



FXT Cluster Creation Guide

Avere Systems

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PREPARING TO CREATE AN AVERE CLUSTER

This guide walks through the steps required to create an Avere cluster from FXT Series hardware nodes. It also describes basic configuration steps that must be done before a cluster is ready to serve data.

If you have not already installed and cabled your FXT Series nodes, follow the instructions in the [FXT 5000 Series Installation Guide](#)¹ before using this document.

If you are creating a vFXT cluster from cloud-based VMs, read the vFXT installation guide customized for your cloud service, available in the [vFXT Installation Guides](#)² section of <http://library.averesystems.com>.

Before starting the cluster creation, make sure you have followed instructions in the [FXT 5000 Series Installation Guide](#)³ to correctly rack and cable the FXT nodes in your datacenter. Make sure that at least one node is powered on.

1.1 Required Information

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

- Name that you want to assign to the cluster
- Administrative password that you want to set for the cluster
- IP addresses:
 - A single IP address for cluster management, and the netmask and router to use for the management network
 - The first and last IP addresses in a contiguous range of IP addresses for cluster (internode) communication (see [IP Address Distribution](#) (page 2), below, for details)(Client-facing IP addresses are set after cluster creation.)
- Optional but strongly recommended network infrastructure:
 - The IP address of a DNS server for the cluster
 - The name of the DNS domain for the cluster
 - 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

¹ https://download.averesystems.com/software/FXT_5000_Installation_Guide.pdf

² <http://library.averesystems.com/#vfxt>

³ https://download.averesystems.com/software/FXT_5000_Installation_Guide.pdf

1.2 IP Address Distribution

An Avere cluster uses IP addresses in three categories:

- **Management IP:** A single IP address for cluster management

This address serves as the entry point to access the cluster configuration utilities (Avere Control Panel or the XML-RPC API). This address is automatically assigned to the primary node in the cluster, and it moves automatically if the primary node changes.

Other IP addresses can be used to access the control panel, but the management IP address is designed to provide access even if individual nodes fail over.

- **Cluster Network:** A range of IP addresses for cluster communication

The cluster network is used for communication among cluster nodes and to retrieve files from the backend storage (core filers).

Best practice: 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 network:** The range of IP addresses that clients use to request and write files

The client network addresses are used by clients to access the core filer data through the Avere cluster. For example, an NFS client might mount one of these addresses.

Best practice: Allocate one IP address per physical port used for client communication on each FXT Series node.

The cluster distributes client-facing IP addresses across its constituent nodes as evenly as possible.

For simplicity, many administrators configure a single DNS name with round-robin DNS (RRDNS) configuration to make it easier to distribute client requests across the address range. This setup also enables all clients to use the same mount command to access the Avere cluster. See [Configuring DNS for the Avere Cluster](#) (page 26) for more information.

The management IP address and a range of cluster network addresses must be specified to create a new cluster; client-facing addresses are specified after cluster creation.

CREATING AN AVERE CLUSTER

This section walks step by step through the process of creating the Avere cluster.

Before starting this procedure, make sure at least one of the FXT nodes is powered on and has network connectivity. Follow the procedures in the [FXT 5000 Series Installation Guide](#)¹.

2.1 Boot the First Node

If you have not already done so, power on at least one of the FXT nodes for your cluster, and make sure it has a network connection and an IP address.

To turn on the node, press the node's power button. Make sure that no alarms are audible from the node (these can indicate a misinstalled or failed power supply).

To check the network connection, make sure that the node's network link LEDs are illuminated (and, if necessary, the indicators on the network switch to which it is attached). Indicator LEDs are described in the monitoring chapter of the [FXT 5000 Series Installation Guide](#)².

When the node boots, it will request an IP address. If it is connected to a DHCP server, it accepts the IP address provided by DHCP. (This is a temporary IP address that you will change when you configure the cluster.)

If it is not connected to a DHCP server or does not receive a response, the node will use Bonjour software to set a self-assigned IP address in the form 169.254.*.*. However, Avere Systems recommends that you set a temporary static IP address on one of the node's network cards before using it to create a cluster. Read [Appendix A: Setting a Static IP Address on an FXT Node](#) (page 39) for instructions.

2.2 Connect to the First Node

You can connect to any of the installed FXT nodes and use its Avere OS software to set up the cluster.

2.2.1 Find an IP Address

To determine the IP address of the node you want to use, connect to it by using a serial cable, direct connection, or through a KVM switch. For more information, read [Connecting to the Physical Node](#) (page 39) in [Appendix A: Setting a Static IP Address on an FXT Node](#) (page 39).

When connected, log in with the username `root` and the default password `tiered2010`

After logging in, you need to determine the node's IP address.

Use the command `ifconfig` to see the addresses assigned to this system.

¹ <http://library.averesystems.com/#installation>

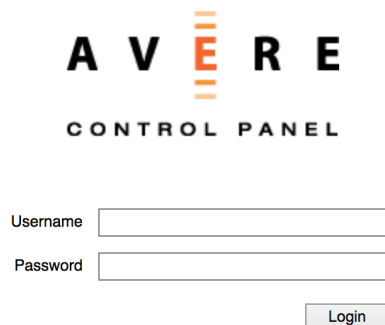
² <http://library.averesystems.com/#installation>

For example, the command `ifconfig | grep -B5 inet` searches for ports with internet addresses and gives five lines of context to show the port identifier.

Write down any IP address shown in the `ifconfig` report. Addresses listed with port names like `e0a` or `e0b` are good options. Do not use any IP addresses listed with `e7*` names, since those names are only used for IPMI ports, not regular network ports.

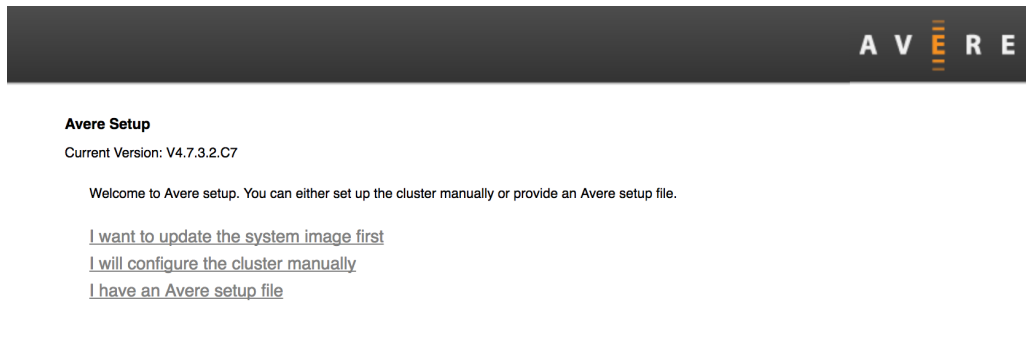
2.2.2 Load the Configuration Wizard in a Web Browser

Enter the IP address for the node in a web browser. If the browser gives a message about the site being untrusted, proceed to the site anyway. (Individual FXT nodes do not have CA-provided security certificates.)



The image shows the Avere Control Panel login interface. At the top, the word "AVERE" is displayed in a large, bold, sans-serif font, with the letter "E" in orange and the others in black. Below it, the words "CONTROL PANEL" are written in a smaller, all-caps, black font. Underneath the header, there are two input fields: "Username" and "Password". To the right of each field is a rectangular input box. Below the "Password" field is a "Login" button with a light gray background and black text.

Leave the **Username** and **Password** fields blank. Click **Login** to load the cluster creation page.



The image shows the Avere Setup page. At the top, there is a dark gray header bar with the word "AVERE" in white, bold, sans-serif font. Below the header, the text "Avere Setup" is displayed in a bold font. Underneath, it says "Current Version: V4.7.3.2.C7". A welcome message follows: "Welcome to Avere setup. You can either set up the cluster manually or provide an Avere setup file." Below this, there are three hyperlinks: "I want to update the system image first", "I will configure the cluster manually", and "I have an Avere setup file".

The next sections in this document walk you through cluster configuration steps.

2.3 Creating the Cluster

A set of configuration screens helps you specify all of the information needed to create your Avere cluster.

Be sure that you have the information ready before starting. Read *Preparing To Create an Avere Cluster* (page 1) to learn what names and IP address ranges you will need.

2.4 Initial Options

The first screen gives three options. Most users can go directly to the “configure a new cluster manually” option.



Options are:

- Update the system image

Choose this option if you need to install new Avere OS software before creating the cluster. (The currently installed software version is listed at the top of the screen.)

If you click this link, you are prompted to specify the package file to use. You can provide a URL and user-name/password, or upload a file from your computer.

- Configure the cluster manually

Choose this option to create a new cluster.

- Use an Avere setup file

Use this option only if directed to do so by Avere Global Services.

Click **I will configure the cluster manually** to load the new cluster configuration options screen.

2.5 New Cluster Configuration Options

The next screen prompts you to configure options for the new cluster.

Avere Setup

Current Version: V4.7.3.2.C7

Welcome to Avere setup. You can either set up the cluster manually or provide an Avere setup file.

[I want to update the system image first](#)

[I will configure the cluster manually](#)

[I have an Avere setup file](#)

Basic Configuration

Cluster name

Admin password

Confirm password

Networking Configuration

Management

Management IP

Netmask

Router

VLAN tag (optional)

MTU

1500

Use 1Gb mgmt network ☐

Cluster

First IP

Last IP

Number of IPs in range

-

Non-mgmt netmask (optional)

Cluster router (optional)

Cluster VLAN tag (optional)

Non-mgmt MTU (optional)

1500

DNS server(s)

DNS domain

DNS search

NTP server(s)

Link aggregation

Disabled

High availability (HA), core filers, and virtual servers can be configured after the initial creation of the cluster completes.

Create cluster

This page is divided into two main sections, **Basic Configuration** and **Networking Configuration**. The networking configuration section also has subsections for the **Management** network and the **Cluster** network.

Click a link below if you want to jump directly to the description of that particular section:

- [Basic Configuration](#) (page 7)
- [Networking Configuration](#) (page 7)
- [Management Network Configuration](#) (page 8)
- [Cluster Network Configuration](#) (page 9)

2.5.1 Basic Configuration

In the top section, fill in basic information for the new cluster.



The screenshot shows a 'Basic Configuration' section with three input fields. The first field, 'Cluster name', contains the text 'SetupDemo'. The second field, 'Admin password', and the third field, 'Confirm password', both contain a series of dots representing masked text. The 'Confirm password' field is highlighted with a blue border.

Cluster Name - Enter a unique name for the cluster.

You can change this name later on the **Cluster > General Setup** configuration page.

A cluster name must meet these criteria:

- Length of 1 to 16 characters
- Can include letters, numbers, and the dash (-) and underscore (_) characters
- Must not include other punctuation or special characters

Note: Your cluster name will be used to identify your files if you need to upload system information to Avere Global Services for troubleshooting or monitoring, so it's helpful to include your company name.

Admin password - Set the password for the default administrative user, `admin`.

Although you should specify individual administrative user accounts for each person who configures or administers the cluster, the user `admin` must exist for the cluster. Log in as `admin` if you need to create additional users.

You can change the password for `admin` in the **Administration > Users** settings page in the Avere Control Panel. Read [Administration > Users](#)³ in the [Cluster Configuration Guide](#)⁴ for details.

2.5.2 Networking Configuration

The **Networking** section prompts you to specify the network infrastructure that the cluster will use.

There are two separate networks to configure:

- The *management network* provides administrator access to the cluster for configuration and monitoring. The IP address specified here is used when connecting to the Avere Control Panel or for SSH access. Most clusters use only a single management IP address, but if you want to add interfaces you can do so after creating the cluster.
- The *cluster network* is used for communication among cluster nodes and between cluster nodes and backend storage (core filers).

(The client-facing network is configured later, after the cluster has been created.)

This section also includes configuration for DNS and NTP servers that are used by both networks.

³ http://library.averesystems.com/ops_guide/4_7/gui_users.html#gui-users

⁴ <http://library.averesystems.com/#operations>

Management Network

The settings in the **Management** section are for the network that provides administrative access to the cluster.

Management

Management IP	<input type="text" value="203.0.113.10"/>
Netmask	<input type="text" value="255.255.224.0"/>
Router	<input type="text" value="203.0.113.1"/>
VLAN tag (optional)	<input type="text"/>
MTU	<input type="text" value="1500"/>
Use 1Gb mgmt network	<input type="checkbox"/>

Management IP - Specify the IP address that you will use to access the Avere Control Panel. This address will be claimed by the cluster's primary node, but it automatically moves to a healthy node if the original primary node becomes unavailable.

After the cluster has been created, you have the option to configure a range of management network IP addresses by using the **Cluster > Administrative Network** settings page. However, most clusters use only one management IP address. Read [Cluster > Administrative Network](#)⁵ in the [Cluster Configuration Guide](#)⁶ for details.

Netmask - Specify the netmask for the management network.

Router - Enter the default gateway address used by the management network.

VLAN tag (optional) - If your cluster uses VLAN tags, specify the tag for the management network.

Read [Working with VLANs](#)⁷ in the [Cluster Configuration Guide](#)⁸ to learn more.

Additional VLAN settings are configured in the **Cluster > VLAN** settings page - read [Cluster > VLAN](#)⁹ in the [Cluster Configuration Guide](#)¹⁰ for details.

MTU - If necessary, adjust the maximum transmission unit (MTU) for your cluster's management network.

Use 1Gb mgmt network - Check this box if you want to assign the 1GbE network ports on your FXT nodes to the management network only.

FXT 5000 Series hardware has four built-in 1GbE ports (e0a, e0b, e0c, and e0d), and all four are included in the management network if this box is checked.

⁵ http://library.averesystems.com/ops_guide/4_7/gui_admin_network.html#gui-admin-network

⁶ <http://library.averesystems.com/#operations>

⁷ http://library.averesystems.com/ops_guide/4_7/network_overview.html#vlan-overview

⁸ <http://library.averesystems.com/#operations>

⁹ http://library.averesystems.com/ops_guide/4_7/gui_vlan.html#gui-vlan

¹⁰ <http://library.averesystems.com/#operations>

Cluster Network

The cluster network settings apply to traffic among cluster nodes, and between cluster nodes and core filers.

Cluster	
First IP	<input type="text" value="192.0.2.12"/>
Last IP	<input type="text" value="192.0.2.40"/>
Number of IPs in range	29
Non-mgmt netmask (optional)	<input type="text" value="255.255.224.0"/>
Cluster router (optional)	<input type="text" value="192.0.2.1"/>
Cluster VLAN tag (optional)	<input type="text"/>
Non-mgmt MTU (optional)	<input type="text" value="1500"/>

First IP and **Last IP** - Enter the IP addresses that define the range of addresses to be used for internal cluster communication. The IP addresses used here must be contiguous and not assigned by DHCP.

You can add more IP addresses after creating the cluster. (Use the **Cluster > Cluster Networks** settings page, documented in the [Cluster Configuration Guide](#)¹¹ - read [Cluster > Cluster Networks](#)¹².)

The value in **Number of IPs in Range** is calculated and shown automatically.

Non-mgmt netmask (optional) - Specify the netmask for the cluster network. (The system automatically suggests the netmask value that you entered for the management network; change it if needed.)

Cluster router (optional) - Specify the default gateway address used by the cluster network. The system automatically suggests the same gateway address that you supplied for the management network.

Cluster VLAN tag (optional) - If your cluster uses VLAN tags, specify the tag for the cluster network.

Read [Working with VLANs](#)¹³ in the [Cluster Configuration Guide](#)¹⁴ to learn more.

Non-mgmt MTU (optional) - If necessary, adjust the maximum transmission unit (MTU) for your cluster network.

DNS and NTP Settings

Below the **Cluster** section there are fields for specifying DNS and NTP servers, and for enabling link aggregation. These settings apply to all networks that the cluster uses.

DNS server(s)	<input type="text" value="203.0.113.8"/>	<input type="text"/>	<input type="text"/>
DNS domain	<input type="text" value="cc.arr.com"/>		
DNS search	<input type="text"/>		
NTP server(s)	<input type="text" value="ntp.cc.arr.com"/>	<input type="text"/>	<input type="text"/>
Link aggregation	<input type="text" value="Disabled"/>		

DNS server(s) - Enter the IP address of one or more domain name system (DNS) servers.

¹¹ <http://library.averesystems.com/#operations>

¹² http://library.averesystems.com/ops_guide/4_7/gui_cluster_networks.html#gui-cluster-networks

¹³ http://library.averesystems.com/ops_guide/4_7/network_overview.html#vlan-overview

¹⁴ <http://library.averesystems.com/#operations>

DNS is recommended for all clusters, and required if you want to use SMB, AD, or Kerberos. For optimal performance, configure the cluster's DNS server for round-robin load balancing as described in [Configuring DNS for the Avere Cluster](#) (page 26).

DNS domain - Enter the network domain name the cluster will use.

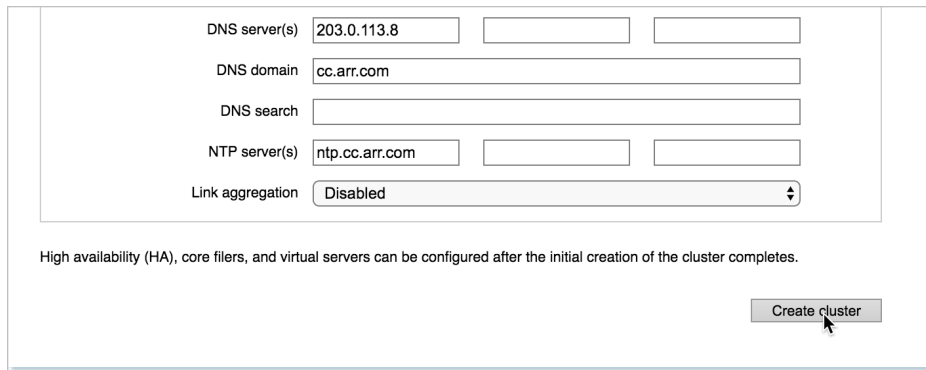
DNS search - Optionally, enter additional domain names that the system should search to resolve DNS queries. You can add up to six domain names, separated by spaces.

NTP server(s) - Specify either one or three network time protocol (NTP) servers in the fields provided. You can use hostnames or IP addresses.

Link aggregation - Link aggregation allows you to customize how the ethernet ports on the cluster FXT nodes handle various types of traffic. Read [Link Aggregation](#)¹⁵ in the [Cluster Configuration Guide](#)¹⁶ for more information.

2.6 Creating the Cluster

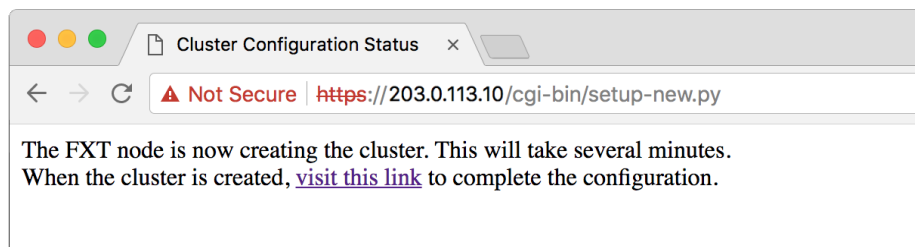
After supplying all the required elements in the form, click the **Create Cluster** button.



The screenshot shows a web form for configuring an FXT cluster. It includes the following fields and controls:

- DNS server(s)**: Three input fields, the first containing "203.0.113.8".
- DNS domain**: A single text input field containing "cc.arr.com".
- DNS search**: A single text input field.
- NTP server(s)**: Three input fields, the first containing "ntp.cc.arr.com".
- Link aggregation**: A dropdown menu currently set to "Disabled".
- A message below the form: "High availability (HA), core filers, and virtual servers can be configured after the initial creation of the cluster completes."
- A **Create cluster** button at the bottom right, with a mouse cursor hovering over it.

The system displays a message while creating the cluster.



After a few moments, you can click the link in the message to go to the Avere Control Panel. This link takes you to the IP address that you specified in **Management IP**. The link will be active about 15 seconds to one minute after you click the **Create cluster** button; if the web interface does not load, wait several seconds and then retry the link.

Cluster creation takes a minute or more, but you can log in to the Avere Control Panel while the process is going on. It is normal for the Dashboard to show warnings until the cluster creation process is finished.

Read [Initial Cluster Configuration Steps](#) (page 11) for more information about logging in and to learn what steps you need to take to get your newly created cluster ready for users.

¹⁵ http://library.averesystems.com/ops_guide/4_7/gui_cluster_general_setup.html#lacr

¹⁶ <http://library.averesystems.com/#operations>

INITIAL CLUSTER CONFIGURATION STEPS

After the cluster is created, complete the setup by adding nodes, specifying the backend storage system to use, setting up your file namespace, enabling SMB access if needed, and other tasks.

This section walks you through the steps to bring your cluster from a newly created basic form to a fully functional system ready to serve data.

3.1 Setup Tasks

Steps to take when configuring a fresh cluster include the following:

- Add cluster nodes

Three nodes is the minimum; many production clusters have more, up to a maximum of 24 nodes.

Read *Adding Nodes to the Cluster* (page 15) for details about adding nodes and configuring High Availability.

- Customize node settings

Read *Customizing Node Settings* (page 19) to learn how to set node names and how to configure IP addresses for node IPMI ports. These settings can be made individually per node, or cluster-wide.

- Specify backend storage

Add core filer definitions for each backend storage system that the cluster will use. Read *Adding Backend Storage* (page 29) to learn more.

- Set up the client-facing filesystem

The Global Namespace (GNS) feature lets you map core filer storage destinations to virtual paths, giving clients a consistent and accessible filesystem structure even if you switch storage media. This feature also allows you to emulate hierarchical storage while using cloud-based object stores.

Read *Configuring VServers and Global Namespace* (page 33) for details.

This step includes:

- Creating vservers
- Setting up junctions between the client network view and backend storage
- Defining which client IP addresses are served by each vserver

Note: Significant planning is recommended before starting to set up the cluster's GNS. Read the *Using a Global Namespace*¹ and *Creating and Working with VServers*² sections in the *Cluster Configuration Guide*³ for help.

¹ http://library.averesystems.com/ops_guide/4_7/gns_overview.html#gns-overview

² http://library.averesystems.com/ops_guide/4_7/settings_overview.html#vserver-settings

³ <http://library.averesystems.com/#operations>

- Adjust network settings

There are several network-related settings that should be verified or customized for a new cluster.

Read *Additional Network Settings* (page 25) for details about these items:

- Verifying DNS and NTP configuration
- Configuring directory services
- Setting up VLANs
- Configuring proxy servers
- Adding IP addresses to the cluster network
- Storing encryption certificates

- Configure SMB

If you want to allow SMB access to your cluster, you must configure SMB and turn it on. SMB (sometimes called CIFS) is typically used to support Microsoft Windows clients.

Planning for and configuring SMB involves more than clicking a few buttons in the Avere Control Panel. Depending on your system's requirements, SMB can influence how you define core filers, how many vservers you create, how you configure your junctions and namespace, access permissions, and other settings.

Read *Configuring SMB Access*⁴ in the *Cluster Configuration Guide*⁵ for more complete information.

When you are ready to activate SMB for your Avere cluster, use the **CIFS** and **CIFS Shares** settings pages in the VServer section of the Avere Control Panel. Refer to the *Cluster Configuration Guide*⁶ for details.

- Install additional licenses

If you plan to use optional features, including Local Directories, FlashCloud™, FlashMove®, or FlashMirror®, you must install additional feature licenses.

- Local Directories is an optional cache organization strategy. It requires some advance planning before implementation. Contact Avere Global Services to discuss its advantages and to obtain a free license.
- FlashCloud enables your cluster to use cloud object storage as a backend core filer.
- FlashMove and FlashMirror give your cluster sophisticated data migration and replication capabilities.

Installing feature licenses is covered in an appendix of the *Cluster Configuration Guide*⁷.

Learn more about FlashMove and FlashMirror in the *Avere OS Data Management Guide*⁸.

- Set up support monitoring

When establishing a new cluster, you should customize the name used to identify your cluster in case a system memory file needs to be sent to Avere Global Services for debugging. You also can configure what statistics are monitored, and enable the proactive support system that automatically uploads status reports to Avere Global Services for remote troubleshooting.

Read *Customizing Support and Monitoring Settings for the Avere Cluster* (page 37) to learn more.

⁴ http://library.averesystems.com/ops_guide/4_7/smb_overview.html#smb-overview

⁵ <http://library.averesystems.com/#operations>

⁶ <http://library.averesystems.com/#operations>

⁷ <http://library.averesystems.com/#operations>

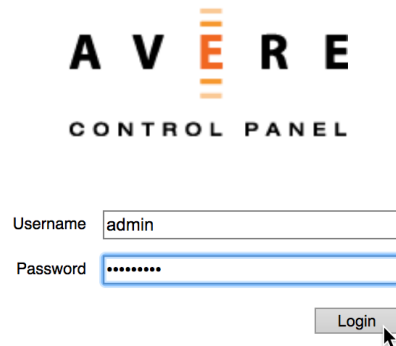
⁸ <http://library.averesystems.com/#operations>

3.2 Logging In to the Avere Control Panel

These cluster setup steps involve changing settings in the Avere Control Panel web interface. (A command-line XML-RPC interface also is available, but it is recommended for experienced Avere cluster administrators only; contact Avere Global Services to learn more.)

Use a web browser to connect to the cluster's management address. A link shows on the cluster status screen while the cluster is being created.

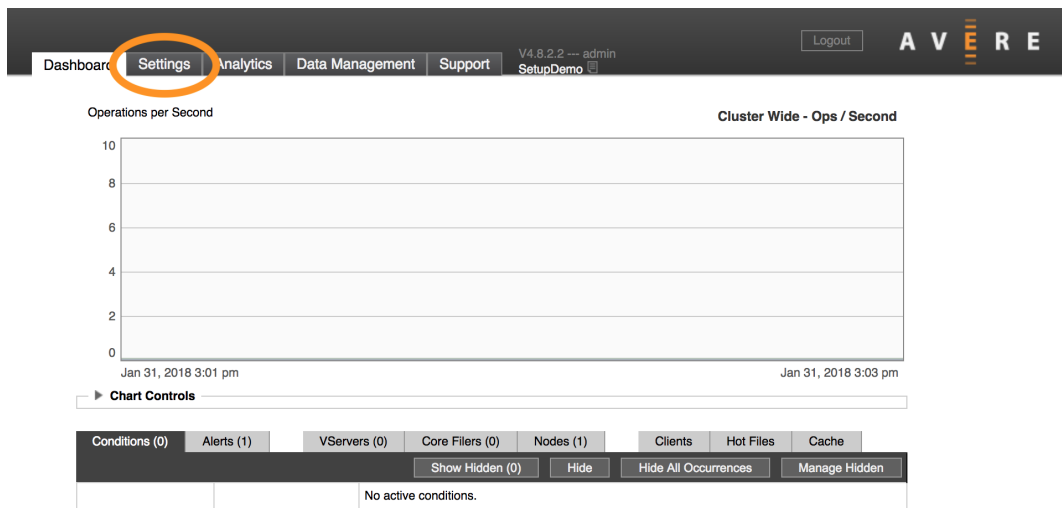
Log in to the web interface with the username `admin` and the password that you set when creating the cluster.



The image shows the Avere Control Panel login interface. At the top is the Avere logo, which consists of the letters 'A', 'V', 'E', 'R', 'E' in a bold, sans-serif font, with a vertical bar of three orange squares between the 'V' and 'E'. Below the logo is the text 'CONTROL PANEL'. Underneath is a login form with two input fields: 'Username' containing the text 'admin' and 'Password' containing seven dots. To the right of the password field is a 'Login' button. A mouse cursor is pointing at the 'Login' button.

The Avere Control Panel opens and shows the **Dashboard** page. As the cluster creation completes, any warning messages should clear from the display.

Click the **Settings** tab to configure the cluster.



Within the **Settings** tab, a menu of configuration pages appears at the left side of the window. They are organized by category. Click the + or - control at the top of the category name to expand or hide the contents of the category.

The screenshot displays the Avere VServer configuration interface. At the top, a navigation bar includes tabs for Dashboard, Settings, Analytics, Data Management, and Support. The Settings tab is active, and the left sidebar shows a tree of configuration categories. The 'General Cluster Setup' category is expanded, showing 'General Setup' as the selected option. The main content area is titled 'General Cluster Setup' and contains two sections: 'General Settings' and 'Node Name Settings'. In 'General Settings', the 'Cluster name' is 'Setup Demo', 'Enable advanced networking' is checked, 'Enable FIPS mode' is unchecked, 'Internet VLAN' is 'Default (tag: -, gateway: 10.1.0.76)', 'Web proxy (Optional)' is 'None', 'Cluster SSL certificate (Optional)' is 'default', and 'Link aggregation' is 'Disabled'. The 'Node Name Settings' section shows 'Node prefix' as 'Setup-demo-###' and 'First node number' as '4'. A 'Submit' button is located at the bottom right of the configuration area.

Dashboard Settings Analytics Data Management Support V4.8.4.2 --- admin Setup Demo Logout AVERE

General Cluster Setup

General Settings

Cluster name Setup Demo

Enable advanced networking ☒

Enable FIPS mode ☐

Internet VLAN Default (tag: -, gateway: 10.1.0.76)

Web proxy (Optional) None

Cluster SSL certificate (Optional) default

Link aggregation Disabled

Node Name Settings

Node prefix Setup-demo-###

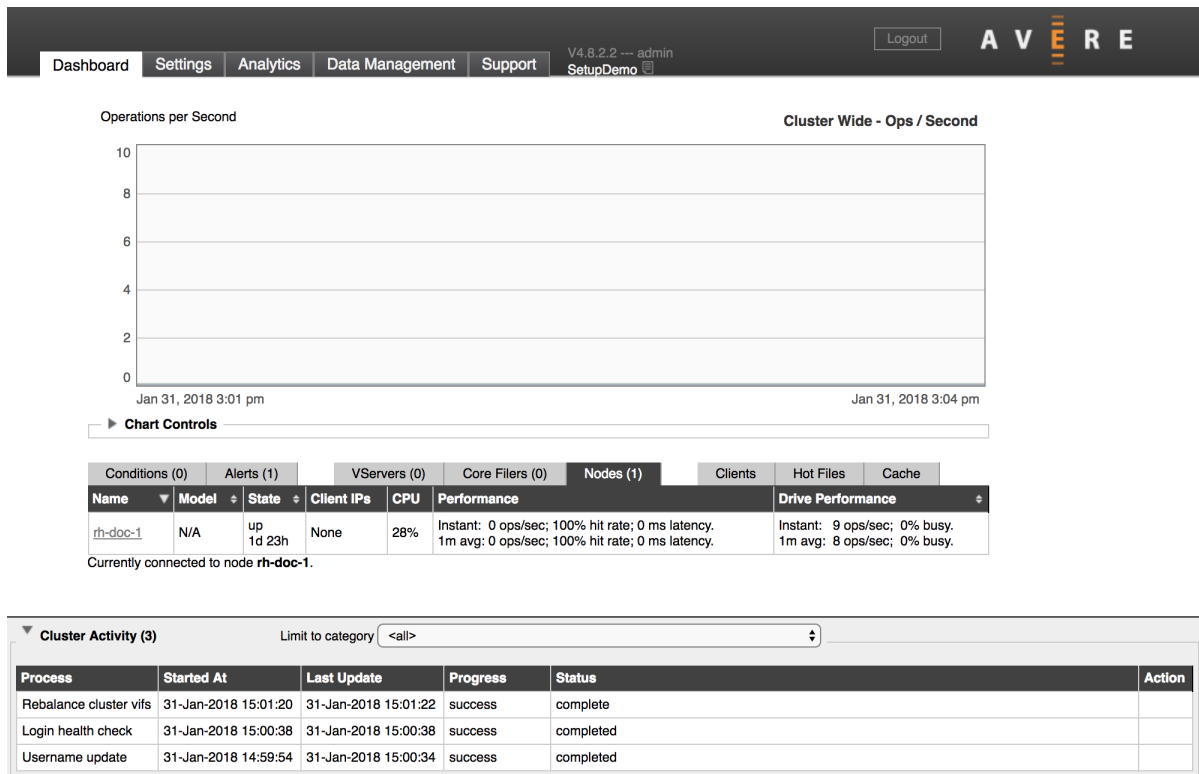
First node number 4

Submit

The next chapters of this document give more specific instructions for using these configuration pages to finish setting up an Avere cluster.

ADDING NODES TO THE CLUSTER

The cluster is created with only the first node. You should add at least two more nodes and enable high availability before proceeding with additional configuration.



This image shows the Dashboard for a newly created cluster, with a single node.

To add nodes, click the **Settings** tab and choose the **FXT Nodes** page in the **Cluster** section.

The screenshot shows the Avere VServer web interface. The top navigation bar includes links for Dashboard, Settings, Analytics, Data Management, and Support. The user is logged in as 'admin' with version 'V4.8.2.2'. The left sidebar lists various configuration options, with 'FXT Nodes' currently selected. The main content area is divided into two sections: 'FXT Nodes - Cluster' and 'FXT Nodes - Unjoined'.

FXT Nodes - Cluster

Showing 1 to 1 of 1 entries

Name	Model	Status	Actions
rh-doc-1	N/A	up	Restart Services Reboot Power down Remove Reformat Offline Suspend

Showing 1 to 1 of 1 entries

FXT Nodes - Unjoined

Showing 1 to 12 of 12 entries

[Manual Discover](#)

Name	Address	Software Version	Status	Actions
max7	10.1.3.78	V4.6.2.5.C4	Wants to join	Allow To Join Match OS version
rh-doc-2	10.1.2.140	V4.8.1.2	Wants to join	Allow To Join Match OS version
rh-doc-3	10.1.2.157	V4.7.3.2.C7	Wants to join	Allow To Join Match OS version

The **FXT Nodes - Unjoined** list shows all unassigned FXT nodes (most data centers have only a few). Find the FXT nodes that you want to add to the cluster.

Tip: Nodes that appear on the **Unjoined** list meet these requirements:

- They are powered on.
- They are connected to an accessible network. If VLANs are being used, they are on the same VLAN as the cluster.
- They can be detected with the Bonjour protocol. Some firewall settings block the TCP/UDP ports used by Bonjour, which prevents Avere OS from automatically detecting the nodes.

If the node that you want to add isn't on the list, click the **Manual Discover** button to find it by IP address.

In some situations, you might need to manually assign temporary IP addresses to each node before you can add them to the cluster - for example:

- Your network uses tagged VLANs and the nodes are not on the correct network
- The nodes have self-assigned Bonjour IP addresses (169.254.*.*) and your network does not permit the use of such addresses

In those situations, follow the instructions in [Appendix A: Setting a Static IP Address on an FXT Node](#) (page 39) to set IP addresses manually.

The node name, IP address, software version, and eligibility status are displayed in the list. Typically, the **Status** column either says "Wants to join" or describes a system or hardware problem that makes the node ineligible to join the cluster.

The **Actions** column has buttons for adding the node to the cluster or for updating the software to match the software version of the nodes already in the cluster.

All nodes in a cluster must use the same version of Avere OS, but you don't need to update a node's software before clicking the **Allow To Join** button. The cluster join process automatically checks and installs the Avere OS software that matches the version on the cluster.

To learn more about the options on this page, read [Cluster > FXT Nodes¹](#) in the [Cluster Configuration Guide²](#).

After you click the **Allow To Join** button, the node status might change as its software is updated in preparation for adding it to the cluster. The image below shows a node that is in the process of joining the cluster (most likely, it's getting an Avere OS update before being added). No buttons appear in the **Actions** column for nodes that are in the process of being added to the cluster.

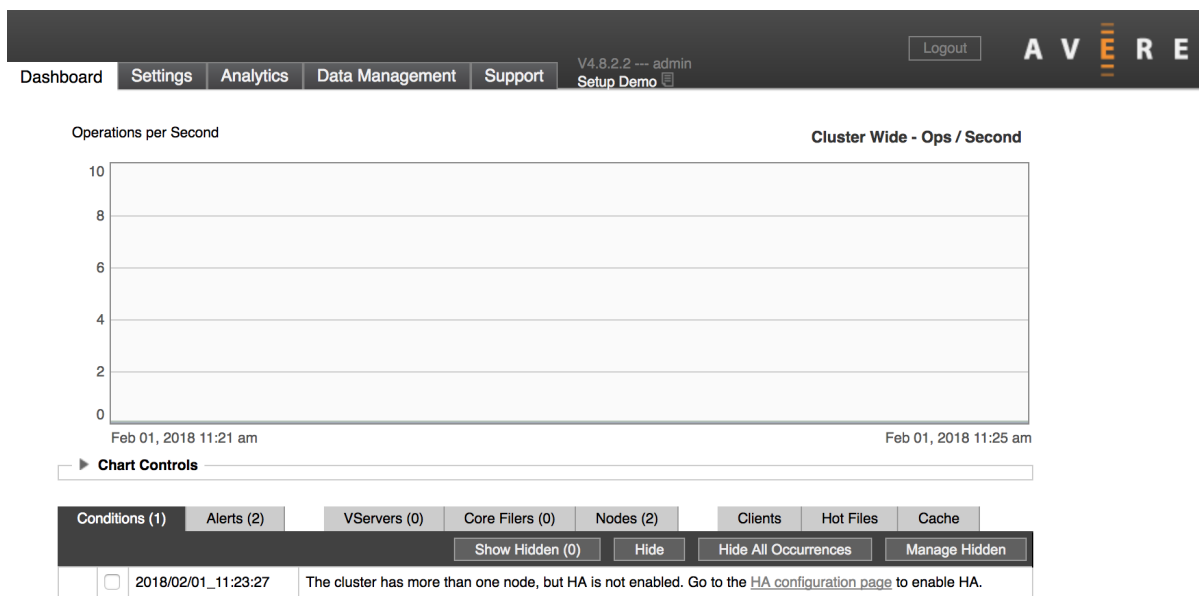
rh-doc-2	10.1.2.140	V4.8.1.2	Allowed to join	
----------	----------------------------	----------	-----------------	--

After a few moments the new node should appear in the cluster nodes list at the top of the **FXT Nodes** settings page.

Repeat this process to add the other nodes to your cluster. You don't need to wait for one node to finish joining the cluster before starting another.

4.1 Enabling High Availability

After you've added a second node to your cluster, you might see a warning message on the Avere Control Panel Dashboard that the high availability feature is not configured. High availability, or HA, is an important feature that allows the cluster nodes to compensate for each other if one goes down. HA is not enabled by default.

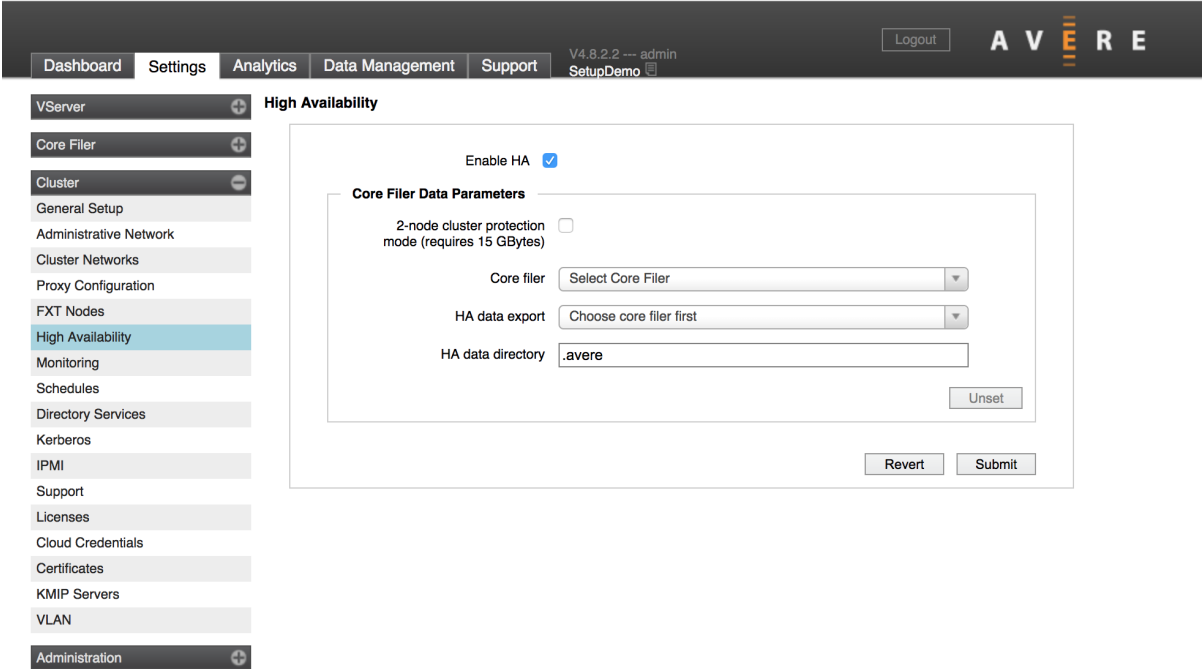


Note: Do not enable HA until you have at least three nodes in the cluster.

Use the **High Availability** page in the **Cluster** section on the **Settings** tab to turn on HA.

¹ http://library.averesystems.com/ops_guide/4_7/gui_fxt_nodes.html#gui-fxt-nodes

² <http://library.averesystems.com/#operations>



Click the box labeled **Enable HA** and click the **Submit** button.

An alert appears on the Dashboard to confirm that HA is enabled.

Conditions (0)		Alerts (4)		VServers (0)		Core Filers (0)		Nodes (3)		Clients	Hot Files	Cache
		Dismiss		Auto Dismiss		Select all		Deselect all		Alert History		Manage Auto Dismiss
	<input type="checkbox"/>	2018/02/01_11:36:48	HA is now fully configured.									
	<input type="checkbox"/>	2018/02/01_16:27:40	Node(s) rh-doc-3 has(have) joined the cluster.									
	<input type="checkbox"/>	2018/02/01_16:23:33	Node(s) rh-doc-2 has(have) joined the cluster.									
	<input type="checkbox"/>	2018/02/01_16:21:40	The cluster images have been updated. The active image is AvereOS_V4.8.2.2; the alternate image is AvereOS_V4.8.2.2.									

CUSTOMIZING NODE SETTINGS

There are some node-related settings that you should consider customizing as part of your initial Avere cluster setup:

- *Node name* (page 19) - The label that the cluster uses for the node
- *IPMI port address* (page 21) - How the node's IPMI port gets its IP address

Both of these settings can be made for individual nodes, or at the cluster level.

Tip: If you want to set either of these values at the cluster level, consider doing it before adding nodes to the cluster. Newly added nodes automatically pick up the cluster-level settings.

To set these items at the individual node level, use the **Node Details** settings page. This page does not appear in the Avere Control Panel's navigation sidebar; load the page by clicking the node name in the list on the **FXT Nodes** page or on the **IPMI** settings page.

(The **Node Details** page also shows configuration information and statistics for the selected node. For more information about the node details page, read [Node Details](#)¹ in the [Cluster Configuration Guide](#)².)

To set node names at the cluster level, use the **Cluster > General Setup** page.

To set IPMI address method at the cluster level, use the **Cluster > IPMI** settings page.

5.1 Node Name Configuration

Set an individual node name on its **Node Details** page, or set a naming schema for the cluster on the **Cluster > General Setup** page.

5.1.1 Set A Single Node Name

You can change the name of a single node by editing the **Node name** field.

Load the node details page by clicking on a node name in the list on the **FXT Nodes** settings page or on the **IPMI** settings page.

¹ http://library.averesystems.com/ops_guide/4_7/gui_node_details.html#gui-node-details

² <http://library.averesystems.com/#operations>

Node Details

Node List > Choose Node: rh-config-1

Edit Node rh-config-1

Node name: rh-doc-1

IPMI mode: No IPMI Configuration

Revert Submit

Details

Cluster IPs: 10.10.10.1-2 (Primary)

Client facing IPs: None

Node management IPs: None

Active image: AvereOS_V4.8.2.2

Alternate image: AvereOS_V4.8.2.2

Performance

1 min average Latency MS: 0.0
Cache Hit Rate: 100
Ops Per Second: 0

Instantaneous Latency MS: 0.0
Cache Hit Rate: 100
Ops Per Second: 0

Disk (1 min avg)	Bytes/Sec (kb)		OPs/Sec		Latency (usec)		Queue Length	Utilization (%)
	Read	Write	Read	Write	Read	Write		
System Drive	8	234	0	10	295	1608	0	0

After updating the node name, click **Submit** to save your changes.

5.1.2 Set the Cluster-Wide Node Naming Scheme

You can set a default name for all nodes that join the cluster in the future by using the **Cluster > General Setup** page.

General Cluster Setup

General Settings

Cluster name: Setup Demo

Enable advanced networking: ☒

Enable FIPS mode: ☐

Internet VLAN: Default (tag: -, gateway: 10.10.10.1)

Web proxy (Optional): None

Cluster SSL certificate (Optional): default

Link aggregation: Disabled

Node Name Settings

Node prefix: setup-demo-###

First node number: 4

Submit

New nodes will be automatically named with the base name that you set and the next available number.

This setting does not affect nodes that joined the cluster before the change.

Use the **Node prefix** field to enter the base name for new nodes. Optionally, you can configure the number of digits in the node number by using the placeholder value # - for example, specifying ### in the **Node prefix** field will give a three-digit node number for each node that uses this naming scheme. The default value is two digits.

You can set the starting node number for automatic assignment in the **First node number** field.

For more detailed information about this setting, read [Cluster > General Setup](#)³ in the [Cluster Configuration Guide](#)⁴.

5.2 IPMI Configuration

Each FXT node has an Intelligent Platform Management Interface (IPMI) port, which provides access to the FXT node hardware for emergency troubleshooting.

As part of your cluster setup, you should configure how the nodes' IPMI ports get their IP addresses. Choose from the following options:

- **No configuration**

- **Static** - Manually set the IP address

Read [Setting a Static IPMI Port Address](#) (page 22) for detailed information about this option.

- **DHCP** - Obtain an IP address from a DHCP server

By default, IPMI ports come configured to use DHCP. If you choose **No configuration**, each node will either obtain its IPMI address by using DHCP, or use whatever configuration was last set for this node's port.

Note: The IPMI port allows access to the FXT node's hardware directly, bypassing the security built in to the Avere operating system. Protect this port from unauthorized use by connecting it to a secure network, ensuring that the IPMI administrator password is changed from the default value, and securing the DHCP environment if you use DHCP to assign IP addresses. Avere recommends using physically separated networks for IPMI ports and data ports.

Like node names, IPMI mode can be set at the cluster level or at the individual node level. Use the links below to jump to the options:

- [Configure IPMI for One Node](#) (page 22)
- [Configure IPMI for the Avere cluster](#) (page 23)

³ http://library.averesystems.com/ops_guide/4_7/gui_cluster_general_setup.html#gui-cluster-general-setup

⁴ <http://library.averesystems.com/#operations>

5.2.1 Setting a Static IPMI Port Address

If using a static IP address for one or more nodes in the cluster, you must provide the IP address and other information.

Node Details

[Node List](#) > Choose Node:

Edit Node setup-demo-002

Node name	<input type="text" value="setup-demo-002"/>
IPMI mode	<input type="text" value="Static"/>
IP Address	<input type="text" value="10.0.1.42"/>
Netmask	<input type="text" value="255.255.224.0"/>
Router	<input type="text" value="10.0.1.229"/>

Provide the following information:

- **IP address** - The address to set for the node's IPMI port
On the cluster IPMI configuration form, this section asks for the first and last IP address instead of a single address. Use these fields to provide a range of IP addresses for the cluster nodes' IPMI ports.
- **Netmask** - The netmask for the IPMI addresses
- **Router** - The router that the IPMI connections should use

Enter the netmask and router for the network that serves your IPMI ports. For security, Avere Systems recommends using physically separated Ethernet networks for IPMI ports and for data services.

5.2.2 Configure IPMI for One Node

Use the **Node Details** page to set how an individual FXT node's IPMI port gets its IP address.

(To open the node details page, click a node name in either the **FXT Nodes** or **IPMI** settings page.)

Node Details

[Node List](#) > Choose Node:

Edit Node setup-demo-001

Node name	<input type="text" value="setup-demo-001"/>
IPMI mode	<input checked="" type="checkbox"/> No IPMI Configuration <input type="checkbox"/> Static <input type="checkbox"/> DHCP

The configuration options are described in more detail in *IPMI Configuration* (page 21), above.

5.2.3 Configure IPMI for the Avere cluster

Configure how all of the cluster's IPMI ports get their addresses by using the **Cluster > IPMI** settings page.

Note: Setting a cluster-wide configuration option overwrites any options that you have set for individual nodes. To customize individual nodes, set their IPMI addresses from the node details page **after** changing the cluster setting.

The IPMI page shows the addresses currently assigned to each node, and the **Configuration Type** column shows whether the node gets its address from the cluster-wide setting (**Cluster**) or from the individual setting (**Manual**).

The screenshot shows the Avere VServer IPMI Configuration page. The page has a top navigation bar with 'Dashboard', 'Settings', 'Analytics', 'Data Management', and 'Support'. The 'Settings' tab is active. The left sidebar shows a tree view with 'VServer' expanded, and 'IPMI' selected. The main content area is titled 'Cluster IPMI Configuration'. It contains a table with the following data:

Node	IPMI Address	Configuration Type
setup-demo-001		Manual
setup-demo-002		Manual
setup-demo-003		Manual
setup-demo-004		Manual

Below the table is the 'IPMI Settings (Optional)' section. It has a 'Mode' dropdown menu. The dropdown is open, showing the following options:

- ☒ No Cluster-wide IPMI Configuration
- ☐ static
- ☐ DHCP

The 'DHCP' option is highlighted. There is an 'Submit' button to the right of the dropdown.

The configuration options are described in more detail in [IPMI Configuration](#) (page 21), above.

Note that if you want to set static IP addresses at the cluster level, you will need to supply a contiguous range of IP addresses that is large enough to provide a unique address to each node.

ADDITIONAL NETWORK SETTINGS

When setting up a new cluster, there are several network-related tasks that you might need to perform.

- Configure round-robin DNS for the client-facing network

Make sure that your client network's DNS system is configured as described in *Configuring DNS for the Avere Cluster* (page 26), below.

- Verify NTP settings
- Set up client-facing IP addresses

Client access is controlled by the cluster's virtual servers (vservers). VServer setup is described in detail in *Configuring VServers and Global Namespace* (page 33).

- Add cluster network addresses

If you need to provide additional IP addresses for cluster nodes, use the **Cluster Networks** settings page. Read *Cluster > Cluster Networks*¹ in the *Cluster Configuration Guide*² for details.

- Configure Active Directory and username/group name downloads (if needed)

If your network hosts use Active Directory or another kind of external directory service, you must modify the cluster's directory services configuration to set up how the cluster downloads username and group information. Read *Cluster > Directory Services*³ in the *Cluster Configuration Guide* for details.

Note that the Avere cluster requires an AD server to support SMB. Configure AD before starting to set up SMB.

- Define VLANs (optional)

You should configure any additional VLANs needed before defining your cluster's vservers and global namespace. Read *Configuring VServers and Global Namespace* (page 33) and *Working with VLANs*⁴ in the *Cluster Configuration Guide* to learn more.

- Configure proxy servers (if needed)

If your cluster is required to use a proxy server to access external addresses, define it in the **Proxy Configuration** settings page and apply it by using the **Cluster > General Setup** page or the **Core Filer Details** page. Read *Cluster > Proxy Configuration*⁵ in the *Cluster Configuration Guide* for details.

- Upload encryption certificates (optional)

Read *Encryption Certificates* (page 27) for details about how to store security certificates for use by the cluster.

For additional information about network services used by the Avere cluster, read *Configuring Network Services for an Avere cluster*⁶ in the *Cluster Configuration Guide*.

¹ http://library.averesystems.com/ops_guide/4_7/gui_cluster_networks.html#gui-cluster-networks

² <http://library.averesystems.com/#operations>

³ http://library.averesystems.com/ops_guide/4_7/gui_directory_services.html#gui-directory-services

⁴ http://library.averesystems.com/ops_guide/4_7/network_overview.html#vlan-overview

⁵ http://library.averesystems.com/ops_guide/4_7/gui_proxy_config.html#gui-proxy-config

⁶ http://library.averesystems.com/ops_guide/4_7/network_overview.html#network-overview

6.1 Configuring DNS for the Avere Cluster

This section explains the basics for setting up DNS for your Avere OS cluster.

If your system is accessed by NFS clients only, using DNS is recommended but not required; it is possible to specify all network addresses by using numeric IP addresses. If your system supports SMB (CIFS) access, DNS is required, because you must specify a DNS domain for the Active Directory server.

DNS also is required if you want to use Kerberos authentication.

6.1.1 Client Load Balancing

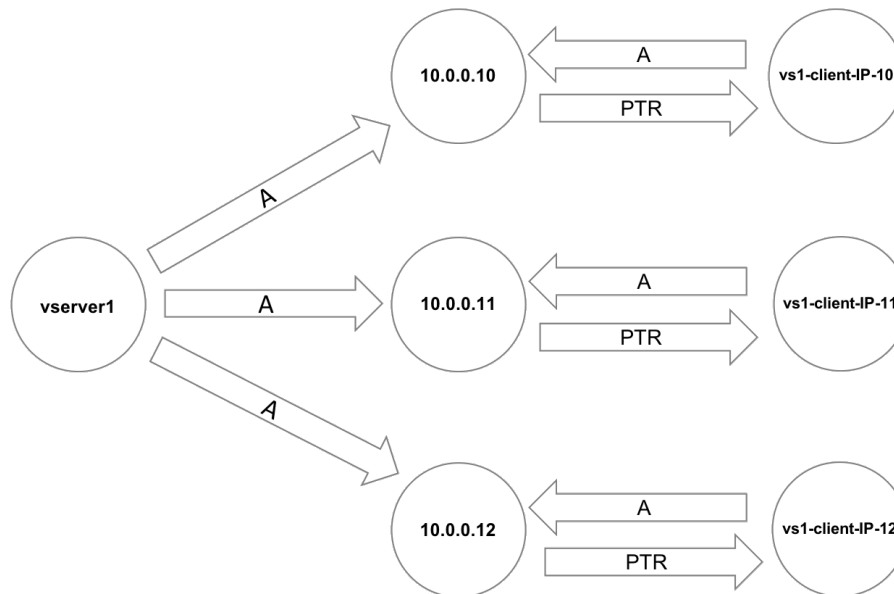
To distribute the overall load, configure your DNS domain to use round-robin load distribution for client-facing IP addresses. (This is called round-robin DNS, or RRDNS.)

When clients access the cluster, RRDNS automatically balances their requests among all available interfaces.

RRDNS Configuration Details

For optimal performance, configure your DNS server to handle client-facing cluster addresses as shown in the following diagram.

A cluster vserver is shown on the left, and IP addresses appear in the center and on the right. Configure each client access point with A records and pointers as illustrated.



Each client-facing IP address must have a unique name for internal use by the cluster. (In this diagram, the client IPs are named `vs1-client-IP-*` for clarity, but in production you should probably use something more concise, like `client*`.)

Clients mount the cluster using the vserver name. The vserver name is also used as the server argument for client mount commands.

Modify your DNS server's `named.conf` file to set cyclic order for queries to your vserver. This option ensures that all of the available values are cycled through. Add a statement like the following:

```
options {
    rrset-order {
        class IN A name "vserver1.example.com" order cyclic;
    };
};
```

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

```
update add vserver1.example.com. 86400 A 10.0.0.10
update add vserver1.example.com. 86400 A 10.0.0.11
update add vserver1.example.com. 86400 A 10.0.0.12
update add vs1-client-IP-10.example.com. 86400 A 10.0.0.10
update add vs1-client-IP-11.example.com. 86400 A 10.0.0.11
update add vs1-client-IP-12.example.com. 86400 A 10.0.0.12
update add 10.0.0.10.in-addr.arpa. 86400 PTR vs1-client-IP-10.example.com
update add 11.0.0.10.in-addr.arpa. 86400 PTR vs1-client-IP-11.example.com
update add 12.0.0.10.in-addr.arpa. 86400 PTR vs1-client-IP-12.example.com
```

6.1.2 Cluster DNS Settings

DNS parameters for the cluster are set in the **Cluster > Administrative Network**⁷ settings page. Settings on that page include:

- DNS server address
- DNS domain name
- DNS search domains

Read **DNS Settings**⁸ in the **Cluster Configuration Guide**⁹ for more details about using this page.

6.2 Encryption Certificates

Avere OS uses X.509 certificates for these functions:

- To encrypt cluster administration traffic
- To authenticate on behalf of a client to third-party KMIP servers
- For verifying cloud providers' server certificates

If you need to upload certificates to the cluster, use the **Cluster > Certificates** settings page. Read **Cluster > Certificates**¹⁰ in the **Cluster Configuration Guide** for details.

To encrypt cluster management communication, use the **Cluster > General Setup** settings page to select which certificate to use for administrative SSL.

Note: Cloud service access keys are stored by using the **Cloud Credentials** configuration page. Read **Cloud Credentials** (page 32) for an overview of that process.

⁷ http://library.averesystems.com/ops_guide/4_7/gui_admin_network.html#gui-admin-network

⁸ http://library.averesystems.com/ops_guide/4_7/gui_admin_network.html#gui-dns

⁹ <http://library.averesystems.com/#operations>

¹⁰ http://library.averesystems.com/ops_guide/4_7/gui_certificates.html#gui-certificates

ADDING BACKEND STORAGE

A *core filer* is the entity that links a backend storage system (for example, a NAS hardware appliance or a cloud object store) to the Avere cluster.

Use the Avere Control Panel to add a core filer to your system.

(Note that a FlashCloud license is required to use cloud storage as a core filer in your Avere cluster. You cannot define a cloud core filer until after the license has been installed.)

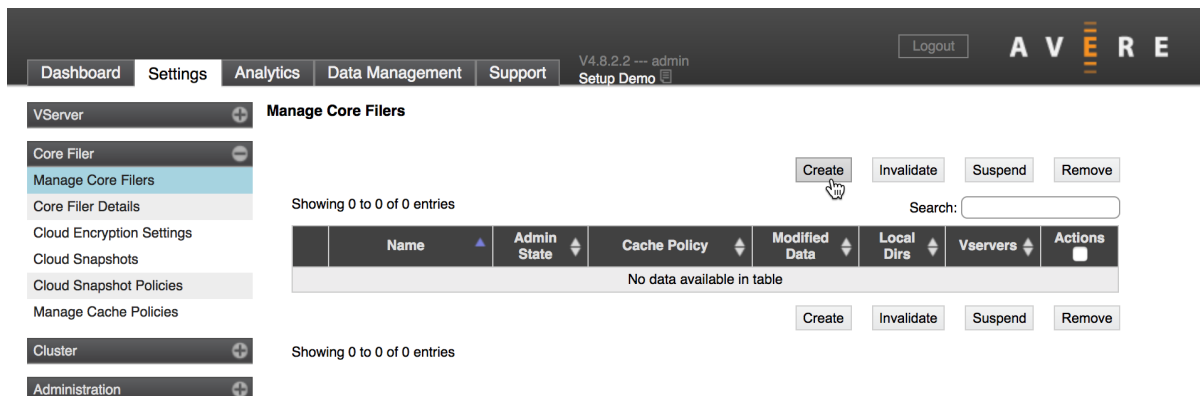
More complete information is included in the [Cluster Configuration Guide](#)¹:

- For additional information about choosing and preparing to add a core filer, read [Working With Core Filers](#)².
- For additional prerequisites and step-by-step instructions, read one or both of these:
 - [Adding a New Core Filer - NAS Core Filer](#)³
 - [Adding a New Core Filer - Cloud Core Filer](#)⁴

After adding a core filer, you can view or modify its properties by using the **Core Filer Details** settings page.

7.1 Adding a Core Filer

Define a core filer by clicking the **Create** button on the **Core Filer > Manage Core Filers** settings page.



The **Add New Core Filer** wizard walks you through the process of creating a core filer that links to your backend storage. The [Cluster Configuration Guide](#)⁵ has very detailed descriptions of the process, which is different for NFS/NAS storage and for cloud storage.

¹ <http://library.averesystems.com/#operations>

² http://library.averesystems.com/ops_guide/4_7/core_filer_overview.html#core-filer-overview

³ http://library.averesystems.com/ops_guide/4_7/new_core_filer_nas.html#create-core-filer-nas

⁴ http://library.averesystems.com/ops_guide/4_7/new_core_filer_cloud.html#create-core-filer-cloud

⁵ <http://library.averesystems.com/#operations>

7.1.1 License-Based Restrictions

The options might be restricted based on what licenses you have installed. The screenshot below is from a cluster that does not have a FlashCloud license installed.

Add New Core Filer

This is a step-by-step guide to adding a core filer to your cluster.

Before you begin, you will need the following pieces of information:

- If you're adding an NAS core filer, you will need the network name or IP (the fully-qualified domain name is preferred) of the filer you are adding.
- You will need a license to create cloud core filers.

Core Filer Details

Core filer type: ☒ NAS ☐ Cloud - **Not licensed**

Core filer name:

Core filer network name/IP:

Filer class:

Network:

Page 1 of 2

Back Next

7.1.2 Cache Policy Choices

On the second page of the wizard you must select a cache policy for the new core filer. These are described in detail in the [Cluster Configuration Guide](#)⁶.

Policies that require additional licenses cannot be selected.

Add New Core Filer

Cache Policy for Flurry-NAS

Cache Policy: ☒ **Cache Policy**

Use this cache policy when others are mounting the file system.

File and directory reads pass directly to the core filer.

The cluster maintains consistency between the core filer and the system cache.

Cache Policy options:

- System Default Cache Policies --
- Clients Bypassing the Cluster
- Read Caching**
- Read and Write Caching
- Full Caching (license required)
- Transitioning Clients Before or After a Migration (license required)
- Custom Cache Policies --
- Go to "Manage Cache Policies" to create one

Diagram:

```

graph LR
    Clients[Clients] -- Read --> Avere[Avere cluster]
    Avere -- Read --> Core[Core filer]
    Core -- Write --> Avere
    Avere -- Read and Write --> Clients
  
```

Some cache policies are unavailable because this cluster is not licensed for the Local Directories feature. A license for Local Directories, FlashMove or FlashMirror is required to activate these cache policies.

[Manage Cache Policies](#)

Page 2 of 2

Back Add Filer

⁶ <http://library.averesystems.com/#operations>

7.1.3 Adding the Core Filer

After filling in all of the required settings in the Add New Core Filer wizard, click the **Add Filer** button to submit the change.

(For a cloud core filer, there is an additional page for specifying the storage system and encryption details - read [Adding a New Core Filer - Cloud Core Filer⁷](#) in the [Cluster Configuration Guide⁸](#) for help with this configuration.)

After a few moments, the storage system appears on the Dashboard's core filers list and can be accessed through core filer settings pages.

The screenshot shows the Avere VServer Administration interface. The top navigation bar includes Dashboard, Settings, Analytics, Data Management, and Support. The left sidebar shows the 'Manage Core Filers' section. The main content area displays a table with one entry for 'Flurry-NAS'. The table columns are Name, Admin State, Cache Policy, Modified Data, Local Dirs, Vservers, and Actions. The entry for 'Flurry-NAS' shows it is online, has a 'Read and Write Caching' policy, 0 files, disabled local dirs, and no vservers. Below the table, there is a detailed view of the filer's configuration, including network name, core filer IPs, and vserver information.

Name	Admin State	Cache Policy	Modified Data	Local Dirs	Vservers	Actions
Flurry-NAS Type: NAS	online	Read and Write Caching Read/Write Writeback: 3600	0 Files	Disabled	None	<input type="checkbox"/>

Showing 1 to 1 of 1 entries

Search:

Cache Policy Info

Policy name: [Read and Write Caching](#)

Cache mode: Read/Write

Writeback delay: 3600

Filer verification: Never

Local directories: Disabled

Network name: grape.cc.ave.com

Core filer IPs: 10.0.0.1

Vservers: None

Note that this screenshot shows a core filer with no vserver - its setup is not complete. You must associate the core filer with a vserver to allow clients to access the storage system. Read [Configuring VServers and Global Namespace](#) (page 33) for help with the next step.

7.2 About Local Directories

The Local Directories feature in Avere OS provides enhanced caching services, which can impact the cluster's throughput in some scenarios. Avere Systems recommends that customers consult their Avere representatives before enabling this feature.

Some caching scenarios require the Local Directories feature, so some cache policies are unavailable until after you have obtained and installed a Local Directories license file. There is no additional charge for the license. Contact Avere Global Services if you have questions.

⁷ http://library.averesystems.com/ops_guide/4_7/new_core_filer_cloud.html#create-core-filer-cloud

⁸ <http://library.averesystems.com/#operations>

7.3 Cloud Credentials

If you add a cloud object store as a core filer, you must specify the cloud service and credentials for accessing the storage, among other parameters. You can add a cloud storage credential as part of creating the core filer.

The screenshot shows a window titled "Add New Core Filer" with a close button in the top right. Inside, there's a section titled "Creating New Cloud Filer". Below this title are several configuration options:

- Service type: A dropdown menu showing "Amazon S3".
- Cloud credential: A dropdown menu showing "Select a credential".
- Bucket contents: Two radio buttons, "Empty" (selected) and "Existing Avere data".
- Use HTTPS: A checked checkbox.
- Certificate verification: A dropdown menu showing "OCSP_CRL".
- Compression mode: A dropdown menu showing "LZ4".
- Snapshot policy: A dropdown menu showing "None".
- Proxy configuration: A dropdown menu showing "None".

At the bottom left of the window, it says "Page 3 of 4". At the bottom right, there are "Back" and "Next" buttons.

If you later want to add, change or remove a credential, use the **Cluster > Cloud Credentials** settings page.

For more details, read the [Cluster > Cloud Credentials](#)⁹ chapter in the [Cluster Configuration Guide](#)¹⁰, and the [Cloud Service and Protocol](#)¹¹ section of the chapter that describes the cloud core filer wizard.

⁹ http://library.averesystems.com/ops_guide/4_7/gui_cloud_credentials.html#gui-cloud-credentials

¹⁰ <http://library.averesystems.com/#operations>

¹¹ http://library.averesystems.com/ops_guide/4_7/new_core_filer_cloud.html#cloud-filer-details

CONFIGURING VSERVICES AND GLOBAL NAMESPACE

Avere OS's *vservers* are virtual file servers that control how data flows between the client and the cluster's core filers.

VServers manage vital functions in an Avere cluster:

- VServers host client-facing IP addresses
- VServers' namespace junctions map the client-facing virtual directory structure to exports on the backend storage
- VServers enforce file access controls, including core filer export policies and user authentication systems
- VServers provide SMB infrastructure

Before starting to configure a cluster vserver, read the linked documentation and consult your Avere representative as needed to understand the structure of the Avere cluster's file serving system.

These sections of the [Cluster Configuration Guide](#)¹ will help you familiarize yourself with Avere OS's vserver and global namespace features.

- [Creating and Working with VServers](#)²
- [Using a Global Namespace](#)³

8.1 Creating a VServer

To create a new vserver, you will need the following information:

- The name to set for the vserver
- The range of client-facing IP addresses the vserver will handle

When creating a vserver you must supply a single range of contiguous IP addresses, but you can add more addresses later by using the **Client Facing Network** settings page.

- If your network has VLANs, which VLAN to use

A cluster can have multiple vservers.

Use the **VServer > Manage VServers** settings page to create a new vserver.

Refer to **VServer > Manage VServers**⁴ in the [Cluster Configuration Guide](#)⁵ for complete information.

¹ <http://library.averesystems.com/#operations>

² http://library.averesystems.com/ops_guide/4_7/settings_overview.html#vserver-settings

³ http://library.averesystems.com/ops_guide/4_7/gns_overview.html#gns-overview

⁴ http://library.averesystems.com/ops_guide/4_7/gui_vserver_manage.html#gui-manage-vservers

⁵ <http://library.averesystems.com/#operations>

Dashboard Settings Analytics Data Management Support V4.8.2.2 -- admin Setup Demo Logout AVARE

Manage VServers

Add New VServer

Vserver name: vservers-1

First IP: 192.0.2.66

Last IP: 192.0.2.87

Number of IPs in range: 22

Subnet mask: 255.255.224.0

VLAN: Default (tag: -, gateway: 10.1.0.76)

Legacy (Simple) VServer: ☐

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8.2 Creating a Junction

A *junction* maps the backend storage path to a client-visible namespace. You can use this system to simplify the path used in client mount points, and to scale capacity seamlessly because one virtual path can accommodate storage from multiple core filers.

Add New Junction

Create a New Junction

Namespace path: sd-access

Core filer: Flurry-NAS

Core filer export: /vol/dpark

Export subdirectory: january

Auto-create subdirectory: ☒

Export policy: Inherit (default)

CIFS access control: POSIX mode bits

Core filer share name: (empty)

Core filer share subid: (empty)

Permissions: Preserve current permissions

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Refer to [VServer > Namespace⁶](#) in the [Cluster Configuration Guide⁷](#) for complete details about creating a namespace junction.

⁶ http://library.averesystems.com/ops_guide/4_7/gui_namespace.html#gui-namespace

⁷ <http://library.averesystems.com/#operations>

Dashboard Settings Analytics Data Management Support V4.8.2.2 --- admin Setup Demo Logout AVERE

VServer Namespace -- vserver-1

Manage VServers Vserver Details Client Facing Network Namespace Export Policies Export Rules NFS CIFS CIFS Shares Core Filer Cluster Administration

Create Modify Move/Mirror (Un)Suspend Remove

Showing 1 to 1 of 1 entries Search:

	Namespace Path	State	Core Filer	Export Policy	Export	Subdir	Actions
▼	/sd-access	Online	Flurry-NAS	inherited (default)	/vol/dpark	january	<input type="checkbox"/>
Path	/sd-access			CIFS access	posix		
Core filer	Flurry-NAS			Share name			
NFS export	/vol/dpark			Share subdir			
Subdir	january			Permissions			
Policy	inherited (default)			Data Mgmt			

Create Modify Move/Mirror (Un)Suspend Remove

Showing 1 to 1 of 1 entries

8.3 Configuring Export Rules

After you have both a vserver and a core filer, you should customize the export rules and export policies that control how clients can access files on the core filer exports.

First, use the **VServer > Export Rules** page to add new rules, to modify the default policy, or to create your own custom export policy.

Second, use the **VServer > Export Policies** page to apply the customized policy to your core filer's exports when accessed through that vserver.

Read [Controlling Access to Core Filer Exports⁸](#) in the [Cluster Configuration Guide⁹](#) for details.

⁸ http://library.averesystems.com/ops_guide/4_7/export_rules_overview.html#export-rules-overview

⁹ <http://library.averesystems.com/#operations>

CUSTOMIZING SUPPORT AND MONITORING SETTINGS FOR THE AVERE CLUSTER

As part of getting your Avere cluster up and running, you might want to make sure that debugging statistics are enabled and that other settings are configured to help Avere Global Services assist you if there is a problem.

Customers also should consider enabling the system's remote monitoring features, which are configured on the **Cluster > Monitoring** settings page. You can configure email alerts, external logging, and SNMP monitoring. (Read *Remote Monitoring* (page 38), to learn more.)

9.1 Support Configuration

These basic support settings should be configured for all clusters.

These settings are made in the **Settings** tab on the **Cluster > Support** page in the Avere Control Panel.

(You might also use the **Support** tab in the Avere Control Panel to configure and kick off manual support uploads if requested by your Avere representative.)

The *Cluster Configuration Guide*¹ guide explains the support options in more detail. Start by reading *Using the Avere Control Panel Support Tab*².

9.1.1 Support Settings Page Items

On the **Settings > Cluster > Support** page, address the following items.

Read *Cluster > Support*³ in the *Cluster Configuration Guide*⁴ for more complete information on these features.

1. In the **Customer Info** section, take these actions:

- **Unique Cluster Name** - If needed, specify a name that identifies your company and also uniquely identifies the cluster if you have more than one. This string will be used to identify any system files uploaded to Avere Global Services. (The main cluster name also is used with diagnostic uploads, but this field supplements the cluster name if needed.)
- **Statistics Monitoring** - Check the box to enable this feature.
- **General Information Upload** - Check the box to enable this feature.
- **Crash Information Upload** - Leave this setting enabled. In the event of a system restart, this setting automatically uploads any resulting memory core files to Avere Global Services for analysis.

Submit those changes, then click the **Revalidate upload information** button to initiate a data upload to Avere Systems as a test.

¹ <http://library.averesystems.com/#operations>

² http://library.averesystems.com/ops_guide/4_7/support_overview.html#support-tab

³ http://library.averesystems.com/ops_guide/4_7/gui_support.html#gui-support-settings

⁴ <http://library.averesystems.com/#operations>

2. Optionally, configure these items in the **Secure Proactive Support** section. SPS is an optional feature that allows Avere Global Services staff to remotely troubleshoot your cluster. Read [Secure Proactive Support \(SPS\)](#)⁵ in the [Cluster Configuration Guide](#)⁶ for more information.

- **Enable SPS Link** - Check the box to turn on Secure Proactive Support.
- **Remote Command Level** - Change the selection from **Disabled** to one of the other options. **Support** is the most conservative level.
- **Shipping Information** - Optionally, fill in the contact name and shipping address to use in the event that any hardware needs to be replaced.

Click the **Submit** button in the SPS section to save those settings.

9.1.2 Support Tab - Upload Test

On the **Support** tab, you can test the **General Information Upload** system.

Select either a particular node or the full cluster in the **Details** section at the top of the **Support** tab. Leave the **Choose gather mode** control set to **Support bundle** and click the **Upload information** button.

The **Support Status** section of the **Support** tab will display messages for each affected node as data is collected and uploaded during the test. The messages progress from `Statistics gathering complete` to `Uploading <filename>` and finally return to `No support operations currently running`.

The test can take five to ten minutes to complete. It is normal for the primary node to take longer to complete than other nodes if you are collecting cluster-wide statistics.

9.2 Remote Monitoring

You can use the **Cluster > Monitoring** settings page to enable remote monitoring tools. Using any of these tools is optional.

Options include:

- **Email Monitoring** - Set up email notification for system alerts.
- **Logs** - Specify a remote syslog server to receive log messages.
- **SNMP** - Set up a simple network management protocol server to monitor your Avere cluster.

Read more about these features and how to configure them in the [Cluster Configuration Guide](#)⁷ in **Cluster > Monitoring**⁸.

⁵ http://library.averesystems.com/ops_guide/4_7/gui_support.html#gui-sup-sps

⁶ <http://library.averesystems.com/#operations>

⁷ <http://library.averesystems.com/#operations>

⁸ http://library.averesystems.com/ops_guide/4_7/gui_monitoring_settings.html#gui-monitoring-settings

APPENDIX A: SETTING A STATIC IP ADDRESS ON AN FXT NODE

This appendix explains how to connect to an FXT node physically and set a temporary static IP address on one of the network ports.

You might need to set a static address if your network does not support using self-assigned IP addresses (in the 169.254.*.* range) and your node does not receive an IP address automatically from a DHCP server.

Each node needs one IP address before it can be used to create a cluster or be added to an Avere cluster. These IP addresses are only used temporarily; during normal operation, the cluster assigns IP addresses to each node.

10.1 Connecting to the Physical Node

There are a variety of ways to connect to the FXT node, including using the serial port, the USB and VGA ports, or the IPMI port. All of these ports are on the back of the chassis. You can use a serial cable or KVM switch, or directly connect a monitor and keyboard to the chassis.

The node's bootloader echoes boot messages to the serial console and accepts interaction from a console command prompt.

10.1.1 Serial Port Configuration Settings

Use a null modem cable to connect to the serial port on the back of the FXT node's chassis.

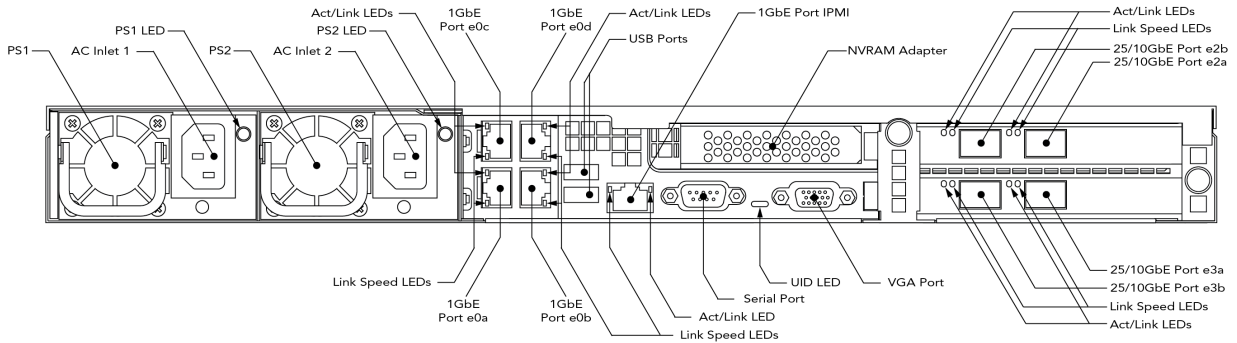
An FXT node serial port uses these configuration settings:

- Speed: 115200 baud
- Data bits: 8
- Stop bits: 1
- Parity: None
- Flow control: None

10.2 FXT 5000 Series Port Locations

This diagram shows the port names and locations for FXT 5000 Series hardware nodes. The 1GbE ports (e0a, e0b, e0c, and e0c) are typically used for initial configuration.

(The data ports - e2a, e2b, e3a, and e3b - are slightly different in different FXT 5000 Series models. The FXT 5850 has dual-mode 25GbE/10GbE data ports, but other models have 10GbE ports with the same names.)



10.3 Logging In and Setting the IP Address

After connecting to the node, you will use the maintenance menu to configure one of the network interfaces.

Log in to the node with the username `maintenance` and the default password `tiered2010`. The node displays the maintenance menu:

```
You have logged into the AvereOS maintenance menu.  If you are configuring a
cluster for the first time, use menu item 1 to configure a network port, and
then access https://ip/fxt to complete the cluster configuration.
```

```
Node [name] running [AvereOS_version]
```

```
Maintenance Menu
```

1. Configure network parameters before cluster join
2. Modify cluster management network parameters
3. Configure a new cluster
4. Reboot node
5. Power down node
6. Disable NVRAM batteries
7. Install new software packages
8. Configure node IPMI networking
9. Reformat node

```
Enter menu item number or type "exit" to log out:
```

Type 1 and press Return.

```
Enter menu item number or type "exit" to log out: 1
This will configure the initial networking parameters.
After configuration, connect via https to the address
supplied to complete configuration
```

Port	Address	Netmask	MTU	Link
e0a	169.254.6.37	255.255.224.0	1500	up
e0b	169.254.5.163	255.255.224.0	1500	up
e0c	169.254.5.146	255.255.224.0	1500	up
e0d	169.254.6.114	255.255.224.0	1500	up

```
Router:
DHCP:  enabled
```

```
DNS Server:
Use link aggregates? [y]:
```

If your system uses link aggregates, make sure this configuration is correct. The system then asks you to configure by DHCP if a server is available, and if not, prompts you to specify the port to configure and the new settings.

```
Configure using DHCP? [y]:  n
Port name [e0a]:
```

If you don't want to configure the suggested port (the first port on the list), enter a different value.

```
MTU [1500]:
VLAN tag (use default for untagged) [none]:
IP address [169.254.6.37]:
```

Make any changes to the MTU or VLAN tag settings that your network requires.

When prompted with the existing IP address, type in the new address.

To prevent conflicts, assign an IP address that is on the same subnet and VLAN as the IPs in your cluster network, but outside the cluster network's IP address range. Remember that this IP address is temporary, and it is used only until the cluster is created or until this node is added to the cluster. As part of the cluster, the FXT node's ports are configured with IP addresses from within the cluster network range.

```
IP address [169.254.6.37]:  203.0.113.0
Netmask [255.255.224.0]:
Router []: 10.1.0.1
DNS server [None]:
Commit changes? [yn]:
```

Type `y` to complete the configuration change.

You only need to set one static IP address per node. After confirming the address change, you can end the console session to this node. (Type `exit` and press Return to end the session.)

If this is the first node in your cluster, follow the instructions in [Connect to the First Node](#) (page 3) to connect to the static IP address that you just set and begin cluster creation.

If this node will join an existing cluster, follow the instructions in [Adding Nodes to the Cluster](#) (page 15) to locate it and join it to the cluster.

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