

BluOS Network Settings & Port Filtering

Below are the primary network configuration settings that will affect Player discovery. I would recommend going over this with your mesh network manufacturer to see if that would resolve the issue.

Multicast

Set to ON

This should be on and **not restricted** as this is the network protocol we use for discovery. This is also used by a multitude of other apps (e.g. AirPlay, Google Cast, etc. so check to see if those apps are broken as well)

Unique BluOS Player Names

BluOS Players (hardware) should NOT get common names like 'Living Room' as this will create issues with past or current devices that also share the name 'Living Room' when they use Multicast. Even if AirPlay is not in use, other smart home devices also use Multicast, and therefore, alternative names like 'Living Room Hi-Fi' or 'Living Room Audio' are good substitute names if 'Living Room' is already taken.

IGMP Snooping

Set to ON

This groups the device broadcasting Multicast traffic (the hardware Player) with the device looking for that traffic (the software Controller). Some devices operate Multicast traffic more efficiently without having this setting on so you will need to see what performs best based in your specific network environment.

QOS and WMM

Set to OFF

This should be fully disabled as this can and has caused issues with the Players getting unfavorable restrictions on their network traffic.

DHCP Reservations

Set to ON for BluOS Players (especially Wi-Fi players)

Creating DHCP reservations will ensure that your players are always assigned the same IP address across your network. This will help to prevent any IP conflicts or discovery issues due to mismanaged IP addresses by the router.

Wireless Isolation (a.k.a. Wi-Fi Guest Mode)

Set to OFF

This should also be disabled as this forces network devices to not be able to communicate with their neighboring devices (a.k.a. smartphone apps) and only be able to speak with the Router/AP to get out to the Internet.

Network Security / Firewall Settings

If using a heuristic like scan may need to be lowered or disabled outright as our Players will utilize UDP and Bonjour services; Multicast which can potentially be seen as a UDP Flood or DDOS attack by some Routers/Access Points.

The ports used with the BluOS / Bluesound Players are as follows:

Required TCP/IP:

- 80 (HTTP)
- 135 (SMB)
- 139 (SMB)
- 443 (Internet Radio)
- 445 (CIFS)
- 1025 (SMB)
- 3400 (UPnP incoming events)
- 3689 (iTunes Sharing & AirPlay)
- 4070 (Spotify incoming events)
- 5353 (mDNS connection)

Required UDP:

- 136-139 (NetBIOS)
- 1900 (UPnP discovery)
- 1901 (UPnP responses)
- 2000 (BluOS® Proprietary)
- 2869 (UPnP sharing service)
- 6969 (Onboarding process)
- 10243 (UPnP sharing service)
- 10280-10284 (UPnP sharing service)
- 11000 (BluOS® Proprietary)
- 11430 (BluOS® Proprietary)
- 5354 (mDNS / Bonjour connection)

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WI-FI NETWORKING TIPS

Large Appliances

Kitchens and utility rooms have large RF “black out” equipment (e.g. refrigerators, microwaves, and large appliances) along with copper plumbing in the adjacent walls.

This means Wi-Fi equipment on *either side* of these rooms will have *significantly* poorer reception than a conventional living space. Also consider this rule when accounting for multi-floor dwellings. Placing wireless access points on either side of (never inside) these rooms will vastly improve the performance of the entire Wi-Fi network.

Radio Frequency Channels

In the USA, the FCC only allows three clean channels in the 2.4GHz range (1, 6, and 11) most WAPs are programmed to automatically choose from one of those three channels. It's a good idea to choose alternate channels manually, and see if this improves performance. In addition to changing those Wi-Fi channels, I'd recommend choosing narrower Wi-Fi channel widths (20MHz is best but 40MHz is fine in the 5.8GHz band). These narrow channel widths are better in a congested Wi-Fi environment. Finally, if your 5GHz network has a different name than the 2.4GHz network, this *defeats band steering* in Bluesound/BluOS because like other Wi-Fi gear, we only remember one SSID; meaning that Bluesound is fixed to the one 2.4 or 5.8 band. Please remove the '5G' suffix from your Wi-Fi network name, making it the same as your 2.4GHz network. Your devices that only operate on 2.4 won't have a problem

connecting, while newer devices can let the router make the best band choice (a.k.a. band steering).

Airtime Fairness

Did you know that two Wi-Fi devices (or more) are NOT permitted to broadcast data at the same time, on the same channel?! Like a major airport runway, devices have to wait for one to finish broadcasting (downloading / uploading data) before the other device can transmit or receive. This of course happens as quickly as milliseconds, or as slowly as whole seconds. Wi-Fi networks are designed so that when one client is communicating with the wireless access point (WAP), the other clients have to wait until the transmission is finished.

Think about how this Wi-Fi communication “dance” applies to streaming audio or video.

In one situation, when a slow transmitting device (such as an old Wi-Fi tablet) gets its turn to communicate over Wi-Fi, it may take longer to send or receive its data.

Meanwhile, other faster devices (newer devices or laptops) must wait until the slow device finishes the transmitting process. Based on the above situation, it is advantageous to segment faster devices to a 5GHz band while moving legacy devices to the 2.4GHz bands. Ideally, clustering physical devices (such as smart TV’s and other media-related network streamers) together on a multi-port ethernet switch will vastly reduce the load on the Wi-Fi network and allow for simultaneous communication(!).

See the tips below for entertainment areas that don’t have the ability to connect using Ethernet.

Equipment

PLC Adapters — these [\\$70-some-odd](#) inexpensive accessories work like a tin can and a string! Just put one behind your main router and the other behind your Bluesound speaker / streamer. They’ll create a reliable network using the power cables (romex) in your walls

Ethernet Switches — once you’ve used the tools above to expand your network’s reliability reach, these [\\$19 ethernet “duplicators”](#) give you more ports with ***ZERO downside!*** Just put one Ethernet switch on the backside of either the eero Satellite or a PLC adapter and you can several more devices to your wired network!

I *always* recommend to people the option of connecting everything (or *anything* that streams) in their entertainment system to ethernet, which by process of elimination, reduces the strain on the available [Wi-Fi airspace](#). The least expensive ethernet switch adds capacity for up to 4 connected devices.

Above all else, please review those prior emails on how to test the individual Bluesound units using their [built-in diagnostic modes](#) to best understand where the connection issues are.

Want more? Here's a lovely, yet general, ['How To Troubleshoot' Wi-Fi article](#) from a great tech news site The Verge

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