Export Rules” of the *Daily Operations Guide*.



### Caution

If you share an NFS export through CIFS, do not change the export policy or rules on the NFS export after setting up sharing. Doing so can result in unpredictable access to the export through

CIFS and possible unauthorized access to data. See the *Daily Operations Guide* for information about managing export policies.

## 2.2. Configuring Other Nodes in the Cluster

Configure additional nodes in the Avere cluster from the node with the management IP address.

➤ To configure the other nodes:

1. In a Web browser, go to `https://mgmt_IP_address/fxt`, where *mgmt\_IP\_address* is the IP address defined on page 8. The Avere Control Panel **Login** page is displayed.

If you are using a browser that supports Bonjour, look in the bookmark toolbar for a link called **Bonjour > Webpages > Avere Cluster Management:cluster\_name\_Cluster**.

2. Log into the cluster with the administrative ID and the password you provided during cluster configuration. The Avere Control Panel's **Dashboard** tab is displayed.
3. Power on any additional nodes, and verify their network connectivity by checking the link LEDs on the network switch to which the nodes are connected.
4. Add the remaining nodes to the cluster in one of the following two ways:

➤ To allow unjoined nodes to join the cluster automatically:

- a. From the Avere Control Panel, navigate to the **Settings > Cluster > General Setup** page.
- b. Select **Allow unconfigured FXT nodes to join this cluster**.
- c. Click **Change cluster parameters**.

Unconfigured nodes on the network automatically join the cluster.

➤ To add unjoined nodes to the cluster manually:

- a. From the Avere Control Panel, navigate to the **Settings > Cluster > FXT Nodes** page. A table displays the list of unconfigured FXT nodes.
- b. For each node that you want to join the cluster, click **Allow to join** at the end of the row of the node's table listing.



## 2.3. Configuring High Availability

*High availability* (HA) provides continuity of data service in the event of a node outage. It provides coherence of the working set and protection of all client-written data in addition to the interface failover provided by the cluster in both HA and non-HA configurations.

High availability requires a cluster of two or more nodes, and requires a data repository on the core filer, but does not require any special configuration beyond enabling it. When you enable high availability, nodes in the cluster automatically configure and optimize themselves for HA.

In a cluster with multiple virtual servers, enabling HA for the cluster automatically enables HA for all virtual servers as well. You cannot enable HA for only a subset of a cluster's virtual servers.

Before configuring HA, you need to specify an export and directory on the core filer where the cluster can store configuration files.



### Important

You must create an Avere data export and directory to be used as a data repository, as described in Section 2.1.4, “Apply an Export Policy” on page 11, before enabling high availability. If you create an Avere-dedicated export, ensure that only the FXT Series edge filers (that is, the cluster IP addresses) have read/write and root access to it. It is strongly recommended that no non-Avere data be stored on the export.

*You cannot select the “Enable HA” checkbox until you specify and submit the data export and directory.*

Do not allow the directory on the export run out of space for the Avere files. If the cluster cannot read and write to the directory, HA services can fail. The directory on the core filer must be 15 GB or larger.

➤ To enable high availability:

1. Navigate to the **Settings > Cluster > High Availability** page. The appearance of this page will depend on which version of the Avere OS you are using.

**Table 2.1. Setting Up High Availability on 3.0xx Avere OS Versions**

The screenshot displays the 'High Availability' configuration page in the Avere OS interface. The top navigation bar includes 'Dashboard', 'Settings', 'Analytics', 'Data Management', and 'Support'. The left sidebar lists various settings categories, with 'High Availability' selected under the 'Cluster' section. The main content area is titled 'High Availability' and contains the following elements:

- Enable HA:** A checkbox that is currently unchecked.
- Protect 2-node cluster using MASS to store state info:** A checkbox that is checked.
- Data Parameters:** A section with a red warning message: 'Important: You must set these parameters before enabling High Availability. You cannot change them while HA is enabled.'
- MASS:** A dropdown menu with 'thor' selected.
- HA data export:** A dropdown menu with '/vol0/lbarr' selected.
- HA data directory:** A text input field containing '.avere'.
- Buttons:** 'Unset', 'Revert', and 'Submit' buttons are located at the bottom right of the configuration area.

**Table 2.2. Setting Up High Availability on 2.1xx Avere OS Versions**

2. For **Avere OS 3.0xx versions**, select **Protect 2-node cluster using core filer to store state info**.

This option, for two-node clusters, allows cluster data to be stored on the core filer if one node fails. You can select this even if the cluster has more than two nodes, and it will then be enabled even if nodes are removed and the cluster falls to two nodes.

If you do not select this option, the cluster will *not* use a core filer as its data repository, which will use more of the cluster's own total drive capacity.

3. For **Avere OS 2.1xx versions**, select **vserver1**, or the name you gave the initial vserver when you created the cluster, from the **VServer** drop-down list. If you have multiple vservers, see the *Daily Operations Guide* for information.
4. From the **Core filer** drop-down list, choose the core filer on which the repository is to reside. This is the cluster's name for the core filer (not necessarily the network name for the core filer). In a GNS configuration, the selected vserver and core filer must be associated with each other. For more information, refer to Section 4.4, "Creating and Maintaining a Global Namespace" of the *Daily Operations Guide*.



#### **Note**

When selecting a core filer for the HA data repository, choose a high-capacity, high-performance core filer with a reliable network connection to the Avere cluster.

5. From the **HA data export** drop-down list, select an NFS export on the core filer to which the cluster can write configuration files. If you created an Avere-dedicated export but do not see it in the list of exports, refresh the page.

6. In the **HA data directory** field, enter the name of a directory on the selected export to which the cluster can write configuration files. The default is `.avere`. It is strongly recommended that you accept the default value for the directory name.

**Note**

- You cannot enter an empty string for the directory name.
- Do not create the directory by using the **mkdir** command or a similar utility; the cluster creates the directory itself.

7. For **Avere OS 2.1xx versions**, select **Allow Cluster Data Manager to use MASS**.
8. Verify the export and directory information.
9. Click **Submit** (for Avere OS 3.0xx) or **Set Avere data parameters** (for Avere OS 2.1xx).
10. Select **Enable HA**, and click **Save**.

**Note**

Avere strongly recommends that you do not change the export and directory for the Avere files after you specify them. Refer to Section 2.6.3, “Unsetting the HA Export and Directory” for information on unsetting the export and directory for the data repository.

## 2.4. Configuring DNS for the Avere System

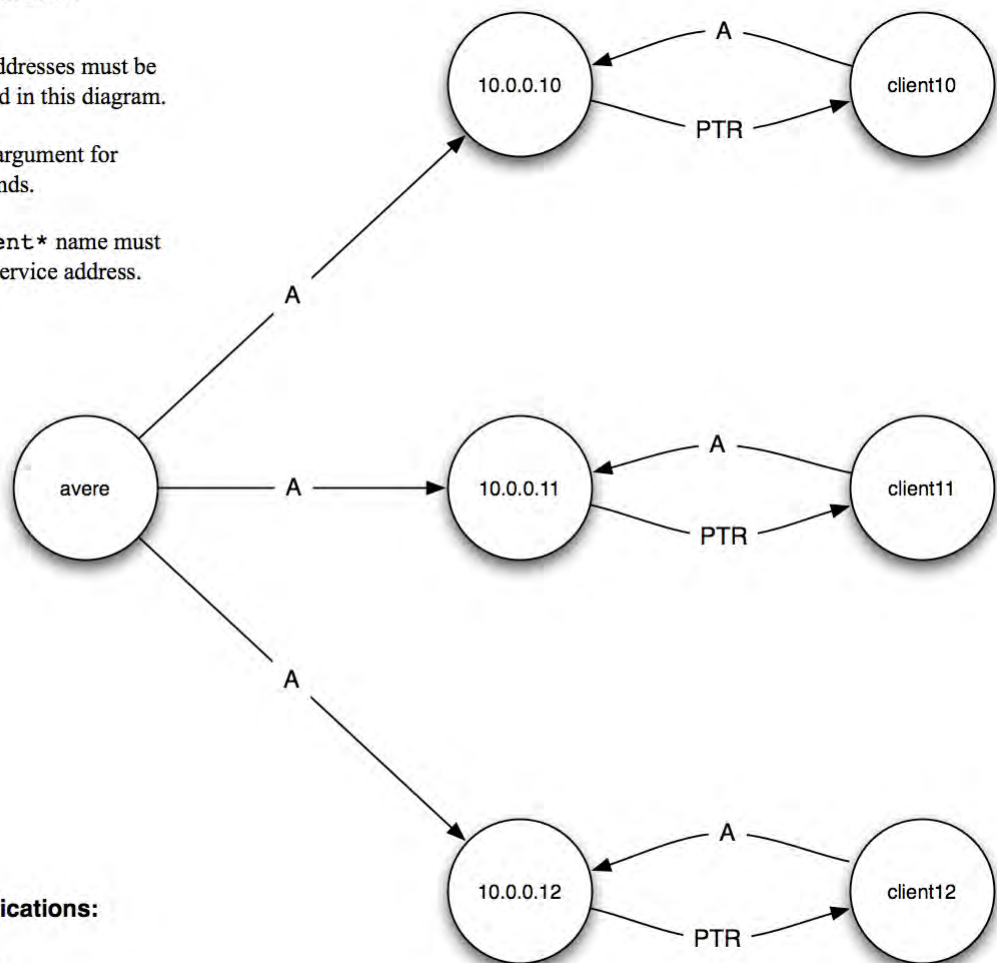
For optimal performance, client-facing Avere addresses must be configured as shown in the following figure.

### Avere DNS Configuration

Avere client-facing addresses must be configured as depicted in this diagram.

**avere** is the server argument for client **mount** commands.

An internal-use **client\*** name must exist for each Avere service address.



### named.conf modifications:

```
options {
    rrset-order {
        class IN A name "avere.example.com" order cyclic;
    };
};
```

The following **nsupdate** commands provide an example of configuring DNS correctly:

```
update add avere.example.com. 86400 A 10.0.0.10
update add avere.example.com. 86400 A 10.0.0.11
update add avere.example.com. 86400 A 10.0.0.12

update add client10.example.com. 86400 A 10.0.0.10
update add client11.example.com. 86400 A 10.0.0.11
update add client12.example.com. 86400 A 10.0.0.12

update add 10.0.0.10.in-addr.arpa. 86400 PTR client10.example.com.
update add 11.0.0.10.in-addr.arpa. 86400 PTR client11.example.com.
update add 12.0.0.10.in-addr.arpa. 86400 PTR client12.example.com.
```

## 2.5. Other Optional Software Features

See the *Daily Operations Guide* for information on setting up additional software features, such as the following:

- Changing the caching policy (formerly known as write mode) for the vserver
- Adding more virtual servers to the cluster to support additional core filers, including global-namespace-enabled (GNS-enabled) vservers
- Configuring NFS export policies and rules
- Configuring CIFS access and creating CIFS shares
- Configuring VLANs
- Configuring monitoring tools such as email pages, SNMP, and syslog servers

For more information, see Section 4.2, “Additional Documentation” on page 25.

## 2.6. Verifying the Installation

➤ To verify the installation and configuration:

- Use the `ping` and `tracert` commands from a client machine to make sure that all IP addresses can be contacted by the Avere Control Panel.
- Verify that NFS clients are able to mount the cluster and read and write data.
- Verify that you can reach the Avere Global Services site by clicking on the <http://www.averesystems.com/support> link on the Avere Control Panel’s **Support** tab.
- Make sure that no red alerts are displayed on the Avere Control Panel’s **Dashboard** tab, which would indicate that the cluster cannot connect with the core filer. In addition, verify that there are no active conditions listed on the Dashboard.
- Click on the **Nodes** tab at the bottom of the Dashboard, and check the **Client IPs** column to verify that the client-facing IP addresses have been distributed appropriately across the cluster’s FXT Series nodes.

You can now begin using the cluster as discussed with your Avere Systems representative.

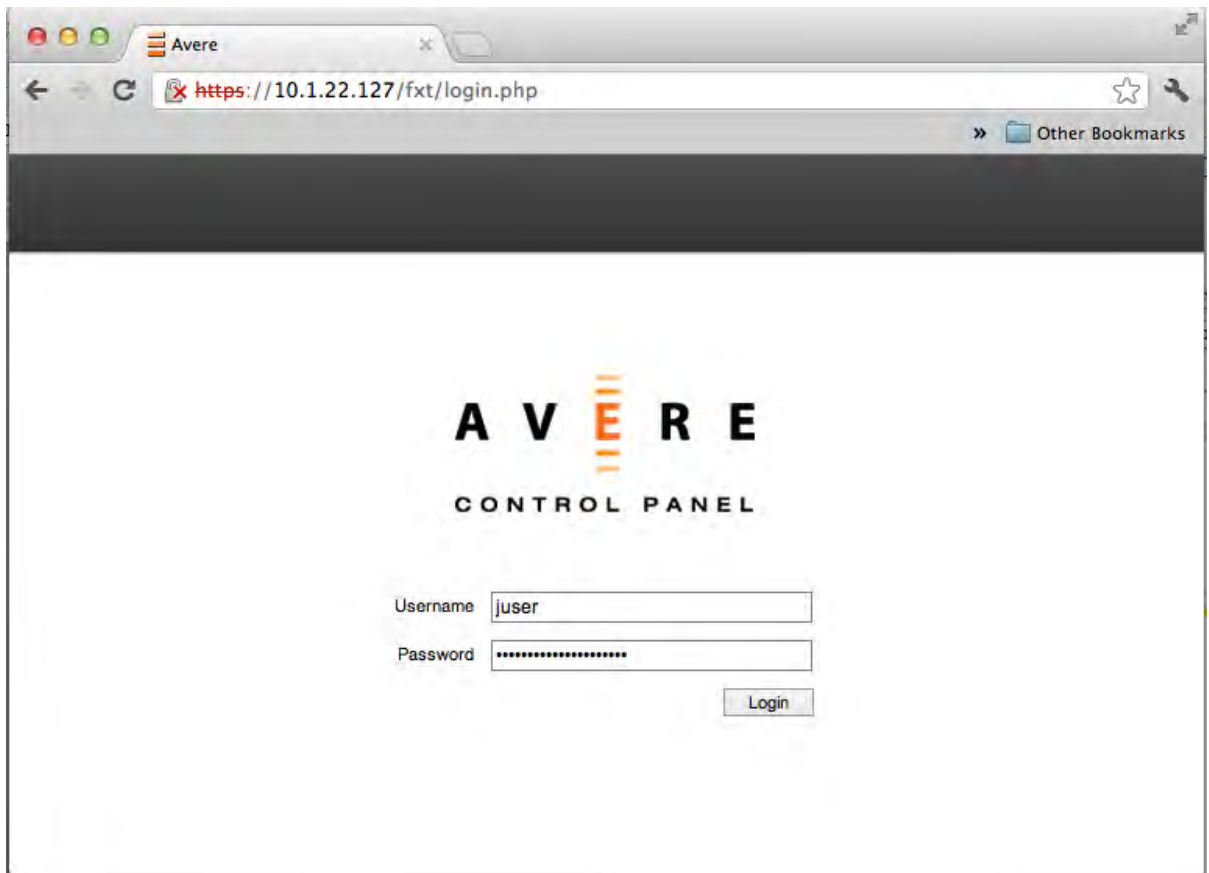
## 2.7. Logging Into the Cluster

➤ To log into the cluster for management and monitoring tasks:

1. Use a Web browser to go to `https://management_IP_address/fxt`, where `management_IP_address` is the cluster's management IP address.

Alternatively, if you are using a browser that supports the DNS-SD protocol, you can navigate to the bookmark labeled `Avere Cluster Management: cluster_name`.

The Avere Control Panel **Login** page is displayed.



2. In the **User** field, enter the cluster's administrative user name.



### Note

The default administrative user name is **admin**.

3. In the **Password** field, enter the administrative password.

The Avere Control Panel's **Dashboard** tab is displayed.





## Chapter 3. Allowing Client Access to the Cluster

A virtual server (*vserver*) on the FXT Series cluster connects clients to data on the cluster and the core filers. Each *vserver* interacts with one or more core filers. When you first add a core filer to the cluster, a *vserver* named *vserver1* (unless you specify a different name) is created automatically in read mode, with a core filer verification time of 30 seconds. Refer to Chapter 6, *Setting the Cache Policy* in the *Daily Operations Guide* for more information on caching settings.

### 3.1. About Cache Policies and Maximum Writeback Delay

The *cache policy* specifies how the Avere system handles file-operation requests between clients and core filers. The cache policy is individual for each core filer.

There are two primary modes of handling data that has changed on the clients.

- In *read mode*, the cluster updates the core filer after each write operation, and checks the attributes on files at a specified interval. This is the best choice for initial setup, while clients are migrated from connecting directly to the core filer to connecting through the cluster.
- In *read/write mode*, the cluster controls all read, write, and attribute (metatdata) operations, and writes changed data to the core filer within a specified interval called the *maximum writeback delay*. This mode accelerates the operations.

The *maximum writeback delay* is the maximum amount of time that a given piece of data is stored on the cluster before being written to the core filer when the cluster is in read/write mode.

When determining what cache mode and maximum writeback delays to use, consider the following:

- The usage period of the average client. For example, if a standard client is a desk workstation that is used for eight hours per day, you might consider eight hours as a reasonable amount of time.
- The importance of the data being worked on by clients. For example, if clients are being used to input mission-critical data, you might consider 30 minutes, one hour, or two hours as the maximum writeback delay. On the other hand, if clients are generating scratch data, a maximum writeback delay of one day or two weeks might be reasonable.
- The amount of data being generated by clients as compared to the capacity of the core filer. For example, if your core filer is notably slow but your clients are generating data rapidly, you might consider increasing the maximum writeback delay to ensure that the core filer is able to accept data at a steady rate that does not overload it.
- On a core filer that has a high rate of data change (for example, an active source-code repository), the cache policy can be set to provide clients with full read/write access, for maximum speed
- On a core filer that does not need much speed (for example, one that holds files that clients access primarily only to read), you can specify a read-only policy, so that any write operations go directly through to the core filer.

## 3.2. Setting the Writeback Delay

➤ To set the writeback delay:

1. Navigate to the **Settings > Core Filer > Cache Policy** page.
2. If necessary, choose the appropriate core filer from the drop-down list under the **Manage Core filers** heading.
3. Choose **Read/Write** for the **Caching Mode**.
4. Choose an amount of time from the **Maximum writeback delay** drop-down list, ranging from **0 Seconds** to **1 Year**. The default value is **1 Hour**.

- Generally, set the maximum writeback delay to any value greater than zero.
- To set the cluster to an equivalent of read mode, set the maximum writeback delay to **0 Seconds**. This setting provides a performance boost but does not guarantee that the file attributes seen by clients are always precisely the same as file attributes on the core filer.

Before using this setting, consult with your Avere Systems representative. Some workloads benefit greatly in this case, whereas other workloads can be impeded.



### Caution

Setting values in the **Advanced Features** panel can lead to problems ranging from performance issues to data inconsistency. Contact Avere Global Services before setting any values on this panel.

5. Click the **Save Settings** button.

## Chapter 4. Managing the Avere Cluster

Day-to-day management tasks for the cluster are designed to be as simple and to require as little attention as possible. For more information, see the *Daily Operations Guide*.

### 4.1. Monitoring Conditions and Alerts

Conditions and alerts are displayed in the Avere Control Panel to give you information about unusual behavior in the cluster, including the severity of the notification, the time of the notification, and a description of the condition or alert, with suggestions for corrective action when available.

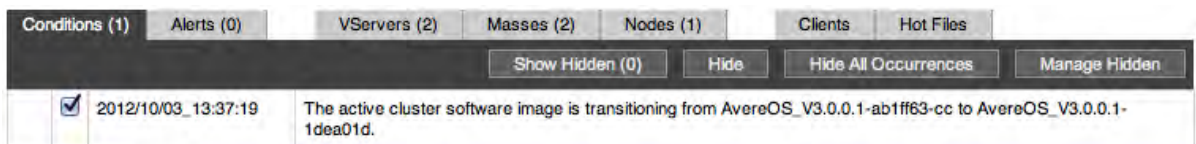
An *alert* is a transient and self-limited situation, often a one-time occurrence. An example of an alert is a software-image upgrade. An alert will remain visible until it is dismissed.

A *condition* is a situation that will probably require some action on the part of the cluster administrator. Conditions can be hidden from the display, but not dismissed (removed).

#### 4.1.1. Severity

Conditions and alerts can be one of three levels of severity:

- Informational. This has no color coding.



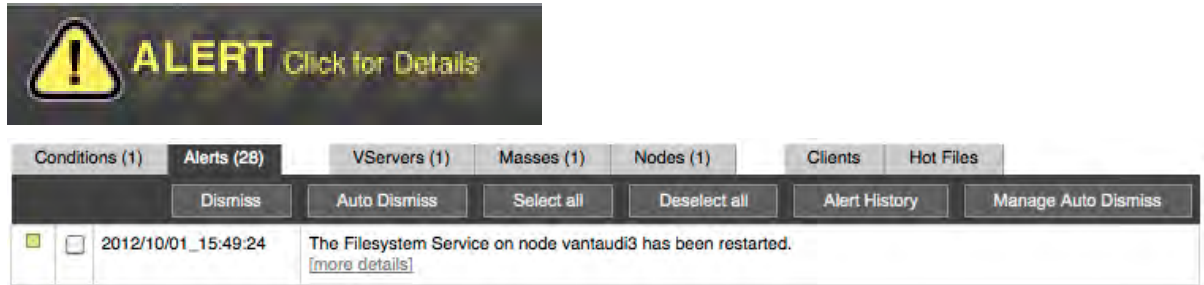
- A *system error*, color-coded red, indicates that the cluster cannot serve some or all data. An example of a system error is loss of communication with one of the nodes in the cluster.

When a system error occurs, a image is displayed at the top of the Dashboard, *and* information about the error is displayed on either the **Conditions** or **Alerts** tab.



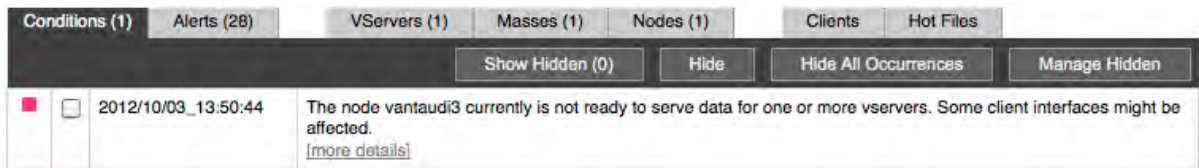
- A *performance notification*, color-coded yellow, indicates that performance, data access, or both are possibly degraded. An example of an alert is the temporary suspension of vserver access while the cluster automatically rebalances its interfaces.

When a performance notification occurs, a image is displayed at the top of the Dashboard, *and* information about the error is displayed on either the **Conditions** or **Alerts** tab.



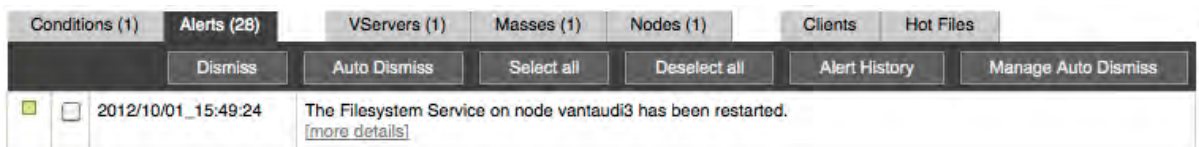
### 4.1.2. Managing Conditions and Alerts

When a condition or alert occurs, the Avere Control Panel provides detailed information under the **Conditions** tab and the **Alerts** tab on the Dashboard's status bar. This information allows you to decide what, if anything, to do about the situation. In most cases, errors that require action provide suggestions in the description text. If you need help to understand the message or resolve the issue, contact Avere Global Services.



Unlike alerts, conditions cannot be simply dismissed; they must resolve themselves or be resolved by an administrator before they are removed from the list of active conditions. They can, however, be hidden, so that older persistent conditions will no longer be listed on the main tab.

Alerts are listed in chronological order, the most recent alert at the top of the list, under the **Alerts** tab of the Dashboard's status bar. Alerts that have occurred since you last viewed the **Alerts** tab are highlighted by bold font.



You can remove alerts from the active list; if, for example, you resolve an alert or determine that its impact is not significant, you can remove it from the list and concentrate on the remaining alerts.

For more information on conditions and alerts, refer to Chapter 9, *Monitoring the Cluster (Dashboard Tab)* in the *Daily Operations Guide*.

## 4.2. Additional Documentation

After you initially configure the Avere cluster, use the following resources to perform additional configuration, monitoring, and maintenance:

- For the latest information about the Avere hardware and software and any limitations, workarounds, and recommendations, see the *Release Notes*.
- For system monitoring recommendations, see the *Daily Operations Guide*.
- To change software settings, or to upgrade the Avere OS software on your cluster, see the *Daily Operations Guide*.
- For full information about FXT Series hardware installation, specifications, and regulatory information, see the *FXT Series Installation Guide*.

## 4.3. Troubleshooting

You might encounter issues with the Avere OS that require intervention by you, by Avere Global Services, or by both. This section provides information on troubleshooting problems and on interacting with Avere Global Services.

Some of the problems you are most likely to encounter and be able to solve are listed below. Suggestions for addressing these issues are provided where applicable. If you cannot resolve the problem on your own, contact technical support as described in Section 4.4, “Contacting Avere Global Services” on page 26.

- If clients have problems reading or writing data, verify the following:
  - Ensure that the network is functioning correctly and that all network connections are intact, as described in Section 2.2, “Configuring Other Nodes in the Cluster” on page 12 and Section 2.6, “Verifying the Installation” on page 18.
  - Ensure that the core filer is operating and available.
  - Ensure that the clients are mounted to the correct location, as described in Section 1.4, “IP Address Distribution” on page 3.
  - Ensure that exports are set and implemented correctly, as described in Section 2.1.4, “Apply an Export Policy” on page 11.
  - Check the *Release Notes* for any further networking or client recommendations.
- If a condition or alert appears on the **Dashboard** tab, read the alert message and try to determine the cause.
  - If you are able to resolve an alert, select its listing under the **Alerts** tab on the **Dashboard** tab’s status bar and click **Dismiss checked alerts**.
  - If you cannot understand the message or resolve the cause, or if the condition or alert does not resolve on its own, contact Avere Global Services.

## 4.4. Contacting Avere Global Services

- To access Avere Global Services contact information when you are using the Avere OS, click the Avere Control Panel's **Support** tab. This page lists the following Web, phone, and email contact information and links:

- Web: <http://www.averesystems.com/support>
- Phone:  
1-888-88-AVERE (1-888-882-8373, Press 2 (Toll-Free in the US and Canada)  
1-412-635-7170, Press 2
- Email: <support@averesystems.com>

When you are communicating with your Avere Systems representative, he or she will assist you in entering information the **Support** tab, and in selecting the correct type and level of information to send to Avere Systems.

Contact Avere Global Services if any of the following events occur:

- The cluster is unresponsive, unreachable, or not serving data.
- The **Dashboard** tab shows an alert or condition, either yellow or red, whose message you do not understand or whose cause you cannot determine.

# Index

## A

### adding

- nodes automatically: [12](#)
- nodes manually: [12](#)

### administrative password for cluster: [7](#)

### alerts

- definition: [23](#)
- detailed information: [24](#)
- dismissing: [24](#)
- informational: [23](#)
- red (system errors): [23](#)
- yellow (performance notifications): [24](#)

### Avere Global Services, contacting: [26](#)

## B

### Bonjour (DNS-SD), supported: [1](#)

### bookmark for logging in: [5](#)

## C

### cache policies, configuring: [21](#)

### clients

- IP address range: [8](#)
- unable to read or write data: [25](#)

### clusters

- configuration file: [6](#)
- creating manually: [7](#)
- information required for configuration: [2](#)
- IP address range: [8](#)
- logging in: [10](#)
- management IP address: [8](#)
- passwords: [7](#)

### conditions

- definition: [23](#)
- detailed information: [24](#)
- informational: [23](#)
- red (system errors): [23](#)
- yellow (performance notifications): [24](#)

### configuring

- cache policies: [21](#)
- DNS (dynamic name system): [17](#)
- first node: [5](#)
- high availability: [13](#)
- multiple nodes: [12](#)

### contacting Avere Global Services (Support): [26](#)

### core filers

- high availability: [15](#)
- IP address: [8](#)

## D

### determining maximum writeback delay: [21](#)

### dismissing alerts: [24](#)

### DNS (dynamic name system), configuring: [17](#)

### DNS-SD (DNS Service Discovery) (see Bonjour)

## E

### enabling

- high availability: [14](#)
- LACP: [8](#)
- link aggregation: [8](#)

### environmental requirements: [2](#)

### export policies

- applying: [11](#)
- viewing rules: [11](#)

## F

### FXT nodes (see nodes)

## G

### global namespaces: [8](#)

## H

### high availability

- configuring: [13](#)
- core filer: [15](#)
- default for two nodes: [13](#), [13](#)
- enabling: [14](#)

### highlights, about: [1](#)

## I

### informational conditions and alerts: [23](#)

### IP address

- client: [8](#)
- cluster (range): [8](#)
- core filer: [8](#)
- management: [8](#)
- NTP server: [8](#)

### IP addresses

- distribution ranges: [3](#)
- required for configuration: [2](#)

## J

### Javascript, required: [1](#)

## L

### LACP (link aggregation control protocol), enabling dynamic: [8](#)

### link aggregation, enabling: [8](#)

## M

### management IP address: [8](#)

### maximum writeback delay

- determining: [21](#)
- setting: [22](#)

## **N**

- namespaces, simple and global: [8](#)
- naming nodes: [7](#)
- NFSv2 and NFSv4 not supported: [1](#)
- nodes
  - configuration: [5](#)
  - configuring multiple: [12](#)
  - logging into: [5](#)
  - names: [7](#)
  - unconfigured: [7](#)
- NTP server
  - IP address: [8](#)
  - recommended: [8](#), [10](#)

## **P**

- password, administrative: [7](#)
- performance notifications (yellow): [24](#)

## **R**

- requirements
  - Ethernet network ports: [1](#)
  - JavaScript: [1](#)
  - NFSv3 client computers: [1](#)

## **S**

- setting
  - maximum writeback delay: [22](#)
  - timezone: [10](#)
- simple namespaces: [8](#)
- support (see Avere Global Services)
- system errors (red): [23](#)

## **T**

- timezone, setting: [10](#)

## **V**

- verifying the installation: [18](#)
- vservers
  - initial default: [21](#)
  - name: [8](#)