

Network recommendations for Anubis

Having correct IP addresses is crucial for audio-over-IP, and there are specific rules to follow.

To communicate together, the network devices must have a unique IP address, and those addresses have to be in the same range. E.g, device 1 is using [192.168.0.9](#) and device 2 is using [192.168.0.39](#) : the devices can connect together, it's in the same range. But if device 2 is using [10.0.0.47](#), it won't be able to communicate with device 1.

Nowadays computers and devices are usually set to automatically get an IP address, and it works fine if there is only 1 network connected.

If there are several networks/network adapters, each network must have its own IP address range, otherwise the system won't know on which network it has to send the data (unless specific exception, for example when "teaming" several adapters, but that is currently not supported on Merging devices). E.g, network 1 is using [192.168.0.9](#) and network 2 is using [192.168.0.39](#) => Not OK
But if network 2 is using [10.0.0.47](#), the device will be able to communicate on both networks properly.

By default, Merging RAVENNA/AES67 devices are using the [169.254.xxx.xxx](#) range, which is usually not used for standard data or home networks. Therefore, if the devices are set to automatically get their addresses, you can have both the audio network (on adapter #1) and the data network (on adapter #2) your computer without further IP address configuration.

Note : all mentioned network adapters, switches and devices are Gigabit Ethernet (1Gb).

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Network topology Scenarios

One Computer and one Merging RAVENNA/AES67 device

- Simply make sure that both devices are set to Automatic IP configuration, whether the connection is direct or through a network switch.

One Computer - one data network - one Merging RAVENNA/AES67 device

- 2 network adapters required, each one connected to its own network.
- On your computer, check that both networks are on different IP range.
In case you need to change one of the network, the RAVENNA/AES67 network is probably the easiest one to modify.
Remember you will have to manually set the IPs on both the Merging device (Anubis, Horus or Hapi) and the computer network adapter connected to it.

One Computer - several Merging RAVENNA/AES67 devices

- 1 network adapter required
- For this configuration you will obviously need a network switch.
For high track count or advanced routing, the switch should be a managed switch validated for RAVENNA/AES67 network (see Appendixes)
- All devices should be set to Automatic IP configuration

One computer - one data network - several Merging RAVENNA/AES67 devices

- 2 network adapters required, each one connected to its own network.
- You will need a network switch to connect the RAVENNA devices on the computer "audio" network adapter.
For high track count or advanced routing, the switch should be a managed switch validated for RAVENNA/AES67 network (see Appendixes)
- On your computer, check that the audio and data networks are on different IP range.
In case you need to change one of the network, the RAVENNA/AES67 network is probably the safest one to modify.
Remember you will have to manually set the IPs on all the RAVENNA/AES67 devices and the computer network adapter connected to it.

One computer - one data network - several Merging RAVENNA/AES67 devices - all on a single network switch (VLAN)

- You will still need 2 network adapters on your computer, but it is possible to connect the audio and data networks on the same switch. The switch must be configured in 2 Vlans. This particular switch configuration splits the network ports into 2 virtual networks, completely isolated from each other. Such configuration is only possible for Managed switch. Merging provides such configuration files for its validated switches (see Appendixes). Please note that the 2 VLANs
- 2 network adapters required, each one connected on separate VLANs.
- As above, check that the audio and data networks are on different IP range, and modify your IP addresses if required.

Single network adapter

- It is still possible to get your data network and RAVENNA/AES67 devices on 1 single network adapter. But there are some limitations : high track count and/or sampling rate will not be possible (glitches or drops may occur, depending on the network traffic and computer performance), and only Unicast connections should be made (therefore no advanced routing possible).
- Please set all devices to Automatic IP configuration.

How to view and configure the IP addresses

Computer configurations

Please follow the procedure on this page, for Windows or MacOS computers.

Merging RAVENNA/AES67 devices

On Horus and Hapi devices, browse to the Setup > Network page.
 On Anubis, browse to the Home page > Settings > General - Network section
 For further details, refer to the device user manual

Appendixes

Managed network switches

Managed switch shall be understood in this context as a switch with configurable parameters such as Multicast (IGMP snooping), and QOS (Quality of service).
 Merging keeps a list of validated switches for RAVENNA/AES67 networks, with configuration guides to help you set it up.
 Please follow this link to view the list and configuration guides.

Network Firewall

Applications (DAW or MediaPlayers) have to authorize them self in the computer firewall.
 If you have firewall issues, you will have to allow your application in the firewall.
 Merging products automatically creates such authorization during their installation, but if you are using third party applications, you may have to do it manually.

RAVENNA network general recommendations

Consult this page for general recommendations and good practice.

Subnet mask

Subnet mask can be used to create sub-networks, for example to isolate devices.
 When setting IP addresses manually, Merging recommends that you let the operating system configure the subnet mask automatically.
 For example, with device 1 set to 169.254.1.20 and device 2 to 169.254.10.20 :
 with a subnet mask on 255.255.255.0, the devices won't have access to each other, device 1 will have access to other devices using 169.254.1.X address, device 2 to devices using 169.254.10.x
 with a subnet mask on 255.255.0.0, the devices will be able to communicate.
<https://en.wikipedia.org/wiki/Subnetwork>

Unicast and Multicast connections

Unicast: from one source to one destination i.e. One-to-One
Multicast: from one source to multiple destinations stating an interest in receiving the traffic i.e. One-to-Many
 Multicast audio connections allows several nodes to "listen" to a single source, but the network configuration must be multicast capable (managed switches) and properly configured (otherwise there will be audio issues, or no audio at all).
 Unicast network configuration is much simpler, and does not require advanced configuration.
 But Unicast audio requires to create 1 source per destination, while Multicast allows to have 1 single source to be sent to several destinations, which changes the network bandwidth used.
 If you have to connect 2 devices together (e.g. 1 Anubis and 1 CoreAudio Mac), you can use Unicast, whether the physical connection is direct or through a standard gigabit network switch (unmanaged).
 If you have more than 2 devices to connect, but are not sharing any modules between the devices, you can also use Unicast. A typical setup would be a Hapi sending its AD Mic inputs into your DAW, and your DAW sending its outputs into Anubis for Monitoring purpose.

If you have more than 2 devices to connect, but need to share modules between the devices, you have no choice but to use Multicast. For example, if you want to send a Hapi AD Mic inputs into your DAW and also in a backup recorder, or if you want to monitor a Hapi AD Mic inputs in Anubis and record those in your DAW.