BM-A1-64DANTE: Monitoring AES67 streams

AES67 is an open standard for Audio over IP (AoIP) interoperability between various established audio networking systems, such as Dante, RAVENNA, Livewire, WheatNet and Q-LAN.

AES67 is purely a solution to allow the transport of audio between these various networking systems, it does not include higher level components such as control or management etc.

While AES67 is understood to be the method of audio transport over IP, the standard does not specify a definitive method of how streams are to be discovered on the network. This has led to a degree of confusion as the established audio networking systems available do not all follow the same method of stream discovery. Therefore devices may all be AES67 compliant, but if discovery is not possible then configuring AES67 audio transport streams between them is not going to happen without a little help.

Dante's discovery method is based on SAP (Session Announcement Protocol). Therefore if using a device utilising this discovery protocol then any non-Dante based AES67 streams will be discovered if configured correctly. For AoIP products that use a different discovery method (such as Bonjour or SIP) an interface/ bridge application (whether hardware or software), or manual intervention would need to be implemented to allow discovery to take place (see **Interfacing to RAVENNA** further in this document).

Configuring Dante for AES67 operation

AES67 support was incorporated into Dante Controller from v3.6.2.4 onwards. It is always best practice to use the latest version of Dante Controller, and this can be accessed via our Support page at: http://www.beldigital.com/support.php. See Dante Software Download.

As discussed in the previous chapter, support of SAP (Session Announcement Protocol) is required for AES67 streams to be discovered. If not, then Dante Controller will be unable to discover the AES67 streams coming from the those device(s) unless some bridging application is initially employed.

AES67 Check List

For AES67 to operate correctly on the current Dante platform, the following conditions should be observed.

- Multicast streams are only supported at present.
- Up to a maximum of 8 channels per stream.
- Multicast IP addresses for the multicast streams must be in the range of 239.69.0.0 – 239.69.255.255. This applies to multicast streams transmitted to and from the Dante device.
- The supported sample rate must be 48 kHz.
- 24 bit linear encoding (L24) is only supported. This applies to multicast flows transmitted to and from the Dante device.
- Receiver latency must be set to 2 ms.
- AES67 only operates on the primary network. Redundancy is not currently defined.
- Minimum network connection speed of 1Gbps is required.

BM-A1-64DANTE AES67 Configuration

1.   With the BM-A1-64DANTE connected to the network, open the AES67 Config tab for the monitor in Dante Controller and click on the **Clear Config** button. This will clear all settings on the BrooklynII card (including card name).

   Note: If no *AES67 Config* tab exists, then you will need to update the BM-A1-64DANTE firmware (including the Audinate BrooklynII card). See http://www.beldigital.com/support.php for full details.

2.   In the *AES67 Mode* box, select **Enabled**.

3.   The default Address prefix in the *Tx Multicast Address Prefix* box is '**69**'. Even though the BM-A1-64DANTE is just receiving multicast AES67 streams, the setting of the prefix in this box is very important. Any received AES67 multicast streams <u>must</u> also be set to the <u>same</u> value. Therefore do ensure that the prefix of all received streams are a) identical and b) match the prefix set in this box. If you need to change the prefix then enter the new value and click **Set**.

4.   Click the **Reboot** button.
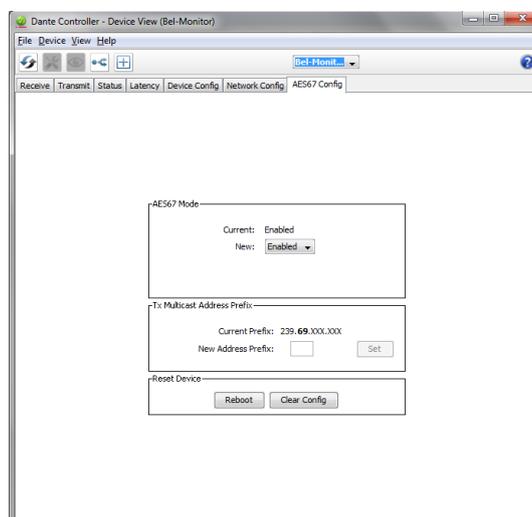
Note: As the BM-A1-64DANTE is only a receiver there is no need to configure any AES67 multicast transmission streams in the Transmit tab.

Configuring Non-Dante Devices for AES67 operation.

As discussed elsewhere in this document, ensure where possible that the non-Dante devices support SAP for automatic discovery of the AES67 streams in Dante Controller.

These devices will need to be configured to transmit AES67 multicast streams. See their relevant user guides for details on how to configure them correctly.

Interfacing to RAVENNA

RAVENNA is an AoIP audio networking system that is commonly found in broadcast environments. It is fully AES67 compliant, however its method of device discovery is different to that of Dante devices. Fortunately though, a free and very useful Windows-based converter application between RAVENNA and the SAP protocol has been developed by ALC NetworX, called RAV2SAP. This software converter monitors both RAVENNA and SAP session announcements and translates them allowing RAVENNA-based AES67 multicast streams to be discovered by Dante Controller and vice versa. (**Note:** the Ravenna stream must be configured to include the AES67 payload. It doesn't as standard. Please consult the necessary user manuals to see how this is achieved.)

Links to this useful application can be found on the Bel support page: http://www.beldigital.com/support.php To download this application, registration on the Ravenna Support Page is required.

AES67 Synchronisation

As can be imagined, synchronisation across different AES67 audio networks is important. There are various options that can be employed, but the situation is somewhat simplified with the BM-A1-64DANTE as it is just an audio monitor rather than a transmitting device. Therefore in this instance the master clock would generally be derived from the main non-Dante based system. To configure this follow the procedure below:

1.   On the non-Dante system, ensure that the PTP v2 Master has a priority of between 1 and 100, and is configured to use the "Media Profile" clock settings instead of "Default Profile" if there is an option. Dante devices do not support the "Default Profile".
2.   On the BM-A1-64DANTE, disable "Preferred Master" and "Sync To External"
3.   The BM-A1-64DANTE (if the only AES67 enabled Dante device in the network) will be selected as the boundary clock between the two audio network systems and will be set as the Dante Master.

Tip: if you want to check that the non-Dante PTPv2 clock is being generated and is locked then install and run the Merging Technology software application '*Ravenna/AES67 Virtual Audio Device*'. This has a real time PTP clock lock indicator (it may be small indicator, but can save you a lot of time tracking down any clocking issues).

AES67 In Operation

Once AES67 has been configured, operation through Dante Controller is much like using standard Dante devices. The key difference is that any incoming AES67 multicast stream will be displayed in blue text on the routing matrix instead of the usual black text. Also, instead of a device name being displayed, it is the multicast descriptor being displayed. This is because Dante Controller is not seeing the non-Dante device(s), but just the AES67 multicast stream(s) being transmitted from it.

These multicast streams can be patched to the BM-A1-64DANTE in the usual manner.
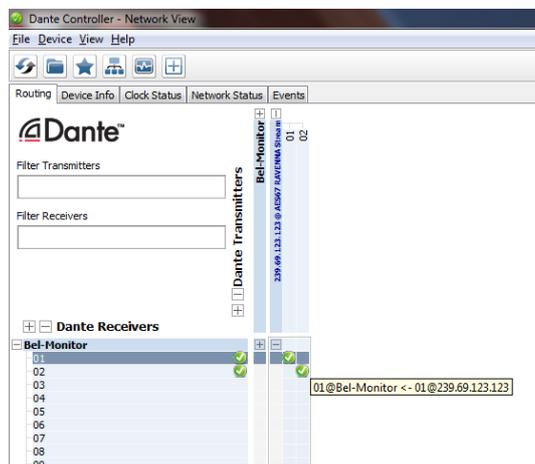
Note: The BM-A1-64DANTE can support any mix of Dante and AES67 streams, therefore it is possible to simultaneously monitor any combination of Dante and AES67 channels (up to the maximum 64ch) at any one time.

Importantly, the multicast IP address(es) is retained upon power-cycles, therefore if the non-Dante units do the same then there is no need to run any discovery program the next time the system is powered. Everything should be remembered and audio should flow.