

Vista Manager Virtual (VST-VRT)

User Guide

Introduction

Vista Manager is a state-of-the-art management and monitoring tool for LAN, SD-WAN, and wireless networks delivering powerful automation features. The virtual machine version of Vista Manager is called Vista Manager Virtual (VST-VRT).

The VST-VRT software is an .iso file that you can use to boot a virtual machine. The VST-VRT GUI allows you to manage the virtual machine and to set up and access applications to run on it. The VST-VRT .ova file makes it easy to configure your virtual machine and install the VST-VRT software.

The VST-VRT GUI provides access to the following applications:

- Vista Manager to provide an integrated graphical display of your network.
- AMF Cloud to manage Allied Telesis wired switches, firewalls, and routers.
- Wireless Controller (AWC) to manage and automatically optimize Allied Telesis wireless network devices.
- SNMP plug-in (and in VST-VRT version 3.7.2 and earlier, SNMP-based Trap Receiver) to monitor a broad range of third-party devices.
- AMF Security to defend your network from internal threats.

This guide tells you how to deploy and configure VST-VRT on an Oracle VM VirtualBox version 6.1 virtual machine. You can also deploy VST-VRT on a version 5.2 virtual machine if necessary.

Product and software version

This guide applies to the Vista Manager Virtual (VST-VRT) 3.4.1 and later. For more information about the latest VST-VRT and applications supported on it, see:

- The product's [Datasheet](#)
- [Vista Manager Virtual \(VST-VRT\) Technical Documents](#)—for release notes and user guides.

These documents are available on our website at alliedtelesis.com.

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System specifications

Server hardware requirements

Refer to the product's [Datasheet](#) for the hardware specifications and requirements.

Supported web browsers

- Google Chrome™
- Mozilla Firefox™
- Microsoft Edge
- Internet Explorer™11 or later
- Apple Safari™

Supported virtualization environment

- Oracle VM VirtualBox version 5.2 and 6.1

Setting up VST-VRT on VirtualBox 6.1 virtual machine

The VST-VRT software is an .iso file that you can use to boot a virtual machine. The VST-VRT GUI allows you to manage the virtual machine and to set up and access applications to run on it. The VST-VRT .ova file makes it easy to configure your virtual machine and install the VST-VRT software.

You use VirtualBox to import the .ova file and set up VST-VRT. The import process does most of the work to configure the virtual machine.

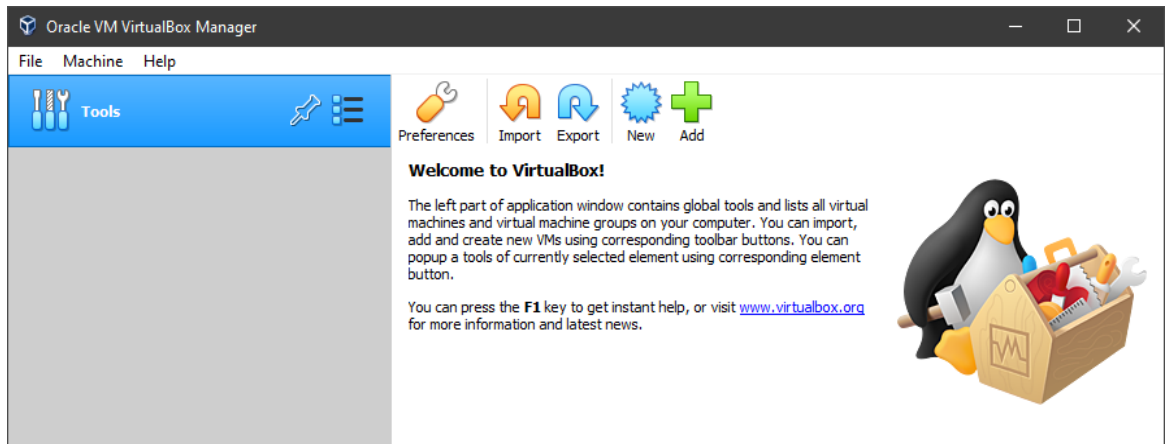
Note: Note that this section describes how to set up VST-VRT for the first time. To upgrade to a later version of VST-VRT software, see the procedure in the Release Notes for the version you are upgrading to. Using an upgrade procedure for a different version may have unpredicted results, including possible data loss.

Before you start you will need:

- VirtualBox version 6.1.x—available from: [VirtualBox](#).
- VST-VRT-x.x.x.iso—available from: [Allied Telesis download center](#).
- AT-VST-VRT-X.X.X-VirtualBox-6.1.ova file—available from: [Allied Telesis download center](#).

Configuration steps

Step 1. Open VirtualBox

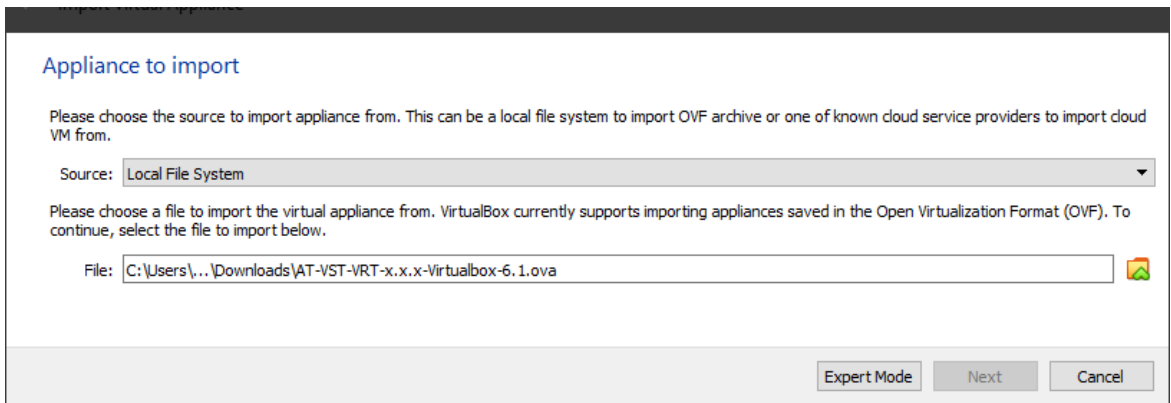


Step 2. Create a virtual machine

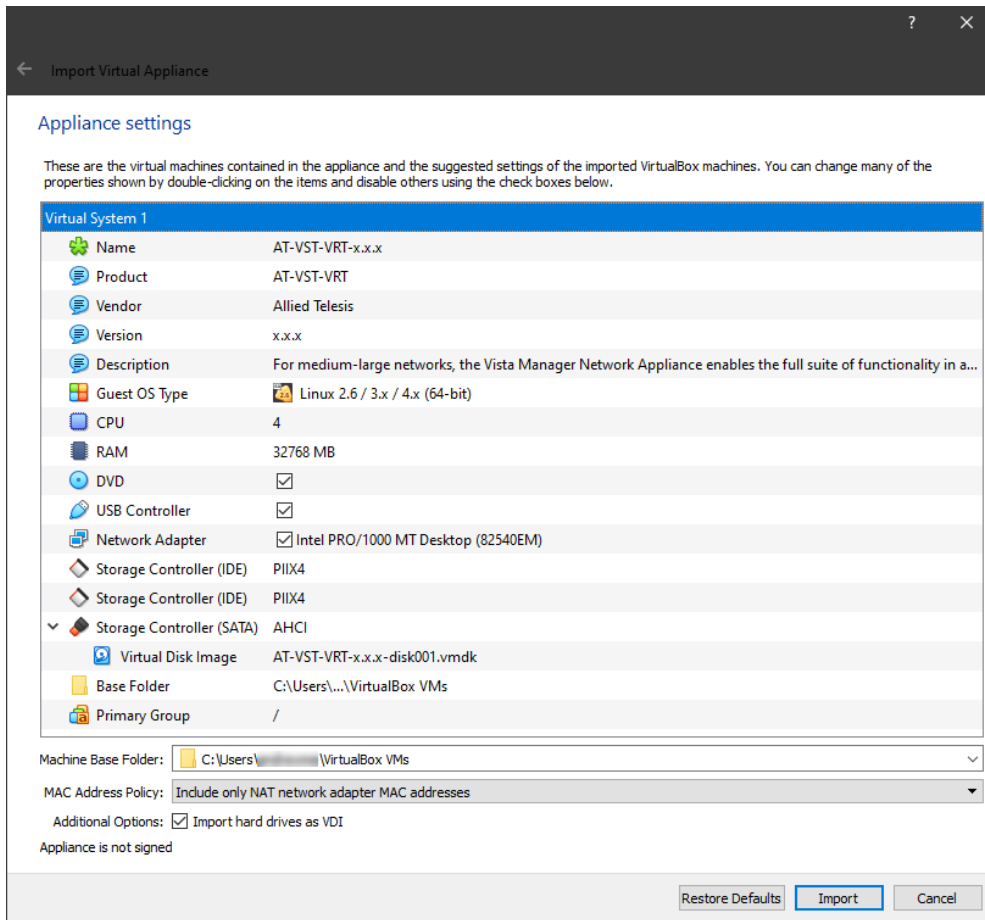
- Select **File > Import Appliance**.



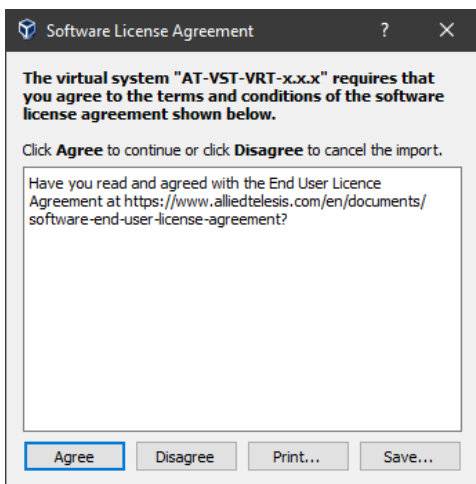
- Browse to locate the .ova file.



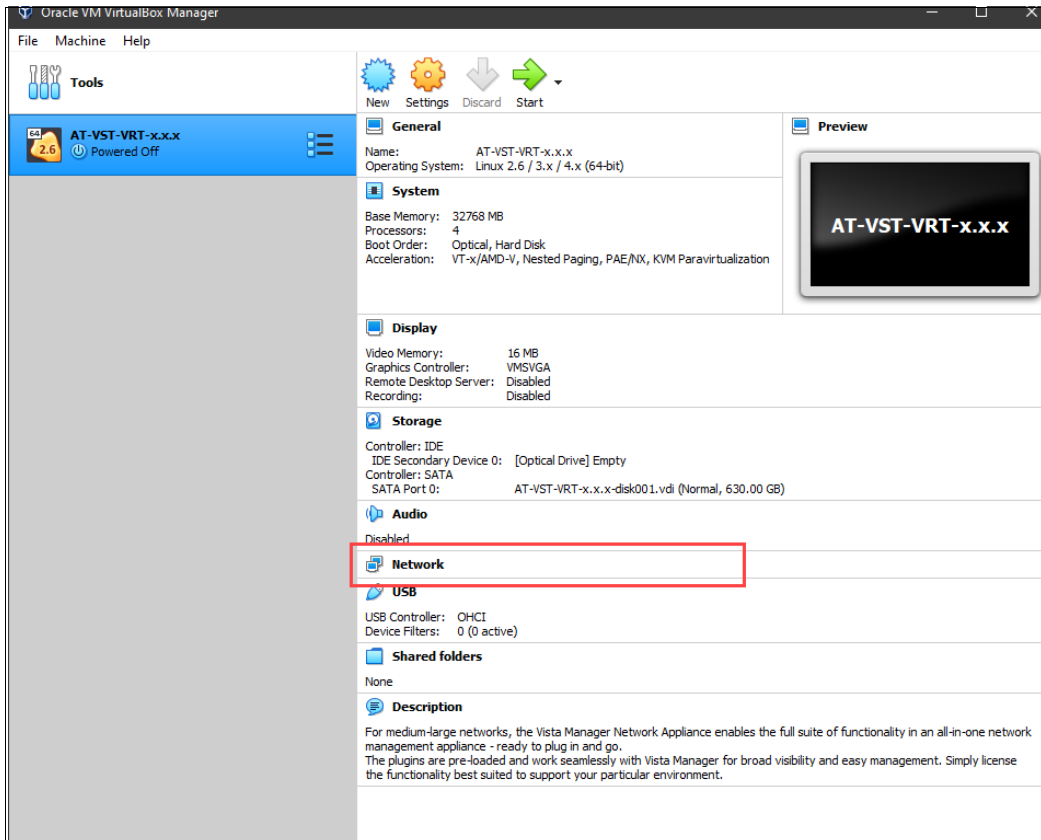
- Click **Next**.
- The **Appliance settings** window opens.



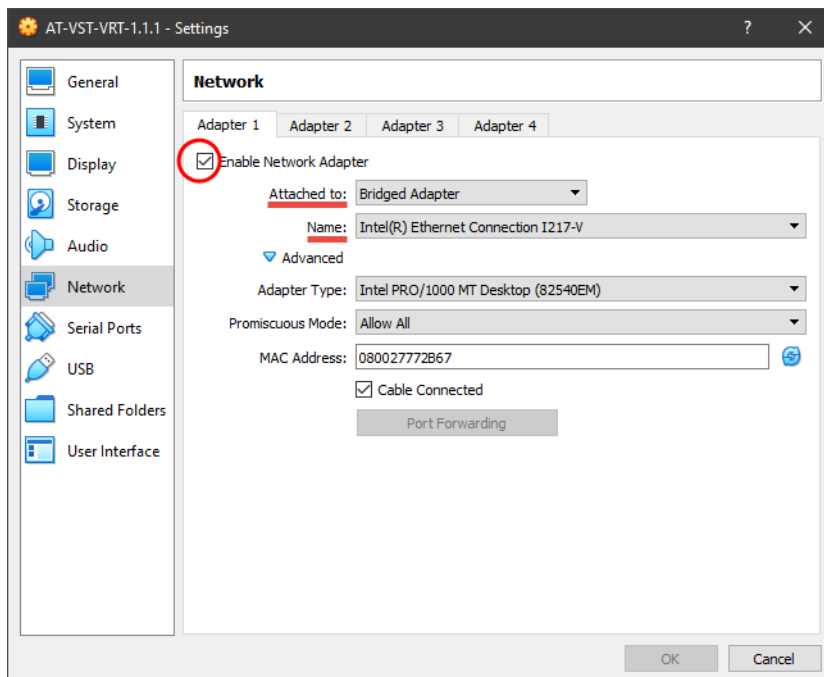
- Click **Import** to start the import.
- Click **Agree** to accept the software license agreement.



- A virtual machine is created.
- The virtual machine is listed on the left side of the window and details about it are on the right.

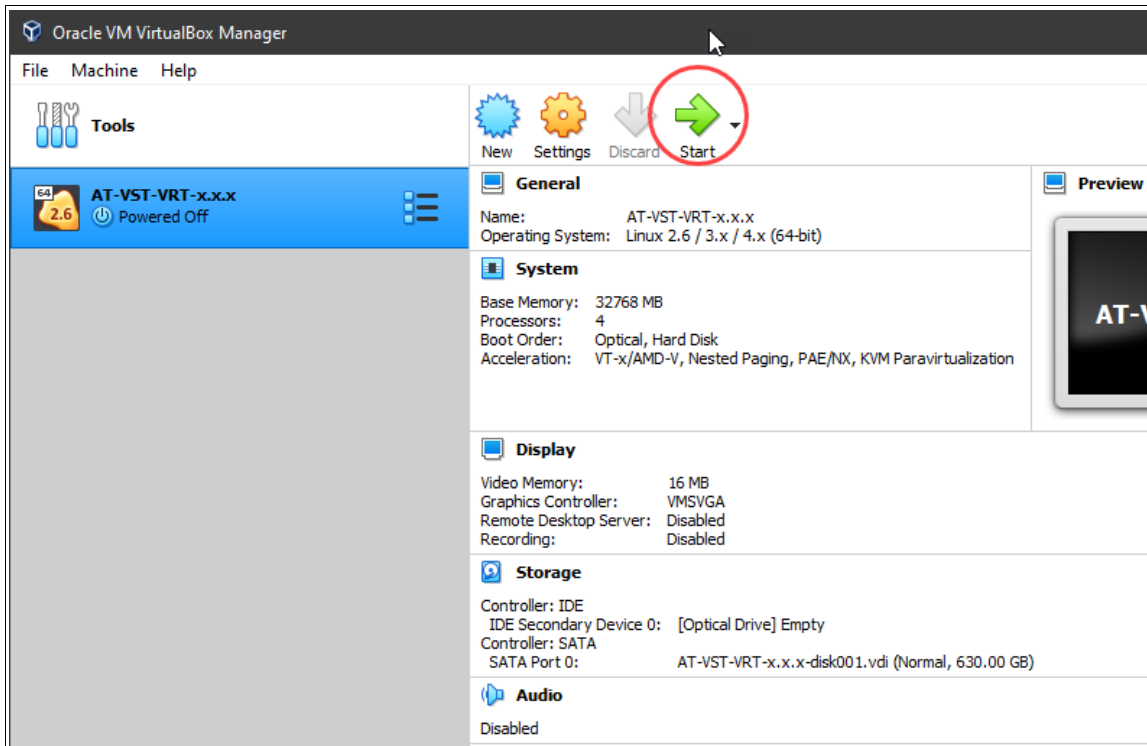


- Double-click on **Network**.
- In the **Network** settings, make sure that **Enable Network Adapter** is checked.
- In the **Attached to** field, select **Bridged Adapter** and the interface **Name** it will connect to.
- The **Advanced** fields will self populate.

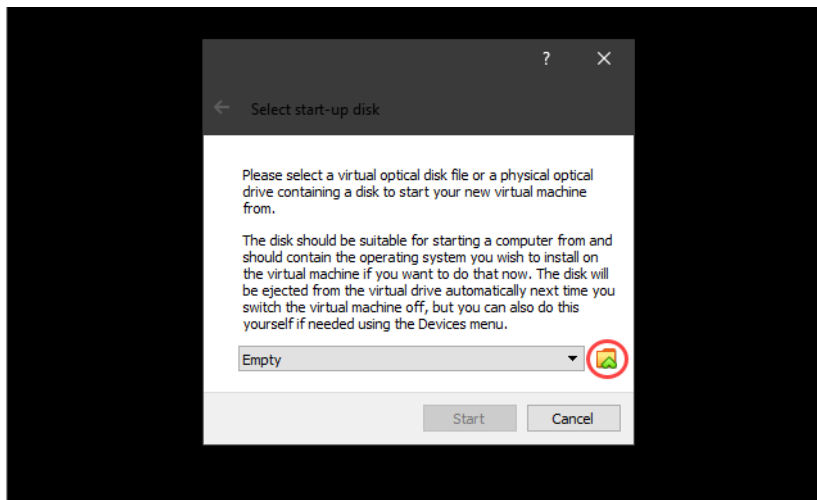


Step 3. Specify the VST-VRT startup disk (.iso file)

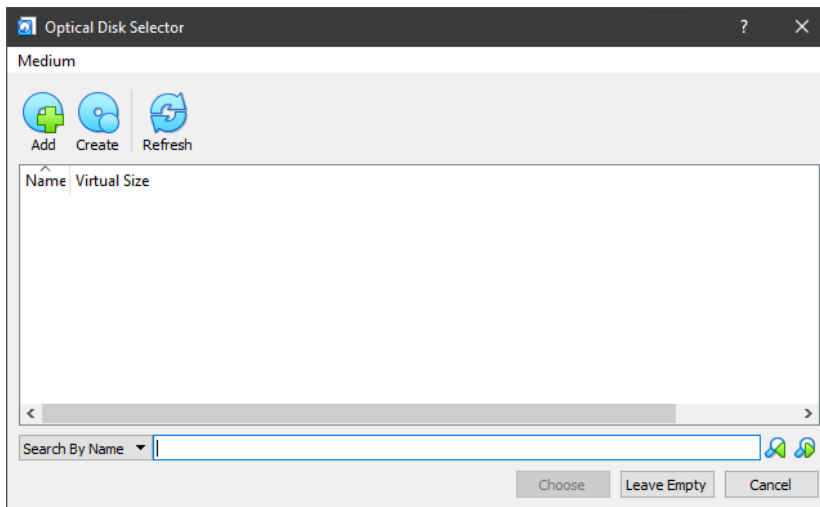
- With the virtual machine selected on the left side of the window.
- Click the **Start** button.



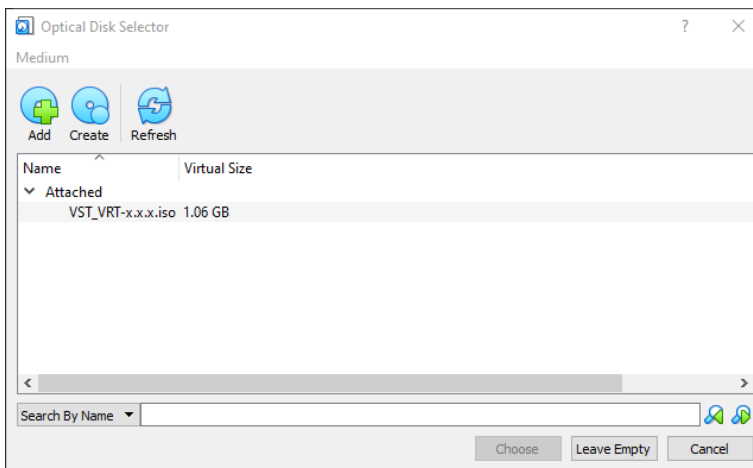
- Click on the **Choose a virtual optical disk file...** button.



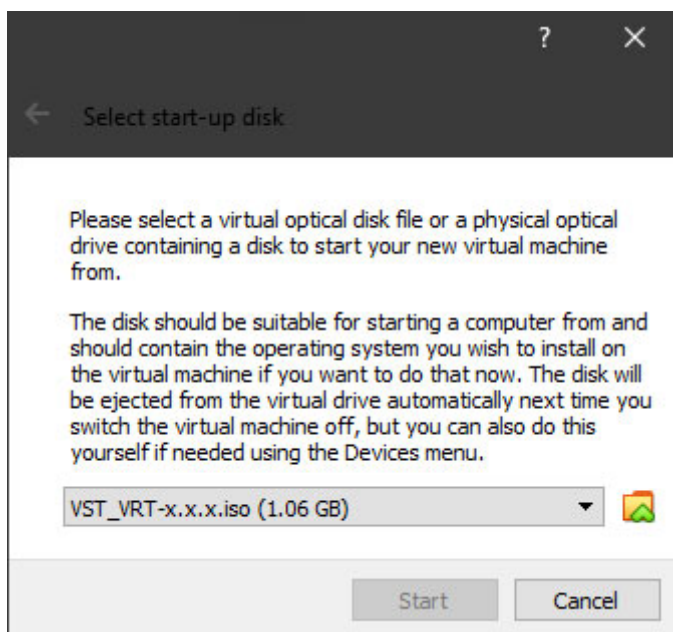
- To add an optical disk image, click **Add** and browse to the VST-VRT .iso file.



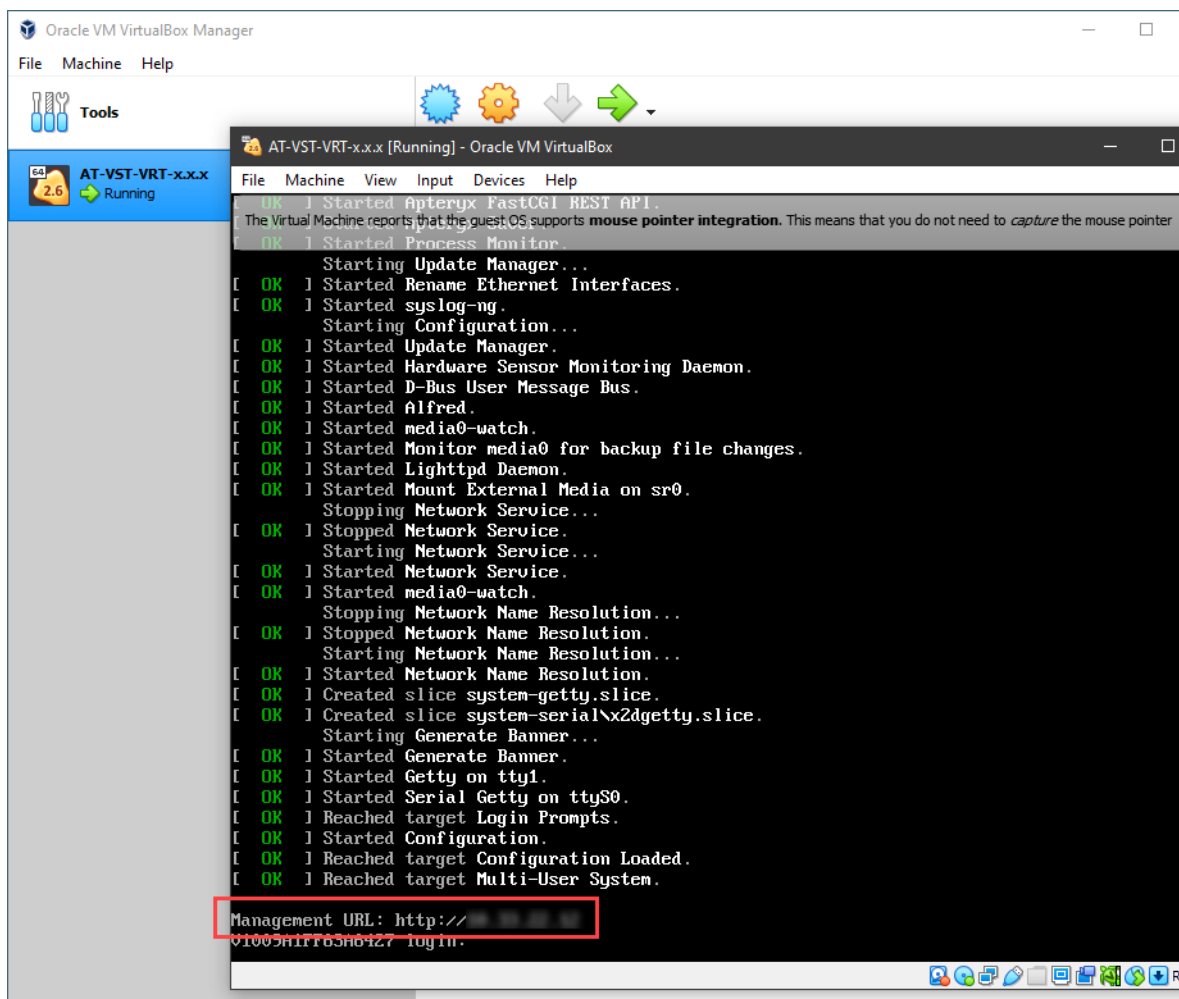
- Once you see the required .iso file in the **Optical Disk Selector**, select it, and click **Choose**.



- The **Select start-up disk** window appears.



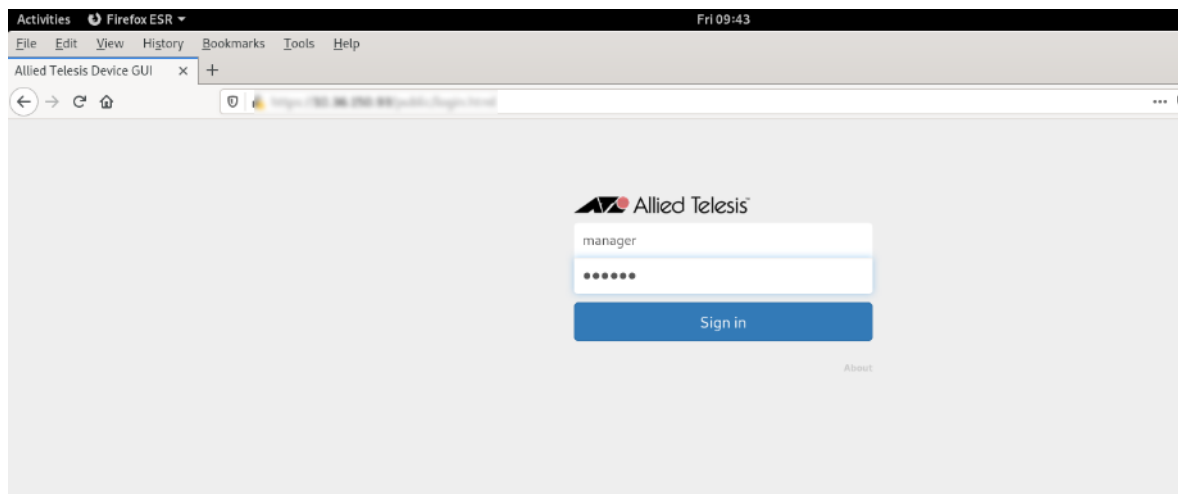
- Click **Start**.
- The machine boots, and you will see the command line appear and run.



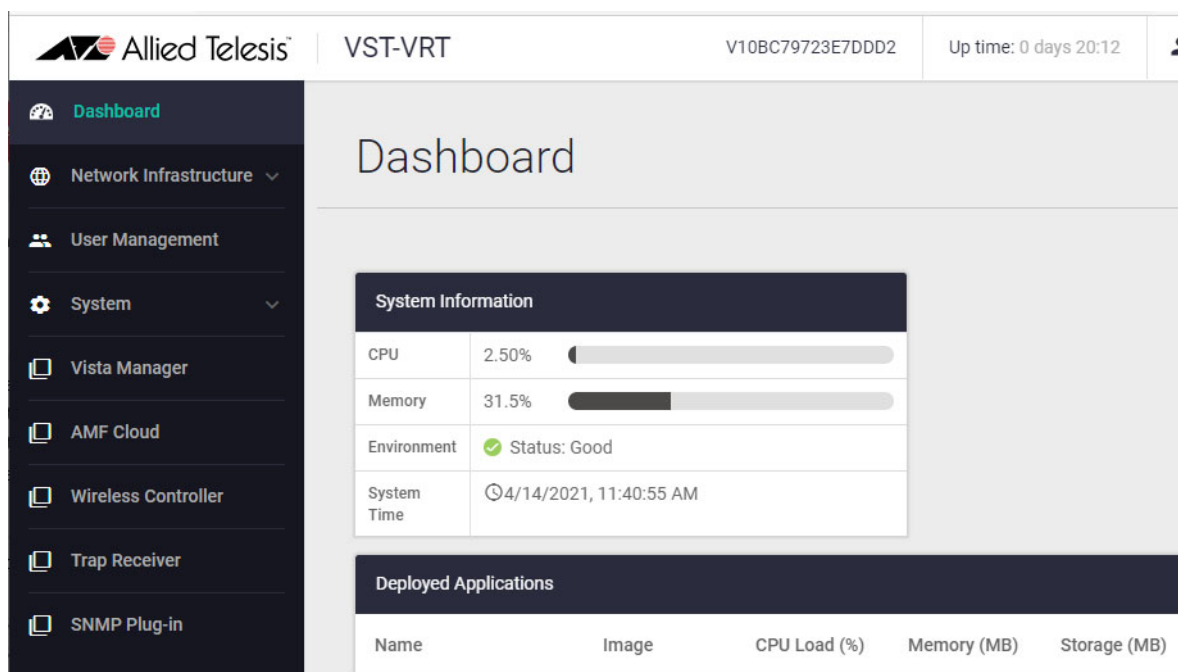
- Take a note of the IP address displayed after the last line: **Management URL**. This is the IP address you will use to connect to VST-VRT, as described in [step 4](#) ahead.
- By default, VST-VRT will attempt to obtain a DHCP address. If no address can be obtained, then 192.168.1.1/24 will be assigned.

Step 4. Connecting to VST-VRT

- Open a web browser and enter the IP address you noted after: **Management URL**.



- Log in (e.g. manager/friend).
- The Vista Manager **Dashboard** opens.



- This completes setting up VST-VRT on a VirtualBox 6.1 virtual machine.

Application resources

Before you can start VST-VRT applications, you need to allocate storage space to them. The maximum amount each application may receive depends on the hardware specifications. We recommend entering the storage values in this table to configure the applications.

Table 1: Recommended storage values for applications

APPLICATION	RECOMMENDED STORAGE (MB)
Vista Manager (Vista Manager EX)	204800
AMF Cloud	32768
AMF Security	81920
Wireless Controller (AWC)	204800
Trap Receiver (SNMP)	40960
SNMP (Full SNMP)	102400

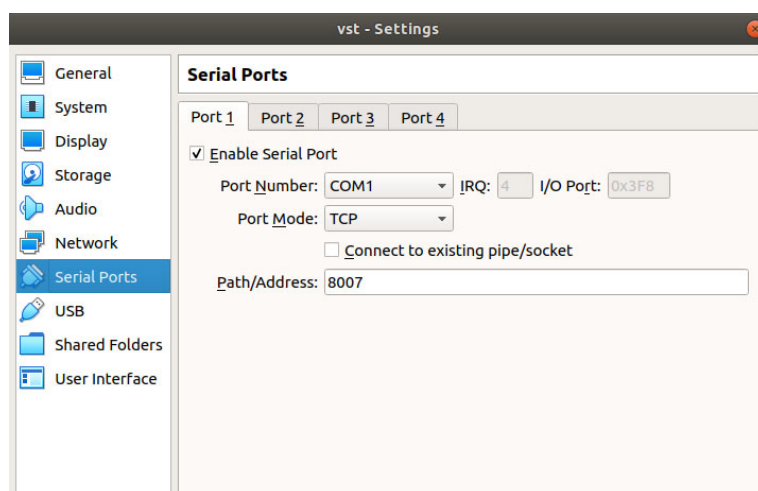
Troubleshooting

Port configuration

Port 8007 needs to be available, as VirtualBox listens on it. If this port is being used, the VST-VRT virtual machine will not boot, and display an error. In the unlikely event that Port 8007 needs to be used by another application, you just need to change the port to an available one, to get VST-VRT booting. The process is as follows:

Inside VirtualBox:

- Click on the VST-VRT virtual machine, and then click **Settings**.
- Click on **Serial Ports**.
- Change 8007 in the **Path/Address** field to be an unused port on the host machine.



Getting started with simple VST-VRT configuration

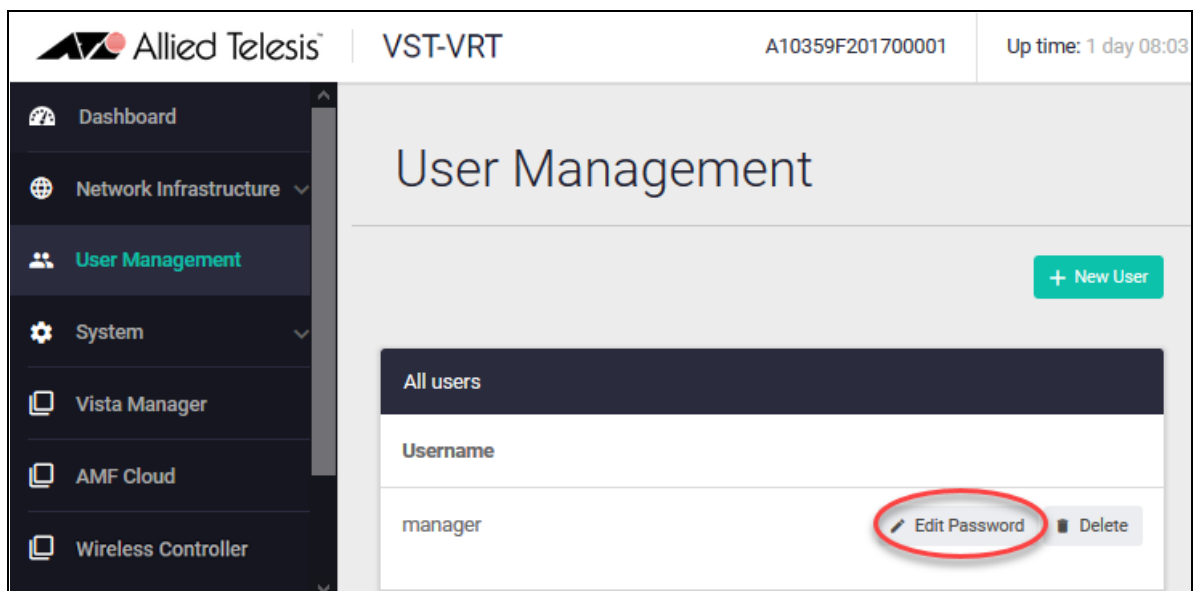
This section describes how to get the applications on VST-VRT started quickly and easily in these steps:

- "Set up network interfaces" on page 15
- "Save the VST-VRT configuration" on page 16
- "Activate an application" on page 17
- "Example: activate the applications" on page 22

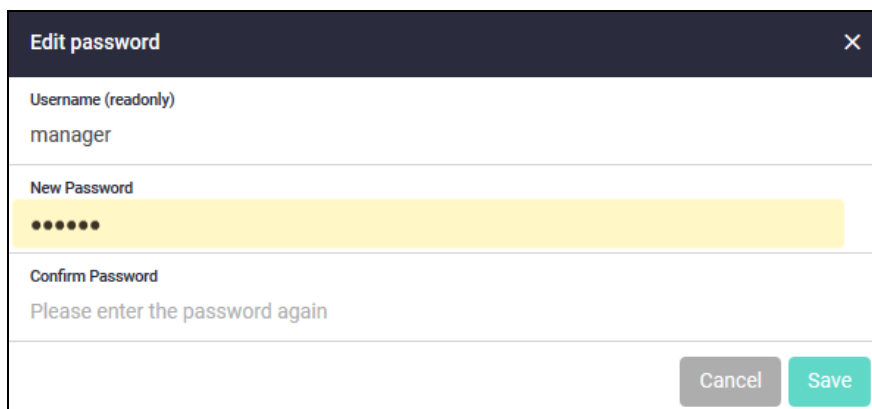
For more detailed information about using VST-VRT, see the sections that follow this one.

Change the manager password

In the Dashboard menu, click **User Management**.



In the User Management page, click **Edit Password** to the right of the user 'manager'.

The image shows a modal dialog box titled 'Edit password' with a close button (X) in the top right corner. It contains three input fields: 'Username (readonly)' with the value 'manager', 'New Password' with a yellow background and masked characters '••••••', and 'Confirm Password' with the placeholder text 'Please enter the password again'. At the bottom right, there are 'Cancel' and 'Save' buttons.

Enter the new password twice and click **Save**.

Set up network interfaces

By default, VST-VRT accepts IP addressing from a DHCP server, including an IP address and a default route. You can get these from the DHCP server. If a DHCP server does not supply this configuration to VST-VRT, you will need to manually add an IP address and a default route.

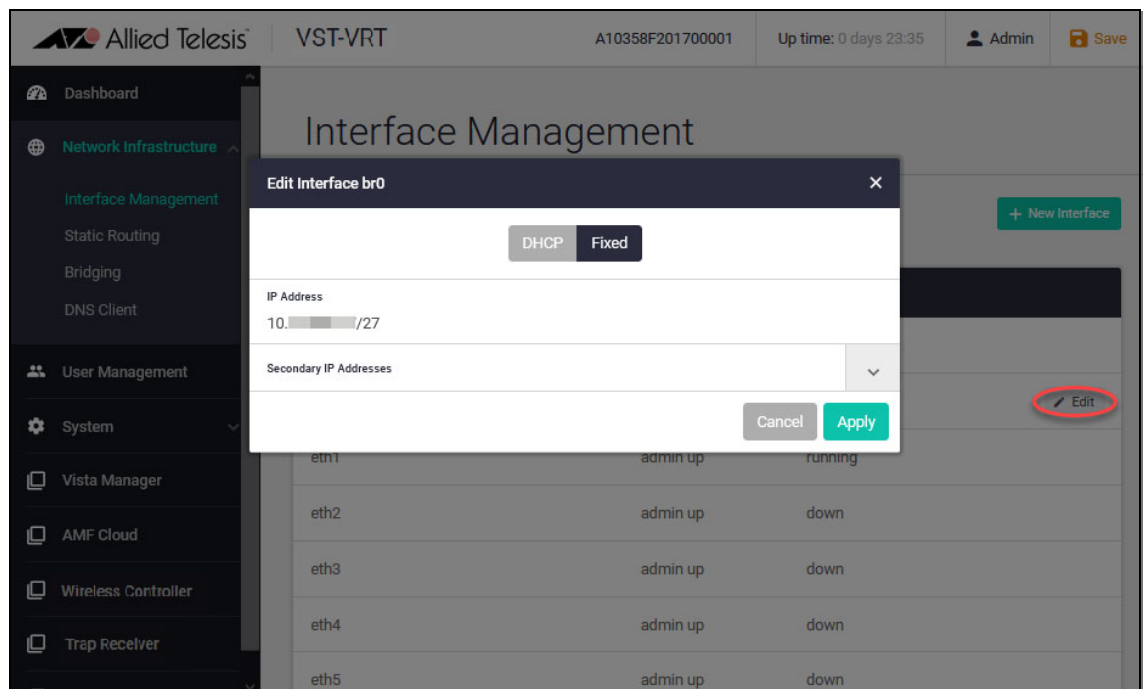
By default, all VST-VRT ports are in the same L2 bridge. During the initial setup, ensure the device is connected to one port only. This prevents it from bridging multiple networks. Later, after the initial setup is complete, you will be able to assign VLANs to ports for the networks they will be connected to ("[Configure Interface Management](#)" on page 29).

1. Configure the IP address.

From the menu, navigate to the **Network Infrastructure > Interface Management** page.

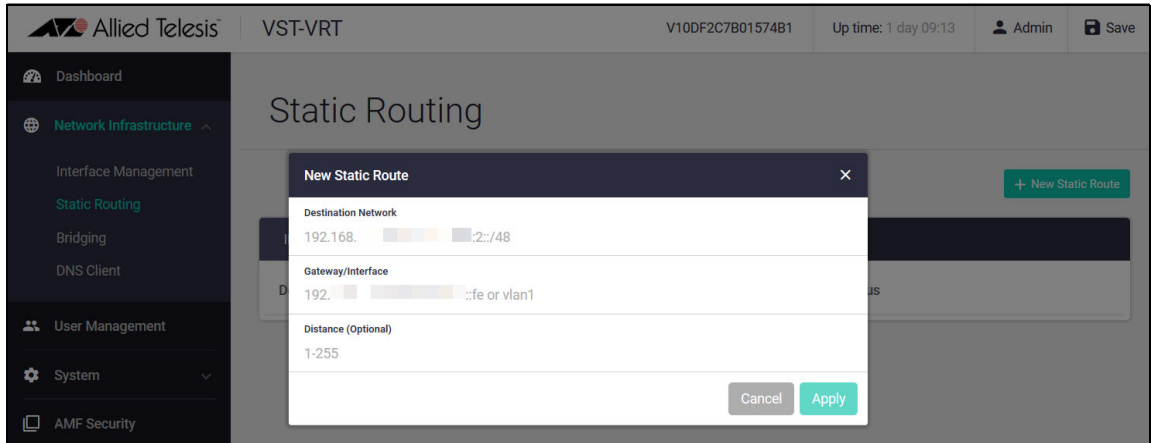
Click the **edit** button to the right of 'br0'. This is the bridge connecting interfaces.

Change the IP address of the bridge (br0) to one that you will be able to navigate to from the device you are accessing the GUI from. When you change the IP address, you will lose your browser's connection to VST-VRT. Point your browser to the new IP address.



2. Add a default route.

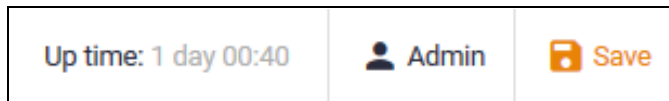
Navigate to the **Network Infrastructure > Static Route** page and click the **+ Static Route** button to add a default route.



To set up advanced network interface configuration, see "[Setting up network infrastructure](#)" on page 26.

Save the VST-VRT configuration

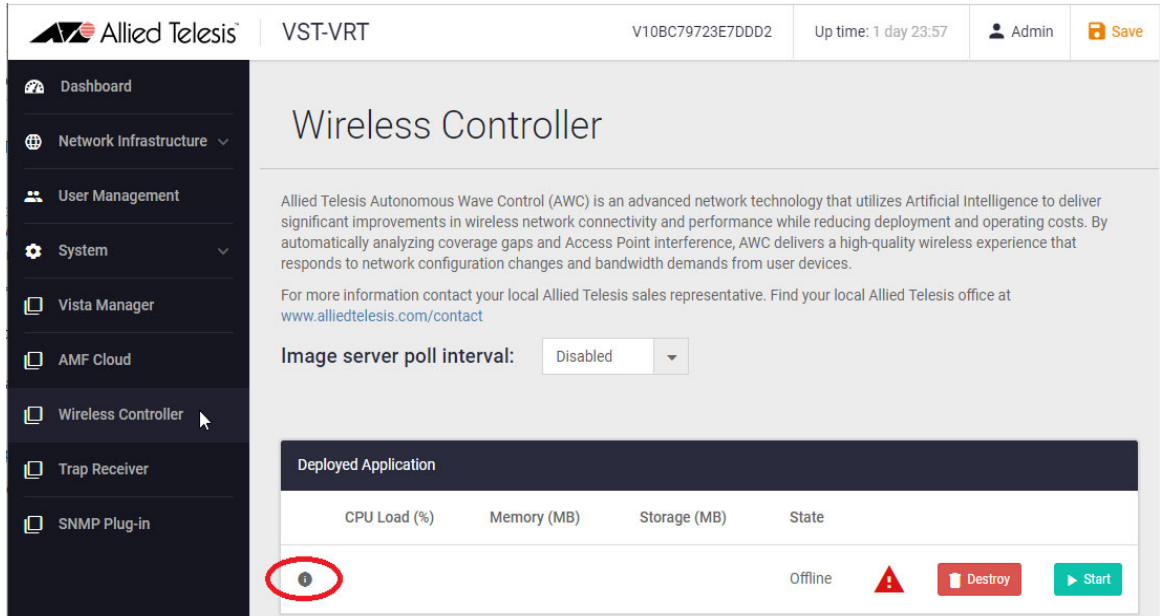
To save the VST-VRT configuration, click the **Save** button at the top right of VST-VRT GUI page. It is orange when there is unsaved configuration and blue otherwise. Save whenever you have VST-VRT configuration you want to retain over a reboot.



Activate an application

Each application is provided ready to use, once the storage size is configured. To activate the application, follow these steps.

1. Click the button for the application in the **menu**. A page opens for the application.






Dashboard | VST-VRT | V10BC79723E7DDD2 | Up time: 1 day 23:57 | Admin | Save

Wireless Controller

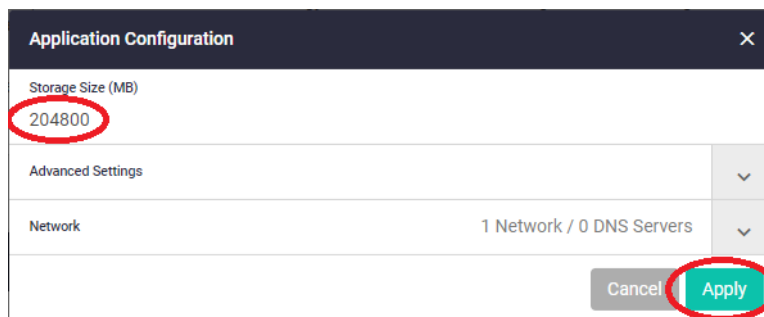
Allied Telesis Autonomous Wave Control (AWC) is an advanced network technology that utilizes Artificial Intelligence to deliver significant improvements in wireless network connectivity and performance while reducing deployment and operating costs. By automatically analyzing coverage gaps and Access Point interference, AWC delivers a high-quality wireless experience that responds to network configuration changes and bandwidth demands from user devices.

For more information contact your local Allied Telesis sales representative. Find your local Allied Telesis office at www.alliedtelesis.com/contact

Image server poll interval: Disabled

Deployed Application			
CPU Load (%)	Memory (MB)	Storage (MB)	State
			Offline   

2. Click on the **Configure** button to the right of the application instance. The **Application Configuration** dialog box opens automatically when you activate the application so that you can configure the set up for the application container. To change this configuration later, click the **Configure** button to right of the application on this page.



Application Configuration

Storage Size (MB): 204800

Advanced Settings: [Dropdown]

Network: 1 Network / 0 DNS Servers [Dropdown]

Cancel Apply

3. Enter the storage size. We recommend entering the storage values in this table to configure the applications.

Table 1: Recommended storage limits for applications

APPLICATION	RECOMMENDED STORAGE (MB)
Vista Manager (Vista Manager EX)	204 800
AMF Cloud	32 768
AMF Security	81 920
Wireless Controller (AWC)	204 800
Trap Receiver (SNMP)	40 960
SNMP (Full SNMP)	102 400

Once the storage size is set, click on the **Apply** button.

Deployed Application			
CPU Load (%)	Memory (MB)	Storage (MB)	State
		204800MB	Stopped Destroy Start

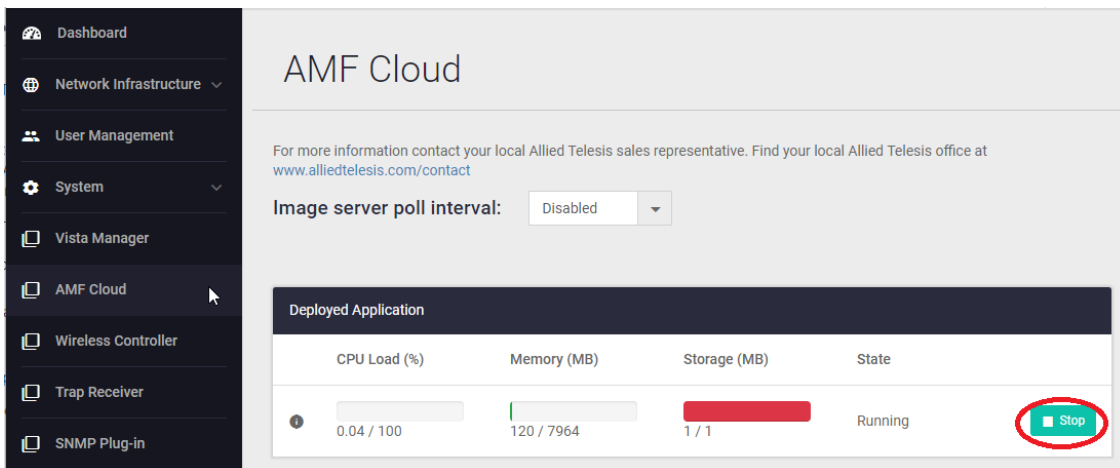
- Click on the **Start** button to start the application. This may take a few minutes. Once deployment is complete, it will show that the application is running.

Deployed Application			
CPU Load (%)	Memory (MB)	Storage (MB)	State
30.84 / 100	296 / 7964	4648 / 204800	Running Stop

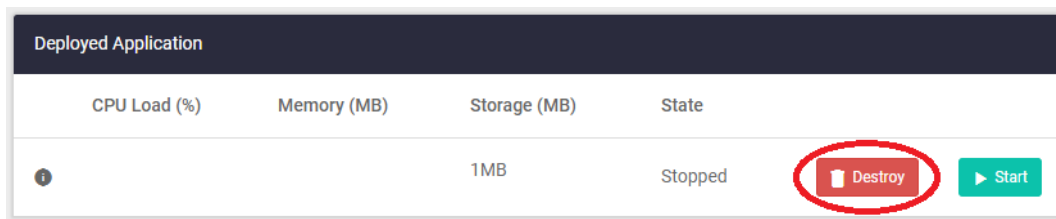
Reconfigure an application

You may need to reconfigure an application after the initial setup. To reconfigure an application, follow these steps.

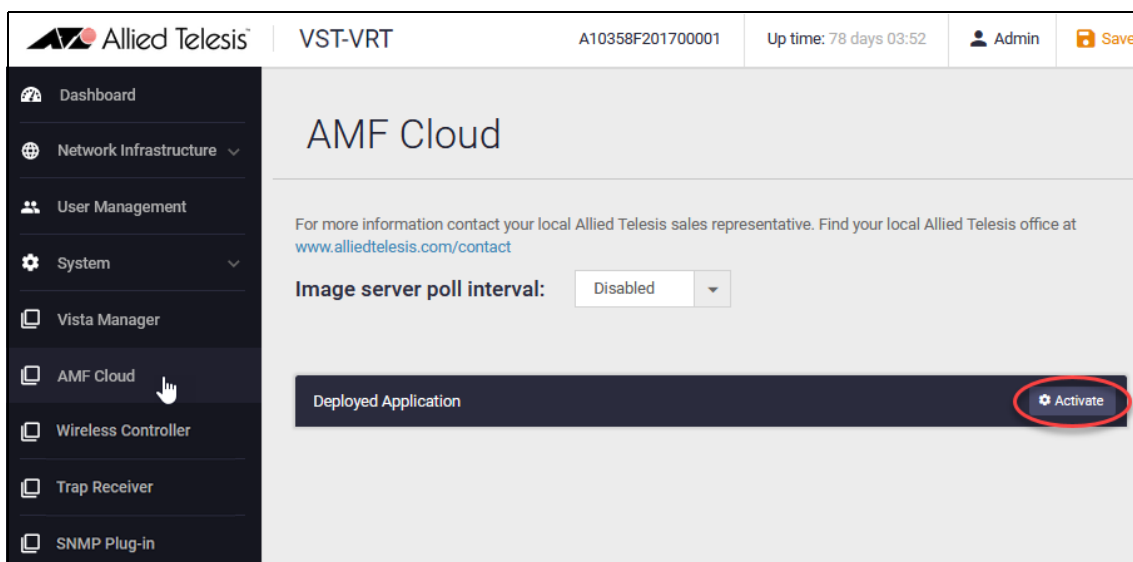
1. Click the button for the application in the **menu**. A page opens for the application.



2. Click on the **Stop** button.



3. Once the application has stopped, click on the **Destroy** button.



4. Click the **Activate** button. An **Application Configuration** dialog box opens for setting up the application.

5. Set up the application parameters:

Enter the storage size. We recommend entering the storage values in this table to configure the applications.

Table 2: Recommended storage limits for applications

APPLICATION	RECOMMENDED STORAGE (MB)
Vista Manager (Vista Manager EX)	204 800
AMF Cloud	32 768
AMF Security	81 920
Wireless Controller (AWC)	204 800
Trap Receiver (SNMP)	40 960
SNMP (Full SNMP)	102 400

Click the **Network** drop down list to expand it. Click **Add Network**. If there is a DHCP server on the network to assign IP addressing, select **Use DHCP**. Otherwise, specify the static IP address for the application. (Leave the Interface Type as Virtual.)

Application Configuration [X]

Image Version: 5.5.0-0.4 [v]

Storage Size (MB): 32768

Advanced Settings [v]

Network: 1 Network / 0 DNS Servers [^]

Interface Type: Virtual [Delete]

External Network VLAN ID: 1

MAC Address (Optional): 74:da:38:9c:6b:a4

Use DHCP

+ Add Network


+ Add DNS Server

Cancel Apply

To set up advanced network interface configuration, see "[Setting up network infrastructure](#)" on page 26.

Before starting any application, you must configure a static or DHCP-assigned IP address for it.

Click **Apply** to create the container for the application with these application parameters and to start the application. This may take a few minutes. The application page displays information about the application instance.

6. To access and configure applications such as Vista Manager EX, AMF Cloud and AMF Security, click the **Open** button or point your browser directly to the IP address of the application. You can see the IP address and other application configuration by hovering the mouse over the small instance information icon  in the left of the **Deployed Application** panel on the application page.

You may be asked for authentication. Use the default username 'manager' and password 'friend' the first time, then change the password for the application.

The first time you access the AMF Cloud application, it requires you to change the default password by using its command line interface. (The time in the password expiry message may be long ago.)

7. Click the **Save** button in the VST-VRT GUI to save the application set-up in the VST-VRT configuration.

Example: activate the applications

VST-VRT has application image files preloaded into persistent storage, such as:

- Vista Manager
- AMF Cloud
- AMF Security
- Wireless Controller (AWC)
- Trap Receiver (SNMP-based) (up to VST-VRT version 3.7.2)
- SNMP (full)

If you will use some or all of these applications, you can activate them in the following order. When you configure the applications, use the storage values in [Table 2 on page 20](#).

1. Log in to the VST-VRT.
2. Activate AMF Cloud if you are using AMF Cloud on the VST-VRT as the AMF master, and configure your AMF network. For information about configuring an AMF network, see the [AMF Feature Overview and Configuration Guide](#).
3. Activate Vista Manager if using it to monitor your AMF and wireless network.
4. Activate Wireless Controller (AWC) if using it to manage wireless access points in your network.
5. Activate SNMP (or Trap Receiver up to VST-APL version 3.7.2) if using one of these to manage third-party devices.
6. Activate AMF Security if using it.
7. Save the VST-VRT configuration.

After activating the applications, you may need to:

- Install licences—you may need to install a license. See the relevant User Guide for the application.
- Register Vista Manager EX plug-ins (the SNMP (full) plug-in or Trap Receiver (SNMP-based) plug-in and/or the AWC Wireless Controller (AWC) plug-in). See the Vista Manager EX User Guide.

For more information about using each application, see its User Guide.

The VST-VRT GUI Dashboard

Log in and you'll see the VST-VRT GUI dashboard. The dashboard provides an overview of the status of VST-VRT and the applications loaded on it.

The screenshot displays the VST-VRT GUI Dashboard. At the top, the Allied Telesis logo is on the left, followed by 'VST-VRT', the device ID 'A10358F20290001', the uptime 'Up time: 3 days 03:55', the user 'Admin', and a 'Save' button. A dark sidebar on the left contains navigation options: Dashboard (selected), Network Infrastructure, User Management, System, Vista Manager, AMF Cloud, Wireless Controller, Trap Receiver, and SNMP Plug-in. The main content area is titled 'Dashboard' and features two sections. The 'System Information' section shows CPU at 18.00%, Memory at 47.6%, Temp at 29°, Fans as 'Status: Active', Environment as 'Status: Good', and System Time as '12/03/2021, 1:32:48 pm'. The 'Deployed Applications' section is a table with columns for Name, Image, CPU Load (%), Memory (MB), Storage (MB), and State. It lists five applications: AT-AMF-app, AT-AWC-app, AT-FULLSNMP-app, AT-SNMP-app, and AT-Vista-app, each with its respective resource usage and a state of 'Running'. An 'Open' button is present for each application.

Name	Image	CPU Load (%)	Memory (MB)	Storage (MB)	State
AT-AMF-app	AMF	0.02/100	130 / 31977	1178 / 32768	Running
AT-AWC-app	awc	0.05/100	614 / 31977	1755 / 50000	Running
AT-FULLSNMP-app	fullsnmp	0.03/100	479 / 31977	1200 / 50000	Running
AT-SNMP-app	snmp	0.05/100	359 / 31977	1165 / 50000	Running
AT-Vista-app	vista	0.66/100	3821 / 31977	1651 / 50000	Running

Saving configuration and logging out

At the top right of the screen you can see the **Uptime** for the switch, as well as the **Admin** button, which is used to log out, and the **Save** button.

Configuration changes you make become part of the running configuration of VST-VRT. This includes:

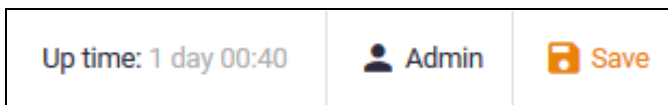
- VST-VRT network configuration such as bridging, VLAN and IP address assignments
- user accounts
- system time configuration
- the state of applications that have been created—whether an application is running when the configuration is saved.

To make them part of the boot configuration, so they can be backed up and will survive a reboot, save these configuration changes. If an application is running when the configuration is saved, it will start up again when VST-VRT restarts.

Save any time there is new VST-VRT configuration that you wish to retain. For example, we recommend saving when you have assigned an IP address to access VST-VRT, changed the 'manager' password, or activated and started applications.

This does not save the internal configuration and data for applications—these are managed separately by the applications themselves.

The **Save** button is colored orange any time there is unsaved configuration. If it is blue, configuration has been saved.







The configuration is saved to a file named "default.cfg" in persistent storage.

System Information panel

The **System Information** panel provides an overview of the current:
























- CPU and memory usage
- environmental status
- system time (format: mm/dd/yyyy hh:mm:ss AM/PM).

System Information	
CPU	0.90% 
Memory	2.1% 
Environment	 Status: Good
System Time	 9/10/2020, 6:53:06 PM


For more detailed system information, navigate to **System > About**, and see ["Monitoring" on page 45](#).


Deployed Applications panel

The **Deployed Applications** panel provides overviews of the applications loaded on VST-VRT and their status.

Name	Image	CPU Load (%)	Memory (MB)	Storage (MB)	State	
AT-AMF-app	 AMF	 0.02/100	 130 / 31977	 1178 / 32768	Running	
AT-AWC-app	 awc	 0.24/100	 614 / 31977	 1755 / 50000	Running	
AT-FULLSNMP-app	 fullsnmp	 0.03/100	 479 / 31977	 1200 / 50000	Running	
AT-SNMP-app	 snmp	 0.03/100	 359 / 31977	 1165 / 50000	Running	
AT-Vista-app	 vista	 0.71/100	 3821 / 31977	 1651 / 50000	Running	

For each application, the Deployed Applications panel displays:

- the **name of the application**.
- the **name of the image** for the application. Once an application instance is created, the lock icon  to the left of the image name indicates that the application is authorised (signed) by Allied Telesis. The lock icon displays when a supported and signed application is activated or upgraded.

If a warning triangle icon  shows instead, upgrade or activate the application to the version matching the operating system. See the Release Note for information about upgrading. When you complete this, the lock icon should display.

If you have completed the activation or upgrade procedure for the application and the warning icon still shows, it may be an unauthorised application image that presents security issues. Remove the application and/or contact your authorised Allied Telesis distributor or reseller.
- the **CPU capacity** it's using and how much is available to it.
- how much **memory** it is using and how much is available to it.
- how much **storage** the application is using and how much is available to it. You must configure a storage allocation as a part of activating the application.
- the **state** of the application. Before an application is activated, the state is 'Offline'. During normal operation, the state is 'Running'. When you activate, stop or destroy the application instance, it shows information such as 'extracting', 'creating', 'stopping', or 'destroying'.

If there is an **Open** button next to the application, you can use this to access the application.

The Menu

At the left of the dashboard are menu items for **Network Infrastructure**, **User Management** and **System**, and for each of the applications loaded on the device. You can expand **Network Infrastructure** and **System** for more menu items. The **Dashboard** item at the top of the menu returns you to this Dashboard page.

Setting up network infrastructure

This section describes network topology and interfaces on the VST-APL, how applications connect to the network, how to configure network infrastructure, default settings and recommendations.

- ["Interface support on the VST-VRT" on page 26](#)
- ["Connecting applications to the network" on page 26](#)
- ["Configure Interface Management" on page 29](#)
- ["Configure Static Routing" on page 31](#)
- ["Configure Bonding" on page 32](#)
- ["Configure Bridging" on page 35](#)
- ["Configure the DNS Client" on page 37](#)

Interface support on the VST-VRT

The VST-VRT provides the following interface support:

- One bridge (br0) is supported on the appliance.
- All ports attach to the bridge by default.
- For Vista Manager, AMF Cloud, Wireless Controller (AWC), SNMP, Trap Receiver, and AMF Security applications, only one virtual network attachment is supported per application.
- Eth interfaces can be joined by static or dynamic (LACP) bonding.

Connecting applications to the network

To connect an application instance to the network, you specify the VLAN for the network connection. This avoids binding the applications to the physical interfaces or to the underlying hardware. This means the applications can easily migrate from one piece of hardware to another without disruption to users.

To manage the VST-APL appliance, you connect to the VST-APL GUI via the bridge interface br0. This is the default management interface to the appliance's VLAN-aware bridge.

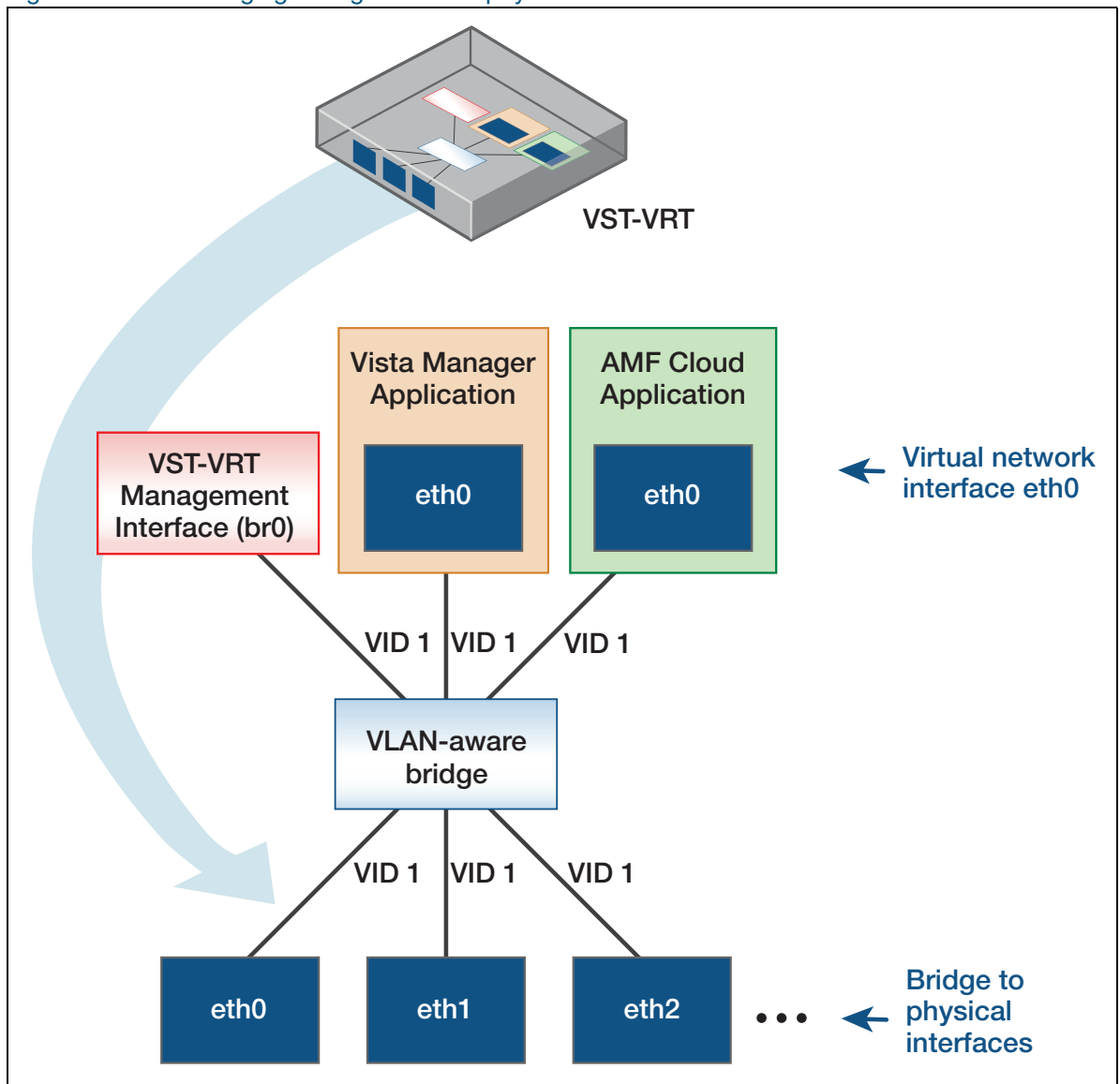
Default topology

By default, each physical Ethernet interface on the VST-APL is connected to the VLAN-aware bridge as an untagged member of the default VLAN, vlan1. In Figure 1 below, eth0, eth1, and so on at the bottom of the diagram, are bridged to the physical interfaces for the device.

When you activate an application instance, you must assign it a network interface via which to reach it. The only supported interface is virtual, and the first virtual interface assigned for each application instance is eth0. As shown for the applications at the top of the diagram, eth0 is the application's virtual eth interface to the VLAN-aware bridge.

This means that by default, any interface in an application instance that is attached to vlan1 is connected to the same Layer 2 broadcast domain as all physical interfaces on the appliance.

Figure 1: Default bridging configuration for physical interfaces

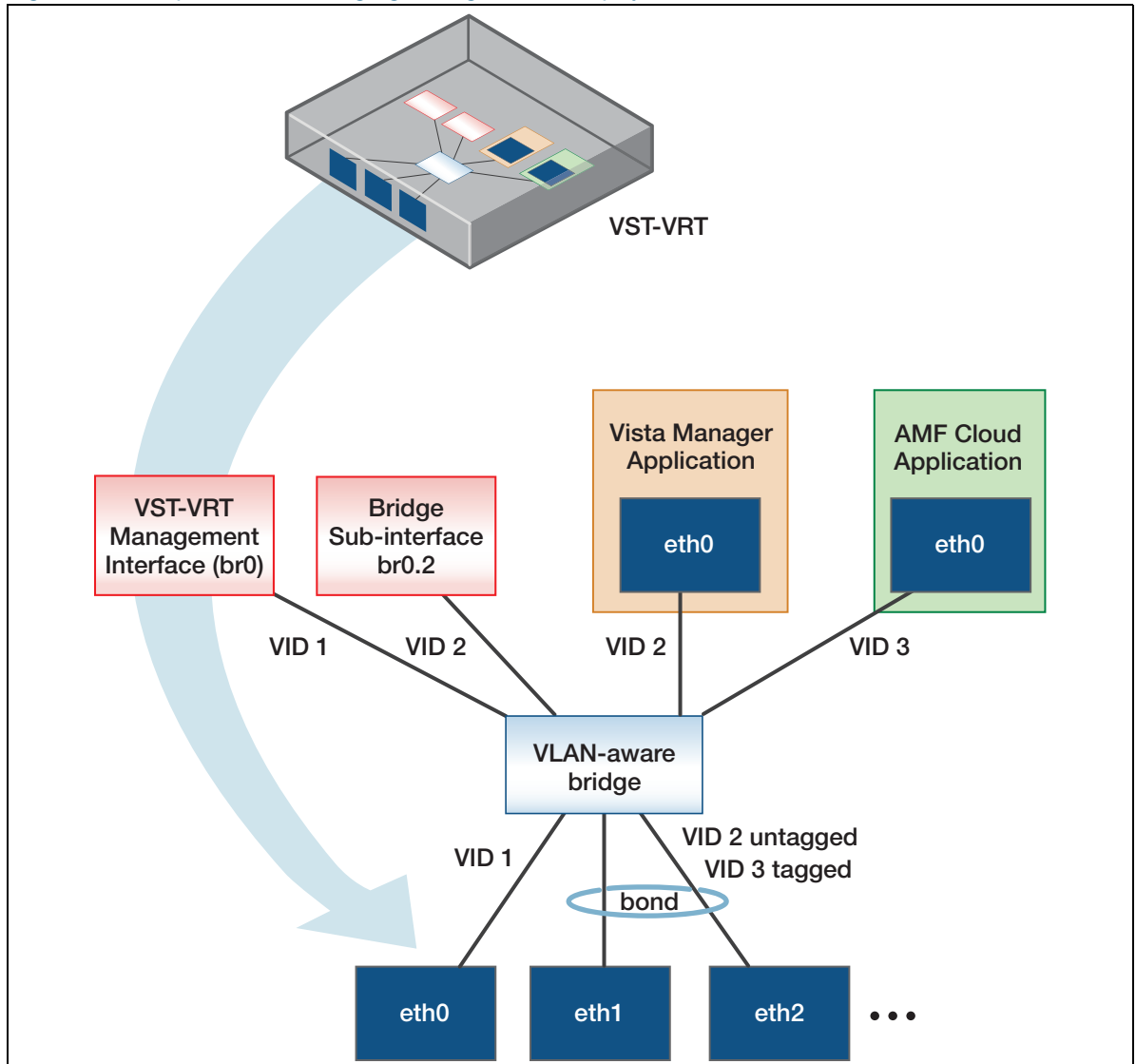


Advanced topology

You can configure the VST-VRT interfaces for more complex network topologies. You can:

- connect different applications on the VST-VRT to different VLANs on the network.
- join two or more eth links of the same speed to create bonds. This could be used to increase the bandwidth for an application's connection to another device on the network, such as an AlliedWare Plus device.

Figure 2: Example custom bridging configuration for physical interfaces



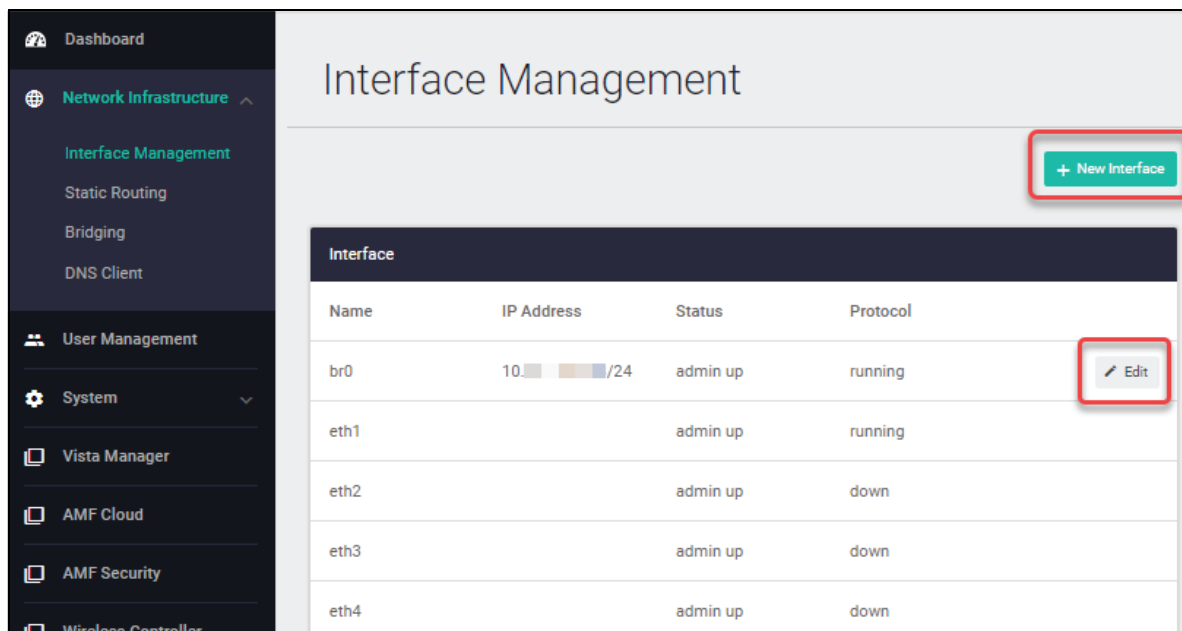
For example, some of the more advanced settings for [Figure 2](#) are:

- AMF Cloud and Vista Manager are NOT connected internally, and would require an external device for connectivity if they needed to communicate.
- The VST-VRT appliance has network connectivity to the Vista Manager application via bridge sub-interface br0.2 which is connected to vlan2.
- Eth0 is only a member of vlan1 with vlan1 as the native VLAN.

- Eth1 and eth2 are part of a bond. The bond is a member of both as an untagged member of vlan2 and a tagged member of vlan3.

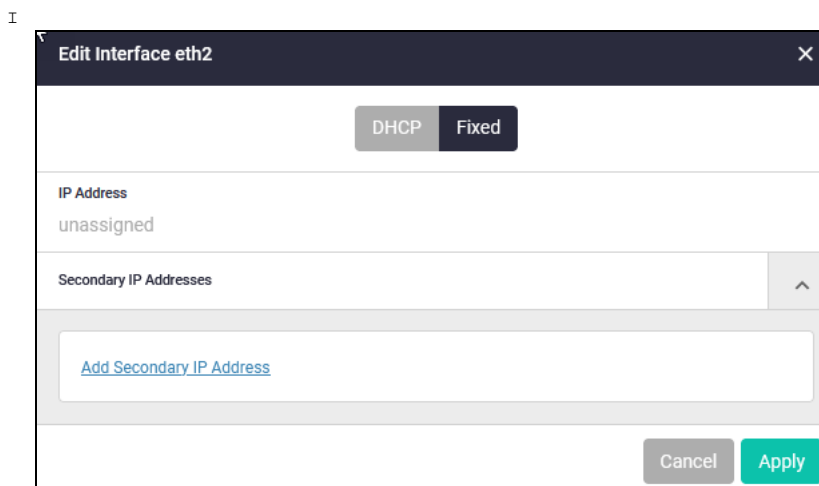
Configure Interface Management

By default, the VST-VRT has a number of physical eth interfaces, and one VLAN-aware bridge (br0). To view and configure interfaces, navigate to **Network Infrastructure > Interface Management**.



On the Interface Management page, you can:

- See an overview of all interfaces on the VST-VRT, including the VLAN-aware bridge (br0), bridge 802.1Q sub-interfaces, eth ports (eth0, eth1, and so on), and bonds. For each interface, see the IP address (if assigned), the status (admin up or down), and whether the protocol is running or down.
- Assign IP addressing to the bridge, bridge 802.1Q sub-interfaces, and eth interfaces that are not attached to the bridge. Click **Edit** to its right. Either select DHCP or enter a primary and optional secondary IP address.



- Create an 802.1Q sub-interface on an eth port or on the bridge. Click the **+ New Interface** button at the top right of the Interface table. In the **New Interface** dialog box, expand the **Interface Name** list, and select the interface. Enter a VLAN ID. Click **Apply**. The new sub-interface will show in the **Interface** panel as the interface and the VLAN ID separated by a dot. For example, if you assign VID 300 to eth2, this is called eth2.300.

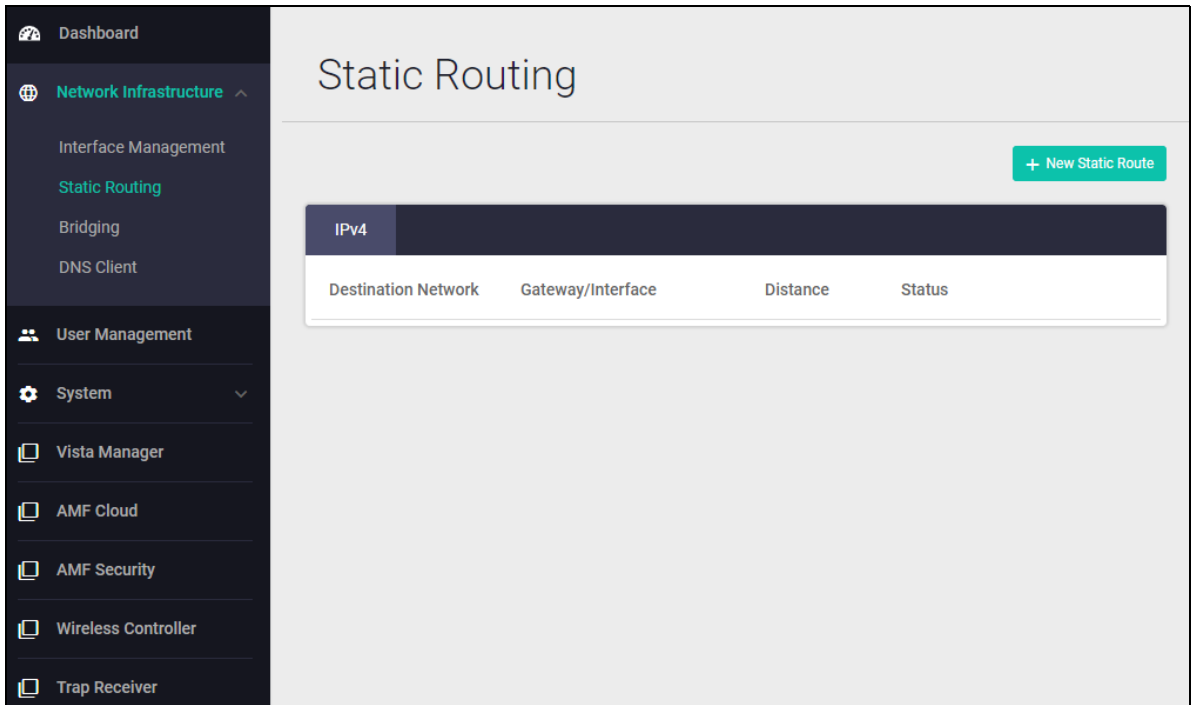
I

The screenshot shows a 'New Interface' dialog box with the following fields and options:

- Interface Type:** dot1q
- Interface Name:** A list with options: br0, eth1, eth2, eth3, eth4.
- VLAN ID:** Enter VLAN ID Here. This field is required.
- Buttons:** Cancel, Apply

Configure Static Routing

By default, the VST-VRT appliance is set accept IP addressing from a DHCP server, or if none is supplied, to use the IP address 192.168.1.1. To configure and view static routes, navigate to **Network Infrastructure > Static Routing**. The default static route is not displayed.



To add a new static route, click the **+ New Static Route** button above the top right of the routes panel.

The 'New Static Route' dialog box is shown with the following fields and values:

Field	Value
Destination Network	10.1.1.0/24
Gateway/Interface	172.16.1.1
Distance (Optional)	1-255

At the bottom right of the dialog are 'Cancel' and 'Apply' buttons.

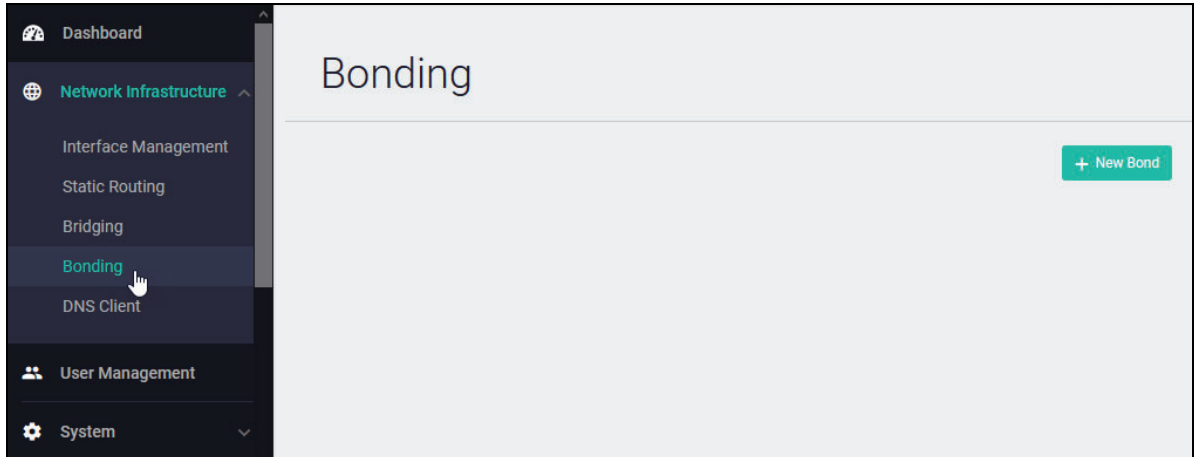
Enter the IPv4 address of the destination network. Specify the IPv4 address for the gateway, and optionally the administrative distance for the route. Click **Apply**.

To edit an existing static route, click **Edit** at its right.

Configure Bonding

You can create static or dynamic (LACP) bonds by joining multiple eth ports. To create, modify, or view bonds, navigate to **Network Infrastructure** > **Bonding**. You can join together in a bond any 2 or more eth links that have the same speed. For example, you can join all the 1 Gb ports into one bond.

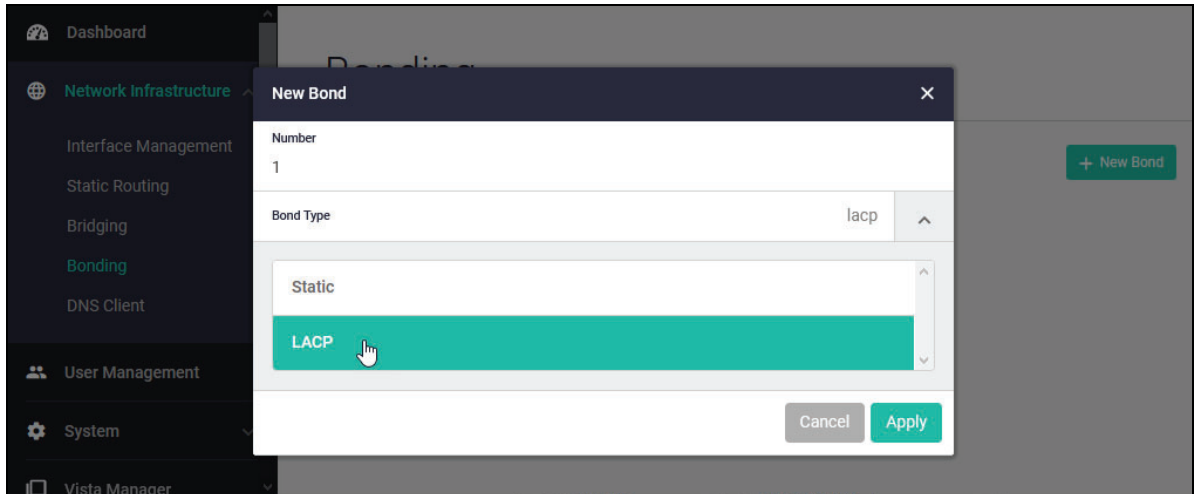
Figure 3: Bonding page



Create a bond

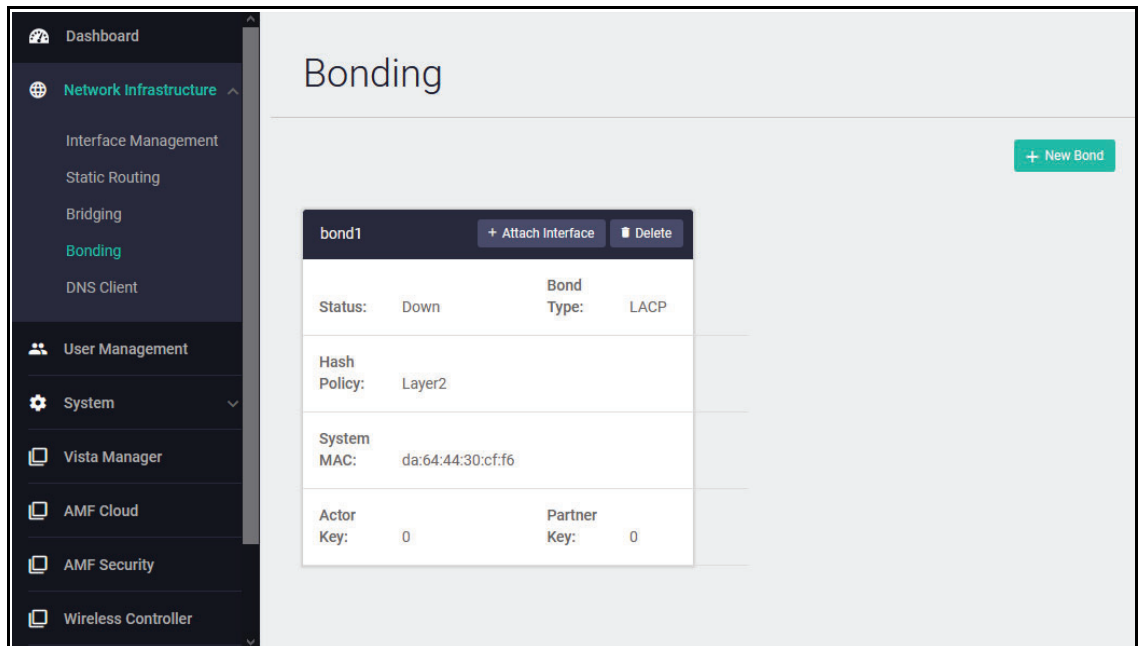
By default the appliance has no bonds. To create a bond:

1. On the **Bonding** page, click **+New Bond**.



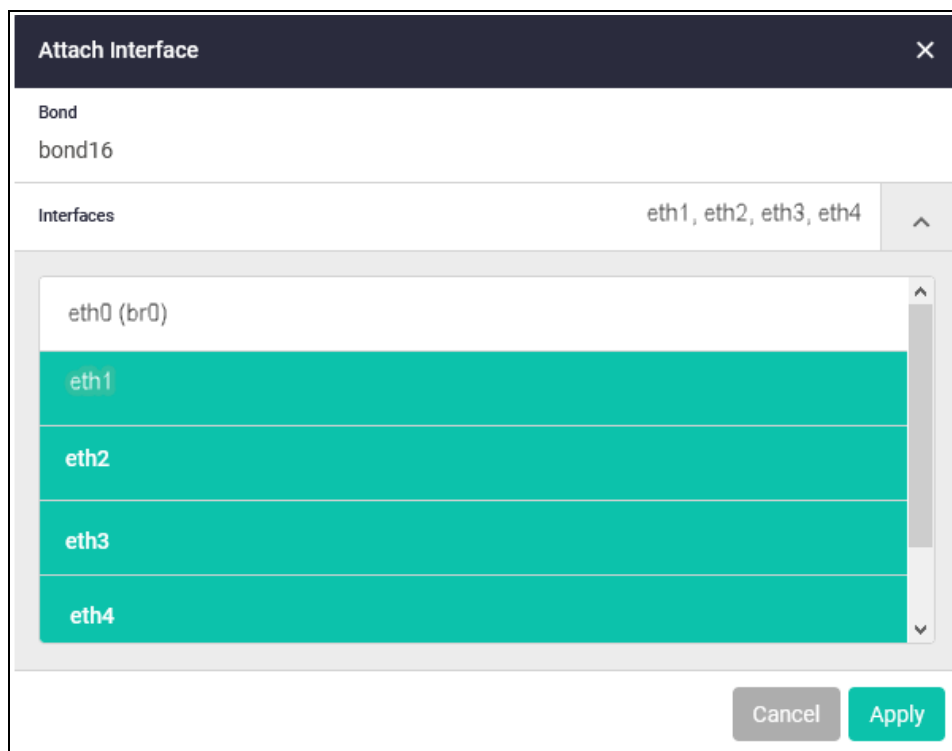
In the New Bond dialog box, enter an ID number for the bond and select whether it is to be a static bond or an LACP (dynamic) bond. Click **Apply**.

The Bonding page shows the new bond with no interfaces.



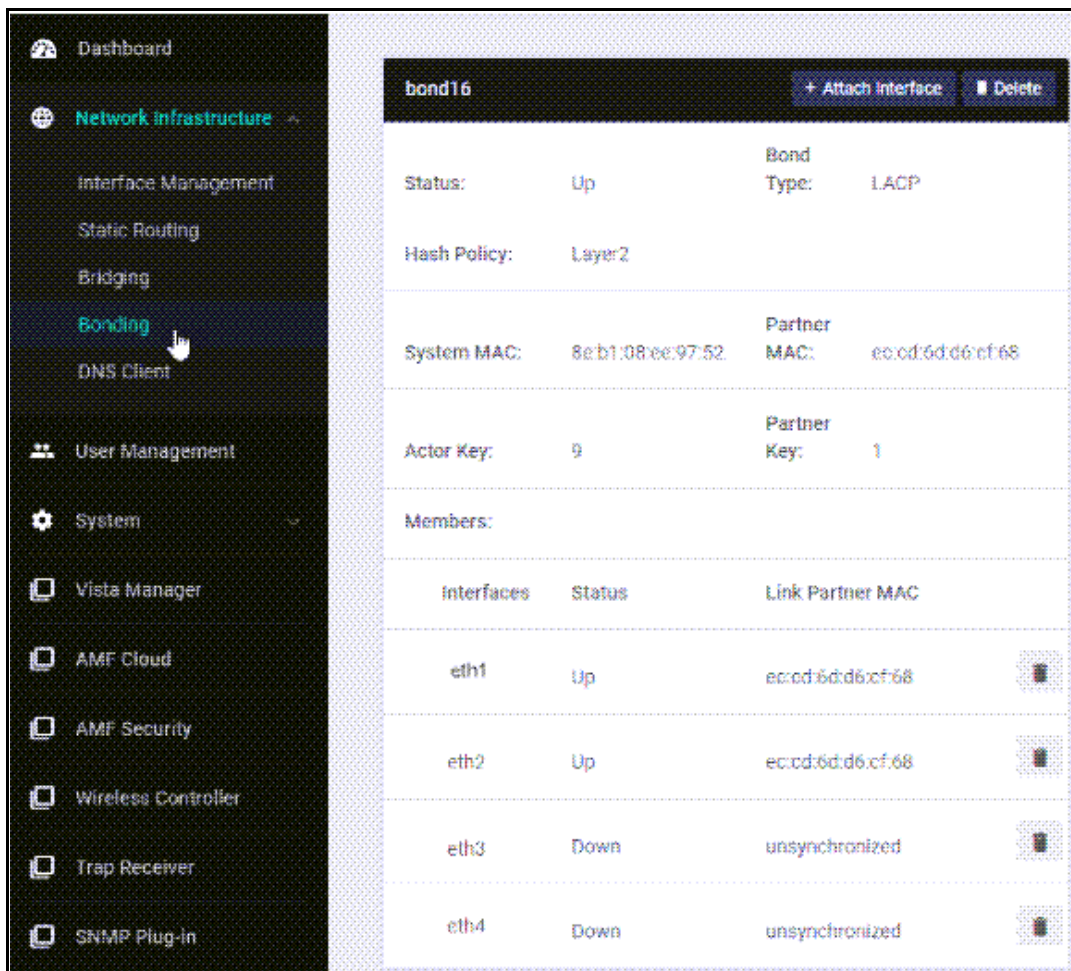
2. Click the **Attach Interface** button in the panel for the bond. Select from the list of available ports to add. An eth port is not available if it belongs to another bond. Any eth ports added to a bond are removed from the bridge.

If an interface in the list is already attached, this is shown in parentheses. Adding the interface to a bond removes it from its previous attachment. For instance “eth0 (br0)” shows that the port eth0 is attached to the bridge br0. If you add eth1 to a bond, it is removed from the bridge.



Click **Apply**.

3. If you configure an LACP bond, you must ensure that the other end of the LACP connection has the appropriate LACP configuration.



The Bonding panel in the Bonding page shows the status of the LACP links, such as:

- **Down** (link down) and **Unsynchronised**;
 - **Up** (link partner interface is running) and **Unsynchronized** (LACP link partner is not configured correctly)
 - **Up** (link partner interface is running) and MAC address of the **Link Partner** (the link partner is synchronized).
4. If required, add the bond to the bridge (**Network Infrastructure** > **Bridging** page). Bonds are not automatically attached to the bridge.

Remove an eth port from a bond

1. Click on the recycle bin by the port in the bond panel on the Bonding page.
2. The eth port is not automatically re-attached to the bridge. Reattach it in the **Bridging** page if required.

Remove a bond from the appliance

1. Click **Delete** at the top of the bond panel in the Bonding page.
2. Eth ports that were attached to the bond are not automatically re-attached to the bridge. Reattach them in the **Bridging** page if required.

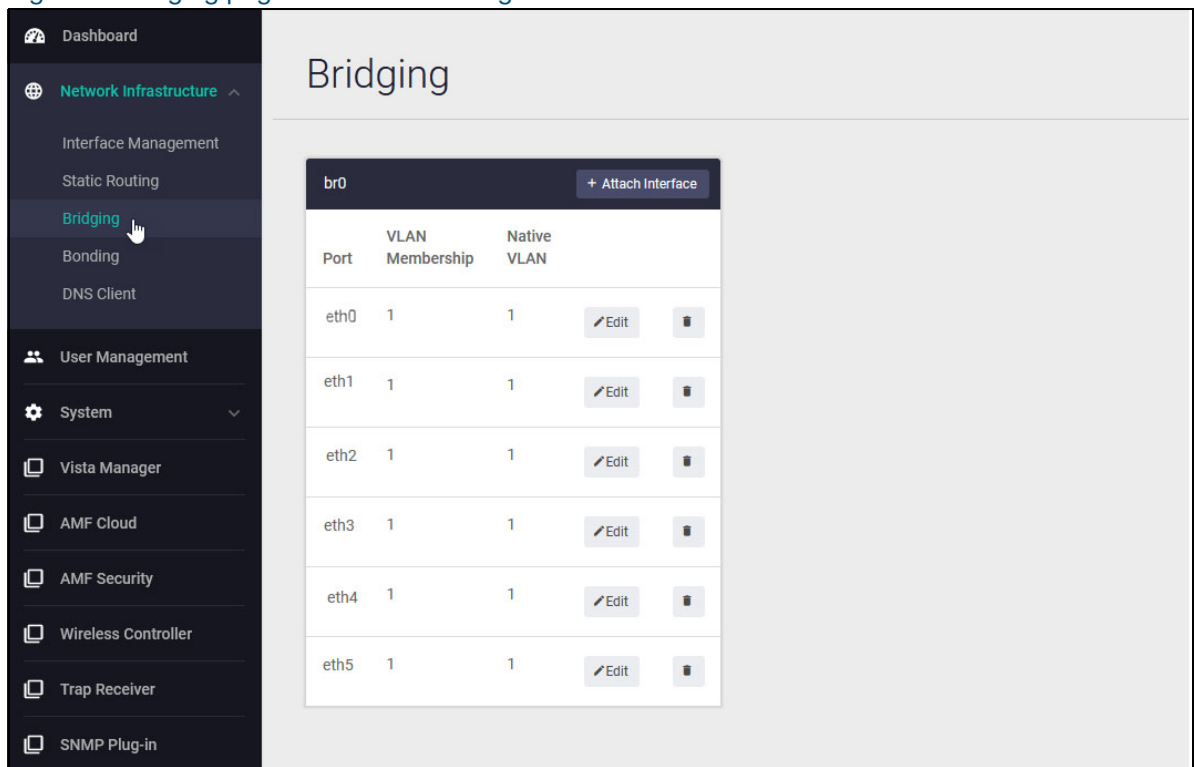
Configure Bridging

There is one VLAN-aware bridge (br0) on the appliance. By default, all physical eth interfaces are attached to the bridge. If you create bonds, they are not automatically attached to the bridge; you will need to attach them. When you activate an application, you create a virtual eth interface attachment to the bridge (eth0).

If the default configuration is suitable for your network, you don't need to change this.

To view and configure bridge connections, navigate to **Network Infrastructure > Bridging**.

Figure 4: Bridging page with default configuration



You can use the **Bridging** page to:

- Attach a physical port or a bond to the bridge. Click the **+ Attach interface** button at the top right of the table. In the **Add Port** dialog box, select from the available interfaces (ports and bonds). Enter the VLAN membership range (a contiguous range) and the native VLAN ID. Click **Apply**.

If an interface in the list is already attached, this is shown in parentheses. Adding the interface to the bridge removes it from its previous attachment. For instance “eth2 (bond16)” shows that the port eth2 is part of bond 16. If you add eth2 to the bridge, it is removed from the bond.

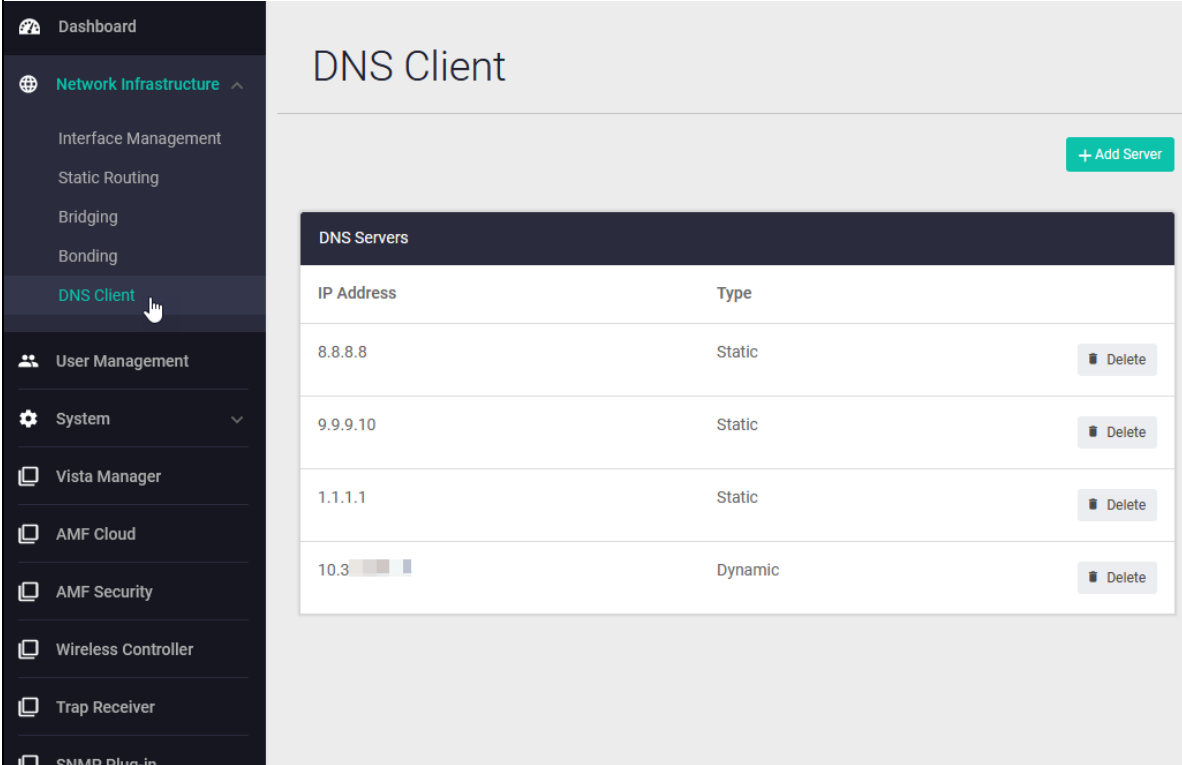
Add Port	
Name	br0
Ports	<ul style="list-style-type: none">bond16eth2 (bond16)eth3 (bond16)eth4 (bond16)eth5 (bond16)
<p>Cancel Apply</p>	

- Remove a port attachment from the bridge. Click the **recycle bin** to its right.
- Edit VLAN membership for physical eth ports and bonds attached to the bridge. Click the **Edit** button to its right. Enter the VLAN membership range (a contiguous range) and the native VLAN ID. Click **Apply**.

Edit Port	
Port	eth5
VLAN Membership	1
Native VLAN	1
<p>Cancel Apply</p>	

Configure the DNS Client

To view or configure DNS servers configured for the DNS client on the appliance, navigate to **Network Infrastructure > DNS Client**. Any DNS Servers assigned by DHCP are shown as dynamic entries.

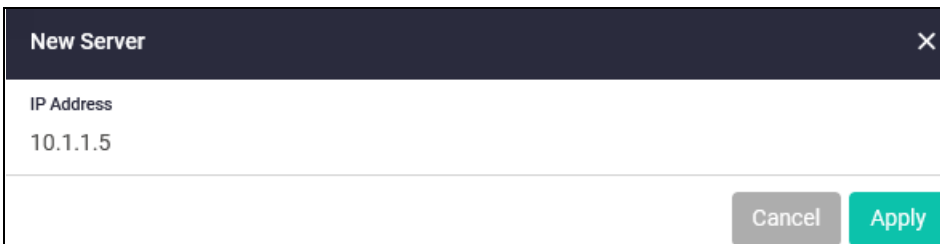


The screenshot shows the 'DNS Client' configuration page. On the left is a dark sidebar menu with options: Dashboard, Network Infrastructure (selected), Interface Management, Static Routing, Bridging, Bonding, DNS Client (highlighted with a mouse cursor), User Management, System, Vista Manager, AMF Cloud, AMF Security, Wireless Controller, Trap Receiver, and SNMP Plug-in. The main content area is titled 'DNS Client' and features a '+ Add Server' button in the top right. Below the title is a table of DNS Servers:

IP Address	Type	
8.8.8.8	Static	Delete
9.9.9.10	Static	Delete
1.1.1.1	Static	Delete
10.3	Dynamic	Delete

In the DNS Client page:

- To add a DNS server, click the **+ Add Server** button at the top right of the table of servers. Enter the IP address of the DNS server and click **Apply**.



The 'New Server' dialog box is shown with a close button (X) in the top right corner. It contains a text input field for 'IP Address' with the value '10.1.1.5'. At the bottom right, there are two buttons: 'Cancel' and 'Apply'.

- To delete a DNS server, click **Delete** to its right.

System management

In this section, see information on how to:

- "Manage files" on page 38
- "Configure system time" on page 41
- "View system information" on page 43
- "Configure users" on page 44

Manage files

Navigate to **System > File Management**. In the File Management page, you can view and manage files in VST-VRT's persistent storage and access troubleshooting data for tech support.

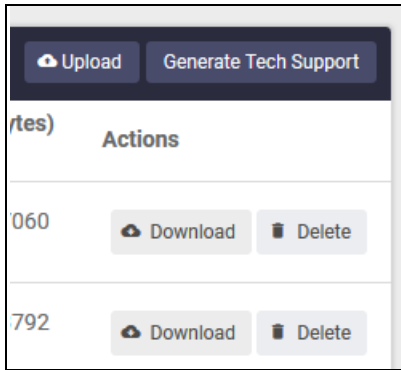
The screenshot shows the VST-VRT File Management interface. The top navigation bar includes the Allied Telesis logo, the device name 'VST-VRT', a unique ID 'V10BC79723E7DDD2', the uptime 'Up time: 1 day 23:57', the user 'Admin', and a 'Save' button. The left sidebar contains a menu with 'System' selected, and 'File Management' highlighted. The main content area is titled 'File Management' and features a 'Reboot' and 'Shutdown' button. Below this is a 'Flash Usage' section with a progress bar at 22% (2.1G / 9.9G). The main section shows the file system path '/fs /flash' with 'Upload' and 'Generate Tech Support' buttons. A table lists files with columns for Name, Modified, Size(bytes), and Actions. The files listed are 'exception.log', 'httpd-unknown_application-ATVSTAPL-1.2.2...', and 'log'. Each file has 'Download' and 'Delete' buttons.

By default this page will show that the VST-VRT file system contains a log directory for log files. VST-VRT stores the messages in log files (filenames "messages*") in the log directory in the persistent storage system.

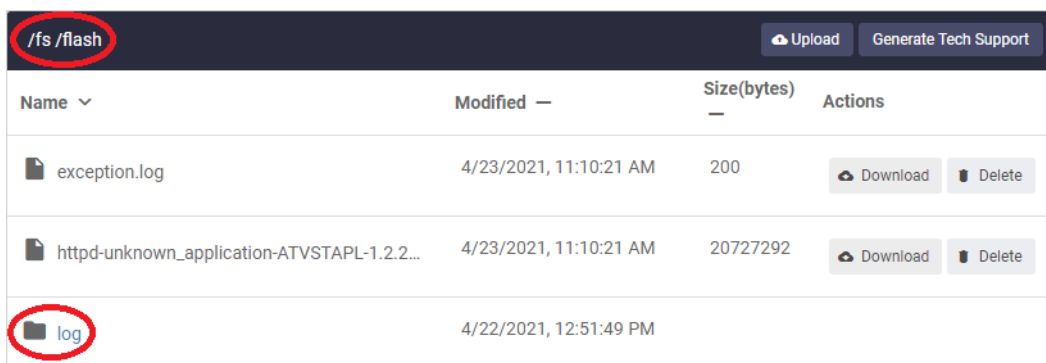
Persistent storage may also contain other files that are:

- generated by VST-VRT, such as tech-support files (tech-support... .tgz)
- uploaded by a user.

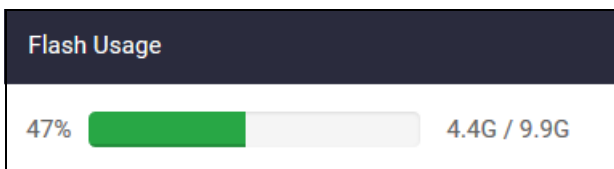
To upload a file to VST-VRT's persistent storage, use the **Upload** button at the top of the file system panel. To download or delete a file from VST-VRT, click the **Download** or **Delete** button to the right of the file.



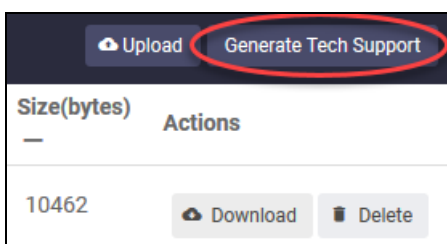
To navigate the file system, click on the path at the top of the file system panel, or click on a directory in the panel.



The **Flash Usage** panel shows the amount and percentage of persistent storage used.



To generate troubleshooting information for VST-VRT, click the **Generate Tech Support** button at the top right of the file system panel.



This creates a tech support file stored in the persistent storage system with a filename like 'tech-support-.....tgz'. The file contains detailed information about configuration and internal processes in VST-VRT. If you need to contact your authorized Allied Telesis distributor or reseller for technical support, use this button to generate tech support, download the file, and send it to them.

To reboot or shut down VST-VRT, use the green **Reboot** or **Shutdown** button buttons at the top right of this page.



Generate tech-support

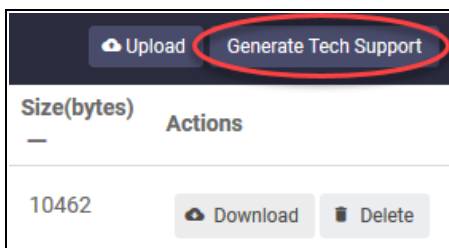
You can generate tech support output for the appliance and for each application instance that is running on it. Tech-support output can assist with troubleshooting. It includes detailed information about configuration and internal processes in the appliance. (You cannot create a tech-support file for an application when it is not running.) If you contact Allied Telesis for support, you can generate tech support files on the device and send them this information.

To generate a tech support output file for a single application:

1. Make sure the application is running.
2. From the VST-VRT dashboard menu, navigate to the application page for the application. For instance, to generate a tech-support file for the Vista Manager application, navigate to the Vista Manager page.
3. Click the **Generate Tech Support** button. The application generates the tech support file and stores it in the appliance **/fs/flash** directory. The file name indicates the application.
4. Wait while the application generates a tech-support file. This can take up to a few minutes. The larger the tech-support data file, the longer this takes.
5. The tech support files will show in the **/fs/flash** directory in the **File Management** page. You can download them from there. You may need to refresh the page to see the new files.

To generate tech support output for the appliance and optionally applications:

1. From the VST-VRT dashboard menu, navigate to **System > File Management**.
2. Click the **Generate Tech Support** button. A pop-up opens showing the device and the running applications. By default, all of these are selected to generate tech-support data.



3. Update the selection as required and click **Generate**. The device and each application generate a tech support file and store it in the appliance **/fs/flash** directory.
4. Wait while the device and applications generate tech-support files. This can take up to a few minutes. The larger the tech-support data file, the longer this takes.
5. Navigate to the **System > File Management** page and the **/fs/flash** directory to view or download the files. You may need to refresh the page to see the new files.

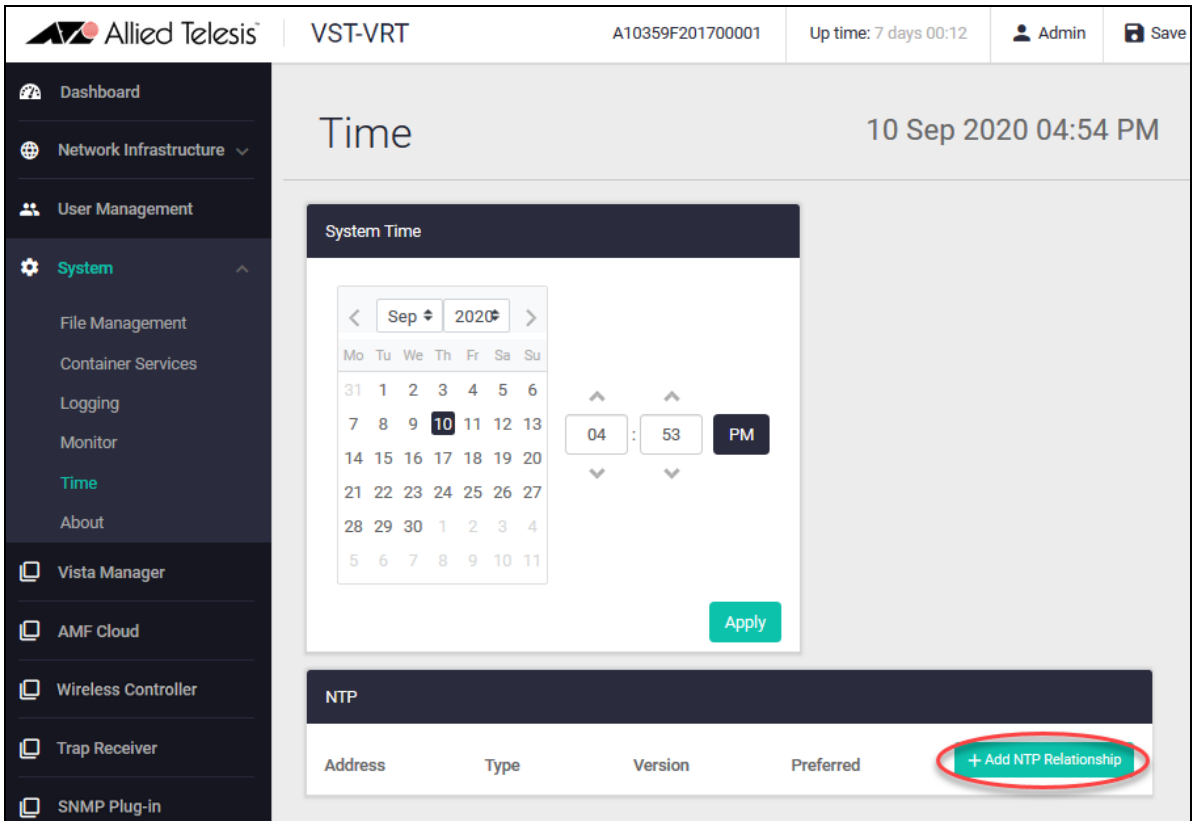
Reboot or shut down

To reboot or shut down the appliance, use the green **Reboot** or **Shutdown** button buttons at the top right of this page.



Configure system time

To configure system time, navigate to **System > Time**. In the **Time** page, you can set the system time manually, or set VST-VRT to use NTP relationships to determine system time.



The system time is displayed as local time according to the time zone of the browser used to connect to the VST-APL GUI (not UTC time).

To set the time manually, set it to local time and click **Apply**.

To add an NTP server for the device to get time settings from using the Network Time Protocol, use the following steps.

1. Click the green **Add NTP Relationship** button at the top right of the NTP panel.

Add NTP Relationship [X]

Address (IPv4/IPv6/Hostname)
192.168.1.1 b8:: / pool.ntp.org

Type [v]

Version [v]

Preferred No Yes

Cancel Apply

2. Enter the IP address of the NTP peer.
3. Expand the **Type** options by clicking the arrow to the right. Select whether the NTP relationship is to an NTP server, peer or pool.
4. Expand the **Version** options by clicking the arrow to the right. Select the version of the NTP protocol to use with this peer.

Add NTP Relationship [X]

Address (IPv4/IPv6/Hostname)
192.168.1.1 b8:: / pool.ntp.org

Type [^]
Server
Peer
Pool

Version [^]
1
2
3
4

Preferred No Yes

Cancel Apply

- Set one NTP peer to be preferred by clicking the **Yes** button. If you configure more than one NTP peer, set the others to **No**. The VST-VRT will set its system time based on NTP messages it receives from the preferred peer, or from another peer if it does not receive valid messages from the preferred peer.

View system information

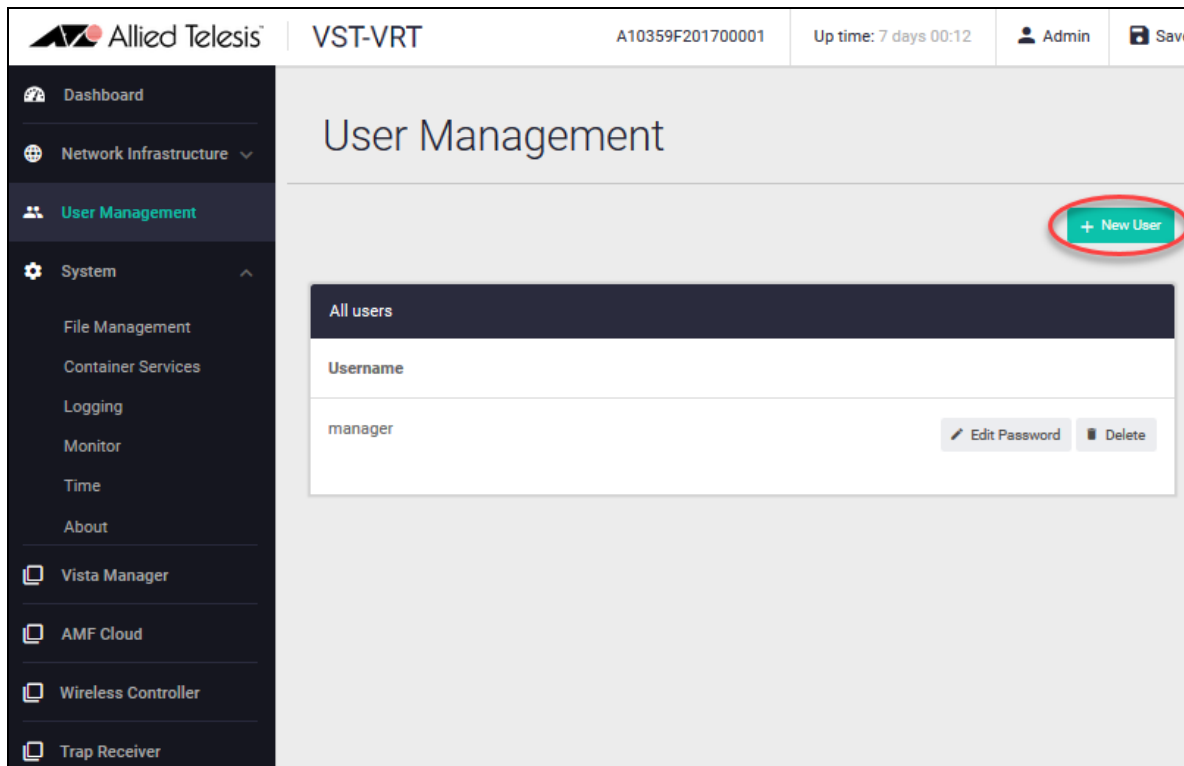
To see details of system hardware, operating software, and environmental indicators, navigate to **System > About**. The About page provides a good overview of your physical appliance and its current setup, and is very helpful in the event of a problem, to assist Allied Telesis support.

The screenshot shows the Allied Telesis VST-VRT web interface. The top navigation bar includes the Allied Telesis logo, the device name 'VST-VRT', the device ID 'V10BC79723E7DDD2', the uptime 'Up time: 3 days 02:11', the user 'Admin', and a 'Save' button. A dark sidebar on the left contains navigation links: Dashboard, Network Infrastructure, User Management, System (expanded), File Management, Container Services, Logging, Monitor, Time, About (highlighted), Vista Manager, AMF Cloud, Wireless Controller, Trap Receiver, and SNMP Plug-in. The main content area is titled 'About' and features a 'System Information' table.

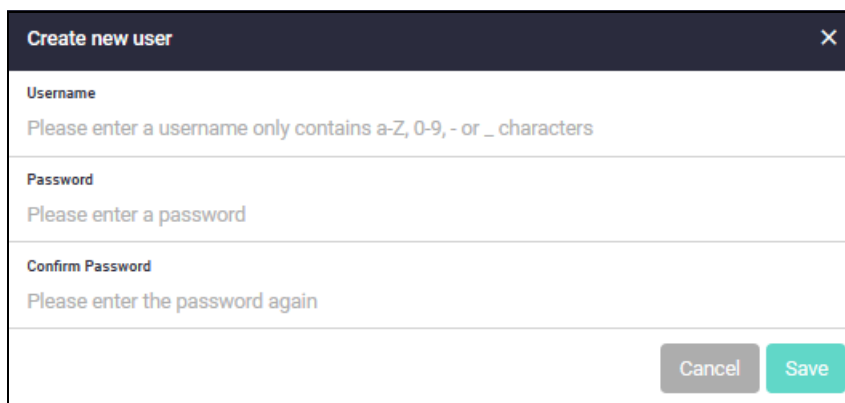
System Information	
Name:	V10BC79723E7DDD2
Model:	AT-VST-VRT
MAC Address:	08-00- XXXXXXXXXX
Serial Number:	V10BC79723E7DDD2
Environment:	✔ Status: Good ▼
Current Software:	x.x.x.iso
Software Version:	x.x.x
Bootloader:	x.x.x
GUI Version:	x.x.x
GUI Build:	202 XXXXXX

Configure users

By default, the VST-VRT comes with a single user account with username “manager” and password “friend”. We recommend you change this password for security. To view and configure user accounts for VST-VRT, select **User Management** in the Dashboard menu.



All user accounts have the same privileges as the ‘manager’ account. To add a new user, in the User Management page, click the green **+ New User** button at the top right of the All users panel and enter the username and password (twice), then click **Save**.



To change the password for a user, click the **Edit password** button to the right of the user, enter the new password, then click **Save** in the **Edit password** dialog box.

To remove a user account, click the **Delete** button to its right.

After making changes to the user accounts, click **Save** at the top right of the VST-VRT window to save the VST-VRT configuration.

Monitoring

You can view some general information for VST-VRT on several pages, including the Dashboard, the File Management page (including Generate tech-support), and the About page.

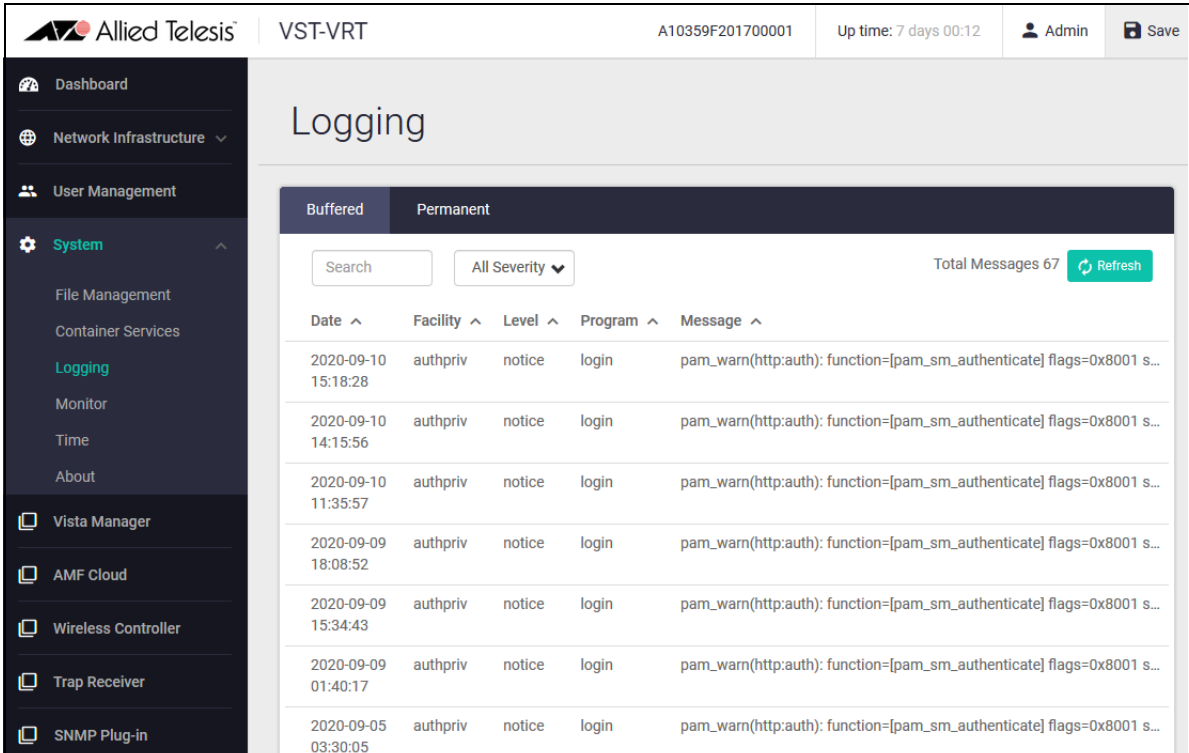
You can see an overview of the environmental status of VST-VRT on the Dashboard **System Information** panel ("[The VST-VRT GUI Dashboard](#)" on page 23) and by navigating to the **System > About** page ("[View system information](#)" on page 43).

This section describes pages that provide more detailed monitoring information:

- "[View log messages](#)" on page 45
- "[Monitor system CPU and memory](#)" on page 48

View log messages

The VST-VRT generates log messages related to the operation of VST-VRT. To view log messages, navigate to **System > Logging**.



The screenshot shows the VST-VRT web interface. The top navigation bar includes the Allied Telesis logo, the device name 'VST-VRT', the ID 'A10359F201700001', the 'Up time: 7 days 00:12', and user information 'Admin' with a 'Save' button. The left sidebar contains navigation options: Dashboard, Network Infrastructure, User Management, System (highlighted), File Management, Container Services, Logging (highlighted), Monitor, Time, About, Vista Manager, AMF Cloud, Wireless Controller, Trap Receiver, and SNMP Plug-in. The main content area is titled 'Logging' and has tabs for 'Buffered' and 'Permanent'. Below the tabs is a search bar and a dropdown for 'All Severity'. The right side shows 'Total Messages 67' and a 'Refresh' button. A table displays log messages with columns for Date, Facility, Level, Program, and Message.

Date	Facility	Level	Program	Message
2020-09-10 15:18:28	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...
2020-09-10 14:15:56	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...
2020-09-10 11:35:57	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...
2020-09-09 18:08:52	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...
2020-09-09 15:34:43	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...
2020-09-09 01:40:17	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...
2020-09-05 03:30:05	authpriv	notice	login	pam_warn(http:auth): function=[pam_sm_authenticate] flags=0x8001 s...

VST-VRT sends log messages to both the:

■ **permanent log**

The permanent log is stored in persistent storage, and retains messages when VST-VRT is rebooted. Messages of severity level warning (4) and higher go to the permanent log.

To view messages in the permanent log, click **Permanent** at the top of the logging panel. If a tech-support file is generated, the contents of the permanent log are included in it.

VST-VRT stores the messages in log files in the log directory in the persistent storage system with file names beginning with 'messages'. To download or delete a log file, navigate to the **System > File Management** page and the **log** directory ("[Manage files](#)" on page 38).

■ **buffered log**

The buffered log is in current memory. It contains the most recent log messages and discards older ones when it fills the allocated memory. These messages are lost when VST-VRT restarts. Messages of severity level notice (5) and higher go to the buffered log.

To view messages in the buffered log, click **Buffered** at the top of the logging panel.

The logging panel displays these components for each message:

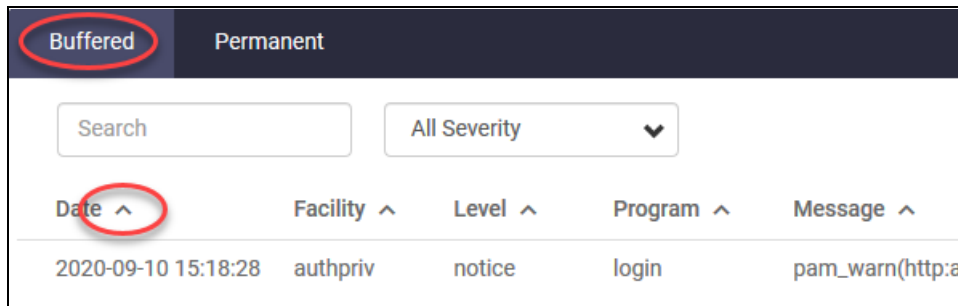
- **Date**—the date and time when the log message was generated, according to the device's clock in the local time zone.
- **Facility**—the facility in the operating software that generated the message.
- **Level**—the severity level of the message, indicating how important it is. See [Table 3](#).
- **Program**—the particular program in the operating system that generated the message.
- **Message**—the content of the message.

Table 3: Severity levels in log messages

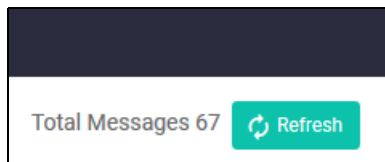
SEVERITY IN MESSAGE	SEVERITY LEVEL	MEANING
emerg	0	Emergency: the system is unusable; operation severely impaired.
alert	1	Alert: action must be taken immediately; operation has been or could be affected.
crit	2	Critical conditions; a possible problem or issue that requires manager attention.
err	3	Error: error conditions; an issue that may require manager attention.
warning	4	Warning conditions; normal notification of an event, not serious or particularly important.
notice	5	Notice: normal but significant condition; useful information that can generally be ignored during normal operation. Messages of this severity level are sent to the buffered log but not to the permanent log.
info	6	Informational messages.
debug	7	Debug level messages; extremely detailed (possibly high-volume) debugging information.

To select which messages to display:

- Show the messages in either the Buffered or the Permanent log by clicking the Buffered or Permanent button at the top of logging panel.
- To filter the messages, select a particular severity level to display or enter a search string.
- To sort the messages, click the arrow to the right of any column headings: Date, Facility, Level, Program, Message.



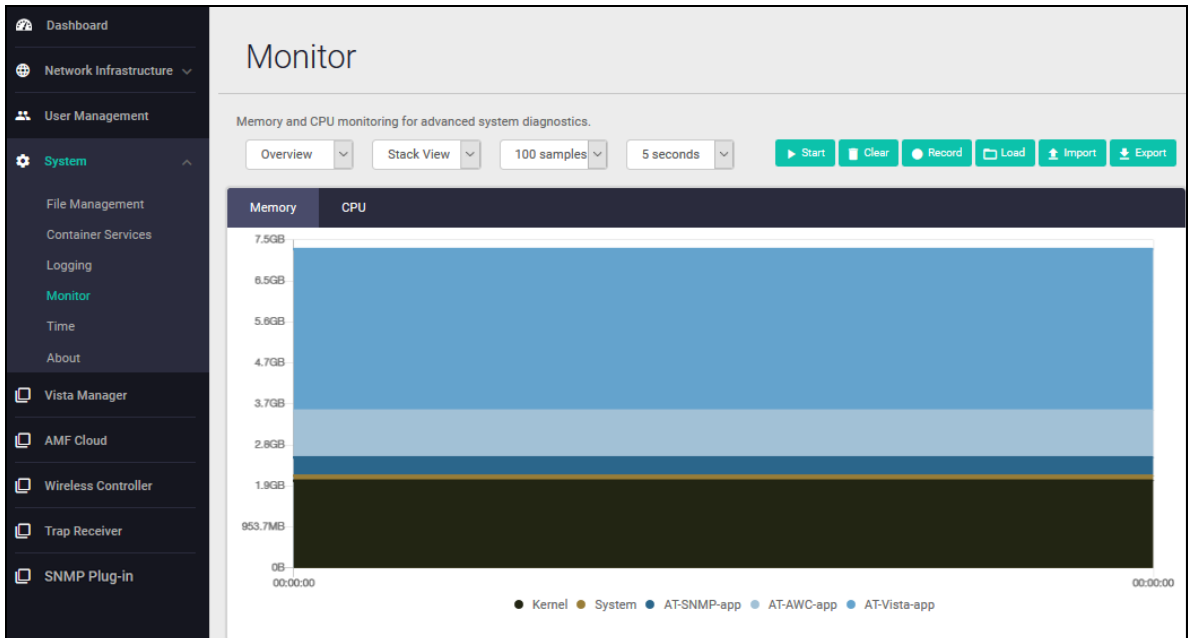
- To update the display, click the green **Refresh** button at the top right of the **Logging** panel. To the left of this button you can see how many messages match the current selection.



- Select how many messages to display at the bottom right of the page.

Monitor system CPU and memory

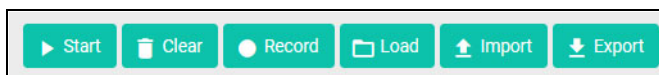
To monitor system CPU and memory use, in the Dashboard, navigate to **System > Monitor**. VST-VRT can gather samples of memory or CPU usage data for VST-VRT itself and for applications running on it.



Set the sampling parameters:

- Set the maximum number of data samples to gather by setting the **sample collection limit** in the drop-down list.
- Set the interval between samples by setting the **sampling period** in the drop-down list.

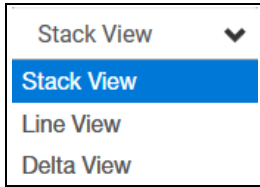
Use the green buttons to gather and record data.



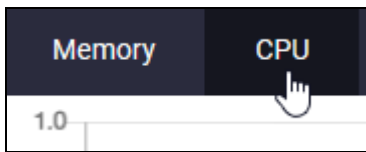
- Start VST-VRT collecting usage data samples by clicking the green **Start** button and stop sampling by clicking the red **Stop** button.
- Record the data in a file in VST-VRT persistent storage by clicking the green **Record** button
- Export the data as displayed in the GUI browser to a file in VST-VRT persistent storage by clicking the green **Export** button
- Reimport data from a file in persistent storage to display in the GUI **Monitoring** page by clicking the green **Load** button
- Import a data file from the file system of the device running the browser to display in the GUI **Monitoring** page by clicking the green **Import** button
- Clear the data from the browser by clicking the green **Clear** button

Select your view of the sampled data (without affecting the sampling itself) in the graph on the **Monitoring** page. The key below the graph shows the color for each program. You can:

- Select the type of **graph** to display from stack view, line view or delta view (values since the start of sampling, beginning at 0) from the drop-down list.



- Select whether to monitor memory or CPU usage by clicking in the **Memory** or **CPU** at the top of the graph panel.



- Display the usage for a particular program by selecting it from the drop-down list. See the color-coded key for the programs below the graph.

To display more detailed memory use for a particular program, select the program in drop-down list to the left above the graph.

Managing applications

This section describes the application pages in the VST-VRT GUI, and:

- "Start, stop and remove applications" on page 50
- "View the Container Services page" on page 51
- "Restore an application after VST-VRT restart" on page 52

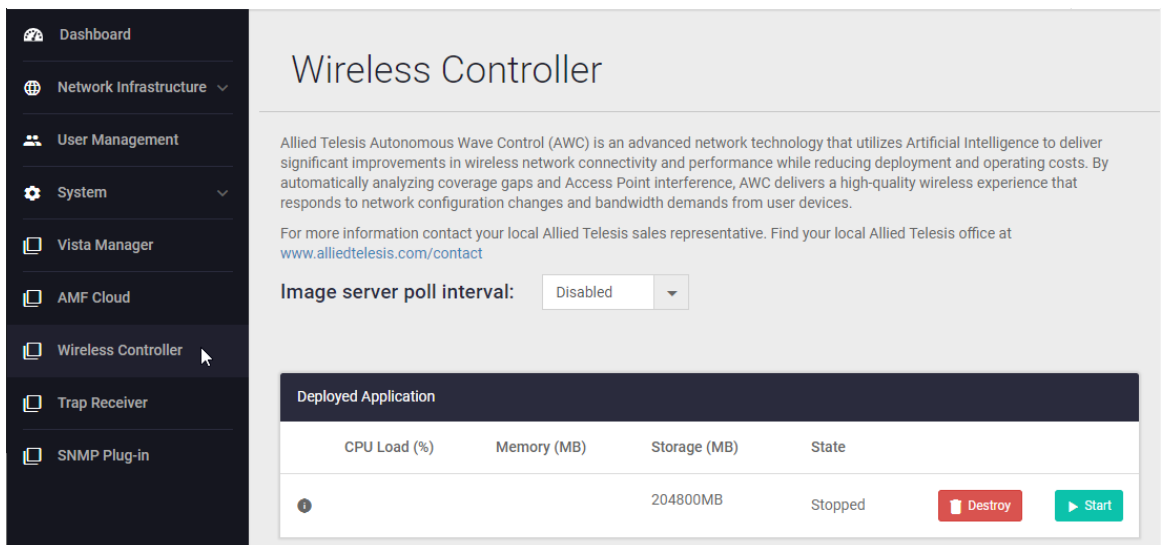
From VST-APL application page you can also:

- Change the configuration for the application container in VST-VRT, including the network interfaces. Click the **Configure** button.
- Generate a tech-support file for an application by clicking the **Generate tech-support** button. See "Generate tech-support" on page 40.

For information about how to upgrade the VST-VRT operating system and supported applications, see the Release Note available from [Vista Manager Virtual \(VST-VRT\) Technical Documents](#) at [alliedtelesis.com](#). Note that each version of VST-VRT supports particular sets of application versions, as in the Release Notes. Other combinations of application versions are not supported.

Start, stop and remove applications

There is a page for each application; click on the menu item for the application to open its page.



The screenshot shows the VST-VRT GUI interface. On the left is a dark sidebar menu with the following items: Dashboard, Network Infrastructure, User Management, System, Vista Manager, AMF Cloud, Wireless Controller (highlighted with a mouse cursor), Trap Receiver, and SNMP Plug-in. The main content area is titled 'Wireless Controller' and contains the following text:

Allied Telesis Autonomous Wave Control (AWC) is an advanced network technology that utilizes Artificial Intelligence to deliver significant improvements in wireless network connectivity and performance while reducing deployment and operating costs. By automatically analyzing coverage gaps and Access Point interference, AWC delivers a high-quality wireless experience that responds to network configuration changes and bandwidth demands from user devices.

For more information contact your local Allied Telesis sales representative. Find your local Allied Telesis office at www.alliedtelesis.com/contact

Image server poll interval: Disabled

Deployed Application			
CPU Load (%)	Memory (MB)	Storage (MB)	State
●		204800MB	Stopped Destroy Start

This page displays the CPU load, the memory in MB, the storage in MB, and the state of the application, including whether it is:

- **Offline**—The application instance has not yet been activated or is not reachable.
- **Extracting, Creating**—when you activate the application, it extracts and creates an instance of the application on VST-VRT.
- **Running**—the application is running; normal operation.
- **Stopping or stopped**—the application stops gracefully. Before you can change the application configuration, you must stop the application. To stop an application, click the **Stop** button.
- **Destroying**—the application and its configuration is being removed from VST-VRT.
Caution: Destroying an application removes the application, its configuration, and all data associated with the application instance from VST-VRT. To destroy an application, click the **Destroy** button.

If the application has its own GUI (such as Vista Manager), then you can access it by clicking the **Open** button. You can also enter the application's IP address directly in your browser.

View the Container Services page

The underlying technology supporting the applications on VST-VRT is Container Services.

The System menu includes a Container Services page. In this page, you can see an overview of all the applications on VST-VRT. Do not use this page to configure or manage applications. Instead, use the separate application pages. Click on the menu item for the application.

Caution: The VST-VRT supports one instance of each application. Attempting to use this page to activate more instances of applications can result in overloading VST-VRT's resources and unpredictable behaviour.

The Container Services page is intended for advanced users who understand the systems resources. For configuration, regular users should only use the specific menu items for each application they need to configure. If you use this page, then monitor the total storage, memory and CPU items in the Compute Node section. If any of these change to red, then you are close to using all the system resources.

Note that the IP address field in the Compute Node Panel on this page is for a Network Attached Compute node. On VST-VRT, this field is empty. The deployed applications run on the local device itself, not on a network attached node.

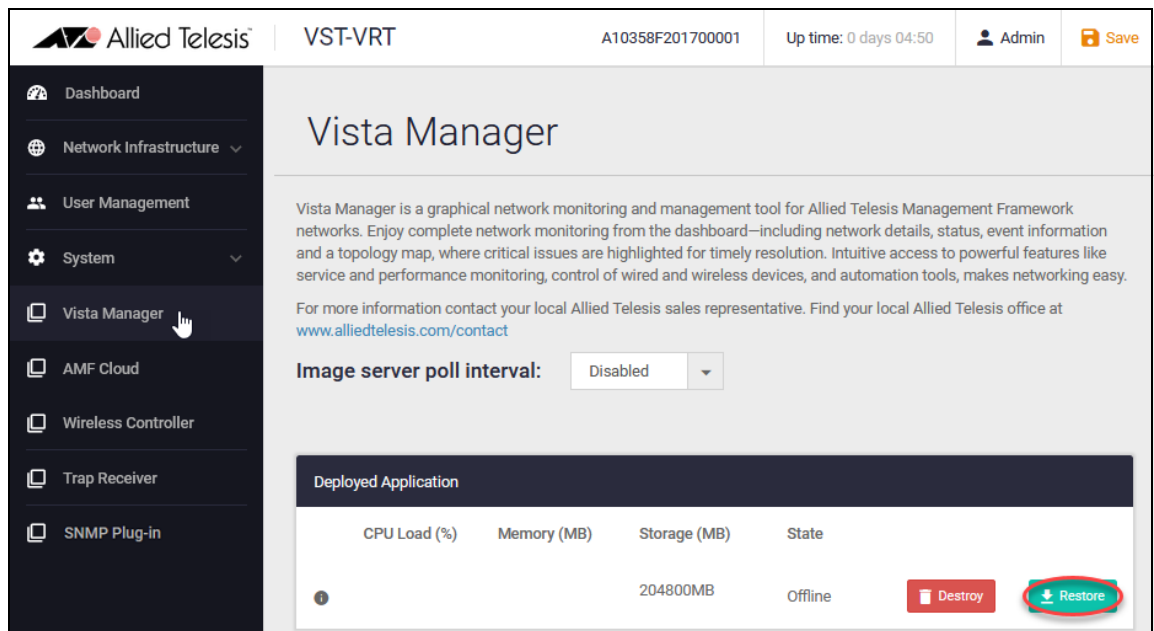
Restore an application after VST-VRT restart

We recommend saving any VST-VRT configuration that you want to retain as soon as you have made it, before VST-VRT reboots. The **Save** button is orange when there is unsaved configuration, and blue when configuration has been saved. Click it to save.

However, if VST-VRT restarts after an application has been activated but before the VST-VRT configuration has been saved, you can still restore the application and its configuration without having to begin again.

To restore one or more such applications:

1. When VST-VRT has restarted, navigate to the application page from the VST-VRT menu.
2. In the application page, click the **Restore** button to the right of the application in the Deployed Application panel.



The screenshot shows the VST-VRT web interface. At the top, there is a header with the Allied Telesis logo, the title 'VST-VRT', a session ID 'A10358F201700001', 'Up time: 0 days 04:50', a user profile for 'Admin', and a 'Save' button. The left sidebar contains a navigation menu with items: Dashboard, Network Infrastructure, User Management, System, Vista Manager (highlighted with a mouse cursor), AMF Cloud, Wireless Controller, Trap Receiver, and SNMP Plug-in. The main content area is titled 'Vista Manager' and contains a description of the tool. Below the description is a dropdown menu for 'Image server poll interval' set to 'Disabled'. At the bottom, there is a table titled 'Deployed Application' with columns for CPU Load (%), Memory (MB), Storage (MB), and State. The table shows one application with 204800MB of storage and an 'Offline' state. To the right of the table are 'Destroy' and 'Restore' buttons, with the 'Restore' button circled in red.

CPU Load (%)	Memory (MB)	Storage (MB)	State
		204800MB	Offline

The application is restored to the configuration it had before the restart. This may take a few minutes.

3. To start the application, click the **Start** button to its right.
4. Save the VST-VRT configuration by clicking the **Save** button.

Upgrading software

To upgrade the VST-VRT operating software, use the procedures in the Release Note for the new version of VST-VRT. This describes how to:

1. Upgrade the VST-VRT operating system and GUI via the virtual machine
2. Upgrade the applications by using the VST-VRT GUI.

Caution: Be sure to use the upgrade procedure in the release note for the version you are upgrading to. The software and procedures for upgrade differ between some versions. Using an upgrade procedure that does not match the version may cause unintended results and potentially lead to loss of application data.

C613-04104-00 REV F



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