Enabling AVB on Extreme Networks switches

This article explains how to perform some common tasks on Extreme Networks Summit series switches related to the AVB features. It is intended as a 'quick start' summary for small Tesira networks using one switch. For more details, including multiple switch considerations, please read the Using AVB with Extreme Switches article at extremenetworks.com.

For an overview on getting connected to the switch please see Connecting to an Extreme switch.

Preliminary setup

- Confirm the Tesira network topology is correct. Review the Tesira network infrastructure article if required.
- Confirm the Tesira devices are fully configured and discoverable in Tesira software.

Switch firmware

Extreme publishes their latest software release recommendations here.

AVB functionality is only supported on ExtremeXOS versions 15.3 or later. In the G2 family Biamp recommends firmware version EXOS 21.1.5.2 (patch 1-5) for mixed media networks. The latest Extreme firmware recommendations are available at ExtremeXOS Release Recommendations, however Biamp does not recommend the 22.x branch for our products at this time. To check the switch's firmware version(s), use either of the following commands:

- To show the running version:
  
  ```
  show version
  ```

- To show the primary and secondary image versions:

  ```
  show switch
  ```
AVB license

AVB support, including AVB, gPTP and MSRP commands, requires the **AVB Feature Pack**. A license is required to activate this feature pack. You will not have access to AVB commands if the license was not purchased and installed on the switch.

- To check that you have enabled a license related to AVB support.
  
  `show license`

  If the AVB license is installed "AVB" will be displayed under "Enabled Feature Packs:", as shown in the screenshot above. Other feature packs may also be listed.

  If you do not see "AVB" listed then the license must be enabled using the command shown below.

- To install the AVB feature pack

  `enable license <AVB license key>`

If required, please review the licensing procedure at [extremenetworks.com](http://extremenetworks.com).
Reset switch

If you are unsure of the current configuration on the switch and wish to start with factory settings, you can reset the unit.

- Clear the configuration with:
  
  `unconfigure switch all`

- When prompted, to confirm type:
  
  `yes`

The switch will reboot. You will be prompted to log in to the switch again after the reboot. You will then be prompted to set management security options, to accept the defaults press "q" as prompted in the CLI.

Enable AVB

- To enable AVB on all ports, enter the following commands:
  
  `disable flow-control rx-pause ports all`
  `disable flow-control tx-pause ports all`
  `enable avb`
  `enable avb port all`
  `disable edp port all`
  `save configuration`

The settings take effect immediately. Rebooting the Extreme switch will load the newly saved configuration from memory. Depending on system size it may take several minutes for switches to reboot and for streams to be established.

If there is a configuration loaded to the Tesira system AVB streams should now be active.

Note: The command `disable edp port all` disables Extreme Discovery Protocol. It can be left on if desired but may add unwanted network traffic in large installations. The CPU overhead should not be too great and it can be optionally left running without affecting AVB traffic.

- To only enable AVB on certain ports or only on those ports where an AVB device is present, use the following command as a guide. In this example ports 1, 5, 6, 7, and 12 are being AVB enabled. Use this in place of the line `enable avb port all`
  
  `enable avb ports 1,5-7,12`

  This can be useful when connecting the AVB network to a corporate network where traffic from AVB protocols may need to be limited. This will also minimize AVB messages from any unused AVB enabled ports when troubleshooting AVB network issues.
Adding Dante

If Dante will be used on the AVB enabled switch you will need to disable IGMP snooping. IGMP snooping is enabled by default. IGMP snooping will cause Dante clock discovery to fail. You will see multiple Master Clock devices shown in Dante Controller, the Dante devices will lose clock sync and latency will increase until audio stops. To resolve this issue apply the command:

```
disable igmp snooping
```

Link Layer Discovery Protocol (LLDP)

LLDP is enabled by default on all Extreme models except for the x440 (first generation) and the x460.

LLDP is required for successful PoE+ negotiation with the Tesira AMP-450P and Tesira TCM-1 family of products.

- To enable LLDP

  ```
  configure lldp ports all advertise vendor-specific dot3 power-via-mdi with-classification
  enable lldp ports all
  ```

Monitor AVB status

Once enabled, you can obtain information about the status of AVB traffic passing through the switch:

- To show active AVB streams:

  ```
  show msrp streams
  ```

There should be at least one 6.336Mb stream which is the pilot stream used by Tesira devices for AVB clocking and timing. The Stream ID will be end with ff:fe (hex equivalent of the stream ID 65534). This will be transmitted by the device with the lowest AVB port MAC address and received by all other Tesira AVB devices. This stream will be active even if Tesira devices are unconfigured or not part of the same system.
Troubleshooting

Other commands can be useful for identifying talker and listener ports and tracing stream activity. Adding the text `port <port number(s)>` to the end of the command string allows you to filter by one or more ports, rather than all. Some other msrp command variations are shown below.

```
show msrp
show msrp listeners
show msrp talkers
show msrp talkers ingress port <port number(s)>
show msrp streams propagation port <port number(s)>
```

- To show VLAN's being used:

  ````
  show vlan
  ````

  There should be a vlan called “SYS_VLAN_0002” which should have a list of the ports participating in AVB streams. Other commands for vlan include:

  ````
  show SYS_VLAN_0002
  ````

- To show details of MVRP and MSRP status:

  ````
  show avb
  ````

  The "show avb" command will provide details on:

  1. **gPTP status** : Enabled and and active " * " on connected ports. You should see "m" or "s" next to the port connected to AVB devices; all other ports will likely have the status “d” (disabled, from a clocking perspective). Tesira control ports will have a "d" status.

  2. **MSRP status** : Enabled and and active " * " on connected ports. You should see "a" or "ab" next to the ports connected to AVB devices. Tesira control ports will have active status " * " only.

  3. **MVRP status** : Enabled and and active " * " on connected ports.
To show gPTP status

```
show network-clock gptp
```

Use this command to view the gPTP properties of all ports, it is the same data shown under "show avb".

```
show network-clock gptp port <port number(s)>
```

Use this command to view the gPTP properties of one or more ports. It is useful for debugging when the summary "show avb" command shows that the port is not operational for gPTP.

• To show port usage

```
show port <port number(s)> statistics
show port <port number(s)> utilization
```

Once results are being displayed using the utilization command use the space bar (followed by enter) to toggle between % bandwidth and packets/sec.

Additional commands are available in this article from Extreme: [What-commands-can-be-used-to-troubleshoot-an-AVB-incapable-switch-port](http://support.biamp.com/)

### CPU monitoring

To enable CPU monitoring on the Extreme switches the following commands are used.

Enable CPU monitoring

```
enable cpu-monitoring
```
Review Tesira AVB status

Check is the **alarm** LED on the front panel of each Tesira device:

- Do any of the expanders have a red **alarm** LED? If so, they may have a problem passing AVB through the switch.
- Do any of the servers have a red **alarm** LED? If so, they may have a problem passing AVB through the switch. For a server, you can find the specific fault message(s) from the front panel LCD screen. To do so, navigate to the triangle exclamation mark icon, and press the Select button on the front panel.

Troubleshooting

If AVB does not work after the above steps have been done, do the following:

- Power down the Tesira devices
- Reset the switch to factory default
- Re-enter the enable avb commands
- Connect your Tesira devices to any switch port
- Power up the Tesira devices
- Perform the above show commands on the switch