Technical Article

Pump up the Volume by Streaming Audio with a Wi-Fi® Mesh Network

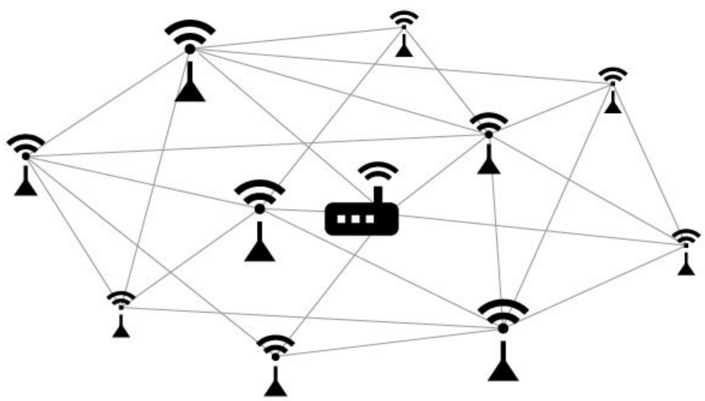
Maxim Altshul

Wireless audio appeared a few years ago, and has been progressing and improving since then. In recent years, manufacturers have turned to Wi-Fi® as a method to transfer audio data which makes a lot of sense for the following reasons:

- Wi-Fi throughput is very high compared to other wireless standards.
- It has a longer range than other connectivity technologies commonly associated with audio streaming.
- It has features that allow for optimal synchronization of audio.

Sounds perfect right?

Well, like any technology implementation there are challenges to overcome. Here, the problem starts with infrastructure. When using a standard star Wi-Fi topology, all speakers must be connected to a single central entity to play music, which limits the user in the placement of home speakers, for example.



The solution? IEEE 802.11s: Or in a less formal name – mesh. With a mesh topology, the possibilities grow larger and limitations dwindle. Infrastructure? No problem. With mesh, every node is connected to each other and everything is efficiently distributed across the network with no central entity. In essence, mesh allows devices with the same configured profile to connect to each other on MAC level. For example, two speakers that are not in range of each other can still be connected through other speakers between them that are in range, turning each speaker into a range extender, among other things.

Mesh packs a lot of features:

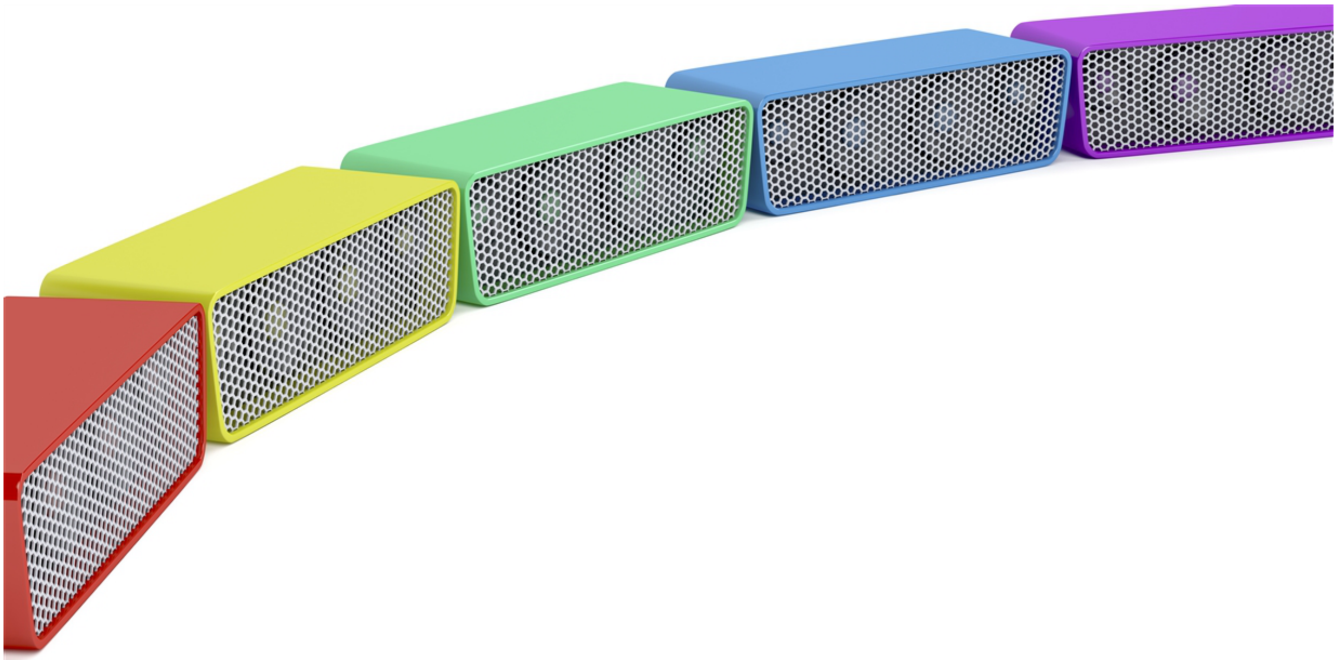
- Self-healing: Replaces paths when a link crashes, so that you never skip a beat!
- Self-forming: Automatic connection between all configured nodes.
- Path selection algorithm: The network automatically chooses the best path for packets for extra speed and shorter latency.
- Range extension: Extend the coverage of Wi-Fi using mesh nodes.
- Network offload: Mesh links are direct, and traffic does not always have to flow through the home AP.
- Improved network capacity: In some cases, an improvement in network capacity is achieved due to the distributed nature of a mesh system.

But the most important feature is this: **802.11s is a standard and we at TI have embraced it and now provide mesh capabilities on all of our WiLink™ 8 Wi-Fi + *Bluetooth*® modules**.

Our WiLink 8 Wi-Fi mesh solutions offer even more features than standard implementations:

- Time synchronization: Enables incredible audio synchronization between all speakers in a zone.
- Enhanced path selection algorithm: TI's Wi-Fi mesh brings path selection to the product level, improving throughput, latency and decision making for systems

Imagine this: You go to the beach with your friends and each person brings their own wireless speaker. They all connect, sync flawlessly and play your music – together.



Want to get more oomph out of your sound system? Get another speaker and place it in the range of another and you are done! Have a set of speakers in your basement but no network coverage? Use mesh to extend your network's range to turn your basement into a dance hall!

A Wi-Fi mesh system will allow a seamless connection that can cover your entire home, even when no central entity is present. Just place that speakers anywhere you want and get that music going!

The solutions and possibilities that a mesh system brings to wireless audio are endless, and with our WiLink 8 combo-connectivity modules you can start making your own today!

So, shall we Tango?

Additional Resources:

- Learn more about WiLink 8 module audio solutions
- Download our white paper about Wi-Fi mesh capabilities
- Read about our advanced audio synchronization capabilities
- Watch our Wi-Fi mesh networks audio demo video