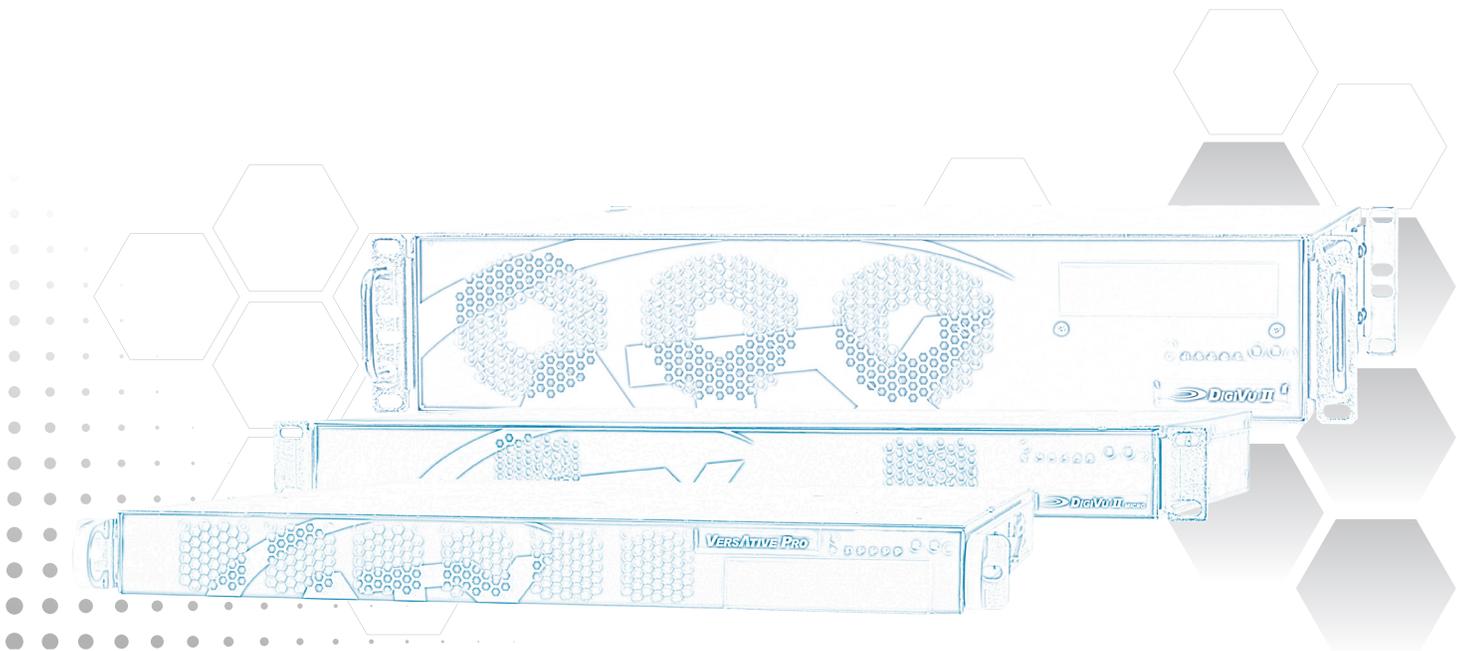




DIGI VU[®] II
DIGI VU[®] II MICRO
VERSATIVE[®] PRO
Patent Pending

Operation Manual



General Guide Notes

Manual Release Date **July 30 2015**

Firmware Version

Some features described in this manual require the latest firmware to be installed on the hardware platform. Check with ATX Networks Technical Support for the latest release of firmware. The firmware installed on your Device may be found in the GUI. At the time of publication of this manual the most current released firmware versions are:

Firmware Version **VA1.0.3.124_VMS1.0.3.703**

Mkip System Menu Version **0.5.5**

Organization of This Manual

This manual is generally organized based on the main functions of Encoding and Transcoding with individual chapters dedicated to describing the configurable features and monitoring. Further chapters outline activities related to the GUI operation and configuration.

Cross Reference Usage

Hyperlinks are used throughout the guide to assist the reader in finding related information if the reader is viewing the PDF file directly. Hyperlinks may be identified by their blue text. Most links are to related pages within the document, but some may reference outside documents if the reader needs that additional information. The Table of Contents is entirely hyperlinked and bookmarks are available but the bookmark feature must be turned on in your Reader application.

Symbol Usage

Throughout the manual, some symbols are used to call the readers attention to an important point. The following symbols are in use:



WARNING: *This symbol usage will call the reader's attention to an important operation feature of the equipment which may be safety related or may cause a service outage.*



NOTE: *This symbol indicates that there is helpful related information available in this note or elsewhere in the guide.*

Although every effort has been taken to ensure the accuracy of this document it may be necessary, without notice, to make amendments or correct omissions. Specifications subject to change without notice.

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GENERAL CONFIGURATION

1. GUI Environment

The GUI is the Device interface (Graphical User Interface) used to manage the VersActivePro transcoder, DigiVuII and DigiVuII Micro encoders. In this manual these encoders and transcoders will be referred to as **Devices** since the GUI is common to all three products.

1.1 Chapter Contents

- [“Port Opening - Switch and Firewall”](#)
- [“The GUI”](#)
- [“Application Terminology”](#)
- [“Descriptive Icons”](#)
- [“Context Sensitive Menus”](#)
- [“Copy & Paste”](#)
- [“Configuring the Device - Quick Summary”](#)
- [“Launch the GUI and Log in”](#)

1.2 Port Opening - Switch and Firewall



NOTE: Any Management Switch used between Devices and the Management Computer will require the following ports to be opened both Inbound and Outbound.

Port Number	Transport	Protocol	Description
80	TCP	RTMP, RTMPT, HTTP	File Upload (Licence, VersActive Software) By default, Flash Player clients make RTMP connections over port 1935 using TCP. To communicate over the RTMP protocol, clients attempt to connect to ports in the following order: 1935, 80 (RTMP), 80 (RTMPT).
8080	TCP	HTTP	HTTP Communications
8111	TCP		Communication
8112	UDP		Communications
8113	UDP		Messaging
8118			Communications
1935	TCP	RTMP/E	Adobe® Flash® (Previewing, Monitoring) Flash Media Server listens for RTMP/E requests on port 1935/TCP. Flash Player and AIR clients attempt to connect over ports in the following order: 1935, 80 (RTMP), 80 (RTMPT).
1935	UDP	RTMFP	Adobe Flash (Previewing, Monitoring) Flash Media Server listens for RTMFP requests on port 1935/UDP
8443	TCP	HTTPS	HTTPS Communications

1.2.1 Notes on Opening Fire Wall Port 1935 for Monitoring

Some firewalls reject traffic that doesn't use the HTTP protocol. This behavior can prevent communication over RTMP even if port 1935 is open. Consult the documentation for the firewall to determine how to configure it to allow RTMP traffic. To use RTMP and RTMFP, any switch or firewall between the server and clients must allow inbound and outbound traffic on port 1935.

If it is not possible to open port 1935 inbound and outbound then monitoring will not work. In this case it is best to disable monitoring altogether within the GUI, see Figure 1-4.

The resource contains both the actual publish and the preview. When the preview can not connect the whole pipeline of the stream will stop and retry and not publish. The events log will report “Cannot connect to RTMP server”. The resource will show “Resource is retrying” at the events tab. Disabling ‘Preview’ will prevent events from being detected when the streams cannot connect during monitoring.

The Preview function for each Resource is on by default, Figure 1-4, but may be disabled at each individual Resource by unticking the Preview On box and then clicking **Save**.

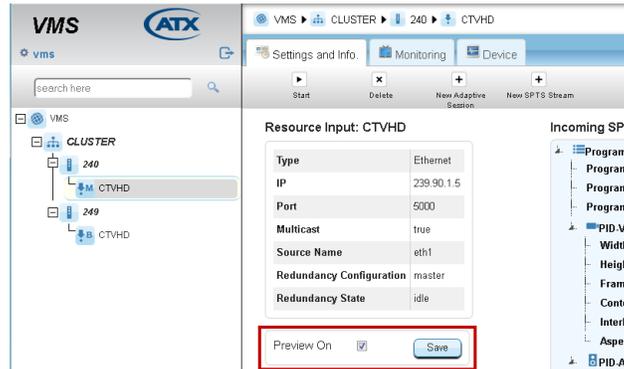


Figure 1-1: Preview Enabled

1.3 Launch the GUI and Log in

1. Open the web browser of your choice, Figure 1-2.
2. Enter the IP address of the Management Port; factory default **192.168.0.23**
3. Login with credentials, Figure 1-3, (case sensitive):
User Name: **vms**
Password: **VMS**
4. The GUI will open as shown in Figure 1-4.

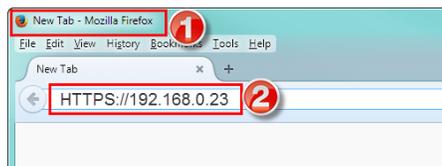


Figure 1-2: GUI Address



Figure 1-3: GUI Login

1.4 Configuring the Device - Quick Summary

These are the key steps required to set up the Device.

1.4.1 Covered in this Chapter:

- GUI Overview
- Open the GUI and log in.

1.4.2 Covered in General Configuration Chapter

- Managing Firmware
- Managing Users
- SNMP

1.4.3 Covered in Device Configuration Chapter

- Configure Ethernet Input & Output Streaming Ports
- Configure QAM Output Modulators

1.4.4 Covered in Encode, Transcode & Publish Chapters

- Create Resources
The resource may come from an analog or digital program on a Capture Card or an Ethernet IP stream address (Devices may have multiple physical Ethernet ports on which Resources may be present).
- Create SPTS Streams

The stream defines the resolution, bitrate, audio codec, and CBR/VBR for the stream. Multiple streams may be added to the session. In the case of the SPTS Stream instance, there cannot be any other streams added.

- Create Adaptive Sessions
A session is intended for MBR applications and defines the codec to be used for the series of output streams. Multiple sessions may be added to any resource. SPST Stream is for IPTV applications.
- Create Publish Points
The publish defines the output protocol, SPTS, HLS etc, the output IP and interface. Multiple Publish Points may be added to the stream.
- Start Encoding or Transcoding Streaming from the Resource icon.

1.4.5 Covered in Ethernet Multiplexer Chapter

- Create an Ethernet Multiplex.
If a number of programs will be aggregated into a single MPTS stream, first create a MUX instance.
- Create TS Sources to the MUX.
- Create a program to the TS source.

1.4.6 Covered in QAM Multiplexer Chapter

- Create a QAM Multiplex to the Device icon.
If a number of programs will be aggregated into a single MPTS stream, first create a MUX instance.
- Create TS Sources to the MUX.
- Create a program to the TS source.

1.5 The GUI

The GUI is based on a familiar **Tree** and **Tabbed Pane** design, Figure 1-4. The main parts are:

1. Tree View of Managed Elements.
2. Pane View of the Selected Element.
3. Tool Bar.
4. Path of Selected Element.
5. Context Sensitive Right Click Menu.
6. Tree View Search Tool.
7. Details View for Selected Element.
8. Alarms Notification Area.
9. Events Notification Area.

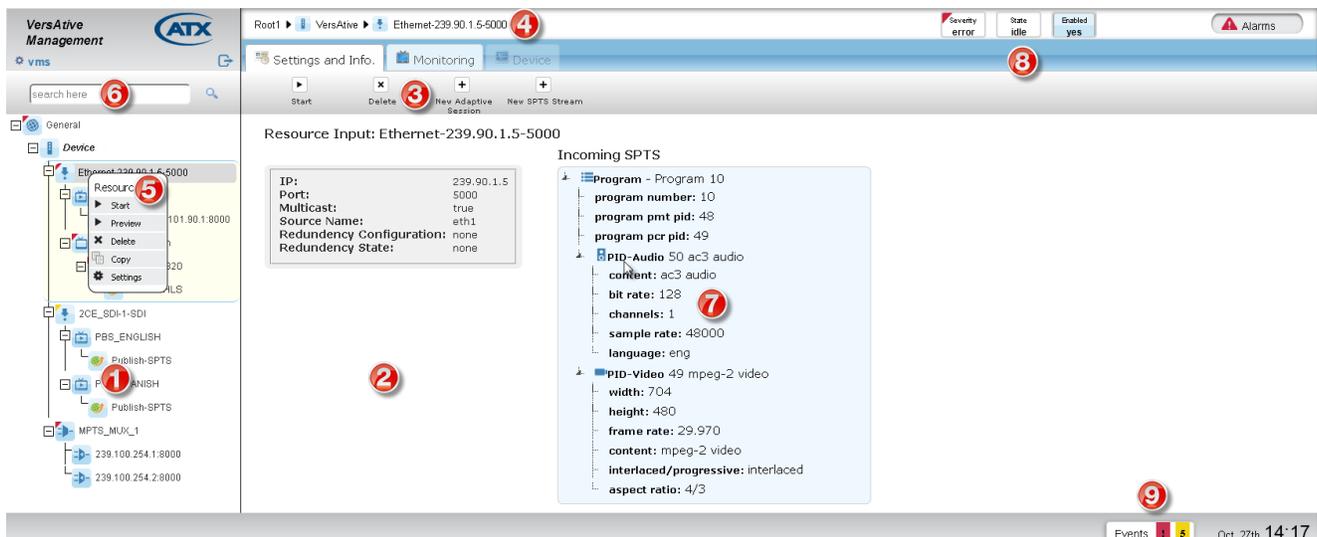


Figure 1-4: The GUI

Managed Elements are displayed in their relationships to each other in the **Tree View**, see Figure 1-4(1), and details pertaining to the elements are displayed in the **Pane View** (2) when the element is selected. Further details about the selected element and configuration dialogs are accessed within the Pane View with **Navigation Tabs**.

1.6 Application Terminology

A review of the application terminology used in the GUI and for the encoding & transcoding applications:

1. Resource
The external video and/or audio source content attached to the Capture Card or IP Port.
2. SPTS Stream
The SPTS Stream defines the resolution, bitrate (constant or variable), and audio codec of the session for IPTV applications.
3. Adaptive Session
An Adaptive Session defines the parameters to be used for encoding & transcoding multi-bitrate Streams.
4. Publish
The Publish defines the output protocol; SPTS, HLS, Flash; the output URL and Physical Interface.

1.7 Descriptive Icons

The icons used in the Tree View are designed to be as descriptive as possible to identify each element's function but each element may also be named by the user with a flexible descriptor.

1.7.1 General

An icon of a Globe representing the Device Hardware Platform.



Platform



Platform Error

1.7.2 Device

An icon representing a computer server. This is the managed VersActivePro, DigiVu II, or DigiVu II Micro **Device**.



Device



Device Error



Device Warning



Device Streaming

1.7.3 Resource

An icon showing content downloaded. Resources are from Capture Card or IP sources without distinguishing between the two.



Resource



Resource Error



Resource Warning



Resource Streaming



Resource Monitoring

A single Resource may be used to create multiple Sessions.

1.7.4 Session



Session



Session Error



Session Warning



Session Streaming



Session Disabled

An icon of a TV or Media Player representing a TV Program. Outgoing Programs are created here.

1.7.5 Stream

In icon of a Media Player or a Media Stream to be played out.



1.7.6 Publish

An icon of the Globe again, this time with an encircling arrow showing output to a broad area 'around the Globe'.



1.7.7 Configuration Icons

Some Icons in the GUI are for configuration and operation purposes.



1.8 Context Sensitive Menus

These are menus that appear on Right Click and are different depending on the element that was first selected.

1.8.1 Device Menu & Tool Bar

Device Configuration options are available on both the Right Click menu and the Tool Bar, Figure 1-5.

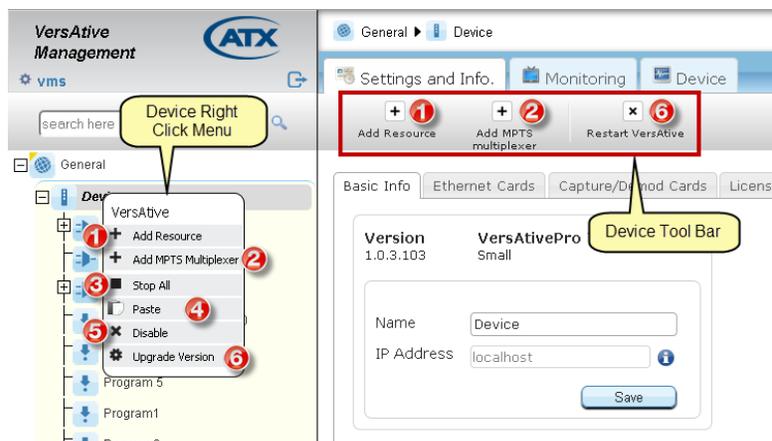


Figure 1-5: Device Right Click Menu & Tool Bar

1. Add Resource
Add to this Device a **Capture Card Resource** for encoding content or an **Ethernet Resource** for transcoding content.
2. Add MPTS Multiplexer
Multiplexes may be built for Ethernet streaming to remote Edge QAMs or output directly to MQAMs (if QAM Output equipped).

3. Stop All
May be used to stop all resources simultaneously. (Resources may also be stopped individually from the resource itself).
4. Paste
A powerful feature used along with the Copy feature to quickly replicate Resources.
5. Disable
Disables the Device Platform.
6. Upgrade Version
Device firmware may be upgraded from here.

1.8.2 Resource Menu & Tool Bar

Resource operations are available on both the Right Click menu and the Tool Bar, Figure 1-6.

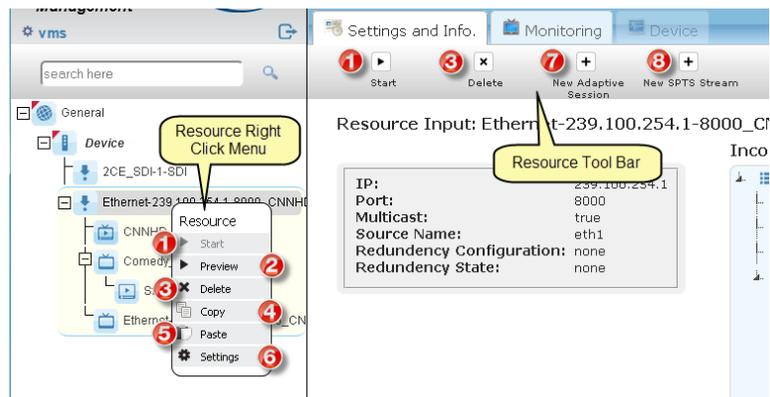


Figure 1-6: Resource Right Click Menu & Tool Bar

1. Start
Starts the associated sessions and streams created on the selected resource.
2. Preview
Displays a 5 frames/sec video window for verification of the resource presence and quality.
3. Delete
Deletes the selected Resource
4. Copy
A powerful feature used along with the Paste feature to quickly replicate Resources. Will copy all streams created on the selected resource.
5. Paste
A powerful feature used along with the Copy feature to quickly replicate Streams, Sessions and Publishes.
6. Settings
A shortcut to basic Info tab.
7. New Adaptive Session
Used to create a new Adaptive session. Multiple sessions may exist on any single Resource.
8. New SPTS Stream
Used to create SPTS streams for IPTV applications.

1.9 Copy & Paste

This section shows a few examples of copying and pasting to replicate Streams, Sessions and Publish Points in the Tree View. Once a Resource and its related Sessions, Streams and Publishes are defined, the Sessions, Streams and Publishes may be replicated any number of times in any location in the Tree View. All pasted objects represent exact images of the copied source and will require some editing to avoid duplication within the Device. The process is the same for all Copy & Paste operations whether Sessions, Streams or Publish Points are being copied.



NOTE It is not possible to rename a Resource once it is created so it is not highly recommended to use this feature to replicate Resources. The Copy & Paste feature was intended to replicate Streams, Sessions and Publish Points only. Copying a Resource will result in the Resource Name being appended with a sequential number to ensure it is unique.

1.9.1 Copy & Paste Sessions

1. Create the Donor Resource with a Session and Publish Points that it is desired to replicate, Figure 1-7.
2. Create a Recipient Resource or multiple Resources that will have Sessions copied to them.

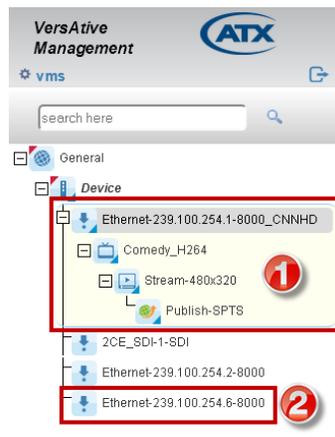


Figure 1-7: Create Donor Resource

3. Right click the **Session** on the **Donor** Resource and select Copy from the menu, Figure 1-8.



Figure 1-8: Select Copy

- Right click the **Recipient Resource** and select Paste from the menu, Figure 1-9.

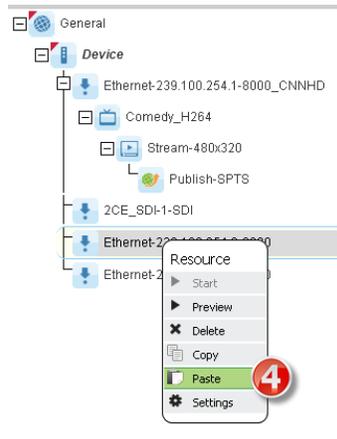


Figure 1-9: Select Paste

- An exact copy of the session is replicated on the new Resource, Figure 1-10.

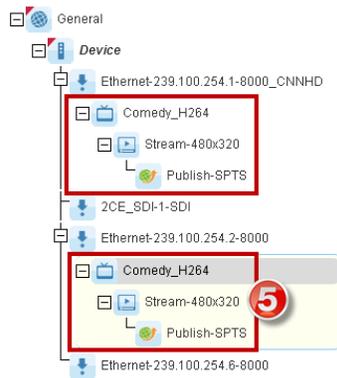


Figure 1-10: SessionReplicated



NOTE The replicated Session will have identical properties to the copied Session so conflicting properties must be edited manually before the session may be streamed.

6. Click to select the **Session** in the Tree View then rename the Session to a meaningful name such as the service name, Figure 1-11.
7. Click **Save** to save the new session name in Tree View.

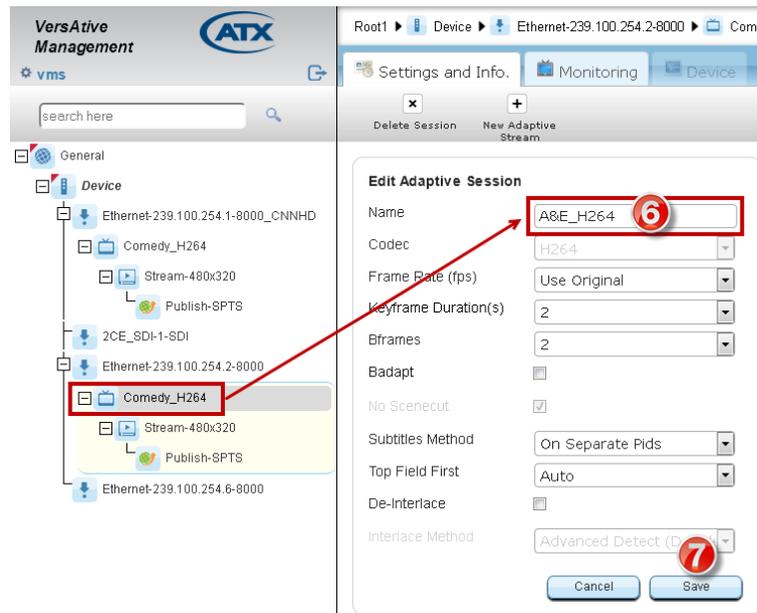


Figure 1-11: Copied Session Renamed

8. Click the **Stream** in Tree View to open the stream parameters window, Figure 1-12.
9. Edit **Video, Audio & Video Pre-processing Parameters** as required.
10. Click **Save** to save and add the session to the Tree View.

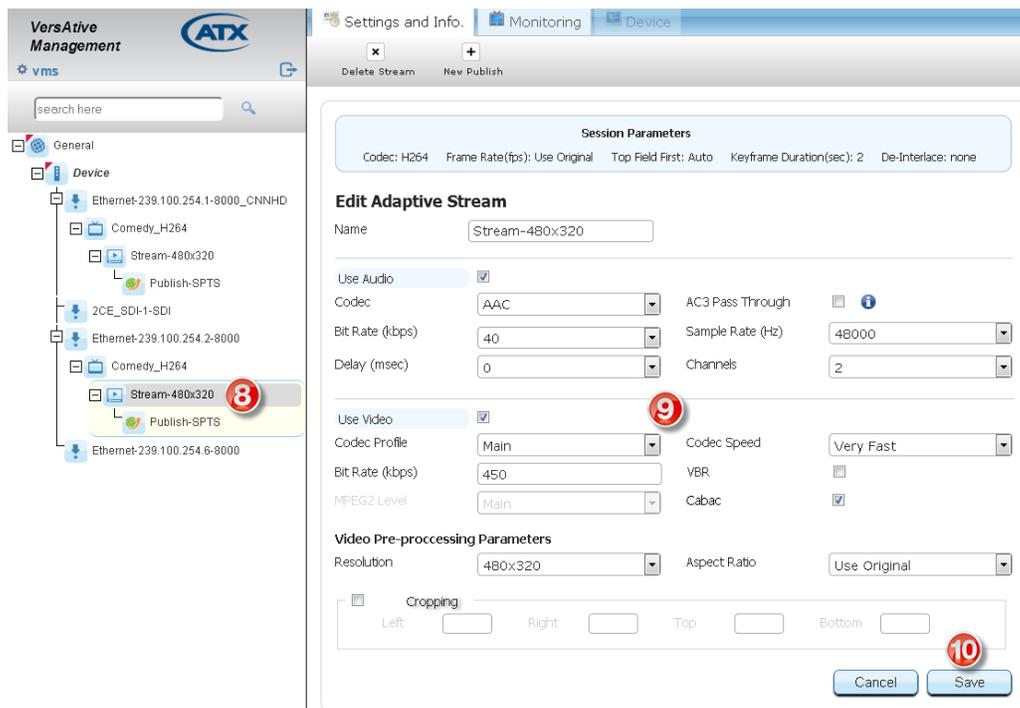


Figure 1-12: Update Copied Stream Parameters

11. Click the **Publish** in the Tree View to open the Publish parameters window, Figure 1-13.
12. Next, **Tick** the box of the **Connection** to be edited.
13. Click **Edit** to enable changing the IP address.
14. Next, **Edit** the IP address to the correct value for this publish.
15. Click **Apply** to apply the change to the connection.
16. Click **Save** to save the changes.

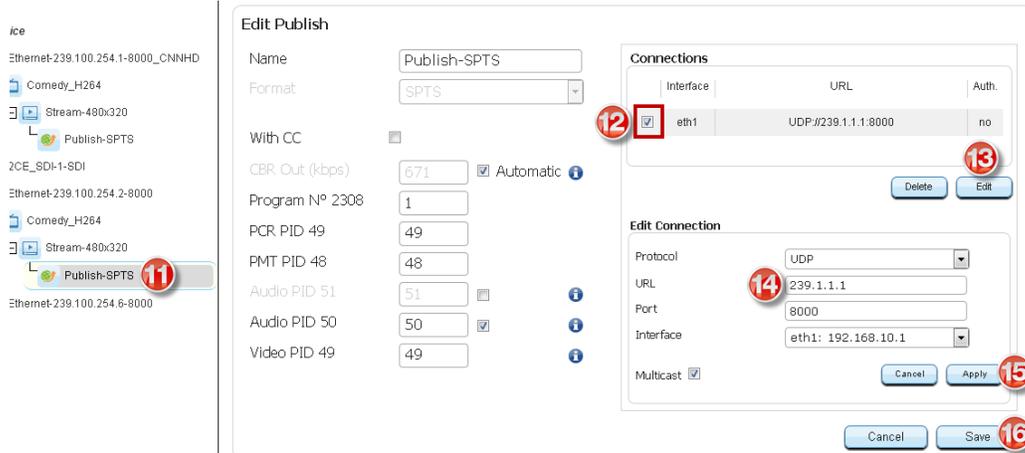


Figure 1-13: Update Copied Publish Parameters

GENERAL (GLOBAL) CONFIGURATION

2. General (Global) Configuration

General level configuration represents the Platform Global settings. This is the top level of the Tree View of the Device and includes the categories of Firmware Upgrades, NTP, User Management, SNMP & Licencing.

To configure Global Platform settings:

1. Click the **General** icon at the top level of Tree View, Figure 2-1.
2. Tabs are then presented in the Pane View for specific system configuration.

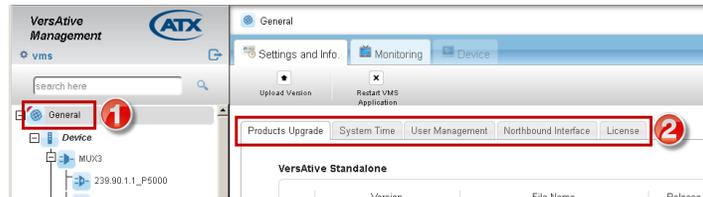


Figure 2-1: General Configuration Tabs

2.1 Chapter Contents

- “Firmware Upgrade”
- “System Time”
- “User Management”
- “Licence”
- “SNMP”

2.2 Firmware Upgrade

Firmware upgrades, when available, are obtained from ATX Networks Technical Support group. Obtain the file and save it to your Management Computer before beginning this upgrade.



Warning Before proceeding, you must stop any configured streams before upgrading the Device.

2.2.1 Upgrade Procedure

1. Login to the system to be upgraded.
 2. Click on the **General** icon in Tree View, Figure 2-2.
- The **Settings & Info** upper level tab and the **Products Upgrade** sub-tab will be selected by default, Figure 2-2. The page shows saved firmware versions, allows reinstalling previous versions or deletion of versions no longer needed. A pin icon on the right marks the currently installed version.

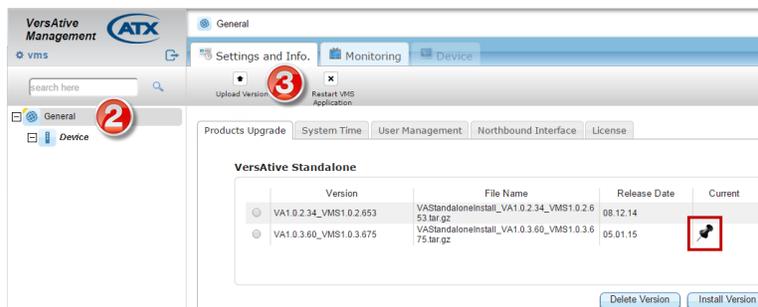


Figure 2-2: Upload Version

3. Click Upload Version on the Tool Bar.
4. In the Dialog box that opens, click **Choose File** then browse to locate the file stored on your computer, Figure 2-3.
5. Click **Upload** to begin the process.

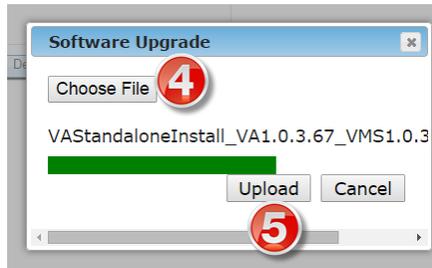


Figure 2-3: Select File

When the upload is complete, the new version will be listed below any previous versions, Figure 2-4.

VersAtive Standalone

Version	File Name	Release Date	Current
<input type="radio"/> VA1.0.2.34_VMS1.0.2.653	VASTandaloneInstall_VA1.0.2.34_VMS1.0.2.653.tar.gz	08.12.14	
<input type="radio"/> VA1.0.3.60_VMS1.0.3.675	VASTandaloneInstall_VA1.0.3.60_VMS1.0.3.675.tar.gz	05.01.15	
<input checked="" type="radio"/> VA1.0.3.67_VMS1.0.3.677	VASTandaloneInstall_VA1.0.3.67_VMS1.0.3.677.tar.gz	14.01.15	

Figure 2-4: New Uploaded Version

6. Click the selector **Button** to select the firmware you just uploaded, Figure 2-5.
7. Click **Install Version**.

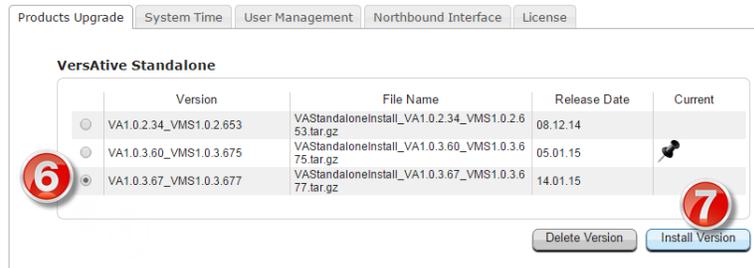
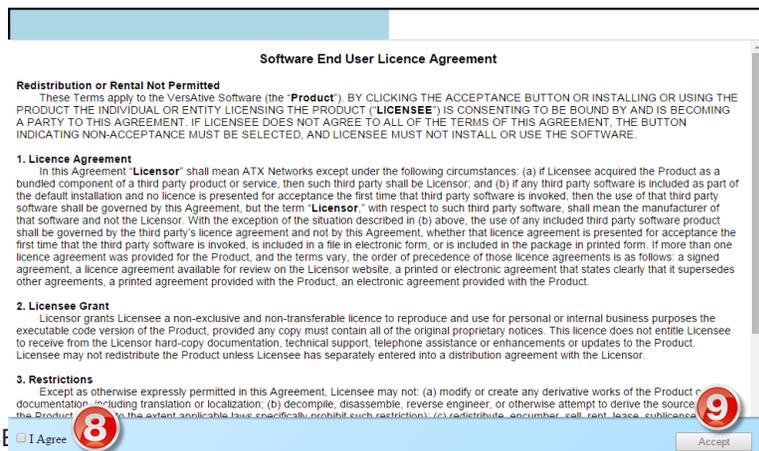


Figure 2-5: Install Version

The firmware upgrade process will begin and a progress screen is presented, Figure 2-6.



- Soon, the SE

Figure 2-7: Accept SEULA Agreement

8. Click the **I Agree** box.
9. Click **Accept**.

Login to the GUI and check that the firmware is installed. The pin icon identifies the firmware just installed, Figure 2-8.

VersAtive Standalone

	Version	File Name	Release Date	Current
<input type="radio"/>	VA1.0.2.34_VMS1.0.2.653	VASandaloneInstall_VA1.0.2.34_VMS1.0.2.653.tar.gz	08.12.14	
<input type="radio"/>	VA1.0.3.60_VMS1.0.3.675	VASandaloneInstall_VA1.0.3.60_VMS1.0.3.675.tar.gz	05.01.15	
<input checked="" type="radio"/>	VA1.0.3.67_VMS1.0.3.677	VASandaloneInstall_VA1.0.3.67_VMS1.0.3.677.tar.gz	14.01.15	

Figure 2-8: New Version is Now Current

2.3 System Time

System time is set by default to be automatically updated by an internally defined NTP server. This setting may be changed to setting the time and date manually or an alternate NTP server may be specified.

2.3.1 Change Time Zone & NTP Server

1. Click **General** Icon at top of Tree View.
2. Click **System Time** tab, Figure 2-9.
3. Select the appropriate **Time Zone** from the dropdown menu.
4. Click the adjacent **Apply** button.
5. Enter the **IP Address** of the desired NTP server (do not enter the URL)
6. Click the adjacent **Apply** button.

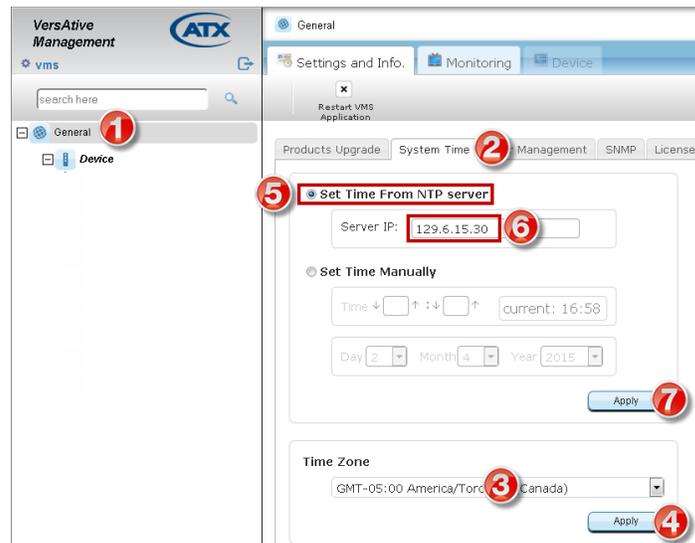


Figure 2-9: NTP Time Server Configuration



Note While it is possible to manually change the date on the System, do so with the caution that Licensing may be adversely affected. This is to ensure that dates are not changed to defeat licence expiry dates. Contact ATX Networks Technical Support if the date on the System needs to be manually changed.

2.4 User Management

A single user is defined by default but users may be added or managed as required. Further, Radius authentication may be implemented.

2.4.1 GUI Authentication

Add User

1. Click **General** Icon at top of Tree View to select it, Figure 2-10.

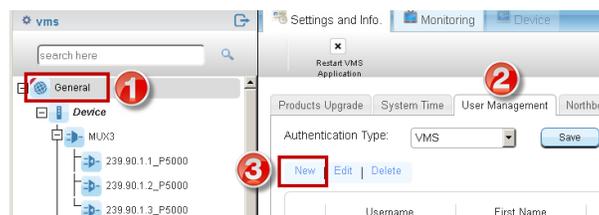


Figure 2-10: Add New User

2. Click the **User Management** tab.
3. Click **New**.
4. Enter **Username** for new user, Figure 2-11 (a user's actual name may also be entered, optional).
5. Select the **Access Level** for new user.
6. Enter **Password** for new user (password will be masked by default).
7. Click **abc** to show password momentarily.
8. Click **Save**.

Figure 2-11: New User Configuration

2.4.2 Radius Server Authentication

1. Click **General** Icon at top of Tree View to select it, Figure 2-12.
2. Click the **User Management** tab.
3. Select **Radius Server** from the menu.
4. Enter the appropriate information and choose the Radius Authentication Type from the drop down menu.
5. Click **Save**.

Figure 2-12: Radius Configuration

2.5 Licence

This page is for information only and displays the licence level installed on the platform. Licences may be updated with a licence file.

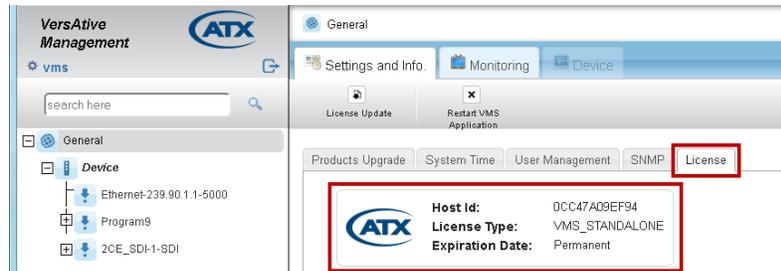


Figure 2-13: Licence Page

2.5.1 Licence Update

The licence on the machine may be updated from a file provided by ATX Networks and this needs to be obtained and stored on the management computer first.

Procedure

1. In the Tree View, click the **General** icon to select it, Figure 2-14.
2. Click **Licence Update** on the Tool Bar.

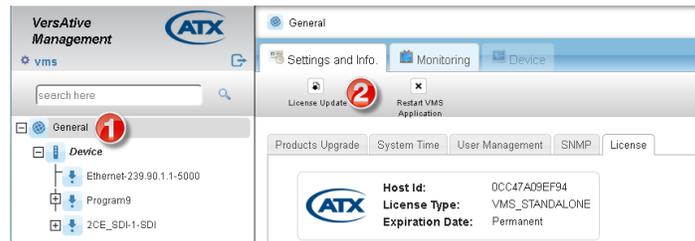


Figure 2-14: Licence Update

3. Click **Browse** to locate the file on the management computer, Figure 2-15.
 4. Select the file with the explorer window.
 5. Click **Open**.
 6. Click **Upload**.
- The licence file is uploaded and updated.

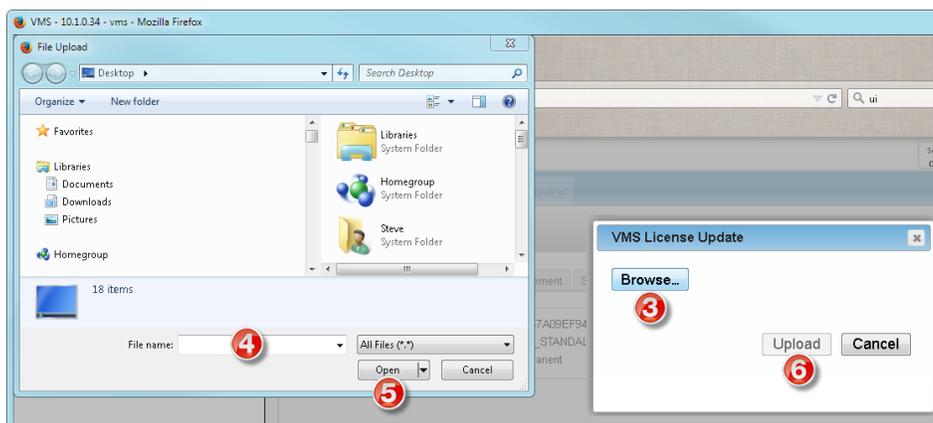


Figure 2-15: Upload Licence File

2.6 SNMP

The platform may be configured to sent SNMP traps to a remote SNMP manager. At this time, the Port is fixed at **162** which is the well known port for SNMP and community is **Public**.

2.6.1 Add SNMP Remote Manager

Multiple SNMP managers may be added to receive traps.

1. Click **General** Icon at top of Tree View to select it, Figure 2-16.
2. Click the **SNMP** tab.
3. Enter the **IP Address** of the remote SNMP manager.
4. Click **Add IP** button to add this IP address to the list.



Figure 2-16: Add SNMP Manager

5. Click **Save** to apply the changes.
 - Repeat to add more SNMP Managers.

2.6.2 Download and Compile the MIB

The MIB will need to be compiled to the SNMP Manager and it is stored locally on the Device hard drive. It may be obtained from the link on the SNMP tab.

1. Click **General** Icon at top of Tree View to select it, Figure 2-17.
2. Click the **SNMP** tab.
3. Click the link **Download MIBs**.
4. Open the downloaded zip file with any zip file client.
5. Extract the two .txt files and compile the files into the SNMP Manager.

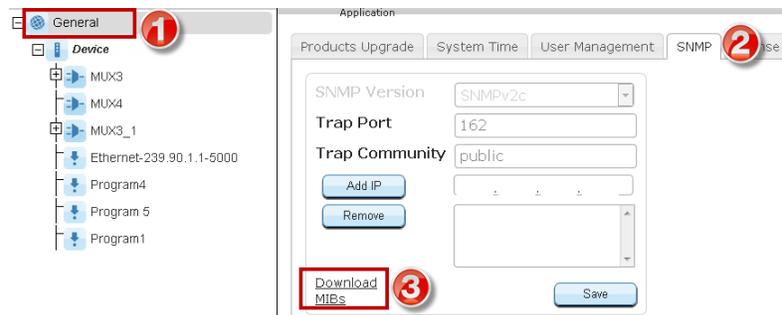


Figure 2-17: Download MIB

2.6.3 System Traps

The traps listed in Table 2.6a are sent by the system to the remote SNMP Managers.

Table 2.6a: System Traps

Trap Name	Description
vmsVersionSupportTrap	"Error: This trap appears when VMS version doesn't support the version of the VersActive "
vmsLicenseUpdateTrap	This trap can be an error or info. - Error trap appears when the license update fails. - Info trap appears when the license is updated successfully.
vmsLicenseExpirationTrap	"This trap can be an error or a warning. - Error trap appears when the license is expired. - Warning trap starts to appear 7 days before the VMS license expires. "
VMS DB Traps	
treeEditTrap	This trap can be an error, info or edit. This trap appears when the user edits the VMS tree
treeEnableTrap	"This trap appears when the user enables/disables the tree in the VMS. "
mysqlUnusedTablesDeletedTrap	"This trap appears when one of the unused tables was deleted from MySQL. "
userAddTrap	"This trap appears when a new user is added to VMS successfully. "
userDeleteTrap	"This trap appears when a user is deleted from VMS successfully. "
userUpdateTrap	"This trap appears when the user is updated in the VMS. Update can be in the user name, password or permissions. "
userLoginTrap	"This trap appears in two situations: When the user logs in to the VMS successfully or unsuccessfully. "
userLogoutTrap	"This trap appears when the user successfully logs out. "
VersActive Communication Traps	
versativeConnectTrap	"This trap appears when the VersActive connects successfully to the VMS. "
versativeTimeoutTrap	"This trap appears when there is no response from the VersActive. "
versativeTakenToOtherVmsTrap	"This trap appears when the VersActive is taken to another VMS. The VersActive becomes disabled on the current VMS. "
versativeTakenFromOtherVmsTrap	"This trap appears when the VersActive is taken from another VMS. The VersActive becomes disabled on the other VMS. "
VersActive General Traps	
versativeGeneralExternTrap	"This trap appears when a non-handled by VMS event received from VersActive. "
versativeGeneralErrorTrap	"ERROR - This trap appears when the VMS receives a 'General Error' event from the VersActive. "
versativeSwUpgradeTrap	"This trap appears when the Versative software is upgraded. This trap can be an error or info. The error indicates that the software upgrade failed. "
versativeSetConfigurationTrap	"This trap appears when the VersActive configuration is set successfully or unsuccessfully. This trap is only info. There are two messages: 'Configuration set Successfully' or 'Failed to Set Configuration' "
versativeVersionTrap	"This trap appears when the VMS performs sync with VersActive, and VersActive Version is Changed. This trap can be error or info. - Info: VersActive Version OK. - Error: VersActive Runs NOT Supported Version. "
versativeDuplicateHostidTrap	This trap appears when two VersActive machines has the same Host ID.
VersActive Streaming Traps	

Trap Name	Description
versativeFrameRateDropTrap	"Frame Rate dropped to more then 10% from configuration. "
versativeResourceStartTrap	"This trap appears when the Resource Starts playing. This trap can be either an Error or Info. - Error: says that the Resource failed to start and the reason for the failure. - Info: says that the resource is started. "
versativeResourceStopTrap	"This trap appears when the resource stops playing. This trap can be either an Error or Info. - Error: says that the resource failed to stop and the reason for it. - Info: says that the resource is stopped. "
versativeDeleteSessionErrorTrap	"This trap appears when the Versative fails to delete a session XML file. This trap can be only an Error. "
versativeTsAnalyzeErrorTrap	"This trap appears when the VersActive fails to analyze a transport stream. This trap can only be an error. "
versativePipelineEventTrap	"This trap appears when the VersActive has a problem with the pipeline and cannot start playing. This trap can only be an error. "
versativeMonitorSignalStateTrap	"This trap appears when the VersActive doesn't detect a video signal. This trap can only be an error. The message says that the VersActive can not detect a video signal. "
versativeMonitorConnectionErrorTrap	"This trap appears when the VersActive has no connection to publish point or VersActive cannot publish the stream. This trap can be only an Error. "
versativeMonitorResourceStatusTrap	"This trap appears when there is no input for the resource and the VersActive retries to connect. This trap can be a warning or info. - Warning: indicates the name of the resource and that the VersActive is retrying. - Info: indicates the name of the resource and that the streaming is OK. "
versativeResourceRedundancyStopTrap	"This trap appears when no redundancy for the resource is found. This trap can only be an error. The message indicates that the resource is stopped and that no backup for the resource is found. "
versativeResourceRedundancySwitchTrap	"This trap appears when the resource redundancy switched to backup. This trap can only be a warning. The message says that the Resource switched to the backup resource. "
versaFtiveNoSignalTrap	"This trap appears there is no signal at the input side - Only for encoding. "
versativeInternalDataFlowErrorTrap	"This trap appears when the VersActive has a problem with internal data flow. This trap can only be an Error. "
versativeFailToOpenAudioDeviceTrap	"This trap appears when audio device cannot be open - Only for encoding. "
versativeDataTimeoutTrap	"This trap appears when the Resource receive Input Data timeout. "
versativeStreamEndedTrap	"This trap appears when Stream is close due to an internal server error. "
versativeFailedToConnectToDrmSrvrTrap	"This trap appears when the VersActive fails to connect to the DRM server. "
versativeProgressReportTrap	"This trap is holding progress of offline transcoding. "
versativeVideoBitrateTrap	"This trap appears when the video bit rate changes in the monitor of the resource. "
versativeFramerateTrap	"This trap appears when the video frame rate changes in the monitor of the resource. "
versativeFrameDropTrap	"This trap appears when the video frame rate drops in the monitor of the resource. "
versativeAudioBitrateTrap	"This trap appears when the audio bit rate changes in the monitor of the resource. "
versativeConnectToPublishServerTrap	No Description available.
versativeSrcInputTimedOutTrap	"This trap appears when the source has a data timeout "
versativeMissingPtsDataTrap	"This trap appears when there is no PTS in PES header. "

Trap Name	Description
versativeRolloverTrap	"This trap appears when PTS of elementary streams overlaps. "
versativePtsDiscontinuityTrap	"This trap appears when the program time stamp is changed. this can happen when the transport stream changes. "
versativeCantRecordAudioFastEnoughTrap	"This trap appears when the VersActive can't record audio fast enough. "
versativeFailToStartRtmpServerTrap	"This trap appears when the VersActive fails to connect to the RTMP server. "
versativeOvfFifoSizeTrap	"This event appears when the SPTS MUX gets overflowed. "
versativeAc3AudioChangedTrap	"This trap appears when the AC3 audio changes. "
versativeDelayCalculationTrap	"This trap appears when the multiplexer loses sync. "
versativeAliveAfterEosTrap	"This trap appears when file transcoding is almost complete - Offline. "
versativeNoInputDataTrap	"This trap appears when no input data for the resource is detected. "
versativeExternalStopSignalReceivedTrap	"This trap appears when User initiates 'stop resource'. "
versativeEvtPsiMonitoringTrap	"This trap appears when there is a PSI change at the input. "
versativeEvtCcErrorTrap	"This trap appears when the resource has a continuity count error. "
versativeCapcardInputChangedTrap	"This trap appears when the capture card format changes. "
versativeMcEncValidationErrorTrap	This trap appears when there is an MPEG2 configuration error. This trap can only be an Error.
versativeClosingConnectionsTrap	"This trap appears when the VersActive closes all the streams. "
versativeFailedToPutFileTrap	This trap appears when an HLS or RTMP stream fails to publish.
versativeSignalDetectedTrap	"This trap appears when a signal for resource is detected. "
versativeReconnectTrap	"This trap appears when the VersActive reconnects successfully to RTMP server. "
versativePipeEvtNoUdpInput	"This trap appears when there is no UPD input for the pipeline. "
VersActive Hardware Traps	
versativeMonitorCpuHeatTrap	"This trap appears when the CPU heat nears it's maximum operation temperature. This trap can be an error or info. - Info message indicates that the CPU heat is at 70C degrees. - Error message indicates that the CPU heat is at 75C degrees. "
versativeMonitorCpuLoadTrap	"This trap appear when the CPU usage nears it's maximum capacity. This trap can be an error or info. - Info message indicates that the CPU usage is at 75 percent. - Error message indicates that the CPU usage is at 85 percent. "
versativeMonitorMemoryUsageTrap	"This trap appears when the memory usage nears it's maximum capacity. This trap can be an error or info. - Info message indicates that the memory usage is at 85 percent. - Error message indicates that the memory usage is at 92 percent. "
versativeMonitorEthLimitTrap	"This trap appears when the Ethernet card nears it's maximum capacity. This trap can be an error or info. - Info message indicates that the Ethernet card is at 80 percent of it's capacity. - Error message indicates that the Ethernet card is at 90 percent of it's capacity. "
versativeMonitorDemodStatusTrap	This trap shows the status of the demod card (enabled/disabled or locked/not locked). This trap can be an error or info. - Error message indicates that the demod card is not locked. - Info message indicates that the demod card is locked, enabled or disabled.

Trap Name	Description
VersActive MPTS MUX and MQAM Traps	
versativeMuxStartTrap	"This trap appears when the mux is started. This trap can be an error or info. - Error message indicates that the mux didn't start. - Info message indicates that the mux started successfully. "
versativeMuxStopTrap	"This trap appears when the mux is stopped. This trap can be an error or info. Error message indicates that the mux didn't stop. Info message indicates that the mux stopped successfully. "
versativeMuxMonitorTrap	"This trap appears when the mux monitor sends a trap. This trap can be an error or info. - Error message indicates that multiplexer monitor received time-out. - Info message indicates that the mux monitoring is OK. "
versativeMuxStillNoTsTrap	"Not Used. "
versativeMuxEventLostTsTrap	"This trap appears when the input transport stream for the mux is lost. "
versativeMuxEventBitrateMismatchTrap	"This trap appears when the output bit rate is less than the sum of input bit rates. This trap can only be an Error. "
versativeMqamSyncErrorTrap	"This trap appears when MQAM receives an error. This trap can only be Error. "

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DEVICE CONFIGURATION

3. Device Configuration

Device Configuration centers on setting up the input and output interfaces of the hardware platform.

3.1 Chapter Contents

- “Basic Information”
- “Ethernet Network Settings”
- “Capture/Demod Cards”
- “Licence Information”
- “QAM Output Devices”

3.2 Basic Information

This tab specifies the actual hardware model such as VersActivePro, DigiVu II or DigiVu II Micro. This model number/name is shown on the Basic Info tab, Figure 3-1.

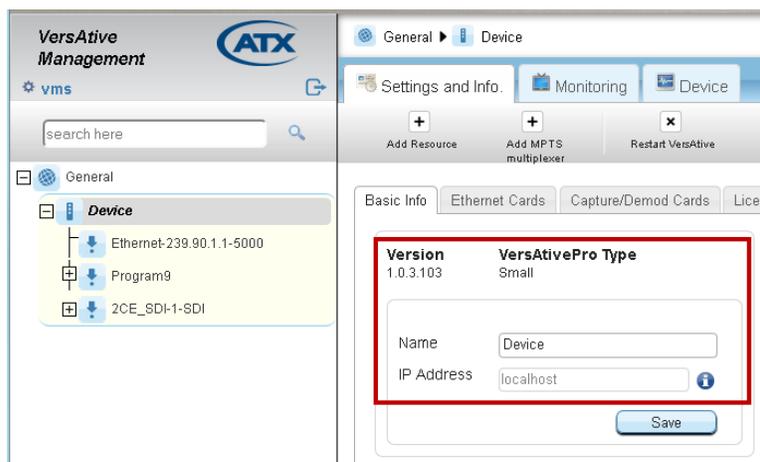


Figure 3-1: Basic Info Page

3.3 Ethernet Network Settings

The Management Port IP address and Streaming Port addresses are defined on the Ethernet Cards tab. There may be more or less Ethernet ports depending on the model and there may even be Virtual ports if a VLAN has previously been defined.



NOTE Changes to the Management Port address will result in a platform reboot. You will need to login on the new IP address.

Change an ETH Port Address

1. Click on the **Device** icon to select it, Figure 3-2.
2. Select **Settings and Info** tab.
3. Select **Ethernet Cards** tab.
4. Select the **Pencil Icon** for the ETH port to be changed.
5. Edit settings as required.
6. Click **Save** to apply the changes.

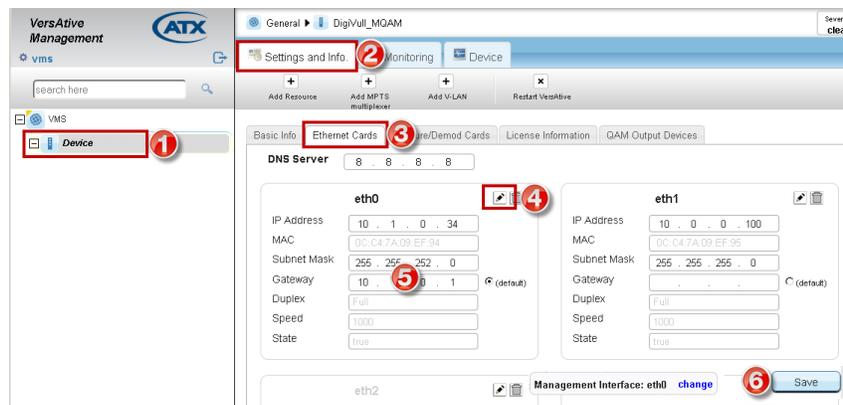


Figure 3-2: Configure Network Settings

3.3.1 Create a VLAN



NOTE For more about management network VLANs, see [“VLAN TAGGING”](#) on page 12-1.

3.3.2 Change the Default Management Port ETH0

The Management Port may be set to a different physical port than the default ETH0. It may also be set to a VLAN port that has previously been defined. The current management port is shown at the bottom of the Settings and Info tab, Figure 3-3.

Change the Management Port Assignment

1. Click on the **Device** icon to select it, Figure 3-3.
2. Select **Settings and Info** tab.
3. Select **Ethernet Cards** tab.
4. Click Management Interface: eth0 **change** link.



Figure 3-3: Configure Management Port

5. In the dialog that opens, select the physical or VLAN port, Figure 3-4.

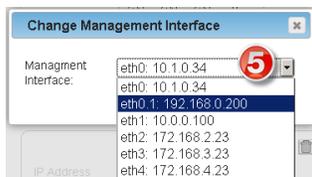


Figure 3-4: Select Port

6. Click **Set** to select the chosen interface, Figure 3-5.



Figure 3-5: Click Set

7. Click **Save** to apply the changes and return to the GUI, Figure 3-6.



Figure 3-6: Click Save

3.3.3 Configure a DNS Server

A DNS server will be required only if a Publish URL (HLS or Flash) is entered on the platform needing to be resolved.

Set DNS Server

1. Click on the **Device** icon to select it, Figure 3-7.
2. Select **Settings and Info** tab.
3. Select **Ethernet Cards** tab.
4. Enter the **IP Address** of the DNS server.
5. Click **Save**.

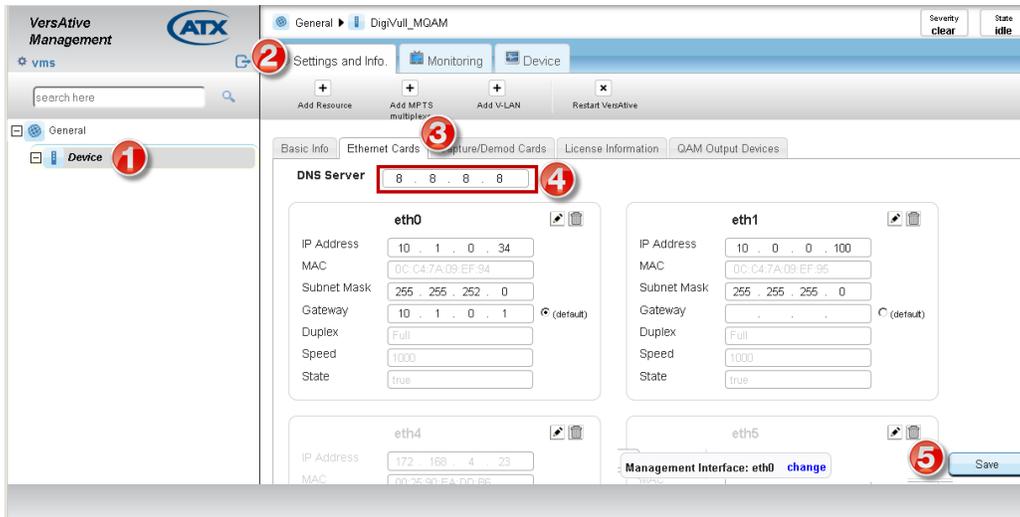


Figure 3-7: Configure DNS Server

3.4 Capture/Demod Cards

View installed Demodulator and Capture cards in platform.

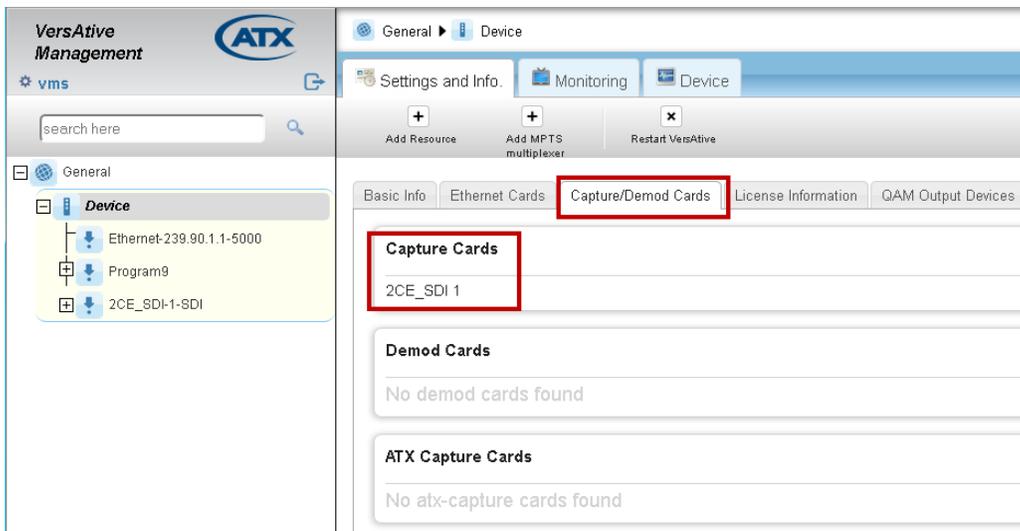


Figure 3-8: Platform Interface Cards

3.5 Licence Information

This tab displays installed encoding licences.

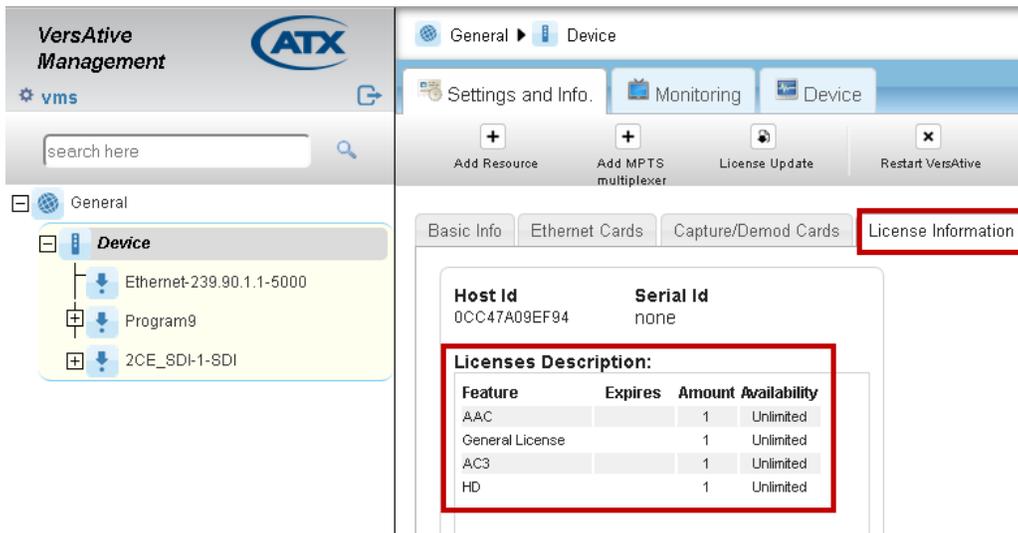


Figure 3-9: Platform Encoding Licences

3.6 QAM Output Devices

This page allows configuration of QAM modulator for QAM output models.



Note: Full configuration information is provide in chapter “QAM Multiplexer” on page 8-1.

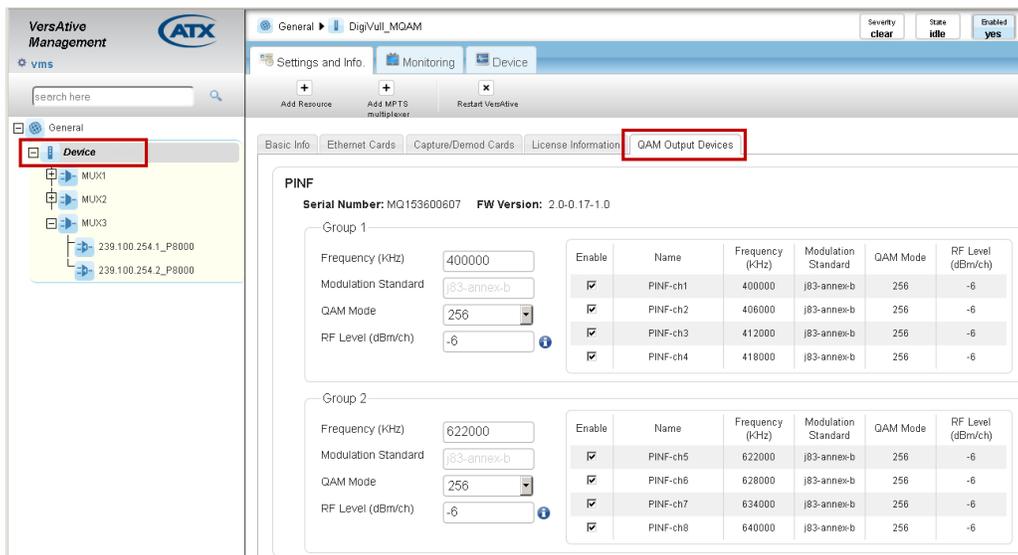


Figure 3-10: QAM Output Configuration Page

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ENCODING APPLICATION

4. Encoding Application

This chapter describes setting up a Source Capture Card to ingest and encode live Analog or SDI video and/or audio for SPTS and Adaptive encoding applications.

4.1 Chapter Contents

- “Capture Card Resources”
- “SPTS Encoding Application”
- “Adaptive Encoding Application”
- “Start the Encoding Process”

4.2 Capture Card Resources

A Capture Card Resource is an input to the platform which exists on one of the physical analog card interfaces as analog or SDI content. These resources are used as source content for subsequent encoding.

4.2.1 Capture Card Audio Options

This section outlines multi-channel mapping options. For content derived from baseband input cards such as HD-SDI and SD-SDI, embedded audio programs are handled differently depending on the audio port selected when creating a resource so it is important to make the correct selection since this cannot be changed afterward. If an incorrect selection is made, delete the resource and re-create it. See the following tables for audio channel processing for each audio port selection.



Note: Currently, in this firmware release, the 16 embedded channels cannot be fully utilized for either of the 16 channel selections. It is recommended that only the 8 channel selections be used for either Dolby Digital 5.1 encoding or for multi-language support.



Note: Currently, in this firmware release, for ‘Embedded 8 ch’ selection (not ‘Embedded ML 8ch’), embedded channels 7 and 8 cannot be utilized even if they appear on the input program. For the ‘Embedded 8ch’ selection, it is assumed that the input conforms to the industry recognized standard channel plan shown in *Table 4.2c* for Dolby Digital 5.1 encoding.

Table 4.2a: Capture Card Audio Port Selection Options

Selection	Audio Channels	Description
Embedded 2ch	2 (single Stereo)	Used to ingest audio that is a single stereo program. With this selection, there is support for 1 output PID.
Embedded 8ch	6 (single Dolby 5.1)	Used to ingest audio that is a Dolby Digital 5.1 source program with channels arranged in the industry standard form shown in Table 4.2c. With this selection, encoder supports 1 output PID which may be configured in Video & Audio Stream Session/Encoding Session/Advanced, as shown in Figure 1-26. Only the first 6 embedded channels may be used.
Embedded ML 8ch	8 (up to 4 stereo Multi-language)	Used to ingest up to 8 audio channels consisting of up to 4 multi-language stereo programs arranged in pairs; 1+2, 3+4, 5+6, 6+8 and as shown in Table 4.2b. With this selection there is support for up to 4 output PIDs which may be configured. Leave blank any PIDs not required.
Embedded 16ch	8 (single Dolby 5.1)	Same as ‘Embedded 8ch’ but 16 channels.
Embedded ML 16ch	8 (up to 4 stereo Multi-language)	Same as ‘Embedded ML 8ch’ but 16 channels.

Table 4.2b: Multi-language Channels Example

Embedded Channel	Channel Content	PIDs Available
Ch 1	English Left	Audio PID #1
Ch 2	English Right	
Ch 3	French Left	Audio PID #2
Ch 4	French Right	
Ch 5	Spanish Left	Audio PID #3
Ch 6	Spanish Right	
Ch 7	Descriptive Audio Left	Audio PID #4
Ch 8	Descriptive Audio Right	

Table 4.2c: Dolby Digital 5.1 Embedded Channels

Embedded Channel	Channel Content	Abbreviation	PID Available
Ch 1	Front Left	FL	Audio PID #1
Ch 2	Front Right	FR	
Ch 3	Front Center	FC	
Ch 4	Low Frequency Effects	LFE	
Ch 5	Surround Left	SL	
Ch 6	Surround Right	SR	
Ch 7			Not currently available for use.
Ch 8			

Table 4.2d: Embedded Channel Name Abbreviations

Abbreviation	Channel Content
Dis	Discard
FM	Front Mono
FL	Front Left
FR	Front Right
RC	Rear Center
RL	Rear Left
RR	Rear Right
LFE	Low Frequency Effects
FC	Front Center
FLC	Front Left Center
FRC	Front Right Center
SR	Surround Right
SL	Surround Left

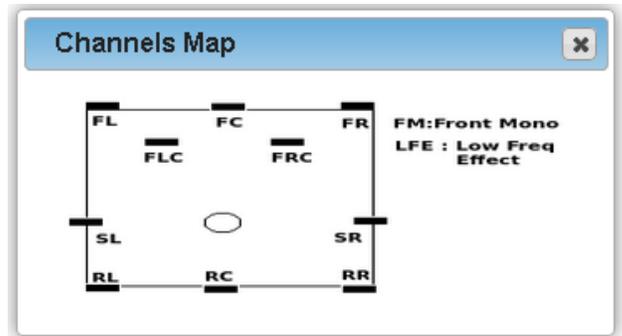


Figure 1-1: Audio Channels Map

4.2.2 Create a Capture Card Resource

A Capture Card Resource is an input ingested to the Device platform using analog or digital capture cards.

1. Click on the **Device** in the Tree View to select it, Figure 1-2.
- Shown as **Device** here, this is a generic label but may also be VersActivePro, DigiVu II or DigiVu II Micro to match the actual physical unit or it may be a name you have assigned to this Device.
2. Select the **Capture Source** tab.
3. Click **Add Resource** on the Tool Bar (or Right Click menu).

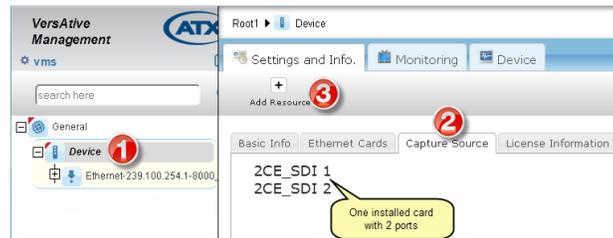


Figure 1-2: Add Capture Resource

4. Select **Capture** from the **Type** drop down choices, Figure 1-3.
5. Select **Card** Input Port from available choices depending on the installed cards (multi-input cards only).

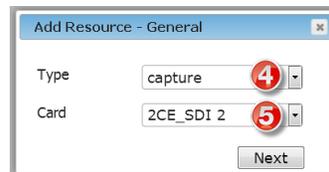


Figure 1-3: Select Capture Resource

6. Give the Resource a meaningful Name, select the Video Format for the incoming video stream (must match what it actually is, not what it will be on the output as that will be set later), Figure 1-5.
7. To customize the output audio channel lineup, select one of the options in the **Audio Input** drop down menu (Figure 1-6) then either select Customize or a known profile from the Audio Input Profile menu (Figure 1-7). In this example we select Customize to show the channel mapping procedure.
- Only in the case of selecting **Embedded 2ch** (Stereo) as the input, there is an option to specify the language descriptor; select the Audio Language from the drop down menu, Figure 1-5.

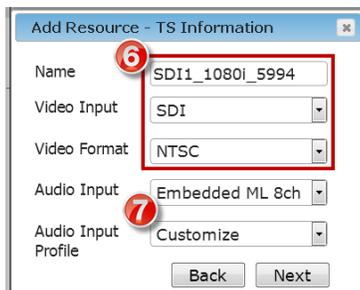


Figure 1-4: Refine Resource Properties

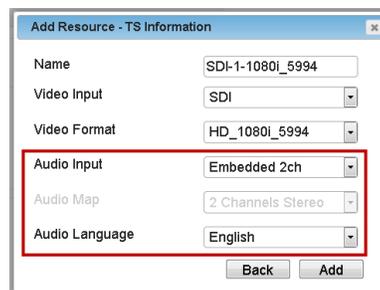


Figure 1-5: Stereo Audio Language



Figure 1-6: Audio Input Options

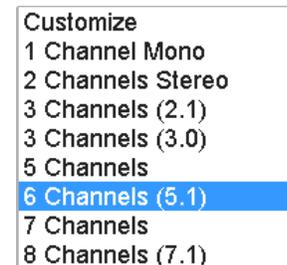


Figure 1-7: Audio Input Profile

8. In the audio Channel Mapping window that opens, Figure 1-8, select **New** once to create an audio channel which will be assigned to a PID. Select **New** multiple times to create the desired number of audio channels, each of which will be assigned a unique PID.
9. Individual output Audio Channels are created (six shown in this example but could be more or less).
10. Customize each channel lineup with the tick boxes and drop down menus. Ticking means the incoming channel across the top is mapped to the corresponding output, left side.
- For help with channel mapping, click the Channels Map button, (see it's position in Figure 1-8) for a display of the channel abbreviations, Figure 1-1.
11. When finished click **Save** to create the Resource with customized audio channels, Figure 1-8.

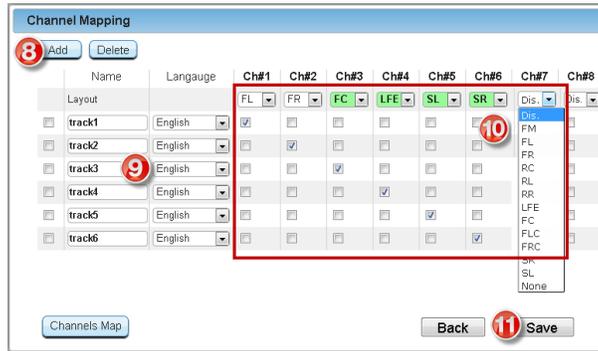


Figure 1-8: Customize Audio Channel Mapping

12. The **Capture Card Resource** is added to the Tree View, Figure 1-9.
13. With the **Capture Card Resource** selected in the previous step, **Properties** are displayed in adjacent window.
14. The 'Preview ON' tick box is selected by default. Untick the box to disable Preview for this resource only and click **Save** if a change was made.
- The Preview function requires a small amount of Device CPU cycles. If the Device is running close to 100% CPU utilization as witnessed by the Device Monitoring page, see "11.2 Monitoring the Device" on page 11-1, disabling preview can help with that condition. Each Resource Preview function must be disabled individually so click each active resource in the Tree View to access this control.
15. Audio Channel Mapping is displayed if it was customized.

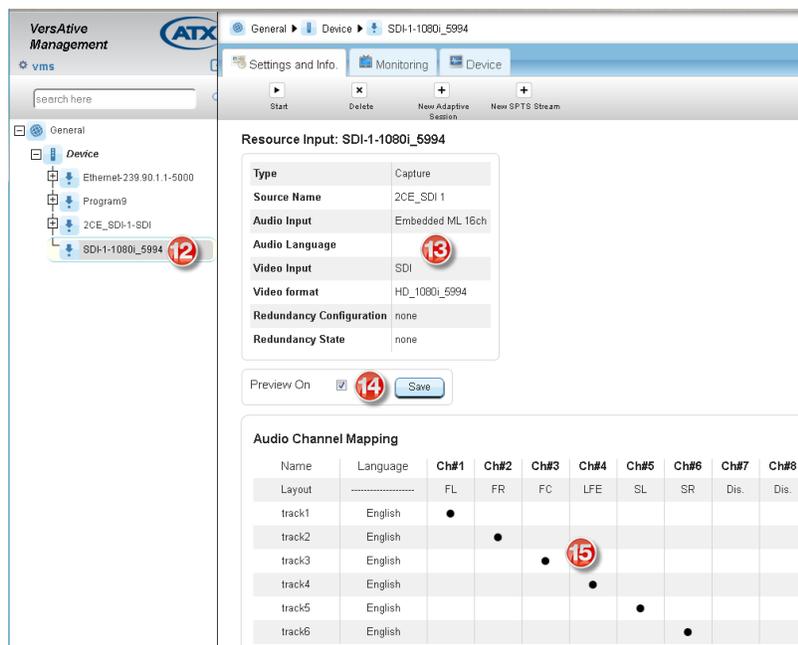


Figure 1-9: Capture Resource Added to Tree View

4.3 SPTS Encoding Application

4.3.1 Create an SPTS Stream

Multiple SPTS Streams with different parameters may be created for the Resource by repeating these following steps.

1. Click to select the previously created **Resource** in the Tree View, Figure 1-10.
2. Select **New SPTS Stream** on the Tool Bar (or Right Click menu).

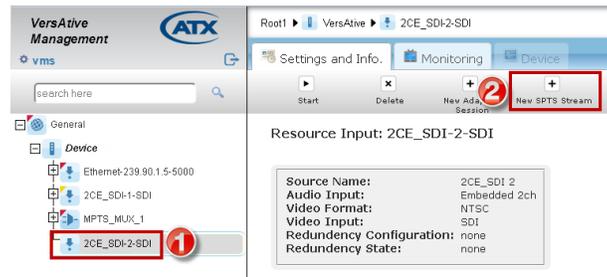


Figure 1-10: Add New SPTS Stream

3. On the page that opens, Figure 1-11, give the stream a meaningful Name such as the service name.
4. Edit **Video, Audio & Video Pre-processing Parameters**. For details, see “[Session Settings](#)” on page 6-1.

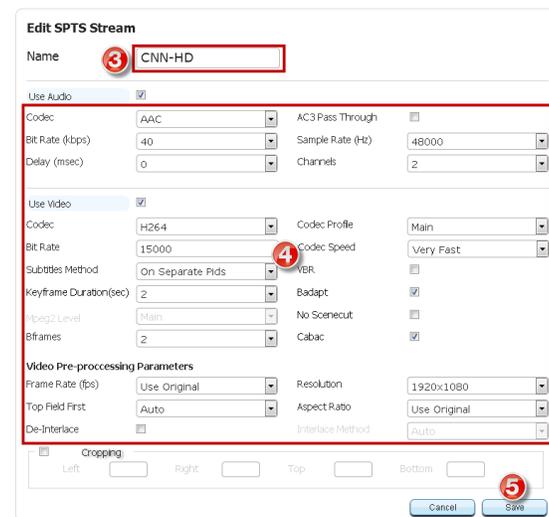


Figure 1-11: Refine SPTS Stream Settings

5. Click **Save** to apply the changes and add the session to the Tree View, Figure 1-16 (1).

4.3.2 Publishing an SPTS Stream

A Publish defines the Output IP Address of the SPTS Stream. Multiple Publish Points may be created for any Stream.

1. Select a previously created **SPTS Stream** by clicking it in Tree View, Figure 1-12.
2. Select **New Publish** on the Tool Bar.

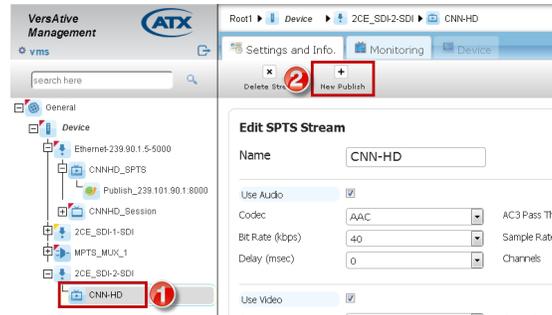


Figure 1-12: Add New Publish to SPTS Stream

3. Give the Publish a meaningful **Name** such as the IP Address, Figure 1-13.
4. Define the **Connection** with IP address and port number then choose physical output Ethernet **Interface**(Choices available will differ between models and could include VLANs if previously created).
5. Tick the **Multicast** box if a multicast IP address was entered(default is unticked - unicast).

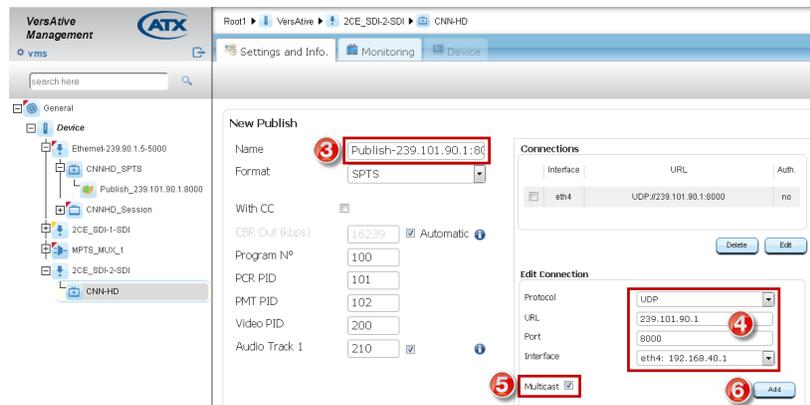


Figure 1-13: Refine Publish Properties

6. Click **Add** to create and add the connection to the Tree View.
7. Connection is created, Figure 1-14, and may be edited by selecting the adjacent tick box then click **Edit**.



Figure 1-14: Connection Created

8. After the Connection is created or edited, click **Save** to apply the changes, Figure 1-15.
9. The **Publish** is added to the SPTS Stream and displayed in Tree View.

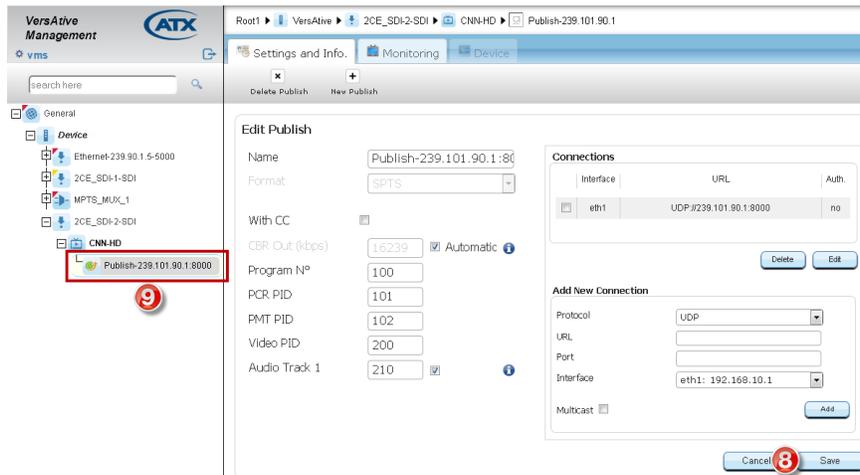


Figure 1-15: Publish Added to SPTS Stream

4.4 Adaptive Encoding Application

4.4.1 Create Adaptive Sessions

An Adaptive Session defines the Codec and Encoding parameters of the encoding. Multiple Adaptive Sessions with differing resolutions and bitrate may be created.

1. Highlight the **Resource** that will have a new Adaptive Session, Figure 1-16.
2. Click **New Adaptive Session** on the Tool Bar.

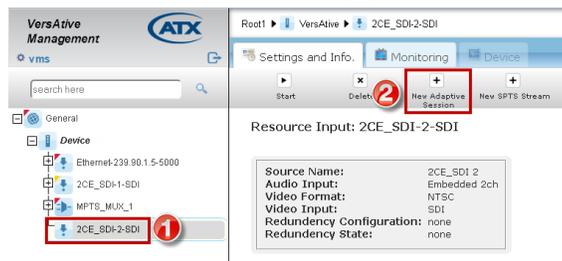


Figure 1-16: Create Adaptive Session

3. Give the session a **Name** and refine parameters such as choice of **Codec**, Figure 1-17.

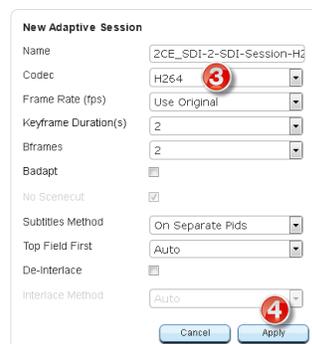


Figure 1-17: Refine Adaptive Session Parameters

4. Click **Apply** to save and add the session.
5. The Session is added to the Tree View, Figure 1-18. More **Adaptive Sessions** may be added in the same way.
6. Sessions may be edited; just click to select the Session in Tree View then make changes and click **Save**.

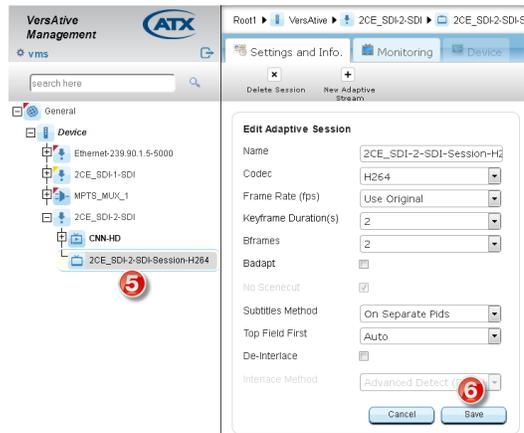


Figure 1-18: Adaptive Session Created

4.4.2 Create Adaptive Streams

An Adaptive Stream defines the output Resolution and Bit Rate of the Adaptive Session.

1. Click to select the **Adaptive Session** that will have the stream added, Figure 1-19.
2. Click **New Adaptive Stream** on the Tool Bar.

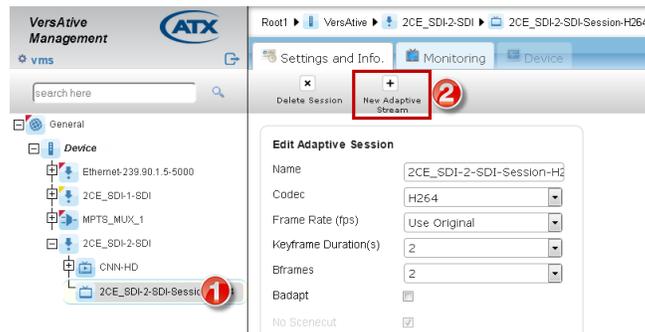


Figure 1-19: Add Adaptive Stream

3. Give the Stream a meaningful name such as the Output Resolution size, Figure 1-20.
4. Refine the **Audio and Video Codec** parameters.
5. Select the **Resolution and Aspect Ratio**.
6. Click **Apply** to save the changes and create the stream.

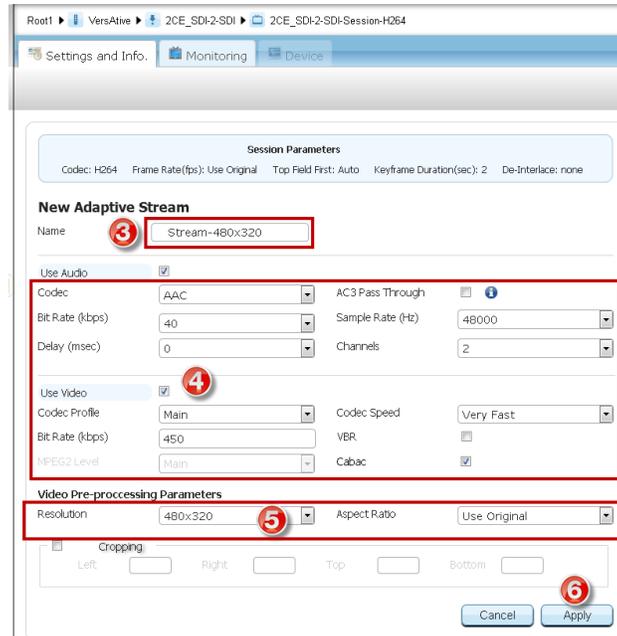


Figure 1-20: Refine Adaptive Stream Parameters

7. The Adaptive Stream is added to the Session and is displayed on the Tree View, Figure 1-21.
8. The Adaptive Stream is also displayed on the Path Bar when the Stream is selected.

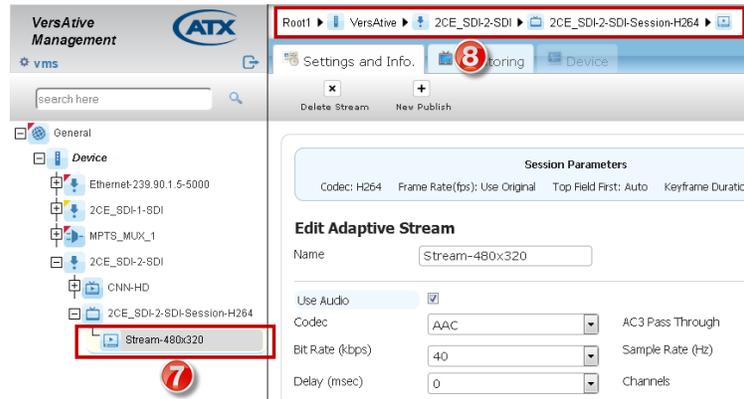


Figure 1-21: Adaptive Stream is Added to Session

4.4.3 Publishing an Adaptive Stream

A Publish defines the Output IP Address and Format as well as providing any authentication of the Adaptive Stream.

1. Select the **Adaptive Session** by clicking it in Tree View, Figure 1-22.
2. Click **New Publish** on the Tool Bar.

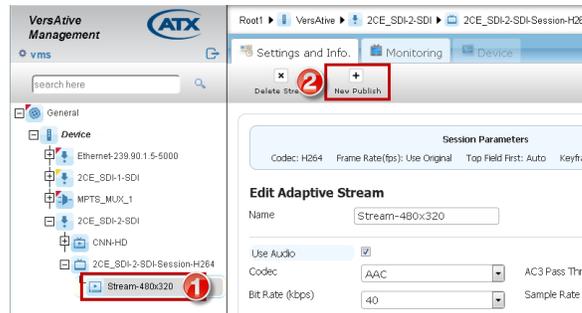


Figure 1-22: Add New Publish

3. Give the **Publish** point a meaningful **Name** such as the Format & IP Address, Figure 1-23.
4. Select the Publish point **Format** from the dropdown menu choices (SPTS, HLS & Flash).

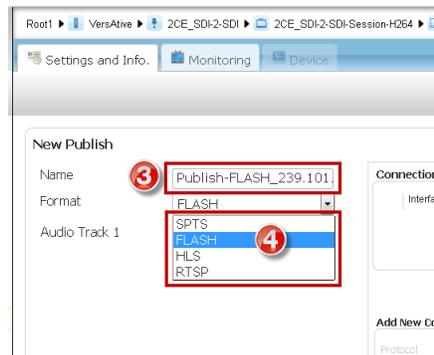


Figure 1-23: Select Publish Format

5. Enter the **Connection URL** address, Figure 1-24.
6. Chose the physical output **Interface** from the dropdown menu (Ports available may differ between models and could include VLANs if previously configured).
7. Click **Add** to create the connection. Multiple connections may be added.
8. The **Connection** is created and may be further edited by selecting the adjacent tick box and click **Edit**.

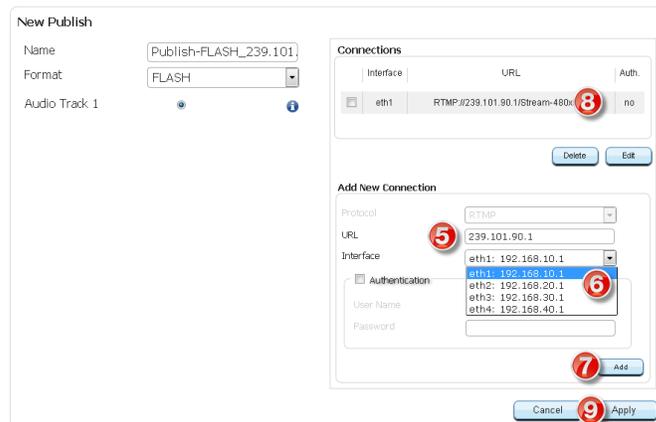


Figure 1-24: Refine Publish Parameters

9. Click **Apply** to save the changes and add the Publish to the Adaptive Stream.
10. The Publish is **Added** and is displayed on the Tree View, Figure 1-25.
11. The Publish is also displayed on the **Path Bar** when the selected in **Tree View**.

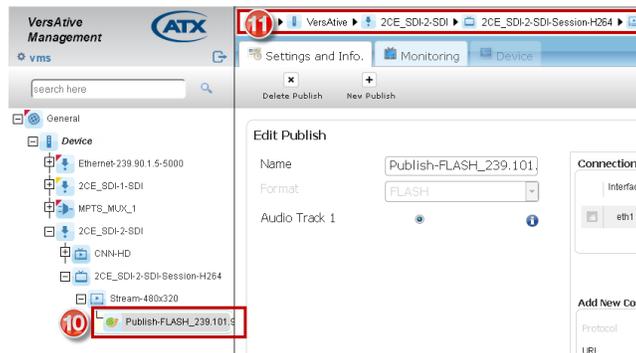


Figure 1-25: Publish is Added to Adaptive Stream

4.5 Start the Encoding Process

The Streaming process is started from the Resource icon and each Resource is started individually.

1. Click to select the **Resource** to be started In the Tree View, Figure 1-26.
2. Click the **Start** button on the Tool Bar (or Right Click menu).
3. The Streaming starts and is indicated on the Tree View by small triangles in the lower right corner of all streaming Element Icons, Figure 1-27.

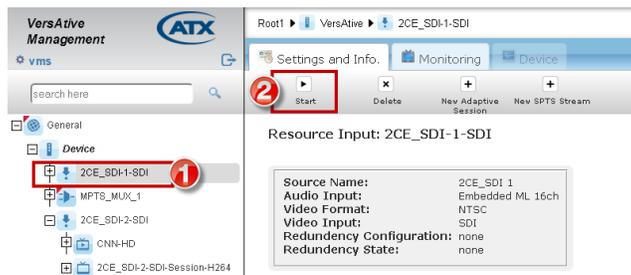


Figure 1-26: Start the Streaming Process

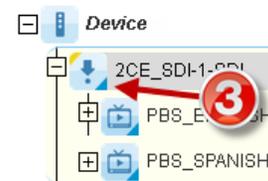


Figure 1-27: Streaming Started

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TRANSCODING APPLICATION

5. Transcoding Application

This chapter describes how to set up an IP stream from an Ethernet port for Transcoding an SPTS stream.

5.1 Chapter Contents

- “Ethernet Resources”
- “SPTS Transcoding”
- “Adaptive Transcoding”
- “Start the Stream”

5.2 Ethernet Resources

An Ethernet Resource is an input to the platform which exists on one of the Ethernet interfaces as an IP stream. These resources are used as source content for subsequent transcoding.

5.2.1 Create an Ethernet Resource

1. Click on the **Device** icon, Figure 1-1.
2. Click **Add Resource** on the tool bar (or Right Click menu).

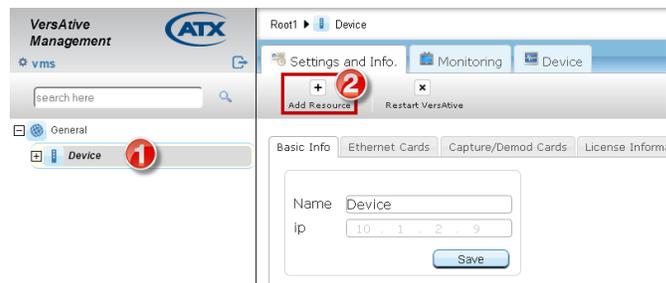


Figure 1-1: Add New IP Resource to Device

3. In the window that opens, select **Ethernet** from the **Type** drop down choices, Figure 1-2,
4. Choose the physical rear panel Ethernet port that the stream appears on from the **Card** choices, eth1, eth2, eth3 or eth4. (Depending on the model ordered, there may be more or less Ethernet port choices).
5. Enter the **IP address**, **Port** and **Protocol** of the IP stream to be ingested, Figure 1-3.
6. Tick the **Multicast** box if this is a multicast stream with an address in the multicast range.
7. If the Stream is a Source Specific Multicast (SSM), enter the Source IP Address.
8. Click **Analyze**.

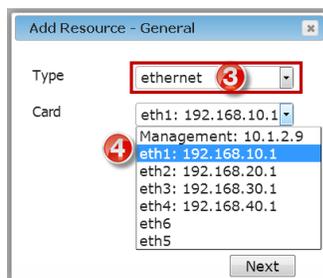


Figure 1-2: Select Input and Output Ports

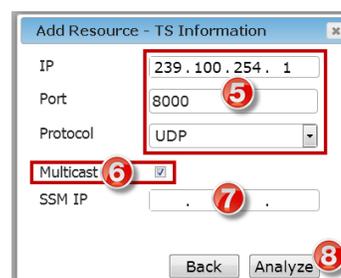


Figure 1-3: Enter Input IP Address and Port

- The streams that are read from the PMT table on that stream will be displayed, Figure 1-4.
9. Click to select the **Program**, Figure 1-4 (also Figure 1-5).
 10. Then, **Drag and Drop** the program onto the **Resource**, releasing when the green check mark appears.

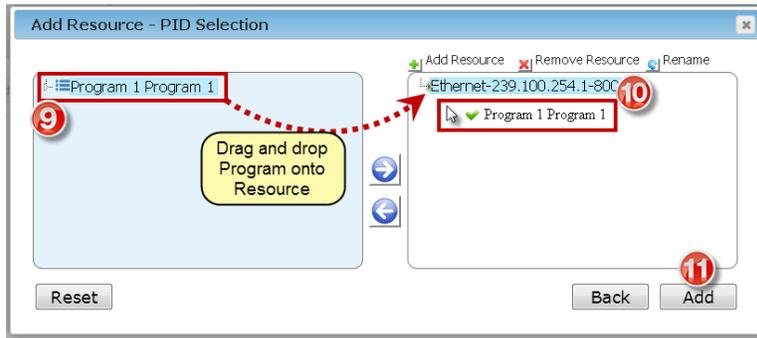


Figure 1-4: Drag & Drop Program to Resource

- Arrow controls may also be used to move programs both ways, Figure 1-5.
11. Click **Add** to add this stream and create the Resource.

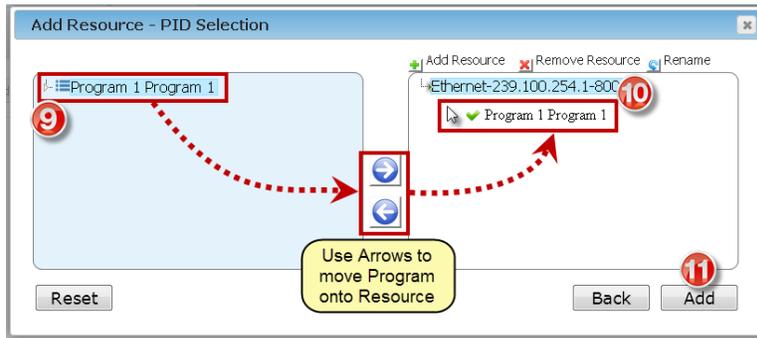


Figure 1-5: Arrow Controls Move Program to Resource

12. The Program is added to the Resource and are shown in the Tree View under the Device with the included SPTS Incoming stream PIDs detailed in the adjacent Pane View, Figure 1-6.

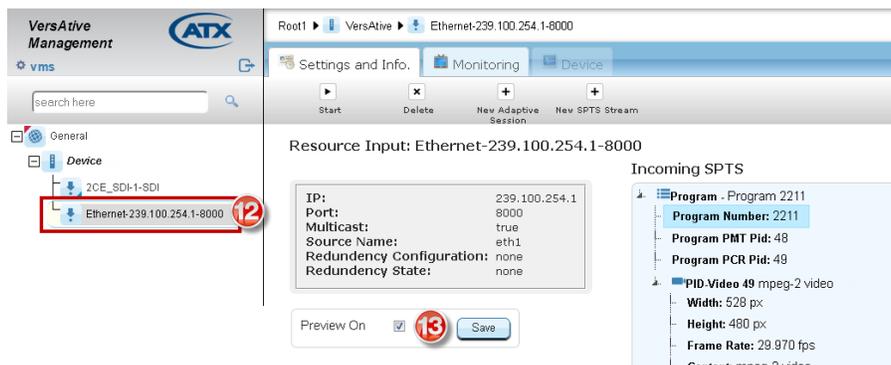


Figure 1-6: Resource Added to Tree View

13. The 'Preview ON' tick box is selected by default. Untick the box to disable Preview for this resource only and click **Save** if a change was made.
- The Preview function requires a small amount of Device CPU cycles. If the Device is running close to 100% CPU utilization as witnessed by the Device Monitoring page, see [“11.2 Monitoring the Device” on page 11-1](#), disabling preview can help with that condition. Each Resource Preview function must be disabled individually so click each active resource in the Tree View to access this control.

5.3 SPTS Transcoding

Any number of SPTS Streams may be created for any Ethernet resource. The Ethernet Resource must be created first.

5.3.1 Create an SPTS Stream

Multiple Streams with different parameters may be created for the Ethernet Resource by repeating these steps.

1. Click to select the Ethernet **Resource** icon in the Tree View, Figure 1-7.
2. Select **New SPTS Stream** on the Tool Bar.

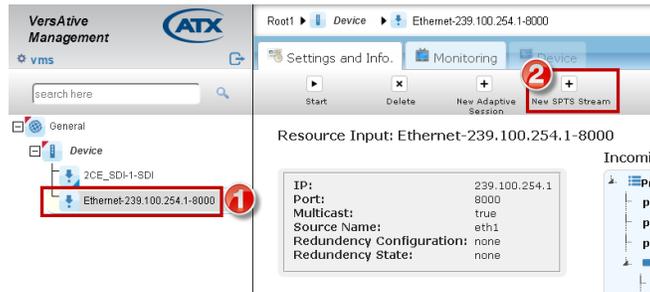


Figure 1-7: Add New SPTS Stream

3. On the new page that opens, Figure 1-8, give the stream a meaningful Name such as the service name.
4. Edit **Video, Audio & Video Pre-processing Parameters** as required. For details, see “[Session Settings](#)” on page 6-1.

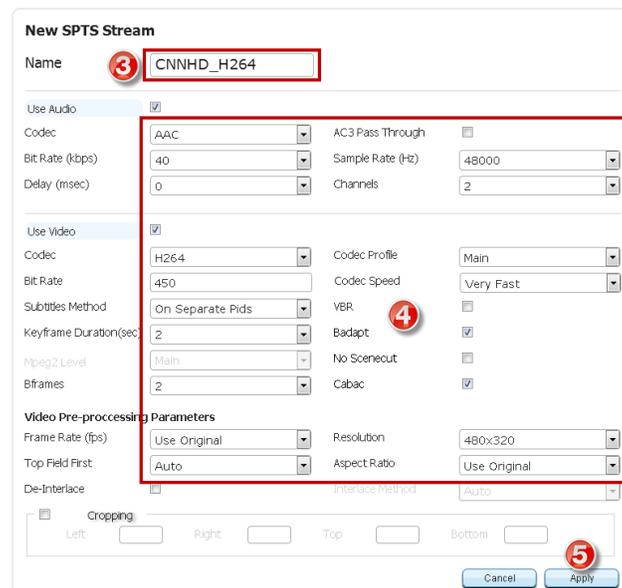


Figure 1-8: Refine SPTS Stream Settings

5. Click **Apply** to save and add the session to the Tree View, Figure 1-9 (1).

5.3.2 Publishing an SPTS Stream

A Publish defines the Output IP Address of the SPTS Stream. Any Stream may have any number of Publishes added by repeating these step for each.

1. Select the **SPTS Stream** by clicking it, Figure 1-9.
2. Select **New Publish** on the Tool Bar.

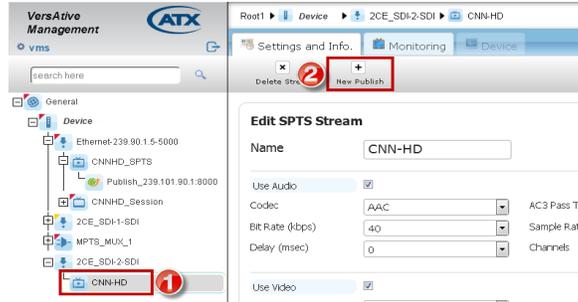


Figure 1-9: New SPTS Publish

3. Give the Publish point a meaningful **Name** such as the IP Address and the type of publish, Figure 1-10.
4. Define the **Connection** with IP address and port number then choose the physical Output Ethernet **Interface** (Ports available may differ between models and could include VLANs if previously configured).
5. Tick the **Multicast** box if this is a multicast IP address(default is unticked - unicast).
6. Click **Add** to create and add the connection to the Tree View.

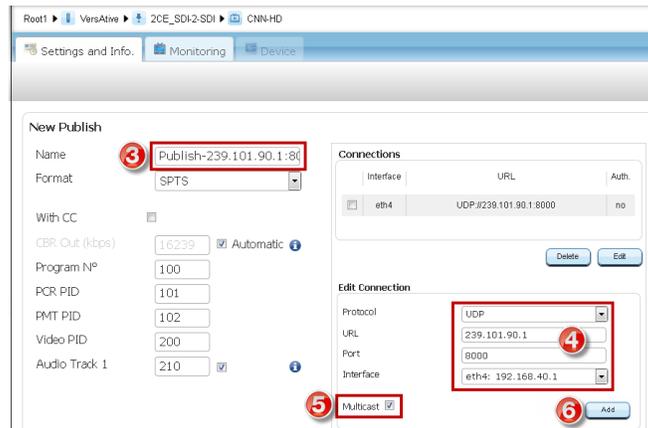


Figure 1-10: Refine Publish Properties

7. Connection is created, Figure 1-11.
 - Connection may be edited by selecting the adjacent tick box then click **Edit**.



Figure 1-11: Connection Created

8. After the Connection is created or edited, click **Save** to apply the changes, Figure 1-12.
9. The **Publish** is added to the SPTS Stream and displayed in Tree View.

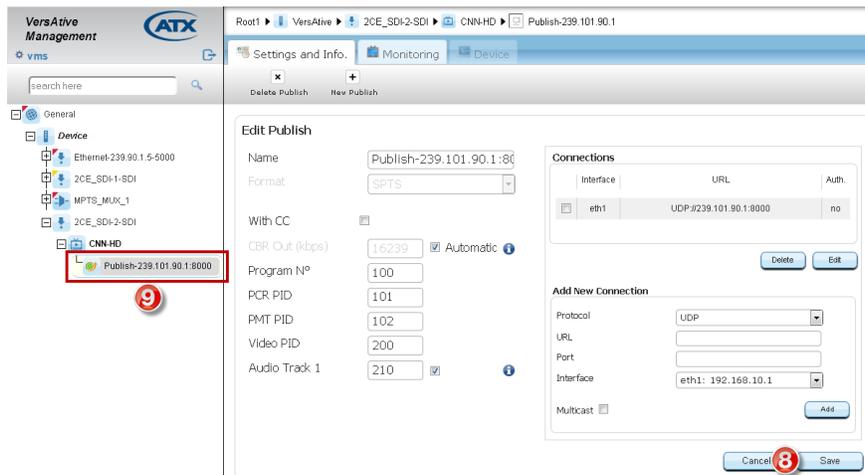


Figure 1-12: Publish is Added to SPTS Stream

5.4 Adaptive Transcoding

5.4.1 Create Adaptive Sessions

An Adaptive Session defines the Codec and transcoding parameters. Multiple Adaptive Sessions with differing resolutions and bitrate may be created.

1. Highlight the **Resource** that will have a new Adaptive Session, Figure 1-13.
2. Click **New Adaptive Session** on the Tool Bar.

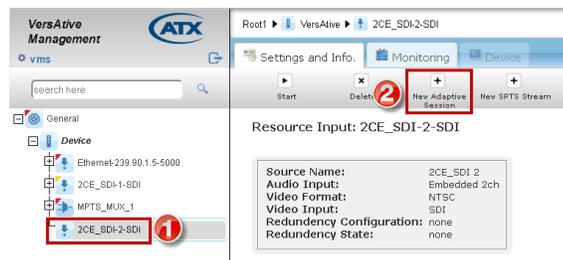


Figure 1-13: Create Adaptive Session

3. Give the session a **Name** and refine parameters such as choice of **Codec**, Figure 1-14.
4. Click **Apply** to save and add the session.

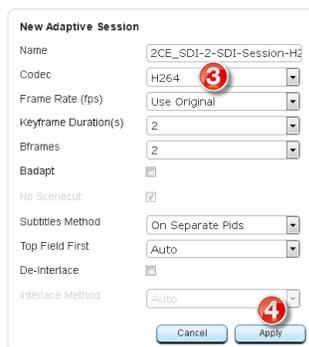


Figure 1-14: Refine Adaptive Session Parameters

5. The Session is added to the Tree View, Figure 1-15. More **Adaptive Sessions** may be added in the same way.
6. Sessions may be edited; just click to select the Session in Tree View then make changes and click **Save**.

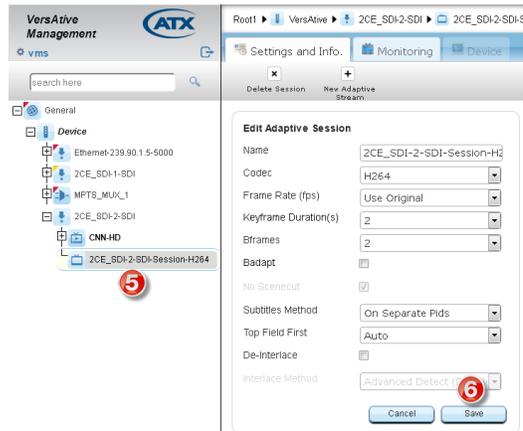


Figure 1-15: Adaptive Session Created

5.4.2 Create Adaptive Streams

An Adaptive Stream defines the output Resolution and Bit Rate of the Adaptive Session.

1. Click to select the **Adaptive Session** that will have the stream added, Figure 1-16.
2. Click **New Adaptive Stream** on the Tool Bar.

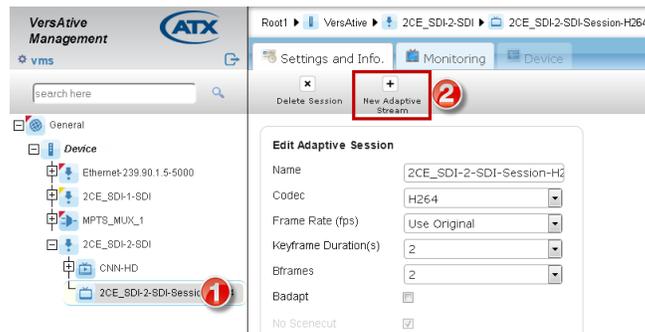


Figure 1-16: Add Adaptive Stream

3. Give the Stream a meaningful name such as the Output Resolution size, Figure 1-17.
4. Refine the **Audio and Video Codec** parameters.
5. Select the **Resolution and Aspect Ratio**.
6. Click **Apply** to save the changes and create the stream.

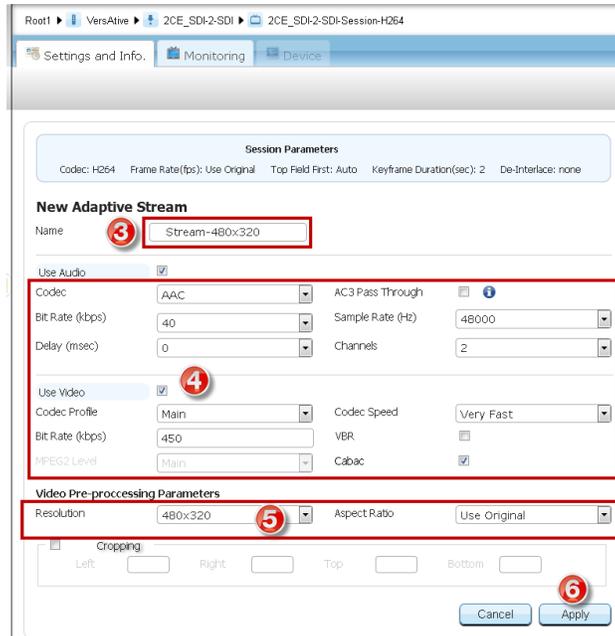


Figure 1-17: Refine Adaptive Stream Parameters

7. The Adaptive Stream is added to the Session and is displayed on the Tree View, Figure 1-18.
8. The Adaptive Stream is also displayed on the Path Bar when the Stream is selected.

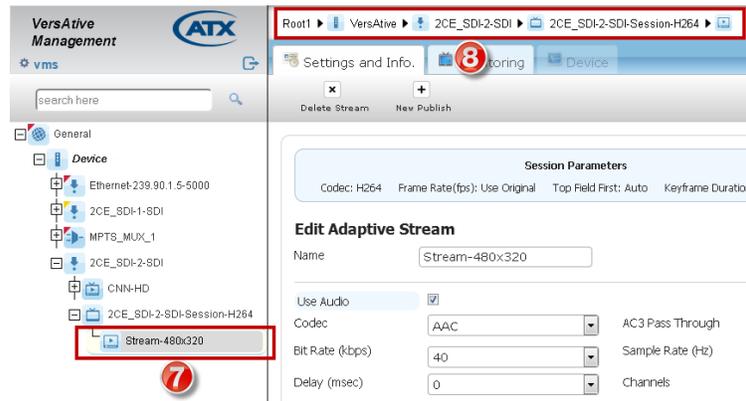


Figure 1-18: Adaptive Stream is Added to Session

5.4.3 Publishing an Adaptive Stream

A Publish defines the Output IP Address and Format as well as providing any authentication of the Adaptive Stream.

1. Select the **Adaptive Session** by clicking it in Tree View, Figure 1-19.
2. Click **New Publish** on the Tool Bar.

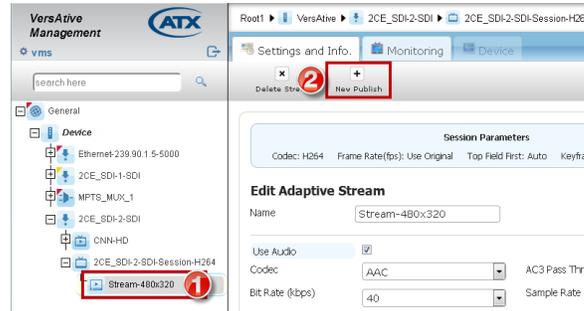


Figure 1-19: Add New Publish

3. Give the **Publish** point a meaningful **Name** such as the Format & IP Address, Figure 1-20.
4. Select the Publish point **Format** from the dropdown menu choices (HLS, SPTS & Flash).

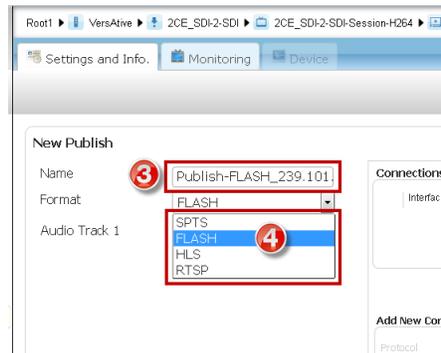


Figure 1-20: Select Publish Format

5. Enter the **Connection URL** address, Figure 1-21.
6. Chose the physical output **Interface** from the dropdown menu (Ports available may differ between models and could include VLANs if previously configured).
7. Click **Add** to create the connection. Multiple connections may be added.
8. The **Connection** is created and may be further edited by selecting the adjacent tick box and click **Edit**.
9. Click **Apply** to save the changes and add the Publish to the Adaptive Stream.

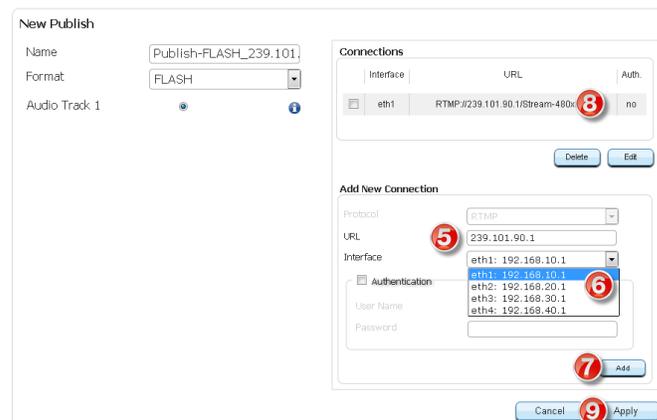


Figure 1-21: Refine Publish Parameters

10. The Publish is **Added** and is displayed on the Tree View, Figure 1-22.
11. The Publish is also displayed on the **Path Bar** when the selected in **Tree View**.

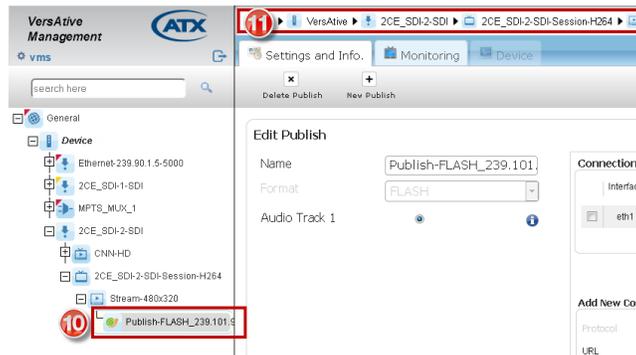


Figure 1-22: Publish is Added to Adaptive Stream

5.5 Start the Stream

The streaming process is started from the Resource icon and each Resource is started individually.

1. In the Tree View, click to select the **Resource** to be started, Figure 1-23.

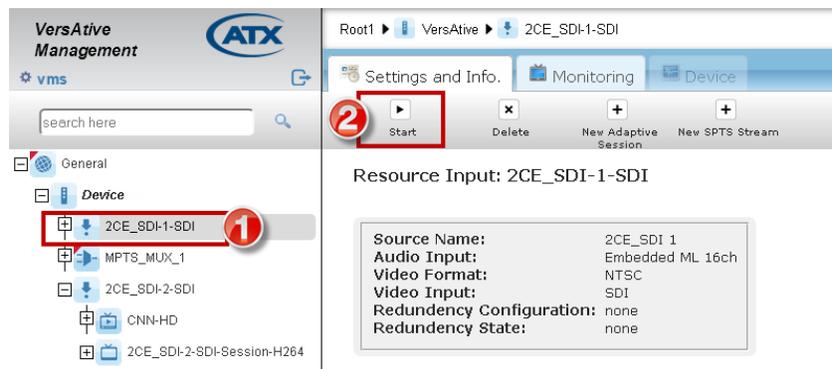


Figure 1-23: Start the Streaming Process

2. Click the **Start** button on the Tool Bar (or the Right Click menu).
3. The Streaming starts and is indicated in the Tree View by small triangles in the lower right corner of all streaming Element Icons, Figure 1-24.

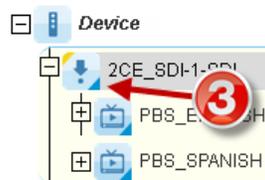


Figure 1-24: Streaming Started

5.5.1 Streaming Icon Indicators

When streaming starts, the icon for each element changes to show a small triangle to indicate that.

Before the streaming is started the icons appear without triangle indicator, Figure 1-25. Once streaming has begun, the triangle appears in each icon, Figure 1-26.

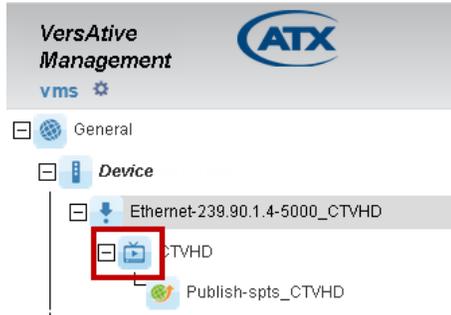


Figure 1-25: Streaming Stopped

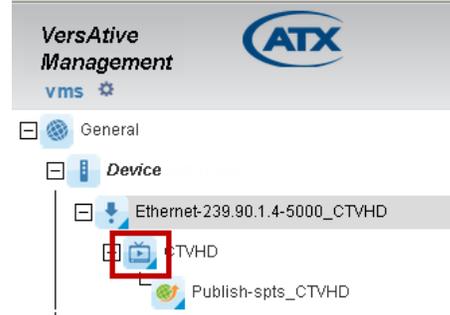


Figure 1-26: Streaming Started

SESSION SETTINGS

6. Session Settings

This chapter describes the configuration variables for SPTS and Adaptive encoding and transcoding.



Note: See “Encoding Application” on page 4-1 and “Transcoding Application” on page 5-1 for programming and setup procedures.

6.1 Chapter Contents

- “SPTS Stream Settings”
- “Adaptive Session Settings”

6.2 SPTS Stream Settings

The screenshot shows the 'New SPTS Stream' dialog box with the following settings:

- Name:** 0-Stream-720x480
- Use Audio:**
- Codec:** AAC
- AC3 Pass Through:**
- Bit Rate (kb/s):** 192
- Sample Rate (Hz):** 48000
- Delay (msec):** 0
- Channels:** 2
- Use Video:**
- Codec:** H264
- Codec Profile:** Main
- Bit Rate (kb/s):** 3000
- Codec Speed:** Very Fast
- Subtitles Method:** On Separate Pids
- VBR:**
- Keyframe Duration(sec):** 2
- Badapt:**
- Mpeg2 Level:** Main
- Scenecut:**
- Bframes:** 2
- Cabac:**
- Video Pre-processing Parameters:**
 - Frame Rate (fps):** Use Original
 - Resolution:** 720x480
 - Top Field First:** Auto
 - Aspect Ratio:** Use Original
 - De-Interlace:**
 - Interlace Method:** Linear
- Cropping:**
 - Left:
 - Right:
 - Top:
 - Bottom:

Figure 1-1: SPTS Stream Properties

Table 6.2a: SPTS Stream Settings

Setting	Value	Description
Name	String	The alpha numeric identifier that you can assign. This should be a meaningful name which clearly identifies the stream or it's purpose.
Audio Encoding Parameters		
Use Audio	Tick Box	Tick to enable the Audio stream in the output.
Codec	Dropdown menu	Choices, MPEG2, MP3, AAC, AC3, EAC3, HEAAC.
AC Passthrough	Tick Box	Only used for AC3 or EAC3. Tick to enable using the original audio configuration.
Bit Rate	Dropdown menu	Audio bitrate. Choices available depend on Codec choice.
Sample Rate	Dropdown menu	Audio sample rate, choices available depend on codec selected; default 48000Hz .
Delay	Dropdown menu	Specifies the delay of the audio channel compared to Video between -1000 and +1000 mS in 10 mS steps; default is 0 .
Channels	Dropdown menu	Number of audio channels. Choices 1, 2 or 5.1 channels.

Setting	Value	Description
Video Encoding Parameters		
Use Video	Tick box	Tick to enable the Video stream in the output.
Codec	Dropdown menu	Choice between MPEG2 & H.264. Some following settings depend on this choice.
Codec Profile	Dropdown menu	Choices of Baseline, Main, High, Low Latency.
Bit Rate	Integer	Enter encoding rate in kbps.
Codec Speed	Dropdown menu	Adjust for best performance based on scene action. Recommended to use default setting for most streams.
Subtitles Method	Dropdown menu	Determines how subtitles (closed captions) are handled; default is On Separate PIDs. <ul style="list-style-type: none"> • On Separate PIDs: Subtitles are placed on PIDs separate from video and audio streams. • Overlay in video: Subtitles are added into the video stream. • Ignore Subtitles: Subtitles are not passed through.
VBR	Tick box	Tick to enable variable Bit Rate output; default is Constant Bit Rate (Un-ticked)
Keyframe Duration	Dropdown menu	The time period in seconds between IDR keyframes; default is 2 seconds .
Badapt	Tick Box	Turn on the adaptive B-frame placement decision algorithm. This setting controls how H.264 decides between placing a P or B-frame. Choice is true (Ticked) or false (not ticked), default is Box Ticked .
MPEG2 Level	Dropdown menu	Only in effect for MPEG2 codec. Choice is Main & High.
Scenecut	Tick Box	Selected (enabled) by default (and cannot be disabled in MPEG2 Codec), adaptive I-frame decisions are enabled. Disabling Scenecut prevents H.264 from generating a key frame when there is a scene cut in the video; important to keep key frames consistent for multi-bitrate videos. See Figure 1-4 & Figure 1-3 and description below.
Bframes	Dropdown menu	Specifies the maximum number of concurrent B Frames that H.264 can use; default is 2 .
CABAC	Tick box	Enables CABAC (Context Adaptive Binary Arithmetic Coder) stream compression and reverts to CAVLC (Context Adaptive Variable Length Coder) system if un-ticked, which significantly reduces efficiency and the decoding requirements. Default CABAC (Ticked).
Video Pre-processing Parameters		
Frame Rate	Dropdown menu	Encoded frames per second; default is use original. Choices between 1 and 60.
Resolution	Dropdown menu	Select from many choices for the appropriate resolution.
Top Field First	Dropdown menu	Ordering of fields either Top or Bottom field first. Default is Auto .
Aspect ratio	Dropdown menu	Choice between 1:1, 4:3 and 6:9 or Use Original; default is Use Original .
De-Interlace	Tick Box	Allows de-interlacing of video frames to convert from Interlace to Progressive if box is ticked; default is not ticked (no de-interlace).
Interlace Method	Dropdown menu	Only effective if De-Interlace is selected. De-interlace choices between Simple and Advanced detect (with and without Double Frame rate) and Linear; default is Linear .
Cropping	Integer	If box ticked, enter number of Pixels to be cropped from each side of the picture.

6.2.1 SPTS Scenecut Setting

The Scenecut setting is found only in SPTS Stream settings, Figure 1-2.

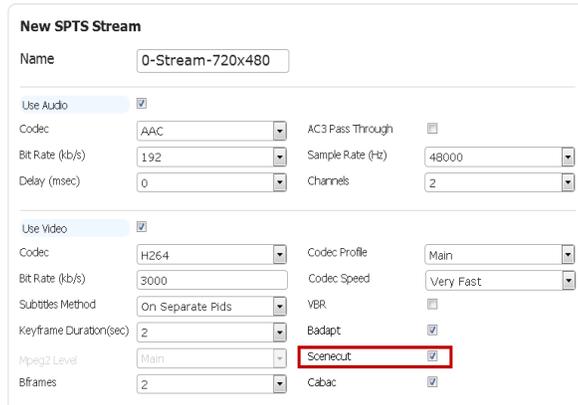


Figure 1-2: SPTS Scenecut Setting

Enabling this setting (box is ticked) allows adaptive I frame decisions based on scene changes and placement of new I/IDR frames as illustrated in Figure 1-3 where we see the irregular timing of the I/IDR frames (the red blocks) indicative of an open GOP structure. When Scenecut is disabled (box is un-ticked), illustrated in Figure 1-4, the red blocks representing I/IDR frames occur in a timed interval based on the Keyframe Duration setting.

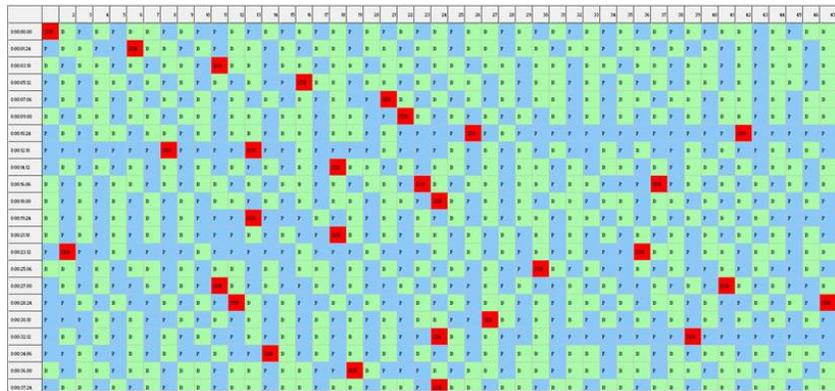


Figure 1-3: Scenecut Ticked - Open GOP

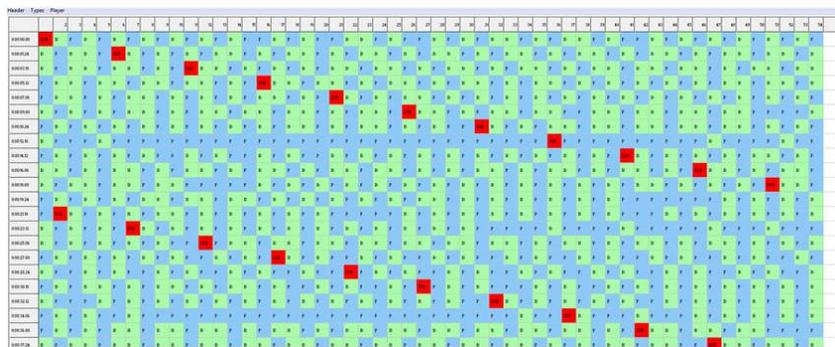


Figure 1-4: Scenecut Not Ticked - Closed GOP

6.3 Adaptive Session Settings

Figure 1-5: Adaptive Session Properties

Figure 1-6: Adaptive Stream Properties

Table 6.3a: Adaptive Session Settings

Setting	Value	Description
Name	String	The alpha numeric identifier that you can assign. This should be a meaningful name which clearly identifies the stream or it's purpose.
Codec	Dropdown menu	Default H.264 encoder for adaptive encoding.
Frame Rate	Dropdown menu	Encoded frames per second; default is use original. Choices between 1 and 60.
Keyframe Duration	Dropdown menu	The time period in seconds between IDR keyframes; default is 2 seconds .
Bframes	Dropdown menu	Specifies the maximum number of concurrent B Frames that H.264 can use; default is 2.
Badapt	Tick box	Turn on the adaptive B-frame placement decision algorithm. This setting controls how H.264 decides between placing a P or B frame. Choice is true (Ticked) or false (not ticked), default is not ticked .
Scenecut	Tick box	Not selected by default (and cannot be enabled), adaptive I-frame decisions are disabled. Disabling Scenecut prevents H.264 from generating a key frame when there is a scene cut in the video; important to keep key frames consistent for multi-bitrate videos. See Figure 1-3 & Figure 1-4.
Subtitles Method	Dropdown menu	Determines how subtitles (closed captions) are handled; default is On Separate PIDs . <ul style="list-style-type: none"> On Separate PIDs: Subtitles placed on PIDs separate from video and audio streams. Overlay in video: Subtitles are added into the video stream. Ignore Subtitles: Subtitles are not passed through.
Top Field First	Dropdown menu	Ordering of fields either Top or Bottom field first. Default is Auto .
De-Interlace	Tick box	Allows de-interlacing of video frames to convert from Interlace to Progressive if box is ticked; default is not ticked (no de-interlace).
Interlace Method	Dropdown menu	De-interlace choices between Simple and Advanced detect (with and without Double Frame rate) and Linear; default is Linear .

Table 6.3b: Adaptive Stream Settings

Setting	Value	Description
Name	String	The alpha numeric identifier that you can assign. This should be a meaningful name which clearly identifies the stream or it's purpose.
Audio Encoding Parameters		
Use Audio	Tick Box	Tick to enable the Audio stream in the output.
Codec	Dropdown menu	Choices, MPEG2, MP3, AAC, AC3, EAC3, HEAAC.
AC Passthrough	Tick Box	Only used for AC3 or EAC3. Tick to enable using the original audio configuration.
Bit Rate	Dropdown menu	Audio bitrate. Choices available depend on Codec choice.
Sample rate	Dropdown menu	Audio sample rate; default 48000Hz.
Delay	Dropdown menu	Specifies the delay of the audio channel compared to Video between -1000 and +1000 mS in 10 mS steps; default is 0 .
Channels	Dropdown menu	Number of audio channels. Choices 1, 2 or 5.1 channels.
Video Encoding Parameters		
Use Video	Tick box	Tick to enable the video stream in the output.
Codec Profile	Dropdown menu	Choices of Baseline, Main, High, Low Latency.
Codec Speed	Dropdown menu	Adjust for best performance based on scene action. Default setting is best for most streams.
Bit Rate	Integer	Enter video encoding rate in kbps.
VBR	Tick box	Tick to enable VBR output; default is Constant Bit Rate (Un-ticked).
CABAC	Tick box	Enables CABAC (Context Adaptive Binary Arithmetic Coder) stream compression and reverts to CAVLC (Context Adaptive Variable Length Coder) system if un-ticked, which significantly reduces efficiency and the decoding requirements. Default is CABAC (Ticked).
Video Pre-processing Parameters		
Resolution	Dropdown menu	Select from many choices for the appropriate resolution.
Aspect ratio	Dropdown menu	Choice between 1:1, 4:3 and 6:9 or Use Original; default is Use Original .
Cropping	Integer	If box ticked, enter number of Pixels to be cropped from each side of the picture.

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PUBLISH SETTINGS

7. Publish Settings

This chapter describes the configuration variables for SPTS, HLS and Flash publishing dialogs.



Note: See “Encoding Application” on page 4-1 and “Transcoding Application” on page 5-1 for programming and setup procedures.

7.1 Chapter Contents

- “SPTS Publish Settings”
- “HLS Publish Settings”
- “Adobe® Flash® Publish Settings”

7.2 SPTS Publish Settings

This page is used to establish publish parameters for publishing an SPTS stream. The procedure to use this is explained in “4.3 SPTS Encoding Application” on page 4-5.

Figure 1-1: SPTS Publish Settings

Table 7.2a: SPTS Publish Settings

Setting	Value	Description
Name	String	The alpha numeric identifier that you can assign. This should be a meaningful name which clearly identifies the Publish or it's purpose.
Closed Captioning	Tick Box	Tick to include the closed caption (Subtitles) if existing.
CBR Out	Integer	Un-tick 'Automatic' to enable entering a CBR bitrate for the Video stream.
Automatic	Tick Box	Tick to turn on Variable Bit Rate output. Un-tick to set to CBR then enter an integer in CBR Out. Default is ticked, VBR .
Program No. xxxx	Integer	Enter the MPEG program number to change default value.
PCR/PMT PID xx	Integer	Change default values if required. Default PCR PID always follows Video PID.
Video PID xx	Integer	Change default value if required.
Audio PID xx	Tick Box / Integer	Input audio PIDs detected are listed along with their PID number and language. Tick to include this language in the output. Mouse over Info icon  to see the language of the audio stream.
Add New Connection		
Protocol	Dropdown menu	Choice between UDP & RTP; default is UDP .

Setting	Value	Description
URL	IP Address	Enter the IP address or URL for the publish. Entry of URL requires a DNS entry defined on the management port IP settings.
Port	Integer	Enter the port number associated with the URL.
Interface	Dropdown menu	Select the output physical Ethernet port the stream will appear on; choices are eth1, eth2, eth3 or eth4 (Ports available may differ between models and could include VLANs if previously configured).
Multicast	Tick Box	Tick this box if the IP address is within the multicast address range.

7.3 HLS Publish Settings

7.3.1 HLS Introduction

HTTP Live Streaming lets you send audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (Mac OS X). HTTP Live Streaming supports both live broadcasts and prerecorded content (video on demand), multiple alternate streams at different bit rates, and the client software can switch streams intelligently as network bandwidth changes. HTTP Live Streaming also provides for media encryption and user authentication over HTTPS, allowing publishers to protect their work. An overview of the HLS topography is shown in Figure 1-2, courtesy of Apple.

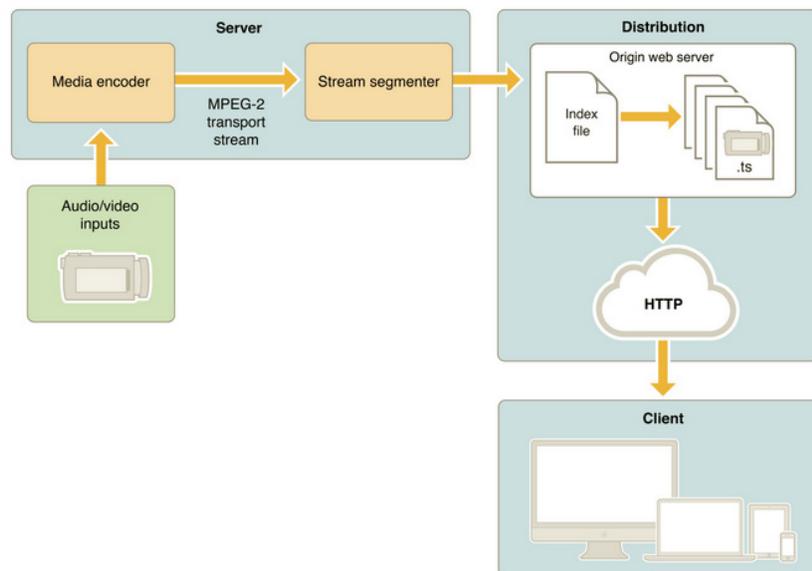


Figure 1-2: HLS Overview



NOTE: We receive lots of questions regarding setup of VersActivePro and DigiVu II encoders for use with HLS Distribution Servers. In order to provide some self-help for those who are need, please refer to the following link for background information on HLS.

<https://developer.apple.com/library/ios/documentation/NetworkingInternet/Conceptual/StreamingMediaGuide/Introduction/Introduction.html>

7.3.2 HLS Publish Settings Page

This page is used to establish publish parameters for publishing an HLS stream within an adaptive session. The procedure to use this is explained in “4.4 Adaptive Encoding Application” on page 4-7.

Figure 1-3: GUI HLS Publish Settings

Table 7.3a: HLS Publish Settings

Setting	Value	Description
Name	String	The alpha numeric identifier that you can assign. This should be a meaningful name which clearly identifies the Publish or it's purpose.
Format	Dropdown menu	Select HLS format.
Index name	String	Enter the index name if different from default value; default is index.m3u8 .
Segment Duration	Dropdown menu	Select the duration values between 3 & 22 seconds in 1 second increments, default is 3 seconds .
Program Number xxxx	Integer	Enter the MPEG program number to change default value.
PCR/PMT PID xx	Integer	Change default values if required. Default PCR PID always follows Video PID.
Video PID	Integer	Change default value if required.
Audio PID xx	Tick Box / Integer	Input audio PIDs detected are listed along with their PID number and language. Tick to include this language in the output. Mouse over Info icon  to see the language of the audio stream.
Add New Connection		
Protocol	Fixed Value	HTTP by default.
URL	IP Address	Enter the IP address or URL for the publish. Entry of URL requires a DNS entry defined on the management port IP settings.
Interface	Dropdown menu	Select the output physical Ethernet port (eth1 thru eth6) the stream will appear on. Choice of ports available differs between models and could include VLANs if previously configured.
HTTP Management	Dropdown menu	Defines the HTTP document management protocol; WebDAV by default.
Authentication	Tick Box	Tick this box to enable the authentication dialogs then enter the username and password.

7.3.3 Example HLS Publish Configuration

An example Device configuration for HLS publishing.

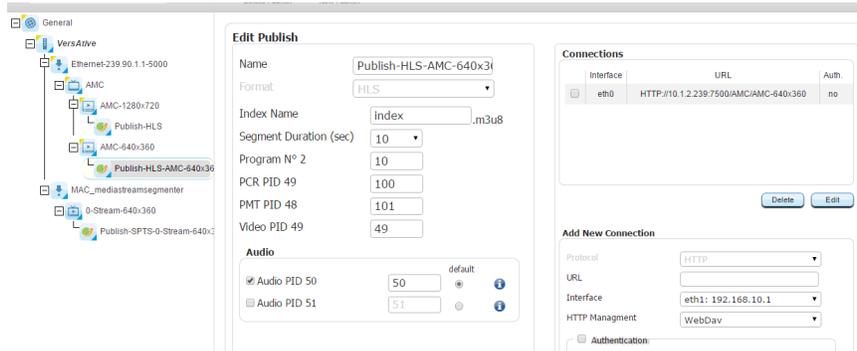


Figure 1-4: Example HLS Publish Configuration

7.4 Adobe® Flash® Publish Settings

This page is used to establish publish parameters for publishing an Adobe Flash stream within an adaptive session. The procedure to use this is explained in “4.4 Adaptive Encoding Application” on page 4-7.

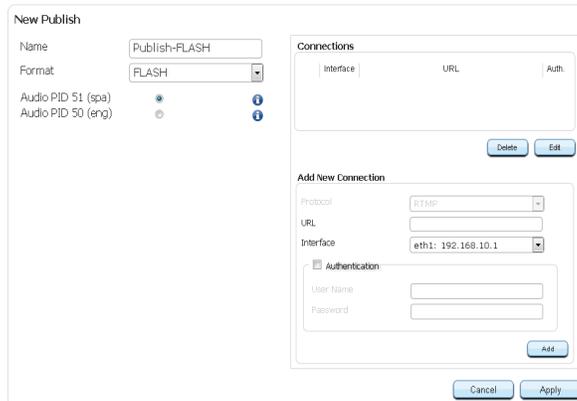


Figure 1-5: Adobe® Flash® Publish Settings

Table 7.4a: Flash Publish Settings

Setting	Value	Description
Name	String	The alpha numeric identifier that you can assign. This should be a meaningful name which clearly identifies the Publish or it’s purpose.
Format	Dropdown menu	Select Flash.
Audio PID xx	Tick Box / Integer	Input audio PIDs detected are listed along with their PID number and language. Tick to include this language in the output. Mouse over Info icon  to see the language of the audio stream.
Add New Connection		
Protocol	Fixed Value	RTMP by default.
URL	IP Address	Enter the IP address or URL for the publish. Entry of URL requires a DNS entry defined on the management port IP settings.
Interface	Dropdown menu	Select the output physical Ethernet port the stream will appear on; choices are eth1, eth2, eth3 or eth4 (Ports available may differ between models and could include VLANs if previously configured).
Authentication	Tick Box	Tick this box to enable the authentication dialogs then enter the username and password.

QAM MULTIPLEXER

8. QAM Multiplexer

Multiplexes comprised of one or many programs may be created with outputs on QAM modulators(if equipped) (M-QAM is the hardware model used by ATX Networks and is an industry standard modularized QAM Modulator).

- M-QAM hardware module input is fed externally from ETH1 so all QAM traffic will be reported on ETH1 port.
- QAM channels are provided in adjacent frequency related groups of four.
- Center frequency of the first (lowest frequency) channel may be specified for each group of four.
- Each adjacent channel center frequency is incremented by 6 MHz from the first specified frequency.

8.1 Chapter Contents

- “Setup a QAM Modulator”
- “Create a QAM Multiplex”
- “Create A TS Source”
- “Adding TS Source Programs”
- “Adding Multiple TS Sources”

8.2 Setup a QAM Modulator

This setup is required only if QAM modulators are provided as a hardware option.

- Click to select the **Device** in Tree View, Figure 1-1.
1. Click the **QAM Output Devices** tab.
2. Edit the **Frequency** of the lowest RF channel, then select the QAM mode from the drop down(default is 256).

Figure 1-1: Setup QAM Output Device

3. Tick the boxes adjacent to QAM channels to enable or untick to disable individual QAM outputs.
4. Edit **RF Level** to set output RF level per channel in dBm. Mouse over the information icon  for valid RF level range.
5. Click **Save** to apply the changes when finished.

8.3 Create a QAM Multiplex

1. Click to select the **Device**, Figure 1-2.
2. Click **Add MPTS Multiplexer** on the Tool Bar (or Right Click menu).

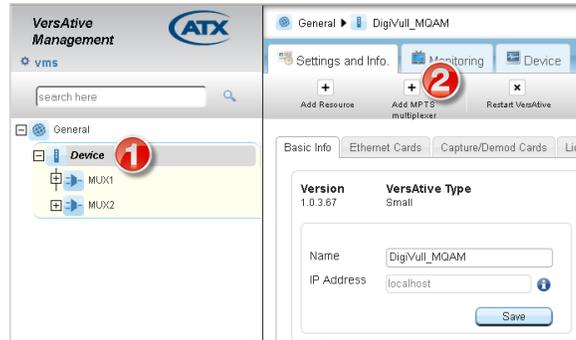


Figure 1-2: Create QAM Multiplex

3. Give a **Name** to the MUX(Optional), Figure 1-3.
4. Select **M-QAM** from the **Output Type** drop down.
5. Select the desired RF output channel from the QAM Channel drop down.
6. Enter the TS (Transport Stream) ID number.

Figure 1-3: Edit QAM Multiplex

7. Tick **PSIP Enable** if the PSIP should be active on this channel(alternately DVB SI Enable or None), Figure 1-4.

Figure 1-4: Select PSIP for Multiplex

8. Once added, the MUX will be in the Tree View under the Device it was added to, Figure 1-5. No need to click Save.
9. If any changes are required, select the MUX in the Tree View then edit any parameters of the multiplex as required.
10. Click **Save** to apply the changes made.

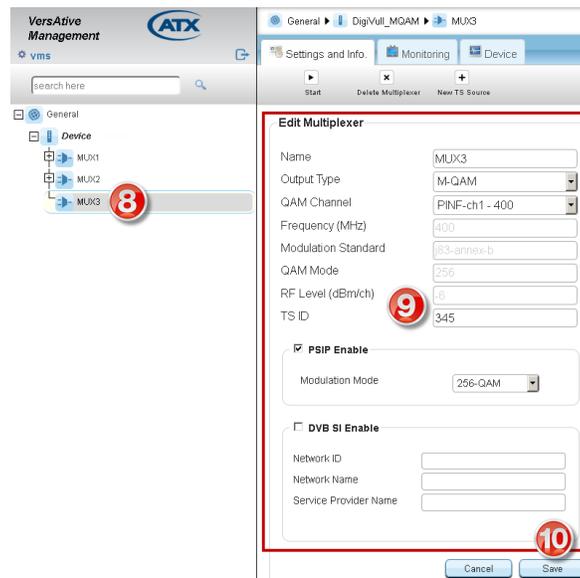


Figure 1-5: Multiplex Added to Device

8.4 Create A TS Source

1. Click to select the **MUX** in Tree View, then click **New TS Source** on the Tool Bar, Figure 1-6.

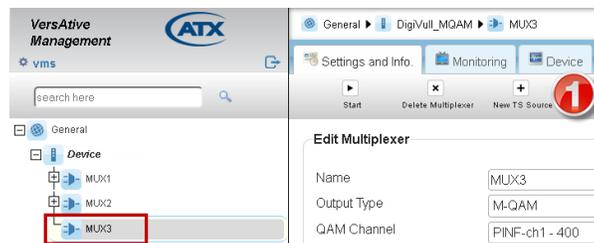


Figure 1-6: Select New TS Source

2. Name the **Source** (Suggestion: Use a meaningful name), Figure 1-7.
3. Tick or untick **Multicast** then enter the appropriate IP address and port number.
4. Select the physical **Interface** (Ethernet port) that the stream appears on from the drop down menu.
5. Click **Add** to add the Source.

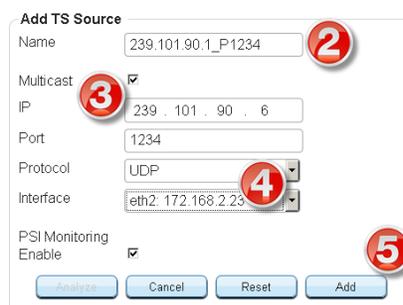


Figure 1-7: Select New TS Source

- The new TS Source is added to the MUX in Tree View, Figure 1-8.



Figure 1-8: New TS Source Added

- To add multiple TS sources to a MUX return to step 1.
 - Multiple TS sources may be added to a MUX to aggregate content.
 - One or more programs may be added from any TS Source.
 - Programs may be added up to the specified bitrate of the MUX but there is no mechanism to limit the bitrate so be careful to not overflow the MUX.

8.5 Adding TS Source Programs

Each TS Source may have one or many programs available as it may be an SPTS or MPTS. Select programs from the added TS sources to fill the MUX.

- With the **TS Source** selected in Tree View, click **Analyze**, Figure 1-9.

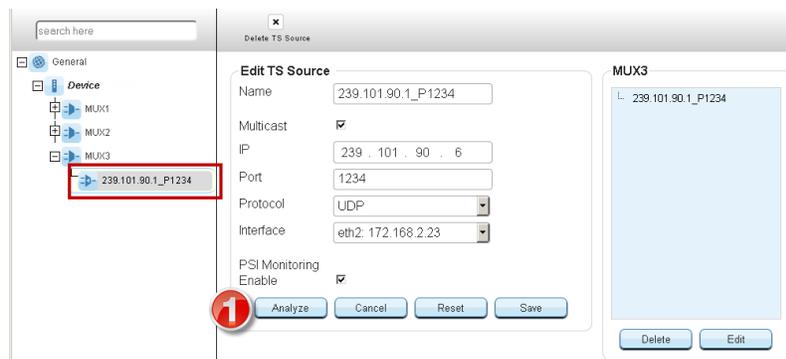


Figure 1-9: Add Program to TS Source

- Click to select the **Program** to be added in the left MPTS Results window, Figure 1-10.
- Click the **Source Multiplex** in the right MUX window.
- Click the **Right Arrow** to add the program to the MUX.
 - Repeat to add more required programs from this TS Source to the MUX if there are multiple.
 - Programs may be deleted by selecting them in the MUX window then click the Left Arrow.

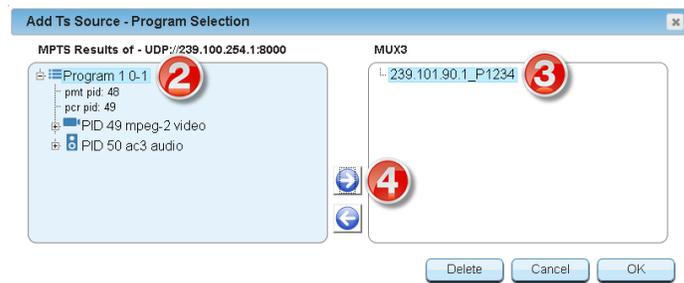


Figure 1-10: Select Program & Source

5. The **Program** is added to the output MUX, Figure 1-11.
6. Click **OK** to save this result.

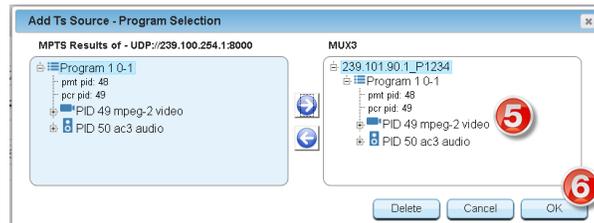


Figure 1-11: Program Added to TS Source

7. With input source selected in Tree View, added program is displayed under the MUX, Figure 1-12.

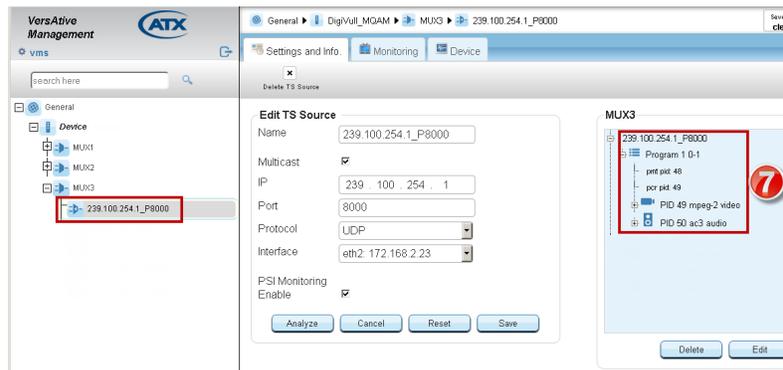


Figure 1-12: Program Displayed under TS Source

8.6 Adding Multiple TS Sources

Multiple input TS sources and programs may be added to any MUX up to the bitrate specified for the MUX, Figure 1-13.

1. Add more new TS Sources to a MUX, see [“Create A TS Source” on page 8-3](#).
 2. For each TS Source, add program(s) to the source, see [“Adding TS Source Programs” on page 8-4](#).
- Only the bitrate of added programs counts toward filling the output MUX.

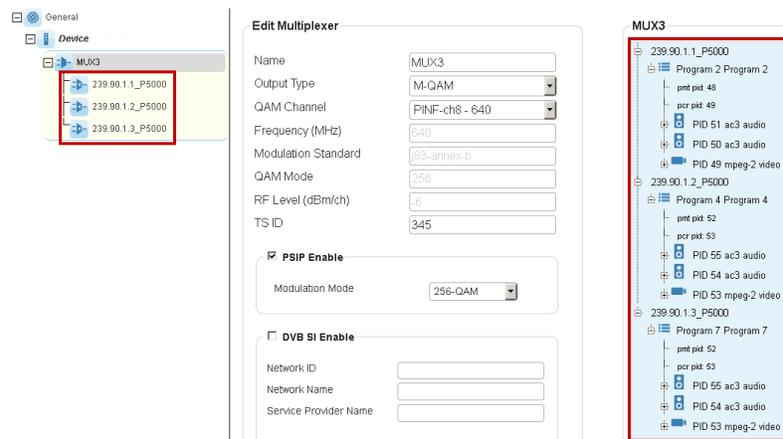


Figure 1-13: Added Program Displayed under TS Source

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ETHERNET MULTIPLEXER

9. Ethernet Multiplexer

Multiplexes comprised of one or many programs (SPTS or MPTS) may be created with outputs on Ethernet ports.

- Unicast or multicast addresses may be specified.
- SPTS or MPTS streams may be used as source.
- Output MUX maximum bitrate may be specified (however, there is no internal mechanism to limit bitrate).

9.1 Chapter Contents

- “Create an Ethernet MUX”
- “Create a TS Source”
- “Adding TS Source Programs”
- “Adding Multiple TS Sources”

9.2 Create an Ethernet MUX

1. Click to select the **Device** in the Tree View, Figure 1-1.
2. Click **Add MPTS Multiplex** on the tool bar.

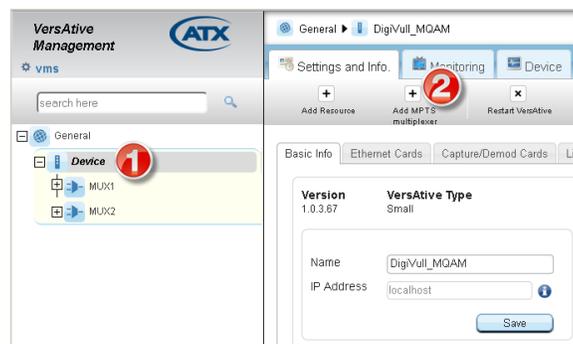


Figure 1-1: Create Ethernet Multiplex

3. Give a **Name** to the MUX(optional), Figure 1-2.
- By default, **Ethernet** is selected in **Output Type**.
4. Enter the output IP address and port.
- If a multicast IP address is entered, tick the **Multicast** box.

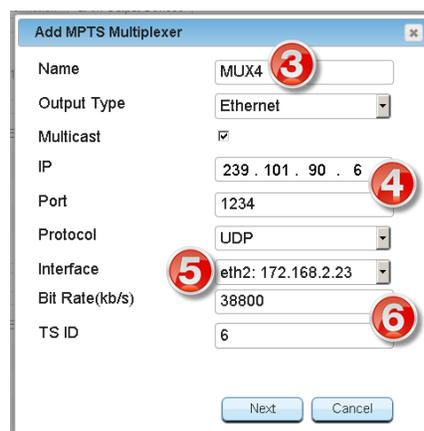


Figure 1-2: Edit Ethernet Multiplex

- From the **Interface** dropdown, select the physical output Ethernet port that the stream should appear on (Ports available may differ between models and could include VLANs if previously configured).



NOTE: The default management port is ETH0 and if Device is M-QAM equipped, the M-QAM is using ETH1 so these two ports should not be used for streaming an Ethernet MUX.

- Enter the TS (Transport Stream) ID number.
- Tick **DVB SI Enable** only if required for the application, Figure 1-3.
 - If this box is ticked then enter Network ID, Name and Service Provider as well.

Figure 1-3: Select PSIP for Multiplex

- Once added, the MUX will be in the Tree View under the Device, Figure 1-4. No need to click Save.
- If any changes are required, select the MUX in the Tree View then edit any parameters of the multiplex as required.
- Click **Save** to apply any changes made.

Figure 1-4: Multiplex Added to Device

9.3 Create a TS Source

1. With the MUX selected in Tree View, click **New TS Source** on the **Tool Bar**, Figure 1-5.

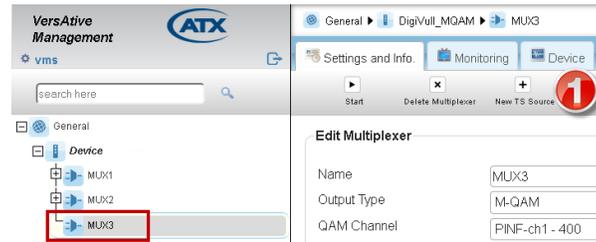


Figure 1-5: Select New TS Source

2. Name the Source using a meaningful name, Figure 1-6.
3. Enter the appropriate IP address and port number, then tick Multicast if the IP address is in the multicast range.
4. Select the input Ethernet port from the drop down that the stream appears on.
5. Click **Add** to add the Source.

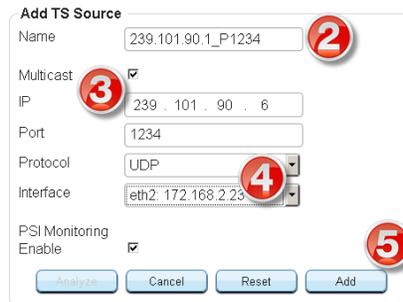


Figure 1-6: Select New TS Source

6. The new TS Source is added to the MUX in Tree View, Figure 1-7.



Figure 1-7: New TS Source Added

- To add multiple TS sources to a MUX return to step 1.
- Multiple TS sources may be added to a MUX to aggregate content.
- One or more programs may be added from any TS Source.
- Programs may be added up to the specified bitrate of the MUX.

9.4 Adding TS Source Programs

Each TS Source may have one or many programs available as it may be an SPTS or MPTS. Select programs from the added TS sources to fill the MUX.

1. With the TS Source selected in Tree View, click Analyze, Figure 1-8.

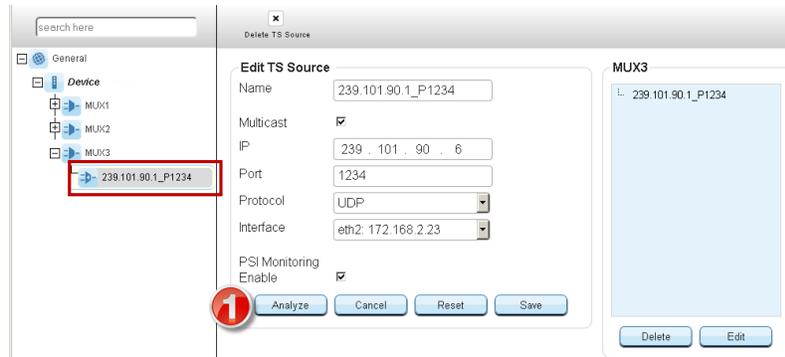


Figure 1-8: Add Program to TS Source

2. Click to select the Program to be added in the left MPTS Results window, Figure 1-9.
3. Click the Source Multiplex in the right MUX window.
4. Click the Right Arrow to add the program to the MUX.
 - Repeat to add more required programs from this TS Source to the MUX if there are multiple.
 - Programs may be deleted by selecting them in the MUX window then click the Left Arrow.

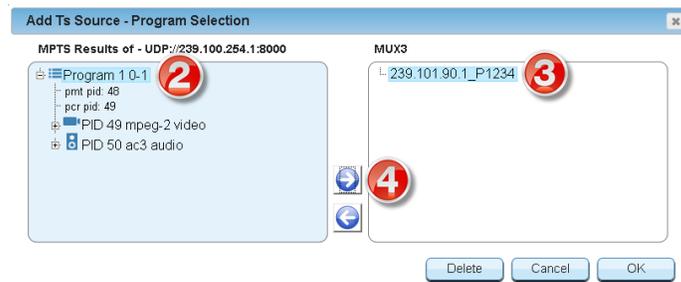


Figure 1-9: Select Program and Source

5. The Program is added to the output MUX, Figure 1-10.
6. Click OK to save this result.

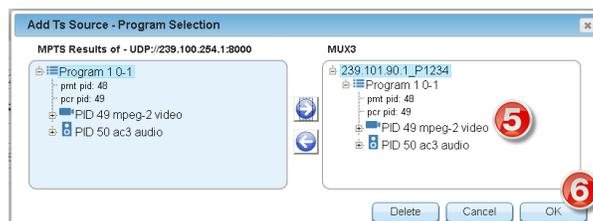


Figure 1-10: Program is added to TS Source

7. With input source selected in Tree View, added program is displayed under the MUX, Figure 1-11.

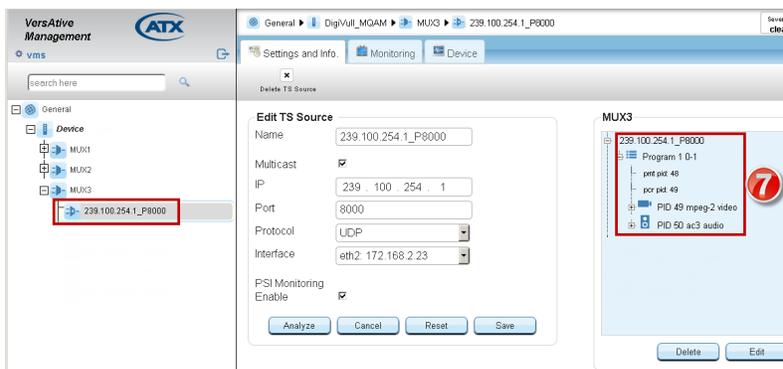


Figure 1-11: Added Program is Displayed under TS Source

9.5 Adding Multiple TS Sources

Multiple input TS sources and programs may be added to any MUX up to the bitrate specified for the MUX, Figure 1-12.

1. Add more new TS Sources to a MUX, see [“9.3 Create a TS Source”](#) on page 9-3.
 2. For each TS Source, add program(s) to the source, see [“9.4 Adding TS Source Programs”](#) on page 9-4.
- Only the bitrate of added programs counts toward filling the output MUX.

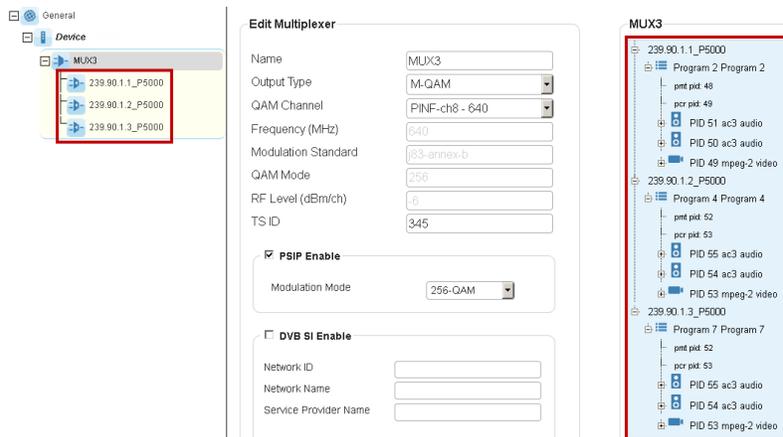


Figure 1-12: Added Program Displayed under TS Source

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ALARMS & EVENTS

10. Alarms & Events

10.1 Alarms

Alarms are current issues that exist with the Device and are not persistent; these are cleared over time as issues are resolved. Alarms are of a minor nature and do not affect or report on the streaming operation of the Device platform. Alarms are presented in the GUI, see Figure 1-1 and Figure 1-2.

1. Severity - Indication of the severity of the current alarm condition.
2. State - Reports on the state of the Device platform, either Active (Streaming) or Idle.
3. Enabled - Reports on the Device. Enabled or Disabled.
4. Alarms Button - Opens the alarms window for review and deletion of reported alarms.



Figure 1-1: Alarms Notifications - Idle



Figure 1-2: Alarms Notifications - Streaming

10.1.1 Reviewing Alarms

Open the Alarms window by clicking the Alarms Button, top right corner of the GUI, Figure 9-8 (4). The Alarms window opens and displays the current alarms, Figure 9-9.

1. Select the desired action from the actions list. “Clear All Alarms” action will directly delete all alarms with a warning.
2. Item’s selection boxes become ticked or manually select each item for action.
3. Review a long list of alarms with the “Previous/Next” action controls.
4. Search an alarm condition with criteria. The list is dynamically refreshed with the items matching the entered string.

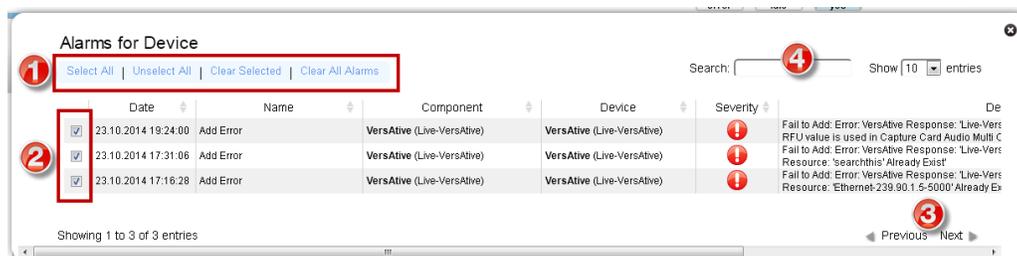


Figure 1-3: Reviewing Alarms

10.2 Events

Events are reported on issues of a higher degree and are persistent; being saved until they are manually deleted. The Events Indicator/Button in the GUI is at the lower right corner, Figure 1-4, clicking of which opens the Events window in the GUI.



Figure 1-4: Events Notifications

10.2.1 Reviewing Events

Open the Events window shown in Figure 1-5, by clicking the GUI Events Button, Figure 1-4 (1).

1. Events are displayed by default in chronological order, most recent first. Use scroll bars or mouse wheel to view list extents.
2. The sort ordering can be changed by clicking the column header. All headers toggle and sort the list between 'top down' & 'bottom down' when clicked.
3. Click the control actions to clear events or open "Events History" window.
4. Search an alarm condition with criteria. The list is dynamically refreshed with the items matching the entered string.
5. Review a long list of alarms with the "Previous/Next" action controls.
6. Severity - Information Only. Does not affect streaming
7. Severity - Warning. Potentially affects streaming.
8. Severity - Error. Event affecting streaming.

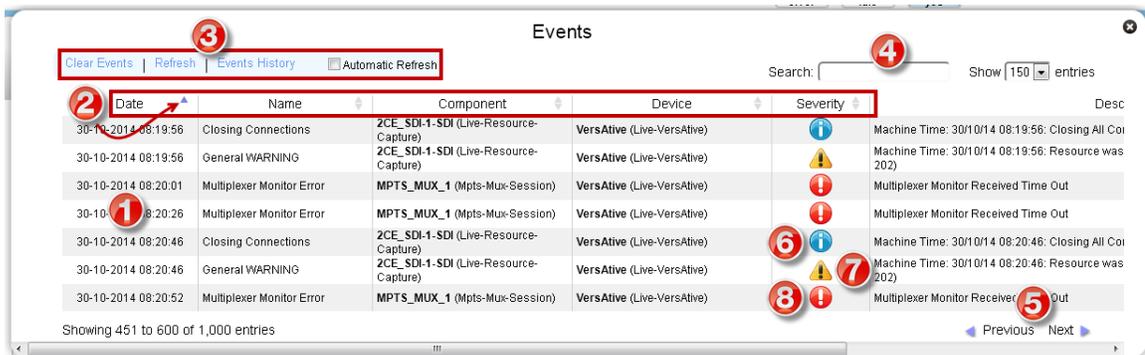


Figure 1-5: Reviewing Events

10.2.2 Events History

Clicking “Events History” in the Events window, Figure 9-11 (3) opens a new browser window or tab, Figure 9-12, in which the alarm history may be manipulated or searched.

1. Choose a date range by clicking the “From/To” dialogs to open a date selector in which the desired date range may be specified.
2. Select desired ‘Severity’, ‘Device’ or ‘Component’ levels to be displayed.
3. Clicking **Apply** button initiates the action. All filter settings require Apply button to initiate action.
4. Events are displayed by default in chronological order, most recent first. Use scroll bars or mouse wheel to view list extents.
5. The sort ordering can be changed by clicking the column header. All headers toggle and sort the list between ‘top down’ & ‘bottom down’ when clicked.
6. Search an alarm condition in the current displayed list with a string. The list is dynamically refreshed with the items matching the entered string.
7. Review a long list of alarms with the “Previous/Next” action controls.
8. Download a copy of the current visible records in a spreadsheet compatible file.

Figure 1-6: Reviewing Events

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MONITORING

11. Monitoring

Monitoring may be implemented on specific entities, Resources, Multiplexes and Streams. Monitoring the Device displays a series of histograms of the performance and load factors of the system hardware. Monitoring Streams shows the stream parameters and a video presentation. Monitoring a multiplex shows the aggregate bitrate of the MUX.

11.1 Chapter Contents

- “Monitoring the Device”
- “Monitor Resources”
- “Monitoring a Multiplex”
- “Displaying Stream Information”

11.2 Monitoring the Device

The Device may be monitored at a Hardware level, which is the underlying machine motherboard.

1. In Tree View, click the **Device** icon, Figure 1-1.
2. Click to select the **Device** tab.

Performance factors monitored include:

3. CPU Load - The histogram of average CPU load over the last 30 seconds displayed in Green.
4. RAM - The histogram of average RAM usage over the last 40 seconds.
5. CPU Heat - The histogram of average CPU temperature over the last 40 seconds.
6. Network Traffic Input- Network Interface input traffic load is displayed in Blue.
7. Network Traffic Output- Network Interface output traffic load is displayed in Red.



Note: The Monitoring page only starts recording when the Device tab is selected in the Tree View.

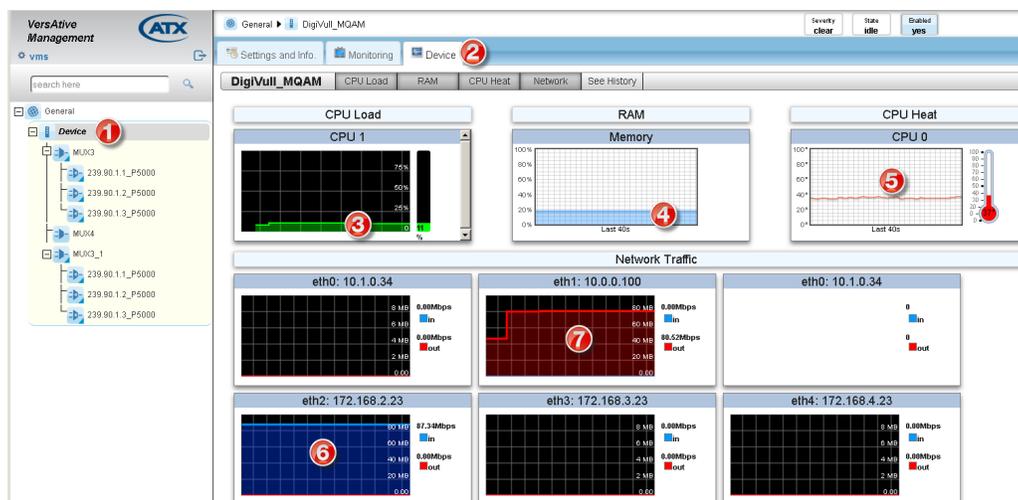


Figure 1-1: Monitoring the Device

11.2.1 Longer Term Device Monitoring

The default view for the monitor period is the last 40 seconds, but a longer term histogram is saved in each Device. This is accessed from the Device tab by clicking the **History** link shown in Figure 1-2.

1. In Tree View, click the **Device** icon.
2. Click to select the **Device** tab.
3. Click the **See History** tab.

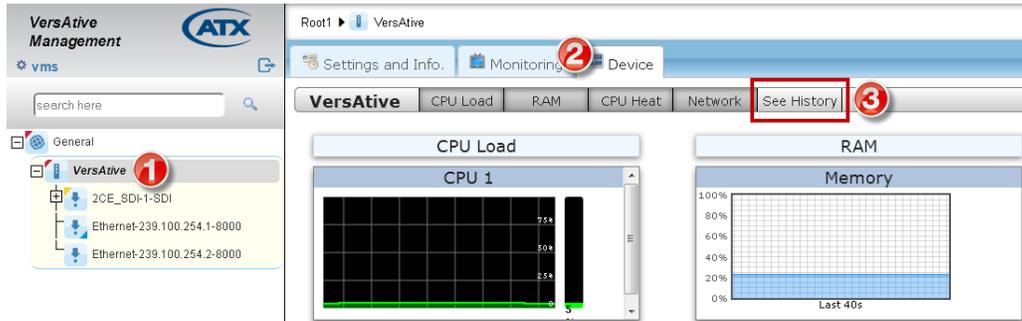


Figure 1-2: Monitor the Device History

A number of options may be selected to determine the length of history. The exact dates may be selected from the calendar by clicking in the **From** and **To** windows, Figure 1-3. Preset time periods of from the last hour up to 2 weeks may also be selected.

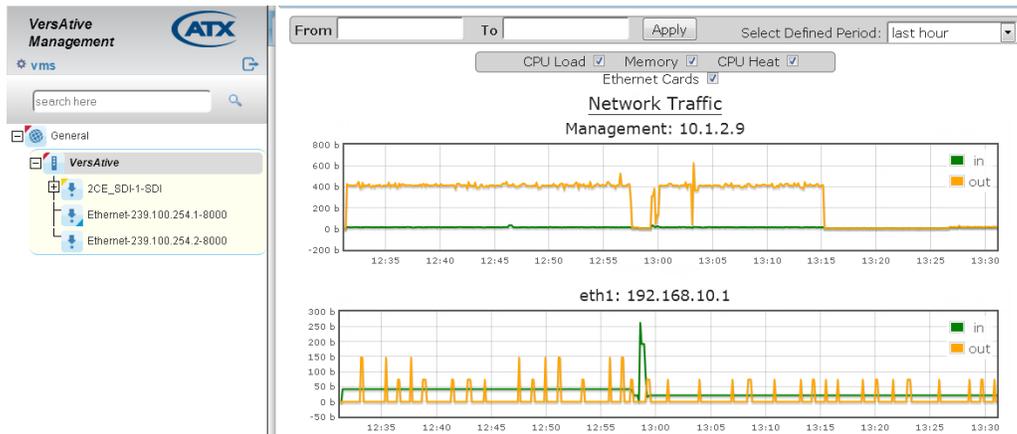


Figure 1-3: Monitor a Device Histogram

11.3 Monitor Resources

The Preview monitoring function for each Resource is enabled by default, Figure 1-4, but may be disabled at each individual Resource by unticking the Preview On box and then clicking **Save**.

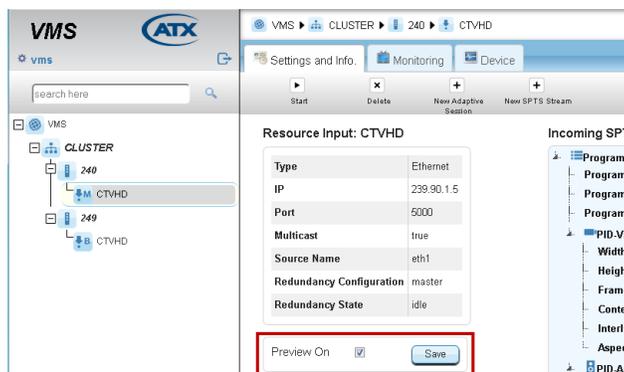


Figure 1-4: Preview Enabled

Previewing resources uses some of the platform CPU cycles although usually an insignificant amount. It is however possible that the encoding functions are running low on CPU cycles witnessed by high CPU load on a Device, see [“Monitoring the Device” on page 11-1](#), and it may be judged that Preview functionality can be sacrificed in order to maximize encoding power. In this case a user may disable Preview to lower CPU load.

11.3.1 Single Resource Preview

Any single Resource may be Previewed to determine the content or quality of the ingested video and audio before the content encoding/transcoding is started. Video is displayed at 5 frames/sec. The resource may be from Capture Cards or Ethernet input. A resource may also be previewed to hear its audio quality if it already has streams created for it but the streaming for this resource must first be stopped.



Note: Audio is only available during Preview and is not available after encoding/transcoding is started.

1. Click to select the **Monitoring** tab, Figure 1-5.
2. From the Tree View, **Right Click** the Resource to be Previewed
3. Select **Preview** in the menu.
4. Properties of the Resource are displayed in the Pane View window.

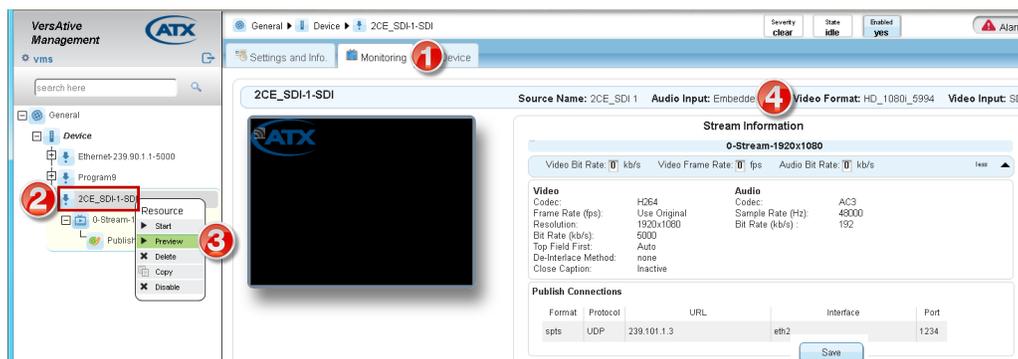


Figure 1-5: Select a Resource to Preview

5. The video is soon presented in a window with accompanying audio, Figure 1-6.
6. Stream parameters are displayed in the Pane View window.
7. The Resource in Tree View shows a purple triangle indicating monitoring is active, Figure 1-6. This must be manually stopped before adding Sessions or Streams or starting encoding/transcoding.

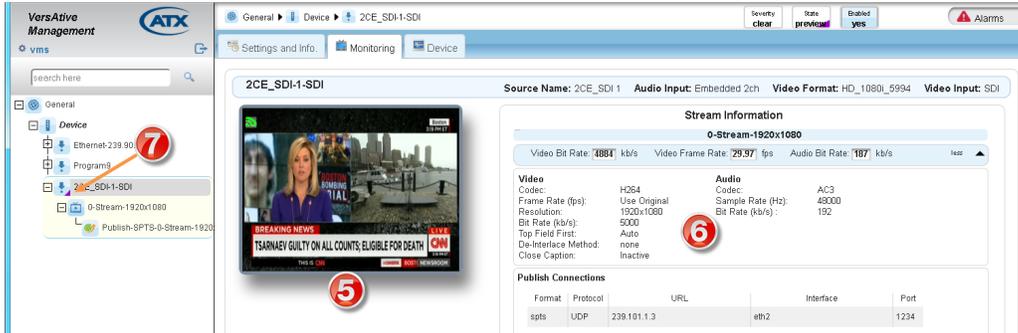


Figure 1-6: Resource Monitor Indicator

8. To stop the Preview, **Right Click** the Monitored Resource to open the menu, Figure 1-7.
 9. Click to select **Stop** in the menu.
- The Resource stops streaming to the monitor window.



Figure 1-7: Stop Resource Monitoring

11.3.2 Multiple Resource Monitoring

All available Resources may be monitored on a single page but audio output will not be available. Video is displayed at 5 frames/sec. For audio monitoring, see “11.3.1 Single Resource Preview”.

1. Click to select the **Monitoring** tab, Figure 1-8.
 2. From the Tree View, click the Device.
 3. All Resources which have active output streams are displayed in the Pane View window.
- There is no accompanying audio.
 - To stop the monitoring, click away from the Device Or Monitor tab.



Figure 1-8: Monitor Device Resources

11.4 Monitoring a Multiplex

Any multiplex may be monitored to determine operating parameters such as bitrate and payload of the MUX over time.

1. In the Tree View, click to select the **MUX** to be monitored.
2. Click to select the **Monitoring** tab, Figure 1-9.
3. The output bitrate of the MUX and the average payload is displayed.
4. A histogram of the output bitrate and payload of the MUX are charted below.

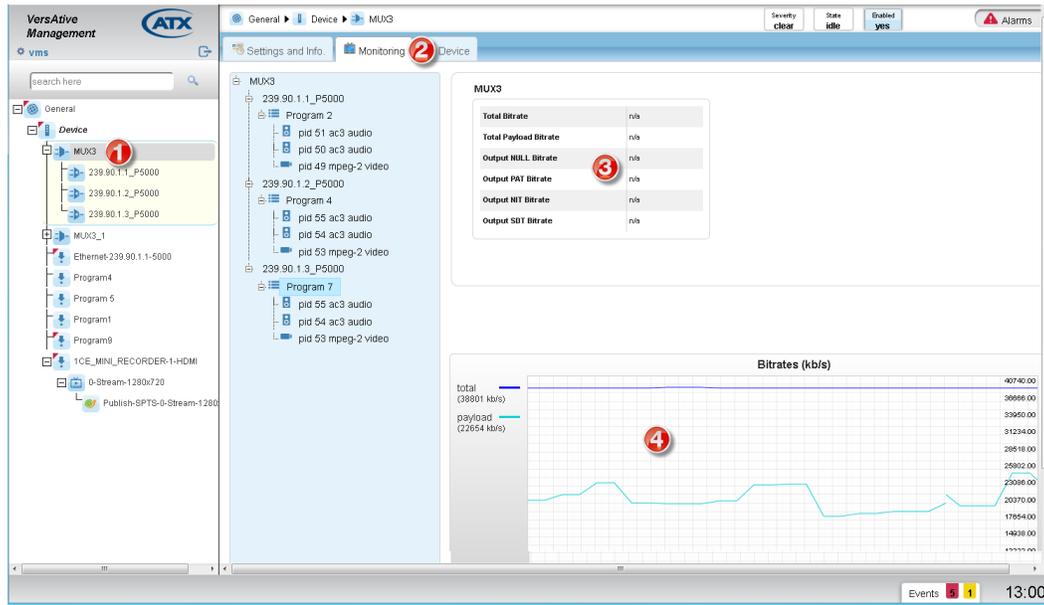


Figure 1-9: Monitor a Multiplex

5. The resource in Tree View shows a Purple triangle indicating monitoring, Figure 1-6. This must be manually stopped before adding Sessions or Streams.

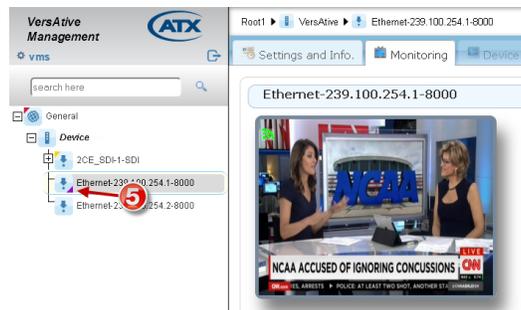


Figure 1-10: Resource Monitoring Indicator

6. To stop the monitor stream, **Right Click** the Monitored Resource to open the menu, Figure 1-11.
7. Click to select **Stop** in the menu.
8. The resource stops streaming to the monitor window.

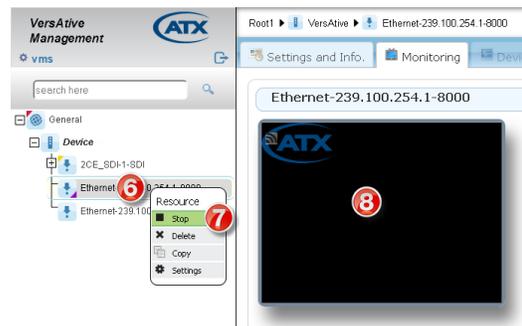


Figure 1-11: Resource Monitoring Stopped

11.5 Displaying Stream Information

During monitoring, there is full stream information available that is displayed by default but this may be turned off.

11.5.1 View Less Stream Information

Expanded stream information shown in the Pane View window is the default setting.

Turning off Expanded Information

1. From the Tree View, click to select the **Resource** to be monitored, Figure 1-12.
2. Click **Less**.
3. Expanded Stream Information is not displayed (example shows before clicking Less).



Figure 1-12: View Expanded Resource Stream Information

VLAN TAGGING

12. VLAN Tagging

Using a VLAN and VLAN tagging is an advanced application for use in networks where the web GUI interface must be accessed remotely over the streaming network facilities and where local physical access to the Device or a dedicated management network is not practical.

12.1 Chapter Contents

- [“VLAN General Information”](#)
- [“Support for VLANs”](#)
- [“Create a VLAN Using the Device GUI”](#)
- [“Create VLAN with MKIP Interface”](#)
- [“Application of VLANs”](#)

12.2 VLAN General Information

12.2.1 What is a VLAN?

In computer networking, a single layer-2 network may be partitioned to create multiple distinct broadcast domains, which are mutually isolated so that packets can only pass between them via one or more routers; such a domain is referred to as a virtual local area network, virtual LAN or VLAN (Wikipedia).

12.2.2 What is VLAN Tagging?

IEEE 802.1Q is the networking standard that supports Virtual LANs (VLANs) on an Ethernet network. The standard defines a system of VLAN tagging for Ethernet frames and the accompanying procedures to be used by bridges and switches in handling such frames. (Wikipedia).

12.2.3 What is the VLAN Numbering Range?

VLANs may be assigned a decimal number from 0 to 4096.

12.3 Support for VLANs

The Device supports VLAN tagging to enable the Management MGMNT physical port to be accessed across the streaming GbE network on a configured switch. This allows remote management of the Device without the problems associated with connecting the management port to an already congested network. Data packets intended for the management process are effectively partitioned from the streaming data.

Each of the Ethernet streaming ports support the creation of multiple virtual Ethernet ports which may be used to create VLANs. This feature may be used to allow both routing the streaming of the input and output video and management access to the GUI on separate virtual networks as if there were two separately wired physical networks installed. In VLAN tagging, the broadcast domain is extended across the VLAN as if the Devices in the group were all locally connected together.

By using VLANs, the video content and management access streams, while arriving together, are separated at the destination switch into two distinct VLAN groups, each routed to a specific physical port defined by the VLAN. In this way all streaming video will be routed to the video receiving Device and the management access will be routed to the management computer(s). In this way, only traffic intended for a given receiving Device will receive it. Since broadcast domains are extended over VLANs, all of the features of a broadcast domain are extended across the VLAN as well.

12.4 Create a VLAN Using the Device GUI

There are two ways to create the VLAN. This procedure shows using the Device GUI.

The VLAN can also be created by MKIP, see “[12.5 Create VLAN with MKIP Interface](#)”

To start, open the GUI and login, refer to Figure 1-1.

1. Click on the **Device** in Tree View to select it, Figure 1-1.
2. Click on **Ethernet Cards** tab.
3. Click **Add V-LAN** button on Tool Bar.

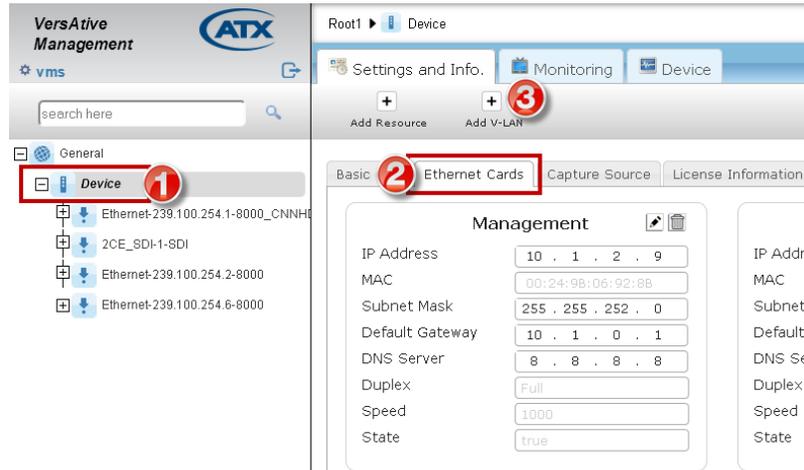


Figure 1-1: Adding New VLAN from GUI

4. In the new dialog that opens, enter the VLAN **Number**(VLAN tag) in the 'name' window, Figure 1-2. The full name will comprise the selected Ethernet port number plus the VLAN number or tag. In the example the selected physical port is eth1 and we entered 666 with the resulting full name in the GUI being eth1.666
5. Chose the output Ethernet **Interface** that the VLAN should appear on. Changing the phy port changes the name.
6. Enter the VLAN Ethernet address, mask and gateway.
7. Click **Add** button to add this interface but it is not added immediately in the GUI.

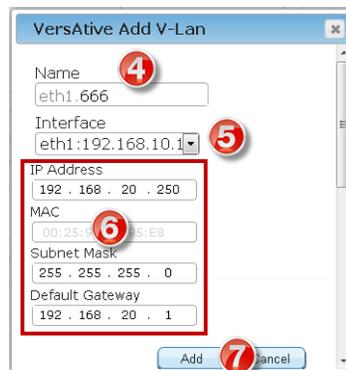


Figure 1-2: Edit VLAN Properties

8. Log out of the GUI then log back in again.

9. The new VLAN is listed with the other physical interfaces, Figure 1-3.

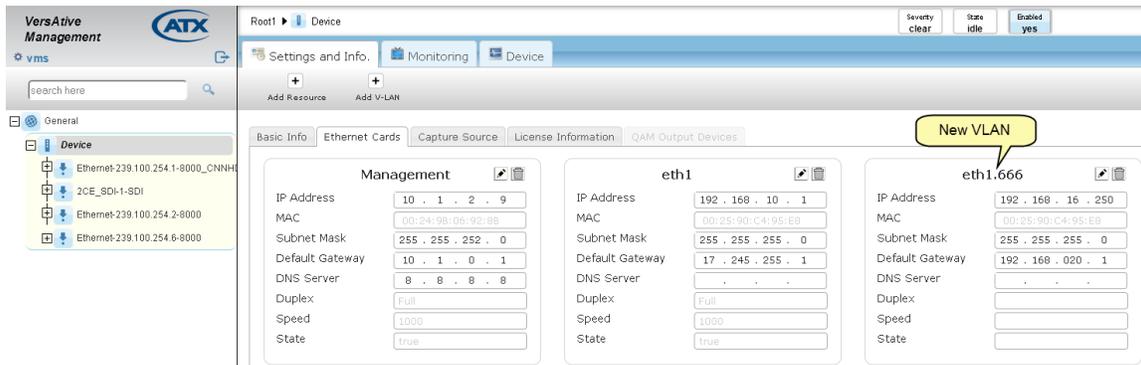


Figure 1-3: Newly Added VLAN displayed in GUI

12.5 Create VLAN with MKIP Interface

There are two ways to create the VLAN. This procedure shows using the MKIP Interface. The MKIP interface is accessed using an SSH client such as PuTTY which is shown here.

The VLAN can also be created in the GUI, see [“12.4 Create a VLAN Using the Device GUI”](#).

Procedure

1. Install and run PuTTY (or another ssh client).
2. Configure PuTTY (or other ssh client) with the IP address of the Device and use the default SSH port 22.
3. Log in with user: **mkip** and password: **123456**

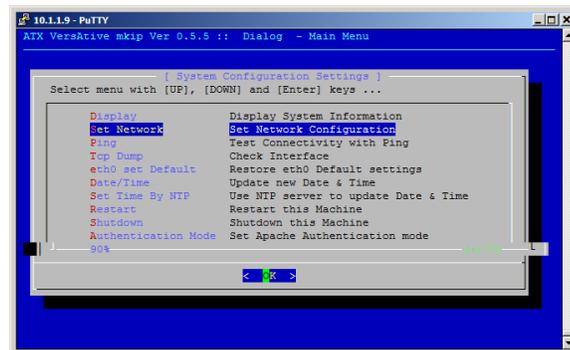


Figure 1-4: Select 'Set Network'

4. Once connected and access to the menu is attained, arrow down to **Set Network**, then click **OK**, Figure 1-4.
5. Select the **Streaming Ethernet Port** that a virtual port will be created on. Select **eth1**, **eth2**, **eth3** or **eth4**.
6. Click **OK** when the **eth'x'** is selected, Figure 1-5.

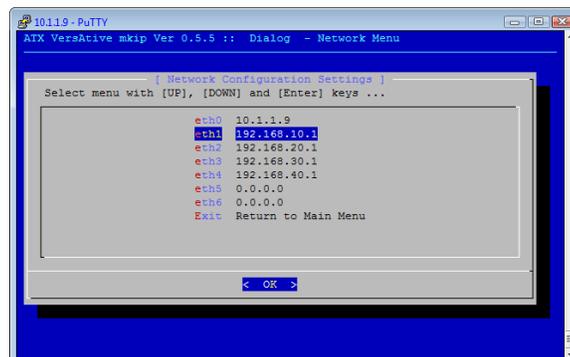


Figure 1-5: Select a streaming port

- Arrow down to select **Add Vlan**, then click **OK**, Figure 1-6.

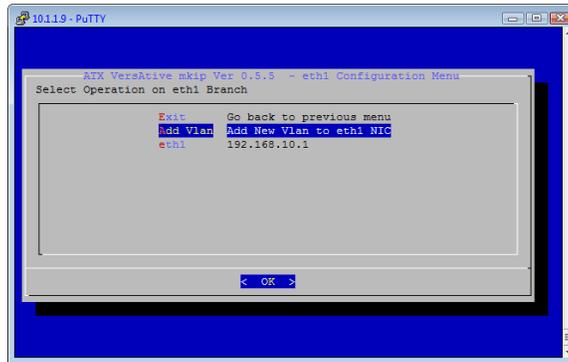


Figure 1-6: Select 'Add VLAN'

- A new page opens where a virtual interface can be named, Figure 1-7. (**vlan name** and **vlan tag** are synonymous).

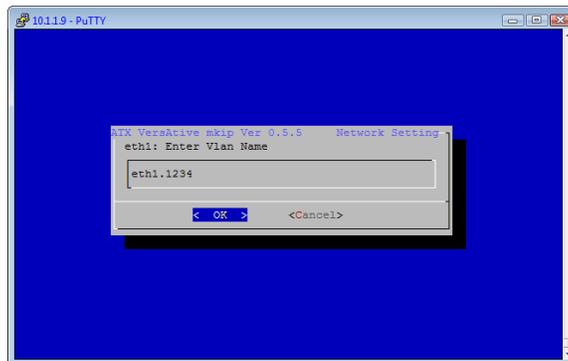


Figure 1-7: Enter vlan tag (name)

- Enter the vlan tag in the format ethx.xxxx where the **Ethernet port** is typed followed by a **dot** then the **vlan tag** in up to 4 numeric digits ranging from 0 to 4096. ie. **eth1.1234** shown in Figure 1-7. Alphabetic characters are not allowed.
- Click **OK** to accept, opening a new page for the **IP address**, (Figure 1-8). Enter the IP address and click **OK**.

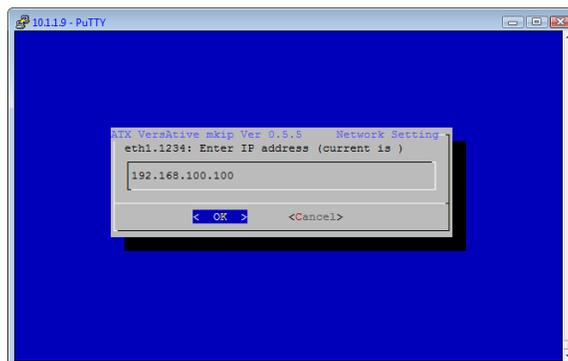


Figure 1-8: Enter VLAN IP Address

11. A new page opens to set the **vlan IP mask**. Enter the mask (Figure 1-9) and click **OK**.

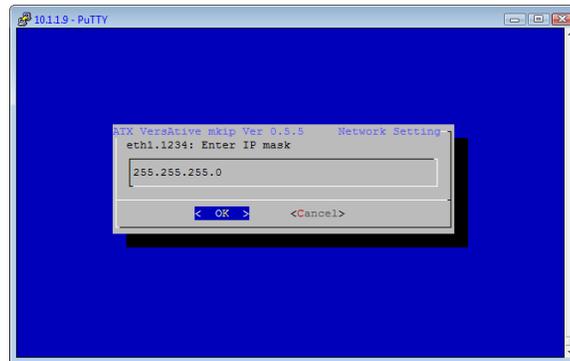


Figure 1-9: Enter VLAN IP Mask

12. A new page opens to set the default gateway. Enter the IP address of the gateway (Figure 1-10). Click **OK**.

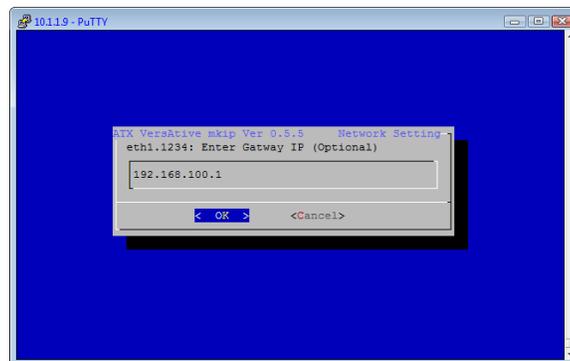


Figure 1-10: Enter Default Gateway IP

13. Before creating the VLAN check that the settings are correct then click **OK**, Figure 1-11.

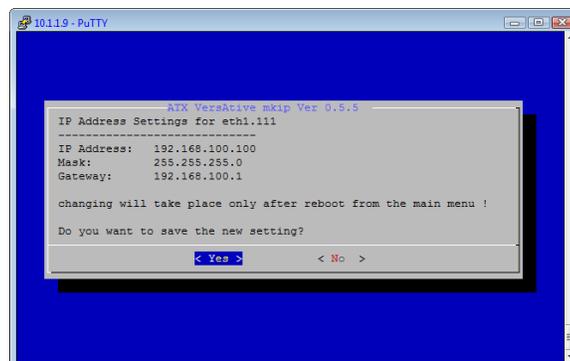


Figure 1-11: Check Settings then accept

14. After the VLAN is created, the VLAN will show in the network list for eth1 branch (in this example), Figure 1-12.

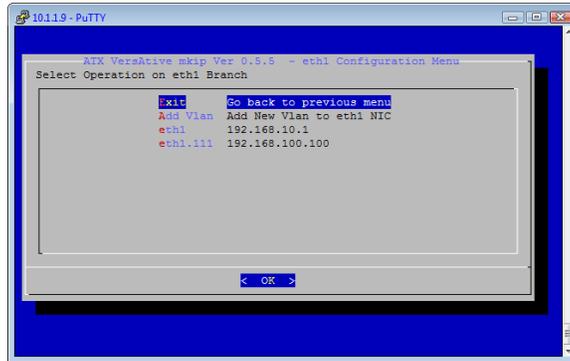


Figure 1-12: Added VLAN shows in list

15. The new configuration may be viewed with the **Display** menu item, Figure 1-13.

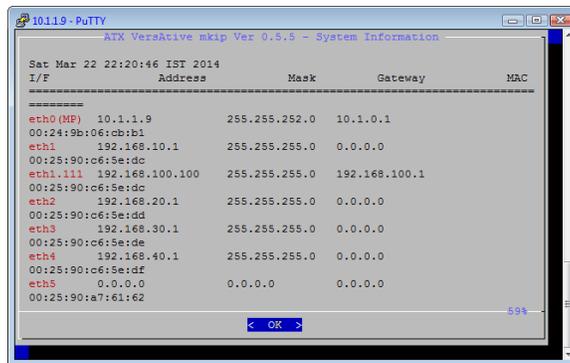


Figure 1-13: 'Display' shows new VLAN

16. When completed filling the requests a reboot from the main menu is required; select **Restart** and click **OK**.

17. After the restart of the server, the new VLAN will be displayed in the GUI on the Device>Ethernet Cards page as shown in Figure 1-14.

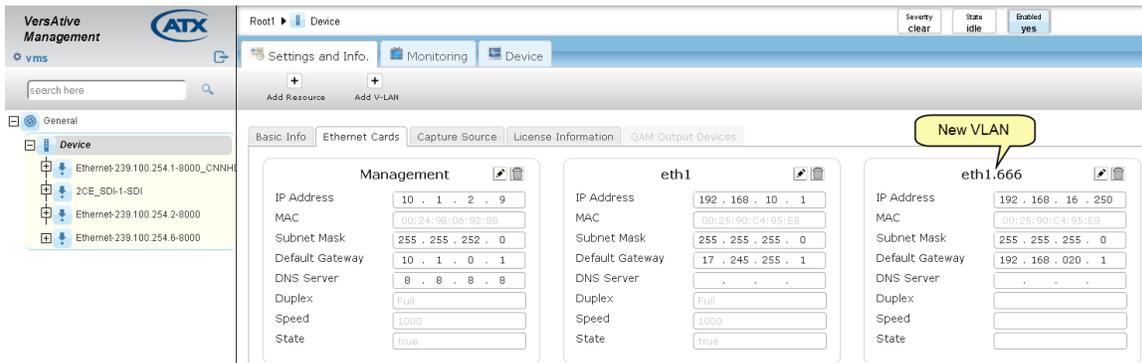
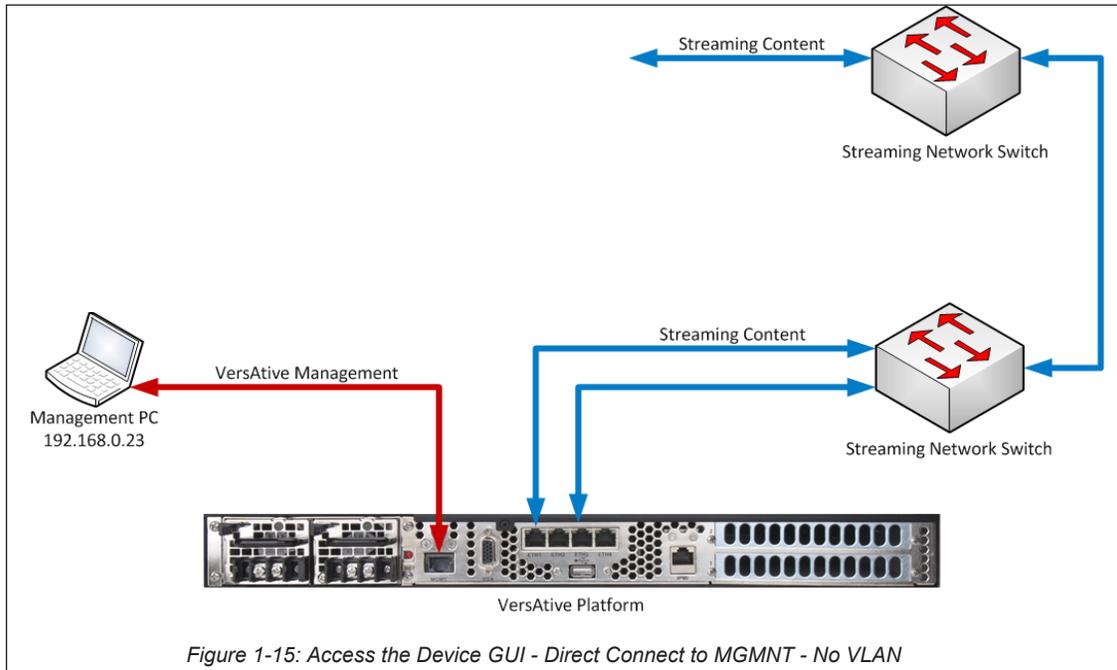


Figure 1-14: Newly Added VLAN displayed in GUI

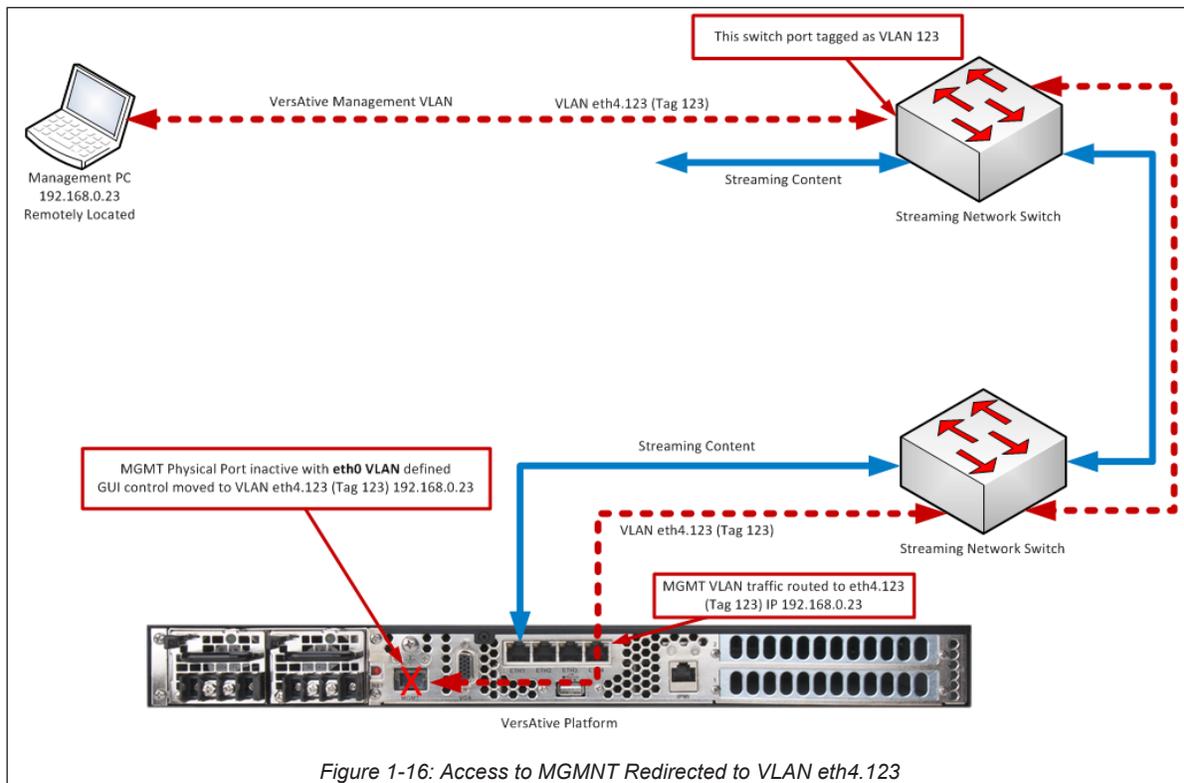
12.6 Application of VLANs

12.6.1 No VLAN

Without the use of a VLAN it is necessary to connect a Management PC directly to the MGMNT port, eth0, of the Device for configuration. This situation can be inconvenient if the Device is remotely located. This scenario is shown in Figure 1-15.



12.6.2 Management MGMNT VLAN



To overcome this limitation, a VLAN for the eth0 port may be created and the management GUI accessed anywhere in the streaming network. The VLAN tag assigned to the Device is likewise assigned to a convenient switch port. In the example in Figure 1-16, the streaming port eth4 is assigned a new virtual port name or **Tag** of 123. The physical switch port in the streaming network has a port tagged with the same Tag name 123 and thus any PC connected to this specific switch port may access the Device on the address assigned for it, which in this example is 192.168.0.23, the usual default address. Traffic of the streaming network is not sent to the port tagged 123 and likewise, traffic for management is only routed to the port tagged 123.

12.6.3 Streaming Network VLAN

In the same way that management traffic is partitioned to appear only on the management VLAN switch port, VLANs may be created to partition streaming traffic segments also. An example is shown in Figure 1-17. Three VLANs are created and all stream from the same Ethernet port eth1. Network trunk ports pass the streams and they exit from the predefined switch which is 'tagged' with the assigned VLAN tags.

Procedure

1. The virtual IP address is configured using the mkip SSH shell menus.
2. Streaming content is assigned to the created virtual interface.
3. The switch port is tagged with the VLAN tag name or number.
4. The content that is assigned to the virtual interface is 'tagged' with the name/number and then only appears at the switch port with a corresponding tag.

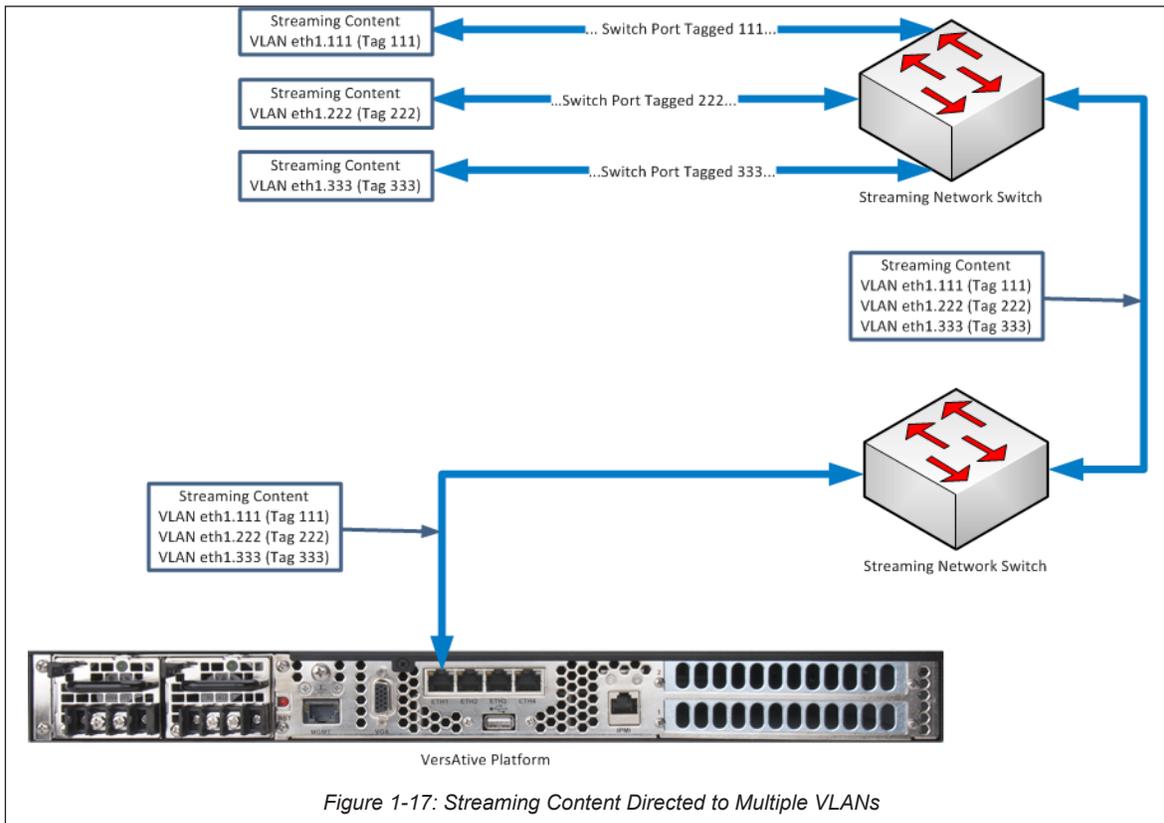


Figure 1-17: Streaming Content Directed to Multiple VLANs

MKIP SYSTEM SHELL

13. Mkip System Shell

The Device encoding/transcoding platform IP Addresses may be configured within the GUI but some features may also be configured with the built in shell interface which is called **mkip**. The mkip interface is accessed through an SSH protocol client such as PuTTY or by connecting a mouse, keyboard and monitor physically to the server. This chapter explains the configuration available within the mkip shell and assumes the connection is by SSH client PuTTY rather than physical connections.

13.1 Chapter Contents

- “SSH Clients Supported”
- “Connect Using Monitor, Keyboard and Mouse”
- “MKIP Shell Menu”
- “Menu - Display”
- “Menu - Set Network.”
- “Menu - Ping”
- “Menu - TCP Dump”
- “Menu - Eth0 Set Default”
- “Menu - Date/Time”
- “Menu - Restart”
- “Menu - Shutdown”
- “Menu - Authentication Mode”

13.2 SSH Clients Supported

Any ssh client may be used to access the shell menu, shown in Figure 1-1. Remember to set translation to **ISO-8859-1:1998 (Latin-1, West Europe)** otherwise lines may not be drawn properly. The SSH client may be installed on any convenient platform.

Use the following when logging in:

```
Username:      mkip
Password:     123456
```

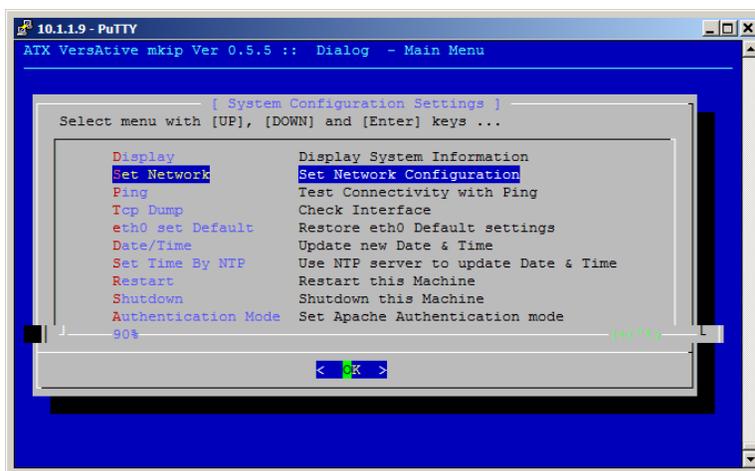


Figure 1-1: Mkip Shell Main Menu

13.3 Connect Using Monitor, Keyboard and Mouse

1. With the Device turned off, connect a VGA monitor to the rear panel VGA port.
2. Connect a USB keyboard and mouse to any of the Device USB ports.
3. Turn on the Device.

The monitor screen will display messages from the Device boot-up application. Once the boot process has finished and no further messages are scrolling up the screen, use the following key combination to access the IP settings screen: **Ctrl+Alt+F2**

- The monitor screen will display **login as:**
4. Use the following:

Username:	mkip
Password:	123456

You will be presented with the **MKIP System Settings** menu on the monitor which will be similar to Figure 1-4.

13.4 Connect Using SSH Client

It may be more convenient to use SSH than to connect a monitor. In this manual we demonstrate using PuTTY, an SSH client. A free copy of PuTTY is obtainable at <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>.

1. Start PuTTY and enter the Device default IP address (192.168.0.23) and SSH port number (22), Figure 1-2. If the address and port have been changed from default, use the applicable address and port.
2. Optionally, for the best display of line drawing, in the Window>Translation section, choose **ISO-8859-1:1998 (Latin-1, West Europe)**

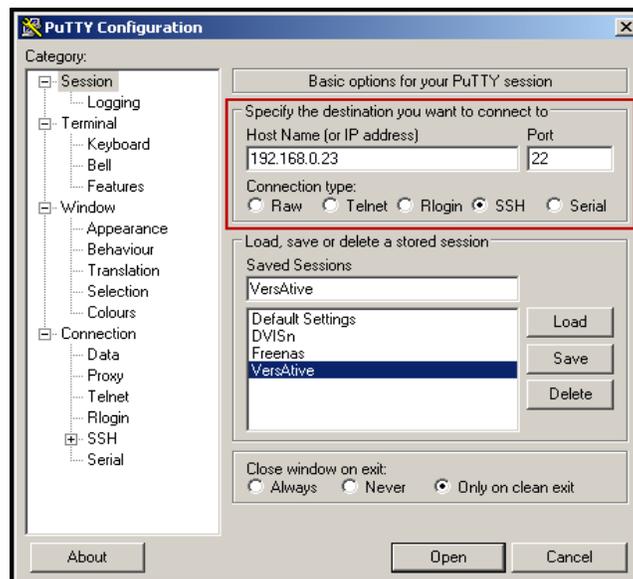


Figure 1-2: PuTTY Session

3. Click **Open**. You are presented with a login screen, Figure 1-3.



Figure 1-3: mkip Shell Login Screen

4. Use the following:

Username:	mkip
Password:	123456

After a short delay, you will be presented with the MKIP System Settings menu, Figure 1-4.

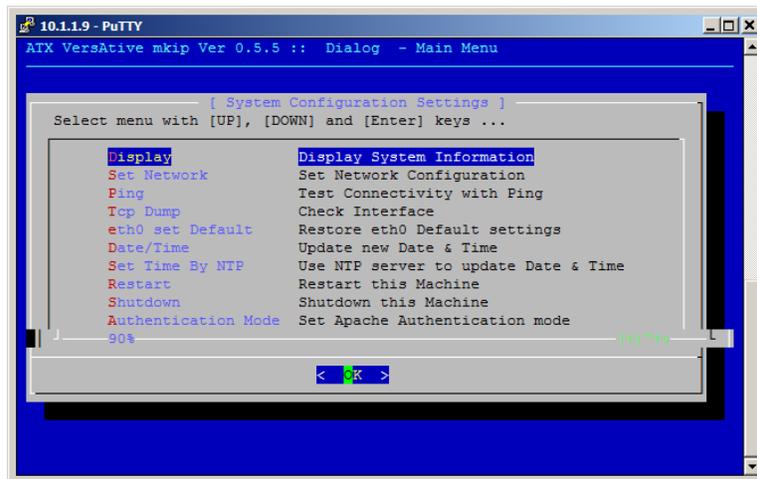


Figure 1-4: mkip System Menu

5. Navigate the shell menu in three ways:
 - Type the letter appearing in red font
 - Use the keyboard up/down arrows
 - Use a mouse left click
 - To select, either click **OK** or use keyboard **Return/Enter**

13.5 MKIP Shell Menu

There are a number of operations that may be performed at the mkip system shell menu as described in Table 13.5a.

Table 13.5a: MKIP System Shell Menu Choices

Setting	Keyboard shortcut	Description
Display	D	Displays system information such as all the IP addresses (including virtual addresses), subnet masks, gateways and physical MAC addresses.
Set Network	S	The IP address settings of eth0, eth1, eth2, eth3 and eth4. Also enables the addition of virtual interfaces, which are most notably used for VLAN tagging.
Ping	P	PING is a network interface utility to test connectivity to other network Devices.
TCP dump	T	Allows the user to check source multicasts on each of the ETH ports.
eth0 set Default	e	Restores all eth0 settings to their Factory Setting with the management IP address (eth0) set to 192.168.0.23.
Date and Time	D	Enter date and time manually. This disables NTP updates.
Set Time by NTP	S	Enter NTP server address to automatically set date and time and over-ride any manual settings. Time zone locale is set here also.
Restart	R	Causes the server to reboot.
Shutdown	S	Causes the server to immediately shutdown and not restart.
Authentication Mode	A	Sets the Apache Authentication mode between Local Authentication (Default) and use of a RADIUS Server.

13.6 Menu - Display

1. Click **Display** to choose to display system IP addresses, Figure 1-5.

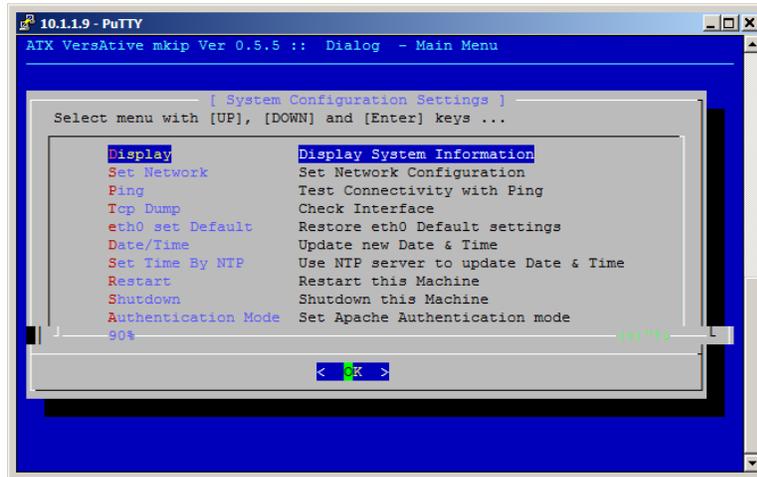


Figure 1-5: MKIP System Configuration Settings Menu

2. Click or select **OK** to open the information window, Figure 1-6.

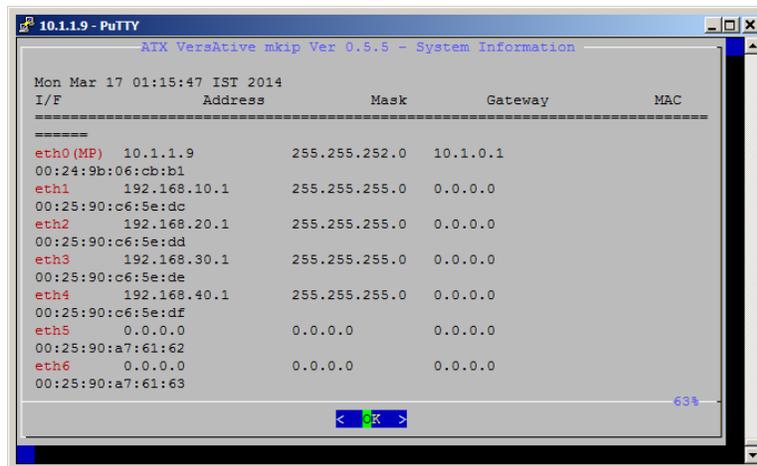


Figure 1-6: Display System Information

3. Click OK again to return to the **System Configuration Settings** Menu.

13.7 Menu - Set Network.

Set all network IP addresses here including creation of virtual addresses for VLAN tagging.

Setting the MGMNT IP address

1. Arrow down to **Set Network**, Figure 1-7.
2. Click **OK** to open the Network Configuration Settings page, Figure 1-8.

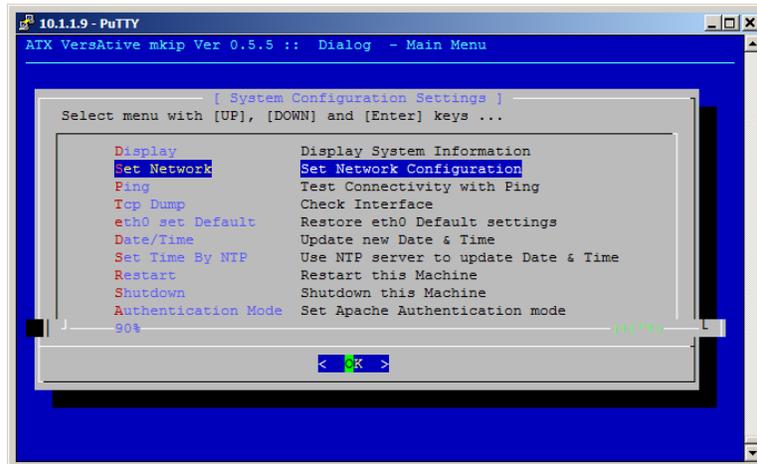


Figure 1-7: Set Network

3. The eth0 network is selected; click **OK** to set the eth0 IP Address (the MGMNT port), . This is a series of pages. Click **OK** each time to proceed to the next page in the series.

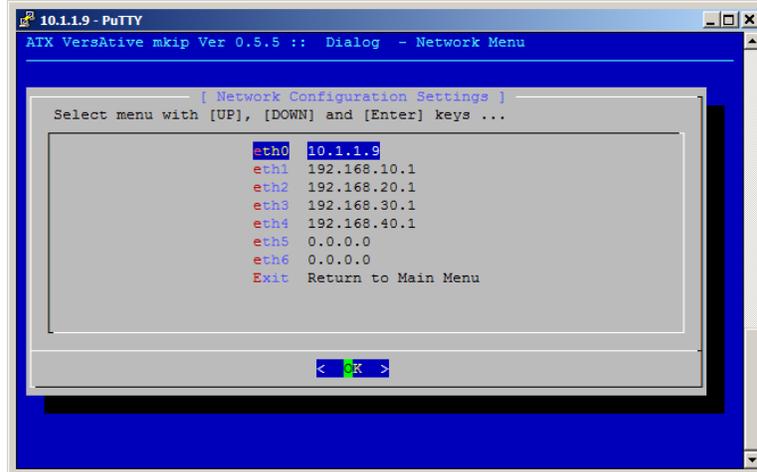


Figure 1-8: Choose Network

- A new page opens where a virtual interface could be added. Again select the physical **eth0** port and click **OK** to change the IP address settings, Figure 1-9.

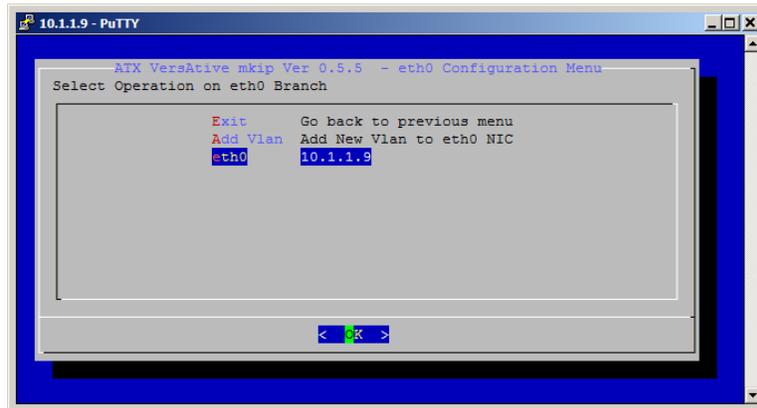


Figure 1-9: Set eth0 Network

- Enter the desired IP address, Figure 1-10.

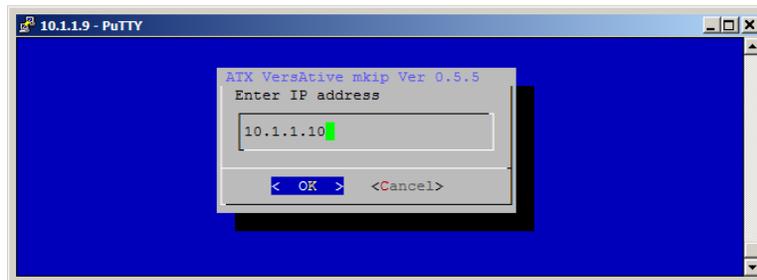


Figure 1-10: Set IP Address

- Set Subnet mask, Figure 1-11.

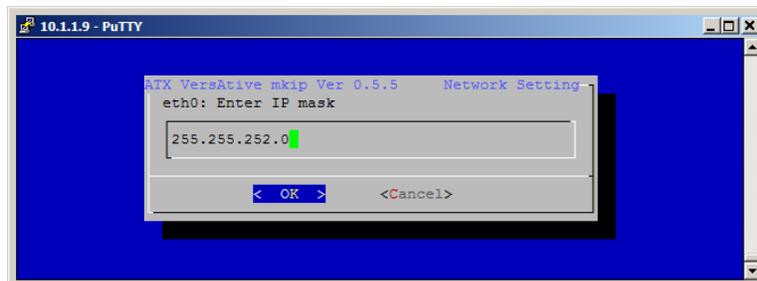


Figure 1-11: Set Subnet Mask

7. Setting the Gateway IP address is optional, Figure 1-12. This is usually the router providing internet access but if there is no router, do not enter any IP address.

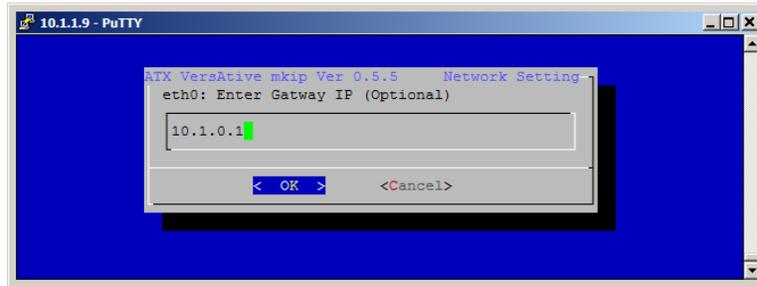


Figure 1-12: Set Gateway

8. If the default gateway IP address was set and this interface default gateway is not already the current machine default gateway, you are prompted next to set that, Figure 1-13. Select yes to set it as the machine default or no.



Figure 1-13: Set as Machine Default Gateway

9. When finished and you accept the changes, Figure 1-14, the server will reboot.

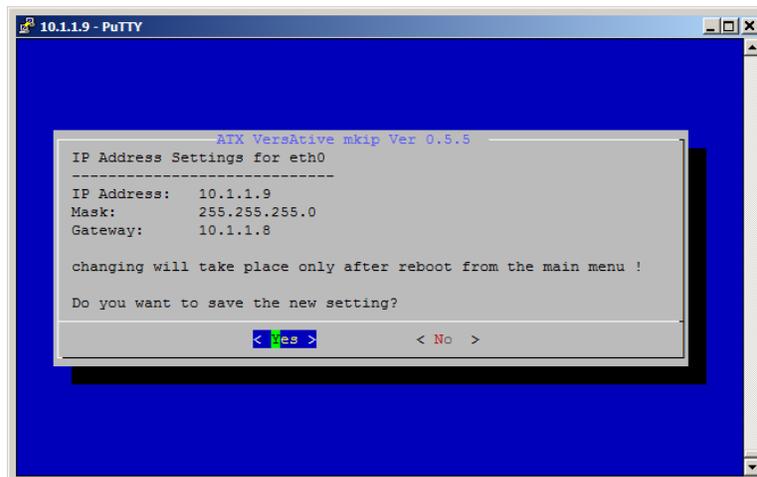


Figure 1-14: Save Settings

10. Reconnect on the new IP address, if changed.

13.8 Menu - Ping

The Ping command may be used to test connectivity between the Device and a remote machine. This is helpful when managing the Device remotely.

1. Arrow down to Ping menu item and click **OK**, Figure 1-15.

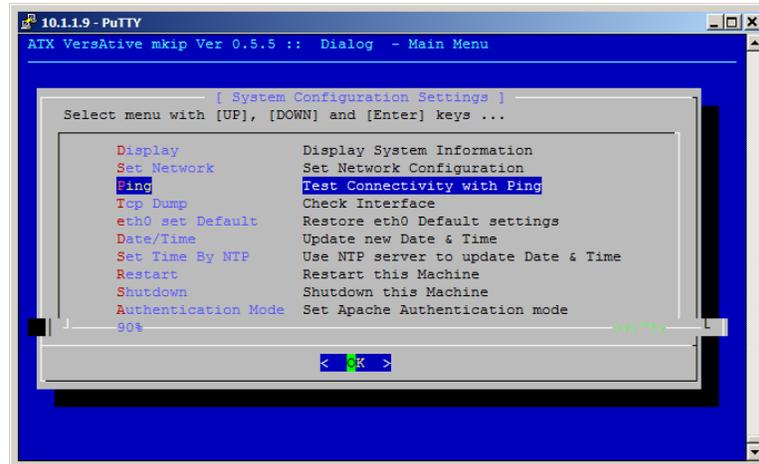


Figure 1-15: Ping

2. Enter a target address on the network or VLAN, Figure 1-16.

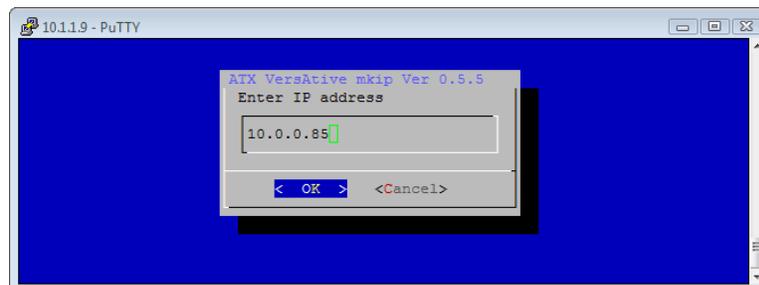


Figure 1-16: Enter target IP

3. Depending on the ability to reach the destination target address, one of the following results will be obtained.
 - If target is not reachable, Figure 1-17.

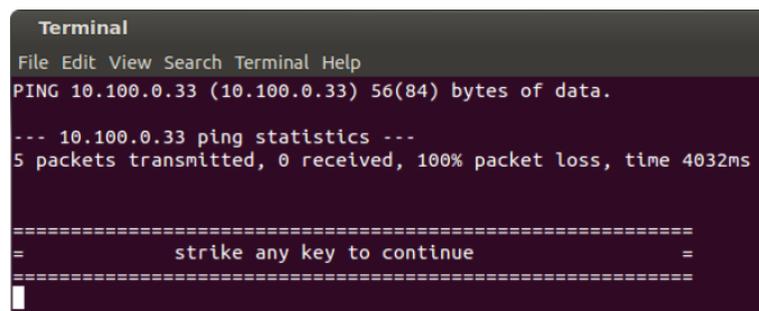


Figure 1-17: Output for no Connectivity

- If target is reachable, Figure 1-18.

```

Terminal
File Edit View Search Terminal Help
PING 10.0.0.85 (10.0.0.85) 56(84) bytes of data.
64 bytes from 10.0.0.85: icmp_req=1 ttl=64 time=0.459 ms
64 bytes from 10.0.0.85: icmp_req=2 ttl=64 time=0.347 ms
64 bytes from 10.0.0.85: icmp_req=3 ttl=64 time=0.212 ms
64 bytes from 10.0.0.85: icmp_req=4 ttl=64 time=0.459 ms
64 bytes from 10.0.0.85: icmp_req=5 ttl=64 time=0.359 ms

--- 10.0.0.85 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.212/0.367/0.459/0.091 ms

=====
=                strike any key to continue                =
=====

```

Figure 1-18: Output for Connectivity

4. Strike any key to return to the menu.

13.9 Menu - TCP Dump

Use this option to obtain a TCP protocol dump for troubleshooting interface issues and connectivity.

1. Select **TCP Dump** from the menu, Figure 1-19

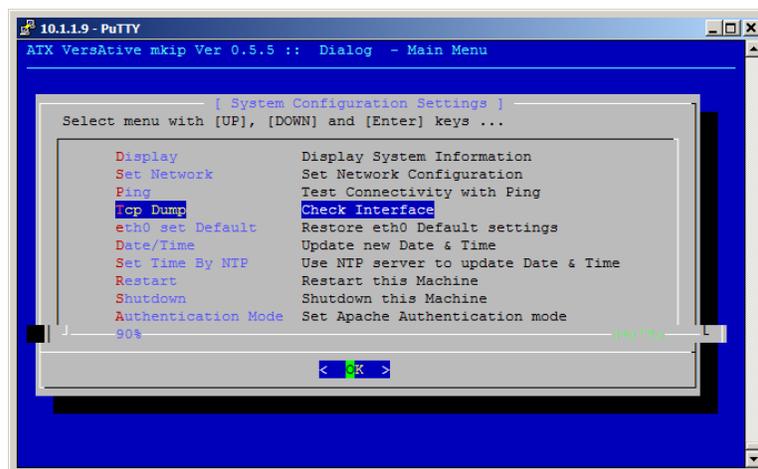


Figure 1-19: Select 'TCP Dump'

2. Specify a target interface by typing the interface name, Figure 1-20. Click **OK**.

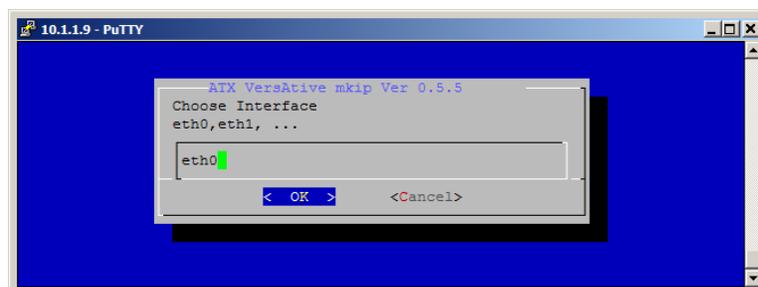


Figure 1-20: Select an Interface

3. A time limit for this dump must be specified in seconds, Figure 1-21. Click **OK**.

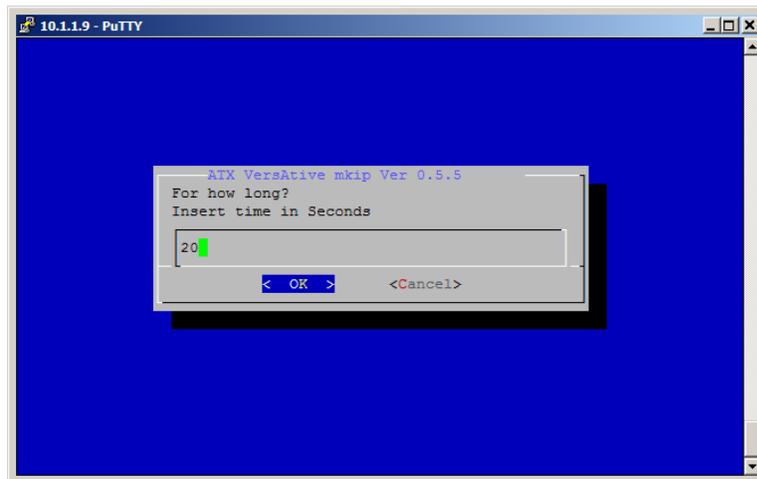


Figure 1-21: Enter a time limit

4. Receive the output of the TCP dump on your terminal session screen, Figure 1-22.

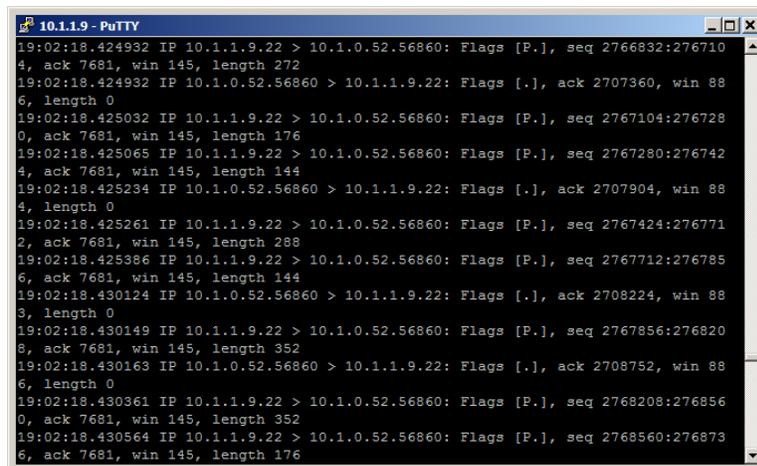


Figure 1-22: View the Dump Data

13.10 Menu - Eth0 Set Default

The current settings of the MGMNT management Interface eth0 may be set to factory default 192.168.0.23 with this option.

1. Select **eth0 Set Default** from the menu, Figure 1-23.

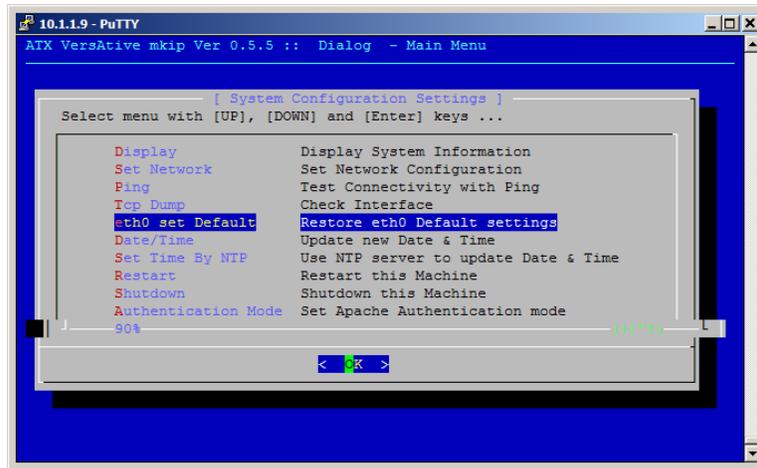


Figure 1-23: Select 'eth0 Set Default'

2. Confirm action, click **Yes**, Figure 1-24.

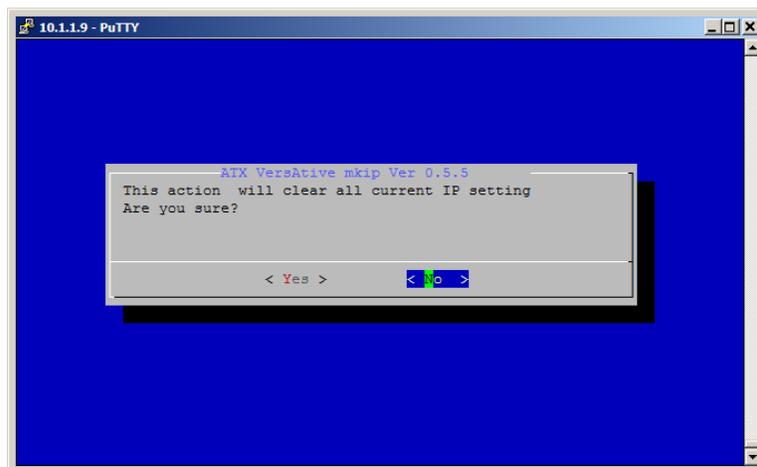


Figure 1-24: Confirm Restore eth0 to Default

3. The change takes place after a reboot. Log in again using 192.168.0.23.

13.11 Menu - Date/Time

The Device time may be set manually from this option. If a date and time is entered, the NTP server IP address, if entered, will be removed.

1. Select **Date/Time** from the menu, Figure 1-25.

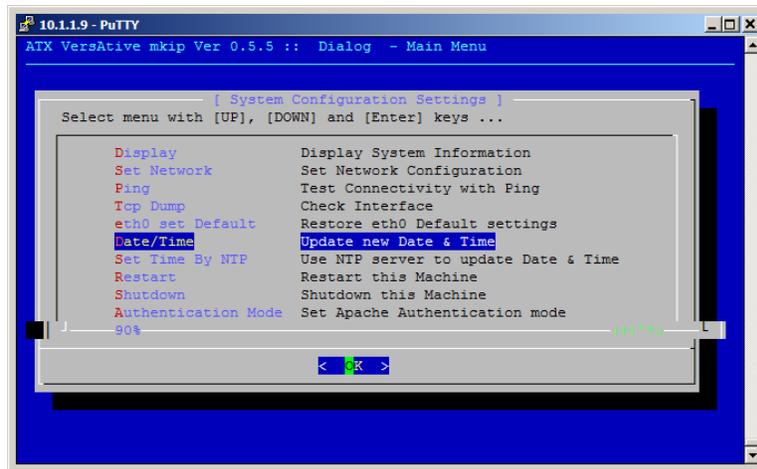


Figure 1-25: Select 'Date/Time'

2. Enter the time and date in the format: **Day Month Year HH:MM:SS** (Example **3 mar 2013 11:22:00**), Figure 1-26. Click **OK**.

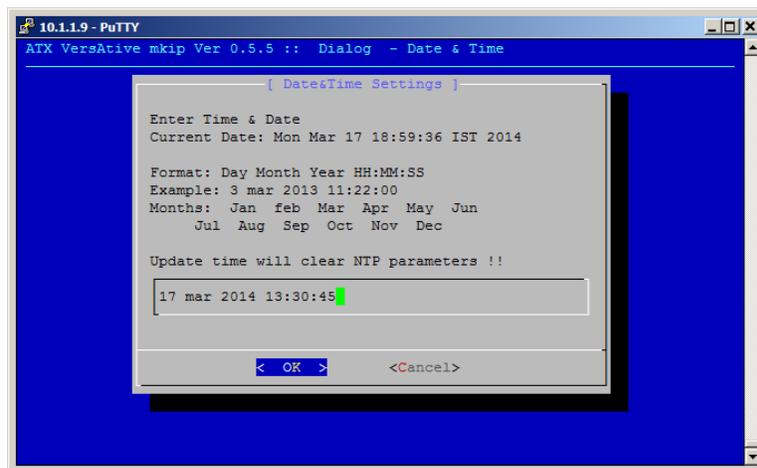


Figure 1-26: Enter Date/Time in correct format

3. Time will be set to the specified time and any NTP server IP addresses will be cleared.

13.12 Menu - Set Time by NTP

The Device time may be set to be updated by an NTP server. This is the only way to define the NTP server. It cannot be set from the GUI.

1. Select **Set Time By NTP** from the menu, Figure 1-27.

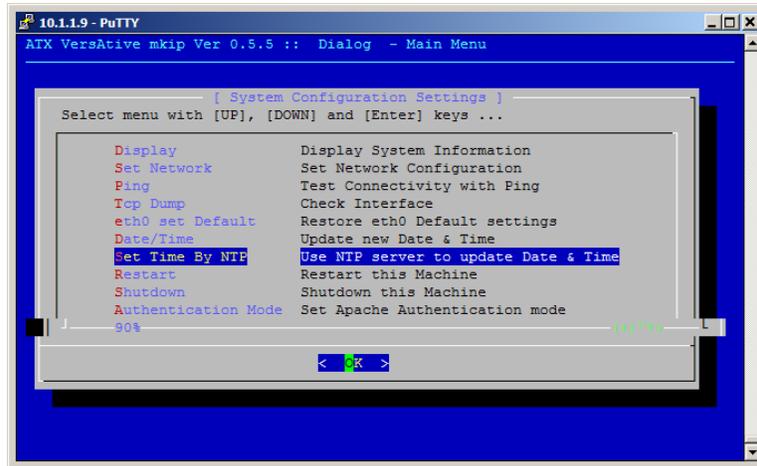


Figure 1-27: Select 'Set Time By NTP'

2. Enter the IP address of the NTP server. Do not use the url, Figure 1-28. Click **OK**.

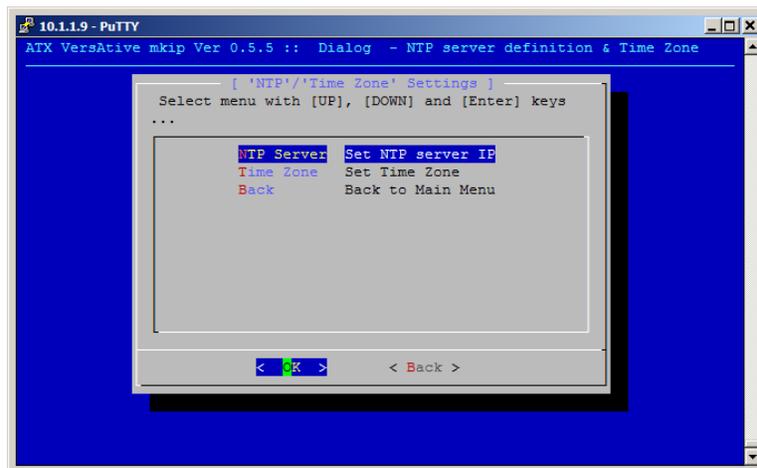


Figure 1-28: Choose 'Set NTP Server IP'

- In the open dialog shown in Figure 1-29, note the time zone that is currently set. If this time zone is incorrect then after setting the NTP IP address, you must also set the Time Zone from the menu next.

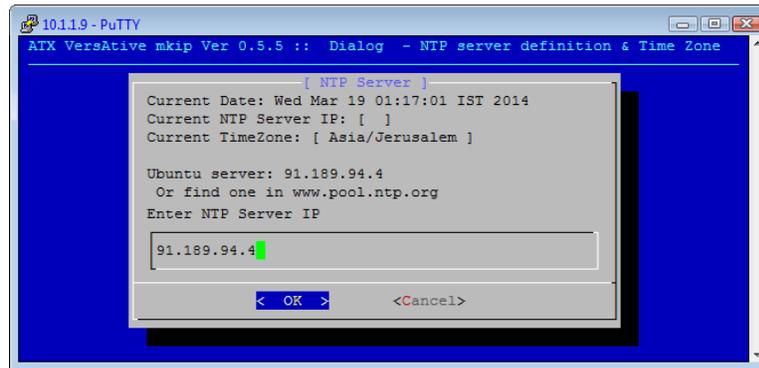


Figure 1-29: Enter the IP address

- If the time zone was incorrect, select **Set Time By NTP** again from the menu, Figure 1-27. This time choose **Time Zone**, Figure 1-28.
- Choose the geographic region for the time zone of the Device, Figure 1-30, then click **OK**.

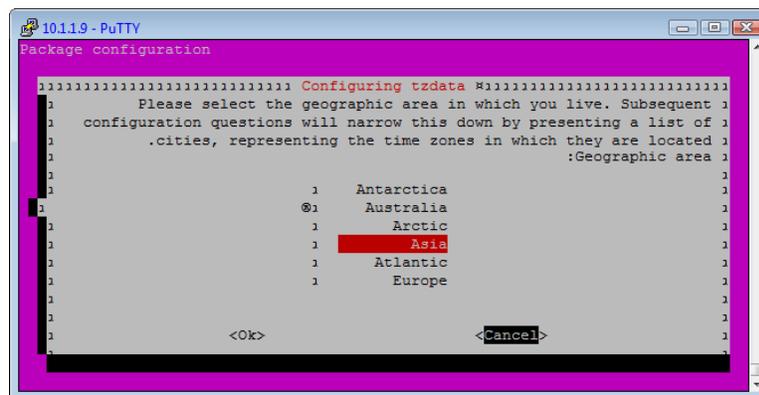


Figure 1-30: Chose Geographic Area

- Choose the local region of the Device, Figure 1-31. Click **OK**.

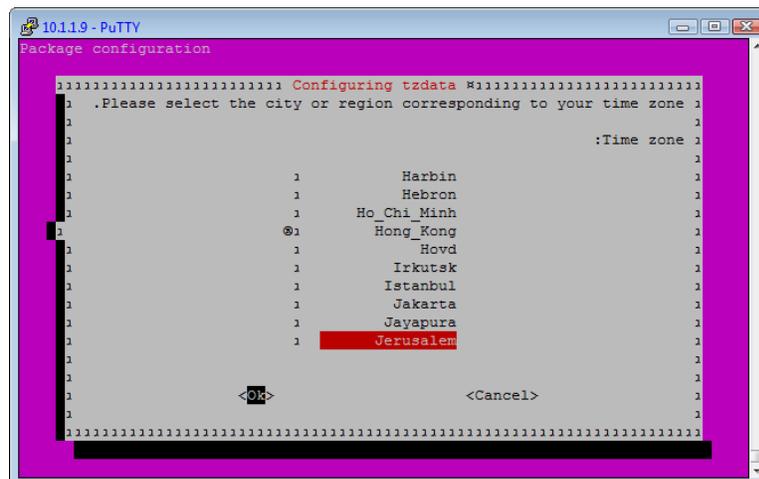


Figure 1-31: Choose Local Region

- Time will be automatically updated from the defined server.

13.13 Menu - Restart

Shutdown and restart the Device server from this option.

13.14 Menu - Shutdown

Shutdown the Device server from this option. The server will not restart.

13.15 Menu - Authentication Mode

Remote Authentication Dial In User Service (RADIUS) is a networking protocol that provides centralized Authentication, Authorization, and Accounting (AAA) management for users that connect and use a network service. RADIUS was developed by Livingston Enterprises, Inc. in 1991 as an access server authentication and accounting protocol and later brought into the Internet Engineering Task Force (IETF) standards. (Wikipedia).

Implementation

RADIUS Authentication is implemented in the GUI (Web and SSH). In this mode the Username and Password of the Web server will be defined on a RADIUS server. Mkip password for log-in through SSH will be defined also on the remote radius server. In this mode the Operator must configure, through 'mkip', several parameters for identification against the Remote RADIUS Server.

Local Authentication

GUI current and default mode.

In this mode The User name and the Password are as Usual and hard coded(Both the Apache2 username/password and mkip password).

Radius Authentication

In this mode the Operator needs to configure the parameters that mentioned above.

After the configuration done:

Web Username and Password are as configured on the Radius server.

Mkip password is as configured on the radius server.

Configurable Parameters

- Radius Server IP - RADIUS Server port
- Port number
- Secret Key - Secret key given by the RADIUS Server
- Time-Out Interval - Number of seconds trying to access RADIUS server before giving up
- Cookie-time - Number of minutes for which the cookie exists.

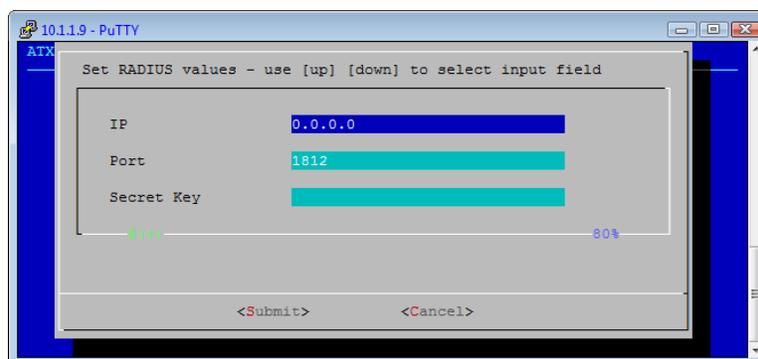


Figure 1-32: Configure RADIUS Settings

The Operator will need to add 2 Users to his RADIUS server.

1. mkip (the hard coded username) with password - For SSH access – mkip login.
2. Username and Password - For Web authentication.

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SERVICE & SUPPORT

14. Service & Support

14.1 Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products. Please contact ATX Customer Service to obtain a valid RMA number for any ATX products that require service and are in or out-of-warranty before returning a failed module to the factory.

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14.2 Warranty Information

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