Solutions for an 80-channel network with three destinations

A common application question from installers is "how can I get more multicast bundles on my RAVE network?" This document provides some solutions to this concern for both repeater and switched network installations. The network in this application example consists of 80 unique audio channels destined for three separate locations in a large venue. The graphics in this document do not show all of the network wiring and audio flow. Instead the visuals indicate units belonging to a given LAN or VLAN through color-coding. Each of the three destinations on the network are separated at the bottom of each graphic and each show membership to an appropriate LAN or VLAN segment.

For the purpose of this document, RAVE 161, 161s and 161s-24 are synonymous. The same is true of the RAVE 160 series. It should also be noted that this document is applicable to all RAVE transmitters including the AES/EBU models.

Possible Options

1. Run three independent networks on a managed Ethernet switch.

   Creating three virtual local area networks (VLANs), each with its own CobraNet conductor, can do this. If communications is in one direction only, five RAVE 161 products will be needed to accommodate 80 channels of 20-bit audio. Figure 1 shows the network configuration.

   The RAVE 161 units are multicast transmitters and are shown at the top of the figure. The RAVEs with the bold perimeters are CobraNet conductors. Each conductor connects to a separate VLAN on the Ethernet switch, which is shown in the middle of the diagram. All units in Figure 1 are color-coded. The color depicts the group of units belonging to a particular VLAN. Routing between CobraNet transmitters and receivers, as well as between end nodes and the Ethernet switch, is implied via the color-coded group. The yellow receivers at destinations 1, 2 and 3 all belong to the yellow VLAN and connect to the appropriate ports on the network switch. The same is true with the green and blue receivers and VLANs. It

should be noted that all 80 channels of multicast audio are present at each of the three destination points… the point of the application.

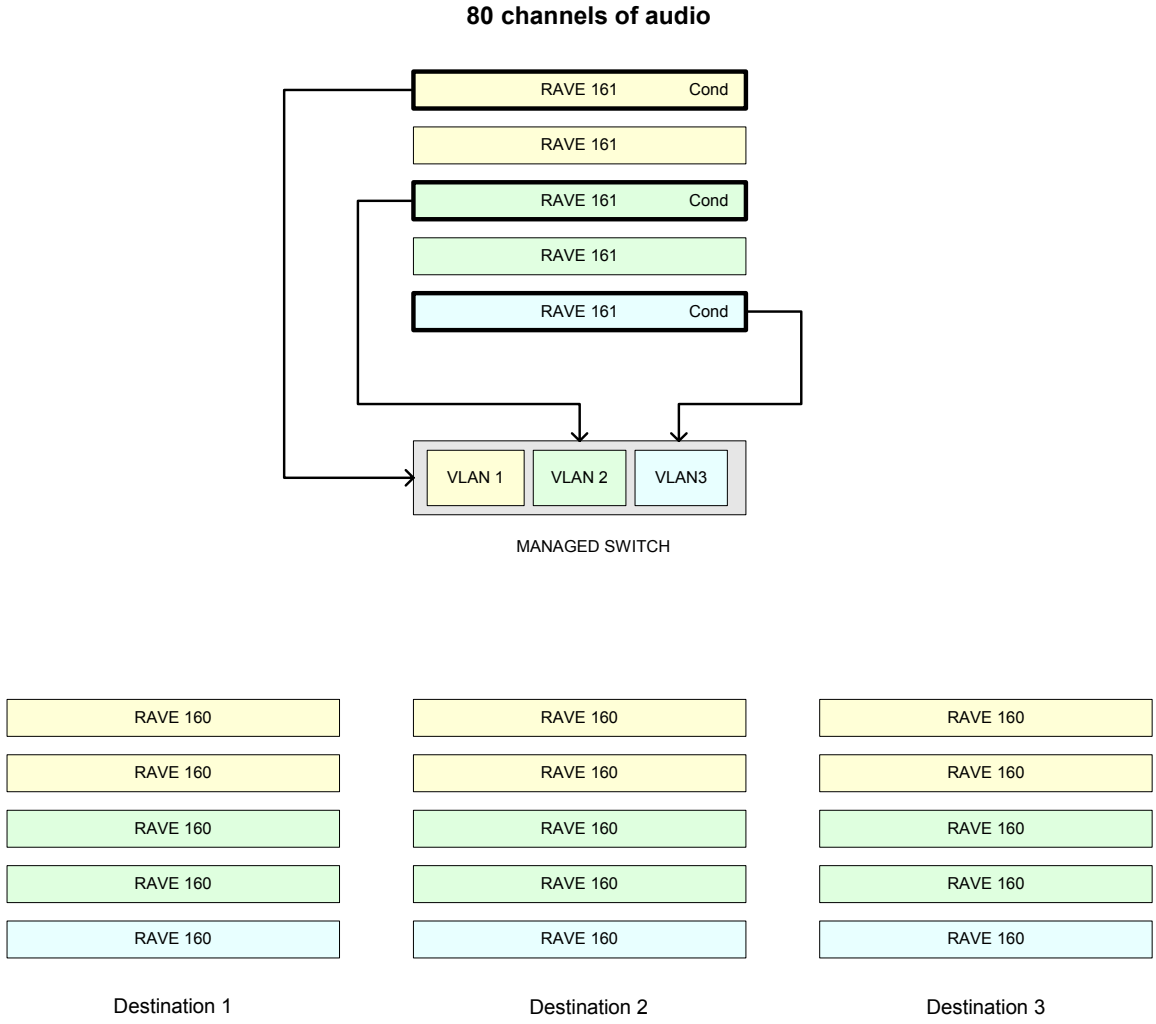

Figure 1

2. Run three independent, but synchronized, networks on a managed Ethernet switch.

The network design shown in Figure 1 can be modified so that all units are synchronized to the same clock. This may be necessary if the network consists of AES/EBU RAVE models or there is an external need for system synchronization. An example of this is to feed the "Sync Output" of the yellow conductor and feed it to the "Sync Input" of the green and blue conductor units. The green and blue

conductor units must be configured for external synchronization mode. External sync can be configured via hardware, by setting the RAVE's left front panel rotary switch to "8" or above. Software configuration is also possible through assertion of the "syncConductorClock" management interface (MI) variable. (Refer to the CobraNet Technology Datasheet, on the Peak Audio website, for more details on MI variables).

3. Run one switched network with multicast and unicast bundle delivery.

Since there is a 4-bundle limit to multicast audio delivery on network switches, the remaining 6 bundles must be delivered via unicast transmission. It is possible to copy audio channels via software within the RAVE 161 units. When full bundle copies are made, the result is that the original 8 channels of audio (input at the rear panel connectors) will be delivered on one unicast bundle while the copied 8 channels are delivered on a separate and unique unicast bundle.

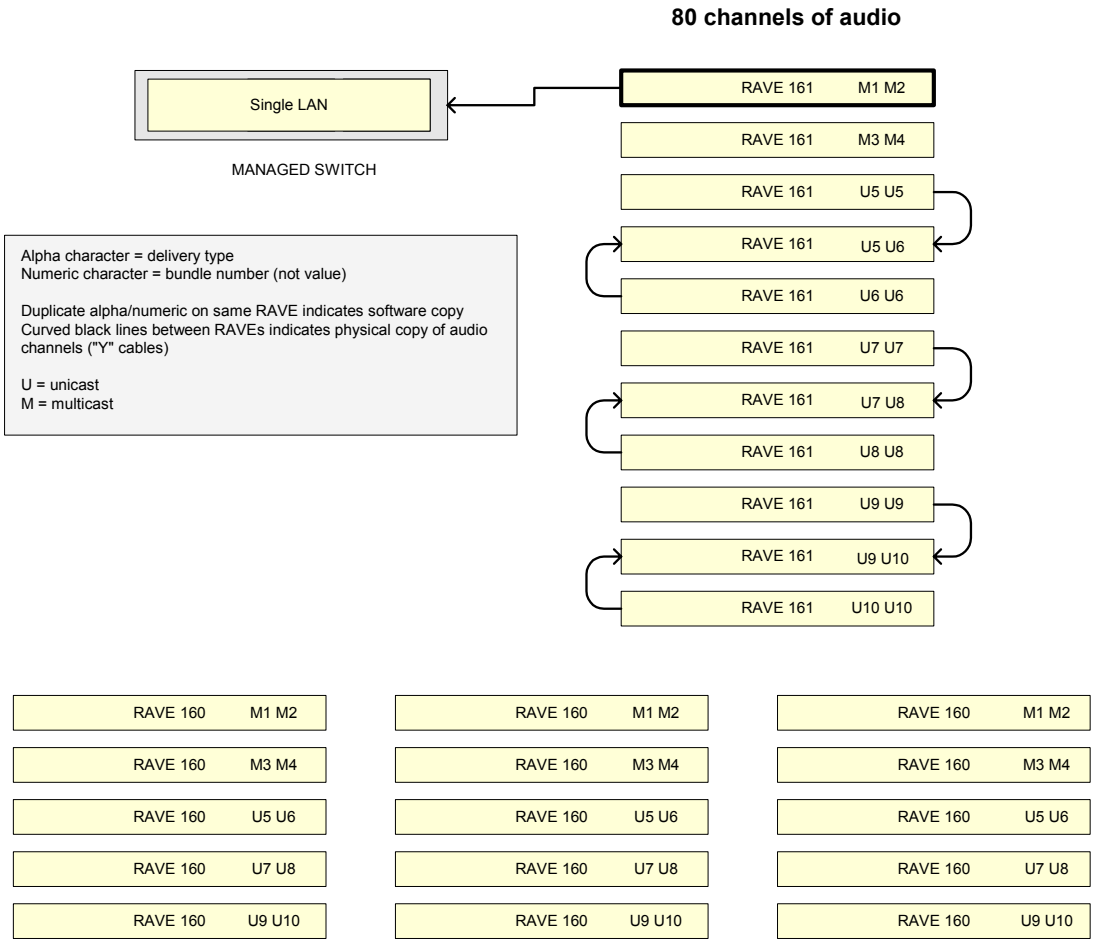

Figure 2

When there are 3 or more destinations, there is no choice but to split some of the physical signals externally. This can be done with a console, splitter box or "Y" cables. Figure 2 shows the network diagram for a switched network with a single conductor and single LAN.

In Figure 2, all RAVE devices belong to the same LAN. There are obviously more units required due to the unicast requirement. Each RAVE device shows two designators indicating the delivery type and bundle reference. The delivery type is shown with an M for multicast and a U for unicast. The bundle reference is shown at the transmitter and receiver. Note that multiple instances indicate channel copies, either through software or signal splitting. Figure 2 shows that the top two RAVE 161 units are delivering all of the multicast bundles. There are six additional RAVE 161s that each deliver a unique bundle and a software copied bundle. The remaining three RAVEs have physical bundle copies that are required for the third destination.

4. Run two independent repeater networks.

This is probably the easiest solution to implement and the least expensive. However, it required a dedicated audio network. Although CobraNet-specific control and monitoring are possible, we don't recommend the use of repeater networks implementing this configuration.

Note that repeater networks are multicast by design and can accommodate 8 bundles (64 audio channels at 20-bit resolution) reliably. Figure 3 shows the network diagram for an 80-channel solution on two repeater networks. Again, color-coding is used to show the independent LANs. CobraNet conductors are again shown with bold perimeters.

5. Run two independent, but synchronized, repeater networks.

As discussed in solution 2 above, it is possible to synchronize the secondary repeater network to the first network. This is accomplished by feeding the "Sync Output" of the CobraNet conductor on one network into the "Sync Input" at the rear panel of the conductor on the remaining repeater LAN.

The conductor that is synchronizing its local clock to the reference source at the "Sync Input" must be configured for external synchronization mode. External sync mode can be configured via hardware, by setting the left front panel rotary switch to "8" or above, or through software assertion of the "syncConductorClock" management interface (MI) variable.

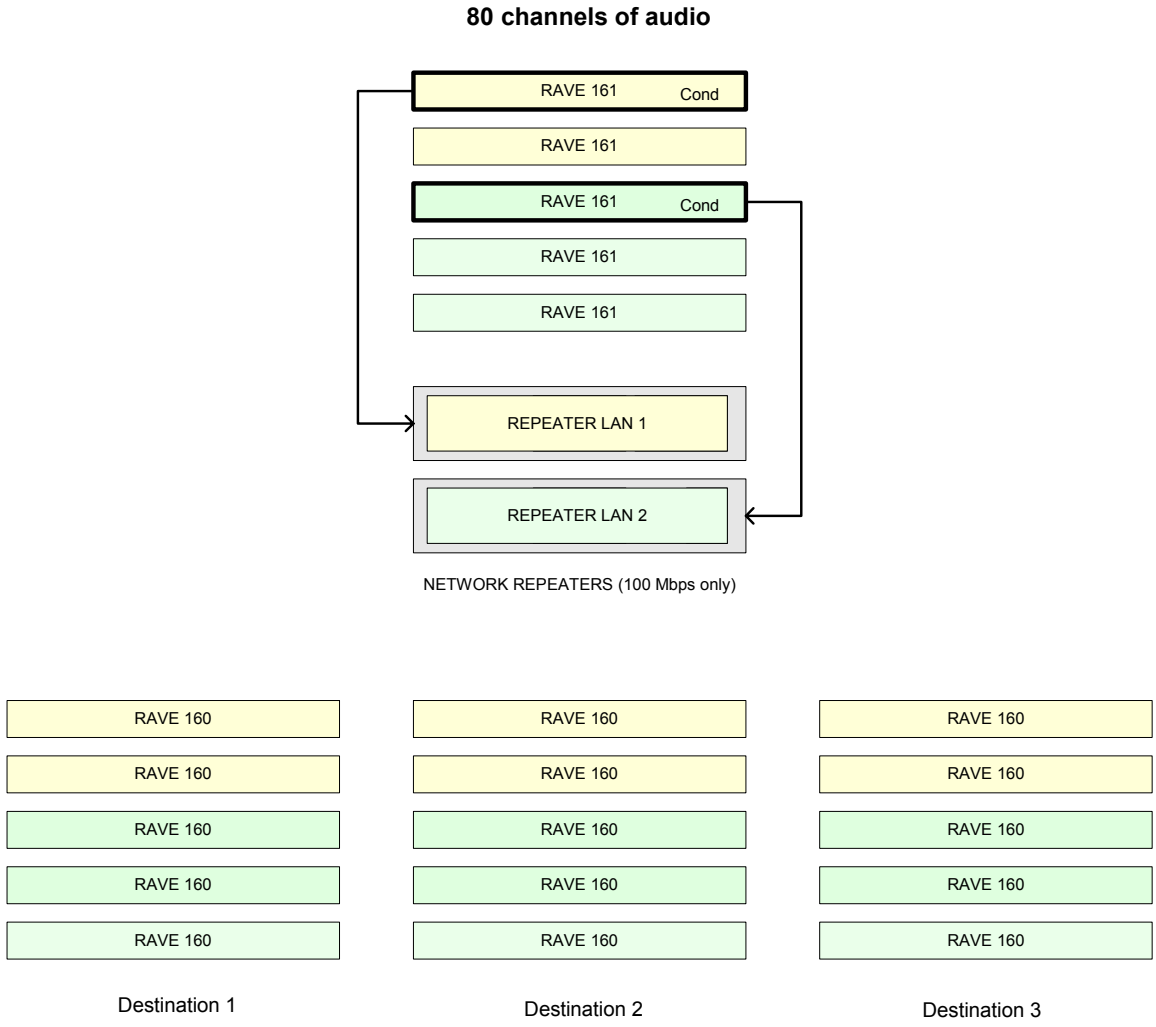

Figure 3