

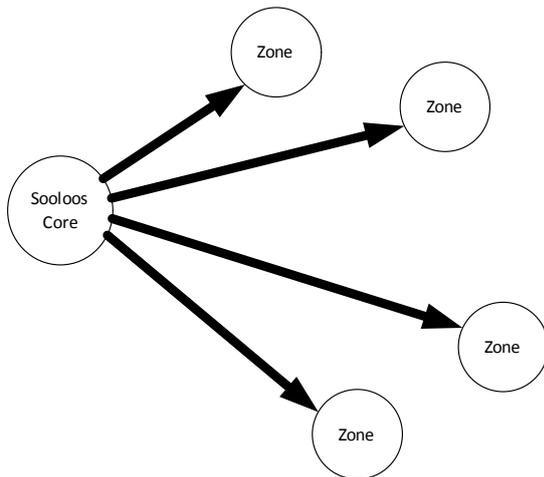
## Sooloos Zone Linking & Multicast

### What is 'multicast'?

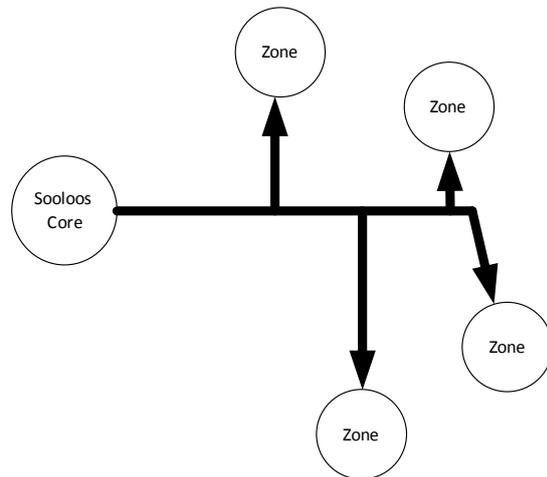
Normally when you stream audio from a server, the player (such as a Source component or a Sooloos ID40 card in an 800-series product) establishes a one-to-one connection with the server to deliver the audio - this is called 'Unicast'.

IP multicast is a method of sending Internet Protocol (IP) data packets to a number of receivers in a single transmission - most often employed for streaming media. It is a technique for one-to-many and many-to-many real-time communication over an IP infrastructure in a network.

### Unicast



### Multicast



### Why is necessary to use a multicast compliant router in a Sooloos Digital Media System?

Our Zone Linking feature takes advantage of Multicast technology to distribute audio to multiple zones efficiently.

If more than one player requests the same material, an additional unique stream has to be created between the server and the player. This is less efficient, increases bandwidth requirements and can lead to issues including buffering problems and loss of playback, especially in larger systems.

## What benefits does multicast streaming bring to Sooloos?

With Multicast, each player notifies the server that they wish to listen, and the server tells the player to look for data that's unique to the selected stream.

All the players listen for the same identifier and the network delivers the same data to all of them, a bit like tuning in to digital radio. Multicast can improve bandwidth throughput and helps to maximise audio quality and reliability.

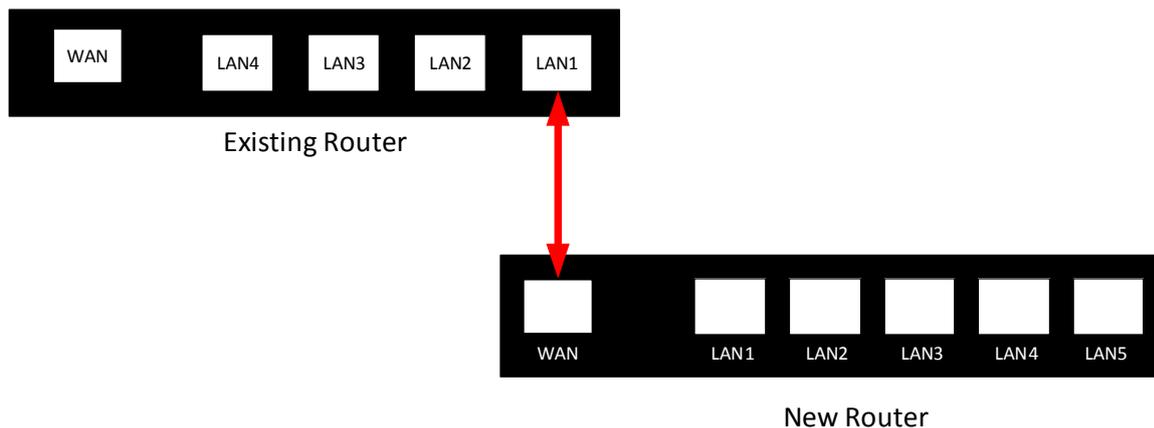
## Is there anything else I should be aware of?

We have found that some wireless routers have difficulty operating in the presence of even low bandwidth Multicast streams, while other routers handle it without issue.

Our tests have shown that some dual-band (2.4/5GHz) 802.11n WiFi routers work fine, but others do not. Some routers allow you to configure a setting called 'Multicast Rate'. This often defaults to 'high' (dense), but if set to a lower value (sparse), potential problems can be avoided by adjusting the value until the system works.

## What if my Customer already has a router e.g. provided by their ISP?

If a customer has a router which cannot be removed e.g. ISP-supplied and mandatory such as Sky, then the suggested option is to create a new network which can be connected to any original router via its WAN port:



Before carrying out this configuration a clear understanding of advanced networking issues such as Network Address Translation and how this affects things such as UPNP devices may be required. Depending on the environment that the Sooloos system is being installed into, this may require the engagement of a network specialist.