roon

The music player for music lovers

User Guide

Background

Roon is a music management and listening solution that takes a very different approach to interacting with your music. Instead of seeing a spreadsheet-like view of your music (as with iTunes and almost all other media systems), Roon provides a very rich non-list based experience, using credits, artist relationships, genres, lyrics, concert/tour dates, artwork, and more to allow for an informative navigation and exploration of your library.

Roon manages digital music files collected on hard drives and networked storage. It can also watch your iTunes library, and optionally integrate with the music streaming service TIDAL.

Roon cleans up your music library, upgrades the metadata associated with your music, and provides a user interface that is far richer than anything else out there. Roon makes music exploration and discovery both informative and fun.

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This unofficial User Guide was created from Roon knowledge base content by Michael Whitehead.

www.roonlabs.com

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1.0 What is Roon?

1.1 What is the Software?

Roon provides no-compromise audio perfection. Bit perfect playback of lossy and lossless file formats, including high resolution audio content (PCM and DSD). Additional conveniences such as crossfading and volume normalization make it suitable for both concentrated listening sessions as well as social events.

Roon manages your audio renderers (the things that make sound). Whether they be built-in sound devices, like your laptop's audio output, a USB connected DAC, or even networked audio devices.

Roon is an application suite that must be installed. It is not a website. It runs on Macs, Windows PCs and Tablets, Linux PCs, Android Tablets, Apple iPads and iPhones. Support is provided on the Community Site, and membership details and configuration are provided on the Roon website.

Roon uses your music files, Internet Radio streams, and content from the TIDAL streaming music service, but doesn't come with any music.

The Roon software is constantly being improved and updates are always free of charge to licensed users.

1.2 How Does Roon Work?

Architecture

Roon has an architecture that is slightly different than what you might be used to.

It would first be most helpful to read the pretty marketing material on this, as it is the most helpful in getting the basic concepts down.

After reading the page above, you should know that there are three main components in the Roon architecture: core, control, and output.

Core

The core is the brain of the system. It manages the control and output components, and keeps track of the content in your music library.

The core is responsible for:

- Managing your digital music library
    - Discovering your music files
    - Noticing when music files are added, deleted, or modified in real-time

  - Extracting Metadata Tags from your music files
  - Background analysis of your audio content
  - Identifying your music files so we can improve your library with artwork, credits, reviews, and other enhanced metadata.
  - Keeping metadata up to date as new information becomes available and features are added.

- Managing playback to audio outputs (see below)
  - Managing a play queue and a set of controls for each Zone.
  - Managing output to multiple Zones, including synchronized playback
  - Retrieving audio from files or internet services and decoding it to PCM or DSD
  - Streaming PCM or DSD audio to outputs

- Driving one or more controls (see below)
  - Serving data to controls, whether they are local or networked
  - Responding to requests from controls
  - Providing a synchronized experience across multiple controls

- Other stuff
  - Handling software updates

For more information about why the core is such an important part of Roon's architecture, see here: Why Core?

Control

Roon's rich user interface runs on Windows, macOS, Android, and Apple iOS.

Roon develops the *control* software for all platforms out of a single code-base. This is deeply important to our ability to deliver an extremely rich experience across many hardware and software platforms.

If we built the app the traditional way--by developing a separate app for each platform, they would soon diverge in behaviour, and some would inevitably lag behind. Instead, we chose to invest in infrastructure up front, and do things differently. This choice enables us deliver richer functionality in less time, while providing a more consistent experience across the multiple platforms that Roon supports.

The network protocol that the core and control use to communicate is also intensively engineered.

Our control infrastructure is designed carefully to work identically whether you are sitting in front of a computer running a Roon core, or whether you are using another device on your network. It works just as well if you have one control or a dozen.

Data on different controls stays synchronized in real-time. There's no lag, and we never let you see stale data.

These details may seem abstract from where you're sitting, but these ground-up architecture choices act together to product an unparalleled multi-device experience.

Output

Outputs are devices that make noise.

Roon is built from the ground up to run a multi-room audio system. Whether you have one output or a dozen or more, we have you covered.

Our playback engine is built for audiophile quality playback of standard and high-resolution audio content to a wide variety of output devices.

Our RAAT streaming technology moves bit-perfect streams to Roon Ready networked devices and outputs connected to devices running Roon, Roon Server, or Roon Bridge.

Roon supports many different kinds of output devices, including:

- Roon Ready Networked devices.
- Connected outputs, including USB DACs, sound cards, and built-in outputs
- AirPlay devices
- Logitech's Squeezebox devices
- Meridian Audio's networked endpoints
- HQPlayer

For a more comprehensive view of our output support see here: Partner Devices Matrix

Storage

In the context of Roon, storage is where you keep your digital music. This can be the hard drive on your computer, your iTunes collection, NAS device, an external hard drive, or TIDAL.

- Local Folders
- iTunes
- NAS Devices
- USB Disks
- TIDAL

Local Folders

On first launch, Roon will find the default music folder on your respective operating system and allow you to import what's inside. On Windows, that's:

```
C:\Users\<Your Username>\Music
```

and on Mac, it's:

```
~/Users/<Your Username>/Music
```

Many people forget these default folders exist, and create new *local folders* where they store their music. By creating a local folder, you are allocating space on your *internal* hard drive for your music. Wherever your computer goes, your music goes with it.

iTunes

iTunes has been the frontrunner in digital music collection management for over 15 years, so we understand that many of our customers come to us from a background in iTunes.

Most iTunes collections are stored in local folders in a default location determined by iTunes, but some iTunes customers have saved space on their internal hard drives by moving their iTunes collections to non-standard locations.

We've built Roon to handle both scenarios, and you can read more about iTunes storage and how to import your iTunes library here.

NAS Devices

NAS is an acronym for Networked Attached Storage. Consumer NAS devices are plugged into a router or network switch, are accessible by devices on the same network, and have hard drives for storage. They allow for storage and retrieval of data from a centralized location for authorized network users.

A NAS is like having your own private cloud, and more powerful NAS devices can run Roon Server - a headless version of Roon. This alleviates the need to have Roon running on a laptop, Mac or PC. If Roon Server is running on a NAS device - which are typically left running 24x7 - that you use to store your music, you can simply launch a Roon control on your phone, tablet or laptop and start listening.

To get started using music from a NAS drive, give this a read.

USB Disks

USB Disks are probably the most common form of storage behind local storage. They can be cheap and portable or hefty and expensive, but they're always a great way to extend disk capacity beyond the limits of an internal hard drive.

USB Disks are just as the name suggests - hard drives that attach to your computer via USB. On Windows and macOS a USB disk will show up as an ejectable drive, and they generally act the same way a local folder would.

Roon also treats USB disks very similarly to local folders, but keep in mind that there can be added instability when using a USB disk. USB ports can degrade and no longer work, wires can come loose, spinning drives can fail, etc. If your computer can't see the USB disk, then Roon won't be able to see it either. If you launch Roon and notice music missing from your collection, make sure your USB disk is running properly first!

TIDAL

Roon's TIDAL integration gives you access to TIDAL's massive collection of music overlaid with Roon's extended metadata. You can find new music there, based on what you already own, and get lost in endless recommendations. If you've already signed up for TIDAL, then you already know what your "Favorites" are (if not, there is a free trial!)

We treat your TIDAL favorites just like storage. If you "Favorite" something in the TIDAL app, it is always accessible under the "My Music" pane. Similarly in Roon, if you're looking at a TIDAL album and click "+ Add To Library", we're adding it to your *stored* music, which makes it easily accessible via the album browser in Roon.

Common Configurations

There are a lot of ways to utilize Roon's software packages in your setup, but this article details a few of the configurations we see most. Before continuing, you may want to read up on the three pillars that make up our architecture -- Core, Control, and Output.

- On one PC
- On PC + Mobile device (core + remote)
- Multizone, multicontrol
- Roon on a NAS

On one PC

The simplest configuration is Roon on one computer, offering Core, Control and Output functionality. Just download the Roon app, and you're good to go.

Roon will automatically find your system's default output. You can also configure Roon to use a USB audio device, or a Roon Ready device on your local network.

On PC + Mobile device (core + remote)

Roon is available for phones, tablets, PCs, and Macs; allowing you to use those devices as remotes for your Roon core.

In this configuration, your PC will run the Roon core, and another device will run Roon Remote. You can run as many remote devices as you need for no additional charge, giving you the option to control Roon from anywhere in your home.

If you want to run the Roon core on a server, or computer tucked away in your closet, consider installing Roon Server on your core device, then use another device for remote control. You can read more about Roon Server here.

Want to set up a Roon Remote but don't know where to start? Click here

Multizone, multicontrol

Finally – high-resolution, multi-protocol, multi-room streaming for your whole home!

Roon streams formats up to 384kHz/24-bit PCM and DSD256 to Roon Ready devices via our RAAT protocol, and intelligently converts audio to the optimal resolution for other devices. Roon allows you to seamlessly control multiple audio endpoints from all your devices.

Looking to extend Roon's audio playback capabilities to other devices or computers in your home? Check out Roon Bridge

Roon on a NAS

NAS devices are a great way to store music in one central place, and are just like having your own personal cloud. Some NAS devices are powerful enough to run the Roon core. Running Roon 24x7 on a NAS eliminate the need to have a PC or Mac running to use Roon.

If you're interested in using your NAS device as a Roon core, we have an extensive write up including information on why you'd want to use your NAS as a Roon core, installation instructions, and recommended setups here.

RAAT

What is RAAT?

RAAT (Roon Advanced Audio Transport) is the backbone of Roon's audio distribution technology.

It is designed to support a wide range of software and hardware applications without format support restrictions or quality compromises. It provides rich user experiences by integrating with displays, buttons, volume controls, and source switching capabilities.

It enables you to play your Roon music to:

- Roon Ready hardware devices
- Audio outputs, sound cards, and USB DACs connected to the Core.
- Audio outputs, sound cards, and USB DACs connected to any computer or device running Roon Bridge
- Audio outputs and USB DACs connected to Android devices running Roon Remote.

We like to think of RAAT as AirPlay for Audiophiles.

In November of 2015, we released the Roon Ready SDK to hardware manufacturers to enable them to create hardware products that speak RAAT. Since then, over 50 Roon Ready products have been introduced, and more products are in progress on an ongoing basis.

Philosophy

Well-architected systems give better user experiences. They work better in the short and long term, and they surface fewer unexpected limitations down the road as the world changes.

RAAT is plumbing. It gets the audio from point A to point B without screwing it up, and without bringing limitations to the table that might compel the software/hardware on either side of it to screw things up. It's an enabling technology for "doing things right" everywhere else in the system. Otherwise, it shouldn't get in the way.

There is more to audio distribution than just audio. Networked DACs and streamers frequently have additional controls: source selection, volume/mute controls, standby buttons, and so on. RAAT is designed to integrate with those controls, allowing your networked devices to be controlled from around the home, as well.

Design Goals

- Support all relevant audio formats today and for the foreseeable future. We don't publish a list of formats that RAAT supports because it is not the limiting factor.
- Stable Streaming over Ethernet and WiFi networks. We take this for granted in 2016, but it's easier-said-than-done, and a huge set of implementation choices are driven by this requirement.
- Modest endpoint hardware requirements. This means endpoints don't have to handle expensive DSP or content decoding--that will happen on the server. This means that many existing devices can add support for Roon Ready without changing the hardware.
- Audio devices must own the audio clock. Many other protocols get this wrong, including AirPlay. It's not possible for two clocks to agree perfectly. Letting the DAC control the pace of streaming removes the need for a clock-drift-compensation mechanism that is bound to increase cost, decrease sound quality, or both.
- Tight playback synchronization suitable for multi-room listening. There's a careful line to walk here. If we demand ultra tight (1-10us) sync, it becomes impossible to implement the system on existing/unspecialized/heterogenous hardware platforms. We shoot to be within 1ms (and under ideal circumstances often much better), which is more than adequate for multi-room listening.
- Support for new streaming services, file formats, DRM schemes, etc can be supported without firmware upgrade. In fact, the only reason an upgrade should be required is to fix a low-level bug, or to access more hardware functionality. This is *really* important. Not all partners/hardware have easy firmware update paths that can be done at home. Our acceptance of this reality has deeply influenced RAAT's design. Just as with Google's Cast devices, the majority of the business logic is delivered to the device at run-time as a script. This means that we are capable of completely re-designing the audio streaming and buffering logic without updating device firmware. This is absolutely critical, since most of the bugs + evolution in a system like this relate to networking, not audio. Other than Cast, we are unaware of another system that is this flexible.
- Cheap to implement, and easy to distribute. No patented technologies involved. No requirement that manufacturers use technologies that are subject to export restrictions. And Roon provides a high quality, portable reference implementation as a base for customization instead of a pile of documents describing a network protocol.

- Provide a great user experience. This means no stupid 2s delays when touching transport controls (looking at you, AirPlay). It means no too-simple-to-be-good approaches to zone synchronization (looking at you, squeezebox). It means no artificial stream format limitations. It means that the system is flexible enough to allow processing in the server or the endpoint. It means that volume control and source selection works right whenever possible.
- Promote honesty regarding what is happening to the audio. RAAT is tied to Roon's signal path feature. We work with manufacturers to make sure that potentially destructive processing stages like software volume controls are exposed to interested users, and that processing isn't being concealed or hidden.
- Enforce high quality user experiences via a certification program. User experience is another core competency for us. We are actively pushing hardware companies to make better user experiences by iterating with them on the product before allowing them to be released. We require parity between Roon Ready integrations and other audio protocols offered by the devices, ensuring that Roon support does not become a second class citizen. Another requirement of the certification program is that hardware manufacturers leave devices with us long-term for support and QA.
- Two-way control integration. Artwork and now-playing information can be displayed on hardware devices. Front-panel controls and IR remotes can control Roon via the device. Volume controls on device front panels can be kept in sync with Roon. If you're talking to a device that has multiple inputs, and start music in Roon, the input automatically switches to Roon's input. Anyone who's used Roon's Meridian integration knows the value of this set of capabilities.
- Deeply extensible protocol. We've placed many extension points in the hardware protocol, and in the interfaces between the RAAT implementation and the hardware-specific code. This allows us to easily support more functionality in the future. We fully expect to learn of more use cases as the breadth of hardware that we are supporting grows, and the protocols are designed to get out of the way and scale gracefully.
- No support for under-specced platforms or un-proven network stacks. RAAT is built to evolve over time. We continue to improve the network protocol. We might decide to change the buffer size requirements on the device to increase stability. We might decide to build a second network protocol optimized for streaming over WAN, or something else like that. We give the same advice for users of Roon as we do to manufacturers building RAAT-based products: under-specced systems lead to bad user experiences; hardware is cheaper than ever and getting cheaper all the time; don't over-economize if you want the best result.

2.0 Getting Started

2.1 Getting Roon and a Membership

Roon is downloadable from our downloads page.

But first it's a good idea to first familiarize yourself with how Roon works. Then you should read more about our software packages here to determine what's required for your setup.

Then you'll want to download and install Roon. If you haven't already purchased a purchased a membership or signed up for a free trial on our website, you'll be prompted to do so when you install Roon and log in for the first time.

Membership Status

You can always check your membership status by visiting the Membership tab of your account page. There are are few different types and states of a Roon membership.

Trial Membership

We offer a 14-day no risk free trial. From your account page you can check to see how much time is left in your trial, upgrade to a lifetime membership, or cancel your trial. Free trials automatically convert to an annual membership at the end of the trial period.

Annual Membership

The annual membership is $119/year and begins at the end of a trial period, or it can be purchased on its own. From your account page you can check to see the expiration date of your membership, upgrade to a lifetime membership, or cancel your membership.

If you upgrade to a lifetime membership during your first annual term, get in touch with us and we'll refund you for any unused months of your annual membership.

Cancelled memberships will remain active until the end of the current term. If you want to continue for another year with Roon, annual memberships renew automatically and you will be charged for the next year. Don't worry, we'll send you a reminder a few days before your membership ends.

Refund policy: We offer a full refund at the purchase price within 30 days.

Lifetime Membership

Congrats, you're with us for life! The lifetime membership is a one-time fee of $499 and is not a recurring charge, nor are you subject to any future charges.

Refund policy: We offer a full refund at the purchase price within 30 days.

Past Due

If we tried to charge you but there was an issue with your credit card, you'll see "Past Due" on your account page. When the charge fails, we'll send you an email and try again a few days later. After 4 attempts, your membership will be cancelled.

Our payment processor will decline credit cards for a few reasons:

- Your card is expired (we'll send you an email if we notice your card is about to expire)
- Your card details are incorrect
- Your bank has a block on internet purchases
- Your bank thinks the charge is fraudulent
- You have spending limits in place

If you get an email from us about a failed charge, visit the Payment tab of your account page and make sure your card details are correct. If everything looks good, 95% of the time the issue is resolved with a quick call to your bank.

Once you've cleared the issue with your bank, let us know and we'll try charging your card again.

Coupon Code Membership

You may have purchased a membership through one of our dealers, or you are redeeming a complimentary membership from one of our partner promotions.

To redeem your membership, visit https://roonlabs.com/coupon.html and enter your code. If it's a complimentary membership, be sure to add your credit card details on the Payment tab of your account page so there aren't any hiccups when it comes time to start your membership.

How many licenses do I need?

What's included in a license?

A Roon license includes the following:

- 1 Roon core that manages your music library (your "main" installation)
- Unlimited Roon Remotes (Windows PC's, Macs, Android devices, Apple iPads and iPhones)

Where can I see what licenses I have?

You can always check what licenses you have on the Membership tab of your account page.

Can my license be used in more than one location?

Yes! If you only have one Roon license, you can simply log in to Roon at any location, and Roon will prompt you to de-authorize the previously active installation. However, you can't run Roon in two locations *at the same time* with only one license.

If you would like to run Roon in two (or more) locations concurrently, you will need to purchase additional license(s) so you can run a new Roon core in another location.

How do I transfer a license to a new computer?

To transfer your Roon license to a new computer, simply install Roon and log in on the new computer.

If you want to transfer your Roon installation and preserve your edits, playlists, and favorites, you'll need to create a backup and restore it on your new computer. You can read more about creating and restoring backups here**.**

2.2 Hardware Requirements

Roon will run on just about any recent PC or Mac. Performance and quality of experience will depend on the size of your music collection and the performance of your hardware. Check out this comment on our community site for the nitty gritty details.

Recommended Basic Hardware Platform

- Intel Core i3, Ivy Bridge+
- 4GB RAM
- SSD boot drive
- 1440 x 900 Resolution

Supported Software Platforms for Roon Core or Roon Remote

- Windows 7+ (10 recommended)
    - OpenGL 3.0 support is required to run Roon.
    - Media Packs are required for Windows Server 2012 R1/R2, or Windows N/K/NK
- macOS 10.8+ (10.12 recommended)
- Linux (More Info)
    - Intel x86_64 builds Core and Output functions.
    - ARM builds only support Output functions.
- NAS platforms (More Info)
    - QNAP

- Synology

Supported Android Phones & Tablets

Roon can run on many ARM or x86 based Android tablets and phones running 4.4 and higher.

Android devices that are **at least 8 inches** run the full Roon interface. Tablets **smaller than 8 inches** run an interface designed for smaller screens and phones.

We can't test Roon on every Android device out there, so the following list shouldn't be taken as an endorsement of any specific device's support or performance.

Tablets

While most of the Roon team uses iPads, we've heard from users that they are successfully running Roon on:

- Google Nexus 9
- Google Nexus 10
- Samsung Galaxy Note 10.1 2014 edition
- Sony Xperia Z4
- Samsung Galaxy Tab 3 8.0
- Samsung Galaxy Tab S 10.5'' T800
- Sony Xperia z1
- Samsung Galaxy Pro
- Samsung Galaxy Tab A
- Samsung SM-P600

Not currently recommended/supported:

- Samsung Tab 3 (7.0, Lite 7.0)

Phones

The only Android phone we regularly use within our company is the **Google Pixel 2**. We've heard from users that they are successfully running Roon on:

- Google Pixel 2 (Recommended)
- Google Pixel
- Google Nexus 6p
- Google Nexus 6
- Google Nexus 5
- Samsung Galaxy S7 Edge
- Motorola Moto G

Supported iPads & iPhones

Roon Remote is available in the App Store. **It requires iOS 11** and works with:

iPhones

- iPhone SE
- iPhone 5s
- iPhone 6/6+/6s/6s+
- iPhone 7/7+/7s/7s+
- iPhone 8/8+/8s/8s+
- iPhone X

iPads

- iPad Air
- iPad Air 2
- iPad Mini 2/3
- iPad Pro
- iPad 2017
- iPad 2018

The older iPads are not supported as they either lack a 64bit CPU or an OpenGL ES 3.0 capable GPU.

Note that Roon Remote also requires an active Roon membership, and a Roon Core running on the same network.

Roon Ready Devices

Roon partner programs

Our reason for being is to provide the most exciting way to engage with music.

On one level, Roon achieves that by working with your music (both files and streams) to present not just the content itself, but the context that surrounds it and relates it… things like when and where it was made and the people responsible for composing, performing, and producing it.

The other piece of the puzzle is how Roon supports the user in their hardware decisions, by easily and reliably playing music without complications, on a wide range of devices, from a variety of manufacturers.

This is where our hardware partner programs come in.

Roon Ready network players

Roon Ready is the highest level of Roon integration available to partners, and means that Roon technology is actually customized for, and embedded into, their devices.

It's a designation given to audio player hardware products that have both implemented RAAT, and have been certified by Roon Labs for proper implementation. For more details on what RAAT can provide, how it differs from other network streaming protocols, and the design philosophy behind it, please check out the RAAT page.)

But the Roon Ready program's biggest strength is that it goes beyond technology... it leads to a great product, in both sound quality and user experience.

We've seen too many great audio products hindered by poor user experience (UPnP), and too many good experiences compromise on sound quality (AirPlay), so we designed the Roon Ready program to ensure this wouldn't happen. Roon Ready Partners and Roon are each in control of what they are best at... audio is in the hands of the hardware manufacturer, and the control of the user experience in our hands.

And the products will be certified by both the manufacturer and by Roon, which means you can trust that you will receive the best experience and support from Roon Ready devices, regardless of the manufacturer.

Roon Tested DACs

We want Roon to work with all the hardware out there, but most importantly, we want our users to have confidence that the products they have (or are considering buying) will work well with Roon. To achieve that, we came up with a second hardware partner program called "Roon Tested". We need to have a working relationship with the manufacturer to make this happen.

The idea is that we test various manufacturers' audio endpoints with Roon, using a much more rigorous test than any normal user would. The manufacturer also tests Roon with their product, and makes sure we don't do anything bad to their endpoint. Because the manufacturer has provided us with their hardware, we can test our software against every device when we make new releases.

A few USB and networked audio products out there do some special in-app stuff when you hook them up to Roon. They're identified in Signal Path and the zone selector, and Roon can identify the product, support extra features, provide links to the manufacturer website and the product's manual, and so on...

If your favourite product is not showing up as *Roon Tested*, contact your manufacturer and tell them to get it tested. We only can test what we have in our possession. Feel free to link them to this post.

Roon Core servers

If you're just trying Roon for the first time, chances are you downloaded and installed it on your Mac or Windows PC. That's a great place to start, but many people would prefer not to depend on a PC being on at all times. Roon Core devices from our partners have Roon Server pre-installed (or offer it as a downloadable option) so all you need to bring to the party is your tablet or phone!

Roon Core devices can be controlled from Mac, Windows, iOS, and Android devices by downloading Roon or Roon Remote for those platforms.

Partners and Devices

You can see the full list of partners at on our website, where you can click through to each partner to learn more about the partner and their devices.

The official list of Roon Ready partners and devices can be found on our partners page. The official list of Roon Tested partners and devices can also be found there.

We also have a Partner Devices Matrix that will give you tons of information on each device.

2.3 Downloading Roon

Software Packages Overview

Roon is offered in a variety of software packages to accommodate your setup. Whether you are running Roon on one computer, or need to stream audio to multiple rooms across several devices, you can use this overview to find the right versions of Roon for your configuration.

It's a good idea to check How Roon Works before continuing here, as it'll explain the concepts below.

After reading the below, visit our downloads page to get started with your installation.

Roon

✓Control ✓Core ✓Output

An all-in-one solution that includes control, core, and output functionality. Choose this package if you only have one computer that manages your music library and connects to your audio outputs (wired via USB or over the network).

NOTE: This package requires OpenGL 3.0 to run the custom graphics engine that powers Roon. If your machine does not support OpenGL 3.0, as an alternative you can install Roon Server and control it with Roon Remote on your mobile device.

Roon Server

✓Core ✓Output

Roon Server is for those who want to install Roon on a machine with no monitor or graphical interface. This machine will still manage music library and audio outputs, but because it has no graphical user interface, it requires another device for control. After installing Roon Server on your headless machine, you can install Roon Remote on your mobile device or laptop to control Roon Server. You can read more about Roon Server here.

Roon Remote

✓Control ✓Output

Installing Roon Remote on a supported iPad or Android tablet allows you to control Roon or Roon Server using Roon's rich, immersive browsing experience. Roon Remote does not include core functionality, but it can connect to a Roon or Roon Server on your network. You can read more about using Roon remotely here.

Note: You can also run Roon Remote on another Mac or PC, just install the Roon app and choose to run as a remote during setup.

Roon Bridge

✓Output

Roon Bridge can be installed to add audio outputs to your setup over the network, perfect for multi-room configurations. You can read more about Roon Bridge here.

Roon Server

What is Roon Server?

In terms of our Architecture, Roon Server packages provide Core and Output functionality.

Why would you want to use Roon Server?

A computer being used as a server that does not have a display or keyboard directly attached is called a “headless” server.

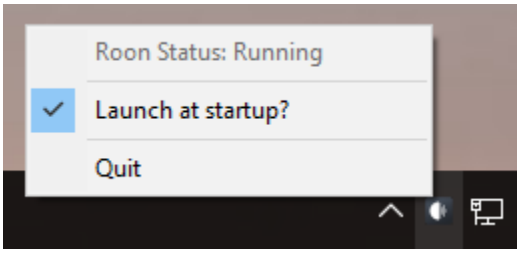
Roon Server is a software package that provides a “headless” Roon install; that is, it is a version of Roon that has no user interface. Roon Server also uses less computing resources than the full version of Roon, and is the best choice for installation on headless servers.

Roon Server is used in conjunction with Roon or Roon Remote, both of which provide control functionality.

Roon Server runs on Linux (x64), macOS, and Windows (x86 and x64).

The 'Launch at startup' option

Roon Server on a Windows PC has a "Launch at startup" option, so that Roon Server will start up automatically when the user logs in to Windows.



To avoid the need to manually log into Windows each time the server hardware is rebooted or Windows is restarted, it's a good idea to set up an auto-login for this account.

macOS has a similar option available to launch Roon Server at login.

On Linux, Roon Server runs as a service. You can manually start/stop it if needed. You can disable the service if (for whatever reason) you do not want it to load at startup and enable/start it manually afterwards.

Roon Remote

How do I control Roon remotely?

When you first install Roon, you will set up your Core, which functions as the main server for Roon in your household.

Whether your Core is near where you listen to music or on the other side of the house, there's a good chance it's not a convenient device for picking music. This is doubly true if you're using Roon in more than one room, or with networked audio devices.

Wherever you listen to music, Roon gives you the freedom to browse your collection using a variety of different devices, whether that's a computer, tablet or phone. In all these cases, you'll be running Roon as a Remote.

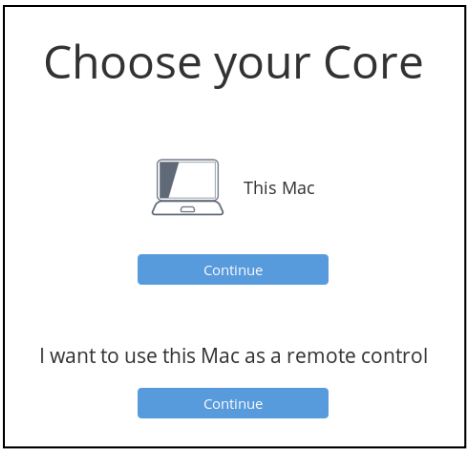
Setting Up Roon Remotes

Step 1

Install Roon on any supported devices you want to use as a remote, including Macs or Windows computers, Android tablets or phones, or iPhones / iPads.

Step 2 (Windows and macOS only)

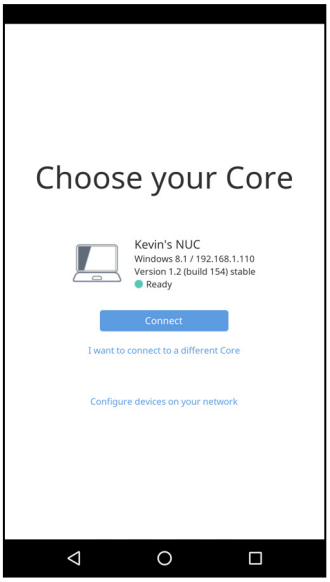
When setting up Roon to run as a remote on Windows or macOS, you'll first need to choose to run *as a remote control*: (click on the lower of the two *Continue* buttons!)



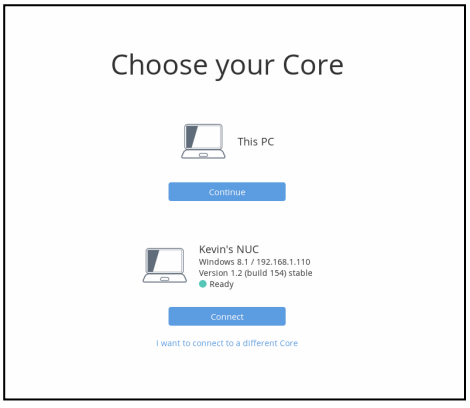
Choosing to run Roon as a Remote Control on Windows or macOS

Step 3

Finally, chose your Core and you're all set! Now you can browse your music and play to any Roon zone on your network.



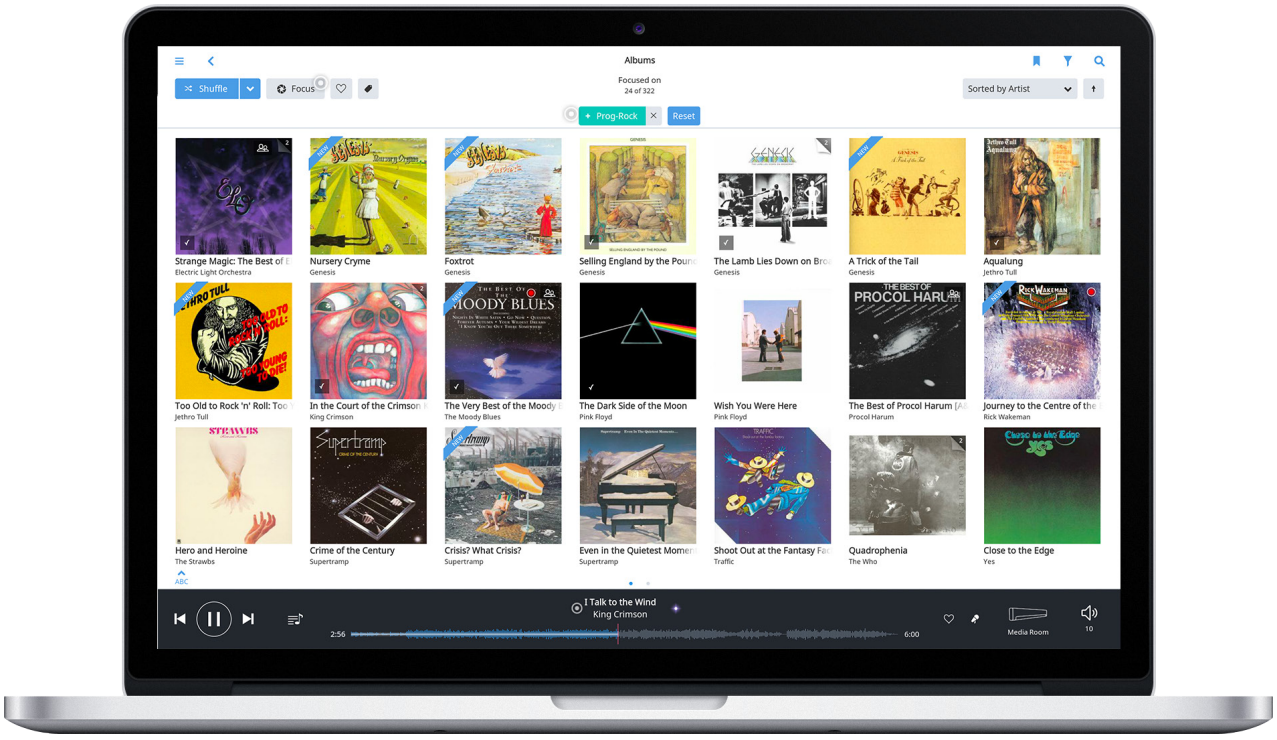
Choosing Core on Phone



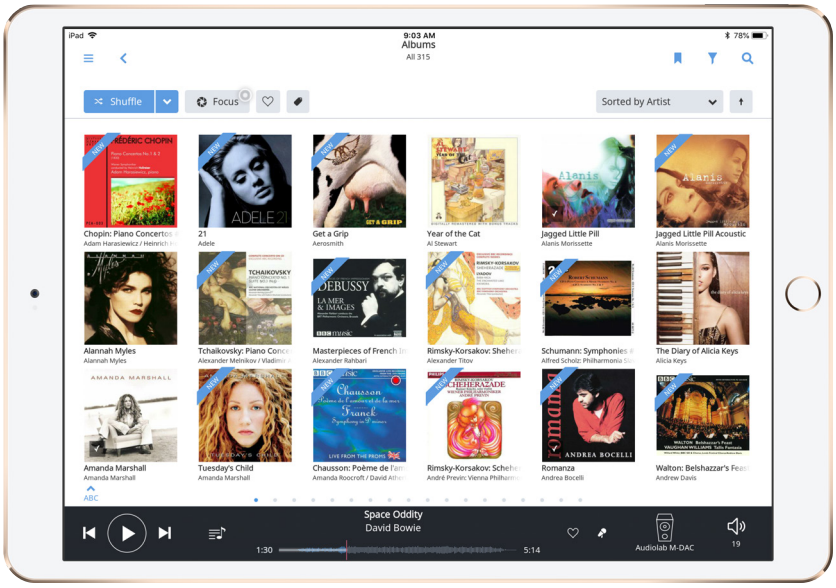
Choosing Core on Tablet and Desktop

Room Remote Images: Mac, iPad, iPhone X and Galaxy S9+

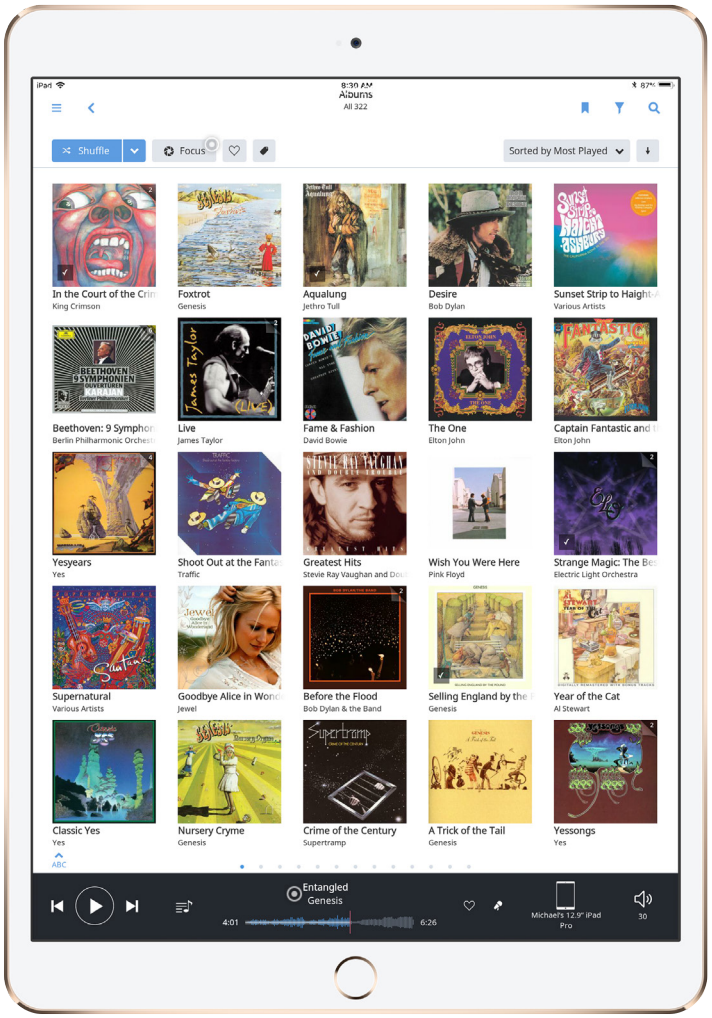
Roon Remote on iPhone X & Samsung S9+



Roon Remote on MacBook Pro



Roon Remote on iPad Pro 10.5" Landscape Mode



Roon Remote on iPad Pro 12.9" (Portrait mode only available on 12.9")

Troubleshooting

If your Remote is having trouble connecting, there are some troubleshooting tips here.

You might also want more information about system requirements. You can find those:

- Here for Macs and Windows computers
- Here for Android tablets and phones
- Here for Apple iPads and iPhones

Roon Bridge

What is Roon Bridge?

Roon Bridge is a software package that extends Roon's audio playback capabilities to other devices or computers in your home. It runs on Windows, macOS, and Linux, including inexpensive embedded platforms like the Raspberry Pi.

After installing Roon Bridge on a device, any audio hardware attached to that device is made available to your Roon install exactly as if Roon had direct access to to the audio hardware.

This enables you to place audio outputs anywhere in your home where you can connect an Ethernet cable or muster a decent WiFi signal, and makes it that much easier to separate the media server from your listening environment.

Once Roon Bridge is set up, you can use Roon to pick music to play to your new zone. You can also link it with other Roon Audio zones around the house for simultaneous bit-perfect playback!

How do I set up Roon Bridge?

Roon Bridge on Windows and macOS

Roon Bridge installers can be found on our Downloads page. Roon Bridge can run on nearly any computer running:

- Windows 7
- Windows 8
- Windows 8.1
- Windows Server 2012 R2
- Windows 10
- macOS 10.8 or higher

Roon Bridge on Linux

Roon Bridge happily runs on many linux platforms, from x64 NUCs all the way down to ARM-based devices like the Raspberry Pi, Cubox, Wandboard and others.

While it is possible to run Roon Bridge in many Linux environments, it is designed and optimized for use in dedicated or semi-dedicated devices where it's possible to control the audio hardware exclusively.

You can find more information about setting up our Linux packages here.

Set Up

Once you've installed Roon Bridge, you'll need to configure your device's audio outputs.

Start by opening Roon on your Windows or macOS computer, or Roon Remote on your iOS or Android device.

In Settings, click the Audio tab -- in the Networked section, you should be able to see the list of audio devices discovered by Roon Bridge.

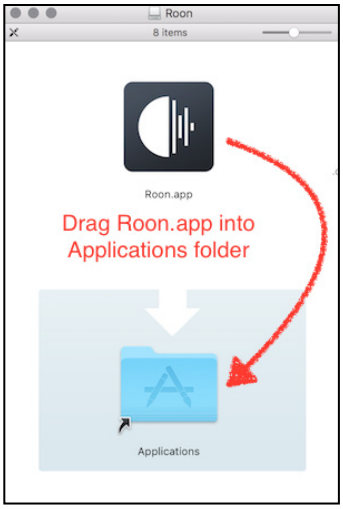
Enable the device (or devices) you want to use. More detailed instructions about setting up your DAC can be found here.

Finally, you can check on the version# of your Roon Bridge installation and manage software updates from the "About" page in Roon.

2.4 Installing Roon

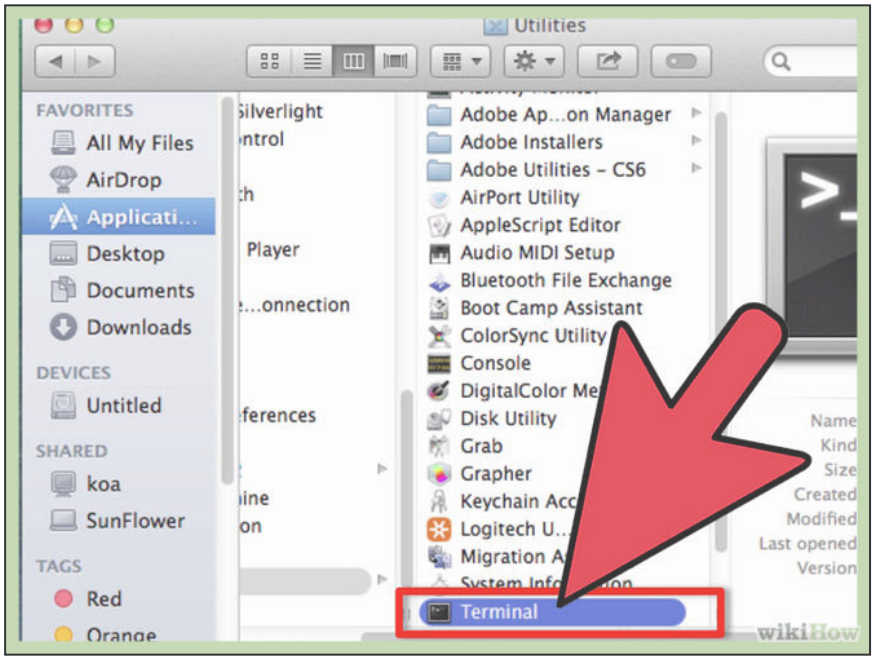
Installing Roon on macOS

1. Download the .dmg (Disk image) file from our downloads page. See Software Packages if you're not sure what to grab
2. Open the .dmg file by double clicking it
3. In the Disk Image window, drag the Roon icon into the Applications folder
4. Navigate to your Applications folder in Finder, and double click Roon to launch it. If Roon doesn't launch, try right clicking it and selecting Open
5. Eject the Disk Image in Finder



Installation Errors on macOS

On occasion, Roon may not have the correct permissions to run on macOS. If you attempt to launch Roon and the icon bounces but Roon never opens, your permissions may not be set up correctly. To fix this, first make sure Roon is not running. Then, you'll need to open Terminal like this:



Then, just copy this command (CMD+C) and then paste it into the terminal window (CMD+V):

```
sudo chown $(whoami) ~ ~/Library; chmod u+rwx ~/ ~/Library
```

At this point you'll be asked to type in your password -- **note that you may not see anything as you type**. That's expected, so just type the password correctly, hit enter, and you're done!

Try to run Roon again, and let us know how it goes.

If you're still having issues, it may be related to macOS's enabled fonts. Roon uses Arial, which is included with macOS so it should always be available, but if it is not *enabled*, macOS prevents Roon from accessing the font and the app can't launch.

To fix the issue, open the application "Font Book" on your Mac. When you open "Font Book" you'll notice that some fonts or styles are grayed out and say "Off", which prevents applications from accessing those fonts. Right click Arial in the list, and click Enable. This will give Roon access to Arial and your next launch should be successful.

If Roon still won't launch on macOS, login at our Community Site using your Roon account and let us know the details of your situation.

Firewall Configuration on macOS

Roon should be able to connect with your firewall enabled, but some users have reported issues that we've traced to their firewall.

Turning off your firewall is a good way to start troubleshooting if you're having problems running Roon with a remote, and you'll want to turn it off on both sides -- the computer running your main Roon install, and the computer running your remote. There are instructions for how to do that on macOS here.

Installing Roon on Windows

1. Download the .exe file from our downloads page. See Software Packages if you're not sure what to grab
2. Open the .exe file by double clicking it
3. Follow the on screen instructions to install Roon

32-bit vs 64-bit

Roon can run as a 64 bit application on both Windows and macOS. This means better performance, particularly for members with larger collections.

For macOS users Roon will always run in 64 bit mode, as will RoonServer.

Windows users will still be able to run Roon as a 32 bit app, but most users will want to switch over to 64 bit versions of Roon and RoonServer, especially with collections over 100,000 tracks.

macOS users will run the 64 bit version of Roon (or RoonServer) automatically

Windows users - Roon can switch Roon to 64 bit by grabbing the appropriate installers from our Downloads page. Then quit Roon, run the installer, and you're all set!

Windows users - RoonServer can also switch to 64 bit by grabbing the appropriate installers from our Downloads page. Quit Roon Server, run the installer, and you're set.

You can confirm you're running the 64 bit version of Roon or RoonServer by visiting the About page, accessible from Settings.

Installation Errors on Windows

If you're getting an error like "OpenGL 3.0 Required" when you try to launch Roon on Windows, then it's possible your graphics card drivers are out of date, or your graphics card is not powerful enough to run Roon.

Roon requires OpenGL 3.0, but you can always install Roon Server from our downloads page and control Roon remotely from your phone, tablet, or another PC that has OpenGL 3.0.

If Roon won't launch at all on Windows, login at our Community Site using your Roon account and let us know the details of your situation.

Why Am I Getting Windows SmartScreen Errors?

In Build 320 and later, you may receive a message from Windows Defender SmartScreen when downloading the Roon installer, preventing you from installing Roon. For more information on why this is happening, please visit this article.

Firewall Configuration on Windows

Roon should be able to connect with your firewall enabled, but some users have reported issues that we've traced to their firewall.

Turning off your firewall is a good way to start troubleshooting if you're having problems running Roon with a remote, and you'll want to turn it off on both sides -- the computer running your main Roon install, and the computer running your remote. There are instructions for how to do that on Windows here.

When I minimize Roon, all I see is a blank screen?

This is a Windows specific issue related to a bug in certain Intel drivers, and can even happen in programs as ubiquitous as Excel. You can confirm what video card(s) your computer has by visiting Device Manager on your PC, then clicking the Display Adapters dropdown.

In many cases you can resolve this issue by finding the latest drivers for your video card and manually installing them.

If your PC has a standard Intel HD GPU *and* another Nvidia or Radeon card, you may also be able to resolve this issue by configuring Roon to use your Nvidia or Radeon card instead of the Intel.

If you have a Nvidia card you can do so with these steps:

1. Press the Windows key and search for "NVIDIA Control Panel" and open the control panel
2. Under 3D settings in the sidebar, click 'Manage 3D Settings'
3. In the Program Settings tab, click 'Add' under option number 1 'Select a program to customize'
4. Click Browse, then navigate to **`C:\Users\`**[your username]**`\AppData\Local\Roon\Application`**, and select Roon
5. Press 'Apply' and ensure Roon has been added
6. Restart Roon

If you have a Radeon card you can follow these steps:

1. Press the Windows key and search for "AMD Radeon Settings" and open the control center
2. Click the Gaming button
3. Click the Add button and select "Browse"
4. **Navigate to** C:\Users**[your username]**\AppData\Local\Roon\Application**, and select Roon**
5. Click Open. You will see a Roon profile has been created.
6. Click on the Roon profile button (not on the vertical ellipsis section). This opens the custom graphics settings for Roon
7. Turn the "OpenGL Triple Buffering" setting ON

8. Restart Roon

Installing Roon on Windows 2012R2

Dependencies

Roon requires certain codecs be installed on your system. Without these codecs, Roon can have trouble importing or playing certain kinds of files, which can cause instability.

The Media Pack for Windows Server 2012 can be found here, and is required in order to use Roon: https://www.microsoft.com/en-au/download/details.aspx?id=40837

Installing Roon on iOS and Android

Roon is available on both iOS and Android:

For more information on what iOS and Android devices are supported, visit these links:

- Supported Android Devices
- Supported iOS Devices

Installing Roon on Linux

Overview

Two packages are available for Linux: Roon Bridge and Roon Server.

There is no real purpose to running Roon Server and Roon Bridge on the same machine, since both provide identical access to audio devices. That said, doing so should not cause any problems.

Roon Server for Linux runs on x86_64 platforms. Roon Bridge for Linux runs on x86_64 and armv7hf and armv8 platforms.

In all cases, our objective is to support releases of Linux distributions going back to roughly early 2014, but there may be exceptions. Distribution-specific feedback is welcome.

We have had the strongest positive experiences with Ubuntu 15.10, and up-to-date Arch machines, but testing has also taken place on Ubuntu releases going back to 14.04, as well as Fedora 22 and 23.

The arm builds are intended for relatively recent hard-float capable devices like the Raspberry Pi 2, iMX6-based products like CuBox and Wandboard, Allwinner A20s, Odroid C2's, Allwinner H3's, etc. Depending on the exact use case, they might run on weaker hardware, too. Be sure to check out Audio On Linux for some hardware specific notes if you plan to go that way.

There are Two Ways To Install

Option 1: Use **The Easy Installer** which installs Roon Bridge with our recommended settings and minimal hassle

Option 2: Download and install the package manually according to your preferences.

Either way, you will need to install the required **Dependencies** before installing `RoonServer` or `RoonBridge`.

Download Links

Easy install scripts (Recommended):

- Roon Server (x64)
- Roon Bridge (x64)
- Roon Bridge (x86 32bit)
- Roon Bridge (armv7hf)
- Roon Bridge (armv8)

Packages for manual installations (See Below):

- Roon Server (x64)
- Roon Bridge (x64)
- Roon Bridge (x86 32bit)
- Roon Bridge (armv7hf)
- Roon Bridge (armv8)

Dependencies

ffmpeg or avconv (Roon Server only)

`ffmpeg` or `avconv` must be installed and available in your `PATH`. Roon Server will fail to start if it can't find one or the other. You only need one or the other, not both. If both are present, Roon Server uses `ffmpeg`.

On Debian, Ubuntu, and other distributions that use `apt-get` for package management, generally one of the following commands will meet this dependency:

For ffmpeg:

```
$ sudo apt-get install ffmpeg
```

For avconv:

```
$ sudo apt-get install libav-tools
```

If your distribution supports neither option, and you're staring down the barrel of building one of these things from source code, you can always grab statically linked copy of **`ffmpeg`** here and drop it into **`/usr/local/bin`** as a last resort.

libasound2 (1.0.27+ required, 1.0.29+ recommended)

Roon depends on ALSA, the Advanced Linux Sound Architecture. Most distributions have a package called **`alsa-lib`** or **`libasound2`** that satisfies this dependency.

In order to support Native DSD playback, you need a kernel that supports your device see here--you may need to patch your kernel) as well as ALSA 1.0.29+.

We have not tested Roon against older ALSA libraries--they may work, may not.

cifs-utils (Roon Server only)

If you intend to use Roon's network folders feature, the **`mount.cifs`** command must be available in your **`PATH`**. Generally this comes from a package called **`cifs-utils`**.

glibc 2.14 or higher

We target **`glibc`** versions going back to version 2.14. If you use an alternative libc, and your libc claims binary compatibility with glibc 2.14 or higher, we would be interested to hear how it goes for you.

Recent Linux Kernel.

We test with recent (4.x) kernels. It's likely that older ones will work too. A bunch of relevant ALSA work was merged in around 3.19, so going back further than that might be asking for trouble if you intend to run audio devices with DSD support.

The Easy Installer (Recommended)

The easy installer is a simple way to install Roon Server or Roon Bridge on Linux with our recommended settings. The installer will identify missing dependencies and/or compatibility issues before attempting to install the package. If you run into compatibility issues, see the **Dependencies** section above.

Our recommended settings are:

- Installation in **`/opt/RoonBridge`** or **`/opt/RoonServer`**
- Data is stored in **`/var/roon/RoonBridge`** or **`/var/roon/RoonServer`**
- The app will run as **`root`**
- The app is launched immediately, and will relaunch automatically at boot.

We've tested this installer on several recent distributions including:

- Arch (current)
- Fedora 23
- Ubuntu 15.10

If it works well on other systems, please let us know so we can add them to the list.

Roon Server x86_64

```
$ curl -O http://download.roonlabs.com/builds/roonserver-installer-linuxx64.sh
$ chmod +x roonserver-installer-linuxx64.sh
$ sudo ./roonserver-installer-linuxx64.sh
```

Roon Bridge x86_64

```
$ curl -O http://download.roonlabs.com/builds/roonbridge-installer-linuxx64.sh
$ chmod +x roonbridge-installer-linuxx64.sh
$ sudo ./roonbridge-installer-linuxx64.sh
```

Roon Bridge armv7hf

```
$ curl -O http://download.roonlabs.com/builds/roonbridge-installer-linuxarmv7hf.sh
$ chmod +x roonbridge-installer-linuxarmv7hf.sh
$ sudo ./roonbridge-installer-linuxarmv7hf.sh
```

Roon Bridge armv8

```
$ curl -O http://download.roonlabs.com/builds/roonbridge-installer-linuxarmv8.sh
$ chmod +x roonbridge-installer-linuxarmv8.sh
$ sudo ./roonbridge-installer-linuxarmv8.sh
```

Log File Location.

If you used the easy installer, log files can be found in `/var/roon/RoonServer/Logs`, `/var/roon/RAATServer/Logs`, and `/var/roon/RoonBridge/Logs`.

Uninstalling

You can reverse the steps of the easy installer by running it with 'uninstall' as a command line parameter. For example:

```
$ sudo ./roonbridge-installer-linuxarmv7hf.sh uninstall
```

Manual Installation (Advanced)

Manual installations are a bit more involved, and it is not difficult to end up with a broken or poorly functioning install. We will try to support these as best as possible, but we recommend that people who are not already experienced Linux users go with the easy install.

Roon Server and Roon Bridge each ship as a self-contained tarball. The layout and procedures associated with each package is the same, so we will use Roon Server as an example.

Privileges

We recommend running Roon Server and Roon Bridge as root. Our distribution-specific packages are going to work this way, once released.

You are free to run Roon Server/Roon Bridge under other user accounts. If you do this, please make sure:

- The user account needs to be able to create directories in `/mnt` in order to mount networked folders. We use `mount.cifs` to do the mounts.
- The user account must have access to audio devices. Often this is accomplished by adding that account to the `audio` group.
- The user account must be allowed to raise their `ulimit -n` value to `8192`.
- The user account must be allowed to write to the directory where `RoonServer` is installed, so the software can self-update.

Package Layout

After un-tarring the archive, you'll see two interesting scripts inside:

```
RoonServer/
RoonServer/...
RoonServer/check.sh
RoonServer/start.sh
```

The `check.sh` script pokes around your system to try to confirm that all of the needed dependencies are met. It is meant to be run under the same user account that you intend to use when running the actual package. **Missing dependencies can cause confusing failures later on, so confirm that `check.sh` succeeds before opening a support issue**.

`start.sh` is a long-running script that launches and manages `RoonServer` or `RoonBridge`. You can exit `RoonServer` or `RoonBridge` by sending a `TERM` signal to the `PID` of the `start.sh` script.

The package will self-update within its installation directory just like it does on Mac and Windows.

Configuring the Data Location

By default, Roon Server creates hidden directories called `.RoonServer` and `.RAATServer` inside of `$HOME`. Roon Bridge also uses the `.RAATServer` directory.

You can tell Roon Server and Roon Bridge to put that data someplace else using the `$ROON_DATAROOT` environment variable.

For example, if you were installing this is a "traditional" system service on unix, you might want Roon's data to live in `/var/roon`. You could run Roon Server that way like this:

```
$ ROON_DATAROOT=/var/roon ./start.sh
```

If you are running both Roon Server and Roon Bridge on a single machine, they must have the same value for this environment variable.

By default, Logs are located in $HOME/.RoonServer/Logs and $HOME/.RAATServer/Logs.

If you've customized `$ROON_DATAROOT`, then they will be located in `$ROON_DATAROOT/RoonServer/Logs` and `$ROON_DATAROOT/RAATServer/Logs`

Configuring Roon Server or Roon Bridge to run at boot

Our easy installers do this for you. If you are curious about how to do this by hand, feel free to poke around in the scripts--the information is in there.

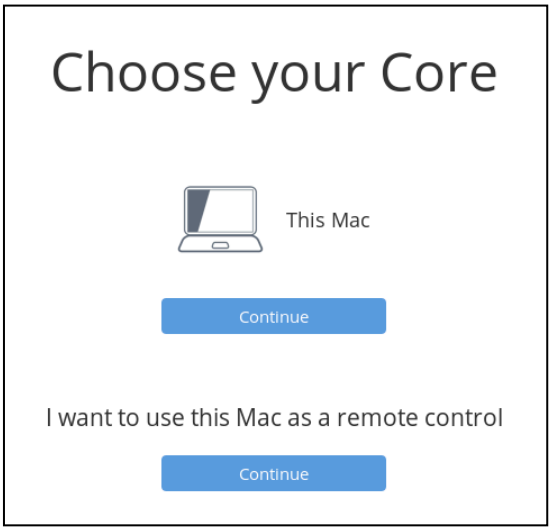
Otherwise, follow your distribution's instructions, keeping in mind that `start.sh` is a long-running script that you will need to start + terminate at the appropriate times.

2.5 Starting Roon

Choosing your Core

Don't know what a Core is? Check out this article for further reading. To put things simply, it's the computer that's going to be doing the heavy lifting and managing your music library -- importing, audio analysis, library maintenance and more. It's your "main" machine.

After you accept the license agreement, you'll be presented with the following screen on first launch:



Roon has a very flexible architecture. The Roon Core, the brain of the system, can be run on your Mac/PC, on a different computer in your home, or it can be run in a dedicated appliance such as the Nucleus.

If you are just trialing Roon, it's easiest to just select "`Continue`" under "This Mac/PC" and proceed to the First Launch section below.

This makes the computer you're currently on the Core, and it's going to manage your music library. Don't worry, you can always change this later.

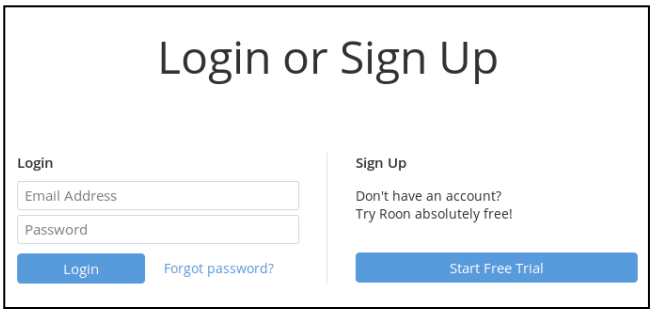
If you've already set up your Roon Core on another device and would like to run Roon as a remote, check out this information.

2.6 First Launch

When you launch Roon for the first time, you'll be taken through a series of screens to help get you set up. You will choose *how* you would like to set up Roon, *what* you want to import, and *who* it's for.

Logging In

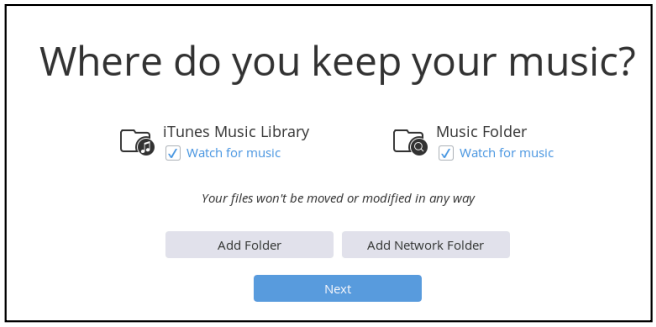
After connecting to the Roon Core, you will see a Login screen:



You will need to log in to Roon using the credentials you signed up with on our website. If you haven't signed up yet, you can click Start Free Trial to get going on.

If you don't remember your password, just click the 'Forgot password?' link and you can request a password reset. If you don't remember the email you signed up with, or you're having other trouble logging in, just get in touch with us.

Importing your music



Now it's time to import your music! Keep in mind that Roon will not copy or move your audio files anywhere. When we say "import" we mean; *let Roon show you your music*, **not** *let Roon copy, edit, delete and move around your audio files without you knowing*. That's why when you import music into Roon, you do so via a "Watched Folder" -- Roon looks at what's in the folder and shows it to you.

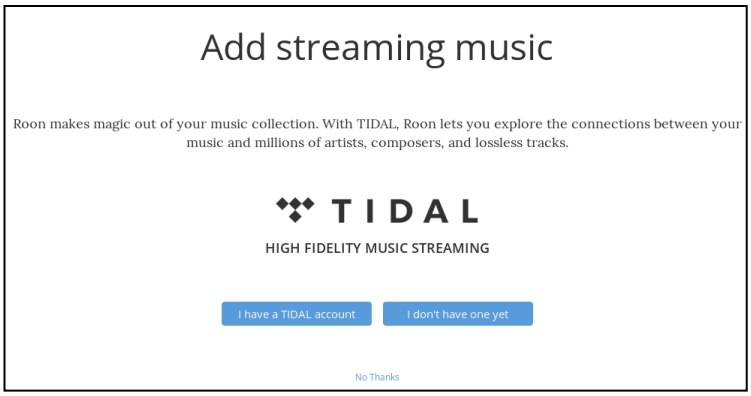
Roon already knows where your iTunes library is* and where your operating system's default music folder is, but you might also keep your music elsewhere. If you keep *all* of your music in your iTunes library or default music folder, just check off the respective boxes and click next.

If you keep your music elsewhere, you'll need to add a watched folder and tell Roon where your music is. Click **Add Folder** if your music is on your computer's hard drive, or an attached USB drive, and navigate to your music folder

Click **Add Network Folder** if you keep your music on a NAS device. If you have any trouble with the on screen instructions after clicking *Add Network Folder*, take a look at this info.

Note: Having trouble importing your iTunes library? Give this a read

Adding your TIDAL account



Roon comes alive when you link your TIDAL account, and allows you to discover music related to your collection that you don't already own.

With TIDAL's multimillion track library and lossless audio experience, and Roon's extended metadata on top of it all, streaming becomes more than listening to radio and packaged playlists; it's enjoying your music the way the artists intended, and finding new music through natural discovery and curiosity.

Already have a TIDAL account? Just click **I have a TIDAL account**. New to streaming or interested in TIDAL? Click **I don't have one yet** to sign up for a 30-day free trial.

Otherwise, just click *No Thanks* -- but trust us, you're missing out!

Jump start your library

If you aren't interested in TIDAL or haven't added an account, you can skip to the next section.

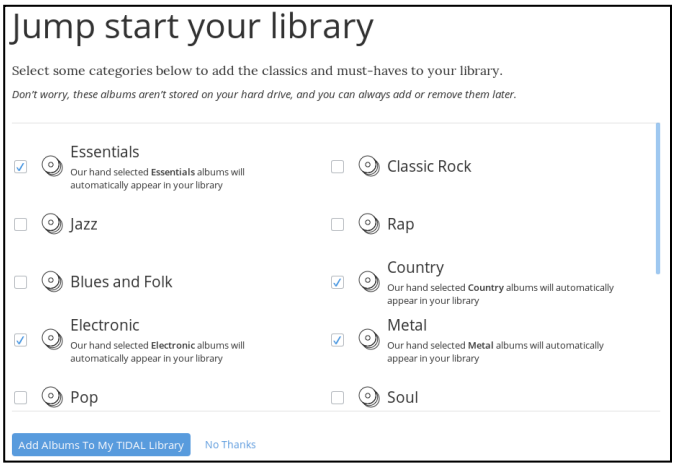
The truth is, not everyone has thousands of albums in their personal collections or even thousands of *tracks*. And not everyone uses a streaming service. If you're one of those people you're not missing out on what Roon has to offer, but we know that you'll enjoy Roon more when there's more music instantly at your fingertips.

We wanted to make it easy for people who are new to TIDAL, or just have small music collections, to add new music to their library and get to listening when they launch Roon for the first time. That's what we did with *Jump start your library*.

Click the genres that interest you, and Roon will add a collection of albums from each selected genre as favourites to your TIDAL library. These albums are not stored on your hard drive, and you can always remove them later.

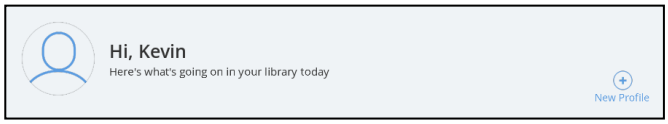
If you already have an extensive TIDAL collection, then this feature may not be for you. This feature adds music to your favourites, and because Roon already helps you find new music based on what's in your favourites, the jump start feature may be more distracting than helpful.

If you're not interested in jump starting your TIDAL collection, just click *No Thanks*.



The TIDAL collections that you select will also automatically create corresponding Tags; for example, the TIDAL "Alternative" collection will create the "TIDAL:Alternative" tag.

Setting up your profile



After you've gone through TIDAL set up, Roon is ready to go! We automatically create a profile based on the name you gave us when you signed up, but you can always edit your profile or add new information. Just click the profile icon next to '*Hi, your name*' to edit your information.

If more than one person will be using the Roon Core, you can add a profile for them by clicking the *New Profile* button.

You might be wondering what information is unique to a person's profile -- Each person in your household can have their own profile, and we'll store their playlists, play history, and all of their favourites there, including albums, songs, artists, and more.

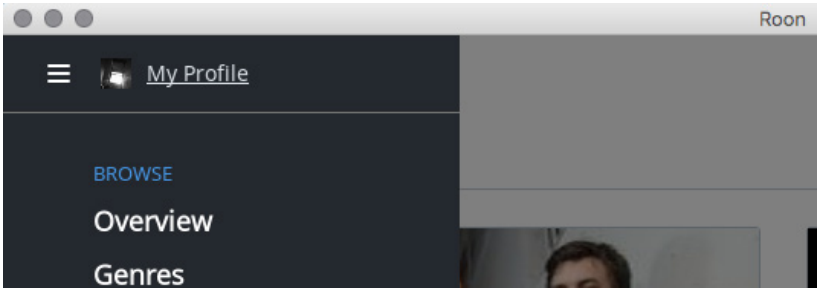
Profiles do not contain library level changes however, so you cannot use a profile to have different libraries per person. For that, we suggest focusing on a tag or the profile's favourites.

Profiles make it easy to keep track of the music you love. Each person in your household can have their own profile, and we'll store their playlists, tags, play history, and all of their favorites there, including albums, songs, artists, and more. Profiles also allow for social sharing and Last.fm scrobbling.

Profiles do not contain library level changes, so you can't use profiles to have different libraries per user. For that, we suggest using Focus, Tags, or the profiles favourites.

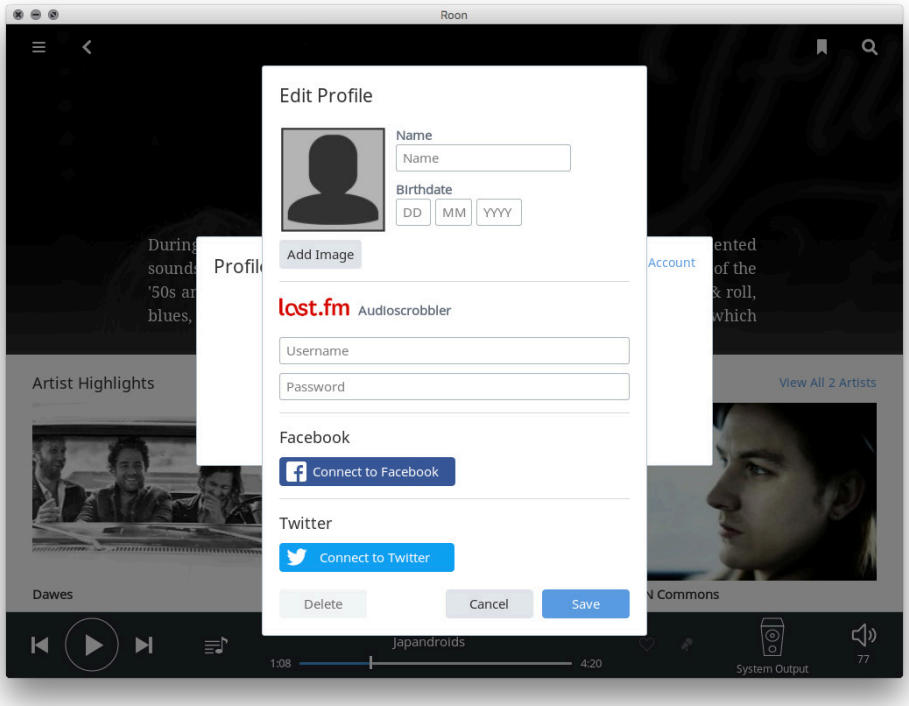
Creating and switching profiles

To create additional profiles or switch between them, just click the current profile (available at the top of the navigation sidebar, or at the bottom right of the pawmasher) then select New Profile, or switch to the desired profile.



What can be configured?

You can configure your profile name, photo, Last.FM account for scrobbling, and Facebook and Twitter authentication for social sharing.



Start playing music!

Now it's time to poke around and listen to music! Click the hamburger icon ☰ at the top left of the window to navigate, and check out some FAQ's to start playing music:

- The Basics of Audio In Roon
- Browsing and Playing Music In Roon
- Other Questions

2.7 How do I backup my Roon database?

Roon's database holds all the information about your Roon library, and about anything you've done in Roon, including edits, play history, playlist creation, favourites, and more.

Unless you don't mind losing that information, we strongly recommend backing up your Roon database periodically.

Your Roon database is full of information about the music you love. In addition to your library's metadata, it also contains any edits you've made, your play history, all of your Roon playlists, your favourites, your settings, and more.

All of this information is stored in your Roon Database. This database is designed to be extremely resilient but catastrophic events like failing hard drives, power cuts, or other unexpected disturbances can corrupt your database.

In rare cases, corrupt databases can be unrecoverable, so it's important you backup regularly to avoid losing data.

Important

Just to be very clear, your Roon Database is **not** the same thing as your music library (your collection of music albums and tracks contained in your Watched Folders). It is a separate database that is maintained by Roon.

How Does It Work?

Automatic backup functionality of your Roon Database is built right into Roon!

The best way to keep your Roon database safe is to set up a Scheduled Backup. Once you've configured a Scheduled Backup, Roon will automatically run your backup on the schedule you've set. Each backup will only save changes since the last backup.

We recommend configuring Scheduled Backups to more than one location. For example, backup to your NAS *and* Dropbox, or to a local hard drive *and* your NAS.

We also strongly recommend that you do not set the location of Scheduled Backups to be within any Watched Folders. Keep the locations separate.

Roon will create a folder called **RoonBackups** wherever you choose to backup to, and you can later select this folder to restore your backup.

Because your database is constantly being updated in the background using applications like Time Capsule, CrashPlan, etc on your live database is strongly discouraged, and can result in corrupt backups.

Where is My Roon Database?

On OSX, you can find your Roon folder (or RoonServer folder) by following these steps:

1. Open Finder and click Go in the top bar
2. Hold down the Alt key to unhide the Library folder
3. Click the Library folder

On Windows, you can find your Roon folder (or RoonServer folder) by following these steps:

1. Open Windows Explorer
2. Click in the address area to the right of the text, to make it active like typing in a web browser, and type **%localappdata%**
3. Find and open the Roon folder

On ROCK:

- If you are using ROCK, you can find the Roon database in your Data directory

On NAS:

- the Roon database will be in the RoonServer folder you set up

On Linux:

- If you used our "easy installer" scripts, then Roon's database is located in **/var/roon/RoonServer**
- If you ran Roon from the **.tar.gz** package by executing **./start.sh** without configuring the **ROON_DATAROOT** environment variable, then it will be in **$HOME/.RoonServer**
- If you have configured **$ROON_DATAROOT** manually, then it will be in **$ROON_DATAROOT/RoonServer**

For full details of how Roon is installed on Linux, see here.

Some Roon Core devices may require additional steps to expose or allow access to the database or the Logs folder. Please check our Community Site or contact the manufacturer of your device if you're unsure.

RAATServer

If Roon support needs access to your RAATServer logs, follow the instructions above, but instead of a folder called **Roon** or **RoonServer**, look for a folder called **RAATServer** .

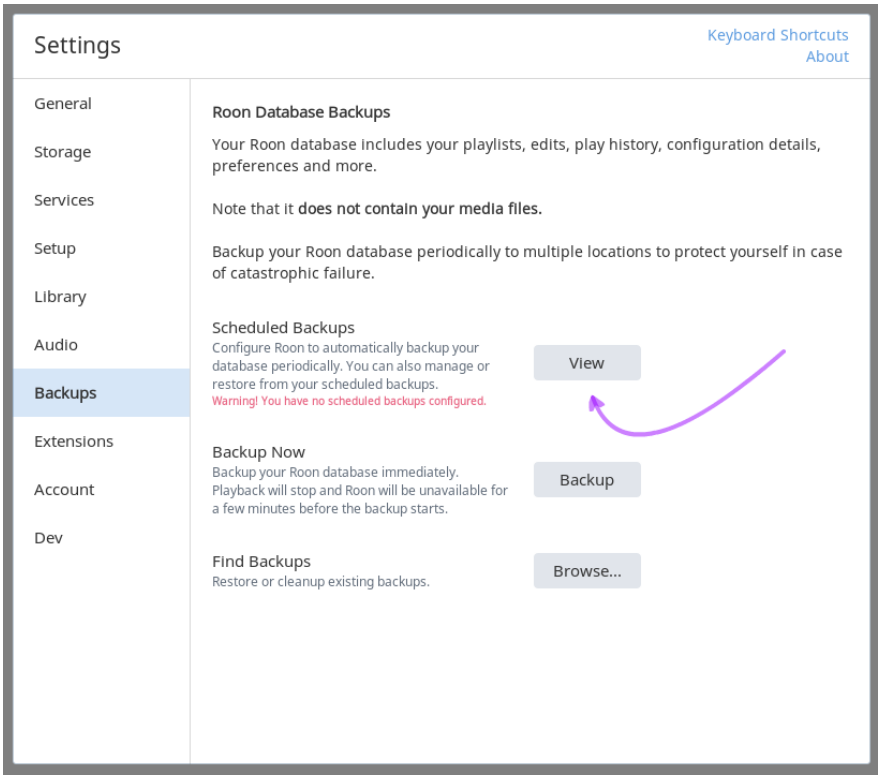
Sending Us Logs

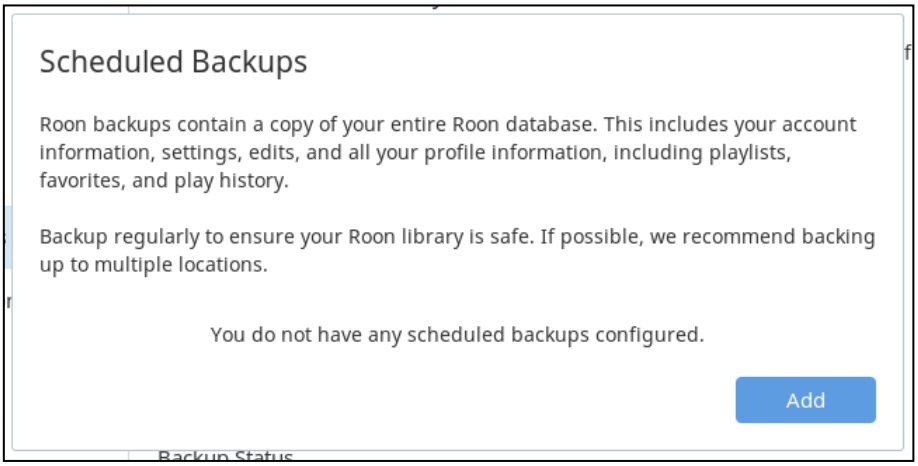
More information about sending us logs can be found here.

Setting Up Backups

To configure backups in Roon, start by visiting the Backup tab of Settings.

In most cases you'll want to configure a **Scheduled Backup**, so you can set it once and not worry about it. Start by clicking View next to Scheduled Backups.

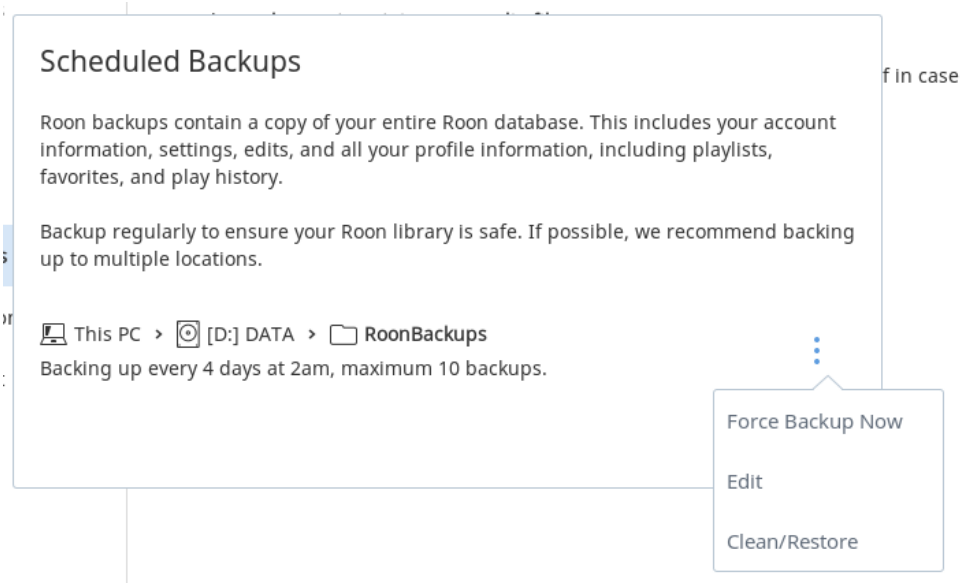




Click Add, and follow the instructions to set up your Scheduled Backups. You'll need to choose a few options, like how often you want Roon to backup and when you want Roon to backup.

Roon will be temporarily unavailable while the "snapshot" of your library is created, so make sure to schedule the backups for a time you're rarely listening to music, like the middle of the night. If music is playing when your backup is scheduled to kick off, Roon will retry the next day.

Once your backup is configured, you'll be able to see it on the Scheduled Backups screen. Click the 3 dots icon ⋮ to make changes to your backup, restore from your backup, or to kick off a backup immediately.



Backing Up Without A Schedule

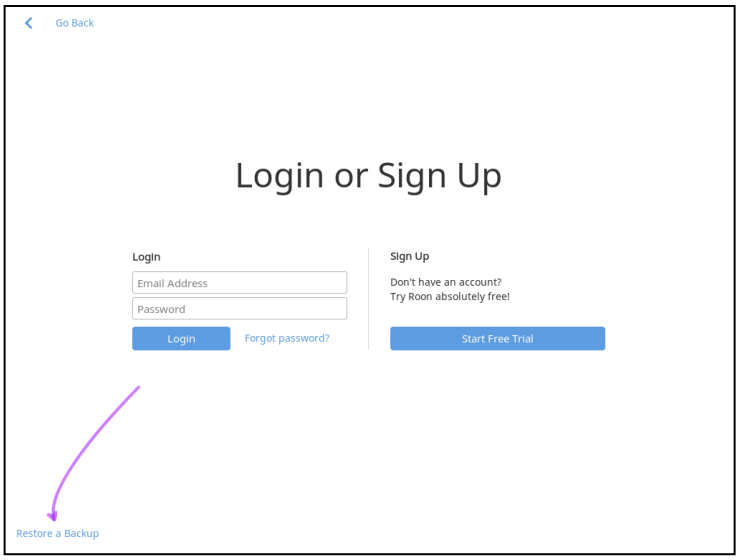
If you don't want backups to run automatically, you can also run a backup at anytime by clicking Backup Now, on the Backup tab in Settings.

You can backup to the same location later, and Roon will only save the changes since the last backup. Later, you can restore any of the backups you have saved to that folder.

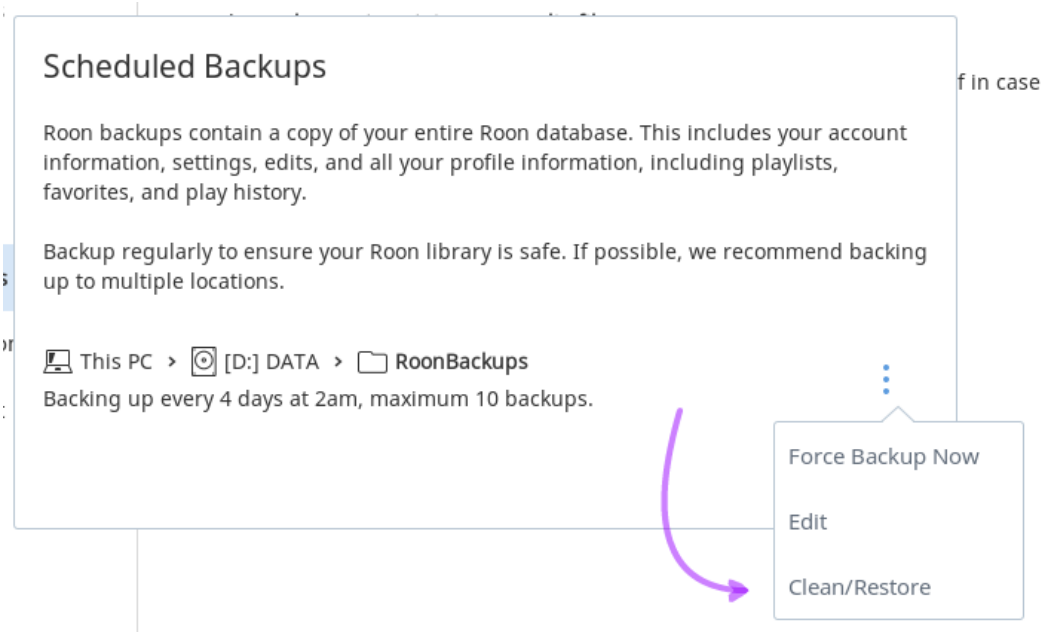
Restoring Backups

If need to restore a backup to a fresh install of Roon (like if you're moving your Core to a new device, or if you're restoring after a hard drive failure), you can do so from the Log In screen.

This will work on any Roon Core that is not logged in.



Scheduled Backups can be restored by clicking Clean/Restore from the Scheduled Backups window.



Other Backups can be restored by clicking Find Backups and pointing Roon at your `RoonBackups` folder. Note that restoring a backup will **permanently** overwrite the current database.

How do I perform a manual backup

Note: we recommend against manual backups. Roon provides a robust built-in backup function that is more flexible and reliable than backing up manually.

If you don't have a good reason for backing up manually, we strongly recommend backing up using the instructions above.

Backing Up Manually (Advanced)

1. **Close Roon** (or Roon Server -- whatever is running your Roon Core).
2. Navigate to your Roon database - details about finding your Roon database can be found here.
3. Copy your entire Roon folder to your backup location.
4. Restart Roon.

Note: you must close Roon while making the backup or your backup may be corrupt.

Note that because Roon's database is frequently updated in the background, we strongly recommend against depending on automatic backup programs like Time Machine, Crashplan, Carbon Copy Cloner, etc and others.

3.0 Setting up Audio

3.1 Overview

This page covers audio in Roon, including an overview of how Roon handles audio, instructions for setting up various audio devices and outputs, and frequently asked questions.

If you have a question and can't find the answer below, just let us know!

The Basics

- How do I set up Roon to use my DAC?
- How can I achieve the best quality output?
- What audio file formats does Roon support?
- Troubleshooting Audio Dropouts
- More Frequently Asked Questions and Troubleshooting

Understanding Audio in Roon

- Audio Setup Basics
- Exclusive Mode
- Signal Path
- DSP Engine
- Multichannel Audio

Connected Audio Outputs

Connected outputs include USB DACs, sound cards, even the built-in headphone jack on your laptop or tablet. These guides will help you get set up.

- Audio Setup Guide
- Windows Notes
- macOS Notes
- Linux Notes

Networked Audio Outputs

Roon also supports several network-based output options.

- Roon Ready Devices - Hardware products that speak to Roon Natively using RAAT
- Roon Bridge - Let you locate audio outputs anywhere on your home network.

- Airplay - iTunes and iOS devices.
- Sonos - Sonos products
- Chromecast - Google and Chromecast-compatible products
- Squeezebox - SlimDevices and Logitech products
- Devialet - Roon includes built-in support for the Devialet AIR protocol
- Meridian - Ethernet-based streaming to Meridian products
- HQPlayer - An extremely high quality DSP-focused media player

Odds + Ends

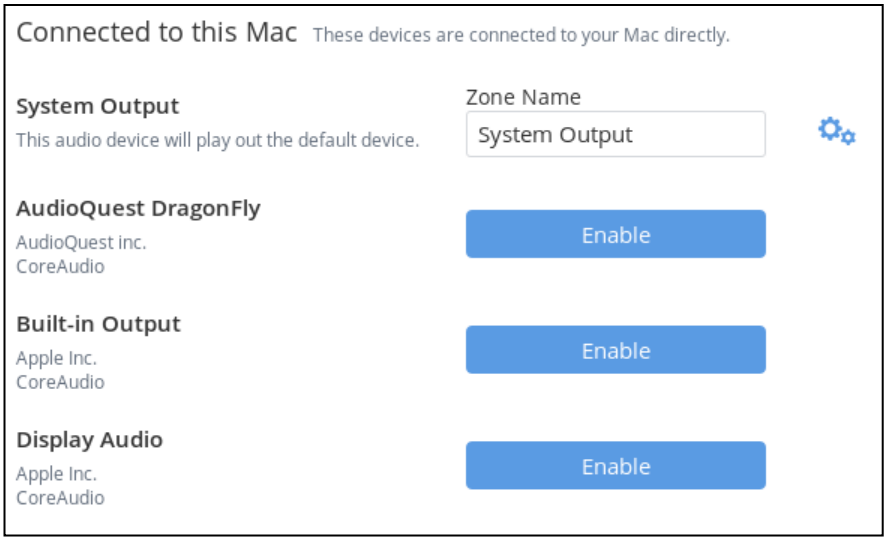
Audio related information that doesn't have a better home yet.

- Explanation of DSD to PCM Settings

3.2 Audio Settings and Your DAC

To access audio settings, first enter Roon's main settings screen, then choose the Audio tab.

Inside the Audio tab, you'll be presented with a list of audio output devices, grouped by type, and in some cases, by which computer or device they are connected to:



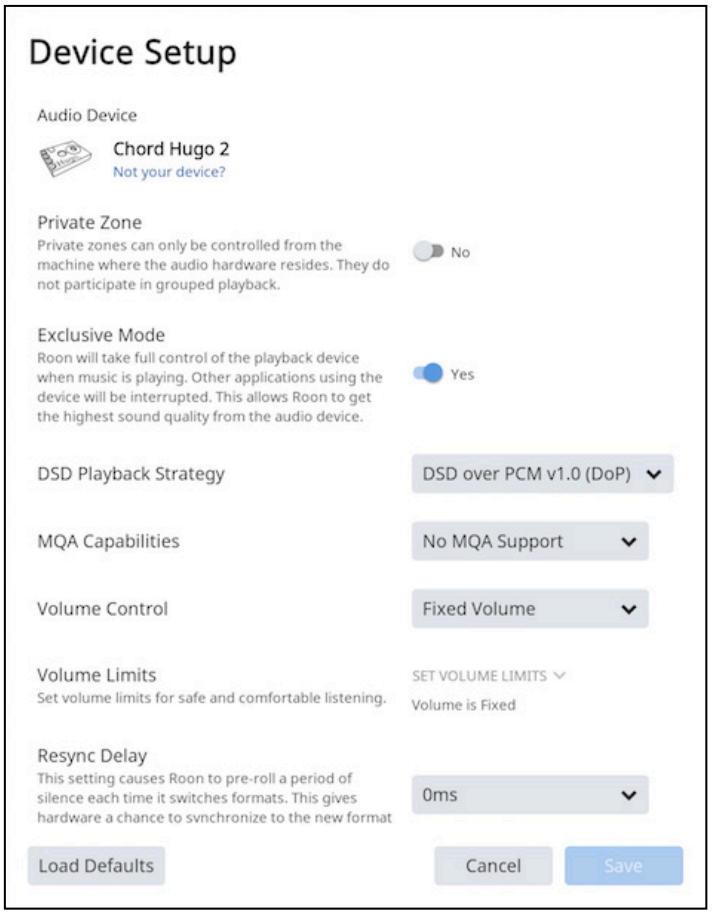
Device settings can be accessed by clicking the Gears icon or the "Enable" Button.

Enabled devices appear as Zones within Roon.

Device Setup

This is the Device Setup screen. It is split into two categories, general and advanced. If your device has been automatically identified by Roon, all of the correct settings should be applied automatically without any extra configuration by the user needed.

You can always return the settings to their default state by clicking **Restore Defaults**. Nothing is saved until you click **Save Settings** so feel free to exit the dialog if you get things into a confusing state and want to undo your changes.



General Settings

Private Zone

Private Zones can only be controlled from the same device where the audio hardware resides, and they are completely invisible to other devices. This also means that they cannot participate in Zone Linking.

This setting is most commonly used for private, or single-user devices like phones and tablets, where it often doesn't make sense to allow other members of the household control playback.

Exclusive Mode

The **Exclusive Mode** setting tells Roon to take exclusive control of your audio device. In order to play back MQA or DSD content, this setting must be enabled. While enabled, the audio device can't be shared with other applications. This allows Roon to precisely control every aspect of the playback without any interference from the operating system. This is a basic requirement for achieving audiophile grade playback.

The audiophiles in the room are nodding their heads.

This concept only applies to connected outputs--i.e. USB DACs, sound cards, or built-in outputs connected to Roon, Roon Server, Roon Remote, or Roon Bridge. If you are using a networked output (AirPlay, Squeezebox, Meridian, or Roon Ready), then the device takes care of this implementation detail internally.

That said, there are plenty of reasons *not* to use it, too. If you need to be able to hear notification sounds during playback, or you like to watch YouTube while listening to music, it's not necessarily a great idea to use this setting--since Roon will keep those other things from working properly. As with many aspects of computer audio, there is often a tradeoff here between convenience and sound quality.

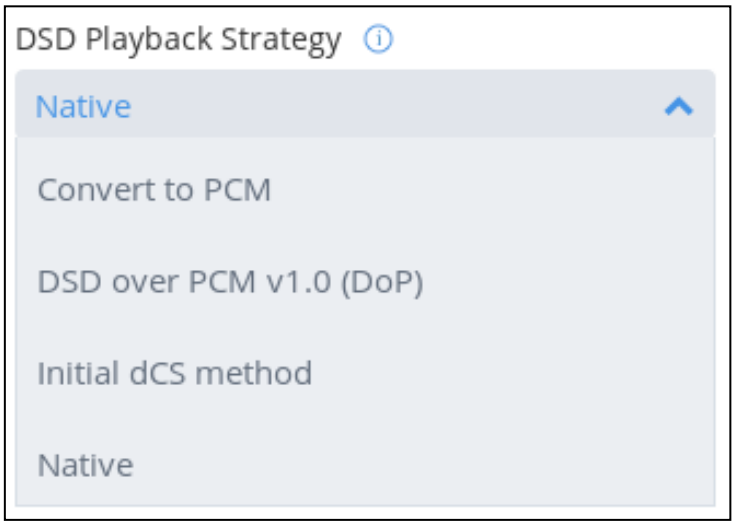
Not all outputs have an Exclusive mode setting. Sometimes this is because we *always* use an exclusive access mode on that output, and sometimes it is because the output is not capable of supporting exclusive access.

This is an overview of the situation:

Platform	Technology	Supports Exclusive Mode	Always Exclusive Mode
Windows	WASAPI	Yes	No
Windows	ASIO	Yes	Yes
Mac OS X	CoreAudio	Yes	No
Mac OS X	ASIO	Yes	Yes
Linux	ALSA	Yes	Yes
Android	OpenSL ES	No	No

In general, we support exclusive mode wherever it is possible.

DSD Playback Strategy



If you didn't go out and buy a "DSD DAC", or you don't know what that means, leave this setting at the default "Convert to PCM" value and stop reading right now.

If you *did* buy a DSD DAC, this is the approach we recommend:

- If Roon offers "Native" as an option, set it up that way and try out some DSD files. If everything works, great you're done. If things do not work, unplug your USB cable, and power cycle the DAC--some DACs misbehave after failed attempts at Native DSD playback.
- If "Native" playback wasn't an option or it didn't work, try "DSD over PCM v1.0 (DoP)".
- If that doesn't work, you either
    - Don't have a DSD DAC after all
    - Have a bit-perfect playback problem.
    - Have a very rare and early DAC that needs the "Initial dCS method" setting. If your DAC wasn't manufactured by dCS, this probably isn't you.

MQA Capabilities

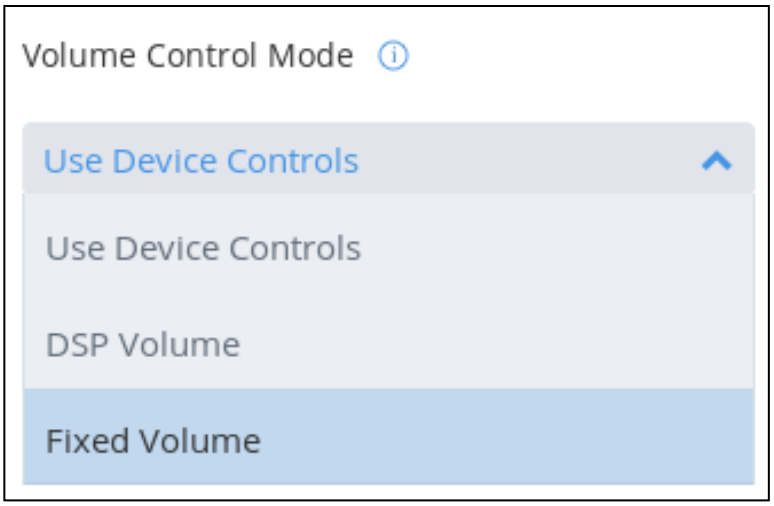
- For many devices, Roon will automatically identify its MQA capabilities and configure this option for you.
- If Roon does not identify the device correctly *or* you would like to change the MQA playback behavior of Roon you can manually override the default settings

See Roon x MQA for more information.

Volume Control Mode

There are a number of options here, and they vary by platform. For more information on platform-specific options, see the platform-specific audio pages, linked at the bottom of this page.

There are a few options that pertain to all platforms. Those, we'll describe here:



Use Device Controls causes Roon to pass volume commands on to your device via the device's driver. Exactly what happens next varies from device to device. If your device advertises a high-quality volume control over USB, it's likely that this is the setting that you want.

DSP Volume uses Roon's built-in 64bit dithered volume processing. This is a high quality option, but should not be your first choice for hardware that provides volume control natively.

Fixed Volume disables volume control from within Roon, sending a fixed-level output signal to the audio device. Use this setting if you plan to control volume elsewhere--for instance, on your pre-amplifier or AV receiver.

It's there to solve problems--if you don't have problems, you don't need it!

Generally the problems this solves are phrased like like "I'm not getting full-volume output even though I have Roon set to Fixed Volume mode or the Software Volume slider is at the maximum", or sometimes "I'm not getting bit-perfect playback, even though I'm in Fixed Volume Mode".

Maybe your device's controls are being manipulated by other software or by the OS, and you want Roon to set them back to a known state each time. Maybe your device boots up at 20% volume every time, and you need Roon to reset it for you. Whatever the case may be, if you're having problems like that, try this setting out and see if it helps.

Resync Delay

This setting is primarily used when an S/PDIF, AES, or I2S connection is involved. Oftentimes, a DAC will take a little bit of time to lock onto a new audio signal--sometimes as long as a few seconds.

This setting causes Roon to play a configurable duration of silence whenever it begins a new stream. Like the last setting, this one is a problem solver. If you find that the beginnings of songs are being cut off, or you're getting a lot of clicks and pops while your DAC locks on to an S/PDIF signal at the start of playback, try increasing this setting. 500ms is a good starting point. If that doesn't work, try gradually increasing it from there.

We default this to a very small value because it produces delays in Roon's user experience. Consider that when setting it up--unless you have an uncommonly slow DAC, settings longer than 1-2 seconds are probably not necessary.

Advanced Settings

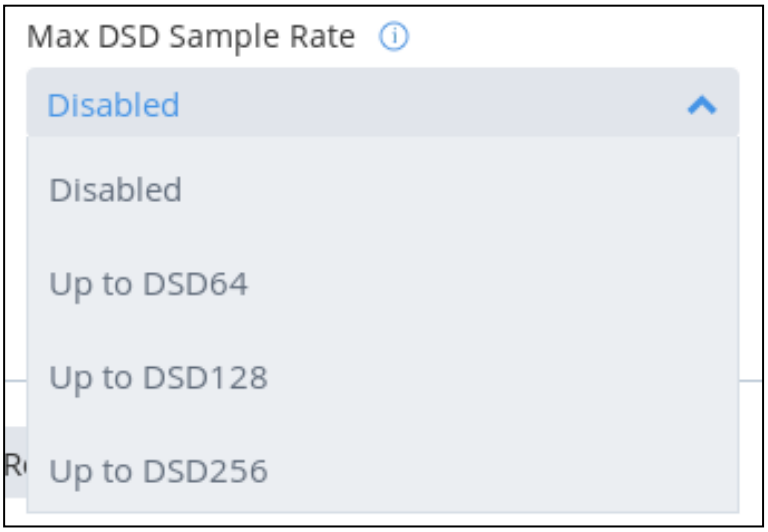
This screen can take on a few different shapes depending on what you are configuring. Lets start simple:

Max Sample Rate (PCM) and Max Bits Per Sample (PCM)

These settings limit the resolution of audio that Roon sends to your device. They are most commonly used in situations involving S/PDIF, AES, I2S, or DACs that over-report their playback capabilities. Like some of the settings mentioned above, they are here to solve problems. 99% of the time, you can safely leave them at the defaults with no ill effect.

Max DSD Sample Rate

This setting is for devices that over-represent their DSD capabilities.



If there are high DSD rates that your device doesn't support, you can use this setting to establish a maximum rate. That way, Roon will convert higher-resolution DSD content to PCM before playback instead of trying to play it directly.

This setting is a problem solver--if you don't have that problem, leave it at the default.

Enable Integer Mode (CoreAudio only)

This setting enables Integer Mode, which disables some extra bookkeeping inside of CoreAudio/ macOS. This is required for bit-perfect 32-bit playback, but does not impact the audio stream if the output format is 24bits or less. It's generally safe to enable, and does no harm, so we recommend turning it on unless it causes problems.

Enable Event Driven Mode (WASAPI only)

This setting enables a cleaner and more modern mechanism for passing audio to the device driver.

We recommend leaving it turned on whenever possible. Some devices, particularly "HD Audio" implementations often found on PC motherboards, can't handle this mode, so you'll have to turn it off. We enable this setting by default whenever **Exclusive Mode** is turned on.

One somewhat counter-intuitive consequence of turning it off is that our Zone Linking functionality doesn't work quite as well without it. You don't want that, do you?

Zone Grouping Delay

This setting adds a manually configured amount of delay to the output of this zone when it is grouped with other zones. Roon works in the background to ensure synchronized playback to all devices when in a grouped zone, this setting should only be configured if there is a consistent delay with the device when it is playing back as part of a grouped zone.

Clock Master Priority

Since MQA authorization by an MQA device requires MQA signalling information to complete the decoding and rendering processes, in certain cases grouped zone playback may interfere with MQA devices' abilities to authenticate and decode the stream.

If you'd like your MQA device to be able to authenticate and decode an MQA stream while playing in a grouped zone, you should set its "Clock Master Priority" setting to the highest in the group.

Use Max Hardware Buffer Size (CoreAudio Exclusive Mode + ASIO only)

This setting causes Roon to use the largest buffer size supported by your device. This setting is a problem-solver, and can reduce dropouts, clicks, and pops with some hardware devices.

If you're not having problems, it's probably best to leave it off.

Use Power-Of-2 Hardware Buffer Size (CoreAudio Exclusive Mode + ASIO only)

This one is sort of like **Use Max Hardware Buffer Size** except it forces buffer sizes to the nearest power of 2 instead of the largest possible size.

This is a workaround for bugs in some audio drivers and devices. It's worth a shot if you're experiencing dropouts, clicks, or pops during playback, but in 99% of cases it adds nothing of value. We don't recommend turning this on unless it solves problems for you.

Set Max Volume at Playback Start

If you choose **DSP Volume** or **Fixed Volume** you'll see an extra setting appear in the advanced settings screen.

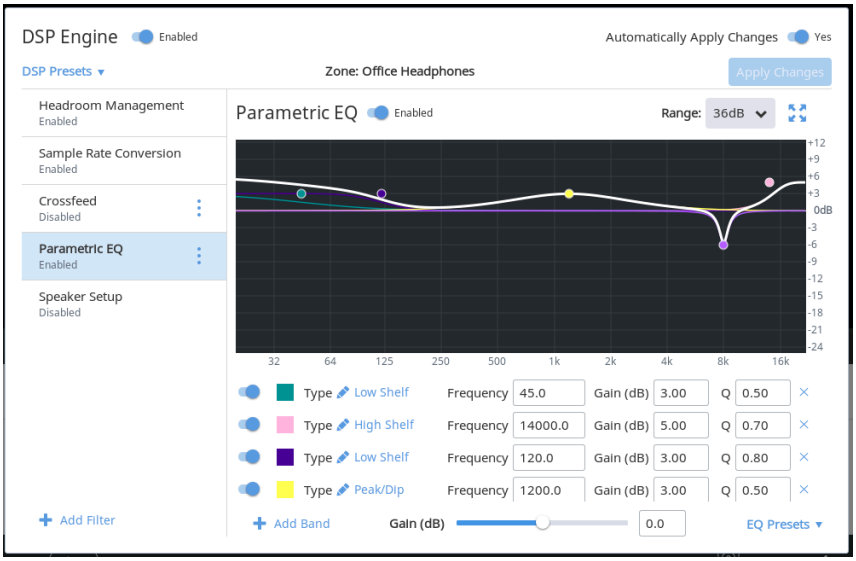
This setting causes Roon to attempt to set the Device's volume control to the maximum level each time it starts playback.

DSP Engine

Warning Label: DSP Engine gives you tools that can create loud or potentially damaging sounds. Experiment at low volume levels until you are confident that things are alright. If in doubt, ask for help.

Getting Started

Each zone has its own, independently configurable DSP Engine:



There are several ways to access the DSP engine.

Filters

The list on the left hand side reflects a list of filters that are applied to the audio stream.

- Headroom Management
- Sample Rate Conversion
- Parametric Equalizer
- Procedural Equalizer
- Crossfeed
- Convolution
- Speaker Setup

The Headroom Management, Sample Rate Conversion, and Speaker Setup filters are fixed in their positions, cannot be removed, and cannot appear more than once.

The remaining four filter types can appear multiple times, and can be added, removed, or re-ordered.

Pay attention to Headroom Management

Insufficient headroom is one of the most common reasons why DSP configurations don't sound right. Roon provides tools for troubleshooting and managing headroom and clipping during signal processing.

For more information, see Headroom Management

Use the Enable/Disable switches

Both the DSP engine as a whole, as well as the individual sections within it can be enabled/disabled using switches that look like this:

This is great for A-B testing.

If by chance some DSP that you've selected isn't working, and isn't showing up in signal path, make sure that the relevant switches are flipped to "enabled".

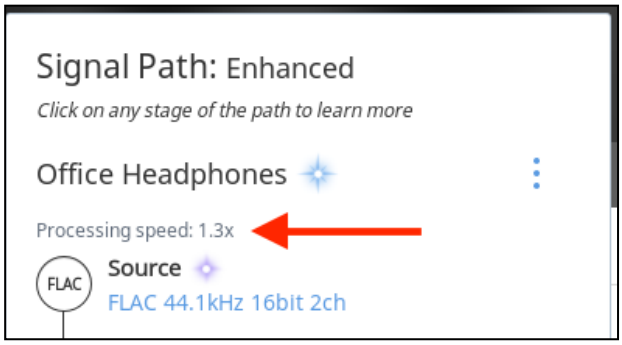
Keep an eye on the Signal Path

If you are playing with DSP features, it pays to be familiar with Signal Path and get in the habit of checking it often to make sure things are happening how you expect them to be. And don't forget to share your favorite signal paths on community.

Pay attention to CPU Usage

Some of the features in DSP Engine can consume a lot of CPU resources. Nothing beats a nice beefy Core i7 if you want to turn everything up to 11. If you're running on a weaker system, particularly one that is shy of our recommendations, modulate your expectations accordingly.

Use the processing speed indicator to get a sense of how "close to the line" you are. Numbers below 1.0 mean that the CPU on your Roon core is not powerful enough to execute the configuration you've requested. This is about as close to peril as you want to be:



Note that Roon currently runs the DSP engine on one CPU core per zone--so this reflects the load relative to consuming a full core. "2.0x" means you're using 50% of one CPU core to play music in this zone.

Pay attention to Network Utilization

When combining upsampling features with network-based streaming, bear in mind that there's a huge difference between playing something at CD quality and playing the same content at DXD or DSD256. Your network could be working 15 times harder than before, depending on the configuration.

Huge differences like this can sometimes expose latent performance issues. This is true of all networks, but *extra*-true when using WiFi or Ethernet-Over-Power.

Zone Grouping

When using RAAT, DSP features and Zone Grouping are fully interoperable.

When using AirPlay, Meridian, Sonos, Chromecast and Squeezebox streaming, there are some limitations

Not into DSP? Fear Not

If DSP features are not your cup of tea, rest assured that just as in previous versions of Roon, all digital signal processing is disabled by default, except when it's required to maintain compatibility with your output device. If you never venture into these screens, nothing is different from how it was before.

As always, you can verify bit-perfect playback using Roon's Signal Path feature.

Multichannel Audio

As of version 1.3, Roon supports multichannel files, signal processing, and playback, of up to eight channels per device.

The following file formats are supported:

- FLAC
- WAV
- DSF
- DFF
- AIFF
- ALAC
- AAC

Multichannel output can be accomplished with:

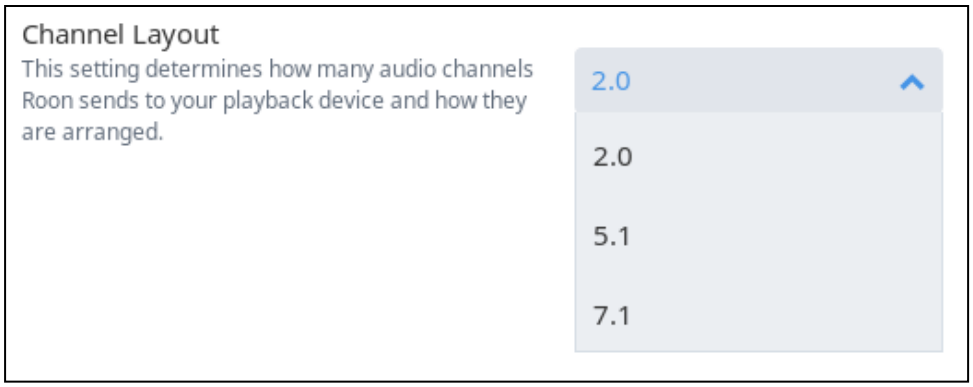
- Locally connected audio devices connected to Roon, Roon Bridge, or Roon Server using
    - ASIO
    - ALSA
    - CoreAudio (recommendation: use ASIO if possible)
    - WASAPI (recommendation: use ASIO if possible)
- Roon Ready devices that support multi-channel playback
- HQPlayer

Configuring your Device for Multichannel Playback

Before Roon will send more than two channels of audio to your device, some configuration is necessary. This is accomplished on the "Device Setup" screen, accessible from Settings->Audio.

Channel Layout

If you have a multi-channel device, this is the most important setting.



The meaning of these layouts is:

- **2.0:** L R
- **5.1:** L R C LFE SL SR
- **7.1:** L R C LFE RL RR SL SR

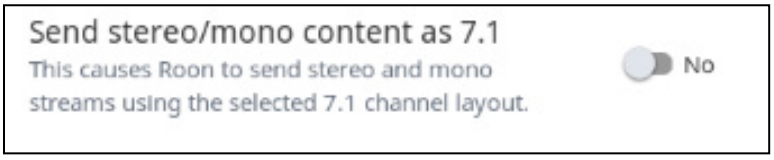
  (**L** = Left, **R** = Right, **C** = Centre, **LFE** = Low Freq Effects, **RL** = Rear Left, **RR** = Rear Right, **SL** = Surround Left, **SR** = Surround Right)

If you have 2 speakers, choose 2.0. If you have up to 6, choose 5.1, and if you have 8, choose 7.1. Then make sure they are wired in the right order.

If you are using HDMI, you may need to use 7.1 even if you only have 6 speakers--many AV receivers don't work properly with 5.1.

Roon Ready devices should present the channels in order specified above. Other devices may do other things. The best way to figure it out is to find some test tones that send audio to one channel at a time and play them back.

Send stereo/mono content as 7.1



Roon 1.3 Build 242 contained a change to our default stereo/mono playback behaviour when talking to multi-channel devices. Previously, the full channel layout was always sent, with silence sent to unused channels. Now, stereo/mono content is sent using the “2.0” layout, and only multi-channel content uses the selected layout. This setting allows users to revert to the old behaviour if desired, but we expect that the default will work for the great majority of use cases.

Multichannel Mixing Strategy

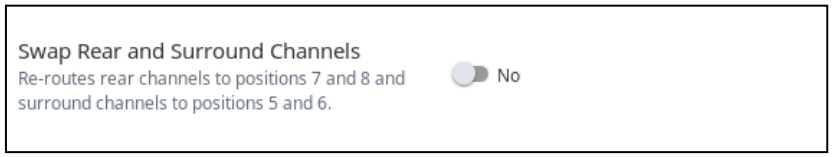
There are two options: "Downmix as Needed" and "Channel Mapping Only".

By default, Roon is set up to Downmix content if the content has more channels than the output device--this is the setting we recommend.

If you prefer that Roon not perform any downmixing, you should use "Channel Mapping Only". Roon will simply drop any channels that can't be mapped to speakers instead of playing them.

Swap Rear and Surround Channels (Only for 7.1).

Sometimes for compatibility or legacy reasons, a system has the surround and rear channels swapped so that the surround channels come before the rear channels. This setting re-directs the audio streams to compensate.



Channel Mapping

The multi-channel world is a graveyard of false-starts and obsolete technologies, plus a lot of video/movie specific schemes that aren't very relevant in an audio-only environment like Roon.

Most musical content produced recently is either in either 2.0, 5.0 or 5.1. There is a small amount of 7.1, too, and a small amount of Quadrophonic content. Compared to these four formats, practically everything else qualifies as exotic in an audio/music context.

Channel mapping for 2.0, 5.0, 5.1, and 7.1 is straightforward, since each larger layout simply adds channels to the previous one. In these cases, Roon matches up the channels from the source material with the channels on the output device and fills any unused channels with silence.

Quadrophonic content is handled slightly differently:

- When playing Quad content to a 5.1 channel layout, the rear channels from the content will be mapped to the corresponding surround channels in the 5.1 layout.
- When playing Quad content to a 7.1 channel layout, the RL and RR channels in the Quad content will be mapped onto the RL and RR channels in the 7.1 layout

Other content is handled on a best-effort basis: if channel labels in the content line up with channels in your output channel layout, they are mapped. Un-mappable channels are ignored. One example: Roon never maps content from a "Rear Center" channel.

As with anything else, if substantial demand for more comprehensive surround sound processing arises, we will consider expanding our support. Come drop us a line on our community site if you have thoughts about this.

Downmixing

Roon's downmixing engine supports the most common cases that come up during music playback.

- 7.1 → 5.1

- 7.1 → 2.0
- 5.1 → 2.0
- 5.0 → 2.0

The primary objective is to ensure that as much content as possible can be played through stereo zones without ignoring non-subwoofer channels. Other cases will fall back on the *Channel Mapping* behaviour described above.

Platform-specific information

The following are platform-specific supplements to this information.

Windows Audio Notes

Roon supports two output mechanisms on Windows: *WASAPI* and *ASIO*.

WASAPI is Microsoft's recommended method for accessing WDM (Windows Driver Model) Audio drivers.

ASIO is an alternative audio driver stack for Windows, built at Steinberg to support pro audio software.

Both are capable of bit-perfect playback. WASAPI is a more modern system, with stronger support for convenience features like volume controls and device identification, and ASIO is more bare-bones and minimal, with a fair share of historical warts.

In general, we recommend that you use WASAPI unless your device has a high-quality ASIO driver available, but since driver quality varies so much from device to device in, it's difficult to make a general recommendation.

For an in-depth overview of Audio Configuration in Roon, check out our Audio Setup Basics info.

This page covers a few Windows-Specific issues.

Using WASAPI volume controls with ASIO drivers

Many people prefer to use ASIO drivers, but ASIO doesn't have support for volume control. If you have an ASIO device that implements high quality volume adjustments via WASAPI, we've got you covered.

Inside the settings for the ASIO driver, just pick the WASAPI device that you want to use for volume control from the **Volume Control Mode** menu.

Work around drivers that misreport device capabilities

This is one of the most confusing settings in Roon, but it's there for a good reason. Allow us to explain.

On Windows there are two ways to determine whether an audio driver supports a particular playback format.

We can **ask nicely**--hey driver, do you support this? Yeah? Cool.

Or we can be **nasty**--hey driver. Play this. Ok you're gonna do it? Oops, never mind...

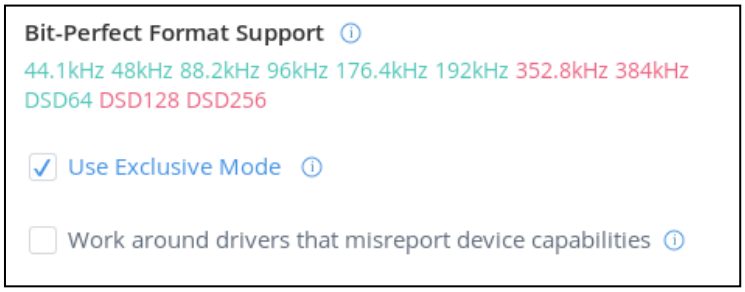
Unfortunately, many drivers give incorrect answers when we ask nicely. And some devices make clicks and pops if we ask the nasty way. That puts us in a tight spot, because we really need to know what your device can and can't do so we can make the best decisions about how to set up the Signal Path.

So, by default, Roon asks nicely. If you go into the Audio Settings screen and you see some formats in red that should be green, try flipping this switch and see if it changes.

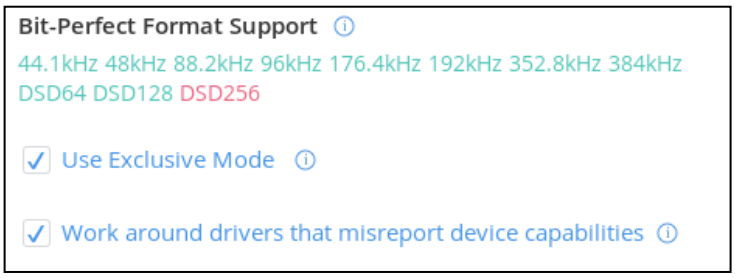
When this setting is enabled, Roon will ask the driver about its format support using the "nasty" method each time Roon is started.

If this checkbox doesn't make a difference, **please** leave it off. It isn't doing anyone any good.

Example: Without the setting



Example: With the setting

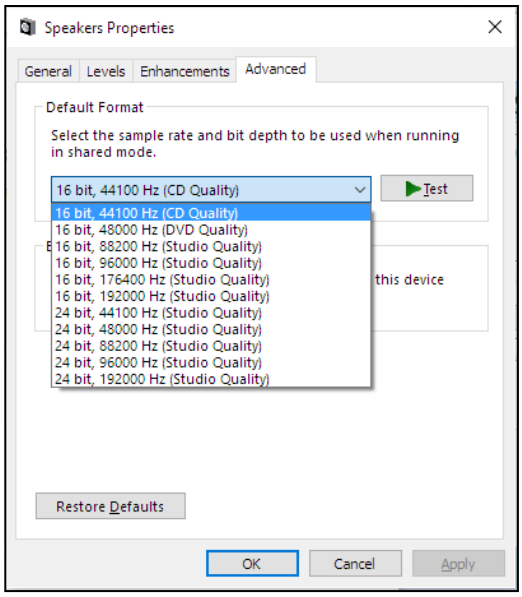


The Political Side...

We would like to live in a world where audio drivers are better than they are today. We are hoping that by putting driver bugs like these out in the open, device manufacturers will be able to see the problem, experiment with it, and fix it, in a way that is minimally disruptive to their customers.

If you see your device mis-reporting its capabilities, it's worth getting in touch with the manufacturer to show them the issue.

If you're not convinced that Roon is getting it right, it's worth comparing against Control Panel. See, Control Panel asks nicely, too, just like Roon:



macOS Audio Notes

Roon supports two output mechanisms on macOS: *CoreAudio* and *ASIO*.

CoreAudio is Apple's native audio framework.

ASIO support on Mac is extremely limited--currently the only devices we are aware of are manufactured by exaSound. If you don't have one of these, you will be using CoreAudio.

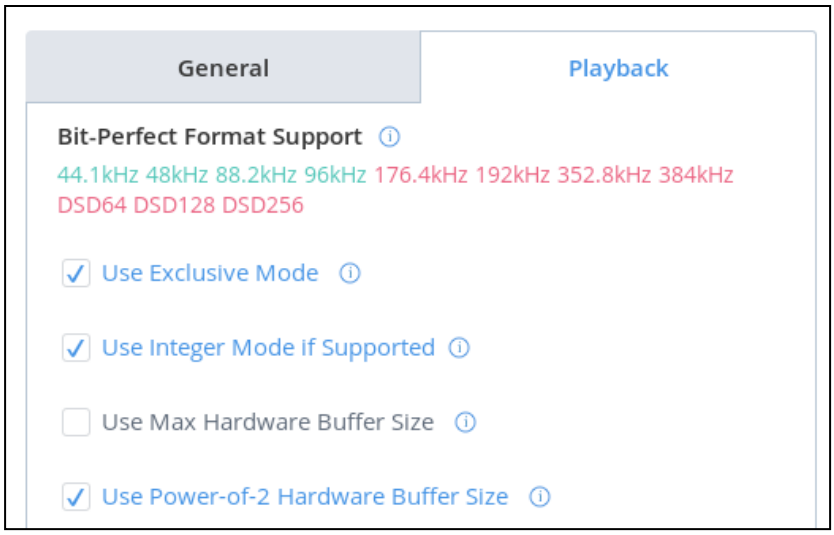
Both are capable of bit-perfect playback. CoreAudio is a more modern system, with stronger support for convenience features like volume controls and device identification, and ASIO is more bare-bones and minimal.

For an in-depth overview of Audio Configuration in Roon, check out our Audio Setup Basics page.

This page is for mac-specific notes and issues.

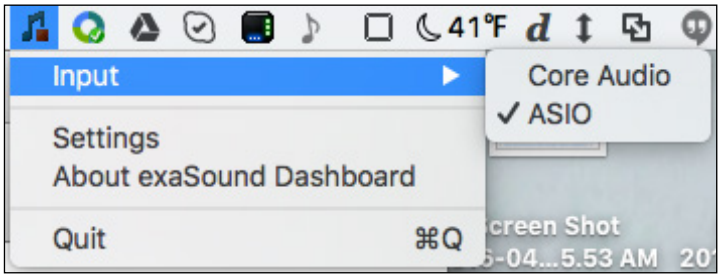
Help, I'm having Staticky or Unstable playback with Dirac!

There's an easy workaround. Make the audio settings for Dirac look like this:



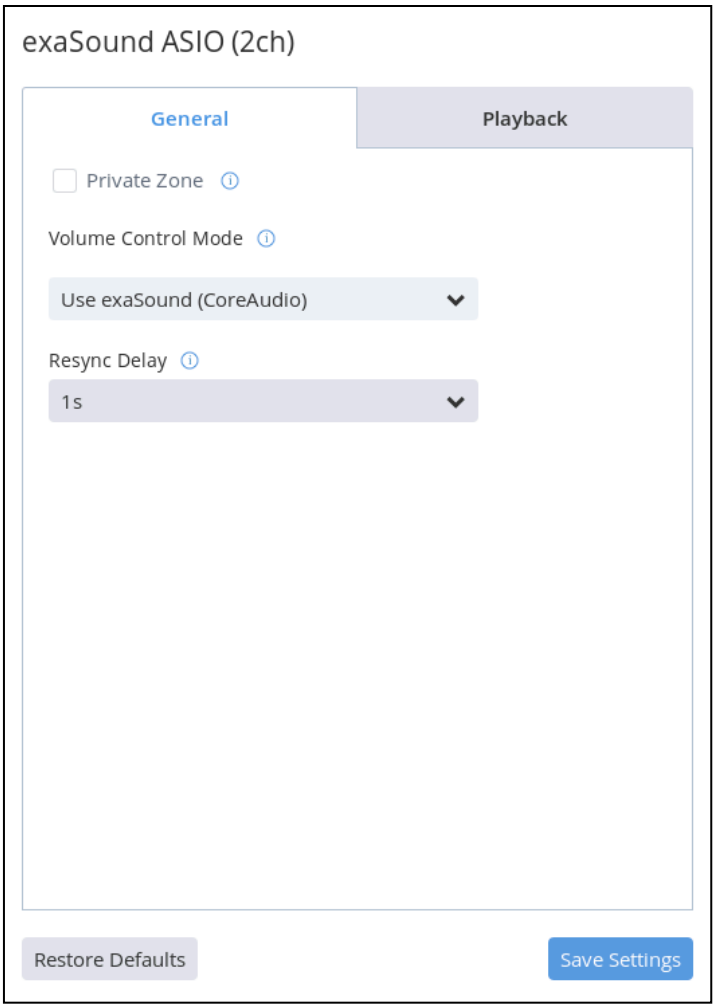
Recommended Setup for exaSound devices with ASIO drivers

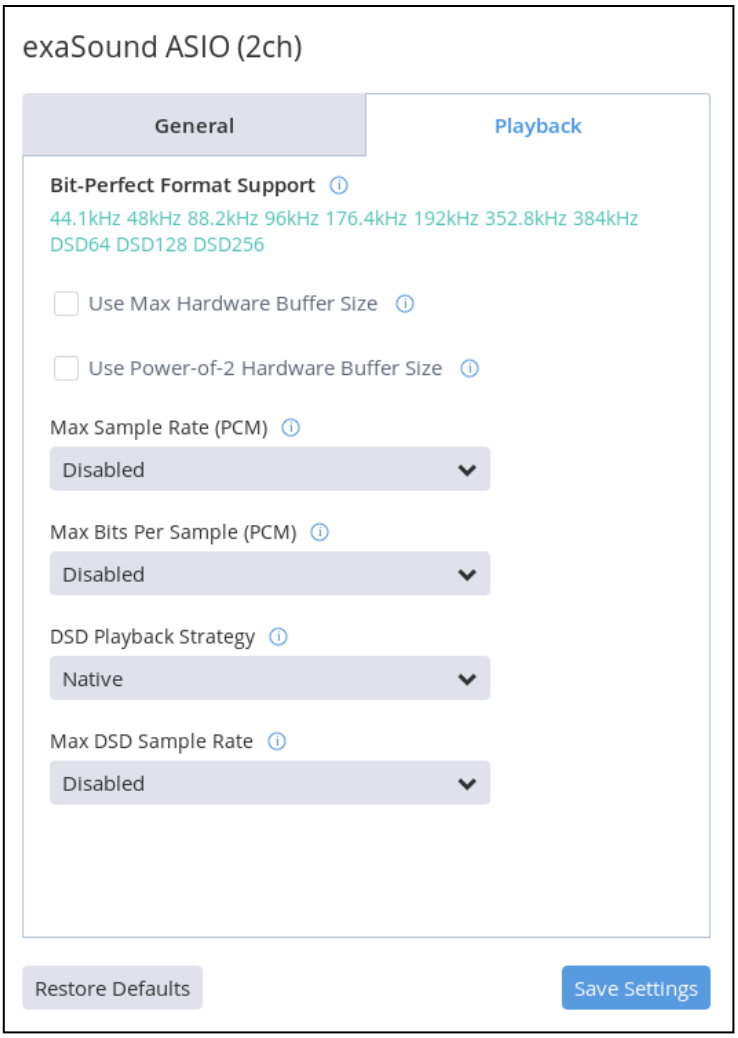
Make sure that the exaSound dashboard is set to "ASIO" mode. If it leaves ASIO mode, or if the dashboard exits, Roon will have difficulty accessing the device. If you have having problems unexpectedly, this is the first thing to check:



Then, in Roon's audio settings, enable the (2ch) version of the driver, even if you have an 8-channel device

Finally, make your setup screens look like this:


exaSound ASIO (2ch)
General
Playback
Private Zone
Volume Control Mode
Use exaSound (CoreAudio)
Resync Delay
1s
Restore Defaults
Save Settings



Then play some music.

Linux Audio Notes

Roon uses ALSA to speak to audio devices on Linux. We only support situations where we have direct and exclusive access to the hardware (in ALSA terms, we are using **`hw:X,X`** device identifiers).

For an in-depth overview of Audio Configuration in Roon, check out our Audio Setup Basics page.

This page is for Linux-specific notes and documentation.

Native DSD Support on Linux

Roon supports Native DSD output on Linux, assuming:

1. Your kernel supports Native DSD output on your DAC
2. Your ALSA library is new enough to expose that support to Roon (1.0.29 or higher).
    - If you are using DietPi, you need to use the "Stretch" image ("Jessie" is built with ALSA V1.0.28) .

See this page for more information on enabling Native DSD support in your kernel. Warning in advance: this stuff isn't for people who are new to Linux.

Crackles, Snaps, and Pops during playback on Raspberry Pi2/3

While stable high-resolution playback is possible on these devices, it often requires some tweaking to get there.

In general, we don't have the answers about this kind of stuff. The best thing you can do if you're running into this sort of thing is to run recent kernels + firmware, and to hunt through the Raspberry Pi communities and see if anyone has figure out the problem you are having.

In particular, we have noticed that the built-in WiFi chip on the Pi3 interferes with USB playback quite a lot. The Pi2 with a USB WiFi adapter does tend to do somewhat better, but we have not yet seen perfect results with DSD256 or 384k PCM on a Pi device.

Issues with 88.2k and 176.4k S/PDIF output on iMX6 devices (CuBox, et al.)

The built-in S/PDIF on this device is kind of a dog--the clock rates aren't bang on, they don't zone-link well, and not all DACs like the signal. Oh, and out-of-the-box the support for 88.2k/176.4k playback is generally missing or broken.

Still interested in using it as an S/PDIF sender?

We've heard that this kernel patch helps with the 88.2/176.4 issues. We don't support this--just putting this information out there in case it's useful. If it works for you, or you have better information that we can publish here, let us know.

Android Audio Notes

Roon uses OpenSL ES to accomplish audio playback on Android.

This is primarily for convenience--Audiophile quality playback on Android is still in its infancy.

For an in-depth overview of Audio Configuration in Roon, check out our Audio Setup Basics page.

Format Support Notes

By default, we set the "Max Sample Rate (PCM)" and "Max Bits Per Sample (PCM)" settings to 48kHz and 16bit, respectively.

Some Android 5.0+ devices can support higher playback rates (and many others can't). This default was a conservative choice that maximizes compatibility with the widest range of devices.

We've had good luck with up to 24/96 on recent Nexus devices. If you want, disable the limits in audio settings and see what happens. If that doesn't work out for you, flip back to the defaults.

3.3 What audio file formats does Roon support?

Built In Support:

- WAV
- WAV64
- AIFF
- FLAC
- ALAC
- OGG

All of the above at resolutions up to 32bit 384khz.

Roon also supports uncompressed DSD64, DSD128, and DSD256 content in the DSF and DFF file formats.

OS Dependent Support:

- MP3
- AAC

Note: Roon does not ship codecs for these formats, but can use OS provided codecs where available, such as on Windows 7+ and macOS 10.8+

Playlists

- M3U files (local media only)

3.4 Playing Music to a *Zone*

Think of a zone as a room in your house, or as an output device that you use to play audio.

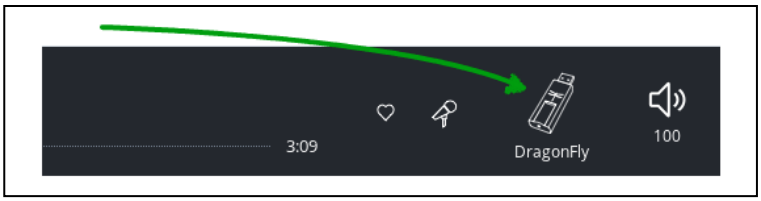
Roon is a multi-room system, so it supports playback of music to one or more **Zones**. The very bottom area of Roon's user interface, called the *footer*, is dedicated to showing information about the currently selected zone.

You might have a zone for the *Living Room*, one for the *Bedroom*, another for your *Office Speakers*, and yet another for your *Office Headphones*.

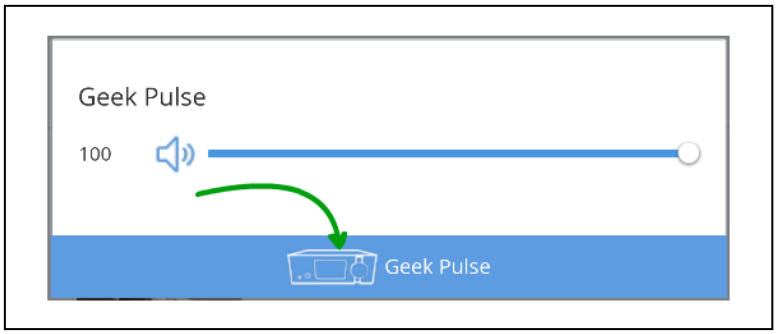
For more information about output devices that work with Roon, see the Partner Devices Matrix. For more information on Roon's architecture at a higher level, see Architecture.

Switching Zones

To switch the zone you're controlling in desktop and tablet interfaces, click the Zone Picker in the footer, next to volume:



On a phone, switch by clicking below the volume popup:



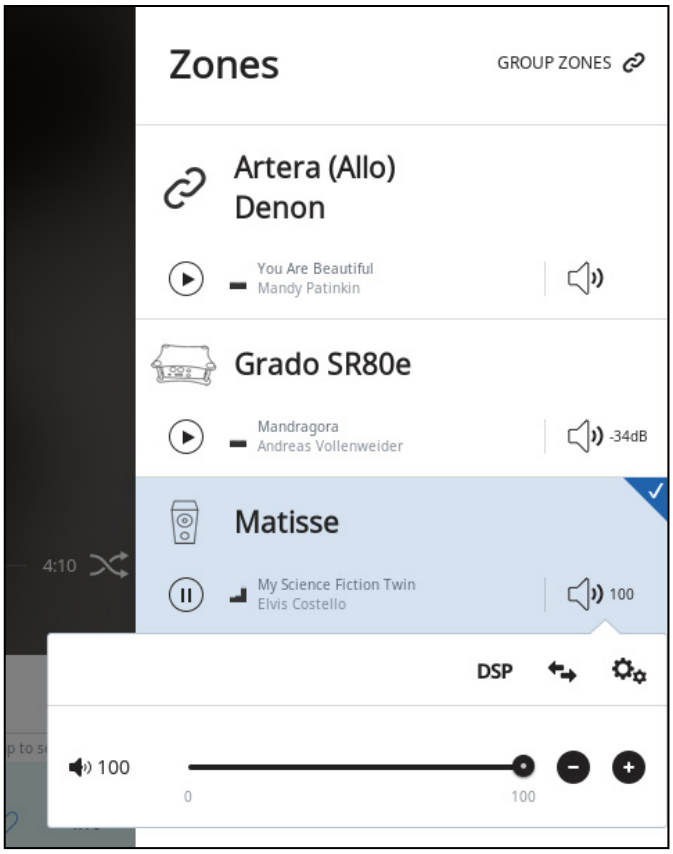
Transfer Zone

Roon allows you to transfer or move your current track, queue and radio to another zone. While viewing the queue, click on the double arrow icon ⇄ and select the new zone.

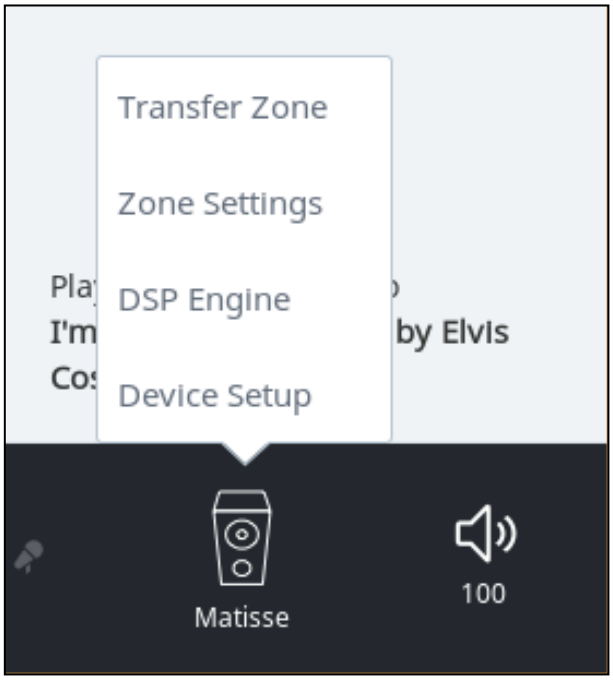
On a phone, click the middle of the footer, on the song name, and select Now Playing. Just below Now Playing will be the double arrow icon ⇄. From there select your new zone.

Other Ways to Transfer Zone

- You can also Transfer Zone by left clicking (or tap) the Zone Picker at the bottom right of the screen. From there, click on the speaker icon next to your currently playing zone and select the Transfer Zone icon (the double arrow).



- You can also Transfer Zone by right clicking (or long press) the Zone Picker at the bottom right of the screen. From there, select Transfer Zone.



Zone Grouping

Roon supports **Zone Grouping**, or synchronizing audio playback in several zones within your house.

Zones can only be grouped with other zones *of the same type*, meaning Squeezebox zones cannot be grouped with RAAT zones, Meridian zones can't be grouped with Airplay zones, etc.

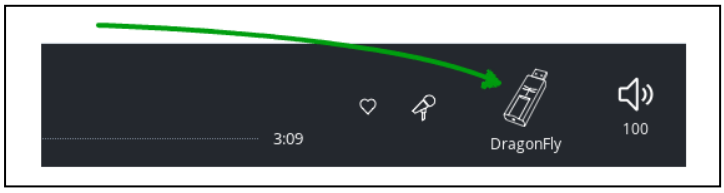
Not all technologies support grouping, but the most commonly used options do. These are the types of zones within which grouping is possible:

- RAAT Zones
    - Roon Ready devices
    - Roon outputs on macOS, Windows, and Android
    - Roon Bridge outputs on macOS, Windows, and Linux
- Squeezebox zones
- Meridian zones
- Airplay zones
- Chromecast zones
- Sonos zones

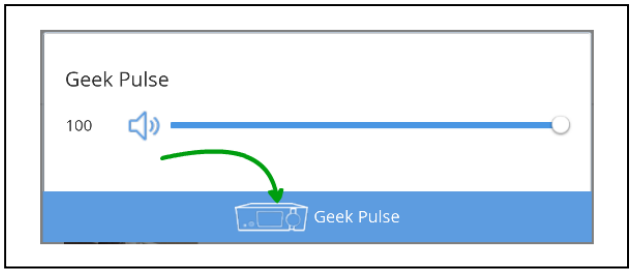
MQA Playback to Grouped Zones Since MQA authorization by an MQA device requires MQA signalling information to complete the decoding and rendering processes, in certain cases grouped zone playback may interfere with MQA devices' abilities to authenticate and decode the stream.

If you'd like your MQA device to be able to authenticate and decode an MQA stream while playing in a grouped zone, you should set its "Clock Master Priority" setting to the highest in the group

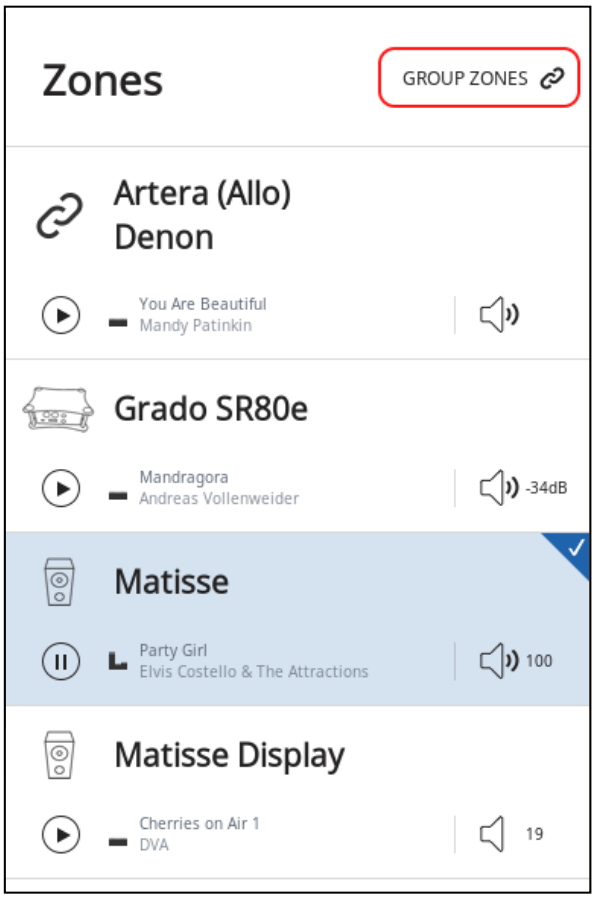
To Group Zones, select the zone you're controlling in desktop and tablet interface, by clicking the Zone Picker in the footer, next to volume:



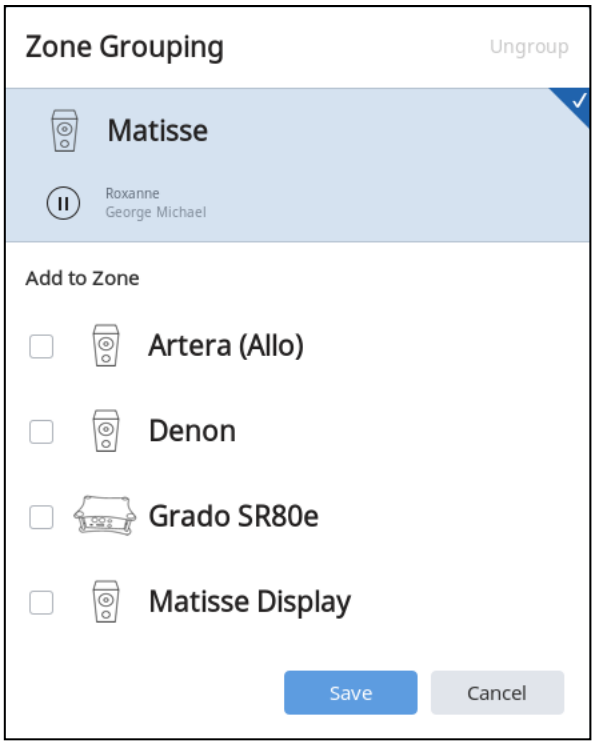
On a phone, select by clicking below the volume popup and clicking Switch Zone:



From there, click on "GROUP ZONES" (here highlighted in the screenshot).



This brings up the available zones; for example:

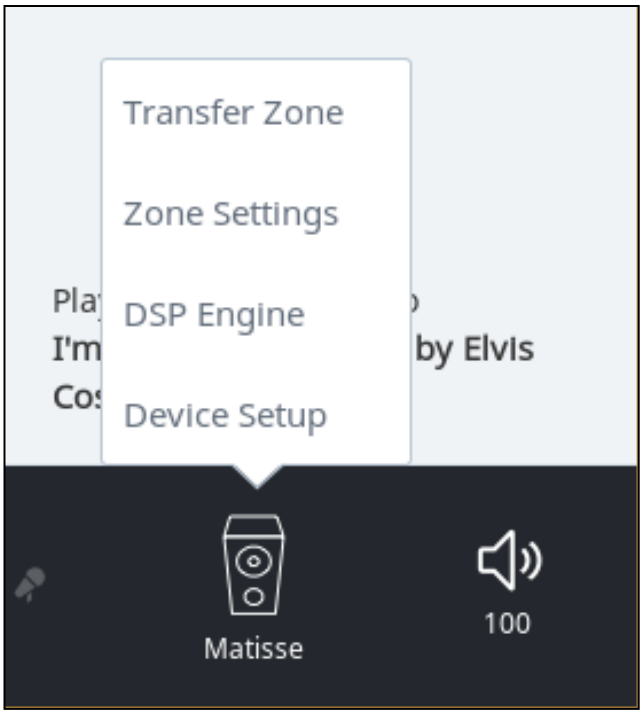


Now click the desired zone(s) to be added and select Save. Your grouped zone will be called something like 1st DAC + 2nd DAC.

If you wish, you can edit the name of the grouped zone in the Zones pop up menu. Click the speaker icon next to the Grouped Zone and select the Settings icon (the gearwheels icon). Now enter the Grouped Zone Name. Note that the name will be lost once you ungroup the zones.

To ungroup your zones, select your Grouped Zone and click "Group Zones" at the top of the zones panel. Next click the zones you want to remove and click Save.

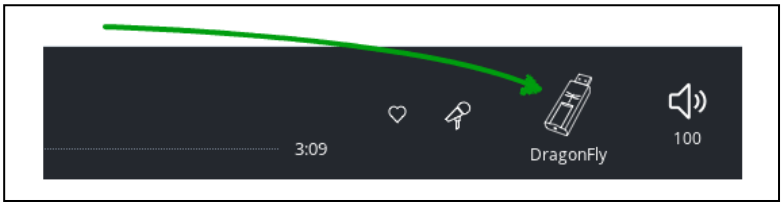
You can also rename your Group Zone by right clicking (or long press) the Zone Picker at the bottom right of the screen. From there, select Zone Settings.



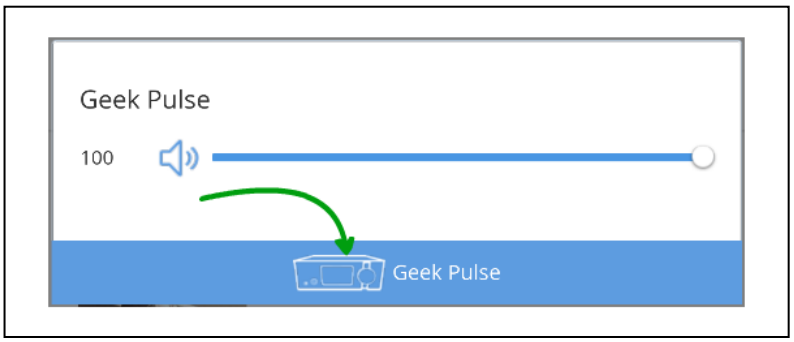
Zone Settings

The Zone Settings screen is used to access zone-level settings like zone names, crossfade, volume levelling and volume limits.

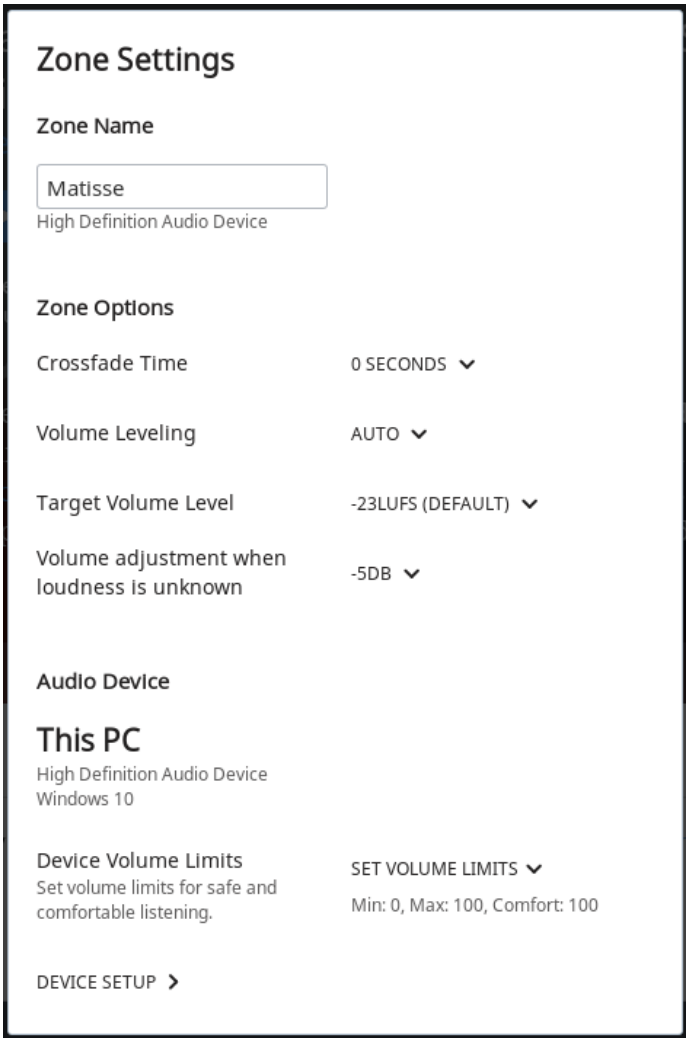
To access Zone Settings, select the zone you're controlling in desktop and tablet interface, by clicking the Zone Picker in the footer, next to volume:



On a phone, select by clicking below the volume popup and clicking Switch Zone:



If you wish, you can edit the name of a Zone or set Crossfade and Volume Levelling in the Zones pop up menu. Click the speaker icon next to the Zone you want to edit and click on the gearwheels icon to access the Zone Settings. Now enter the new Zone Name or set Crossfade, Volume Levelling or volume limits.



Note that if you have Volume Levelling set to "Off", you will **not** see the additional Target Volume Level and Volume adjustment settings.

Another Quick Way to Rename Zones or Set Crossfade, Volume Levelling and Volume Limits

- You can also access Zone Settings by right clicking (or long press) the Zone Picker at the bottom right of the screen. From there, select Zone Settings.

To learn more about the Zone Settings click here.

Private Zones

Private zones are special because they don't support remote control. They are invisible unless you are controlling Roon from the same device where the private zone lives.

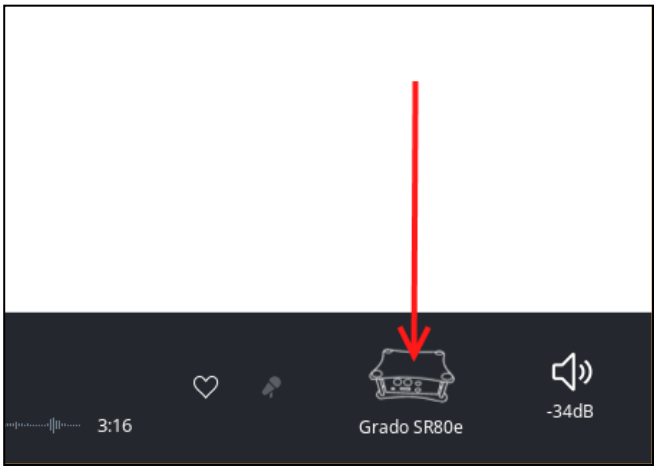
They are most commonly used on laptops and mobile devices when you might not want other people in your household taking control of your speakers or headphones remotely.

Because they can only controlled locally, they are excluded from Zone Grouping.

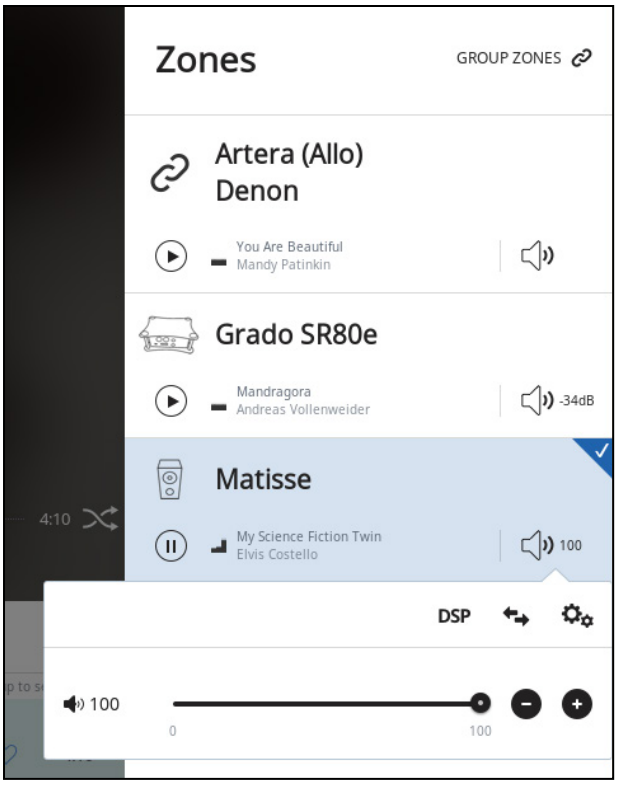
How To Configure Crossfade

You can set a crossfade of 0-10 seconds from the Zone Picker.

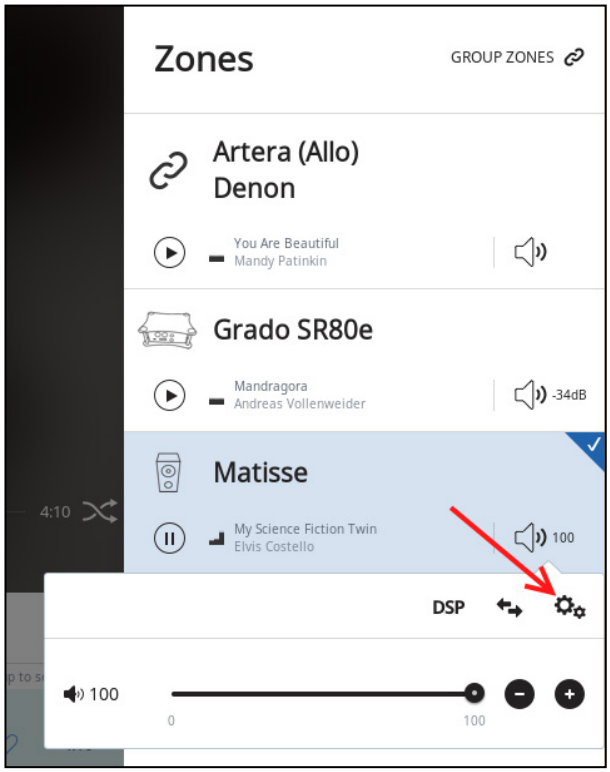
Click the current zone on the right side of the bottom bar, then in the pop up window click the speaker icon followed by the gearwheels icon to display the Zone Picker.



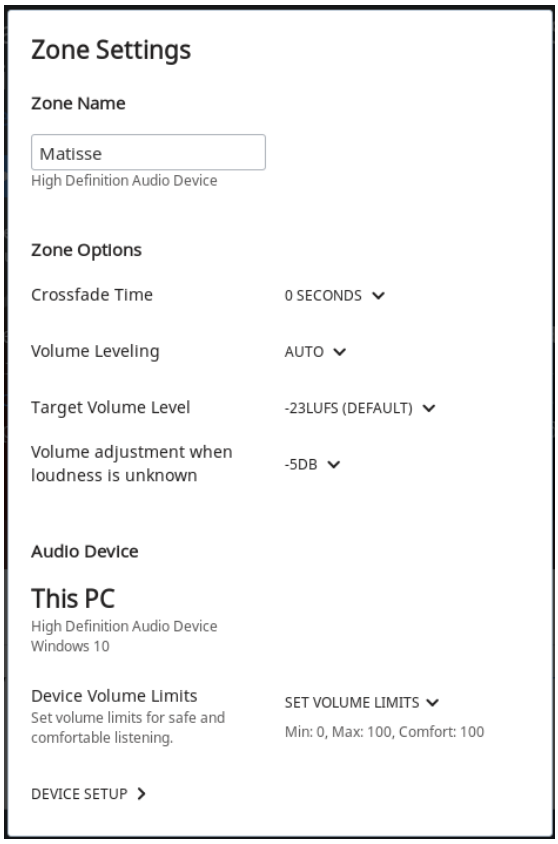
Click on the speaker icon for the zone, or zone group, that you intend to configure



Click on the gearwheels icon to access the "Zone Settings" panel



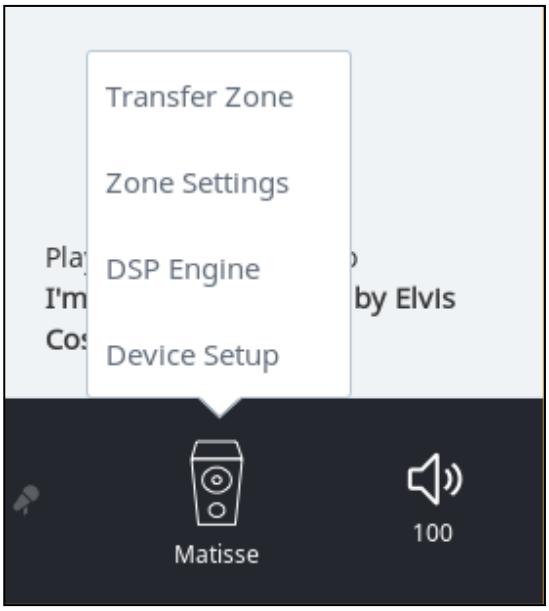
The Zone Settings panel is shown:



Here you can use the drop down to set your crossfade.

Another Quick Way to Access Crossfade

- You can also access Crossfade by right clicking (or long press) the Zone Picker at the bottom right of the screen. From there, select Zone Settings.



What content will Roon crossfade? When will Roon not crossfade?

Roon will crossfade content when:

- Both tracks are the same sample rate and bit depth
- Your Core has enough time to calculate the crossfade

Roon needs some time to calculate the crossfade, so if you have a 5 second crossfade set, you may not hear a fade if you seek right near the end of the track.

Also note that crossfade works better when your collection has been fully analyzed, as Roon detects silence at the start and end of your tracks, and will only fade to actual audio content once your files have been analyzed.

Finally, note that in order to crossfade DSD content, it will be automatically converted to PCM.

3.5. Signal Path

When we set out to create Roon, we felt very strongly that users should have access to honest and precise information describing how their software and hardware devices are performing audio playback.

We also felt that great audio hardware should be showcased. As such, whenever Roon is playing to a Roon Ready device or a recognizable Roon Tested device, we include branding, artwork, and product manual links. Our ability to support specific hardware devices is deeply related to whether or not we can lay hands on it during development, QA, and when addressing support incidents.

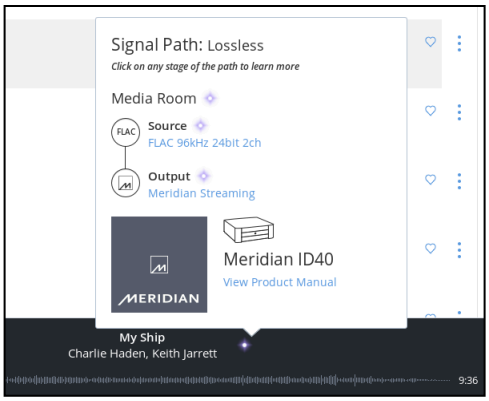
If you don't see your favourite hardware manufacturer in our Partners Matrix, please get in touch with them. There are no costs associated with our programs other than the requirement that hardware samples be made available to us.

It is very easy for poor system design, or poorly implemented or mis-placed DSP to ruin an otherwise excellent experience, and too often, software, hardware, and operating systems silently modify the audio stream without providing any feedback.

While it's impossible for us to identify every processing step that is performed on an audio stream, particularly after we've handed it off to a hardware device, we are committed to transparency and make an effort to paint a clear picture at all times.

How to Find the Signal Path

In the footer, at the bottom of the screen, there is a little coloured light--it might be yellow, green, or bright purple. Click that thing. It should pop up a little depiction of the path that the audio is taking. If you are playing to a hardware device that Roon recognizes, you will also see some information about that product.



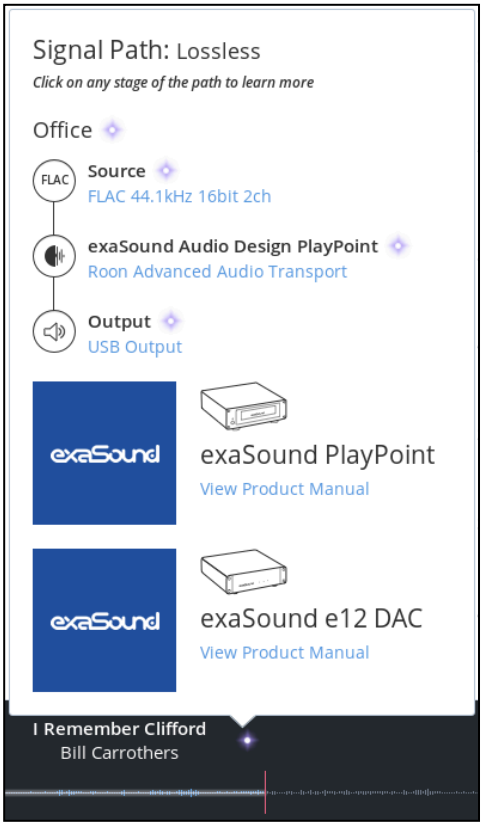
Interpreting Signal Path

Roon uses four colours to predict the sound quality

Lossless Signal Path Examples

Lossless signal paths are indicated by a bright purple light, and mean exactly what the name implies: that the stream is going from the file to the device without being modified.

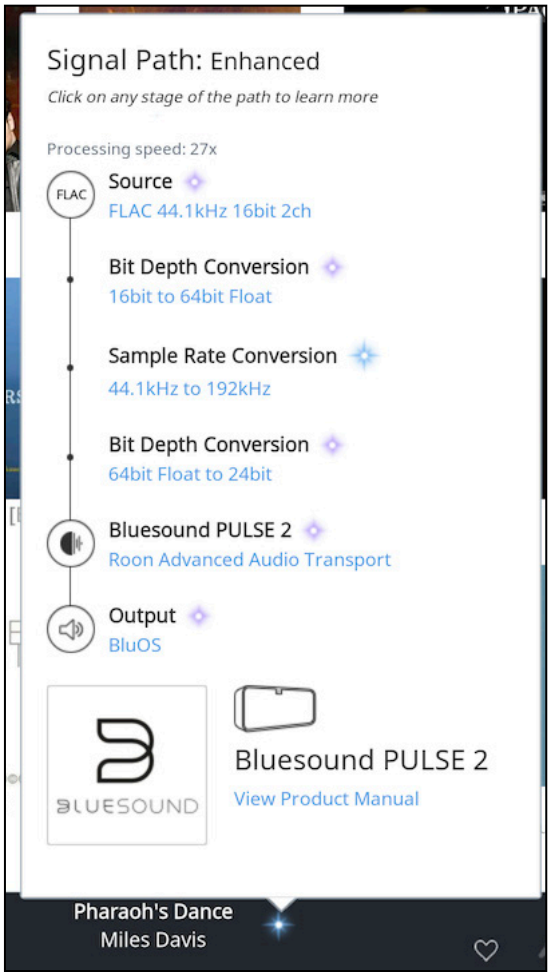
Lossless signal paths are pretty boring--there just isn't much to look at if no-one's touching the audio stream. This is one of the more interesting ones possible in Roon, because it identifies *two* separate devices that are involved in the playback chain.



Enhanced Signal Path Examples

Enhanced signal paths are indicated by a bright blue light. This means that Roon is performing some signal processing steps on the audio *because you asked for them*. The most common reason for a blue light is that features like Volume Leveling or DSP Engine are in use.

This is an example of an "enhanced" signal path, in this case because upsampling is configured in DSP Engine.

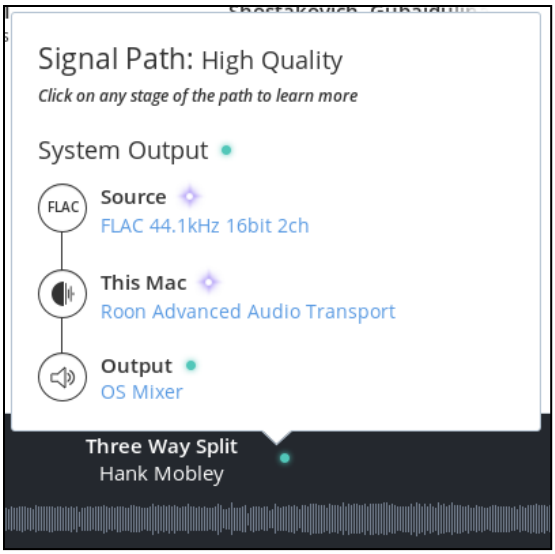


High Quality Signal Path Examples

You can identify a high quality signal path by looking for the green light.

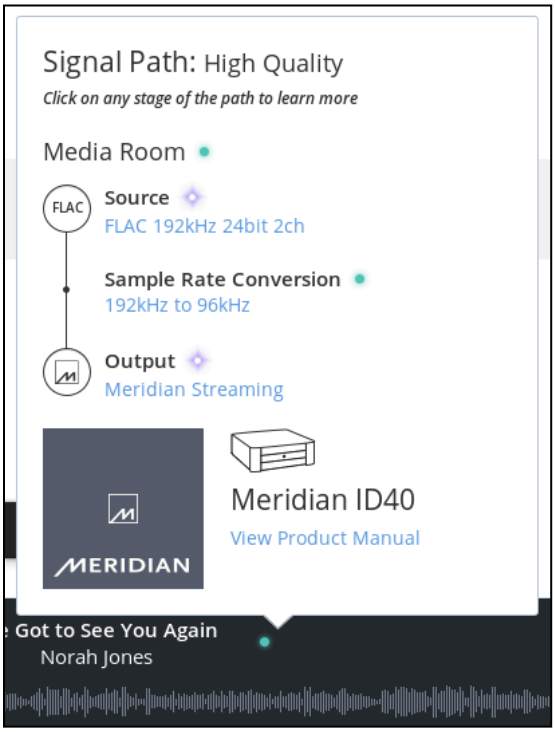
OS Mixer Output

While the Mac software mixer does not do anything *too* gross, it might be performing software-based volume adjustments or sample rate conversion before playing the audio. As such, we can't guarantee that the output quality is lossless, so we label it as "High Quality".



Conversions for Compatibility

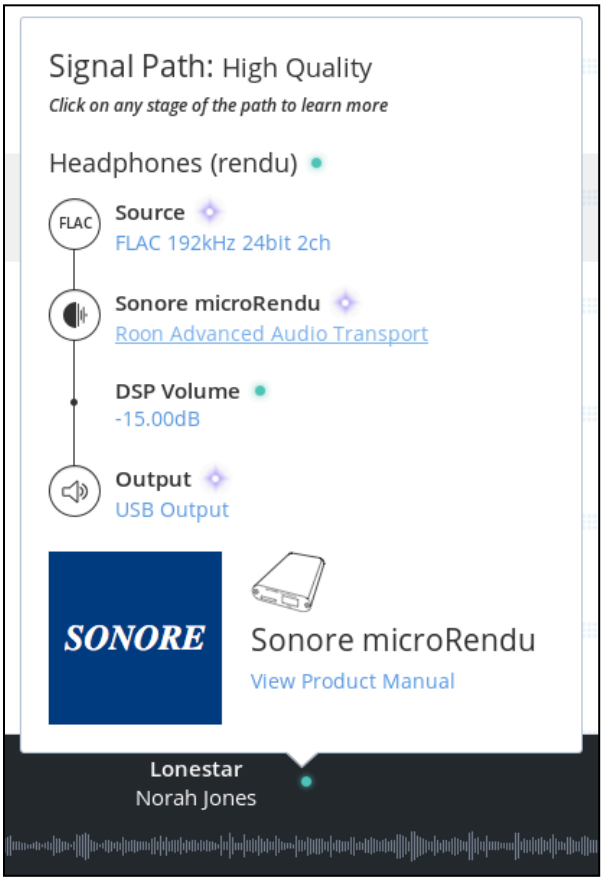
In this example, 192kHz audio is being converted to 96kHz audio because that is the maximum rate supported by this Meridian device. This is an extremely high-quality conversion, with virtually no audible loss in fidelity, but it wouldn't be right to portray it as "lossless".



DSP Volume

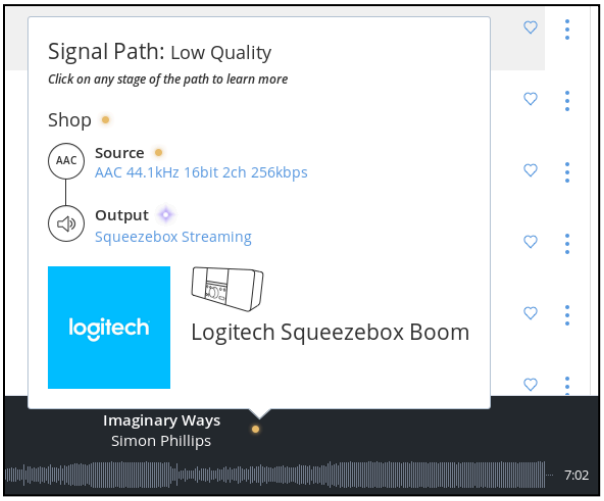
Enabling DSP volume inserts processing steps into the playback change that interfere with lossless playback. There's nothing wrong with this: Features like this also bring great value! We are just trying to keep things honest.

Also note that in this signal path, the volume adjustment is actually happening *outside* of Roon, inside a Roon Ready device.



Low Quality Signal Path Examples

This is a low quality signal path--you can tell because of the yellow light. In this case, we've labeled it as low quality because the source material is an AAC file. For the most part, if you see a yellow light, it's because a lossy file was involved.



Notes on Device Branding

We try as hard as possible to identify devices one-by-one in Signal Path, but sometimes it just isn't possible. There are several reasons why your device may not show up here:

- If we don't have the device in-house, or we don't know how to recognize it, it won't show up. Encourage your manufacturer to contact us!
- Many devices that don't have unique driver strings or USB IDs--often these will be named something like "Manufacturer USB Audio" instead of "Manufacturer Product".
- Some devices use generic drivers (for example, the sycon drivers). These can't be pinned down to a particular manufacturer.
- ASIO-based drivers do not provide a facility for device identification.

3.6 Troubleshooting Audio Dropouts

This document contains information about tracking down and troubleshooting issues that lead to audio dropouts, in particular with RAAT-based outputs, including Roon Ready devices, and outputs connected to computers or devices running Roon, Roon Bridge, or Roon Server.

What are dropouts?

All RAAT-based zones allow the audio hardware to control the playback clock. A consequence of this is that the playback clock stops for *no-one*. If the playback clock reaches a position in time, and the audio that is supposed to be played is not available, a **dropout** occurs.

Instead of holding up the audio hardware to wait for the late-to-arrive data, RAAT outputs replace the missing data with silence and continues with playback.

If 3 seconds out of the past 30 seconds of playback consisted of dropouts, Roon moves onto the next track and displays an error message. This behaviour is new in version 1.2--so systems that limped through playback with some hiccups in previous releases may be more proactive about identifying the problem and moving on.

Why do dropouts happen?

There are four primary causes of dropouts:

- Performance Issues
- Hardware Failures
- Configuration Issues
- Bugs

Performance Issues

These are some examples of performance issues:

- The storage device that holds the media isn't delivering it in time
- The internet service that holds the media isn't delivering it in time
- The internet connection is not fast enough to stream media at this quality level.
- CPU usage on the *Core* or *Output* device is too high.
- Networking hardware is not performing adequately.

One tell-tale sign that you're looking at a performance issue is when the issue gets worse with higher-bitrate streams. If CD-quality content plays fine, but DSD256 is hiccuping, it's probably a performance problem.

Dropouts can also happen if your hardware is not in line with our recommendations. In this case, there really isn't much to do but upgrade the hardware.

Sometimes Roon's support staff can diagnose a performance issue by looking at log files. Other times, it will be clear that a performance issue is occurring because it's affecting apps or devices other than Roon. Tools like Task Manager (Windows) and Activity Monitor (macOS) and `top/iotop/htop` (linux) can sometimes point towards performance issues, too.

Hardware Failures

USB cables go bad. Ethernet cables fail. Routers can be unreliable. Network switches fail. Hard drives fail. RAM goes bad. All of these things can cause problems for Roon.

Some of the most vexing failures fall into this category. The general strategy for tracking down hardware failures is by isolating the failure to the smallest configuration possible.

Isolating Performance Issues and Hardware Failures

Isolating a problem is the process of finding the smallest configuration that reproduces the issue. This proceeds as a process of elimination.

The reason why we isolate issues is to learn something about them. In the ideal situation, the process of isolation ends when you locate one element of your configuration that, when added or removed, causes the problem to appear and disappear. Some of the things that you do when isolating a problem are unrealistic. Sometimes the steps are time-consuming or arduous. But the process works.

Some examples of how you might isolate a problem:

- Turn off or disconnect devices that don't appear to be related to the problem.
- Disconnect the router from the network (unless the problem only happens with internet-based content)
- Swap out ethernet cables and switches--if this causes a change in behaviour that is a red flag for a hardware failure
- If you're using a NAS, try playing content from the local SSD instead. If this changes behaviour, it points towards a performance issue with the NAS or your network
- If you're using WiFi, Power-line networking, or 100 mbit switches, switch to gigabit ethernet--even temporarily--to learn whether those choices are related to the problem.

- Reboot machines and devices. If this causes a change in behaviour, you've learned that this is a problem that develops over time--which can be an important clue.
- Avoid running other software, particularly software that makes significant performance demands or interacts with audio hardware. If this causes a change in behaviour, it almost always increases the understanding of the issue.

Sometimes this exercise ends by implicating hardware, software, or a device driver. Sometimes it ends with the diagnosis of a bug in Roon, or a hardware device. Sometimes it ends when the configuration is small or simple enough for Roon to reproduce the issue in-house and take it from there.

If done rigorously, with patience and discipline, this approach nearly always leads to a satisfying result.

Troubleshooting configuration issues (Roon Ready outputs and other devices)

Many devices have their own configuration screens--often accessible from a web interface. There may be settings on these screens that are worth tweaking.

It can also help to update all devices to their latest firmware, in case the problem you're experiencing has already been fixed.

Troubleshooting configuration issues (Connected outputs)

Some devices or drivers are picky about certain configuration details. This is particularly common with devices that are directly connected via USB and Firewire, and also with software-based drivers.

Roon provides a few settings to help tweak your way around device-specific issues. For more information on manipulating audio settings see Audio Setup Basics.

Re-sync Delay

The re-sync delay setting can help when dropouts occur near the beginning of playback. This is particularly useful with drivers that perform faster-than-realtime buffering. Many software-based drivers fall in this category, as well as some products that have unique buffering strategies.

If you are having brief dropouts around the start of playback, we recommend trying out this setting at 500ms and 1s and seeing if the issue gets better.

Use Power-of-2 Hardware Buffer Size (CoreAudio and ASIO only)

Some devices are sensitive to the *alignment* of the audio buffers that are passed to them. This setting forces buffers to be aligned to sizes that are powers of 2.

This setting is most useful with software based devices and "HD Audio" devices.

Use Max Hardware Buffer Size (CoreAudio and ASIO only)

Some devices are more stable with larger hardware buffers. If you are having issues, it is worth a shot.

Note that some devices only support one hardware buffer size. In that case, the setting does nothing. For devices that expose a range of supported values, this causes Roon to use the largest one.

Buffer Size (WASAPI and ALSA only)

This setting allows you to tell Roon to request a specific buffer size from the driver. There is no guarantee that Roon will get the size you ask for, but it will try to choose the closest one.

In theory, all devices should be willing to accept any buffer size, but this is not always true in practice. Larger sizes aren't always better! We get the best results in the 25ms-100ms range.

Use Event Driven Mode (WASAPI only)

Event Driven mode is the best way to communicate with WASAPI devices, however not all devices, especially some of the more primitive built-in devices that come with computers, do well in Event-Driven mode.

If you are having issues, it might be worth trying with this setting on and off to see if they go away.

Bugs

Sometimes dropouts occur as the result of bugs. Sometimes these are Roon's bugs. Sometimes they are bugs in an internet service. Sometimes the bug is in a device driver, hardware implementation, OS, or even in your NAS.

These are the trickiest to isolate and track down. If all else fails, our support staff is here to help. Many classes of bugs in Roon are captured in our log files. Other bugs sometimes show up in operating-system level logs. You can check the Console app (macOS), The Event Log Viewer (Windows) or `dmesg`/`syslog` (Linux) for evidence of system-level trouble.

3.7 Audio Analysis

What is Audio Analysis?

During audio analysis, each file in your library is analyzed in order to extract information about their audio content.

What is Audio Analysis used for?

Data extracted during audio analysis is used for several purposes:

Volume Leveling

Volume Levelling automatically adjusts the the playback volume in order to maintain a consistent level regardless of the source material. Audio analysis extracts information about the loudness and peak values in the content.

Volume Levelling automatically adjusts the the playback volume in order to maintain a consistent level regardless of the source material.

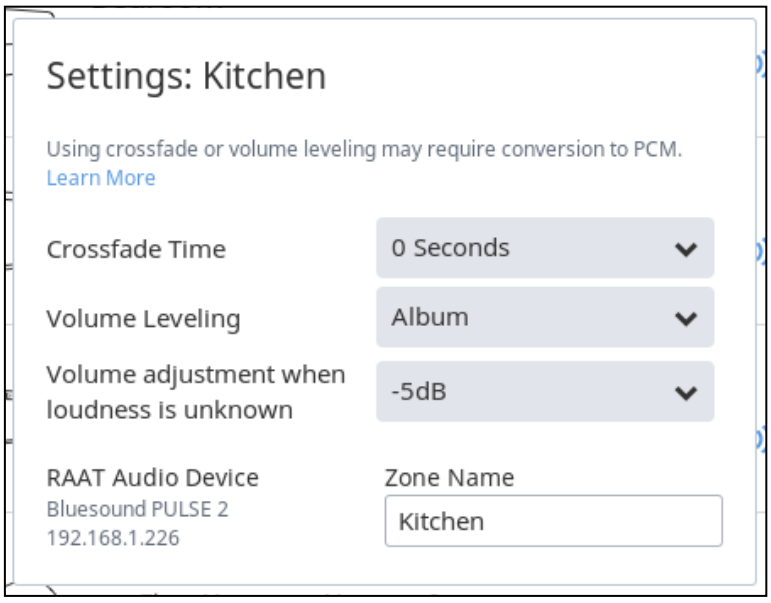
Many people have Volume Levelling enabled all of the time as a way to minimize the need for manual volume adjustments. Others only use it for parties, radio, or mixed playlists where volume level differences from track to track are more severe.

Roon's volume levelling implementation is based on the EBU R128 standards, and we follow the recommendations made by the Music Loudness Alliance.

Before Roon can make adjustments, it must have some information about the loudness of the materials and its peak values. This information is obtained during Audio Analysis.

Enabling Volume Levelling

Volume Levelling is not enabled by default. You can find settings related to Volume Levelling on the Zone Settings screen.



Roon supports four Volume Levelling modes:

- **Off** - disable volume levelling for this zone
- **Track** - Performs adjustments on a track-by-track basis. This produces the most consistent volume level during a playback session, but may result in unpleasant jumps in volume during playback of a gapless album.
- **Album** - Performs adjustments on an album-by-album basis. This means that the entirety of an album plays back with the same adjustment, and there are no perceived volume jumps at track boundaries.
- **Auto** - Uses track adjustments when playing adjacent tracks from different albums, and album level adjustments when playing adjacent tracks from the same album.

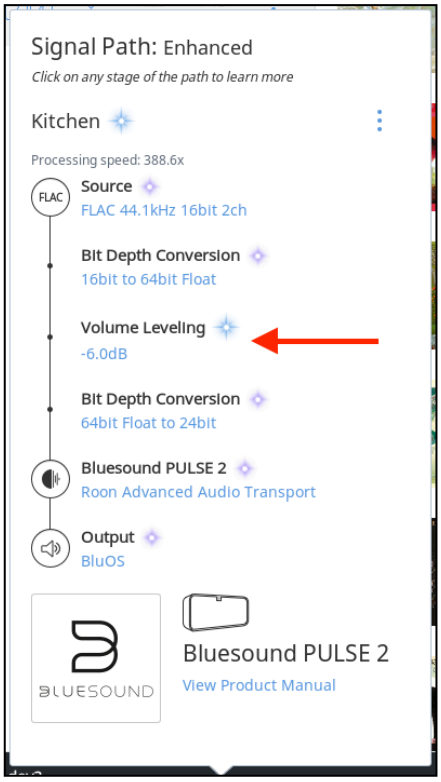
The "Volume adjustment when loudness is unknown" setting specifies a volume adjustment that should be applied when Roon does not have advance knowledge of the loudness of a track, for example when playing a track that has not been analyzed yet, or an internet radio stream.

This setting prevents large changes in volume when transitioning from content of known loudness to content of unknown loudness. The default of -5dB represents a reasonable compromise--since Volume Levelling makes almost all material quieter.

How Volume Adjustments are applied

Adjustments performed for the sake of volume levelling are simple gain adjustments--the audio signal is multiplied by a constant gain value. Currently, the adjustment is applied within Roon's DSP Engine, but it's likely that future Roon Ready devices will support volume levelling in hardware.

You can see exactly what is happening using Signal Path:

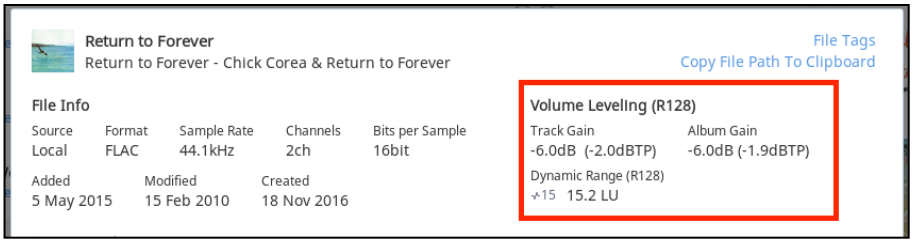


If a positive gain adjustment would cause some part of a track to clip, the gain adjustment is modified to avoid clipping. This reasoning uses the "true peak" value captured during audio analysis. This is fairly rare, since positive gain adjustments are uncommon.

Per R128 recommendations, Roon targets a final loudness of -23 LUFS. This is a fairly quiet level, thus Volume Levelling may prompt you to increase volume elsewhere in the system to compensate.

Viewing Volume Levelling Information

You can see volume levelling information on the File Info popup. This can be accessed by selecting "View File Info..." for a track in your library.



The "dB" numbers represent the volume adjustment that will be necessary to adjust this track or album to the target level of -23LUFS.

The "dbTP" numbers represent the "True Peak" level for the track or album.

The "Dynamic Range" value reflects the R128 "Loudness Range" for this track. For more information, see here.

Using Loudness Data in `REPLAYGAIN` tags

ReplayGain is an older volume levelling system than R128. It is different in a couple of key ways:

- The analysis process uses a different algorithm, so it produces different adjustments
- ReplayGain targets a final volume level that's 5dB louder than R128's target of -23 LUFS
- ReplayGain information is often written into **`REPLAYGAIN_*`** tags in media files.

Since many files out in the world already contains these tags, Roon supports making use of that information when it's present.

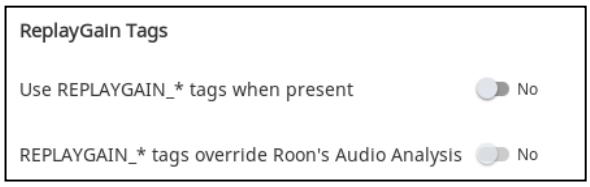
(Note that in may cases, **`REPLAYGAIN_*`** tags may contain R128 measurements that have been adjusted by 5dB to compensate for the differences in target level. This doesn't present a problem--just something to be aware of!)

Roon supports the following file tags:

```
REPLAYGAIN_ALBUM_GAIN
REPLAYGAIN_ALBUM_PEAK
REPLAYGAIN_TRACK_GAIN
REPLAYGAIN_TRACK_PEAK
REPLAYGAIN_REPLAYGAIN_REFERENCE_LOUDNESS
```

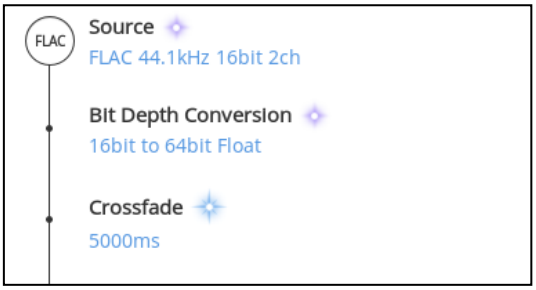
When **`REPLAYGAIN_REFERENCE_LOUDNESS`** is not provided the **`*_GAIN`** tags are interpreted relative to an assumed target of -18 dBFS.

To turn on this support, go into Settings -> Library -> Import Settings, then enable one or both of these options:



Crossfade

When fading between tracks, Roon skips over silence at the beginnings and ends of the tracks, in order to produce a more satisfying overlap. Audio Analysis measures these regions of silence in advance.

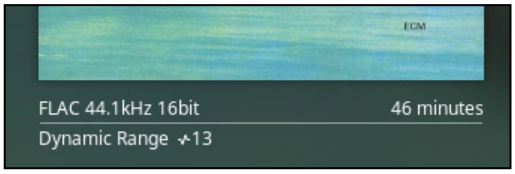


Waveform displays

Audio analysis captures the waveform data used to drive graphics like this:

Dynamic Range

Audio Analysis captures information about the dynamic range of the content in your library:



What is Dynamic Range?

Dynamic range measures the difference in volume between the softest and loudest portions of a track or album. It is most useful when comparing different releases of the same material.

Since the early 90s, many recordings have been increasingly "louder". Since it's impossible for a CD to turn up your stereo, they increase volume using techniques like dynamic range compression. For more information on the "Loudness War", see here.

Dynamic Range measurements provide insight as to what may have been done to a recording, particularly in cases where there are multiple releases to chose from, like this:

In this case, it's clear that while both are versions of the same material, the CD-quality release has been processed in a way that reduced its Dynamic Range when compared to the HDTracks version.

It's important to remember that Dynamic Range is just one piece of information.

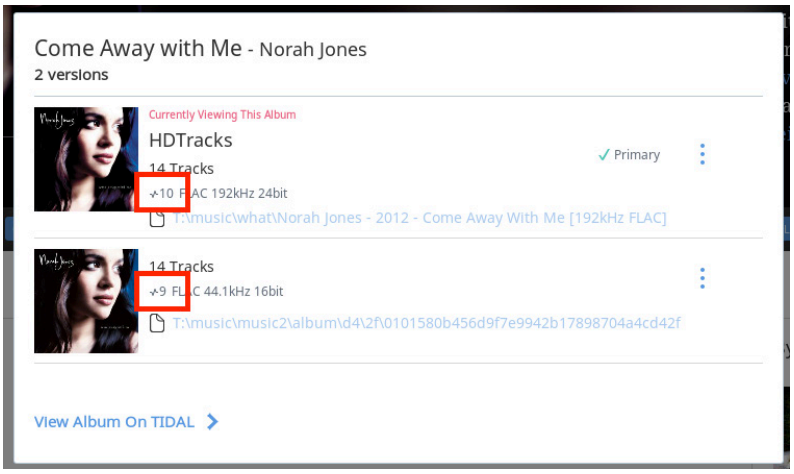
Music with a lot of dynamic range isn't necessarily better than music with less. Orchestral performances will nearly always have a much wider dynamic range than Heavy Metal, but that doesn't necessarily mean that the recordings are any better or worse.

Where can I see Dynamic Range in Roon?

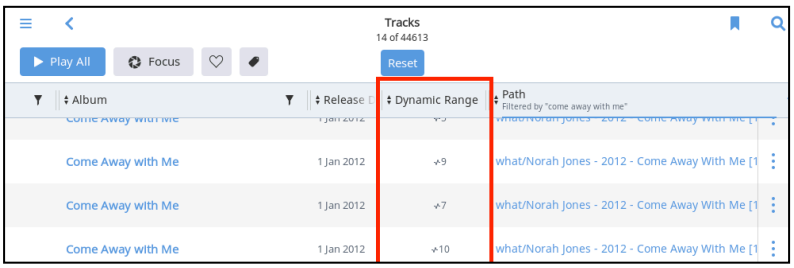
Dynamic Range is displayed in a few places:

On the Album Details Screen

In the "Other Versions of this Album" popup



In the track browser when the "Dynamic Range" column is enabled:



In the "File Info" popup

How is Dynamic Range computed?

As with Volume Levelling Roon's dynamic range calculation is done based on R128 standards. In technical terms, Roon's "Dynamic Range" is the same as R128's "Loudness Range".

That there are older methods of computing Dynamic range out there--most commonly by measuring the "Crest Factor".

Crest Factor measurements reflect the difference between the average volume and the peak volume--so they are easily swayed by periods of silence or near-silence (which distorts the average), and by short-duration peaks--which may not represent the volume of the loudest parts of the track accurately.

The R128 method is more resilient. It begins by computing the statistical distribution of loudness values present at different points in the track, ignoring periods of silence. The computed dynamic range represents the difference between the 10th percentile and the 95th percentile of that distribution. In other words, the "top" of the range is the volume level that 95% of the track sits below, and the "bottom" is the volume level that 10% of the track sits above.

Though both methods portray roughly the same information, Crest Factor values aren't directly comparable to values produced using the R128 method.

Detecting Corrupt media

Because audio analysis touches every file in your library, it's in a great position to detect files with problems.

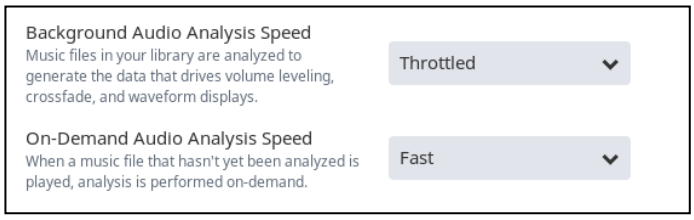
Audio Analysis Settings

Audio Analysis takes place automatically. The entire library is analyzed in the background, and when you start playback of an un-analyzed track, audio analysis is performed on demand.

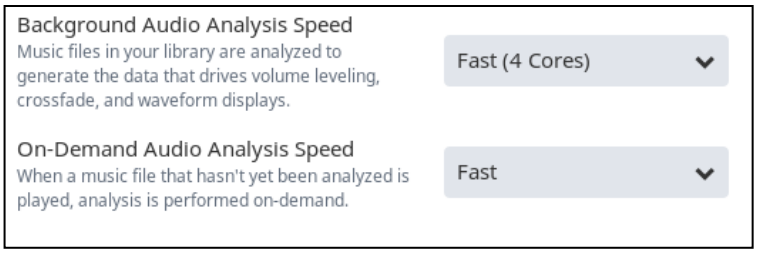
By default, Roon devotes roughly 30% of one CPU core to the task of background analysis, and uses 100% of one CPU core for on-demand analysis. While these defaults make the performance impact of audio analysis less visible, it also means that it can take a very long time.

Analysis performance is almost totally dependent on the performance of the hardware that's serving as your Core.

In Settings->Library, there are two settings that allow you to control the tradeoff between "how long it takes" and "how hard it works the computer". These are located in Settings -> Library:



If you have just imported a large amount of content, are starting from scratch, or have just upgraded to Roon 1.3, and you are eager to have your library analyzed as quickly as possible, you might consider increasing the Background Audio analysis speed to something faster and letting it work hard overnight, like this:



Finally, if you have audio devices connected directly to the machine that's performing audio analysis, it's worth considering the recommendations in Sound Quality In One Computer when choosing your analysis settings during listening sessions.

4.0 Adding Your Music

4.1 Adding Folders Using Path

Adding Folders

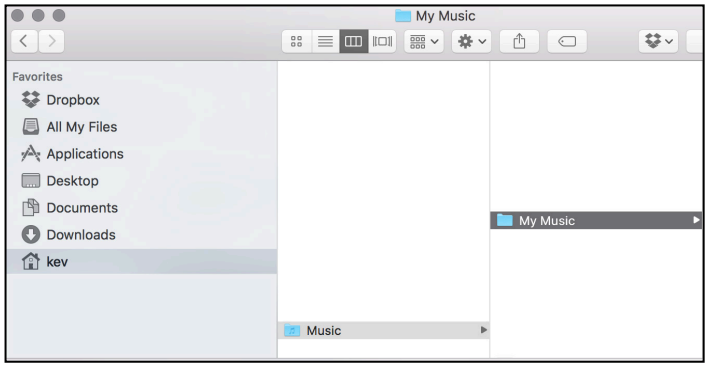
When configuring your Roon Core, you'll need to set up your Watched Folders. In some configurations you can use Roon's built in browser to browse to your music folder and select it.

However, when setting up your Roon Core from a Remote you may need to enter the path of the directory you want to set up as a Watched Folder.

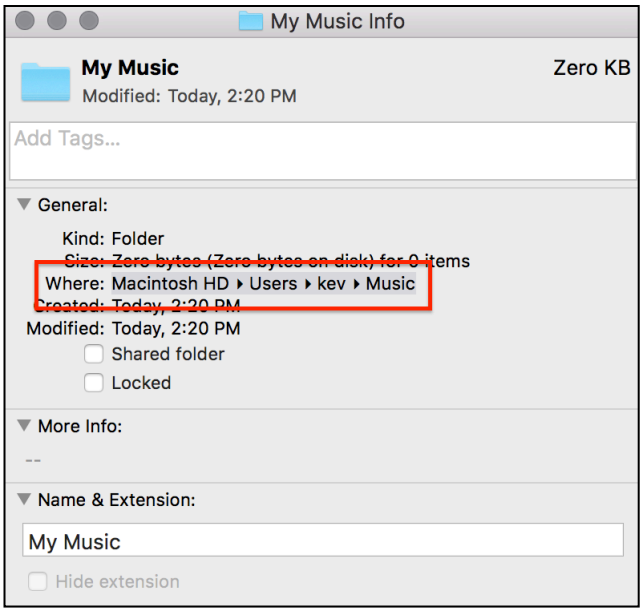
If you're unsure how to find the path, follow the instructions below. Follow the instructions for the operating system you run your Core on.

macOS

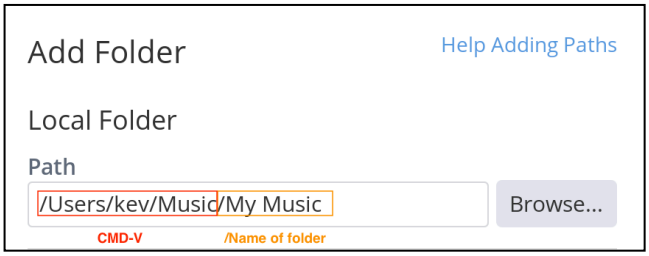
- On the Mac running your Core, use Finder to navigate to the folder where you store your music.



- Right click your music folder and click *Get Info*.
- Highlight the information in the Where field, and press **CMD-C** on your keyboard to copy it.



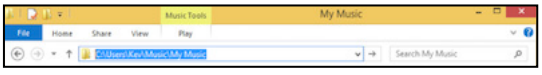
- Open Roon, and use CMD-V to paste the path into the watched folder field. Then, type a forward slash and the name of your folder like this:



Windows

- On the Windows PC running your Core, use Explorer to open your music folder.

- Click on the right side of the Explorer field like a web browser, and Explorer will highlight it and turn it into a path.



- Copy and paste this path into the watched folder field in Roon.

Content Stored On a NAS Drive

- To add network storage, we recommend using your NAS drive's hostname, such as `\\DISKSTATION` or `smb://MyNASDrive`. You can usually find this information by logging into your NAS., and examples are below.

- You can also use your NAS drive's IP address, but note that this can change, depending on your network's settings.

Examples

- If your Roon Core is running on Windows, the path to your networked folder might look like this:

  `\\MyNASDrive\Multimedia\Music`

or

  `\\192.168.1.120\Multimedia\Music`

- If your Roon Core is running on Mac or Linux, the path to your networked folder might look like this:

  `smb://MyNASDrive/Multimedia/Music`

or

  `smb://192.168.1.120/Multimedia/Music`

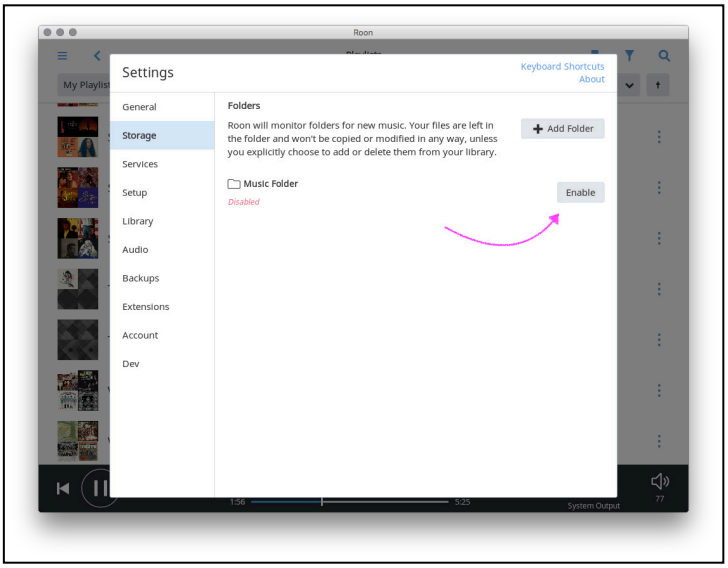
- After you've entered the network path in Roon, enter the credentials required to access your NAS. If a username, password, or workgroup isn't required to access your NAS, just leave the relevant fields blank and click Add Folder

4.2 Importing from iTunes

Roon can easily import your iTunes playlists, and in most configurations, it will update them automatically if you make changes in iTunes.

Our iTunes integration was changed as of Roon 1.3, so read on if you're unsure about the changes, see the What's Changed section below.

If your iTunes library is stored in your computer's music folder, just enable importing from the Storage tab of settings like this:

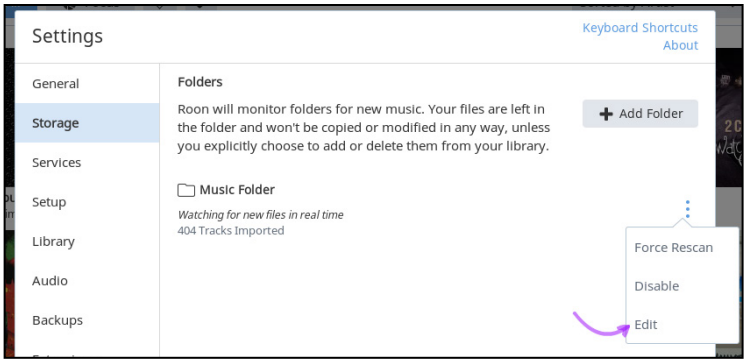


The Basics

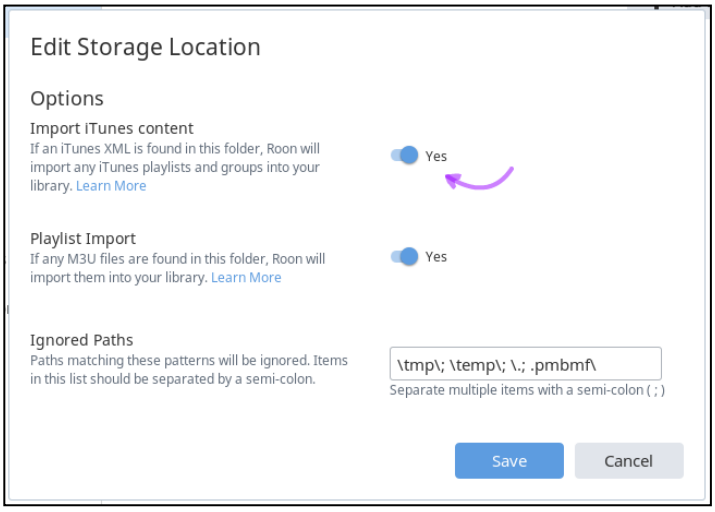
Roon imports your iTunes playlists by reading a file that iTunes can generate, called an XML. This will work as long as your XML is stored in the same folder as your media.

If you've already generated the XML and configured Roon to "watch" the folder where it's stored, all you need to do is enable iTunes import.

First navigate to the Edit screen for the storage location where your iTunes XML is stored:



Then, just enable iTunes Import and you're good to go!

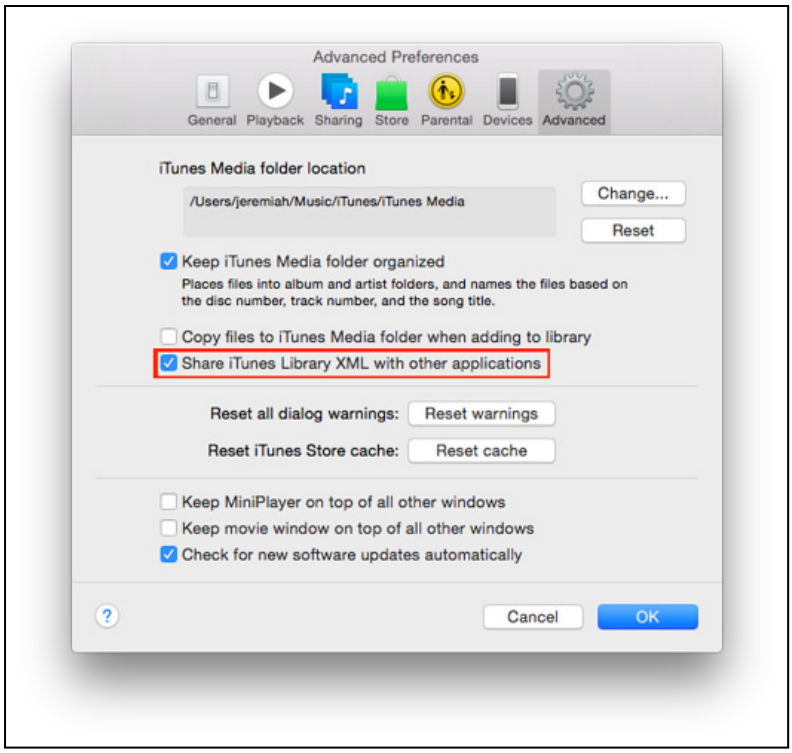


If you want to know more, or if you're having a problem setting up iTunes sync in Roon, read on!

Setting Up iTunes

iTunes can create a file called an *XML file*, which contains a list of all the songs in your iTunes library, as well as all your playlists. When this file has been generated and is stored in your default Music folder, you should be able to just enable iTunes importing as described in *The Basics* above.

Recent versions of iTunes do not create the XML file by default, so you will need to ensure the file is generated by checking this screen and making sure the *Share iTunes Library XML* option is checked.



By default, your iTunes XML is stored at these **standard locations**:

- **Windows**: `C:\Users\ Your User Name \Music\iTunes`
- **macOS**: `Users/ Your User Name /Music/iTunes`

Troubleshooting

In most cases, your playlists should be imported once Roon is watching your iTunes XML.

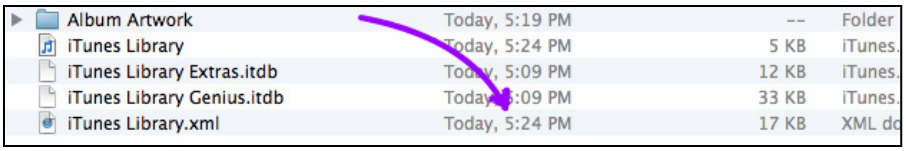
The two most likely issues relate to a) iTunes XML not syncing or b) Media files not stored with XML.

Testing Your iTunes XML Sync

If you're having trouble importing or syncing your playlists into Roon, it's a good idea to first confirm your XML is being updated by iTunes.

To confirm the file is being updated properly, find the XML file -- it will be called **`iTunes Library.XML`** and will likely be stored at one of the standard locations listed above.

Once you've found it make a quick change in iTunes and confirm that the XML file is being updated -- for example, create a playlist called *Test* or add a file to an existing playlist temporarily. You should see the file modification time update to whenever you made the change in iTunes, like this:



Media Files Aren't Stored With XML

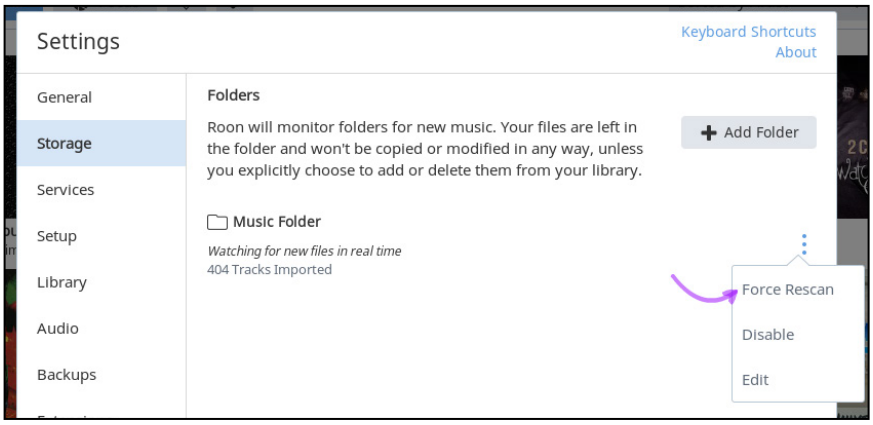
If certain playlists or tracks in your playlists aren't showing up, it's possible your XML is separated from your media files.

First, some background about playlists in Roon. **Imported playlists must be added to Roon in the same folder as the tracks they contain.** So if you've watched two folders, `Downloads` and `Music`, a playlist you want to import in the Downloads folder can only include tracks from that folder -- any tracks it references in the Music folder will be skipped.

Playlists imported from your iTunes folder function the same way. If your iTunes XML is stored in your Music folder, but the files themselves are stored somewhere else (like on an external hard drive) you will need to consolidate them into a single folder for Roon to watch.

A few ways to achieve this are:

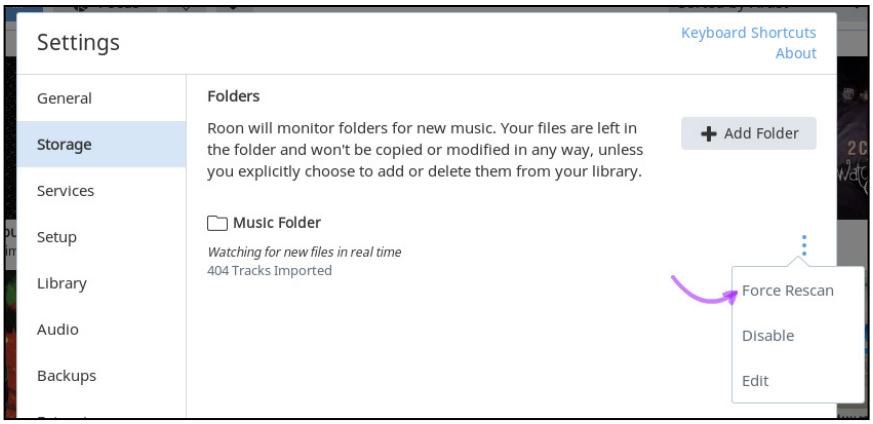
- **Option 1: Copy your XML file to the folder where your media is stored (try this first)**-- in many cases, Roon will be able to understand the contents of your playlists as soon as the XML file is stored in the same folder. Once Roon is watching a folder that contains both your music files and your iTunes XML, force a rescan:



Note that if you copy your iTunes XML this way, subsequent changes made to your iTunes playlists will not sync automatically.

If the above doesn't work, you can also try the following. Make sure you have a backup of your iTunes library before proceeding.

- **Option 2: Copy your iTunes Library to the same location as your files** - In your Music folder, find the folder called iTunes. Copy this to the folder where you keep your music. Once Roon is watching a folder that contains both your music files and your iTunes XML, force a rescan:



Note that if you copy your iTunes library this way, subsequent changes made to your playlists in iTunes will not sync automatically to Roon, **unless** you point iTunes at the new location by following these instructions.

- **Option 3: Consolidate Your iTunes Library** -- if the above doesn't work, or if the music in your iTunes library is spread across multiple folders, you will want to consolidate your library to a single folder.
    - Make sure you consolidate to the folder you want Roon to watch (meaning on your NAS or USB drive).
    - Make sure you have a backup of your media, as iTunes will move your files around.
    - To consolidate your iTunes Library, follow Apple's documentation here.

If your iTunes XML is updating properly and Roon is watching a folder that contains *both your XML and your media, you should be all set. If you're still having problems syncing your iTunes properly to Roon, please let us know.

What's Changed in 1.3

Prior to version 1.3, Roon handled iTunes differently.

Instead of using the iTunes XML to supplement the data in your file tags, Roon previously imported iTunes libraries solely based on the data in the XML.

This worked for some simple use cases cases, but it also caused a lot of problems.

iTunes XML's frequently contain references to files that have been deleted or moved, sometimes by the thousands--producing bad or confusing experiences in Roon. iTunes XML's are also not a great authority on where files are located, and many cases iTunes installs involving network storage could not be made to work correctly.

Moreover, that approach still left many users out in the cold. The iTunes XML represents a list of paths from a computer running iTunes. When the media and the XML and the Roon Core are all on the machine, that works OK, but many people have situations that are more complicated than that--and they were often unable to use our iTunes support at all.

Finally, in that model there wasn't a very good way to migrate away from iTunes later. Since the XML was treated as the sole authority, users had to keep going back to iTunes to import more content or clean up problems.

The new implementation takes a simpler and more balanced approach. It uses the iTunes XML as a source for *additional* information about your files, and to support importing of playlists, but uses Roon's folder-watching infrastructure to locate the actual files. This way you can start with your iTunes library, and then either use both apps side-by-side, or just move forward with Roon.

The downside is: this requires that the iTunes XML and the media files are placed into a single folder that Roon can watch. This can be done in iTunes by "Consolidating" the library, but it will present an extra step for people with particularly complex setups and media spread across devices.

Users who are already using the old implementation can continue to do so -- we're not going to rip it out from under anyone, but new users will only be able to use the new stuff.

4.3 What's a Watched Folder?

You add your local music to Roon via "watched" folders. These are folders that will be monitored by Roon for new music. Your files are left in the folder and won't be copied or modified in any way, unless you explicitly choose to add or delete them from your library. The folders can be configured from the Storage tab of the Settings screen.

Watched Folders

When you set up a watched folder, Roon will scan the folder and add any music it finds to your library without moving or changing the files at all. Roon will also monitor the folder for changes, so any music you add later will automatically be imported.

Local vs Network Drives

Watched folders can be located on local or network drives, and you can add multiple watched folders. Note that on macOS, networked folders must be mounted using SMB, not AFP.

4.4 Configuring Your NAS Device for Roon

Many Roon users choose to store their collections on a NAS drive, and in most cases this is pretty easy to set up. Here are some pointers to get you started:

- We recommend Synology and QNAP storage devices. Roon should work with most NAS drives, but we've found these brands consistently perform well.
- There are no real performance benefits associated with mounting your NAS in the OS vs logging in via Roon's Network Folder functionality.
- If your NAS has a dynamic address it may faster to mount it using the host name:
    - `\\NASDRIVENAME\Music` *(for example)*

- `smb://NASDRIVENAME/Music` *(for example)*

- Make sure to fill in your username and password when you add your NAS drive to Roon.
- If you're having problems mounting your NAS on Windows, you can try using the NAS drive's IP address like `\\892.168.1.135\Music` but you'll want to ensure this address won't change in the future by assigning an IP address on your router, or by setting a static IP address on your NAS. If you're unsure how to set this up, let us know and be careful before you mess around!
- Use `SMBv3` when possible. Failing that, `SMBv2` should also be ok, but **do not** use `smb2 with large mtu` as it has known compatibility issues with Roon. If you're using a Synology NAS and running your Roon Core on macOS, you can find some more information about fine tuning your setup here.
- **AFP is not supported** -- some users may need this functionality for other applications, but it's not needed for Roon. You can find more information about why AFP is not supported here.

Why can't my NAS connect?

If you're having problems setting up your NAS, let us know! But be sure you already know how to add a networked folder using a file path, which you can read more about here.

4.5 TIDAL

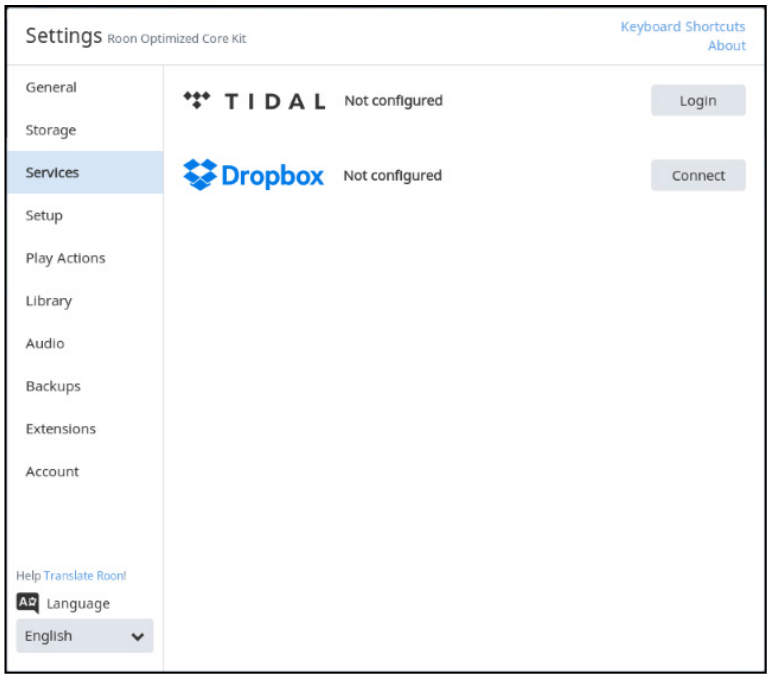
TIDAL is a subscription-based music streaming service that provides lossless audio streaming. Subscribers can stream millions of losslessly encoded tracks to both TIDAL's own apps, as well as Roon.

The Roon + TIDAL is an experience far beyond Roon alone or TIDAL alone, as it allows you to navigate your own music without unwanted content cluttering up your experience, while giving you the right touches of extra content exactly where you want them the most.

Enabling TIDAL

Roon will prompt you to add your TIDAL account on first launch, but you can always link Roon and TIDAL at any time from the Services tab of Settings.

Click the navigation icon ☰ at the top left of the Roon window, then click Settings, and open the Services tab. From here you can click Login to link your TIDAL account in Roon:



TIDAL Collections

The truth is, not everyone has thousands of albums in their personal collections or even thousands of *tracks*. And not everyone uses a streaming service. If you're one of those people you're not missing out on what Roon has to offer, but we know that you'll enjoy Roon more when there's more music instantly at your fingertips.

We wanted to make it easy for people who are new to TIDAL, or just have small music collections, to add new music to their library and get to listening when they launch Roon for the first time. That's what we did with TIDAL Collections.

On first launch, Roon will ask you if you want to jump start your library with TIDAL collections. You can click the genres that interest you, and Roon will add a collection of albums from each selected genre as favourites to your TIDAL library. These albums are not stored on your hard drive, and you can always remove them later.

The TIDAL collections that you select will also automatically create corresponding Tags; for example, the TIDAL "Alternative" collection will create the "TIDAL:Alternative" tag.

If you already have an extensive TIDAL collection, then this feature may not be for you. This feature adds music to your favourites, and because Roon already helps you find new music based on what's in your favourites, our TIDAL collections feature may be more distracting than helpful.

You can always skip this step on first launch and add collections later. Just open the TIDAL browser in Roon and click the Collections header.

Browsing TIDAL and adding albums to your library

Browsing TIDAL is easy if you've already enabled TIDAL in Roon. Just click the navigation icon ☰ at the top left of the Roon window, then TIDAL. Here you can access what's new on TIDAL, TIDAL's Rising list, Playlists, Genres, your Favourites, and our Collections.

If you want to add an album to your library, just click it to open the album detail screen, then click + *Add To Library*. This will add the album to your Roon library so it's accessible alongside your local albums, and add it as a favourite in the TIDAL client.

Why aren't the latest albums on TIDAL available in Roon?

When you're browsing TIDAL in Roon, you're seeing Roon's TIDAL database, not a direct pass through of what's shown on TIDAL -- that's why there's so much more metadata, like recording dates, lyrics, links to composers, credits, etc.

This is also why Roon can sometimes be slightly behind TIDAL when a brand new release comes out -- our database is generated multiple times per week, but sometimes a new album will just barely miss the cutoff, and will show up in a day or two.

4.6 Some of My Music is Missing

If music isn't showing up in Roon, first try to force a rescan of your folder from the Storage tab of Settings.

You may also want to check the list of the Skipped Files, which can be found in the Library section of Settings.

If that doesn't work, the following describes some reasons why music in your watched folder might fail to import:

Unsupported Files

At this time, Roon supports mono, stereo and multichannel content in the following formats: MP3, WAV, WAV64, AIFF, FLAC, Apple Lossless, OGG, and AAC at resolutions up to 32 bit 384kHz. Roon also supports DSD64, DSD128 and DSD256 in the DSF and DFF formats.

Media that's not in one of the formats listed above will not import into Roon.

Files that lack an extension (meaning the file is called "`Song Title`" instead of "`Song Title.flac`" or "`Song Title.mp3`") will also be ignored by Roon's import process, and will not appear in the Skipped Files section.

Corrupt Files

It's possible that some audio files in your watched folders are corrupt. Corrupt files detected during your import will be skipped.

It's a good idea to search your Watched Folder for unusually small files, usually less than 5kb, to see if corrupt media is affecting Roon's importing process.

Special Characters

Don't use "special" characters in the names of files and folders. These will cause problems with the import process. Avoid using:

> **<** (less than), **>** (greater than), **:** (colon - sometimes works, but best avoided), **"** (double quote), **/** (forward slash), **** (backslash), **|** (vertical bar or pipe), **?** (question mark), ***** (asterisk), **$** (dollar sign), **`** (backtick), and **~** (tilde)

Blacklisted Files and Folders

Roon's importing process is based on automatic folder scanning, so some system files or other temporary content is skipped to ensure cross-platform compatibility and stability. Most collections don't have any issues with this, but if you're missing files, you may want to check for content stored in folders that break our naming rules.

The trash/recycle bin and internal system folders created by all operating systems in the top level folder of all drives:

- Any folder named $Recycle.Bin or Recycler which is in the same folder as a folder named System Volume Information.
- Any folder named System Volume Information.
- Any folder named any of .Trashes, .fseventsd or .Spotlight-V100 which is in the same folder as folders with the other two names.
- On Windows, the application data folder (this is typically `C:\Users\name\AppData`).
- On Mac, the Library folder and any hidden folders in your user folder, meaning any folder named Library in your user folder, typically `/Users/name`.
- Any folder with a name starting with a period in your user folder, for example `/Users/name/.Trash`.
- On Linux, any hidden folders in your home folder. For example, `/home/name/.local.`
- The recycle and system folders created in shared folders by QNAP NAS devices.
- Any folder with a name that starts with a **@** or **#** symbol.

In Addition, Roon supports user configurable Ignore Patterns for folder names. These can be changed by selecting the Edit option in Settings -> Storage -> 3 dots icon ⋮ for a watched folder.

These patterns are not case sensitive, but do use the directory separator specific to your operating system (/ on Mac/Linux, \ on Windows). By default, every watched folder is created with patterns to ignore the following:

- any folder named tmp
- any folder named temp
- any folder with a name starting with a period, for example /...and Justice For All/ or /.temp/
- any folder with a name ending with .pmbmf

Confirming The Import

If you're still having trouble finding a file in Roon, it's worth checking to see if the file was imported but misidentified, or added to the wrong album.

You can confirm whether a file was imported by checking the Skipped Files list, or by looking up the file by path.

Still Having Trouble? Let us know

Still can't find your file? We'd be happy to look into the issue further, starting by looking at the media.

Please upload a file that's missing to Dropbox (or similar) and send details about your setup and a link to the file over to Roon Support so we can investigate further.

4.7 Import Settings

Overview

Roon's Import Settings provide control over how Roon handles your music files.

When you modify import settings, Roon re-evaluates each file in your library taking the new settings into account. This approach allows for the settings to be both very powerful and totally non-destructive.

That means that it's completely safe to change your library settings - you can always put them back the way they were later if you change your mind, and the result will be the same as if you never touched them in the first place.

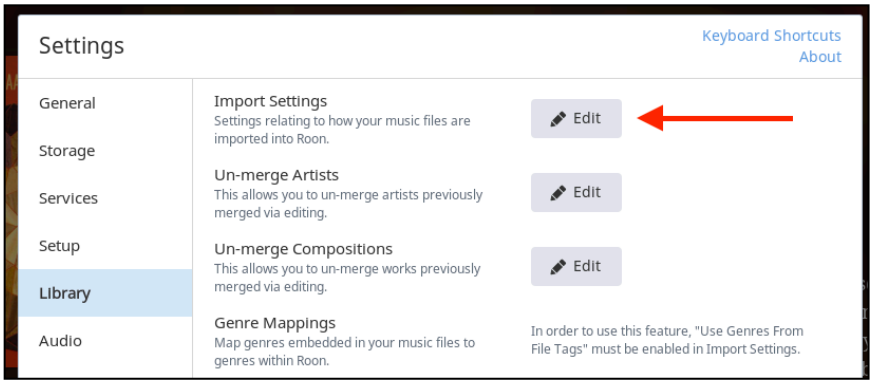
Changing Library Settings Takes Time

This process can take a few minutes to complete, depending on the size of your library and the performance of your Core.

You can continue to use Roon during this time, but performance may be impacted, so it might not be the best idea to experiment with these settings during a party or a critical listening session.

Locating Import Settings

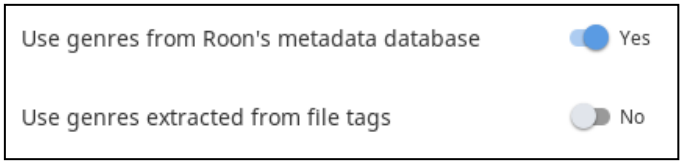
You can launch the import setting screen from Settings -> Library.



Genre Settings

By default, Roon assigns genres to albums and artists automatically and ignores genre information found in file tags. This produces a clean and consistent experience for the majority who do not have clean genre information in their files.

If you want to exert more control over how genres are displayed in Roon, you might choose to enable both options, or to totally opt out of Roon's genre assignments and do it yourself.



For more in-depth information on managing genres in Roon, see here.

Metadata Preferences

By default, Roon displays metadata from our metadata service instead of metadata found in your file tags when both are present.

Starting in Roon 1.1, we introduced "Prefer File" options in our Editing features, which enabled people to choose whether data from file tags or data from Roon's metadata database would be displayed on an album by album, track by track, field by field basis.

This system was very flexible, and allowed for fine-grained tuning, but we received one piece of feedback over and over from our users: that there should be a way to express these preferences globally.

So, in Roon 1.3, we introduced global versions of these settings.

You can find these settings under the **Metadata preferences for Albums** and **Metadata preferences for Tracks** sections in Import Settings.

Note that **Prefer File** does not mean "File Tags Only". Roon considers track credits on a category-by-category basis and, for each category (*Composer*, *Conductor*, *Ensemble*, *Main Performer*, *Performer*, and *Production*), if no credits exist for the preferred metadata source (Roon or File), then Roon will look for them in the other source (File or Roon).

Composer credits have an additional level of complexity in that there is a distinction between *composition* composer credits and *track* composer credits. If we have Roon composition composer credits, but no track composer credits, we will go to your file tags and merge in anything that Roon doesn't already have; one reason for this is to cater for track-specific Arranger (Composer) credits. This is, incidentally, why, if you've put something like "Beethoven, Ludwig van (1770-1827)" in your `COMPOSER` tags, it will appear alongside Roon's "Ludwig van Beethoven" in the composer credits.

This behaviour is deliberate. The reason that Roon applies as much credit metadata as it can is to provide rich and, in many many cases, **unknown** links between the different albums in your library. E.g. Drummer "Joe Shmoe" played on 7 albums in your library... This is fundamental to the Roon experience today and we're likely to leverage this even more in the future.

Import Dates

By default, Roon keeps track of the "Date Added" for each of your tracks based on the first time a file was added to your library.

If you prefer to manage these differently, there are a few possibilities:

The `IMPORTDATE` tag is the most reliable method, and is a good solution for people who would rather manage this explicitly using external tools or scripts.

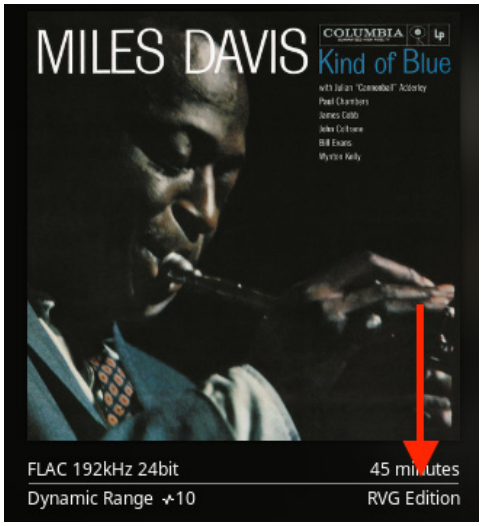
You might consider using the file time settings if you find that the timestamps on your files are a good representation of when you feel that you originally acquired the content. This will be true for some people, and extremely un-true for others. The only way to find out is to look.

In general, we do not recommend that you use **File Modification Time** unless you know what you're doing--it's easy to accidentally change the modification time of a file, which will cause your import dates to change as well.

Also note that on Linux-based systems, the notion of "File Creation Time" is very shaky and may not work as you expect. For extremely nerdy technical details of the effort to resolve this, see here.

Album Version settings

Roon supports the idea of an album "version", which is usually a short piece of text that helps to provide identifying information about the album.



Roon automatically populates the "Version" field from several locations based on a wide range of patterns we've observed in files "in the wild". If your library is more deliberately tagged, you may want to alter these settings to match your tagging practices.

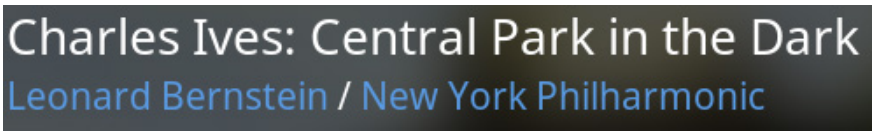
File Tag Delimiters

When processing file tags, Roon splits fields based on certain delimiters. If you prefer, you can customize these.

For example, if your track has a tag like this:

> ARTIST: Leonard Bernstein; New York Philharmonic

Roon can recognize the `;` as a delimiter and split that tag into two separate artists, like this.



Roon's defaults are based on an analysis of millions of "real-world" files, and are generally considered to be safe, but if your library follows different conventions, you may need to change them.

Note that Roon always treats a `NUL` character as a delimiter.

Finally, note that it is nearly always better to simply put separate values in separate tags. A file with two `ARTIST` tags instead of `Artist1; Artist2` will be more easily and unambiguously understood by virtually all software.

Delimiter Settings

When specifying multiple delimiters, please separate them with a space character. Multi-character delimiters are supported.

The most common things people add are `'/'`, `'\'`, or `'|'`. These are relatively safe and do not generally cause problems.

Tag Delimiters for Artist/Composer/Label Tags

This setting impacts Roon's parsing of the following tags:

> COMPOSER, TCOM, ARTIST, PERFORMER, TPE1, TPE2, TPE3, ALBUM ARTIST, ALBUMARTIST, ALBUM_PERFORMER, SOLOIST, SOLOISTS, LYRICIST, VOCALS, VOCALIST, REMIXED BY, REMIXER, MIXARTIST, DJMIXER, MIXER, ARRANGER, ENSEMBLE, ENGINEER, AUTHOR, IWRI, WRITER, CONDUCTOR, ALBUM_ARTIST, PRODUCER, IPRO, FEATURING, TPUB, ORGANIZATION, LABEL

We caution strongly against adding a `','` as a delimiter for Artist/Composer/Label tags. Many real-life artist names contain commas, and this will make mess out of your experience in Roon.

Tag Delimiters for Genre tags

This setting impacts Roon's parsing of the following tags:

> GENRE STYLE GENRES STYLES

Troubleshooting Issues

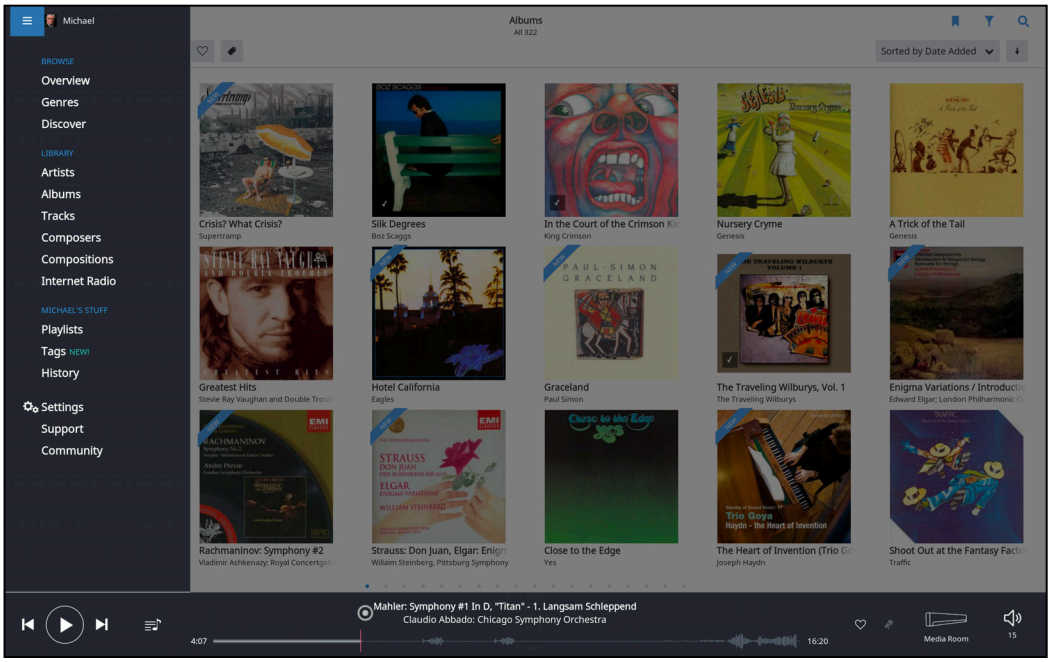
Some tagging software displays one delimiter in its user interface, and then writes the delimiter out to your files differently. Very often the thing displayed in the user interface is a semicolon, even though the underlying file ends up using something else.

These situations can be tricky to debug--since your editor is showing you something different than what Roon is seeing. You can see information about how Roon is reading your tags using View File Info. This can be very helpful when trying to figure out what's going on.

You can find more information about a track anywhere in Roon by selecting it (right-click or touch and hold), and pressing **View file Info** on the selection menu. Here you can see the audio file's information, and you can click on **File Tags** to view its tags.

5.0 Browsing and Playing Music

If you click the navigation icon ☰ at the top left of your Roon or Roon Remote user interface, you see the following options:



Notice how the options are grouped into sections:

Browse

- Overview
- Genres
- Discover

Library

- Artists
- Albums
- Tracks
- Composers
- Compositions
- Internet Radio

Your Stuff

- Playlists
- Tags
- History

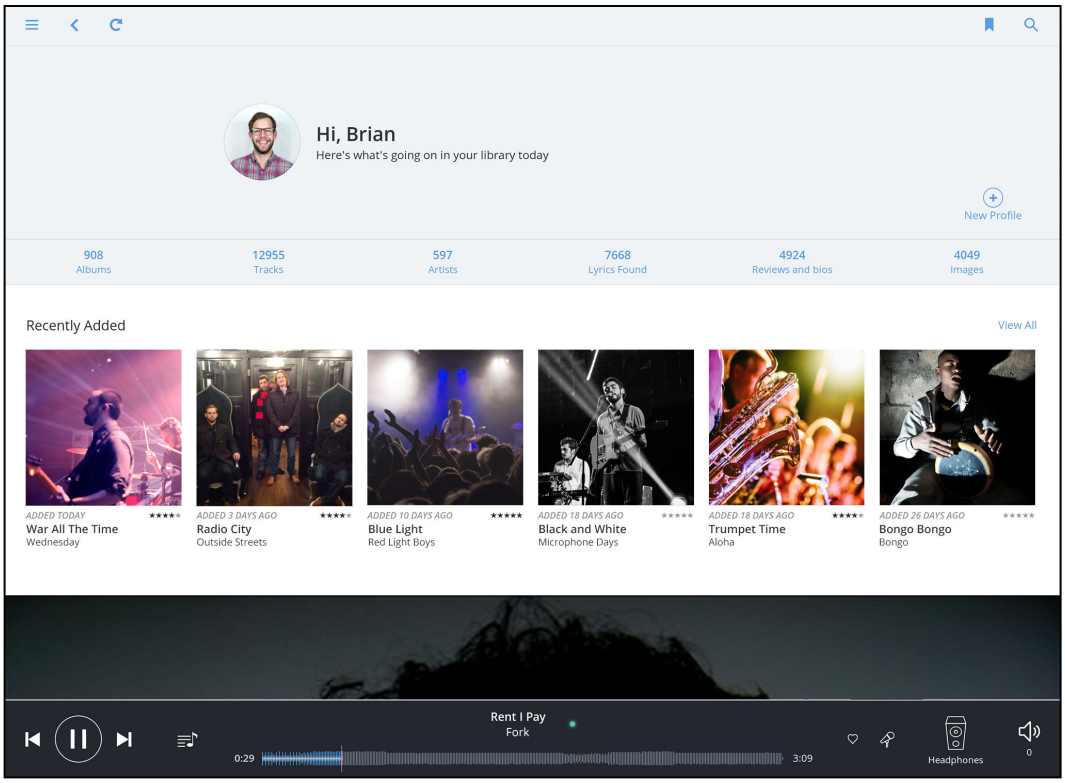
We deal with the *Browse* and *Library* sections in this chapter, and *Your Stuff* in the next chapter.

5.1 Library Overview

The Overview screen is your Roon home page. It's where you can get an instantaneous analysis on what's going on in your library.

Find statistics on how many albums, tracks, artists, lyrics, reviews, and images are in your library. Listen to what you've added to your library recently, check out a new featured artist or composer, start listening to a new genre, check out the recommended playlists on TIDAL, and more.

You can access the overview screen by clicking the navigation icon ☰, then *Overview*:

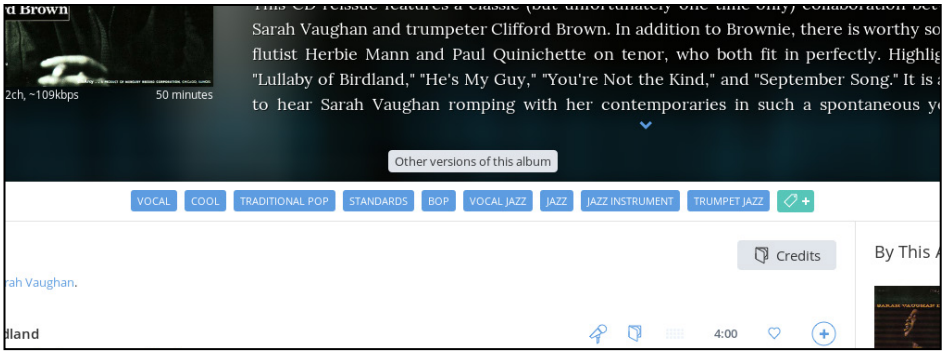


5.2 Genres

When Roon identifies the albums in your collection, it retrieves comprehensive genre information along with cover art, lyrics, artist photos, and credits.

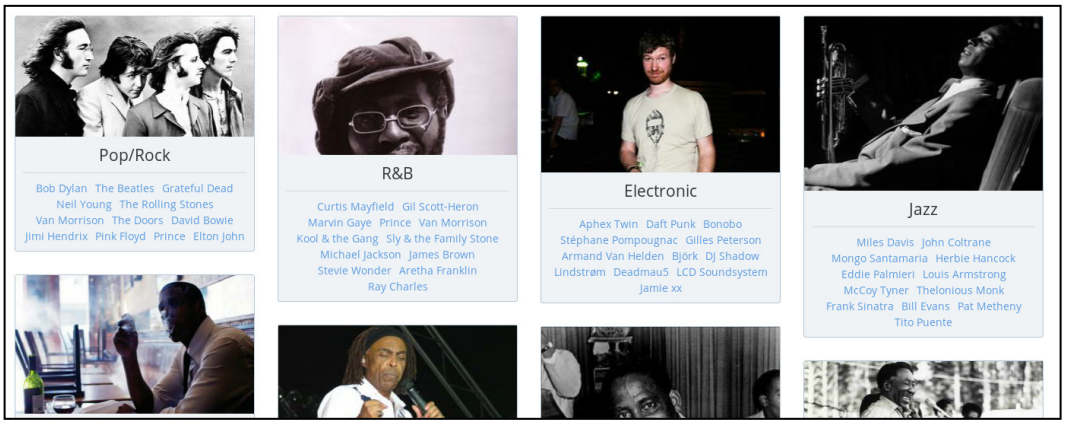
Roon's genre information goes way beyond what's possible with simple file tags, with albums and artists classified under multiple genres at once, accurately reflecting the rich mix of styles many artists performed in over the course of their careers.

You no longer have to choose between keeping all your Jazz albums together, and accurately reflecting the wide variety of styles that Jazz encompasses -- in Roon, an album can be Jazz *and* Bop, and Vocal Jazz and more, all at the same time.



Browsing Genres

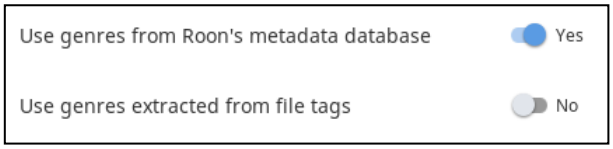
Genres in Roon come arranged in a hierarchy, so even though you might have a collection of hundreds of genres, you never have to browse them all at once. At the top level, you can find categories like Jazz and Pop/Rock, and as you drill down, you get to deeper genres, like Modal Music, or British Invasion.



Your Genres and Library Settings

We know many members have spent significant time grooming the genres embedded in their file's tags, and while Roon imports these genre and style tags into the database automatically, they're not displayed by default. This produces a clean and consistent experience for the majority who do not have clean genre information in their files.

If you'd like to see your own genres in Roon, simply visit the Library tab of Settings, then, edit your Import Settings. You might choose to enable both options, or to totally opt out of Roon's genre assignments and do it yourself.



Editing Genres

Roon supports full editing of genres, and genre assignments. Don't like that Daniel Barenboim is tagged as "Latin"? By all means, remove it.

Roon also supports editing of the genre hierarchy itself. Is Tango a Top-Level genre for you? By all means, put it at the Top-Level.

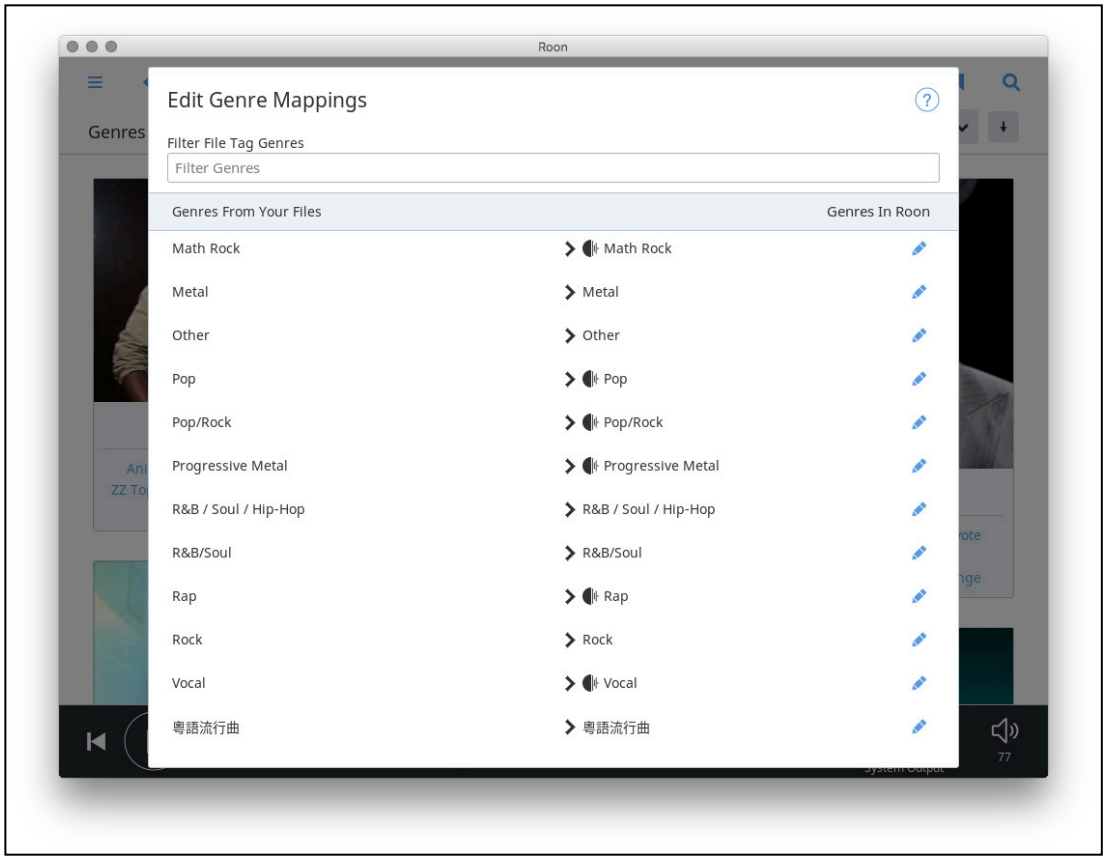
To edit a genre, or to add or remove genres from an album or artist, just click Edit (from the 3 dots ⋮ menu) on the album or artist page, or the Pencil on the genre page.

Genre Mappings (advanced)

Roon supports mapping genres extracted from your file tags when they're brought into Roon. This mapping allows you to:

- Re-write genre names. This is common for near misses like "Prog Rock" vs "Progressive Rock" or "Post Bop" vs "Post-Bop".
- Hide genres that you don't want to see in Roon.

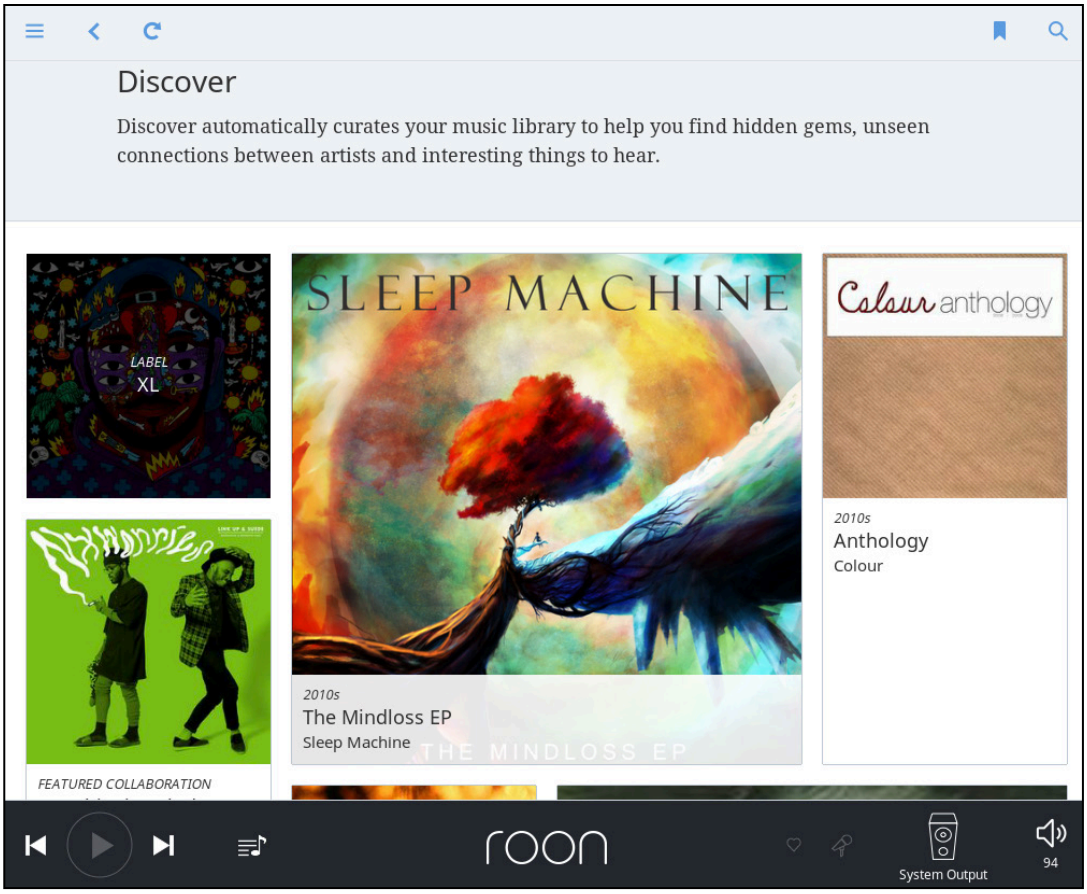
Genre mappings are accessible only if you have "Use genres extracted from file tags" set to Yes. You can access genre mappings in Settings -> Library -> Genre Mappings.



5.3 Discover

Roon's extended metadata opens up a world of opportunity for finding new music. Roon can see how your collection intertwines and connects, then automatically curate your music library to find hidden gems, unseen connections between artists and interesting things to hear.

Discover will show you featured collaborations, compositions, decades, labels, artists and more. To access the Discover screen, click the navigation icon at the top left of the Roon window ☰, and click *Discover*. Click the refresh button ↻ for a new set of recommendations:



5.4 Browsers

Roon looks at your music and finds photos, bios, reviews, lyrics, and concert dates, and makes connections between artists, composers, performers, conductors, and producers. What you get is a searchable, browsable magazine about your music.

This experience is built around our browsers, accessible by clicking the navigation icon at the top left of the Roon window. The browsers are as follows:

- Library Overview
- Genres
- Discover
- TIDAL
- Artists
- Albums
- Tracks
- Composers
- Compositions
- Internet Radio
- Playlists
- Tags
- History

Each browser allows you to dive in to your collection in ways you never could before. Use Focus to find exactly what you want, create bookmarks to save something for later, or use tags to meticulously filter and organize your collection. Dive in!

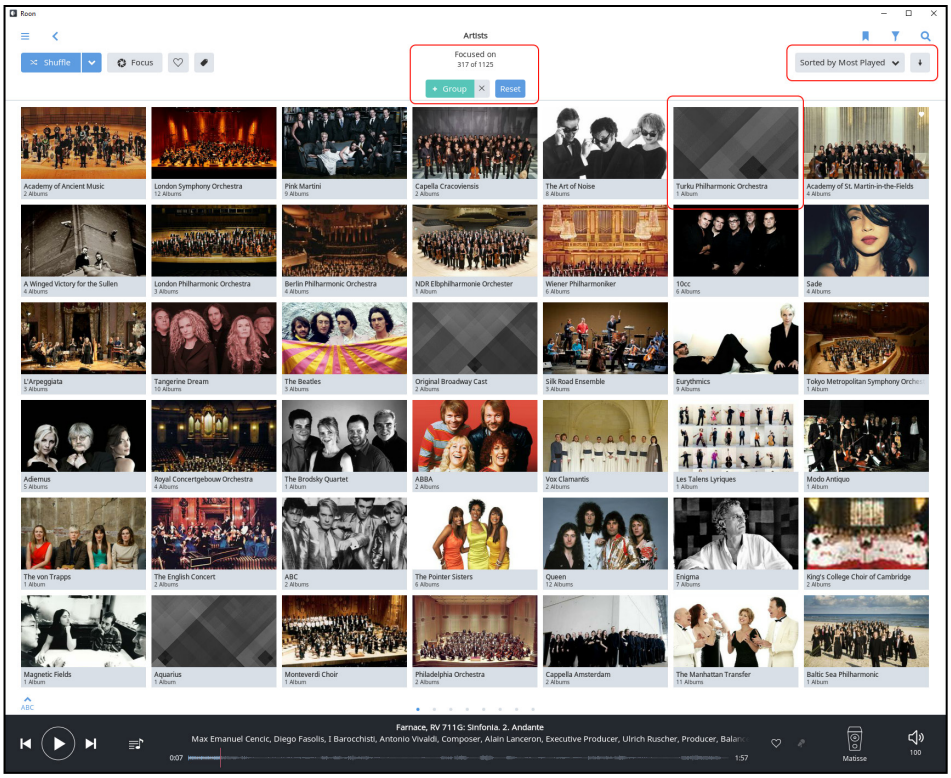
You can bookmark pretty much any screen in Roon by clicking the Bookmark icon in the upper-right, next to Filter. Once you've saved a bookmark, it will be available from the same drop down, allowing you to quickly return to the screen you saved.

This lets you easily jump to any albums, artists, or playlists you want regular access to, or to return to a browser with a specific focus or sort.

Saved Bookmarks can be sorted, renamed or removed by clicking the Bookmark icon then Manage Bookmarks.

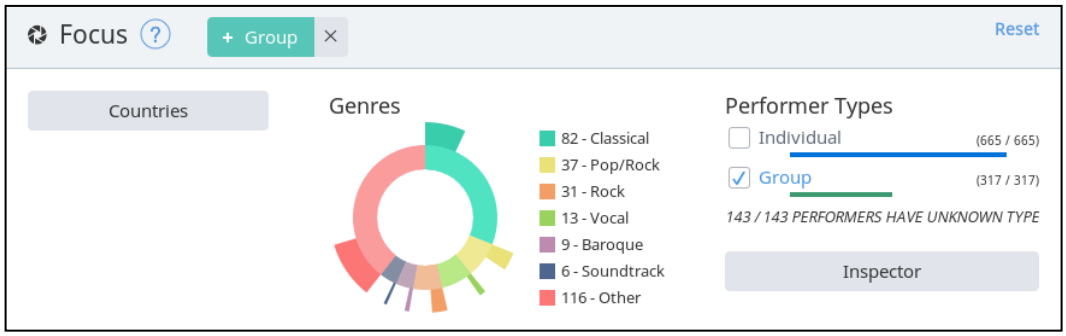
The Artists Browser

You can access the Artist Browser by clicking the navigation icon ☰, then *Artists*. You will see the artists in your library displayed in a screen something like this:



We've highlighted a few items (in red) in this screenshot for further explanation.

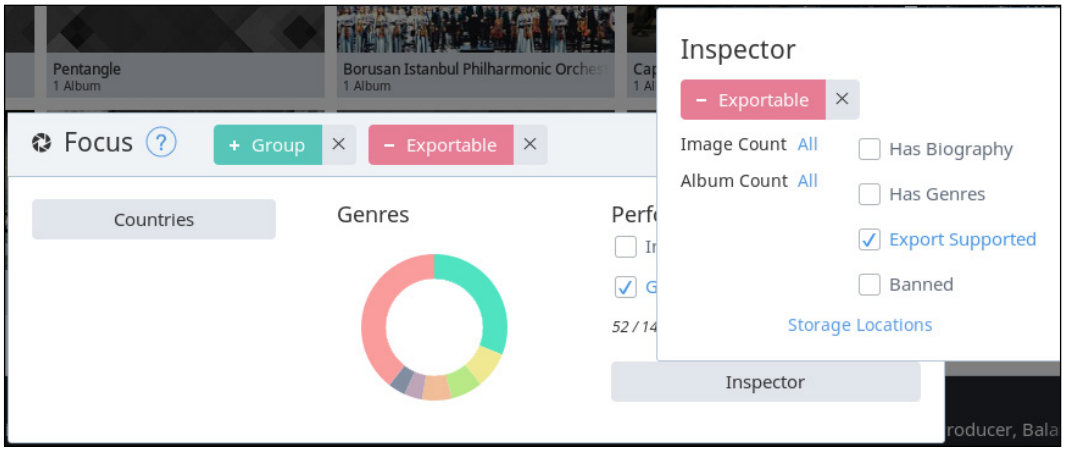
First is the use of Focus. Here, we've used Focus to display just groups, rather than individual performers. The Focus setting to do this was this:



As you can see, Focus in the Artists Browser gives you the ability to select artists on the basis of:

- their country of origin
- the Genres they perform in
- whether the artist is an individual or a group

There are further selection criteria available for artists via the Inspector button in Focus.



Here, in this example of the Inspector criteria, we've focused on Group artists who appear on TIDAL albums only in this particular library (i.e. their albums are not exportable to other devices or storage locations). It's an example of clicking on a Focus criterion a second time to invert it (make it a "NOT" operator).

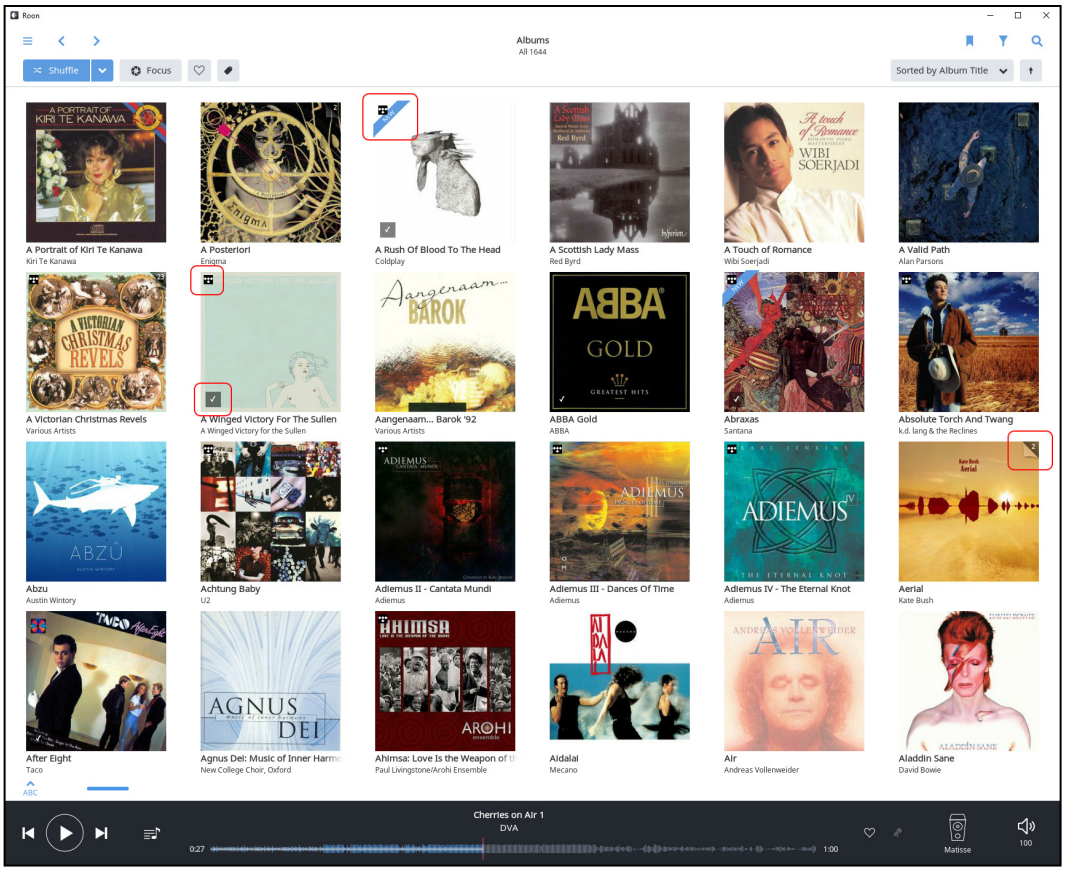
The second feature we highlight in the Artist browser is the Sort menu. Here, we are sorting our artists by "most played" in descending order. The drop-down menu gives you access to other ways of sorting, and the arrow button next to it allows you to invert the sort order.

The last "feature" that is highlighted is that not all artists will have images in Roon's database, so the generic greyed-out image is used instead.

In such cases, you can always edit the Artist entry to add your own images for your library.

The Albums Browser

You can access the Artist Browser by clicking the navigation icon ☰, then *Albums*. You will see the albums in your library displayed in a screen something like this:



We've highlighted a few items (in red) in this screenshot for further explanation.

First up are the "TIDAL" icon and the "New" icon.

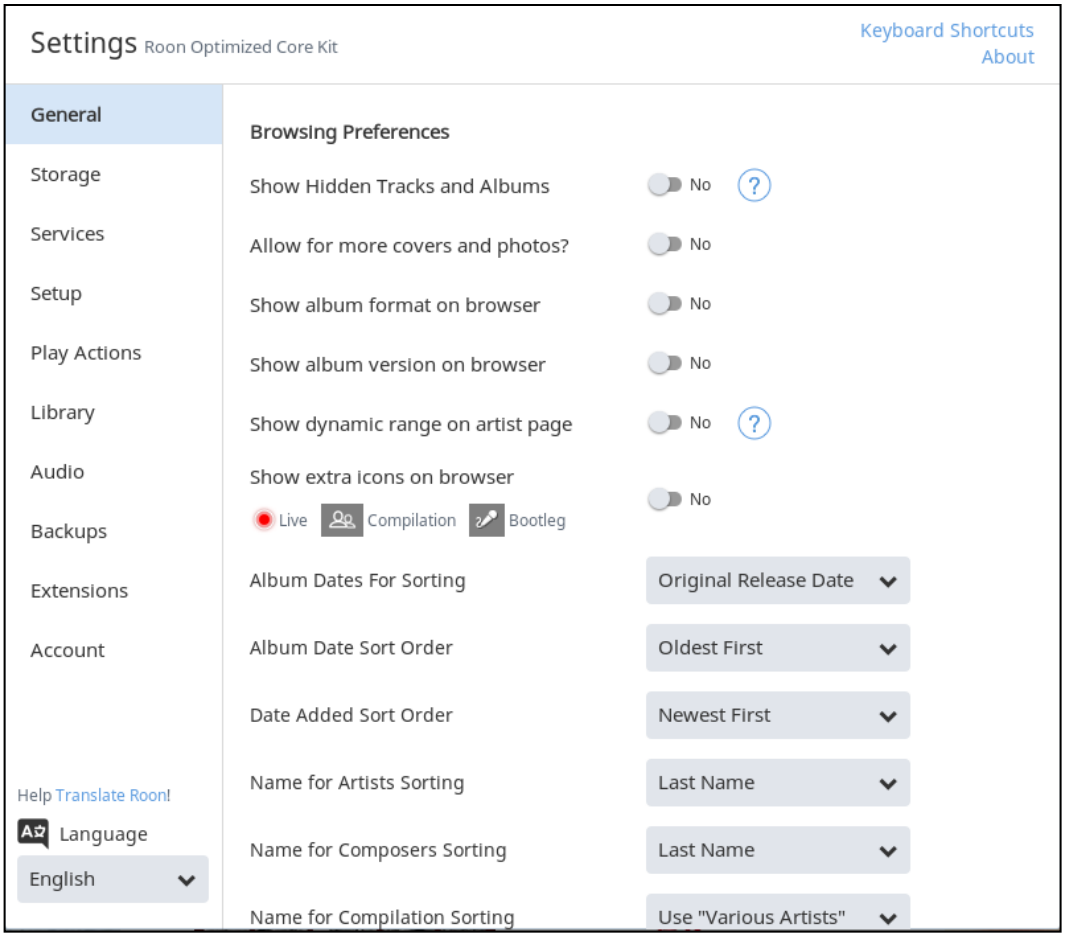
Both will appear, when relevant, in the top left corner of an album cover. If you have a subscription to the TIDAL music service, and have enabled the integration with Roon, then you can you can add TIDAL albums into your Roon library. These albums will always show the TIDAL icon, to distinguish them from your locally-stored albums in your library.

The "New" icon will appear on every newly-added album - whether it is an album added to your local storage, or is a TIDAL album added to your library. Once you play a new album, then the "New" icon will be removed.

The third icon highlighted in this screenshot is the "Picks" icon. This is the checkmark that can appear on the bottom left corner of an album cover. Picks albums are recommended by AllMusic's experts, and they're often either well reviewed, historically significant, or both.

Lastly, look at the cover of Kate Bush's "Aerial"album. You can see a number "2" in the top right corner. This signifies that the album has two discs - it is an example of a multi-disc album.

You can customize the Album Browser by using the General tab:

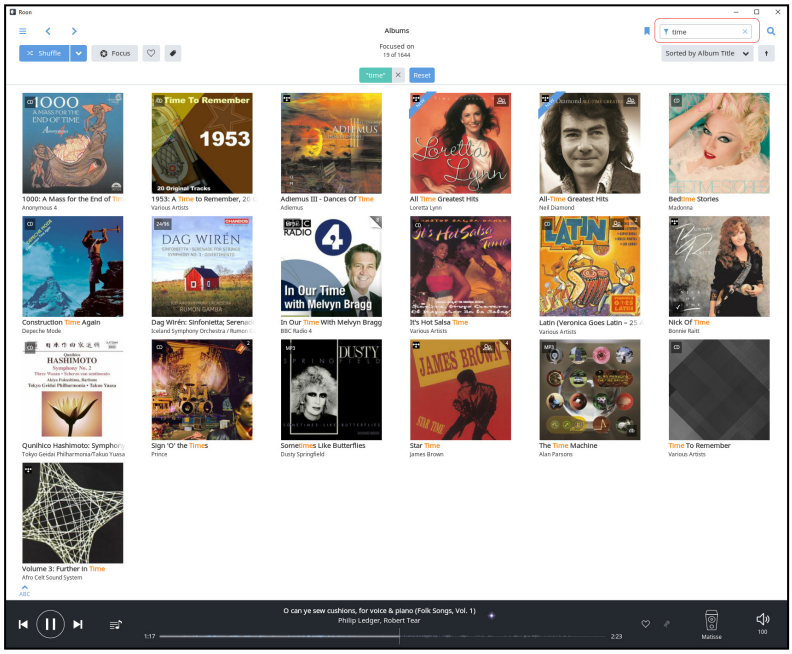


For example you can display more albums per page in the browser, and with extra icons on the covers showing the format of the album.

At the top of the Album Browser are tools for filtering, searching and sorting, together with options for play order:

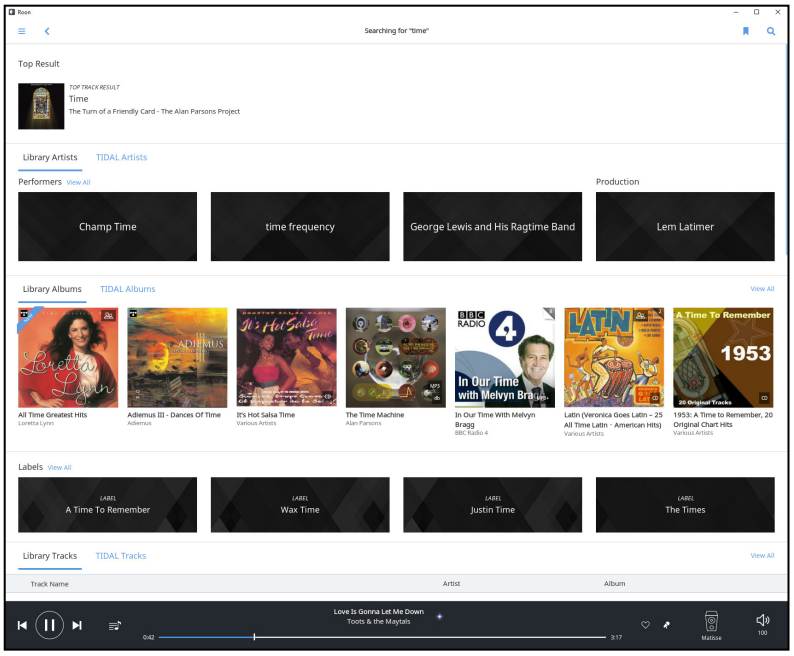
Focus is a powerful feature that allows slicing and dicing your collection in many different ways. It's covered here, but the best way to learn about it is really to dive in and try it. Once you have built a dynamic filter using Focus, you can save it as a Bookmark for instant recall later.

Next to the Bookmark icon at the top right is the Filter icon. In the Album Browser, this allows searching for text in album titles. Here, for example is the result of searching for "time" in this particular library:



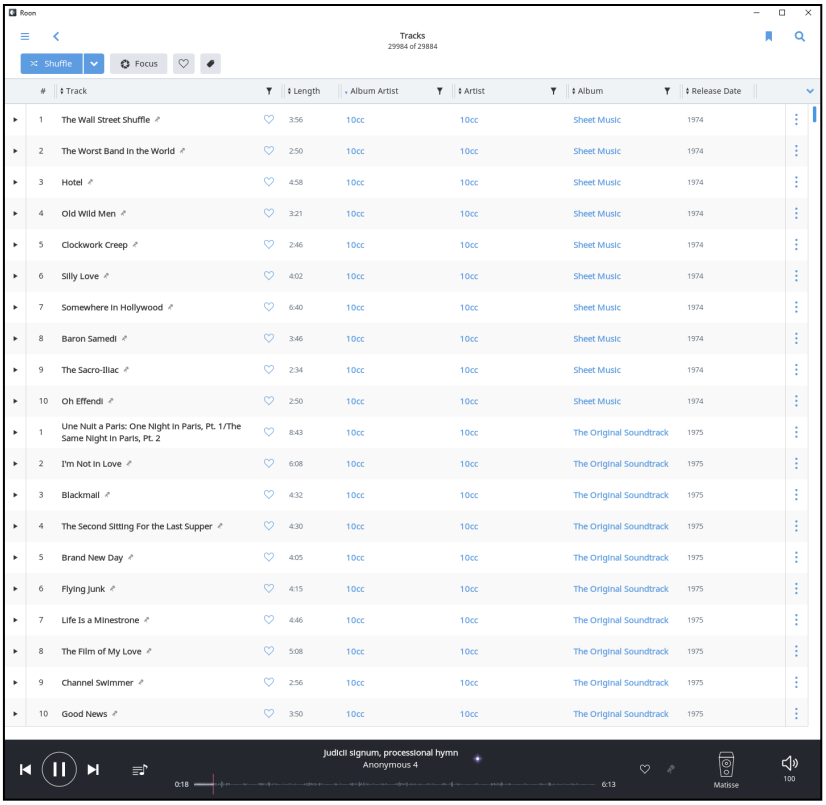
Notice that the text being searched for can be anywhere in the title - in the Dag Wirén album, for example the title has the word "Divertimento" in it...

Next to the Filter icon is the Search icon. While the Filter works on content in the current Browser (here, on album titles), the Search function works across the whole of Roon. So entering "time" here will return results from the entire library, and also from TIDAL, if it is integrated with your Roon:

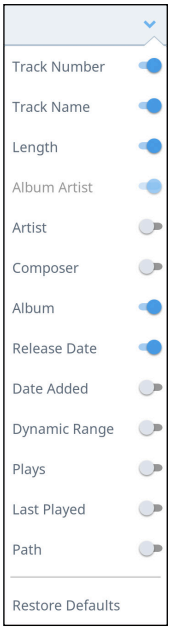


The Tracks Browser

You can access the Track Browser by clicking on the navigation icon ☰, then *Tracks*. You will see the albums in your library displayed in a screen something like this:

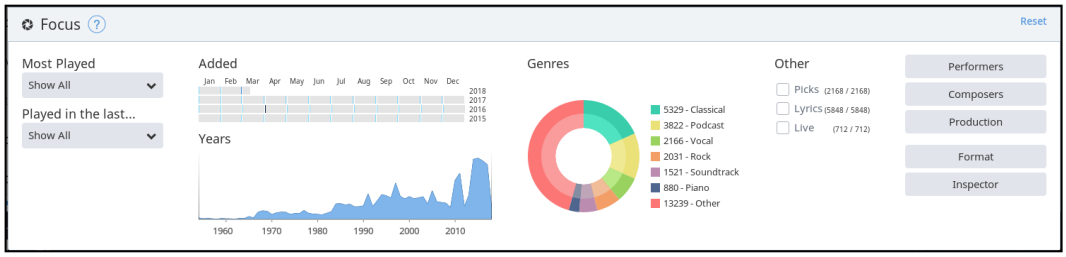


The column headings in the Track Browser are customizable. Click the down arrow on the right of the header bar to reveal the list of available headings, and set those you want using the slider toggles.



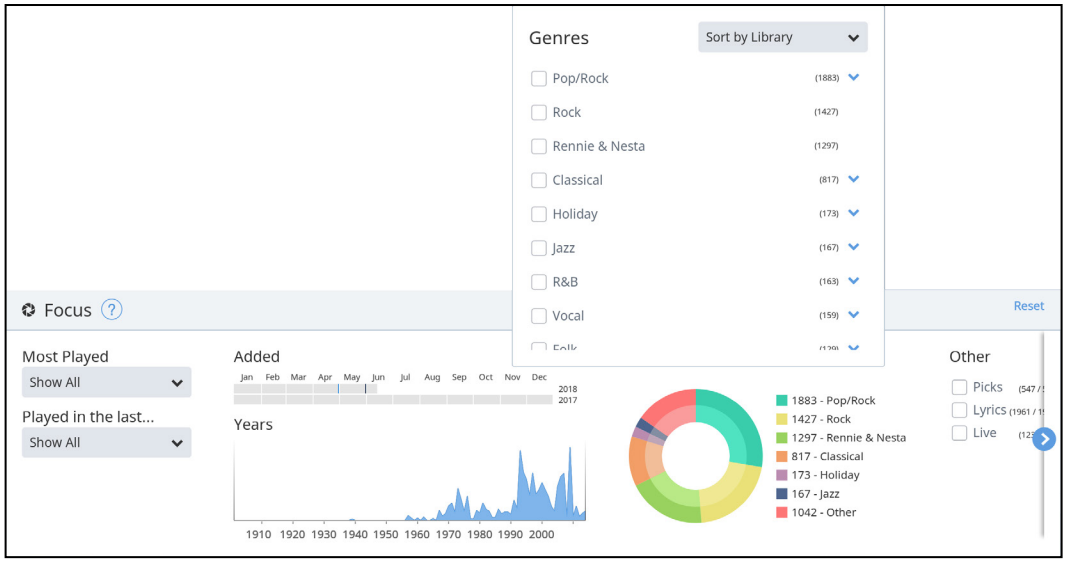
Many column headers also have sort order controls (the arrow icons) or text filter controls (the funnel icon).

As there is for the other browsers, there is a Focus button that can be used for advanced filtering. The Focus criteria here are those relevant for Tracks.



Two things to note about the Genres circle chart:

- Genres are album genres in Roon - Roon does not currently use track genres.
- The chart shows only the top seven genres (by number of albums) - click on it to show the complete list.



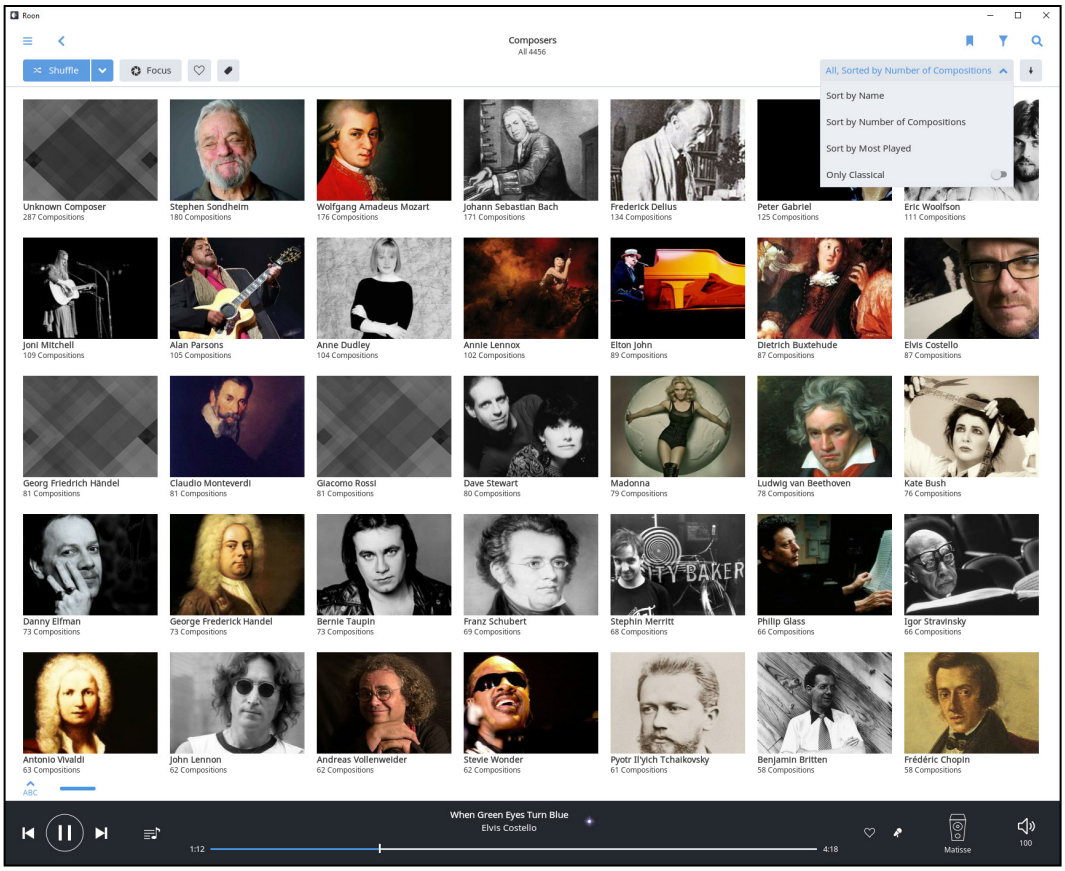
Focus is a powerful feature that allows slicing and dicing your collection in many different ways. It's covered here, but the best way to learn about it is really to dive in and try it. Once you have built a dynamic filter using Focus, you can save it as a Bookmark for instant recall later.

Next to the Focus button are the Favourites filter button and the Focus on Tags button.

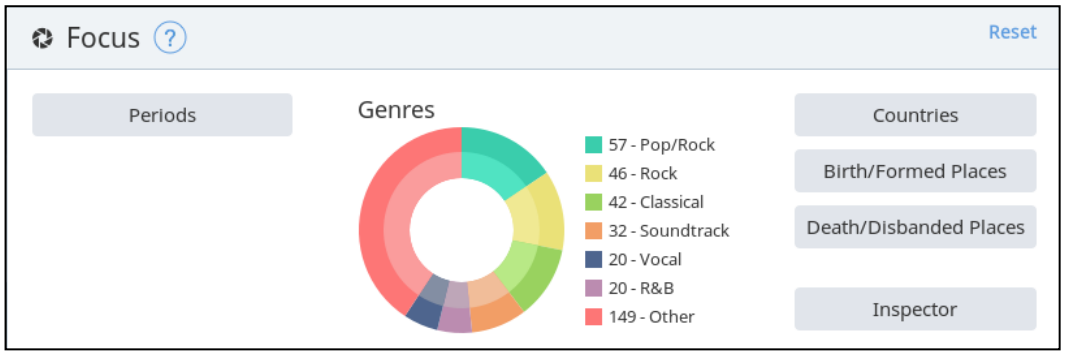
Next to the Bookmark icon at the top right is the Search icon, which searches across the whole of Roon.

The Composers Browser

You can access the Composers Browser by clicking on the navigation icon ☰, then *Composers*. You will see the composers in your library displayed in a screen something like this:

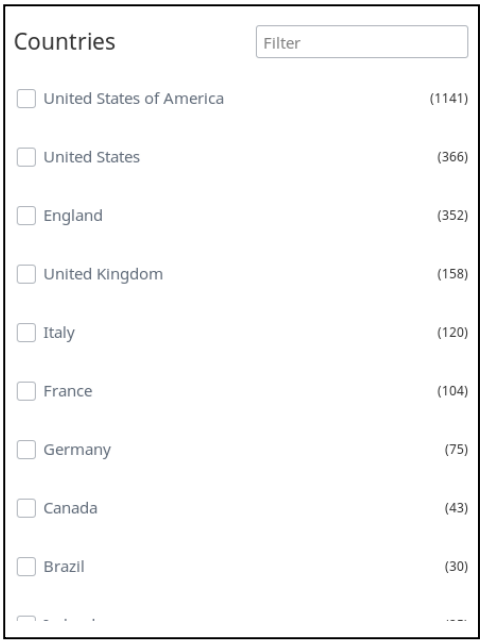


Click the down arrow on the right of the header bar to reveal the list of available sort orders, and you can also choose to only display Classical composers by setting the slider toggle in this menu to "on". As for the other browsers, there is also a Focus button that can be used for advanced filtering. The Focus criteria here are relevant for Composers.



Clicking a Focus button will reveal the possible choices for that category. If there is more than one page, the pop-up window is scrollable, and will also have a Filter field for quick access to the desired

choice(s). Here, for example is the pop-up window for the composer countries in this particular library. Note that the content is ordered by frequency, with the most used forms listed first.

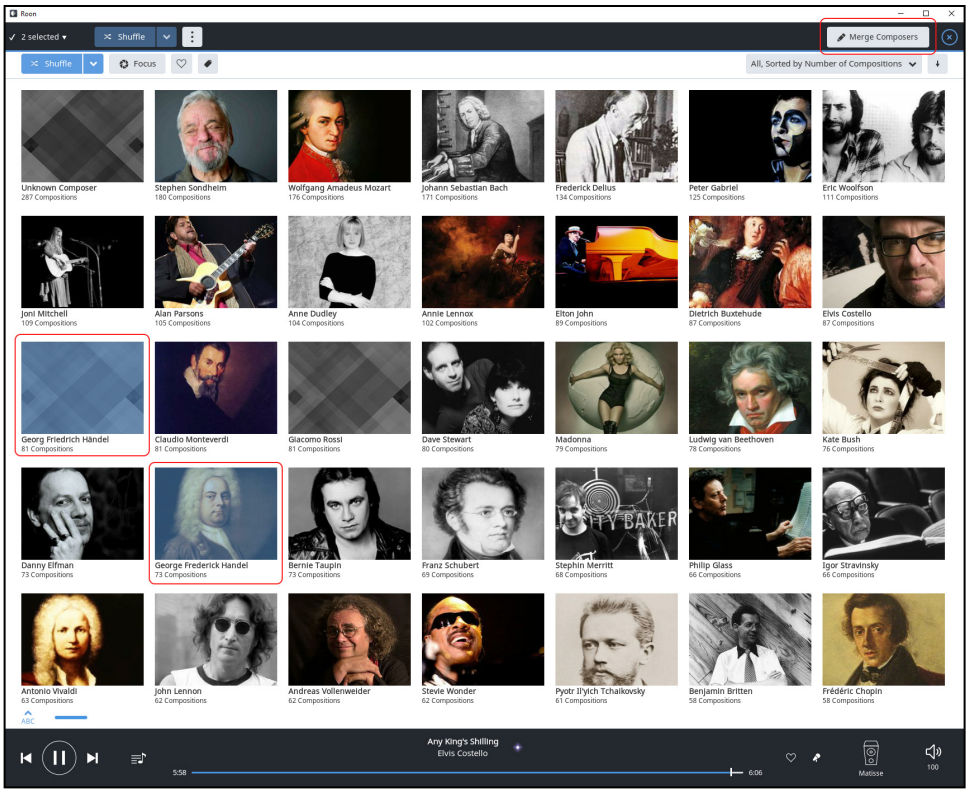


Focus is a powerful feature that allows slicing and dicing your collection in many different ways. It's covered here, but the best way to learn about it is really to dive in and try it. Once you have built a dynamic filter using Focus, you can save it as a Bookmark for instant recall later.

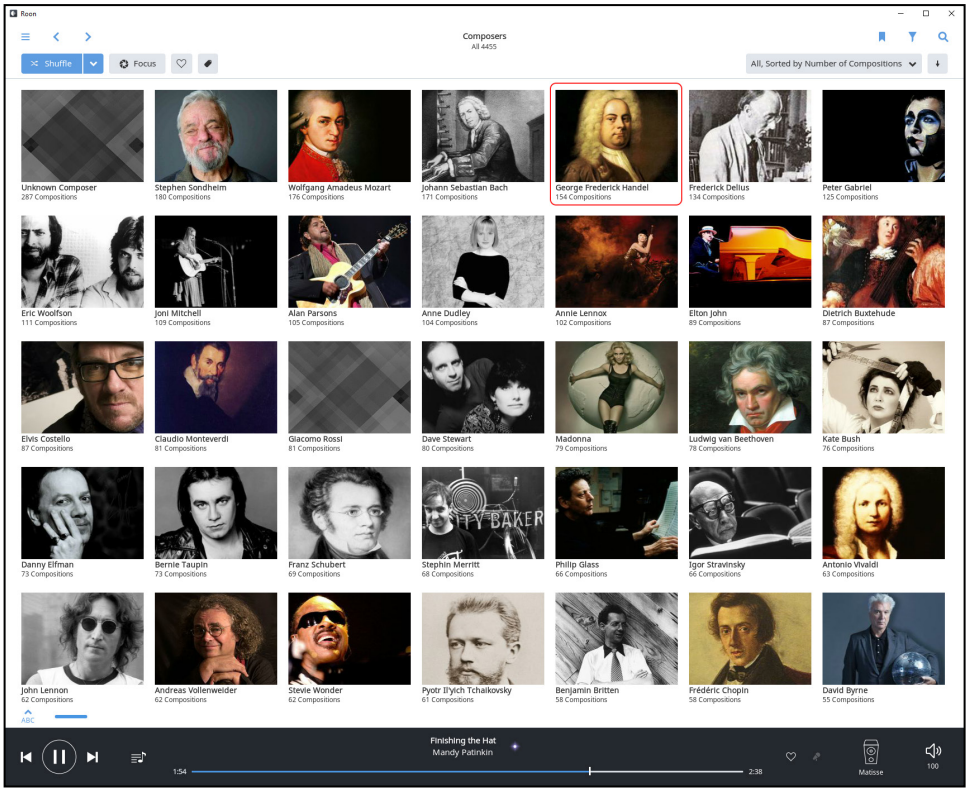
Next to the Focus button are the Favorites filter button and the Focus on Tags button.

Next to the Bookmark icon at the top right is the Search icon, which searches across the whole of Roon.

Looking back at the overview of Composers in this particular library, you may have noticed that Handel appears twice (with different spellings of his name). We really want to have these two entries merged into one. Fortunately, Roon makes this easy to do. Simply select the entries that need to be merged (right-click on a composer entry, or press and hold for touchscreens), and the "Merge Composers" button appears at the top of the screen:

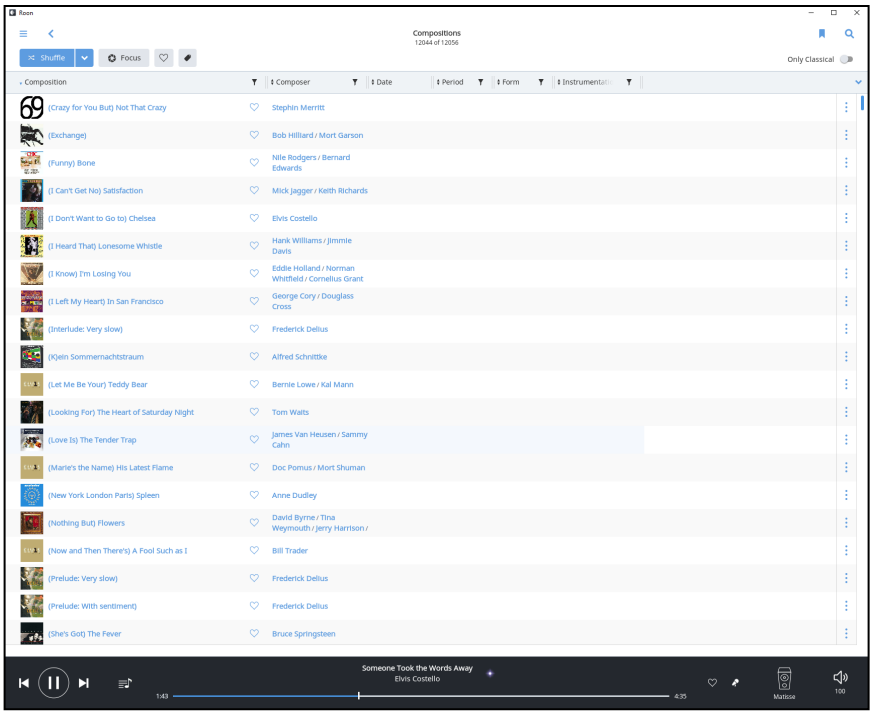


And here's the end result, Handel has moved up the list :

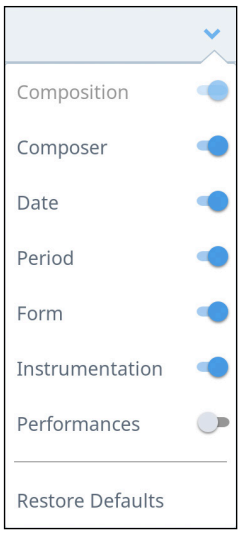


The Compositions Browser

You can access the Compositions Browser by clicking on the navigation icon ☰, then *Compositions*. You will see the compositions in your library displayed in a screen something like this:

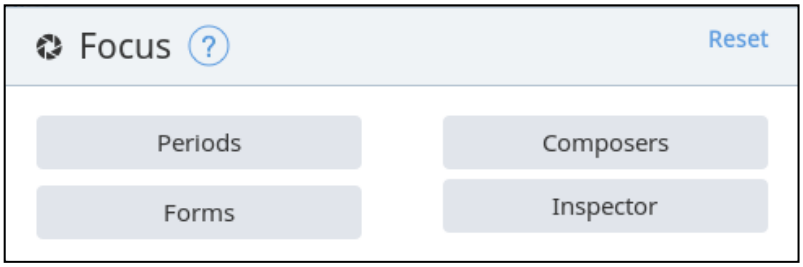


You can choose to only display Classical compositions by setting the slider toggle at the top right of the display to "on". The column headings in the Compositions Browser are customizable. Click the down arrow ⌄ on the right of the header bar to reveal the list of available headings, and set those you want using the slider toggles.

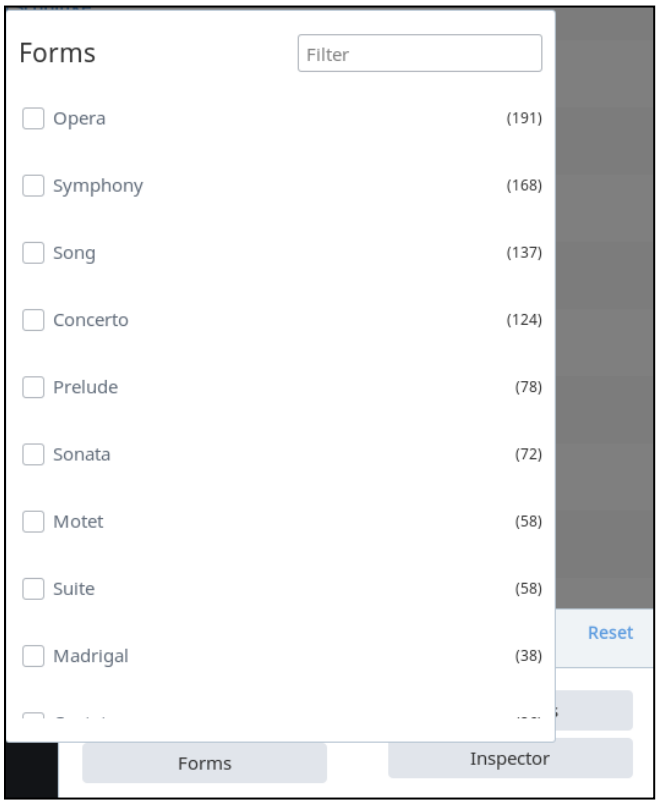


Many column headers also have sort order controls (the arrow icons) or text filter controls (the funnel icon).

As for the other browsers, there is also a Focus button that can be used for advanced filtering. The Focus criteria here are relevant for Compositions.



Clicking a Focus button will reveal the possible choices for that category. If there is more than one page, the pop-up window is scrollable, and will also have a Filter field for quick access to the desired choice(s). Here, for example is the pop-up window for musical forms in this particular library. Note that the content is ordered by frequency, with the most used forms listed first.



Focus is a powerful feature that allows slicing and dicing your collection in many different ways. It's covered here, but the best way to learn about it is really to dive in and try it. Once you have built a dynamic filter using Focus, you can save it as a Bookmark for instant recall later.

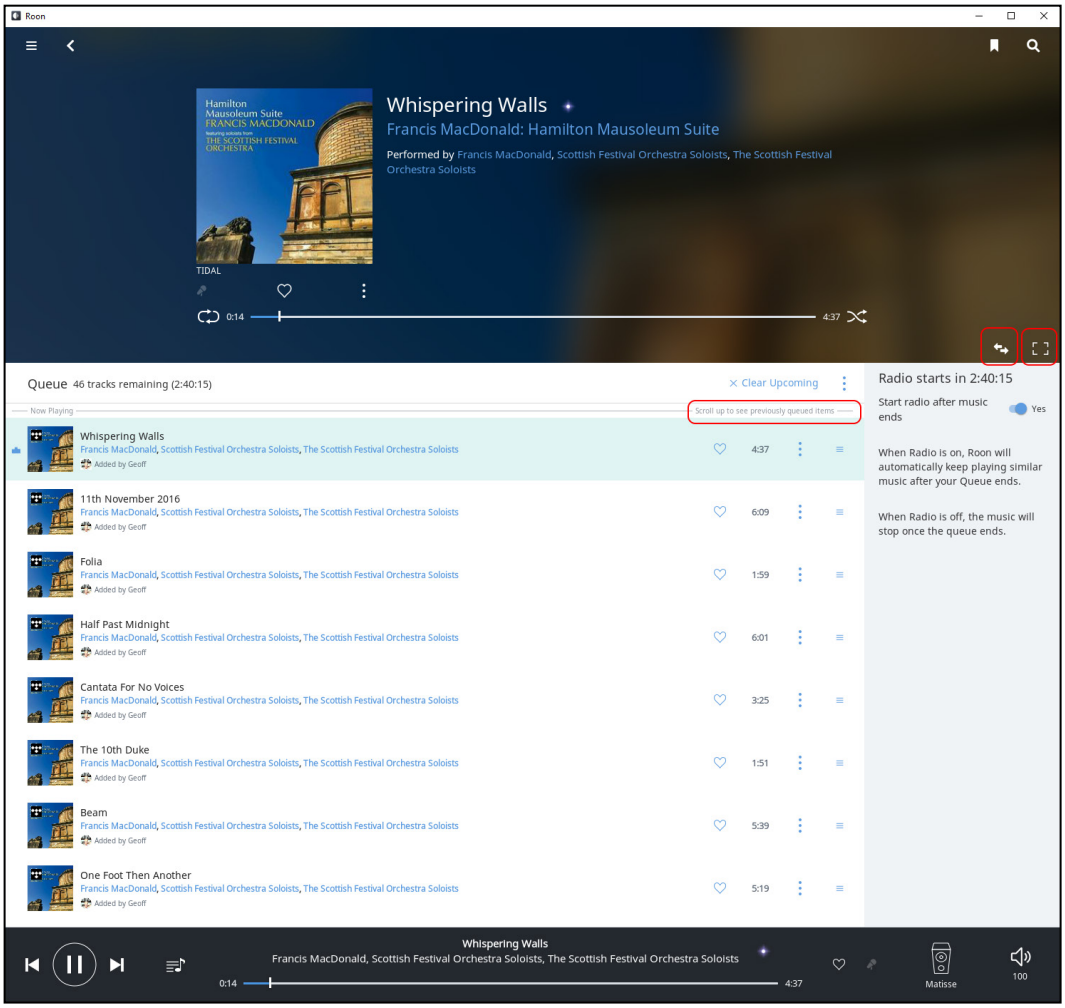
Next to the Focus button are the Favorites filter button and the Focus on Tags button.

Next to the Bookmark icon at the top right is the Search icon, which searches across the whole of Roon.

5.5 The Queue

The queue is a list of songs that are waiting to be played. You can access the Queue by clicking the queue icon at the bottom of the Roon window, or just click the currently playing song.

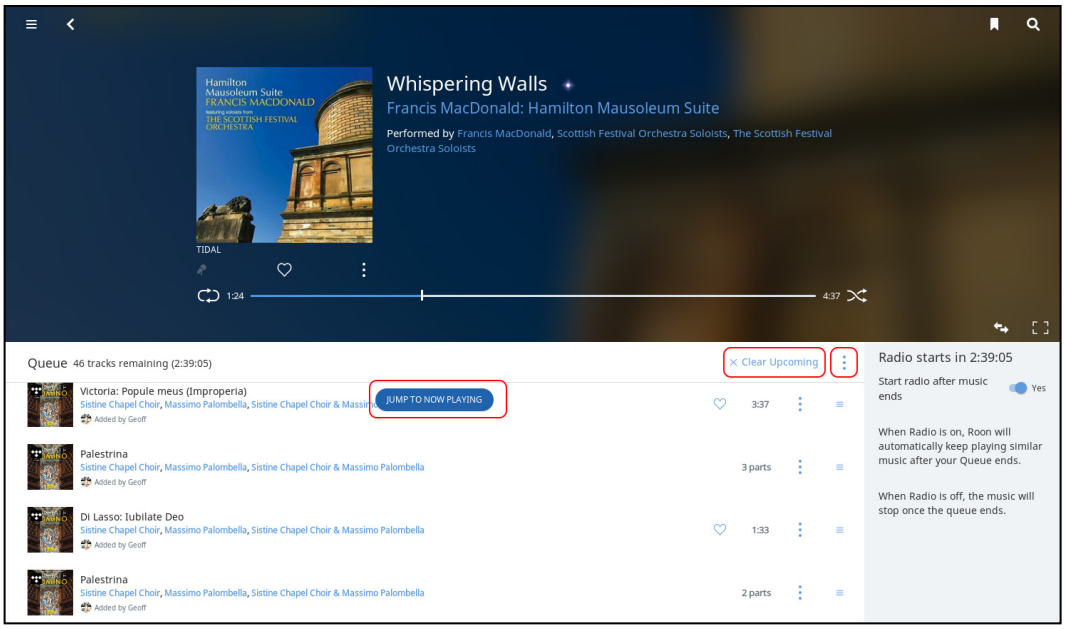
The queue will be displayed, with the currently playing track shown at the top of the list, and also in the panel above the queue list.



We've highlighted (in red) some of the additional features of the queue screen.

- Click the double arrow to bring up the Transfer Zone picker if you want to transfer this queue to another zone.
- Click the square outline icon next to it to switch to fullscreen mode.
- The queue list is scrollable, both up and down. If you have a mouse with a scroll wheel, this will also scroll the list.

Next we see a view where the queue has been scrolled away from the currently playing track. We've also highlighted some additional features of the queue. These features apply to the queue as a whole.



Once you scroll away from the currently playing track, a "Jump to now playing" button will appear. Clicking (or touching) this will instantly reposition the view so that the currently playing track is once again at the head of the list.

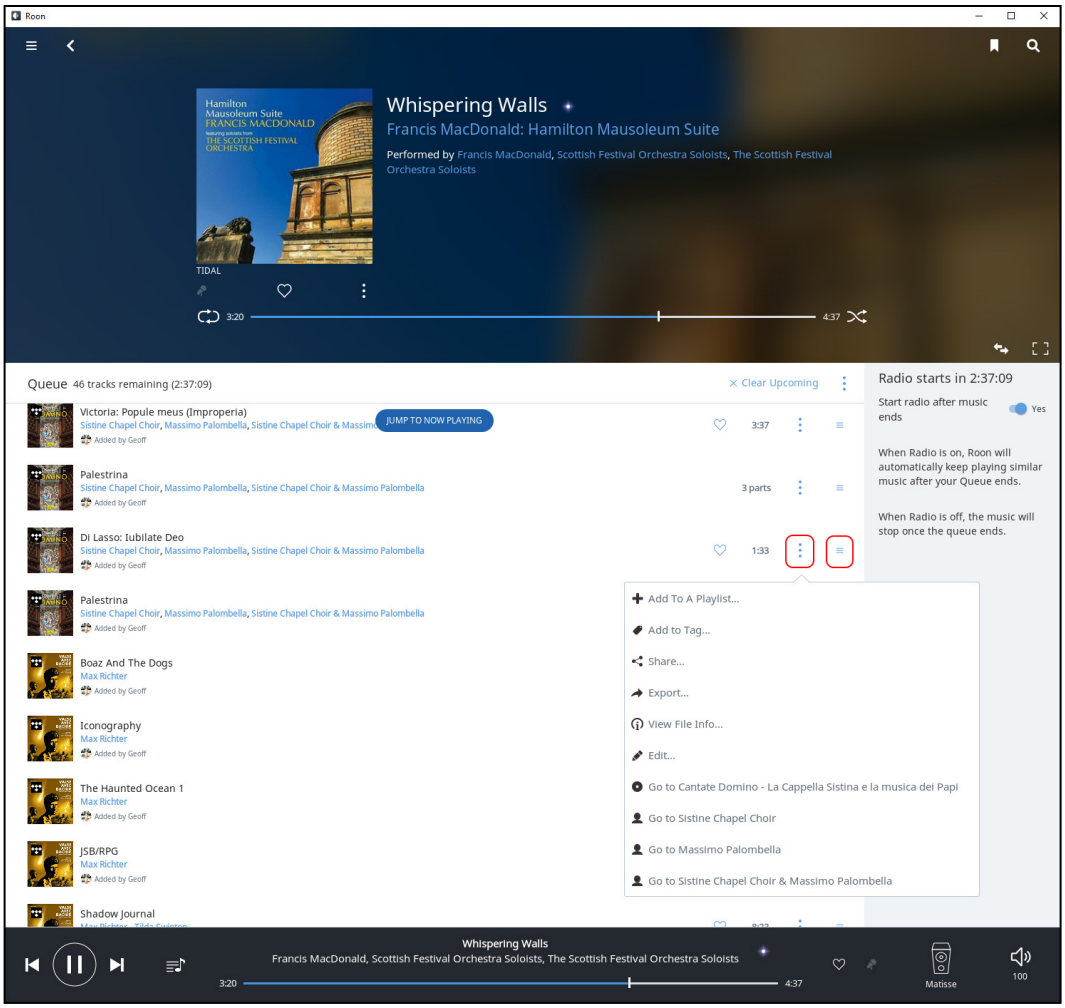
Click or touch "Clear Upcoming" to remove all the as yet unplayed items in the queue. Once this is done, this changes to a "Clear All" function that will clear out the entire queue (including the currently playing track).

The 3 dots icon ⋮ above the queue will display a menu to:

- Add the queue to a Playlist.
- Add the queue to a Tag.
- Export the queue.

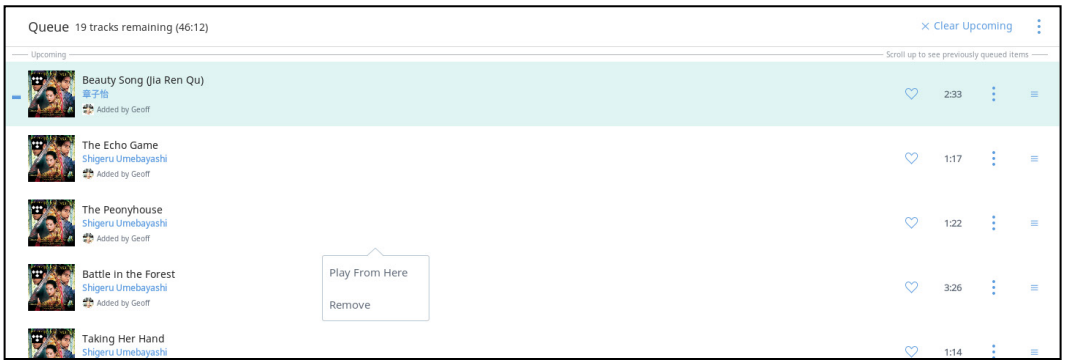
For the above functions, you can choose whether to have either the previously queued items, the upcoming items, or all of them added to the Playlist, Tag or Exported.

Here we've highlighted functions that act on individual items in the queue:

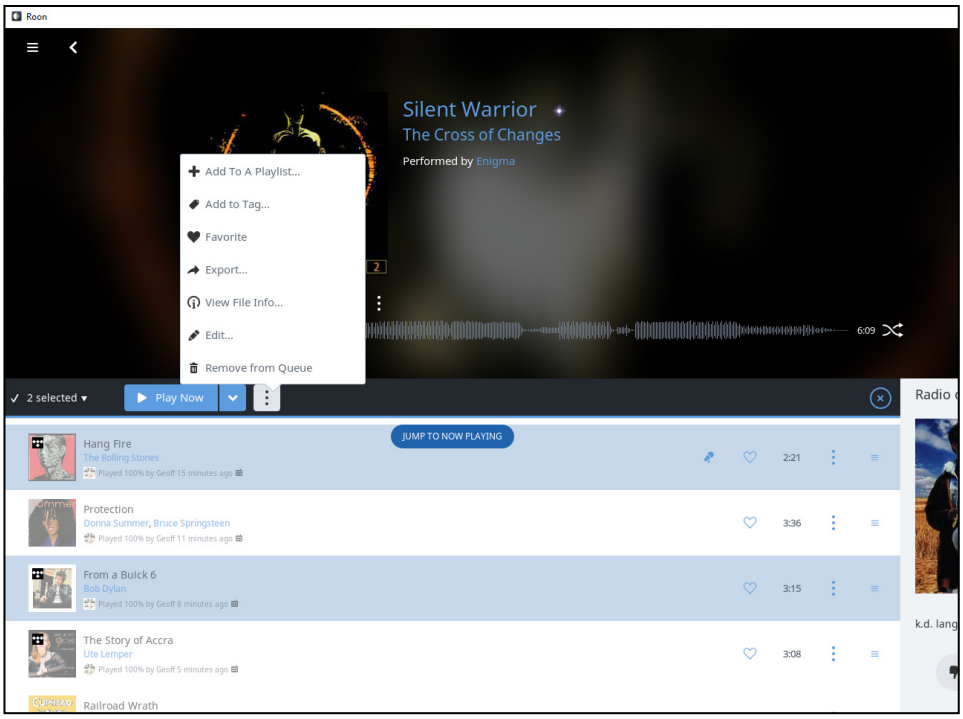


The 3 dots icon ⋮ will display a menu as shown. The 3 bars icon ☰ is for adjusting the position of the track in the queue. Click and hold on the icon to move the track up or down the list.

Clicking on a track in the queue will bring up a menu that can be used to either play the queue starting with the selected track, or to remove the track from the queue entirely.



You can also right-click (or press and hold) on queue items to display a menu bar (acting on the selected items), which includes a 3 dots icon ⋮ and the menu shown.



Once a song has been played, it remains in the queue for the remainder of the session. If you want to see the music you've already played, you can scroll up the list to the beginning of the session. If you want to see further back in time, then you can access your play history from the sidebar.

You can set your queue to loop .

You can also turn on Radio in the queue, or turn the queue on shuffle by clicking the shuffle icon .

5.6 Play Options

When you see something you like - such as a Track or an Album - in Roon, you generally have four options for how you want to play that content: *Play Now, Add Next, Queue and Start Radio*. You also get a fifth option - *Play From Here* - when you are working with Tracks.

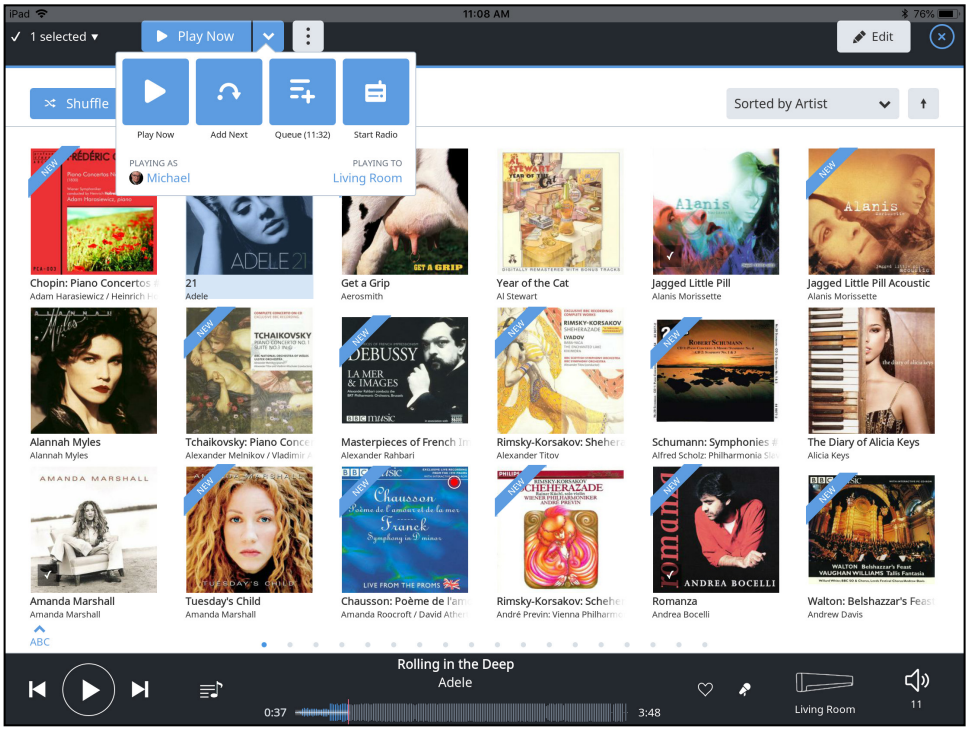
Clicking *Start Radio* will create a "channel" of similar songs from your library. This is based on Roon's deep knowledge of your music, including genres and years, as well as editorial data like Picks. Once Radio starts, you can see what's coming up next from the queue screen, and you can give it the thumbs up or thumbs down.

Choosing *Play Now* will always start the music immediately. The play button functions slightly differently depending on what you're playing.

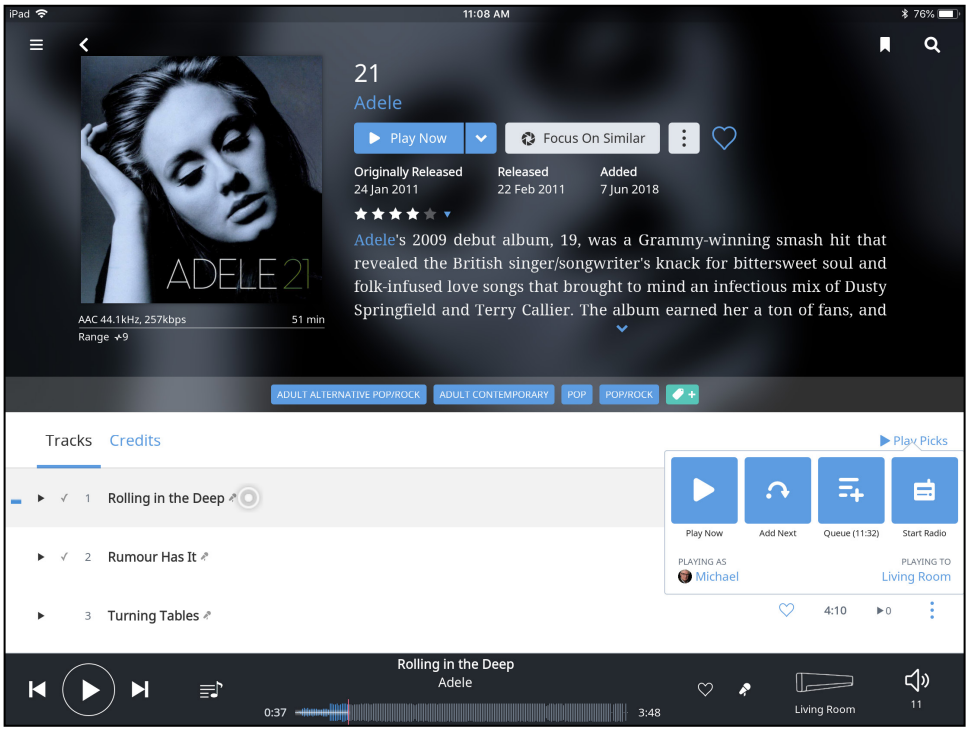
- Songs, albums, and playlists will simply play in order
- Content without a clear order (like genres, composers, or artists) will be shuffled

- Playlists will play the song you've selected, then it will continue with the rest of the playlist

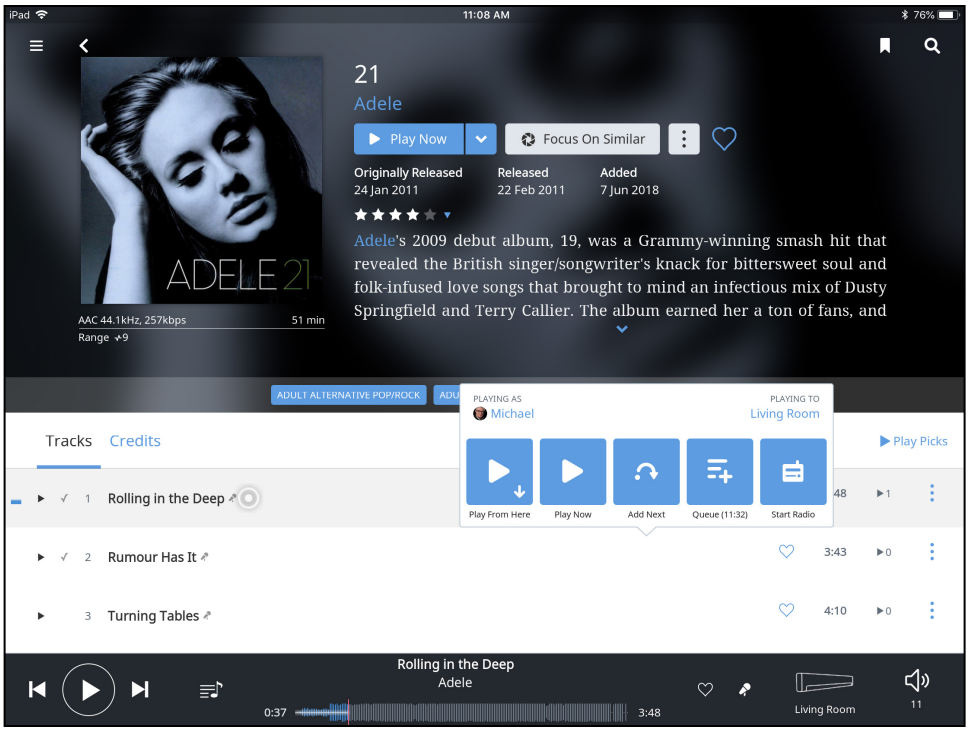
Some examples include:



Album Browser: Click & Hold Until Selected, Then Click ⌄ to See These Options

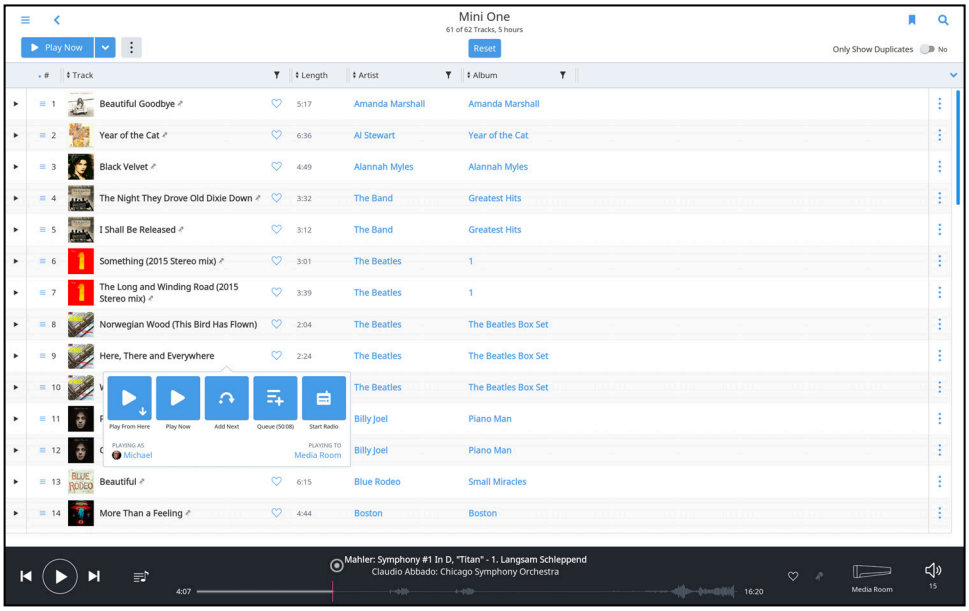


Album Details: Click *Play Picks* to See These Options



Album Tracks: Click any Track to See These Options

If you want to start an album in the middle, you can select a track and choose *Play From Here*.



Playlist: Click any Track to See These Options

If you want to play a single song from a playlist, you can select the song, and select *Play Now*.

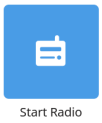
5.7 Radio and Internet Radio

Radio

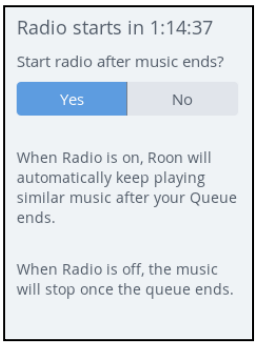
Roon works to match every song in your library, so we know exactly when each song was released, who played on the song, what label it came out on, what genre it is, and lots, lots more.

Our Radio feature uses this metadata to create a personalized station for you, playing similar songs from your collection.

Radio starts when you click any music in your library and choose the *Start Radio* button:

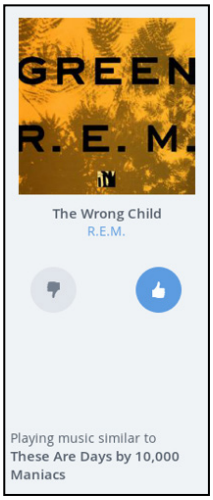


By default, Radio will also start whenever there aren't any more tracks in your Queue:



You can turn this feature off by clicking No in the Queue. Access the Queue by clicking the name of the currently playing track along the bottom of Roon, or by pressing `CTRL/CMND + E`.

Once Radio is active, you can thumbs up tracks to add them to your Queue, or thumbs down them to skip the selection.



Internet Radio

Starting with our 1.2 release, it's now possible to play your favourite streaming Internet radio stations right in Roon!

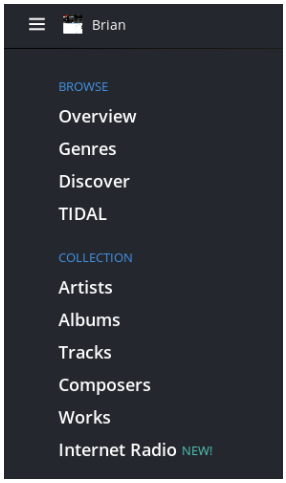
How It Works

In the future, we are planning to offer a full directory of streaming internet radio stations, so look for this functionality in a future Roon release.

For now, you'll be able to copy and paste links to any compatible stream into Roon. Any available station info will be retrieved, and you'll be able to access this station from any device running Roon on your network, and you'll be able to stream the station to any output on your network.

Accessing the Internet Radio Browser

You can access the internet radio browser by clicking on the main menu button ☰ in the upper left corner of the screen, then selecting *Internet Radio*.



Adding a Station

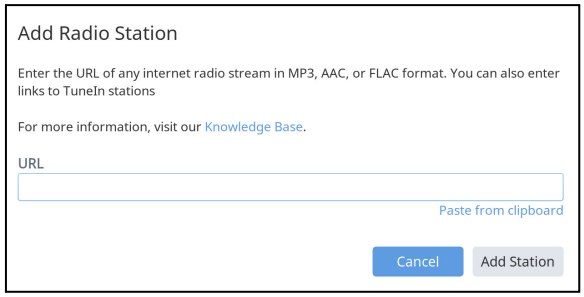
Roon can play back stations that stream in MP3, AAC, and FLAC formats, and also supports TuneIn web page URLs. You can usually find a streaming URL on the radio station's website, or you can use the URL of a TuneIn web page. For example, KCRW's streaming URL looks like this:

```
http://newmedia.kcrw.com/legacy/pls/kcrwsimulcast.pls
```

And their TuneIn web page URL looks like this:

```
http://tunein.com/radio/KCRW-899-s32152/
```

Roon supports both, and you can use either to add a radio station to Roon. To add a station, first click Internet Radio in the navigation menu. Click + Add a Station and paste the streaming URL, or URL of a TuneIn web page in the field:



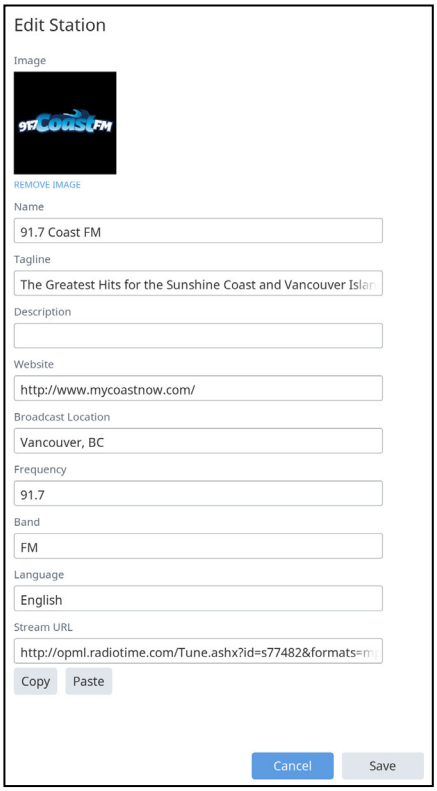
Click Add Station, and Roon will retrieve any information it has about the station. You can add or edit an image for the station, name, tagline, description, website, broadcast location, or frequency. After you've edited the relevant fields, click Add Station and Roon will add the radio station to your Internet Radio page.

Click the newly added station, press play and enjoy!

You can also find and exchange station URLs with other members of the Roon Community here.

Editing a Station

If you need to edit anything once the station has been added, just right click (or press and hold) the station to select it, and press Edit on the selection menu.



5.8 Roon Focus: Smart Playlists

Many people use "smart playlists" to keep track of specific content in iTunes dynamically, such as all your albums with the genre "Rock", or all your AAC files.

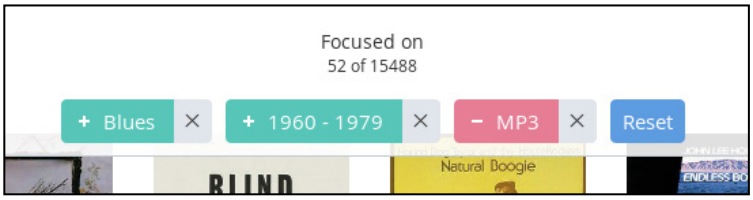
In Roon, this type of dynamic filtering is done using Focus.

Using Focus

In Roon, you can filter your collection in all sorts of ways with Focus, which is available in the Albums, Tracks, Artists, Composers, and Compositions Browsers.

For example, you can focus on Blues from the 60's and 70's. You could also add the MP3 format, and **click it a 2nd time to exclude** MP3s.

This is what it looks like when you're focused on Blues from the 60's and 70's, *excluding* MP3s:



Saving Foci

If you create a Focus you love, or if you have certain views you want to come back to frequently, you can always save the current view by clicking the Bookmark icon in the upper-right, next to Filter. Click the bookmark icon, then *Add Bookmark*, enter a bookmark name, then click *Save.*

Later on you can click the bookmark name to access that saved Focus, or you can click *Manage Bookmarks* to reorder, rename, or delete your Bookmarks.

Examples

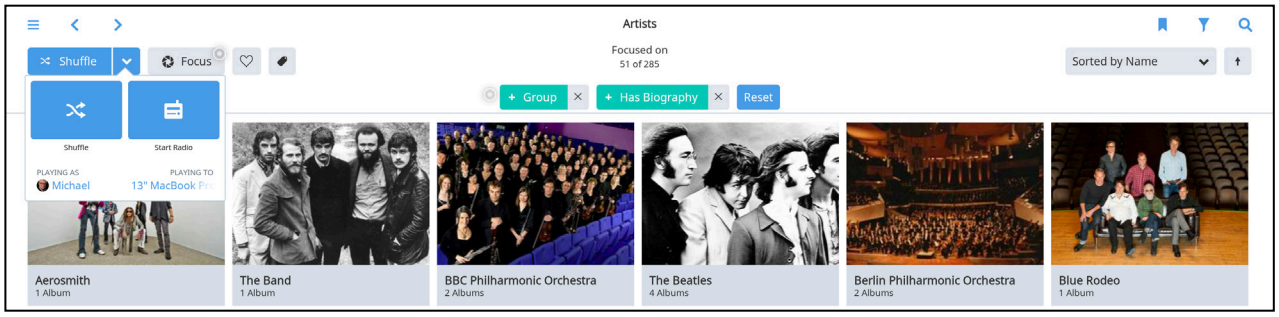
You can create Bookmarks on nearly every screen in Roon. A few examples you might try are:

- High resolution content
- Music From The Sixties
- Jazz, Sorted By Date
- All Albums Sorted By Import Date
- My Top 50 Most Played Albums
- Album Favourites (Sorted By Most Played)
- Albums I've Never Listened To
- Favourite Tracks Played This Week

Using Bookmarks and Saved Foci

Once you've saved some bookmarks, you can access them from the bookmarks menu at any time.

And once you load a saved focus you want to listen to, just click ▾ to see what Play options you have.



5.9 Favorites

Really liking something you found in Roon? Add it to your Favourites by clicking the heart icon ♡ wherever you see it -- on an album screen, next to tracks, artist screens, compositions, composers, it's everywhere!

After you've favourited something, you can access it later by viewing in the corresponding library browser (Artists, Albums, Tracks, Composers, or Compositions), and clicking the Favourites button ♡.

This icon actually has three states, which are stepped through by each click.

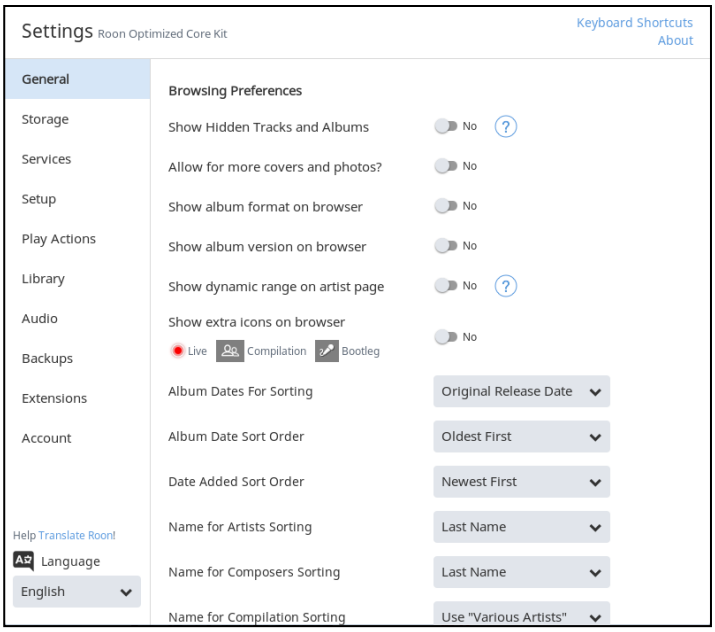
- Not favorited: ♡
- Favorited: ♥
- Banned: ⊘

The "Banned" state means that the item to which it applies (e.g. a track, an album, or a work) will never be included in a queue created by the Radio.

5.10 Sorting

There are a variety of sort options available on all of Roon's library browsers (Artists, Albums, Tracks, Composers, Compositions, Internet Radio, Playlists and Tags), accessible by clicking the dropdown at the top right of the Roon window on any browsing screen.

The way things are sorted in Roon can be customized in the General tab of Settings. Just click the navigation icon at the top left of the Roon window, click Settings, then the General tab and scroll down:



5.11 Selecting Tracks, Albums & More

You can select tracks, albums, and lots of other things from almost any screen in Roon.

To select something, right-click when using a mouse, or press and hold when using a touch interface.

Once you've selected something, a selection bar will appear at the top of Roon:

Using Selection

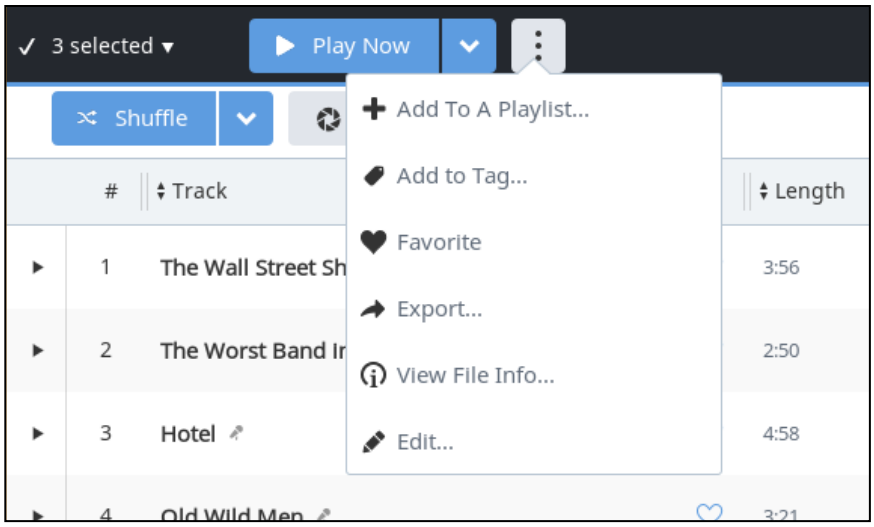
Click *Play Now* to listen to the selected content.

Click the 3 dots icon ⋮ to:

- Add or remove Tags
- Add tracks or albums to a playlist
- To favourite the selected tracks or albums
- To copy (export) music out of Roon (like to your phone, or to a flash drive to take with you)
- To export a spreadsheet of the selected content, for organizing or analyzing your collection
- To edit the selected tracks or albums

If you've selected tracks in the Track Browser, this menu has an additional option available for tracks:

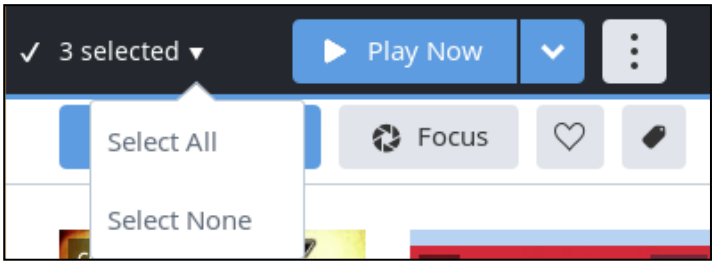
- View File Info... (giving information such as format and storage location)



Click *Edit* to see editing options available for the content you've selected.

Click X to deselect the content.

You can also click the dropdown on the left to select all the items on the screen, or to deselect all.



6.0 Playlists and Tags

You can access the Playlist Browser by clicking the navigation icon ☰, then *Playlists*.

You will typically have two kinds of Playlists: those you import from elsewhere, and those you create within Roon. Those created within Roon can be edited, with songs being added, removed and reorganized.

Roon can also import and play various types of Playlists, such as iTunes Playlists.

Playlists created in Roon are attached to a user profile, so each member of your household can have their own playlists. This does not apply to imported playlists, which are Shared Playlists and are available to everyone. When you Save a Copy of an imported playlist, that playlist is saved to the current user's Profile, so that is a way to make playlists just for yourself playlists you import.

Playlists vs the Queue:

The first thing to understand about Roon is that there is a difference between Playlists and the Queue.

When you select a track or album to play, it is slotted into the Queue for playback. As you queue more songs, they are added to the end of the Queue, like a jukebox.

Likewise, if you select a playlist, it is added to the Queue. And multiple playlists can be added to the Queue at any time.

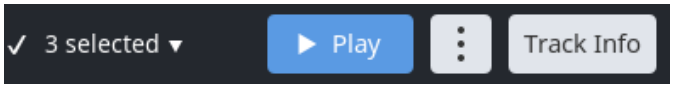
6.1 Using Playlists in Roon

Creating Playlists

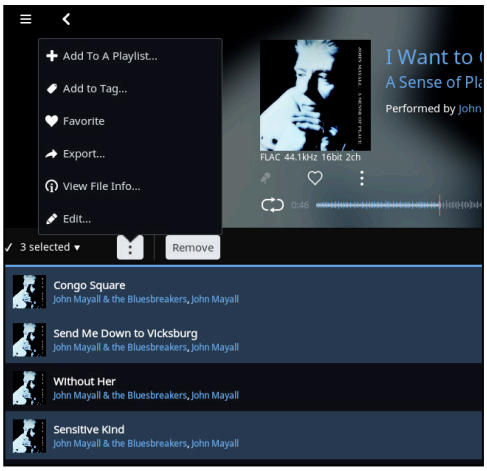
You can add tracks or albums to playlists from almost any screen in Roon.

First, select what you want to add by right-clicking if you're using a mouse, or pressing and holding when using touch.

A selection bar will appear across the top of Roon:



Click the 3 dots icon ⋮ and select *Add To A Playlist* to add the selected songs or albums to an existing playlist, or to create a new playlist.



A Few Examples of Creating Playlists from Roon

Adding the currently playing song

If you want to add the currently playing song, access the queue by clicking on the View Queue icon at the bottom of the screen. Now click the 3 dots icon under the album artwork of the song that's currently playing and select *Add To A Playlist*. Select a current playlist or select *Create Playlist* at the bottom of the window to Create a new one.

Adding a song or songs from what's currently in the queue

If you want to add a song or songs from what's currently in the Queue, access the Queue by clicking on the View Queue icon at the bottom of the screen.

Right click (or long press) one of the songs in the Queue. Click on the *1 selected* dropdown and *Select All* - or continue to right click other songs in the Queue. Once you have selected your desired songs, click the 3 dots icon above and select *Add To A Playlist*. Select a current playlist or select *Create Playlist* at the bottom of the window to create a new one.

Adding a song or songs from the Tracks Browser

Access the *Tracks Browser* by clicking the navigation icon ☰, then *Tracks*.

From there, you can narrow your search for tracks to add by using Focus or by clicking the heart icon ♡ to list your favourites.

Once you've narrowed down the desired songs to add to your playlist, right click (or long press) one of the songs. Click on the *1 selected* dropdown and *Select All* - or continue to right click other songs. Once you have selected your desired songs, click the 3 dots icon ⋮ above and select *Add To A Playlist*. Select a current playlist or select Create Playlist at the bottom of the window to create a new one.

Adding a song or songs from History

Access the *History Browser* by clicking the navigation icon ☰, then *History*.

If you want to add a song or songs that you've recently heard or maybe you've had people over and everyone contributed songs to the queue and you want to save them in a playlist, creating a playlist from History is a great way to do it.

Right click (or long press) one of the songs in History. Click on the *1 selected* dropdown and *Select All* or continue to right click other songs. Once you have selected your desired songs, click the 3 dots icon ⋮ above and select *Add To A Playlist*. Select a current playlist or select Create Playlist at the bottom of the window to create a new one.

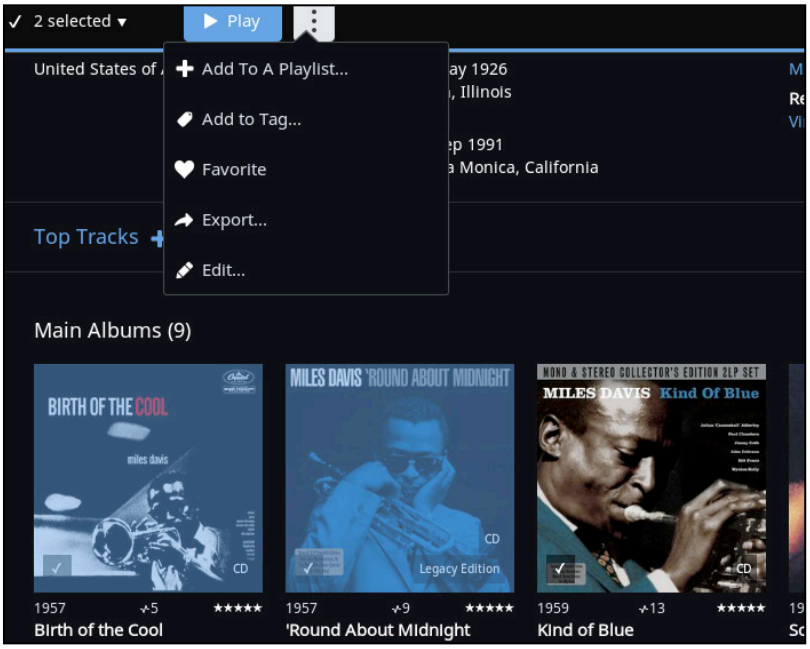
Adding a song or a complete album from the Album View

You can add a song, multiple songs or a complete album while viewing an album. Select the album you want to add to a playlist. From there you have a few options.

- Click on the 3 dots icon ⋮ next to a single song and select *Add To A Playlist*. (see below)
- Right click (long press) your desired songs and click the 3 dots icon ⋮ at the top of the screen and select *Add To A Playlist*.
- Click on the 3 dots icon ⋮ near the album name at the top of the screen, to add all the songs in the album, and select *Add To A Playlist*.

Add an album or albums from various views within Roon

From the various areas within Roon that you can view multiple albums, such as the Album Browser, while viewing an Artist, Browsing a Genre, Composers Browser or even the Overview page, you can add an entire album or albums to a playlist. Just right click (long press) each album you want to add to a playlist and click the 3 dots icon ⋮ above and select *Add To A Playlist*. Select a current playlist or type a name to create a new one.



There are many more ways to add songs to a playlist. Almost anywhere you see the 3 dots icon ⋮, you can select *Add To A Playlist*.

Editing Playlists

Playlists created in Roon can be edited by selecting *Playlists* from the main navigation sidebar.

Click the playlist you want to edit. On the playlist details screen, you can make a few different edits:

- Select tracks to remove them from the playlist.
- Click the 3 dots icon ⋮ at the top of the playlist to rename, change the owner of the playlist or delete the playlist.
- Use the drag handle icon ☰ to reorder tracks.

You will not be able to edit an imported playlist. You must first Save a Local Copy. To do this, click on the playlist and then click the 3 dots icon ⋮ and select Edit. Now select *Save a Local Copy*. You will now have two copies of the playlist. The imported playlist is still a Shared playlist, seen by all users. The newly created copy will only be available to the user (owner) that created the copy. Once you save a

copy of a playlist, there is no connection back to the original. If you want to edit an iTunes playlist, you must do that in iTunes.

Since Version 1.3, Roon allows you more flexibility editing and displaying Playlist information. You are now able to reorder, sort by various columns, and filter by track name, album or artist. You can also add or delete track fields. For example, you can include *Dynamic Range* and *Number of Plays* columns to your Playlist Views.

Only Show Duplicates:

If you have a large Playlist, you can now toggle *Only Show Duplicates* at the top right of the screen. This can help you from duplicating songs in your Playlist.

Filtering:

Whenever you see the Filter icon, you can search for specific track names, artists or albums.

Adding and Removing Columns:

You can also add or delete track fields. For example, you can include Dynamic Range and Number of Plays columns to your Playlist Views. To do this, click the drop down icon on the far right of the screen. From the resulting dropdown list of fields you can add and remove columns.

Note: You cannot remove a column if you are currently sorting by it. Sort by track number and try again.

Sorting by Column:

To sort by column, just click the name of the column.

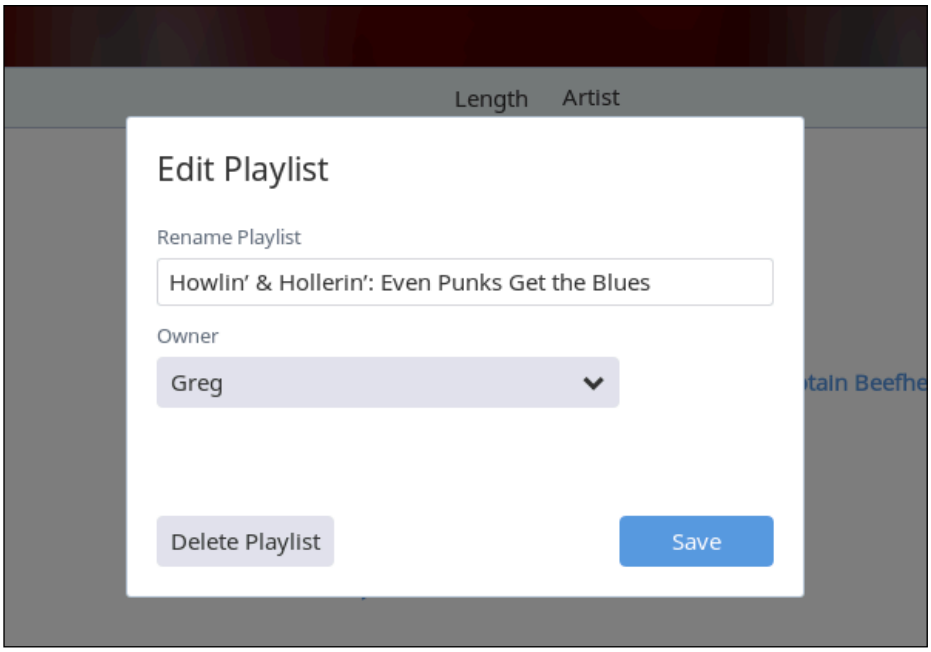
Reorder Tracks:

To reorder your tracks, simply use the drag handle icons to the left of each track number. The track numbers will renumber automatically.

Deleting Playlists

In order to delete a playlist, first select *Playlists* from the main navigation sidebar.

Click on the playlist you want to delete. Click the 3 dots icon and select Edit. From there click *Delete Playlist*.



Please note the following consequences of deleting an imported playlist:

- iTunes Playlist. Not editable in Roon -- it must be deleted in iTunes.
- M3U Playlist. The M3U file will be permanently deleted from your hard drive.
- Tidal Playlist. A playlist made by Tidal will be unfavourited in Tidal. A playlist you created in Tidal will be removed from your Tidal account.

Playing Playlists

In order to play a playlist, first select *Playlists* from the main navigation sidebar.

At the top left of the screen, you will see the *My Playlists* dropdown menu. If accessed, you will see Shared Playlists. If Shared Playlists is set to On (blue), it will show all imported playlists and your user playlists. If it's set to Off (white), you will only see your user playlists.

To play a playlist, first click on the playlist to select. There are various options to play your playlist:

1. Clicking *Play Playlist* will allow you to start playing the entire playlist. All songs will be added to your queue in order.
2. Left click (or tap) a song as your starting point and that song plus the following songs will be added to your queue.
3. Right click (or long press) a song. Select *Play Now* at the top of the screen and only that song will be added to your queue.

6.2 Importing Playlists

Importing playlists is easy in Roon! In most cases it happens automatically as long as you have your storage set up correctly.

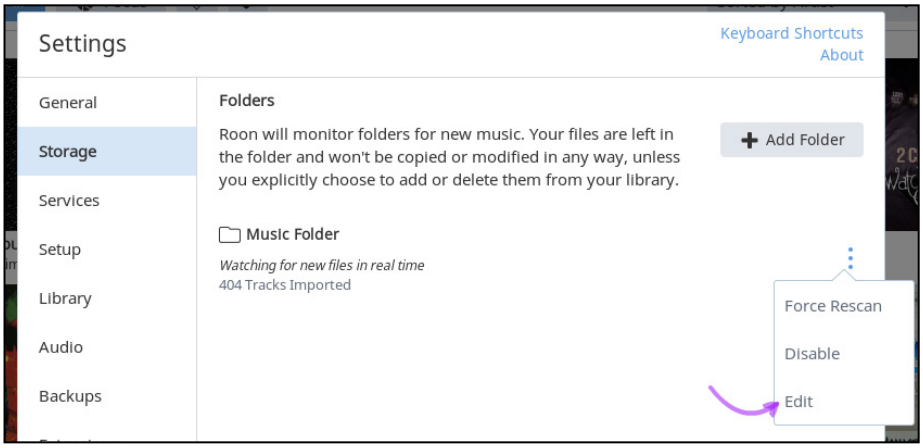
Playlists imported from Tidal, iTunes, or from M3U files are not editable in Roon at this time. If you want to edit them in Roon, you can *Save a Local Copy* in Roon by clicking the 3 dots icon ⋮ and select Edit at the top of the playlist's detail screen. This will save the copy into the current users Playlist Browser. The original imported playlist will still be available or can be deleted.

iTunes Playlists

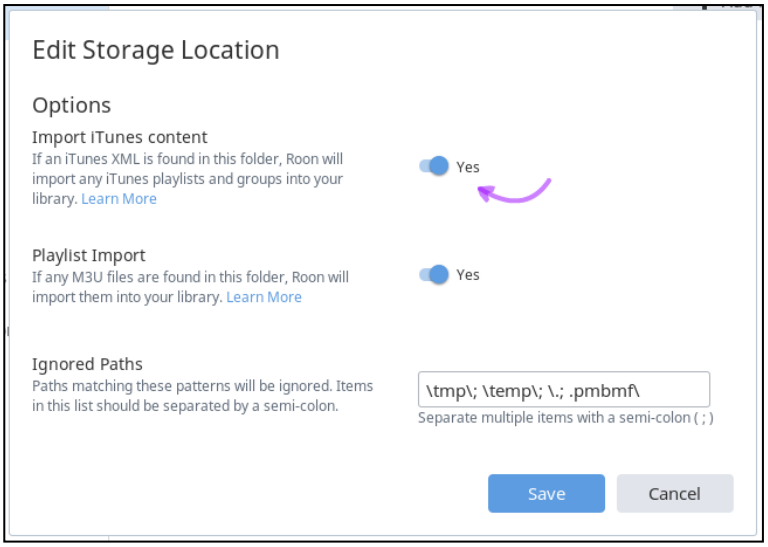
Playlists you created in iTunes should be available to you in Roon, once you've included your iTunes Music Library.xml file in your iTunes Watched Folder.

Roon can monitor your iTunes library, importing your music and playlists, and updating your Roon library automatically when you add new music in iTunes.

In most cases, you can enable this functionality by visiting the Storage tab of Settings, and clicking + Add Folder and Browsing to your iTunes music folder. If you select the option to Import iTunes Content, make sure your iTunes Music Library.xml file is in this folder.



Then, just enable iTunes Import and you're good to go! Your iTunes playlists will show up in Roon.



If you're having trouble importing your iTunes library in Roon, or you're not seeing your playlists, give this info a read.

TIDAL Playlists

Playlists you have marked as a Favourite in your TIDAL account will appear in your Playlists in Roon.

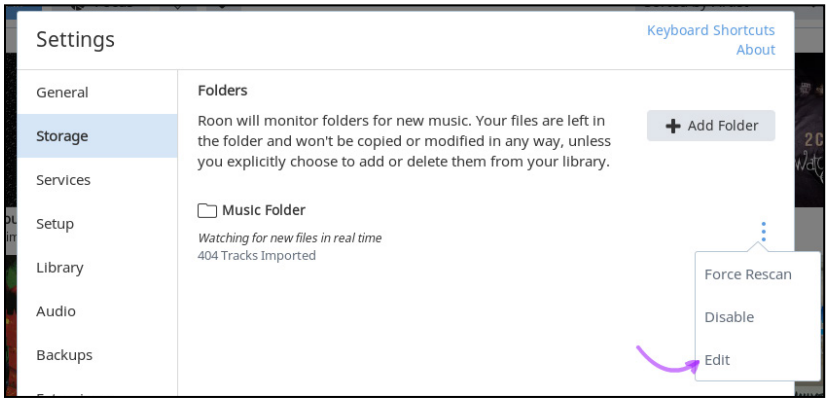
Playlists imported from TIDAL are not editable in Roon at this time, and Roon does not support syncing playlists back to TIDAL. If you want to edit your TIDAL playlists in Roon, you can Save a Local Copy in Roon by clicking the 3 dots icon ⋮ and select Edit at the top of the playlist's detail screen.

You can also browse for Tidal playlists in Roon by selecting Tidal from the main navigation sidebar. If you find a playlist that you like, select it, click the 3 dots icon ⋮ and select Edit and *Save A Local Copy*.

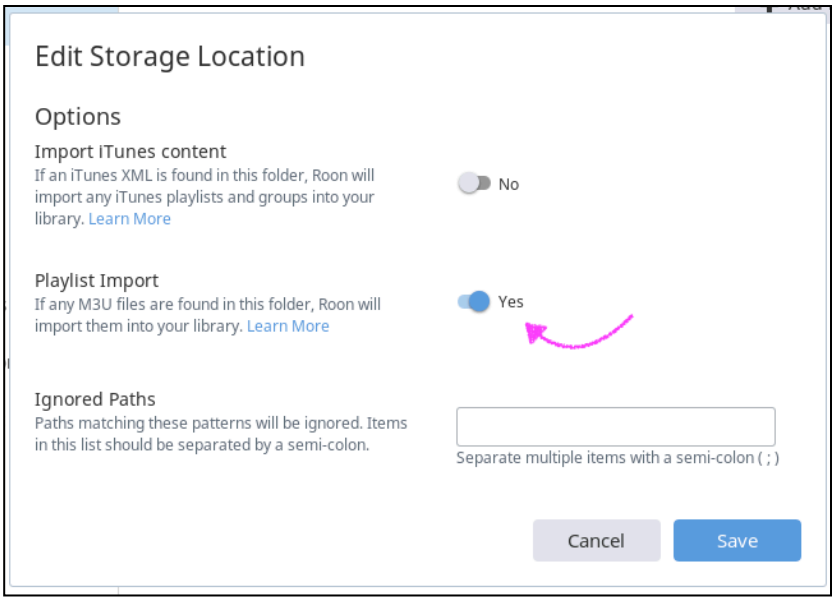
M3U Files

M3U playlist files in your watched folder will also be imported as shared playlists.

You can enable/disable M3U playlist importing from the Storage tab of Settings, just open the Edit screen for the storage location where the M3U is stored.



Then turn on or off Playlist Import.



In order for an M3U to appear in Roon, it must:

- **Include tracks from the same watched folder** (tracks from other watched folders will be ignored - tracks can be stored anywhere in the watched folder where the M3U is stored, but the contents of an M3U playlist cannot span *multiple* watched folders)
- **Reference file paths that Roon can understand** -- if you have moved your media or your M3U file, or if you think M3U is being ignored by Roon, you should open the M3U in a text editor and confirm that the path for a given song matches the path for that track displayed in Roon
- **Does not exactly match the track list of the directory the M3U is stored in** -- if you have a playlist stored in a folder with an album, and that playlist is simply a listing of the album's tracks, it will be skipped Importing playlists is easy in Roon! In most cases it happens automatically as long as you have your storage set up correctly.

Smart Playlists

If you have iTunes importing enabled, Roon will also import your smart playlists. If you want to create new playlists in Roon and are looking for something similar to smart playlists, there's an easy way to create them using Focus. Check out more info on this here!

6.3 Tags

Tags are a great way to organize your collection, giving you quick access to *just* the right music. You can tag almost anything in Roon, and it's easy to get started.

Roon's Tags feature was designed to be fast, easy, and endlessly flexible. For example, you can use Tags to:

- Organize music for a party (by tagging artists or genres)
- Keep track of music from a certain source (ie, *HD Tracks*, or *Bandcamp*)

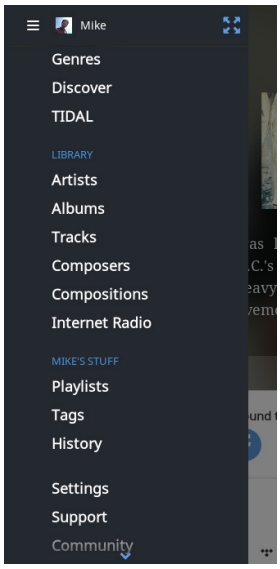
- Remember context (ie, *Recommended By Brian*, or *Music From Summer 2000*)
- Keep track of edits (ie, Artists That Need Better Photos)

Roon's Tag functionality was rewritten from the ground up for Roon 1.3, so read on for an overview of the feature and details of what's changed.

What's Changed?

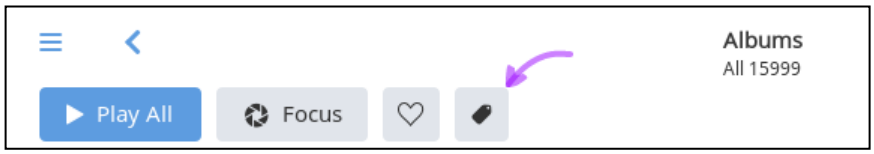
Tag Browser

The biggest change to Tags in Roon 1.3 is the addition of the Tags browser. You can access the Tag browser from the sidebar:



Filtering By Tags

In addition to browsing everything you've tagged, you can also dig deep into the content of your Tags using Roon's normal browsers. Focus on a tag by clicking at the top of the browser:

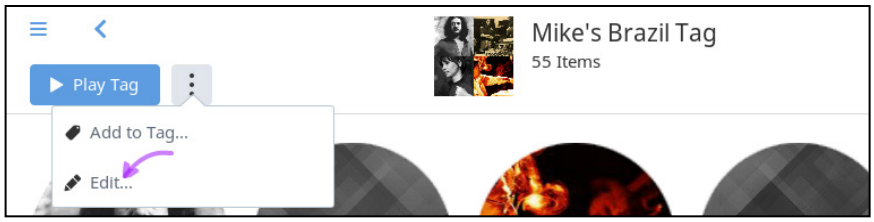


When focusing on tags, you'll not only see the albums you've tagged, but also albums from artists you've tagged, or albums that contain compositions by Composers you've tagged.

Tags and Profiles

Since release 1.3, tags can also be profile specific. This means you can create tags that are either "shared" with other members of your household, or that are only visible to you.

You can always edit the "ownership" of a tag from the Tag details screen, by clicking the 3 dots icon ⋮.



If you've previously created tags, they will be "shared" tags, meaning they're accessible to all profiles.

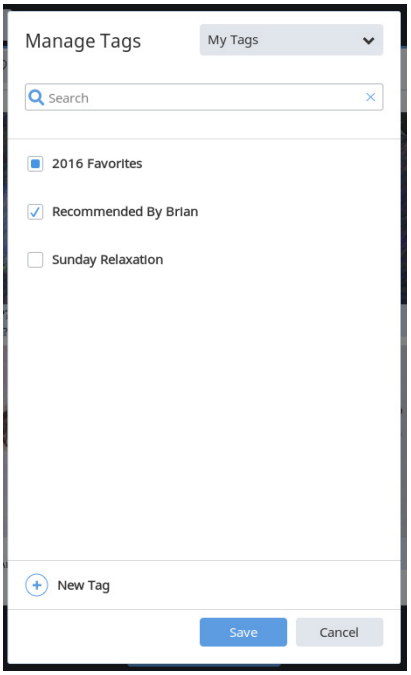
Adding tags

You can add tags to Artists, Albums, Tracks, Composers, Compositions, Playlists, Genres, or other Tags by clicking the 3 dots icon ⋮.

On many pages, you can also tag content by clicking the Tags icon .

You can also tag multiple items at one time by selecting them and choosing *Add To Tag* from the selection bar.

In all these cases, Roon will open the Manage Tags screen:



From the Manage Tags screen you can:

- Type in the *Search* area to filter the list of Tags.
- **Add A Tag**: Fill in the check box next to the Tag you want to apply, then click *Save*.
- **Remove A Tag**: Uncheck the check box and click *Save* to remove a tag from the content you've selected.
- **Create A New Tag**: Click New Tag to create a new tag

The *Manage Tags* screen will also let you confirm what's been previously tagged. In the example screenshot above, 3 albums have been selected and you can see that:

- Some of the content had been previously tagged as "*2016 Favourites*".
- All of the content had been previously tagged as *Recommended By Brian*
- None of the content had been previously tagged as *Sunday Relaxation*

Automatically Added Tags

If you have added TIDAL Collections to your library, then Tags corresponding to the Collection will be created automatically. For example, if you have added the Classical Collection, then a Tag called TIDAL:Classical will be created.

Browsing Tags

To find your tagged music, open any browser and click , which will allow you to Focus on your various tags.

You can also view the contents of your Tags by visiting the Tags browser.

7.0 Editing and Grooming Your Collection

7.1 Introduction to Editing in Roon

Roon Understands Your Music

Roon was built from the ground up to be the most powerful way to manage your music library. Every track in your library is automatically matched to Roon's rich, interlinked metadata. This allows Roon to model your library with a level of depth and accuracy that's not possible in other systems.

Roon has a deep understanding of the music in your library, which opens up all kinds of possibilities as your music is imported and displayed in app. Understanding what makes Roon different will allow you to take full advantage of what we believe is the most advanced music management application ever.

What Makes Roon Different

At launch, Roon was largely focused on users who want their files automatically identified and managed. It quickly became clear we needed to do much more to meet the needs of users who want to exert control over how metadata is displayed and experienced in the app.

Since then, editing features have continually been added, and as of Version 1.3 the vast majority of metadata in Roon editable. Why did it take so long?

Roon's understanding of your music goes way beyond what you see in most other applications. If an album is listed under the wrong artist in another app you just edit the text, but Roon's understanding of your albums goes way beyond a simple piece of text. Each artist, performer, composer, and producer in Roon is a detailed multi-dimensional person -- edits need to tap into that power, or the whole system falls apart.

For example, Roon can distinguish whether a given album was released by this Bill Evans or this one, which is important when you're browsing a Composer's compositions, or all the Jazz albums a given sideman played on. And by understanding the people involved in each album, Roon can ensure this album shows up on James Brown's page, even if it was actually released by *The Famous Flames*.

But my file tags are already perfect!

We believe you! But even perfectly groomed file tags can only take you so far.

Roon is build around a rich Object Model, where entities like Albums, Tracks, Artists, Composers, and Compositions stand as equals.

Compared to our approach, file tags lack in richness simply because the labor required to replicate this level of richness is impractical. And file tags lack in expressive power because they make it more and more difficult to represent information each time you take another step further away from the track.

7.2 Roon vs: Tags

Roon is build around a rich Object Model, where entities like Albums, Tracks, Artists, Composers, and Compositions stand as equals.

Compared to our approach, file tags lack in richness simply because the labor required to replicate this level of richness is impractical. And file tags lack in expressive power because they make it more and more difficult to represent information each time you take another step further away from the track.

Here's a few examples of how that power is put into play.

Distinguishing distinct Artists with the same name.

Nothing special was done to get this result. Three albums are present, each with `ARTIST` tags containing `'Air'`. Instead of conflating these two groups into one "Artist", Roon matched the albums, and came back with information about two artists, both called "Air", but with totally unique identity, and data.

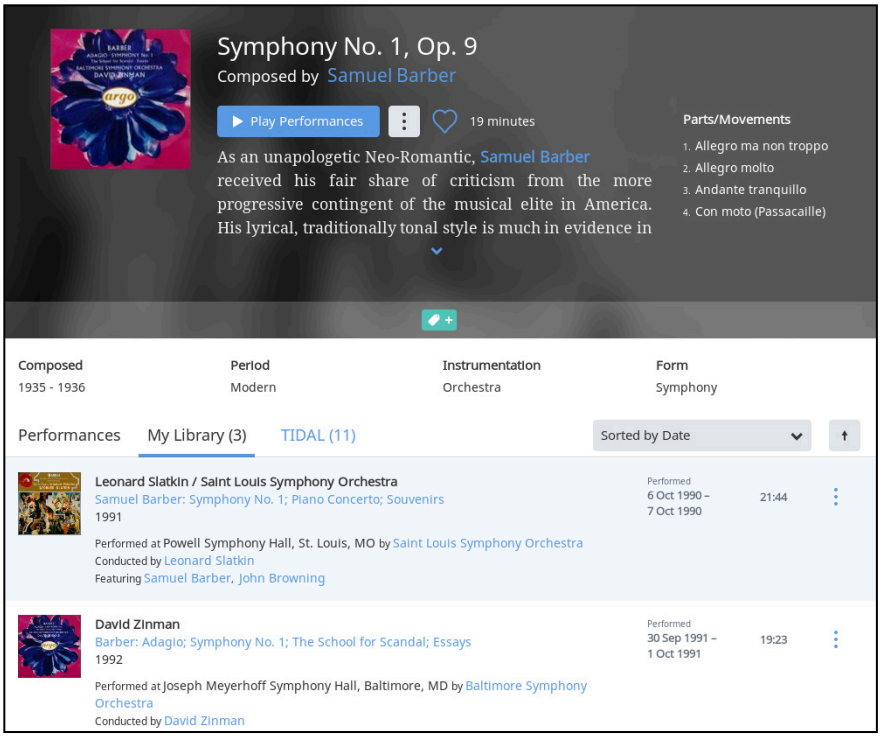
Supporting Rich Metadata for Artists, Composers, and Compositions

It's relatively straightforward to tag a track with rich track-level data, and to consistently tag tracks within an album with rich album level data--this workflow is central to most tag management software.

It's significantly less straightforward to manage compositions or artists at the same level of richness--these entities appear many, many times within a library, so there is no obvious place to store rich data about them in tags. You could duplicate it for each track, but what if the tracks disagree? Batch editing operations become difficult when they span subsets of many albums.

Most metadata groomers simply resolve to not worry about putting much data at any level other than "album" or "track". Artists and Composers get names, sort keys, and possibly artwork. There's a total poverty of composition level data. Secondary performers receive almost nothing, since there's really no good way to provide a sort key or a piece of artwork for the drummer.

Roon's approach is fundamentally more powerful. File tags are just one information source taken into account. And that makes pages like this one possible:

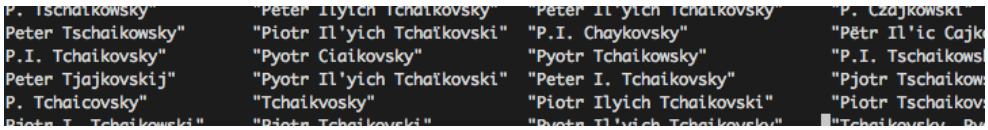


None of the data on that screen appeared in a file tag, save for the album titles, covers, and release dates.

Fuzzy Logic

Tag-based systems virtually always take text at face value. If two names are spelled differently, they *must* refer to distinct people. These systems lack the contextual information to make smart fuzzy matches when appropriate.

Tell that to Pyotr Ilyich Tchaikovsky....

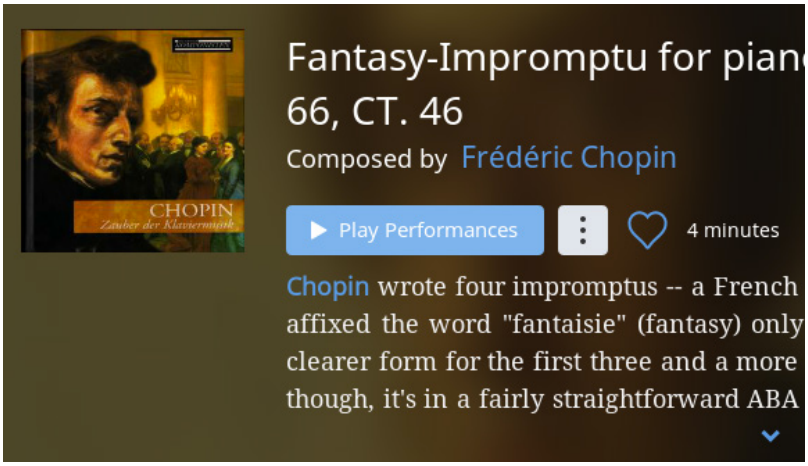


Roon understands that these names all refer to the same guy. The information about what to call him, and how to sort him (plus a whole load of other data) are stored in a single, centralized, easily editable place, instead of being distributed across file tags from hundreds of albums on which his compositions appear.

Likewise, Roon understands that while this album was released by the "Miles Davis Quintet", it is also worthwhile to treat "Miles Davis" separately as a primary artist.

The file tags, in this case, do not mention "Miles Davis" at all. By utilizing an extensive database of knowledge about published music, we can be confident that a strong navigation path - in both directions - between this album and "Miles Davis" is appropriate here, despite the name never appearing directly in the tags.

And when Roon encounters Frédéric Chopin's *Fantasy-Impromptu*:

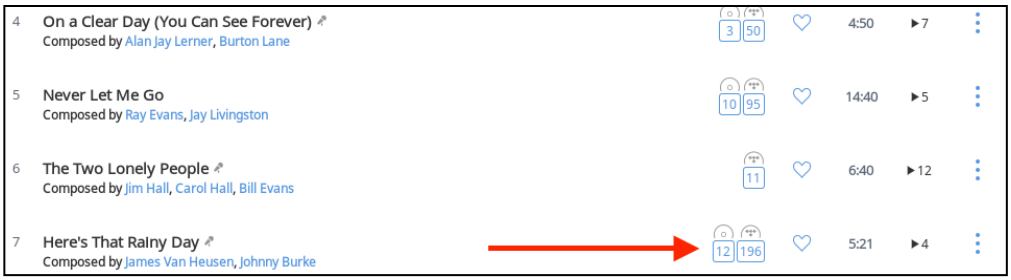


Roon knows that this composition is cataloged separately as Opus 66 and CT 46. A new track appearing in your library that spelled the composition title as *Fantasie Impromtu, CT 46*, with `'Fryderyk Franciszek Chopin'` as its composer can be properly matched--because there's enough evidence to do so.

Building associations inside, and outside, of your library

This is a huge achilles heel for traditional groomed collections. Even if they are internally self-consistent, the rest of the world isn't consistent *with them*.

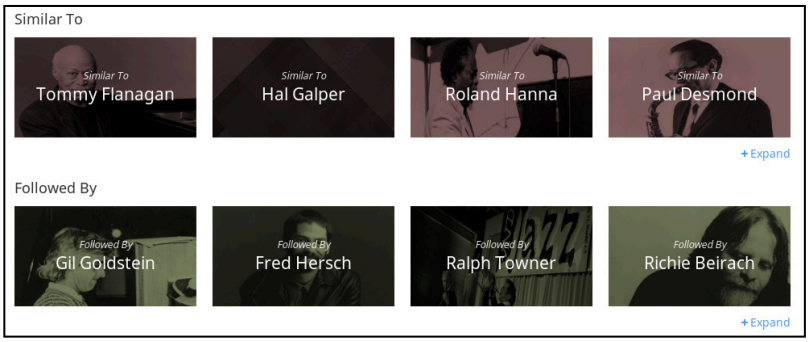
Take a look at this track listing from Bill Evans' *Alone*:



Those little icons are saying "you have 12 other recordings of *Here's that Rainy Day* in your library, plus there are 196 more recordings available via your TIDAL subscription".

That is an incredible piece of context. First--you may not be aware that you have this many copies--the American Songbook can be sneaky like that. But more importantly, the fact that **196 other people** have made recordings of it, tells you that, compared to the other compositions on the album, it is more significant historically. If you know this material, these counts will simply make sense to you--*The Two Lonely People* is an obscure title mostly performed by Bill Evans personally. The other two are important compositions, but less important than *Here's that Rainy Day*.

But lets say you're more interested in Bill Evans than these compositions today--because we have an understanding of who Bill Evans is, we can help you find other artists you might like to listen to:



This only works because Roon has a firm grasp on what these entities--artists, composers, and compositions *are*. They are not just names--they are richer, first-class entities that can serve as hosts to lots of data.

7.3 3-Layer Editing Model

Roon automatically tries to identify every track and album in your library.

Once your content has been matched to our database, detailed metadata will be retrieved for not just the tracks or albums but for every performer, composer, producer, and artist involved in the recording.

This information is stored in your Roon database, unlike other applications which may overwrite the information in your file tags. This information is populated into three layers:

- Edits
- Roon Metadata

- File Tags

First, file tags are extracted. These tags are stored in their own layer, and are used to identify the music in your collection. When an identification is successful, Roon's rich metadata is retrieved and populates the Roon Metadata layer.

By default, Roon displays data from the top-most layer that's present. This means that edits you make override Roon's metadata, and that by default Roon's metadata overrides the information from your file tags.

Version 1.1 introduced the notion of **metadata preference**. By selecting "Prefer File", you are telling Roon to flip the order of the two bottom layers like this:

- Edits
- File Tags
- Roon Metadata

This means the information from your file tags is displayed.

Metadata preferences are set up on a field-by-field and object-by-object basis, offering extreme flexibility. You can prefer local data on an album-by-album or track-by-track basis to fix isolated problems, or you can set preferences for your entire library (see Bulk Edits below).

Metadata Identification

So much of Roon's power comes from accurate identification, and it's one of the most complex parts of our system.

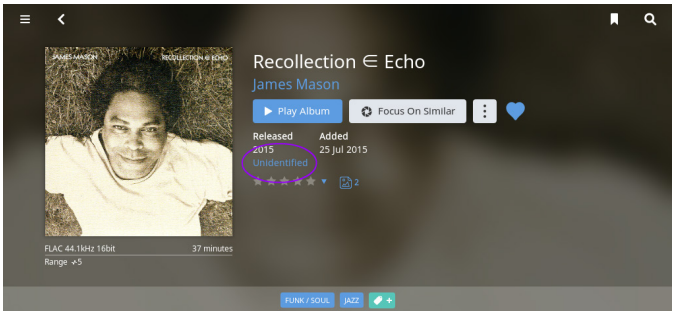
Once an album is matched to our database, not only do you get detailed credits, composer data, release date and label information, and genre, but all this information is updated once a week to retrieve new metadata and correct errors.

When this works, all your music is cross-referenced by the musicians, composers, production staff, and labels involved in the release. That's why editing the album identification is almost always the best place to start.

When To "Identify" An Album

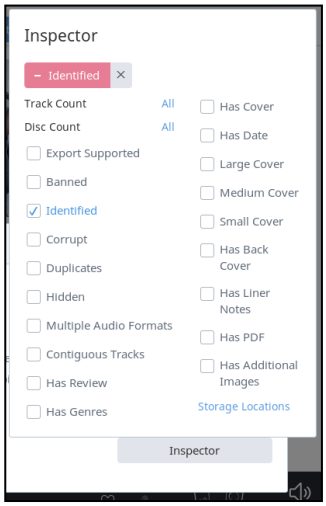
The most important time to use the Identify feature is when an album is unidentified, meaning Roon has not matched the album to our database at all.

You can find unidentified albums by looking for the "Unidentified" text on the Album Details screen like this:



You can also use Focus to find unidentified albums, by navigating to the Inspector on the far-right.

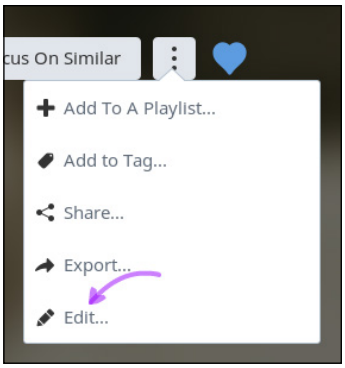
Click Identified, then click the word "Identified" a second time -- it will go red, meaning you're only viewing albums that are **not** identified, like this:



There are times when you may want to use Identify for albums that Roon has matched. This may be because you have a different version or edition of the album, or because Roon has misidentified the album.

Identifying Your Albums

You can Identify albums by clicking Edit on the 3 dots ⋮ menu, or by pressing **`CTRL/CMD + I`** on Windows or MacOS.



On the Album Editor screen, choose Identify Album, and Roon will look for a match. Choose your album from the list, and make sure the tracks match up.

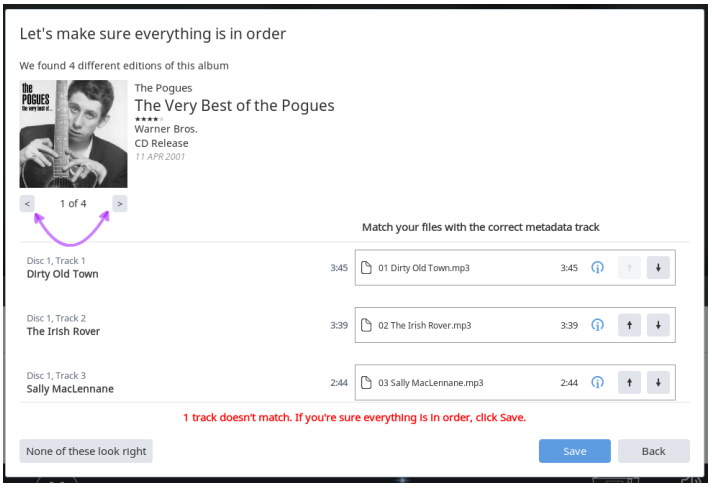
In some cases, Roon will have metadata for an album, but no track timings. Because we don't have track timings to match up these albums will not be matched automatically, but you can still get good metadata by confirming the track titles and making the match. Most importantly, this ensures you'll get updated metadata when our coverage for this album improves.

In other cases still, Roon will have metadata for an album, but no track information at all. Again, automatic matching isn't possible, but in this situation, you can still benefit from Roon's album-level metadata which will be used in conjunction with your own track metadata.

Editions

Many albums have been released in different formats, pressings, and masterings over the years. In many cases, Roon will have distinct information for each edition, which you can retrieve using the Identify feature.

Cycle through the various editions using the arrows highlighted below:



Then, make sure the track titles (and timing, when available) match up, and save. That's it!

7.4 Editing Techniques

Types Of Edits

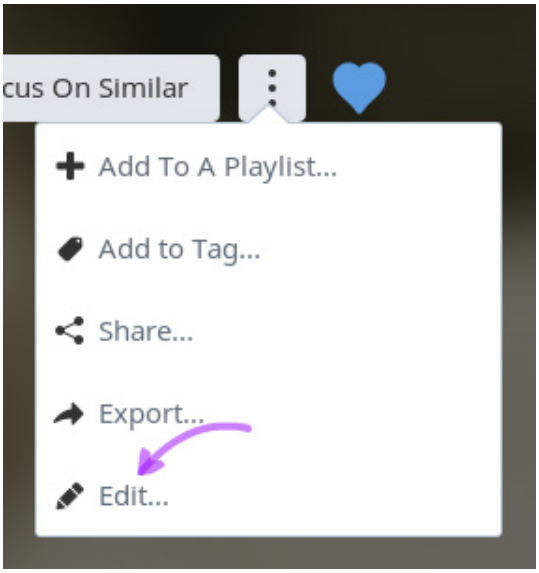
Broadly speaking, there are two types of edits you can make in Roon:

- **Display Edits** - these are edits of text displayed in Roon, and done using Roon's 3 Layer Editing Model. For example, you might edit an album title to use what appears in your file tags, as opposed to what Roon retrieved automatically.
- **Link Edits** -- Roon's powerful metadata engine generates links that connect the music in your library. For example, a composition in Roon is going to be linked to one or more composers. If a composer was missing or erroneous, you might edit that link by adding an additional link, or by removing the erroneous link.

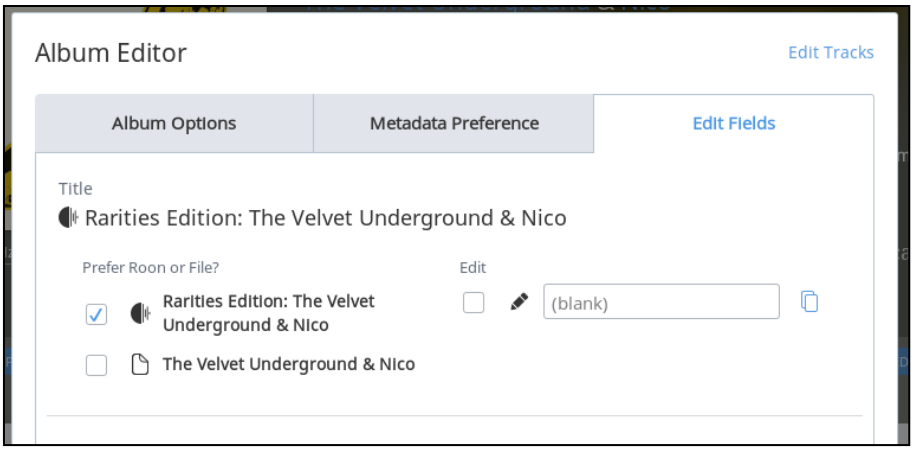
"Display" Edits

Display Edits have been part of Roon since version 1.1. Because the metadata that Roon retrieves automatically is stored in its own "layer", it's always possible for text-based fields to fall back to the information stored in your file tags, or to any edits you type in by hand.

You can edit Albums, Tracks, Artists and more by clicking edit on the 3 dots ⋮ menu:



When editing albums you'll want to click over to the *Edit Fields* tab:



In this screen shot, you can see that Roon has retrieved an album title *Rarities Edition: The Velvet Underground & Nico* whereas the file tags simply refer to the album as The *Velvet Underground & Nico*.

You can choose from either field, or type your own edit into the Edit field at right. You can also press the Copy button to copy the currently selected value over for editing.

Just like you can set any text field to either the Roon metadata layer, the file tag layer, or the edit layer, you can also select multiple albums or tracks and set metadata preferences for all of them at once. For more information about this, see Bulk Editing.

For some fields, you can set Library Preferences, so that everything in your collection always defaults to your preferred metadata. This is great for fields like Genres or Import Date, or for text fields where you've done a lot of grooming (like album or track titles). For more information visit Library Settings

"Link" Edits

Roon's advanced metadata model is built around "objects", not text. That means that you can have multiple people in your library named Bill Evans, each with their own rich biographical data: where they were born, what albums they played on, which songs they've composed, who they were influenced by or collaborated with, and so on.

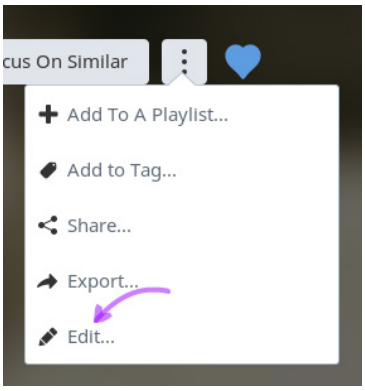
Roon is built around the connections between people and the music they're involved in, and so changing these connections goes beyond simple text edits -- you actually need to change the links.

Some examples of "links" in Roon:

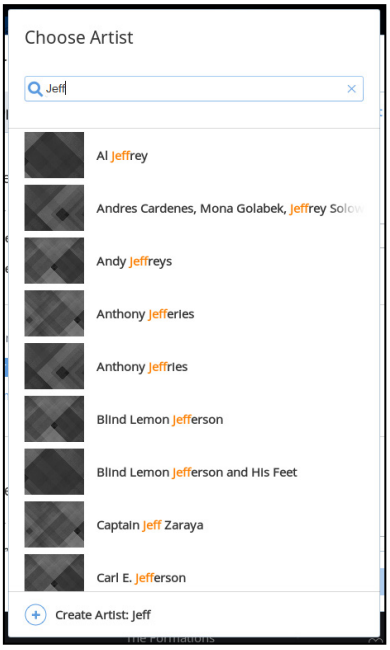
- An album's Main Performer
- A track's Primary Artist
- A composition's Composer
- An album or track credit

How To Add or Remove Links

Editing links in Roon is similar to editing text fields. You can click the 3 dots icon ⋮ on any Track or Album, or you can select multiple tracks or albums to add or remove links to all of them at once (see Bulk Editing.



When editing, you'll first choose who you want to link (or unlink).



From this screen you can choose from among all the performers and composers in your library, or you can create new Artists in your library.

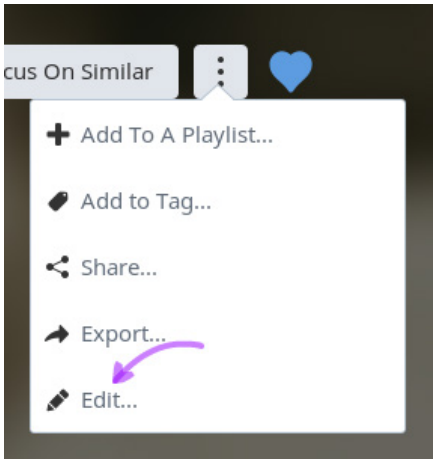
Note that you should only create a new artist if you're sure the person doesn't already exist in your library, as artists you create will not generally get extended metadata unless they are associated with an identified album or composition.

If you are adding a Primary Artist to an album, a Main Performer to a track, or a Composer, just click save and you're done!

If you are adding a credit, the next step will be to pick a role. Roon has an extended list of roles to choose from, and you can let us know if there's anything missing.

Editing Albums and Tracks

Like most metadata in Roon, you can edit albums and tracks by clicking the 3 dots icon ⋮.



Album Edits

There are a number of ways albums can be edited in Roon. These include:

- **Track Grouping** - Editing the track list to add or remove tracks, or merge multiple albums or discs into a single album
- **Album Grouping** - Group multiple editions of the same album into a set (like the stereo version and the 24/96 High Res version)
- **Main Performers and Album Artists** - Editing the artists credited with releasing the album, or the name of the artist as listed on the cover
- **Editing Fields** - Editing the album's metadata, or the metadata of the tracks included in the album
- **File Scanning** - Forcing Roon to re-scan, re-identify, or re-analyze your album

- **Deleting An Album** - Permanently deleting the files from your hard drive or from your streaming library favorites

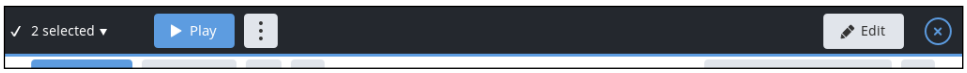
Track Grouping

Roon works hard to make sure all your tracks are properly grouped into albums, so they can be identified. If you're finding that your multi-disc sets are being split up, you may want to look over your folder structure or tags to figure out why, as described here.

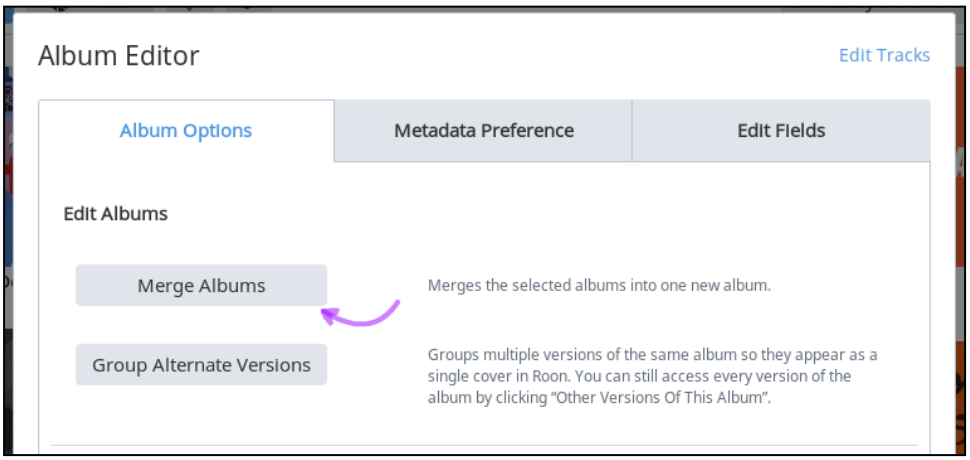
If you need to add missing tracks to an album, or merge multiple discs into a single album, there are a few ways to do this.

Merging Albums

If you can see the two or more discs that need to be combined into a single album, start by selecting them both.



Then, click edit, and from the Album Editor, choose Merge Albums.

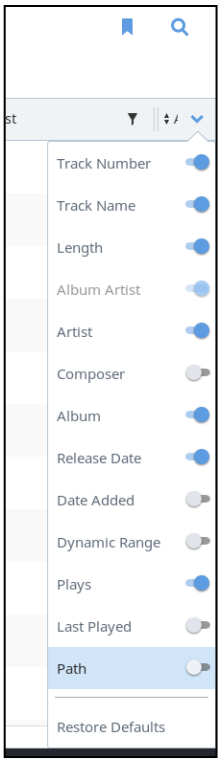


On the next screen, you can confirm the tracklist and disc numbers, and save.

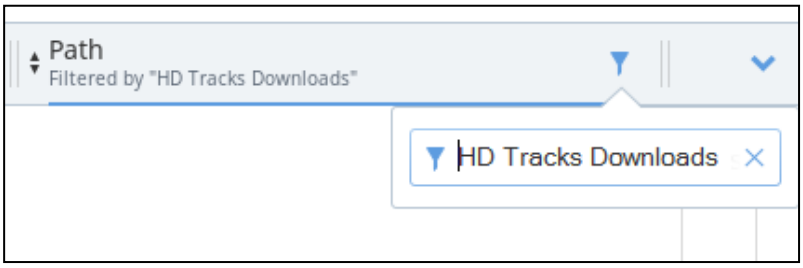
Grouping Tracks Into Albums

If you need to group a number of tracks into an album, you can do that from the Tracks browser. Just selecting all the tracks on the album and click Edit in the selection bar, then choose Group Tracks.

If needed, you can also enable the Paths column in the Tracks view, like this:



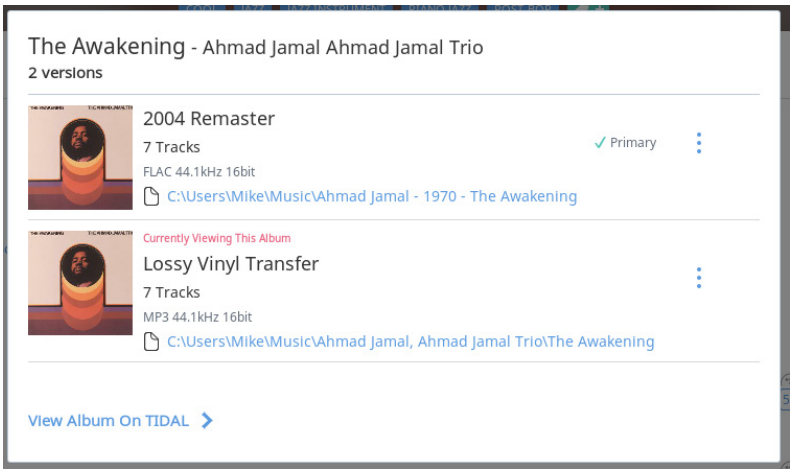
Then you can use the Path column on the far-right to filter for the path of your files.



Finally, select all the tracks on the album and click Edit in the selection bar, then choose Group Tracks.

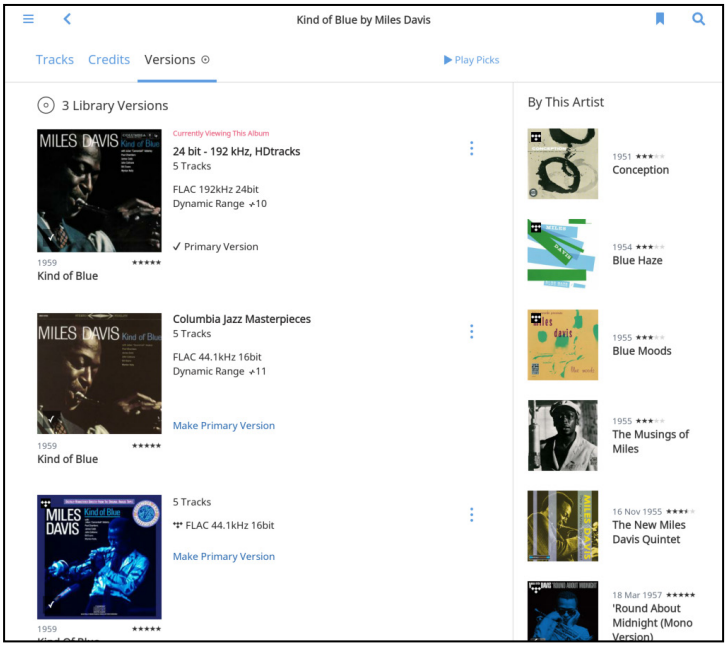
Album Grouping (Alternate Versions)

If you have more than one version of an album (such as the original vs the remaster, or the CD Quality vs High Res), Roon can group them together, making it easy to track the various editions and pick a favourite.



Albums with similar titles and track lists will be grouped together automatically. You can also manually group albums by selecting them both and choosing *Group Alternate Versions*.

Once every version of the album is grouped together, it's easy to browse through them from the Versions tab.



When browsing your library Roon hides duplicates by default, but you can turn this off at any time from the General tab of Settings by toggling the **Show Hidden Tracks And Albums** option.

Working with Grouped Albums

When Roon finds albums in your library with similar artist and album info and similar lengths, they are considered to be duplicates.

When duplicates are detected in your library, or when an edition of the album is available on TIDAL, you'll see the **Versions** tab on the Album page:

The icons displayed here let you know which versions are available:

- The disc icon means there are other versions of this album in your Library
- The TIDAL icon means there are versions of this album on TIDAL not yet added to your library

Clicking this tab will display the versions of this album that are available from your library, and below it will display versions on TIDAL.

You can click **Add to Library** to add versions from TIDAL to your Library. For versions in your Library, you can view the number of tracks, format, bitrate, dynamic range and storage location.

Editing Grouped Albums

When you open an album with multiple versions, Roon will display the primary copy, which defaults to the highest quality copy available.

From the Versions tab, you can pick a different primary copy by pressing **Make Primary Version**.

Inside your library, you can remove an album from the set by selecting the options icon and selecting **Remove from duplicates**.

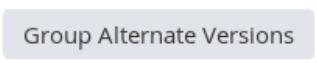
Adding Albums To A Group

Because Roon's duplicate detection is based on a match of the album's metadata (artist, album, track titles) *and* their length, sometimes not every duplicate in your library is detected automatically. For example, if you have 3 copies of Kind Of Blue, but one of them has a different number of tracks, it may not be added to the group automatically.

To add albums to a group, in the album browser or in the artist page, right click (or long press) each album to select.

Next, click *Edit* in the top-right:

The edit screen will show up. Just click



The selected versions of the album will be grouped together. That's it!

Main Performers vs: Album Artists

Roon's handling of albums is built to understand subtleties that many other applications gloss over.

For example, consider the case of groups like *James Brown & the Famous Flames* or *The Miles Davis Quintet* -- both of these groups released albums, but are they distinct from James Brown or Miles Davis, respectively? More importantly, when you're browsing these seminal artists, do you want the albums by these groups to appear?

Roon handles these distinctions by crediting albums in two distinct ways:

- **Album Artist** is the name on the album cover. In the two examples above, this would be *James Brown & the Famous Flames* or *The Miles Davis Quintet*. This is a text field, and like other text fields it can be modified with a "display edit".
- **Album Main Performer** is one or more links, that ties the album to the person we would generally credit as being the album's artist. By ensuring your album has a link to, say, James Brown or Miles Davis, you can ensure this album is included in the artist's discography, without losing the context that this album was originally released by a group.

When an album's Main Performer and Album Artist differ, you will see both names on the album page, like this:

Note that if Roon does not have sufficient metadata about the Album Artist, the link will not be active.

File Scanning and Deleting

The Album Editor screen also gives you a number of ways to re-scan your files, under the **Your Files** section.

If you're having trouble picking up changes you've made to your files tags, these options may help.

The *Your Files* section also allows you to delete the album from your hard drive. Note that this does not simply remove the album from your library -- if you choose to delete the album in Roon, the files will be permanently removed from your hard drive, or will be removed from your favourites on the streaming service.

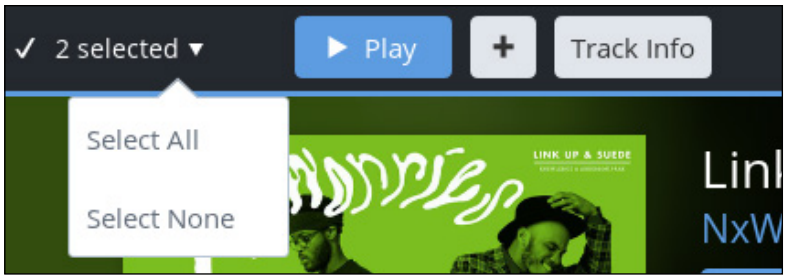
Other Edits

Bulk Edits

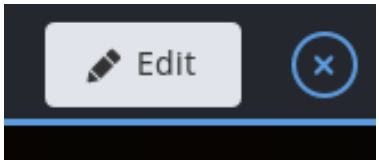
Most album and track edits can be performed on more than one item at a time. For example, you might want to add a genre to 5 different albums, or you might want to add a composer to 3 different tracks.

To edit more than one item at a time, start by selecting one of the items. You can do this by right-clicking or long-pressing on the item.

Select additional items by clicking them, or choosing "Select All" from the command bar:

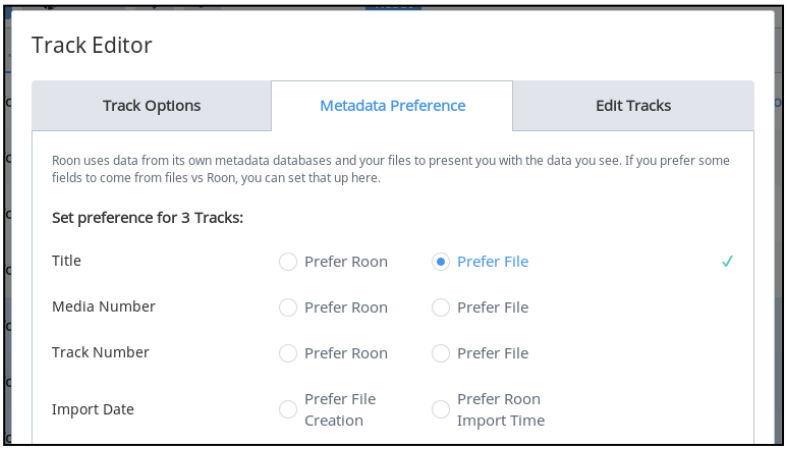


Once, you've chosen the albums or tracks you want to edit, click Edit:



On the Track or Album Editor Popup, you will be able to make two kinds of edits:

- **Metadata Preferences** - make Display Edits by choosing to prefer either Roon metadata or metadata from your file tags
- **Edit fields** - change metadata for the selected content, either by editing fields or adding/removing links



In this screenshot, you can see that **3 tracks are being edited**.

You can also see that these 3 tracks are being edited to use the title from their file tags, as opposed to Roon metadata.

You can see that an edit has been made, as denoted by the green check mark on the right. Click the checkmark to clear the edit, or click Save at the bottom of the Track Editor to save the edit.

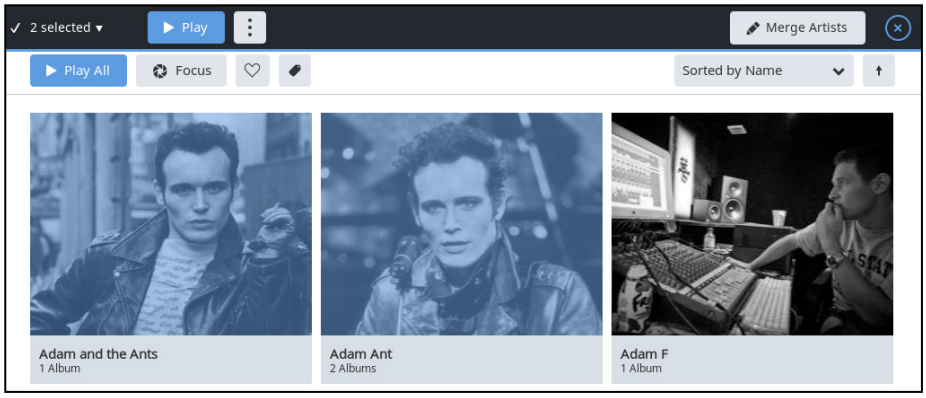
Note in addition to editing multiple albums or tracks at once, you can also set Library Preferences, which will ensure that certain data from your file tags is always used.

Merging People and Compositions

Roon's metadata model allows for complexity and subtlety that's not possible in other systems, such as the ability to have two artists with the same name. However, as good as Roon's metadata is sometimes we get bad metadata from our metadata providers, or errors crop up in our handling of that metadata or in our understanding of your file tags.

One of the most frustrating issues that can crop up is duplicate entries for Artists, Performers, Composers, and Compositions. It's great when Roon is sensibly handling two different people named Bill Evans, but when you have two entries for *the same* Bill Evans, they will need to be merged.

To merge two Artists, Performers, Composers, or Compositions, start by selecting them both. You can start selecting people by right-clicking or long-pressing on one of them.



Once you've selected the two people or compositions you want to merge (as pictured above), just click Merge Artists in the top-right.

Other Edit Options

There are a variety of available options when editing your metadata, and we've built a few tools to simplify the editing process.

Merging albums

If a multi-disc set you've imported doesn't seem to be identifying properly, you can edit your files directly, or you can edit the album in Roon.

For more information on how to merge albums, check out our write-up on the topic.

Fixing track grouping (missing or extra tracks)

If it looks like your album has missing or extra tracks, you should be able to fix this using our Fix Track Grouping feature. It is a powerful feature that can help you:

- Merge albums if you're having difficulty with our Merge Albums feature
- Split multi-disc sets into individual albums

- Merge multiple discs into one disc
- Move tracks into a new disc
- Rearrange tracks into their proper order
- Rearrange discs into their proper order

To learn more about the Fix Track Grouping feature and its various applications, click here.

Visibility in Roon

In our visibility settings, you can hide and unhide albums in Roon. By default, hidden albums are not shown in Roon, although this can be changed from Settings > General tab.

To see tracks that you've hidden, you can either use Focus to show them, or change the default behaviour in Settings.

Your Files

Roon updates the metadata in your collection periodically, and analyzes your audio files on import, but you can always force Roon to do it again in the *Your Files* section of the edit menu.

You can re-scan your music for changes to file tags and embedded artwork, which will also scan for cover art saved in the same folder as the album.

You can re-identify your music, which attempts to match the album in Roon's database just like the first time you imported it.

You can re-analyze your music for corruption.

You can delete your music, which **will permanently delete the selected files from your hard drive**. Tracks from streaming services will be removed from your Favourites on the streaming service, and no longer appear in your Roon library.

Can I use Roon to groom my file tags?

Roon does not alter your files in any way, and there is no way to edit your file tags in Roon. Roon was never designed to be tagging software -- Roon will use the tags as a starting point, after which it will add it's own rich metadata on top. But you can always choose to display metadata from your file tags in Roon.

If you want to learn more about how file tags play a role in Roon, be sure to read the above section: 3-Layer Editing Model.

7.5 Compilations, soundtracks, live albums, bootlegs

Roon has support for tracking live albums, compilations, and bootlegs, as well as live tracks. We are populating this data from two different metadata providers at the moment, but it's fairly new to us, and may contain inaccuracies. Please let us know if you run into incorrectly flagged tracks or albums.

These flags are editable. There's also a setting in Settings->General to flag albums as live albums, compilations, or bootlegs using icons in the album browser if you want that information to be a part of your browsing experience.

7.6 Multi-disc sets

Roon supports multi-disc sets, and shows them as one album cover in the album browser. If your multi-disc sets aren't showing up properly, you can ensure they do by following the instructions in this article

If you're importing a multi-disc set, the best way to ensure it's identified properly is to make sure the track listing matches the original release.

Identifying Multi-Disc Sets

For best results, make sure the whole set is in its own folder, and make sure the file tags include:

- The name of the album (meaning all discs have the same album title)
- Accurate track numbers, (meaning each disc starts with Track 1)
- Accurate media numbers (meaning each disc is numbered Disc X of Y, with Y being the total number of discs in the set)

Directories

We look for a couple different possible folder structures when it comes to the individual discs.

So this scheme will work:

```
Music/
    Miles Davis - The Complete Columbia Album Collection/
        01-01 Track.flac
        01-02 Track.flac
        ...
        02-01 Track.flac
        02-02 Track.flac
        ...
    Pink Floyd: Discovery/
        01-01 Track.flac
        01-02 Track.flac
```

```
        ...
        02-01 Track.flac
        02-02 Track.flac
        ...
```

And this will work just as well:

```
Music/
    Miles Davis - The Complete Columbia Album Collection/
        CD1/
            01 Track.flac
            02 Track.flac
            ...
        CD2/
            01 Track.flac
            02 Track.flac
            ...
        ...
    Pink Floyd: Discovery/
        CD1/
            01 Track.flac
            02 Track.flac
            ...
        CD2/
            01 Track.flac
            02 Track.flac
            ...
        ...
```

One thing that likely **won't** work is having all the discs of a box set separated into album-level directories, like this:

```
Music/
    Miles Davis - The Complete Columbia Album Collection CD1/
        01-01 Track.flac
        01-02 Track.flac
        ...
    Miles Davis - The Complete Columbia Album Collection CD2/
        02-01 Track.flac
        02-02 Track.flac
        ...
    ...
    Pink Floyd: Discovery CD1/
        01-01 Track.flac
        01-02 Track.flac
        ...
    Pink Floyd: Discovery CD2/
        02-01 Track.flac
        02-02 Track.flac
        ...
    ...
```

Don't do that!

Fixing Errors

If a set you've imported doesn't seem to be identifying properly, you can edit your files directly, or you can edit the album in Roon. If your set is split up, you can select the various discs in the album browser, and then choose Merge to combine them into a single disc.

You can also select the disc (or click Edit under the 3 dots ⋮ menu while viewing its Album Details screen) and choose Identify, to search Roon's database and try to find a better match.

7.7 Genre handling

Genres are a very personal topic for many of our users -- we were honestly surprised at the depth, variability, and intensity of opinions that users hold about this topic.

Roon supports full editing of genres, and genre assignments. Don't like that Daniel Barenboim is tagged as "Latin" by Rovi? By all means, remove it.

Roon supports editing of the genre hierarchy itself. Is Tango a Top-Level genre for you? By all means, put it at the Top-Level.

Roon also supports extracting genres from file tags. This creates some interesting problems: genres in file tags aren't inherently hierarchical, and don't necessarily match up with the default genres that come with Roon. It's also fairly common for real-world files to contain junk in the genre tags that you'd rather not see in-app.

Display Settings

There are two settings in Roon: "Show Roon Genres" and "Show Genres from File Tags". You will find them in Settings => General tab and default to "Yes" and "No" respectively, preserving the 1.0 behaviour by default.

If both settings are set to "No", then you're essentially starting with a blank slate--the only genres that you will see are those added using Roon's editing functionality. If both settings are set to "Yes", then you will see Roon's genres and your genres side by side. Otherwise, you can choose to see only genres from Roon, or only genres from your files.

Genre Mappings

Only necessary to use if you have Settings > General > Show Genres from File Tags set to Yes.

Roon supports mapping genres extracted from your file tags when they're brought into Roon. This mapping allows you to:

- Re-write genre names. This is common for near misses like "Prog Rock" vs "Progressive Rock" or "Post Bop" vs "Post-Bop"

- Hide genres that you don't want to see in Roon

You can access the Genre mappings editor via Settings -> Setup -> Genre Mappings

7.8 Import dates

Traditionally, Roon has kept track of "Date Added" for tracks based on the first time that Roon saw a file or TIDAL track. This isn't ideal when our collections typically go back for decades and Roon hasn't been released for nearly as long.

There are a few features to improve this situation. You can edit the import dates for your tracks to match the file modification or creation times in the filesystem (multi-select a bunch of tracks in the track browser and use the "Metadata Preference" tab if you want to perform this operation to large amounts of content at once). You can, of course, also edit your import dates manually.

8.0 Tips and Tricks

8.1 Sound Quality

Roon is built from the ground-up to produce extremely high-quality output, however Roon works differently from other software, so you may not be able to drop it into an existing setup and get the same results immediately.

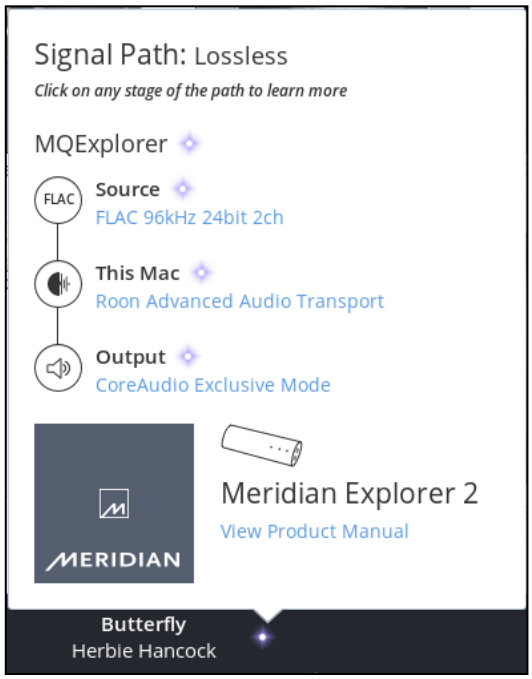
Like most things in the world of Computer Audio, it takes some tuning before everything is just right. Roon is no exception. This page contains our official advice for maximizing the sound quality that you obtain from Roon.

Some Basics First

If you are using a connected output like a USB DAC, start by checking out out our Audio Setup Basics. Make sure that you are using Exclusive Mode output. If you are playing back DSD content, make sure that Roon is set up to utilize the DSD capabilities of your DAC.

Networked outputs generally require minimal setup work in order to achieve excellent sound quality.

In general, if you're chasing sound quality, you should start with a bright purple light in Signal Path, like this:



Focus on getting that configuration right first. One you're there, you may or may not want to experiment with enhancement features like DSP Engine or Volume Levelling. Always proceed carefully, and try to pay attention to how each change impacts what you're hearing. When it comes to DSP enhancements, less is often more.

Roon is Heavier than Other Media Players

Many Audiophile grade media players focus on being extremely lightweight and doing nothing but audio playback. This is a tradeoff--they get to offer a simpler approach to sound quality, but they can't offer a rich user experience.

At Roon Labs, we aren't willing to sacrifice user experience or functionality at the altar of sound quality--we are determined to provide both at once.

At the same time, this is a bit of an oxymoron. A fully featured media server doing everything that we want it to do will never be as lightweight as a standalone, single-zone player application. So instead of trying to do the impossible, we've addressed this problem by changing the rules a little bit.

Instead of trying to pack a lightweight media player, and heavyweight media server into a computer in your listening room, we provide the tools you need to put space between those pieces--because they really don't belong together anyways.

This is, we feel, the best of both worlds--

- Our lightweight playback components (Roon Bridge, Roon Ready devices, and networked endpoints) are *much* lighter than any media player software out there because all they do is copy audio from a network interface to an audio device. They don't even have to do work to decode your media files!
- Our media server can afford to do things that no lightweight player app could do without losing its lightweight status--like automatically fetching and updating metadata for your library in the background, and supporting audiophile-quality playback in the listening room while other members of your household import new content and play audio in other rooms simultaneously.

With Great Power comes Great Responsibility

Out of the box, Roon is configured to optimize for usability, and a great first run experience. These aren't necessarily the best choices for Sound Quality!

This guide is here to help you get the best possible sound quality out of Roon without compromising other features.

This is possible, but it requires some legwork. Lets get started.

Before proceeding, please be familiar with our Architecture. The words "Core", "Control" and "Output" will feature prominently in the rest of this document.

Our Recommendations

Rule 1: Core and Output on separate devices

To get the best sound quality from Roon, plan for an ethernet cable between your Core and Output components.

One way to accomplish this is with a Roon Ready hardware device.

You can also get there by using Roon Bridge--our lightweight endpoint package. Combine that thing with a Raspberry Pi or Cubox and an audiophile-grade power supply and you have a *great* little network bridge to use with your existing USB DAC.

You could also use one of our other supported networked devices, like a Squeezebox Touch, or a Meridian MS200, MS600, ID40, or ID41. For more information on setting up these devices, see Meridian Setup or Squeezebox Setup.

Finally, you could use Roon with HQPlayer and NAA (Network Audio Adapter). In this arrangement, we recommend locating Roon and HQPlayer on the same (powerful) computer, and locating the NAA in the listening area. For more information on setting up Roon with HQPlayer see HQPlayer Setup.

We provide many solutions because solving this problem is important to us!

Rule 2: Control and Output on separate devices

Roon's user interface is a GPU-accelerated OpenGL masterpiece. It works your GPU (Graphics Processing Unit) harder than any other audio app we're aware of. Do you really want that GPU doing its thing right next to your audio gear? Didn't think so.

We permit you to connect audio devices to just about any place where Roon's control software runs. This might be great for members of your household who value convenience and user experience first, but it's not great for your listening room.

One great way to satisfy this rule is to use a tablet or phone to control Roon in the listening room. These devices are great control points--they wake up, do their thing over WiFi, and then go to sleep when you start listening, thus ending their ability to influence what you're hearing. Even better, they have no direct electrical connection to *anything* audio related since they are battery powered.

Rule 3: Keep an eye on the Signal Path

Features like Volume Normalization, Crossfade, DSP volume controls, and DSP Engine all affect what you're hearing. If you have those things turned on, and you're not happy with what's coming out, it's worth experimenting with turning them off or changing their settings.

Note that Roon's DSP volume control is a pass-through at 100% volume--so it should have no influence unless it's being used.

You can always check Signal Path to see what is going on.

Rule 4: Don't under-spec the server

Slow servers, NAS's, and network connections can affect sound quality by preventing the Output components from receiving audio in time. This can manifests as clicks, pops, dropouts, and static.

Both Roon and all RAAT outputs use strategically placed memory playback buffers to limit the impact of this sort of thing, but poor performance can still lead to behaviour in the CPU or networking hardware as it handles the audio stream in fits and spurts.

Invest in your server components just like you would in your other gear, and remember that there is no downside to a Core i7 with a fan if you've got it located two rooms away from the listening area. Take a look at our hardware specs, and try not to come in below our recommended level, and especially, plan on using an SSD to store Roon's databases.

Rule 5: Use Ethernet between Core and Output

Roon has comprehensive and robust support for WiFi, but the sound quality often isn't the same.

For your highest quality rooms, plan on using wired gigabit ethernet connections between the Core and the Outputs.

But I want to do it all on one computer!!!

We value convenience and flexibility as much as we value sound quality, so we're not going to stop you.

8.2 Sound Quality in One Computer

This page is for people who want to run Roon's Core, Control, and Output components all in one computer. This is not how you get the best sound quality from Roon. For the final word on Sound Quality and Roon, please check out Sound Quality.

Ok, so you want to run everything within one computer. You're free to do that, too. We don't agree that that's the best way to get the best sound quality out of Roon, but hey, you're entitled to your reasons, and we still want to help you get the best experience you can out of your setup.

Note: These recommendations are not for people who have their Core and Output components separated already. This is for people trying to use Roon in a standalone configuration.

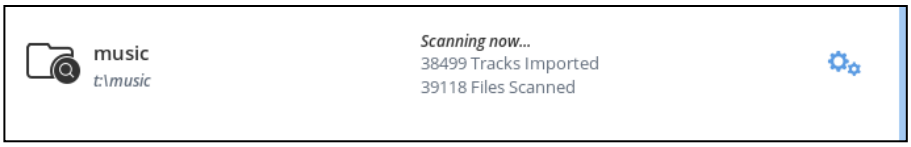
Our Recommendations

Disable background work or wait for it to finish

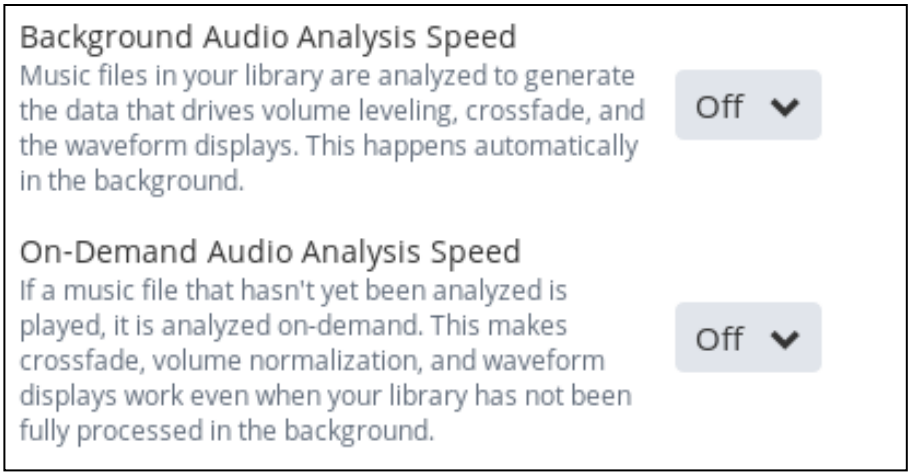
Here's a bunch of ideas. Some are things to control for. Some are other troubleshooting techniques.

(1) In settings -> services, look "Syncing library now" + wait for it to finish:

(2) In settings -> storage, look for "Scanning now..." + wait for it to finish:



(3) In settings -> setup, disable both analysis settings.



(4) The spinner in the upper right covers importing and metadata lookups. Wait for that to finish, too.

Monitor the Logs

Check out Roon's Log Files and make sure that nothing too heavyweight is going on during playback.

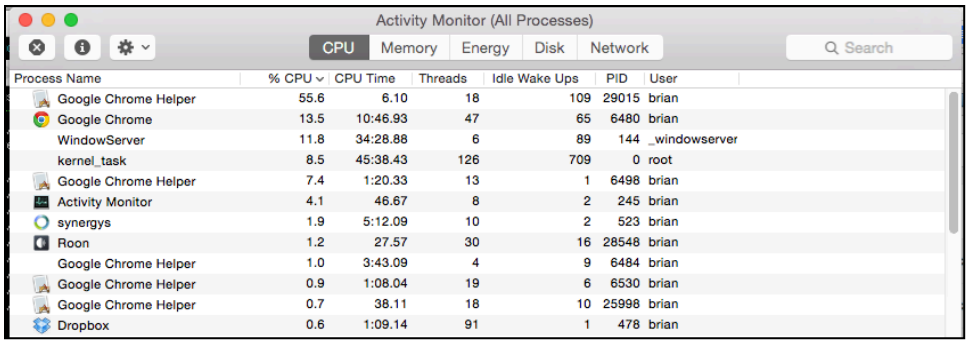
When Roon is at idle, and you're not playing music or clicking around, there shouldn't be tons of text flying by. Roughly every 15 seconds you'll see one of these:

00:13:16.155 Info: [stats] 3196mb Virtual, 412mb Physical, 54mb Managed, 31 Threads, 120 FDs (73 REG, 25 IPv4, 8 DIR, 5 KQUEUE, 4 CHR, 3 PIPE, 1 systm, 1 unix)

If you see a ton of stuff, then Roon is working--and there's a chance that this is polluting your listening experience.

Monitor CPU usage

This can be another clue of unexpected stuff happening. When Roon is idle, its CPU usage should be low:



This is a quick snapshot of one of the machines here at Roon. Clearly Google Chrome is doing quite a lot--if you're worried about things that Roon might be doing outside of the "bit-perfect playback" domain, you should be just as worried about stuff like this. If we saw this, we would exit Chrome before proceeding with a critical listening session.

If you have two GPUs (graphics processing units), control for it

Many laptops have two GPUs--usually a power-efficient integrated GPU as well as a powerful discrete GPU provided by NVIDIA or AMD. Machines like this typically switch between the GPUs automatically depending on the workload. Running graphics intensive software (even stuff like Google Maps), or attaching external monitors can cause the discrete GPU to kick in.

Some people find that they can achieve better sound quality using the integrated GPU. On Macs, software like gfxCardStatus can help you monitor and control which GPU is being used. On Windows PC's, this is generally managed in a control panel provided by the GPU manufacturer.

Roon's OpenGL-based user interface runs comfortably on most integrated GPUs, but some laptops react to our use of OpenGL by defaulting to the discrete GPU--this can pollute A-B testing between Roon and other software that may not use OpenGL.

If you are performing tests, this is a detail to keep an eye on, and to control, particularly if you find that one state of affairs sounds better than the other.

Consider exiting the Control during playback

Did you know that you could run Roon Server + Roon as a remote on the same machine at the same time? Some people find this setup to be kind of a head-scratcher, but it works great, and it can be a sound quality problem solver.

Fire up Roon as a remote, queue up some music, then *exit the remote*. Roon will continue to play your music sans remote, and without letting our rich UI affect your listening experience.

Note: This page is for people who want to run Roon's Control, Core, and Output components all in one computer. This is not how you get the best sound quality from Roon. For the final word on Sound Quality and Roon, please check out Sound Quality.

8.3 Keyboard Shortcuts

macOS Keyboard Shortcuts

Key command	Action
Tab	Toggle Navigation Menu (use numbers to further navigate)
⌘-E or control-E	Show Now Playing/Queue
⌘-S or control-S	Show Screensaver
⌘-Y or control-Y	Show History
⌘-I or control-I	Open Editor
⌘-LEFT or control-LEFT	Go back to previous screen in your navigation history
⌘-RIGHT or control-RIGHT	Go forward to next screen in your navigation history
Spacebar	Play/Pause
⌘-J or control-J	Previous track
⌘-K or control-K	Next track
⌘-UP or control-UP	Volume up
⌘-DOWN or control-DOWN	Volume down
⌘-M or control-M	Toggle mute
⌘-B or control-B	Add bookmark
⌘-F or control-F	Search
⌘-A or control-A	Select All
⌘-D or control-D	Deselect All
⌘-T or control-T	Stop Music
/ (slash)	Filter (on music browsers)
⌘-G or control-G	Toggle Focus (on music browsers)

Windows Keyboard Shortcuts

Key command	Action
Tab	Toggle Navigation Menu (use numbers to further navigate)
Ctrl-E	Show Now Playing/Queue
Ctrl-S	Show Screensaver
Ctrl-Y	Show History
Ctrl-I	Open Editor
Ctrl-LEFT	Go back to previous screen in your navigation history
Ctrl-RIGHT	Go forward to next screen in your navigation history
Spacebar	Play/Pause
Ctrl-J	Previous track
Ctrl-K	Next track
Ctrl-UP	Volume up
Ctrl-DOWN	Volume down
Ctrl-M	Toggle mute
Ctrl-B	Add bookmark
Ctrl-F	Search
Ctrl-A	Select All
Ctrl-D	Deselect All
F11	Toggle fullscreen mode
Ctrl-T	Stop Music
/ (slash)	Filter (on music browsers)
Ctrl-G	Toggle Focus (on music browsers)

9.0 Trouble Shooting and Support

9.1 Contacting Support

Roon Labs takes support very seriously, and we work closely with members to resolve every issue reported to us. If you are having a problem with Roon, we are here to help.

All technical support related to Roon happens on our Community Site. Roon Labs staff monitors the Support section closely, and if you are having a problem, all you need to do is post the details listed here. Roon Labs Staff will follow up and you may also get answers from our team of knowledgeable Community Moderators, or from other members.

When issues arise, some have asked us why we don't have phone or email support. The answer is that we truly believe this is the fastest way to help our customers, and we think the results speak for themselves -- every day, we see questions answered and issues resolved, as our team works closely with customers to make sure everything works exactly as it's supposed to.

The Roon Labs Community site should be your first stop for all issues, other than billing questions, which should be emailed in order to protect sensitive personal data.

9.2 How do I move my Roon library to a new computer?

Roon tracks every file in your library, and any actions you take in Roon are attached to that file, whether you're editing it, adding it to a playlist, marking it as a favourite, or tracking how many times you've played it.

Starting with Roon 1.1 (Build 69), Roon will be able to track your files and preserve your edits in as many situations as possible, including cases where you need to move your Roon Core install to a new operating system.

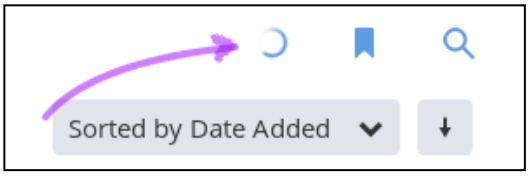
The instructions below detail the process for moving your install to a new operating system while preserving your edits, playlists, login info, history, preferences and more.

Migrating To A New Computer

Before you start, please:

- Confirm you're running the latest version of Roon -- you can check this by clicking *About* on the Settings page
- Make sure you have a recent backup -- instructions are here.
- **Confirm the audio extraction process has completed** -- Once in while (*such as when you first update to Build 69*) Roon will need to extract audio from your files for tracking. While your files

are being analyzed, you can monitor this process by clicking the spinner in the top-right, next to Bookmarks and Search

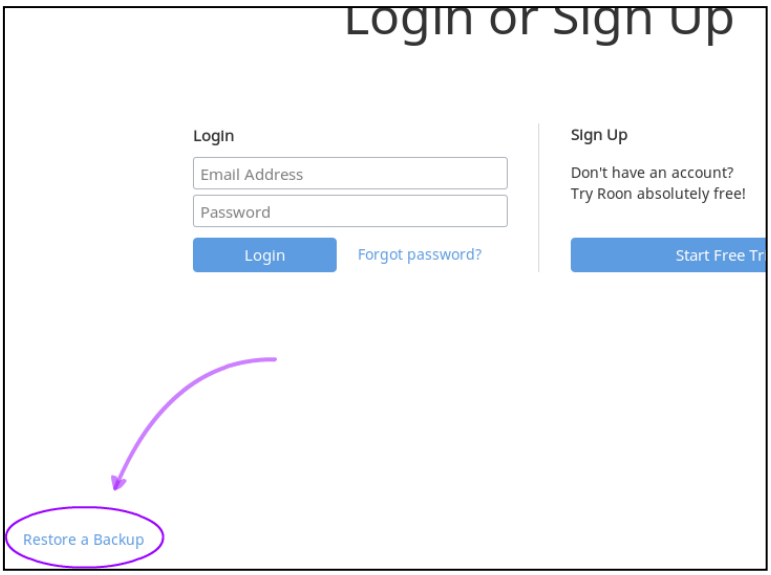


If the spinner disappears, your files have been fully analyzed.

Steps

Note that these instructions don't cover moving your music files themselves. If you store your files on a USB drive, you will have to confirm it works on the new computer that will be running your Roon Core. If you use a NAS drive, you may have to re-add it to Roon once you've followed the steps below and moved your database to the new platform.

1. **Make a backup** (details here) to a local or network storage device.
2. **Install Roon or RoonServer on the new machine**. You can visit the Roon website, and download the appropriate installer for your new platform
3. **Run the installer** and launch Roon or Roon Server. If you installed Roon Server, you will need to also launch Roon in order to configure your new Core. This can be done from any other supported computer or tablet on your network.
4. **Restore the backup**. When you reach the log in screen, don't log in. **Click the *Restore a Backup* link in the lower-left** and point Roon at the backup you made in Step 1.



Important: In many cases, Roon will no longer be able to find your storage devices. In order to preserve your edits, play history, and playlists, make sure to edit the paths according to this guide.

If you have any issues with this process or need more assistance, please let us know. Thanks!

9.3 Why can't Roon Remote Connect?

If you're running Roon in remote mode and having problems connecting, here are some troubleshooting steps to get you going.

Accept Remote Connections

The first thing to confirm is that your main Roon install is set up to accept connections from remotes.

To do this, click the main Navigation menu (top-left of Roon) and select Settings.

Click the Settings tab, and make sure "Accept connections…" is set to **Yes**.

Additional Troubleshooting

Firewall Roon should be able to connect with your firewall enabled, but some users have reported issues that we've traced to their firewall.

Turning off your firewall is a good way to start troubleshooting, and you'll want to turn it off on both sides -- the computer running your main Roon install, and the computer running your remote.

Once you've turned off your firewall, restart Roon on both computers.

Many anti-virus programs include firewalls, so instructions for turning off your firewall will vary. The two most common firewalls are Windows Firewall and OSX Firewall.

Network Setup It's important to be sure both computers are on the same network, and have the same network settings. The best way to confirm this is to check your IP address and network settings.

When you find your network settings for both computers, you'll to confirm:

- Both are on the same IP network (ie **192.168.1**.104 and **192.168.1**.106)
- Both have the same netmask (this often looks like **255.255.255.0**)

To find your network settings on Windows, type "Network and Sharing Center" into the Start Menu. Then, click on your connection (either WiFi or ethernet), then select Details.

To find your network settings on OSX, open System Preferences from the Apple menu, then click Network. Click Advanced to find your IP address and netmask.

Additional Troubleshooting If you've confirmed everything above, and you've already restarted both computers, please let us know the following information below:

On your main Roon install:

- Operating System
- Firewall status (type, whether enabled)
- Network connection (WiFi/ethernet, IP address)

On your remote Roon install:

- Operating System
- Firewall status (type, whether enabled)
- Network connection (WiFi/ethernet, IP address)

Network configuration

- Network hardware (routers, bridges, switches, media streaming devices, network security hardware, etc)

If you're an advanced user familiar with networking, you can find more information about using port forwarding here.

We've also heard reports that the Fidelizer plug in on OSX can cause networking issues, so we recommend disabling it if you're having issues.

9.4 FAQ: Audio Basics

Have questions about setting up your DAC in Roon? Wondering how to get the best sound quality? Setting up a network endpoint? You've come to the right place.

This is a list of **our most commonly asked questions relating to audio in Roon**. Give it a read, and if you're not finding the answer to your question, just let us know!

The Basics

- How do I set up Roon to use my DAC?
- How can I achieve the best quality output?
- What's Exclusive Mode?
- How do I know if Roon is playing losslessly? What's Signal Path?
- What kind of processing is Roon doing to my audio?

Frequently Asked Questions

- What audio file formats does Roon support?
- What types of audio devices does Roon support?
- Which zones can I control remotely?
- How do I use directly-attached audio devices on a Roon Server running Windows?
- Does Roon support DSD?
- How do I link audio endpoints so they play the same thing simultaneously?
- What's volume leveling?

Integrations

- How do I use Roon with Airplay devices?
- How do I use Roon and Squeezebox devices together?
- How do I use Roon and HQPlayer together?

Common Troubleshooting

- Why did all my zones disappear?
- I'm having problems setting up Airplay
- Getting a Playback failed error
- Why is Roon converting to PCM?
- How do I install missing audio codecs?

9.5 FAQ: Browsing and Playing Music

Ready to browse your music Roon? Unsure where to start? Have questions? You've come to the right place.

This is a list of **our most commonly asked questions relating to setting up Roon**. Give it a read, and if you're not finding the answer to your question, just let us know!

The Basics

- What play options are available for artists, albums, composers, genres, and tracks?
- What's Radio and how does it work?
- When I press Play Artist, how does Roon choose the songs to play?
- How do I select songs or albums? What can I do?
- How do I know if Roon is playing losslessly? What's Signal Path?
- How do I build playlists in Roon? How do I edit them?

Frequently Asked Questions

- Are there any keyboard shortcuts?
- Where can I set a crossfade?
- How do I browse a specific decade or genre?
- When I play something, tracks that were in my queue disappear. Why is this and how can I get around it?
- Can I scrobble to Last.fm while I listen in Roon?
- Where are my compilations and soundtracks sorted to?
- How do I create a “smart playlist”? How do I save a Focus?

Common Troubleshooting

- I'm having trouble setting up Roon with my NAS
- Some of my files aren't showing up in Roon
- An album was misidentified, or is shown as "Unidentified"
- Roon is displaying incorrect track titles
- Roon is showing “Playback has failed due to playback parameter negotiation with the audio device”
- I’m getting an OpenGL error trying to start Roon – what’s going on?

9.6 FAQ: Other Questions

- What languages are supported?
- I want to use Roon on my phone or tablet, is there a mobile version available?
- What models of iPad can I use Roon with?
- What Android tablets can I use Roon with?
- How do I update Roon? How do I make sure I'm running the latest version?
- I only want to browse albums in my collection from a certain decade, is there a way to do this?
- How can I see what I've played the most?
- My compilations and soundtracks aren't sorted by artist name in the album browser, can I change that?
- There are some tracks missing from one of my albums, how do I find them?
- How do I export audio files to a different location?
- Where's the loop button?
- Roon Support asked me for a "Support package", how do I do that?
- Roon Support gave me a "Support ID", where do I enter it?
- How do I cancel my free trial?
- What is Bookmark? How can I save bookmarks?
- How do I export my library to an Excel spreadsheet?
- What's the difference between Radio and Internet Radio?
- Why can't Roon Remote Connect?

10.0 Additional Articles

10.1 Why Core?

What is the Core?

The **Core** is media server software that runs on a powerful computer, NAS, or turnkey appliance (from one of our Roon Core partners), located on the network within your home.

(For more information on how it fits in with **Control** and **Output** components, see the Architecture overview.)

When we emphasize that Roon requires a **Core**, we do so because it is important to draw a distinction between Roon and some other systems...

Some systems run "in the cloud" like Spotify and Google Music. Others are comprised of several de-centralized components with no central "brain" like UPnP, DNLA, and OpenHome.

Many more have a "Core" just like Roon, including iTunes, JRiver, and Logitech Media Server, but it is important to understand this architecture in order to understand the things that Roon can do for you.

Why does Roon require a Core?

Roon has a Core because it allows us to make the best product possible.

When buying audio equipment, you expect the manufacturer to use and apply the best engineering, technology, and materials available to them. By organizing our architecture around a central core running on a powerful machine, Roon does the same thing in the software space.

There are as many product architectures as there are products, and each has its own advantages and compromises. The main compromise associated with Core-based architecture is the cost of having an "extra" component.

The great thing about “compromising” on this cost is that it keeps a host of other compromises away from all other elements of the user experience.

The decision to require a Core is a more expensive approach, but it allows us to deliver more value, so we don’t view the cost as a real compromise--it is just a reflection of value we place on providing the best user experience possible.

Here are some of the ways the Core improves your user experience...

Superior Library Management

Our approach to library management enables data-intensive features such as the incredibly rich links and information from which the browser is generated, as well as Radio and Discover.

Roon's library management is based around an object database. This means that instead of storing data in the traditional tabular form, we model your music as a web of interconnected entities and their relationships to one another.

For a typical music library, Roon is tracking millions of objects--everything from tracks and albums to compositions, performances, labels, genres, credits, and a dozen other kinds-of-things. **Modern CPUs, generous memory allotments, and modern solid state disks are enabling technologies for software like Roon.**

Together, they allow us to keep your library "live", and continuously ready for browsing and playback.

They enable us to perform complex queries that would be impractical for a traditionally architected application, and they let us perform background processing on your music library in order to continually improve the user experience.

Many core-less systems shoehorn library management into a low-cost embedded processor that already exists within the system (typically, these are about as powerful as a 3-5 year old cell phone). Roon would not be able to do what it does within those constraints.

Audio Gear In Its Own Space

Roon Advanced Audio Transport, the technology behind Roon Ready devices, is our network-based audio streaming technology.

RAAT does many things, but most importantly, it separates audio output from the CPU intensive, bus-interrupting, electrically noisy activities of computer audio like managing the play queue, decoding audio streams, talking to music services online, and communicating with the various devices on your network.

This architecture means that the core can be much more powerful while having no impact on your audio performance. You wouldn't put a quad-core Intel i7 CPU with a big noisy CPU fan into the same box as an analog amplifier, right? Of course not.

Roon's Core can be completely separated from the audio gear without compromises in functionality on either end.

Buy that noisy i7, tuck it in a closet far away from the listening area, provide it with power and network connectivity, and forget about it. While the centralized Core does the heavy lifting, audio devices can be simpler, lighter-weight, more reliable, and less electrically noisy.

Content/Hardware Compatibility

It is very important that all content in Roon can be played on any device that Roon supports. The Core is instrumental in ensuring that this is possible, and that it will stay that way for the foreseeable future.

Sometimes this requires expensive digital signal processing, like when we convert a DSD256 file into a CD-quality stream for playback on an AirPlay device in a secondary listening room. Other times, playing content requires business relationships to be in place--like the agreement that allows us to play authenticated TIDAL streams.

By centralizing these concerns in Roon's Core, we ensure that endpoint manufacturers don't need to do this work, or make these relationships, one by one. This enables hardware manufacturers to focus on what they do best, while we handle the variety of file formats, delivery mechanisms, and licensing schemes.

Looking towards the future...

By building the system around a powerful Core, separate from Control and Output functions, you are setting yourself up for the best experience now and in the future.

Roon isn't standing still. The product changes, improves, and grows on a constant basis as we are always working on new ways to utilize your Core to its maximum potential. And as new file- types, streaming services, and new options arrive in the audio marketplace, we will want to embrace them.

Over time, this will mean new features, more data-intensive features, more applications for background processing of your library, more advanced digital signal processing features, and a richer data model for your music library. And over time, this will mean you will need more computing power.

The last thing anyone wants is for "the slowest devices out there" to hold back the growth of Roon as a whole, or for you to be forced into replacing a component that is still fine (your DAC or amp, for example) to add computing horsepower for new Roon features.

Separating the Core from Control and Output components gives you the most freedom and flexibility going forward.

Why not decentralize the Core?

You and your family should be able to take full advantage of the merits of networked audio. This means that Roon will need to serve audio devices in multiple rooms while being controlled by many control devices throughout the home. It also means that a Roon system must be incrementally expandable over time.

Decentralized systems require that each control point and output take on some of the duties that our core performs.

In the case of audio endpoints, these duties often include audio decoding, digital signal processing, play-queue management, and sometimes even aspects of library management.

Control points often become deeply involved in library management, and are sometimes even pressed into service decoding or processing audio.

Systems that weigh down their audio devices with server duties require audio devices to be more costly, and often place powerful CPUs right next to to delicate audio circuitry. Not only do you end up paying for that increased complexity each time you add a zone to the system, this sort of architecture encourages sound quality compromises.

Systems that place too much responsibility on their control points frequently have trouble keeping views in sync across multiple control devices, and sometimes even stop the music when your phone drops off of the WiFi network or runs out of batteries.

Decentralized systems also have no good place to perform background processing on your library or maintain a rich metadata database, so they casually omit any functionality that would require those things.

Roon's architecture espouses a clear separation of concerns. Audio devices can be lightweight and focused only on audio playback. Control points need only display a user interface during the period of time when they're being used. And compute-intensive library-management and audio-processing duties can be centralized on a powerful Core elsewhere in your home.

Why not just put the Core in the Cloud?

The cloud just isn't there yet!

It's getting closer with every year, and we fully expect the balance to tip at some point. Roon is prepared to evolve accordingly when that happens, but we also need to make products that work today.

Today, high-resolution music is still too bandwidth-intensive for many internet connections, and the costs associated with storing a large lossless or high-resolution music library in the cloud are arduous.

Streaming services may eventually address some of those limitations, but even for those who are willing to use them, the hybrid library- local and streaming content combined- is the norm. Today's streaming services are missing huge swaths of content, and still do not deliver that content in the highest quality possible, so this will likely be the norm for some time.

A high-performance Core in your home opens up exciting possibilities for the product that would be too costly to build in the cloud--it's simply much less expensive to put a powerful machine in your home to run Roon than it would be to rent the same machine from a data center on an ongoing basis.

10.2 'Rune Ready' & Partner Devices Matrix

Roon Ready

The Roon Ready program combines our RAAT technology with a comprehensive certification program, support infrastructure, and co-branding between Roon and device vendors in order to create the best experience possible for our users.

Manufacturers producing Roon Ready product are able to integrate Roon's streaming technology directly into the firmware of their devices. Devices are reviewed in-house at Roon Labs and kept on-hand over the long haul so that we never have to say "sorry, we haven't got one of those" when providing support. And manufacturer/device branding are integrated into Roon throughout the app.

Technology

The RAAT technology is the backbone of the Roon Ready program. It offers technological benefits such as:

- Network auto-discovery of devices
- Highly reliable daily operation
- 32-bit/384khz PCM playback
- DSD playback
- Multi-channel playback
- DAC as its own clock master
- Two-way communication (for volume, mute, convenience switching, metadata displays, standby controls, and other commands)
- Multi-room synchronization of devices from different manufacturers

For more information on the design goals and philosophy behind RAAT, see here.

Certification

Roon Ready certification is a detailed process. We sit down with a device, typically for a period of a few weeks, learn about it, and work through the fine-tuning of the integration to make sure that all details are seen to as well as is practicable. The device doesn't go out the door until we say it's ready!

Quality Assurance

We perform dozens of test cases to ensure that the device meets our quality standards, perform stress testing to make sure that it will stand up in the real world, and put the device through dozens of hours of "real life" usage to try and ferret out annoying quirks.

We perform compatibility tests that would be difficult to perform "in one place" at any one manufacturer. It's very rare for companies to have large libraries of gear from their competition. Roon represents a

neutral party--we have everyone's gear in the same room, and can test combinations that might not exist anywhere else on earth.

Support

One of the requirements of the Roon Ready program is that we have copies of Roon Ready devices on hand in order to provide support. This is a complete game-changer for our support operations. When we have the hardware on hand, we can go plug it in and try to replicate a problem. Bugs quickly get fixed, and quirks are easily explained. When we don't have the hardware, we are often flying blind.

In some cases, when Manufacturers make many products that are nearly identical, we don't keep every single one in our library. This does not generally hinder our ability to provide support, as we only permit this when the differences are very minor (for example, many manufacturers make a DAC and Integrated Amp product that are identical except for analog output circuitry--differences like these do not impact Roon). You can see the status of individual devices in the Partner Devices Matrix.

Finally, we continue working with manufacturers on an ongoing basis. As RAAT improves, we let our partners know so that they can deliver software updates. When we run into usability issues with devices, we make noise and offer to help. We have the contacts to get other companies to pay attention to issues.

Parity

One important part of the certification process is ensuring *Parity* between RAAT and other network based input options. Between the certification program and the Roon Ready license agreement, we make sure that users do not receive a worse experience when using a device via RAAT than they would using other network based input mechanisms. This requirement applies both at the time of certification and on an ongoing basis.

There are many dimensions to maintaining Parity. We obviously don't allow decisions that hurt the sound quality of the product when combined with Roon, but we also work to make sure that users have equal access to capabilities like Software Volume controls, Tone Controls, and DSP features in an endpoint device.

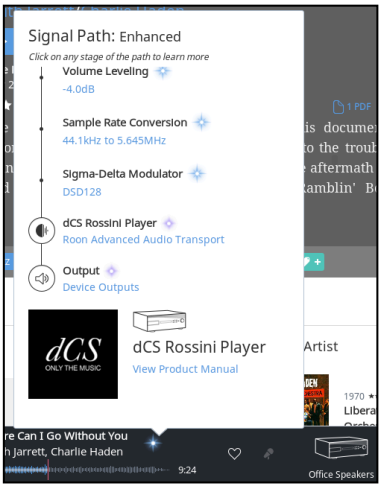
That said, the native capabilities of the device don't always match the capabilities exposed by other network input options. There are devices out there, for example, that accept 384kHz or DSD files when acting as media servers, but internally play those files at 192kHz after downsampling or DSD->PCM conversion. These situations are most common in systems that do not have their own "core", where endpoint devices are doing double-duty as playback hardware and media servers.

In Roon's architecture, we prefer to perform compatibility-oriented format conversions in the Core rather than performing them in endpoint firmware. In the end, this decision is made jointly by Roon and the Partner on a case-by-case basis. Sometimes conversions are moved from the device into Roon (since in most cases the Roon core has a much larger CPU and can perform higher quality conversions), and sometimes device manufacturers elect to keep conversions where they are and reflect them appropriately in Roon's Signal Path instead.

Regardless of the situation, we never allow a device to pass certification if we believe that using it with Roon will result in a downgrade in sound quality.

Co-Branding

Roon Ready products enjoy custom line art, manufacturer branding and product manual links in-app, like this:



As well as customized partner pages on our website like this.

Partner Devices Matrix

Roon supports a wide variety of hardware devices, including the ones in the lists below and many more. In general, we expect all Roon Ready, USB, AirPlay, Squeezebox, and Meridian devices to work with Roon.

What does "In-House" mean?

The "In-House" column indicates that we have one of these devices in-house for testing, QA, and support purposes, and that we have a relationship with the manufacturer.

Sometimes there are device-specific issues or quirks that require support, or even minor tweaks to Roon. When these issues arise, the dominant factor in how quickly they can be addressed is whether or not we have access to the hardware.

We openly encourage all manufacturers to send us samples and to point out any erroneous information on this page.

Roon Ready Network Devices

These devices enjoy our highest level of support. They support our flagship RAAT audio streaming technology natively, and we are personally involved in testing and certifying the implementations to ensure the best user experience possible when these devices are paired with Roon.

Vendor	Model	In-House
Audio Alchemy	DMP-1	Yes
Auralic	ARIES	Yes
Auralic	ARIES G2	Yes
Auralic	ARIES LE	Yes
Auralic	ARIES MINI	Yes
Auralic	ALTAIR	Yes
Auralic	POLARIS	No
Ayre	QX-5 twenty	Yes
Ayre	EX-8	Yes
Bluesound	NODE	No[2]
Bluesound	NODE 2	Yes[2]
Bluesound	POWERNODE	No[2]
Bluesound	POWERNODE 2	Yes[2]
Bluesound	PULSE	No[2]
Bluesound	PULSE 2	Yes[2]
Bluesound	PULSE FLEX	No[2]
Bluesound	PULSE MINI	No[2]
Bluesound	PULSE SOUNDBAR	No[2]
Bluesound	VAULT	No[2]
Bluesound	VAULT 2	Yes[2]
Brinkmann	Nyquist	Yes
Bricasti	M5 Network Player	Yes
Bricasti	M1 DAC	Yes
Bryston	BDP-1	No
Bryston	BDP-2	Yes
Bryston	BDP-3	Yes
Bryston	BDP-Pi	Yes
Cary Audio	AiOS	Yes[2]

Cary Audio	DMS-500	Yes[2]
cocktailAudio	X50	Yes
cocktailAudio	N15	Yes
dCS	Network Bridge	Yes
dCS	Rossini Player	Yes
dCS	Rossini DAC	No
dCS	Vivaldi Upsampler	Yes
dCS	Vivaldi One	Yes
DEQX	HDP-5	Yes
DEQX	Premate Plus	Yes
exaSound	PlayPoint	Yes
Elac	Discovery	Yes
Elac	Discovery Z3	Yes
HiFiBerry	Amp+	Yes
HiFiBerry	DAC+	Yes
HiFiBerry	Digi+	Yes
IQaudIO	Pi-DAC+	Yes
IQaudIO	Pi-DigiAMP+	Yes
Krell	Vanguard Universal DAC	Yes[3]
Krell	Digital Vanguard	Yes[3]
LUMIN	A1	No
LUMIN	D1	Yes
LUMIN	D2	No
LUMIN	M1	No
LUMIN	S1	No
LUMIN	T1	No
LUMIN	U1	No
Musica Pristina	A Cappella II	Yes
Musica Pristina	Virtuoso Network DAC	No
NAD	C368	Yes[2]
NAD	C388	No[2]
NAD	C390	No[2]
NAD	CI580	No[2]

NAD	CI720	No[2]	
NAD	M12	No[2]	
NAD	M15HD	No[2]	
NAD	M17	No[2]	
NAD	M32	No[2]	
NAD	M50	No[2]	
NAD	M50.2	No[2]	
NAD	T187	No[2]	
NAD	T757	No[2]	
NAD	T758	No[2]	
NAD	T777	No[2]	
NAD	T787	No[2]	
Naim	Uniti Atom	Yes	
Naim	Uniti Nova	Yes	
Naim	Uniti Star	No	
NOVAFiDELITY	N15	Yes	
NOVAFiDELITY	X50	Yes	
OPPO	UDP-203	Yes[1]	
OPPO	UDP-205	Yes[1]	
Sonore	MicroRendu	Yes	
Sonore	SonicOrbiter SE	Yes	
Sonore	microRendu	Yes	
Sonore	Signature Rendu SE	Yes	
Sonore	ultraRendu	Yes	
SOtM	sMS-200	Yes	
PS Audio	DirectStream DAC	Yes	MQA Decoding requires Redcloud update
PS Audio	DSjr DAC	Yes	MQA Decoding requires Redcloud update
PS Audio	PerfectWave DAC	Yes	MQA Decoding requires Redcloud update
TotalDAC	d1 music server	Yes	
Trinnov	Amethyst	Yes	
Trinnov	Altitude16	Yes	
Trinnov	Altitude32	Yes	

[1] Due to technical limitations within these products, the audio interface available to the RAAT firmware is unable to support DSD or multichannel playback. OPPO is investigating a path forward, but as of now, we don't know if or when these limitations will be bypassed.

[2] MQA decoding via RAAT is not yet available with this product.

[3] This device does not support convenience switching due to a hardware limitation.

Roon Tested USB Devices

Roon speaks to any USB device that is recognized as a sound card by the underlying operating system.

Unless otherwise noted, all of the below devices support USB Audio 2.0.

One of the most difficult user-experience details for device manufacturers is volume control. We've noted our experience with tested devices below, to help you make an informed decision. If you are planning to use the device in fixed output mode, or with a software volume control, this column will be less interesting.

When it comes to DSD playback, not all formats work on all platforms. For the most part, devices that support DSD64 and DSD128 do so on all platforms. Some devices can only accomplish DSD256 playback using ASIO drivers on Windows.

As always, the primary source for information about devices and their capabilities should be the manufacturers themselves. This page is purely for the convenience of our users.

Vendor	Model	In-House	USB Volume	Max Format	Notes
AudioQuest	DragonFly	Yes	Yes	96kHz	
AudioQuest	DragonFly Red	Yes	Yes	96kHz	
AudioQuest	DragonFly Black	Yes	Yes	96kHz	
Auralic	VEGA	Yes	No	384kHz DSD256	DSD256 requires firmware update at dealer
Bel Canto	DAC 2.5	Yes	No	96kHz	USB Audio 1.1 device
Bel Canto	uLink	Yes	Yes	192kHz	USB->S/PDIF Converter
Benchmark	DAC1 PRE	Yes	Yes	96kHz	USB Audio 1.1 device
Benchmark	DAC2 HGC	Yes	Yes[1]	192kHz DSD64	
Brinkmann	Nyquist	Yes	No	384kHz DSD256	
Chord	Hugo	Yes	No	384kHz DSD128	Has Internal Battery
Chord	Mojo	Yes	No	768kHz DSD256	Has Internal Battery
Chord	Hugo 2	Yes	No	768kHz DSD256	Has Internal Battery
Chord	Hugo TT	Yes	No	768kHz DSD256	Has Internal Battery
Chord	Dave	Yes	No	768kHz DSD512	
Chord	Blu Mk. 2	Yes	No	768kHz	
dCS	Paganini	Yes	No	192kHz	
dCS	Rossini	Yes	Yes[1]	384kHz DSD128	
dCS	Vivaldi	Yes	Yes[1]	384kHz DSD128	
dCS	Vivaldi One	Yes	Yes[1]	384kHz DSD128	
DEQX	HDP-5	Yes	Yes	192kHz	
DEQX	Premate Plus	Yes	Yes	192kHz	
exaSound	e12	Yes	Yes	384kHz DSD256	ASIO is supported on Mac
exaSound	e22	No	Yes	384kHz DSD256	ASIO is supported on Mac
exaSound	e28	Yes	Yes	384kHz DSD256	ASIO is supported on Mac
exaSound	e32	No	Yes	384kHz DSD256	ASIO is supported on Mac
exaSound	e38	Yes	Yes	384kHz DSD256	ASIO is supported on Mac

Exogal	Comet	Yes	Pending	Pending	
HOLO	Spring	Yes	Yes[1]	384kHz DSD512	
iFi	iDAC2 Micro	Yes	No	384kHz DSD256	
iFi	iDSD Micro	Yes	No	768kHz DSD512	Has Internal Battery
iFi	iDSD Nano	No	No	768kHz DSD256	
iFi	iLink	No	No	192kHz	
KEF	Egg	Yes	Yes	96kHz	USB Audio 1.1 device
KEF	LS50 Wireless	Yes	Yes	192kHz	
LH-Labs	Pulse	Yes	Yes	384kHz DSD128	
LH-Labs	Pulse X	Yes	Yes	384kHz DSD128	
LH-Labs	Pulse X∞	Yes	Yes	384kHz DSD256	
LH-Labs	GeekOut V2	Yes	Yes	384kHz DSD128	
LH-Labs	GeekOut V2+	Yes	Yes	384kHz DSD128	Has Internal Battery
Korg	DS-DAC-10R	Yes	No	192kHz DSD128	Setup: 0.5s resync delay, Max PCM Rate 192kHz
Meitner	MA-1	Yes	Yes	192kHz	
Meridian	Explorer	Yes	Yes[2]	192kHz	
Meridian	Explorer[2]	Yes	Yes[2]	192kHz	
Meridian	Prime	Yes	No	192kHz	
Meridian	Director	Yes	No	192kHz	
Moon	230HAD	Yes	No	384kHz DSD256	
Moon	280D	Yes	No	384kHz DSD256	
Moon	340i	No	No	384kHz DSD256	(D3 option req'd for DSD)
Moon	350P	No	No	384kHz DSD256	(D3 option req'd for DSD)
Moon	430HA	No	No	384kHz DSD256	(D3 option req'd for DSD)
Moon	260D	No	No	192kHz	
Moon	380D	No	No	384kHz DSD256	
Moon	650D	No	No	192kHz	

Moon	780D	No	No	384kHz DSD256	
Moon	ACE	No	No	384kHz DSD256	
MSB	The Analog	Yes	Yes[1]	384kHz DSD256	
Mytek	Stereo192 DSD-DAC	Yes	No	192kHz DSD128	Mac USB driver support is inconsistent.
Mytek	Brooklyn	Yes	Yes	384kHz DSD256	
Oppo	BDP-105	Yes	Pending	Pending	
Peachtree	Nova	Yes	No	192k	
Pro-Ject	Maia DS2	Yes	Yes[1]	384kHz DSD256	
Pro-Ject	DAC Box DS2 Ultra	Yes	No	768kHz DSD256	
Pro-Ject	Pre Box DS2 Digital	Yes	No	768kHz DSD256	
Pro-Ject	Pre Box RS Digital	Yes	Yes[1]	192kHz DSD256	
Pro-Ject	Pre Box S2 Digital	Yes	No	768kHz DSD256	
PS Audio	DirectStream DAC	Yes	Yes[1]	384kHz DSD256	
PS Audio	DirectStream Junior DAC	Yes	Yes[1]	384kHz DSD256	
PS Audio	DirectStream PerfectWave DAC	Yes	Yes	192kHz	
Resonessence Labs	HERUS	Yes	Yes	352kHz DSD128	
Resonessence Labs	HERUS+	Yes	Yes	352kHz DSD128	
Schiit	Bifrost	Yes	No	192kHz	
Schiit	Modi 2	Yes	No	192kHz	
Soulution	590	Yes	No	192kHz	S/PDIF Bridge
T+A	DAC 8 DSD	Yes	No	384kHz DSD512	
Teac	UD-501	Yes	No	DSD128	
Technics	SU-G30	Yes	No	384kHz DSD256	
Technics	SU-G700	No	No	384kHz DSD256	
Technics	SU-R1	No	No	384kHz DSD128	
Technics	ST-C700D	No	No	192kHz DSD128	

Technics	ST-C700	No	No	192kHz DSD128
Technics	SU-C700	No	No	192kHz DSD128
Technics	SU-C500	No	No	192kHz DSD128
Technics	SU-C550	No	No	192kHz DSD128
TotalDAC	d1 family	Yes	No	192kHz DSD64

[1] When the USB-based volume control on this device is below 100%, DoP playback does not work

[2] Volume control impacts the headphone jack, but not the digital/line out

Meridian and Sooloos Networked Devices

Meridian's streaming protocol supports audio transport at up to 24/96. Roon will convert all higher-resolution content to 24/96 or 24/88 before transmitting it to Meridian devices.

Some Meridian configurations support higher quality playback via MQA encapsulation.

Meridian's zone linking implementation does not include a mechanism for clock drift compensation. We do not recommend using it unless you're using hardware-based clock slaving to keep things in lock-step.

Vendor	**Model**	**In-House**	**Max Format**	**Notes**
Meridian	218	Yes	24/96	
Meridian	251	Yes	24/96	
Meridian	ID40/41	Yes	24/96	Plug-in modules for 800 series products.
Meridian	MS200	Yes	24/96	
Meridian	MS600	Yes	24/96	
Meridian	MC200	No	24/96	
Meridian	MC600	No	24/96	
Meridian	Control:10	No	24/96[2]	
Meridian	Control:15	No	24/96	
Meridian	Ensemble	No	24/96[1]	
Meridian	Source:One	No	24/96	
Meridian	Source:Five	No	24/96[1]	Severely performance constrained. Not recommended.

[1] The Ensemble and Source:Five internally resample all audio to 16/44.1

[2] The Control:10 resamples all 88.2kHz audio to 44.1kHz

Merging Technologies NADAC

Roon supports Merging's NADAC, and we keep one in house for testing + support. The NADAC is a networked DAC that communicates with Roon using a CoreAudio or ASIO driver.

AirPlay Devices

Roon supports most AirPlay devices released from 2011 onwards. Roon will convert all audio at higher resolution than 16/44 to 16/44 before transmitting it to an AirPlay device.

Vendor	Model	In-House	Max Format	Notes
Apple	Apple TV2	Yes	16/44[1]	
Apple	Apple TV3	Yes	16/44[1]	
Apple	Apple TV4	Yes	16/44[1]	
Apple	Airport Express (2nd gen)	No	16/44	
Bowers and Wilkins	A7	Yes	16/44	
Bowers and Wilkins	A5	No	16/44	
Bowers and Wilkins	T7	No	16/44	
Bowers and Wilkins	Z2	No	16/44	
Bowers and Wilkins	Zeppelin	No	16/44	
Naim	Mu-So	Yes	16/44	

[1] Apple TV models internally resample all audio to 16/48

Raspberry Pi HATs

Roon is compatible with the Raspberry Pi 2 and 3, and supports all known Raspberry Pi HATs that expose ALSA drivers on those platforms. Most of our users use DietPi or Ropieee.

Vendor	Model	In-House
Allo	Piano	No
Allo	Piano 2.1	Yes
Allo	Boss DAC	Yes
Allo	DigiOne	Yes
Allo	USBridge	Yes
HiFiBerry	Amp+	Yes
HiFiBerry	DAC+	Yes
HiFiBerry	Digi+	Yes

IQaudIO	Pi-Digi+	Yes
IQaudIO	Pi-DAC+	Yes
IQaudIO	Pi-DAC Pro	Yes
IQaudIO	Pi-DigiAMP+	Yes

Squeezebox Devices

Roon supports audio streaming to Squeezebox endpoints.

For more information on how this works and some of the limitations in our integration, see our Squeezebox Setup page.

The Squeezebox products have rather weak WiFi implementations. Playback up to 24/48 is fairly solid on these devices over WiFi, but we recommend using Ethernet for higher-rate applications.

Roon speaks to software-based Squeezebox emulators like Squeezelite and SqueezePlay, but we do not provide technical support for these configurations. You can find help with this in the community.

Vendor	Model	In-House	Max Format	Notes
Logitech	Squeezebox 3	Yes	24/48	
Logitech	Sqeezebox Radio	Yes	24/48	
Logitech	Squeezebox Boom	Yes	24/48	
Logitech	Squeezebox Transporter	No	24/96	
Logitech	Squeezebox Duet	No	24/48	
Logitech	Squeezebox Touch	Yes	24/96	
Logitech	Squeezebox Touch+EDO	Yes	24/192 DSD64[1]	Requires 7.8.x firmware and EDO plugin, only for S/PDIF output

[1] Roon can send DoP encapsulated DoP64 to the Squeezebox Touch for use with a DSD capable DAC with an S/PDIF input.

Devialet AIR

Roon supports the Devialet AIR protocol and can stream to Devialet Expert products.

Sonos

Roon can stream to all Sonos products.

Chromecast

Roon can stream to all Chromecast-compatible products.

KEF LS-50 Wireless

Roon supports network streaming to KEF LS-50 Wireless speakers.

Due to the technical details of KEF streaming these speakers are not Roon Ready, so linking multiple pairs of LS50w is not possible and some RAAT-specific functionality (like convenience switching or advanced Signal Path functionality) is not possible.

Software Products

HQPlayer

HQPlayer is an advanced, up-sampling media player. It offers some of the best software-based up-sampling and sigma-delta processing available on the market today, as well as convolution, channel mapping, and networked audio output solutions.

Roon can be configured to use HQPlayer as its audio output. In these configurations, HQPlayer owns the final connection to the device, and Roon is just passing along a stream of bits from your media files.

This allows you to enjoy the processing benefits of HQPlayer and the library management capabilities of Roon at the same time.

Virtual Sound Cards

Roon works with some virtual sound card products. We know that some of our users have used, or have attempted to use, software products like like DIRAC, JPLAY, Asio4All, and JRiver via ASIO, WDM, and/or CoreAudio drivers.

These are difficult to support because they don't always behave exactly like real hardware/drivers. Sometimes if we can exactly replicate a problematic situation in-house, it's possible to tweak Roon to be more compatible even when these things aren't perfectly behaved. If you are having an issue with one of these please report it to our support team, and we'll see what can be done about it.

Just as with hardware devices, it always helps when manufacturers cooperate during support situations and provide licenses to their software for support purposes.

10.3 Roon Server on NAS

Roon Server requires a more powerful processor than most media servers due to the architecture of our Core. Historically, most NAS devices have not been powerful enough to deliver a first class experience with Roon, but an increasing number are becoming capable.

Less powerful NAS devices can also work for smaller collections, although they won't perform as well as systems that meet our recommended specifications.

Why would anyone want this?

If you already have a capable NAS and you don't want another machine in the house to run as the brain of your audio system, running Roon Server on your NAS can be a great solution. If you have a large amount of content, a NAS can be a convenient and secure way to store it, especially if you have other personal media (photos, video, backups). Another benefit is that NAS operating systems can provide RAID mirroring, which provides fault tolerance. *However, remember that RAID mirroring is not an alternative to backup.*

Why wouldn't someone want this?

NAS devices are electrically and mechanically noisy, not optimized for high performance audio, and not especially powerful (for their cost). With the arrival of 6TB and 8TB drives, most people no longer need a multi-disk NAS in the home because all their music can be stored on a single drive, and less expensive machines for running your audio system exist.

Which NAS devices are supported?

Most QNAP and Synology devices with a 64-bit Intel CPU and at least 2GB RAM are supported.

We strongly recommend 4GB of RAM and an SSD for the Roon databases. Your music files can be on spinning disks, but ideally the Roon database should be on an SSD. This one optimization can provide the single biggest improvement to Roon's performance and user experience.

Note: If your NAS does not have a free slot for an SSD, you can use a SSD via an external enclosure connected via eSATA or USB 3.0. Anything 64GB or larger should be fine -- extra space will not help you any. In mid-2016, you can buy a 128GB USB 3.0 SSD on Amazon for under $60. The gain in experience is absolutely worth the $60. An upgrade of RAM can be done on many devices; check your NAS device's manual.

What is the ideal NAS configuration for Roon?

The NAS family we recommend as of mid-2016 is the QNAP TVS-471 with an Intel Core i3 or i5 and 4GB of RAM.

An optimal NAS configuration:

- 1 bay with a small SSD (120GB, about $40 right now) for the Roon Server install and the Roon database

- 2 bays with 6TB drives, RAID1 (mirrored)
- 1 bay with 6TB drive for weekly backup off the mirrored set

Why this works so well:

- The SSD gives you fast performance for Roon. We advise against running Roon's database on a spinning disk.
- The dual 6TB mirrored drives give you fault tolerant storage for music, which allow for about 15,000 CD quality albums.
- The third 6TB drive gives you a periodic local backup of your music. Remember, RAID is fault tolerance, and not backup.

The whole thing is under $2k and pretty awesome to stuff in a closet or rack away from your listening room.

If you require more music storage (or storage for something other than music), go with a TVS-671 or TVS-871, which have more drive bays. On these platforms, use a similar configuration as noted above.

What is a Roon database? Where are the music files stored?

Roon stores its metadata and indexes in a custom database built for performance. This database is populated by Roon when it identifies your music files. It lives separately from your music files, and for performance reasons, it is highly recommended that the Roon database be on an SSD instead of a spinning disk. Your music files can be stored on spinning disks with no consequences to performance.

The database files are internal to Roon, and should not be manipulated.

Normally, if your music files are on the NAS's drive, you would access them with smb://host/share or \host\share syntax. However, since the files are local on the NAS, which is where your Roon Server is running too, you can use the local paths for better performance. See the install info below on how to pick the right local path.

What will happen if Roon Server runs on a slower CPU (such as Atom or Celeron)?

Roon Server uses a lot more CPU than any other audio software. You can read about why we have a Core and why it requires so much more CPU than other software here.

While Roon Server will work fine on these slower CPUs, consequences of running on them potentially include:

- Stuttering or dropouts in audio playback
- Slow response for searching
- Slow loading of artist, album, composer, and work pages
- Longer startup and connection times for remotes

- Slower audio analysis for normalization/crossfading/other
- Slower import of new music

Overall, the experience will not be as good as it can be. You can fix this by running on a better suited CPU, such as an Intel Core i3 or i5.

What will happen if the Roon database runs on a spinning disk (non-SSD)?

Roon database performance is impacted most by the media the Roon database is run on. We don't run Roon databases on spinning disks, and neither should you. Will it work? Yes. Will you have the best Roon experience: NO. Everything will be noticeably sluggish if you run on a spinning disk.

How does this install differ than a normal Linux install?

The NAS's operating system is not general purpose, but the Roon Server software for your NAS is the same as the standard Linux Roon Server, so there should be no difference in functionality.

As with any Linux installation, support for Native DSD output is contingent on having a kernel + ALSA library that supports it.

How do I install Roon on my QNAP or Synology NAS?

This project was a collaboration between the Roon Team and a member of the Roon community: Chris Rieke!

Chris had started working on the Synology version of Roon Server on his own, so we contacted him and arranged to work together on these projects. Chris will be involved in the maintenance and support for both of these NAS packages in the future.

Roon Server for QNAP can be installed from the QNAP App Center (under "*Entertainment* "). Download links for the Synology version of Roon Server, as well as detailed installation instructions can be found on his site.

10.4 ROCK, Roon OS & NUC

Creating Your Own ROCK Server

ROCK is a do-it-yourself build of Roon OS, a custom Linux based operating system for running Roon Server.

ROCK: The Roon Optimized Core Kit

Let's first explain what Roon OS is, and then we can talk about Roon Optimized Core Kit.

Roon OS is a custom Linux based operating system, tailored for running Roon Server and providing a best-in-class, appliance-type user experience to host the Roon Core.

Roon OS boots very quickly and integrates with the Roon suite of applications for updating, discovery, configuration, and support. It also comes with a disaster recovery mechanism.

Roon OS includes a web-based administration UI which allows users to check system status, configure network settings, start or stop services, and factory-reset the device from desktop and mobile web browsers. The Roon application also can locate Roon OS on the network and give the user a link to open this web UI in a browser.

To allow partner manufacturers to build custom turn-key Roon Server based offerings, Roon OS has a few hooks for manufacturers to customize Roon OS to their specific device.

So, what is Roon Optimized Core Kit (ROCK) then?

ROCK is a do-it-yourself build of Roon OS. To use it, you will need to buy hardware components, assemble them, and install ROCK.

This is is what ROCK offers (and what it doesn't offer):

- It is completely free ($0).
- It is an alternative to Windows/MacOS/Ubuntu/Arch/etc..
- It runs Roon (The stock Linux Roon Server to be exact), but does not come with a Roon membership. You can sign up for a free trial or purchase a Roon membership here.
- It is an extremely lightweight Linux-based operating system. Much more on the scale of an embedded machine than a desktop or server operating system.
- It is a turn-key image with all required pieces to make a Linux based Roon appliance without any prior knowledge of Roon or Linux.
- It should be near silent or completely silent, depending on hardware.
- It auto-updates in an experience similar to Roon, integrated fully into the Roon Remotes' *Settings -> About* page.
- OS updates will blow away any "custom" changes you may have made to the OS, so we do not recommend you try to tweak the OS.

- It provides a web browser based configuration for networking setup, factory reset, power/reboot, etc...
- It can not run additional software, nor does it support any customizations or modifications to the operating system.
- It has working multichannel digital audio output support (if the hardware has a working HDMI or DisplayPort connector).

You can migrate your Roon databases over to it easily using our Backup functionality. It exposes your internal storage and external storage (USB) drives over an SMB share (micro-NAS!). You can backup your storage content using whatever backup solution you use currently because the internal storage is accessible via a network share. The OS does not need to be backed up, because it can easily be re-flashed at any time.

What hardware does ROCK run on?

For a fully turn-key fanless system in a beautiful case, you will want the Nucleus by Roon Labs.

If you are willing to buy computer components, put it together, and install the operating system by hand, we suggest the following configurations:

ROCK For Small to Medium Sized Libraries

We recommend the NUC7i3BNH with 4GB RAM and 64GB M.2 SSD for small to medium sized libraries. You can find these components on Amazon at the links below, or add them to your Amazon cart with one click further down.

Component	Amazon US	Amazon UK	Amazon DE
NUC7i3BNH	View	View	View
4GB RAM	View	View	View
+ upgrade to 8GB RAM	View	View	View
64GB M.2 SSD*	View	View	View
*+ upgrade to 128GB M.2 SSD**	View	View	View

*If you are planning to add a non-M.2 SSD for internal storage, please note that the Intel NUC will only accept 2.5" drives with a maximum 9.5mm thickness.

You can add the base NUC7i3BNH + 4GB RAM + 64GB M.2 SSD to your Amazon cart with one click at these links:

Add to cart Amazon US

Add to cart Amazon UK

Add to cart Amazon DE

ROCK For Large Libraries or DSP Use

We recommend the NUC7i7BNH with 8GB RAM and 64GB M.2 SSD for large libraries or heavy DSP use. You can find these components on Amazon at the links below, or add them to your Amazon cart with one click further down.

Component	Amazon US	Amazon UK	Amazon DE
NUC7i7BNH	View	View	View
8GB RAM	View	View	View
64GB M.2 SSD*	View	View	View
*+ upgrade to 128GB M.2 SSD**	View	View	View

*If you are planning to add a non-M.2 SSD for internal storage, please note that the Intel NUC will only accept 2.5" drives with a maximum 9.5mm thickness.

You can add the base NUC7i7BNH + 8GB RAM + 64GB M.2 SSD to your Amazon cart with one click at these links:

Add to cart Amazon US

Add to cart Amazon UK

Add to cart Amazon DE

If you have trouble finding the 64GB SSD, just get a 128GB. The price difference should be small and soon enough it'll become impossible to find 64GB. The NUCs above can hold 42mm or 80mm M.2.

Same goes for 4GB RAM -- just get an 8GB stick if you can't find the 4GB stick. Make sure the spec is the same -- DDR4 SODIMM.

If you have more than 12,000 albums, or plan on using demanding DSP features in Roon, we suggest you get the second option.

More about ROCK's hardware support...

- We have worked with Intel to support their Intel NUC line of products. They are low power high performance easy to install units that work very nicely as a Roon Core Server. The models we support are:
    - NUC5i3XXX
    - NUC5i5XXX
    - NUC6i3XXX
    - NUC6i5XXX

  - NUC7i3XXX
  - NUC7i5XXX
  - NUC7i7XXX
- **Any hardware configurations other than the above are unsupported**. Although they may work now, they may also stop working at any time due to updates.
- You will need most likely need to update your BIOS on these machines.
- We recommend using the onboard ethernet, but support for some USB ethernet and WiFi adapters are included. Some of the above NUCs have built in WiFi, which we do support, but once again, we recommend using ethernet.
- 4gb RAM minimum, 8gb is more than you will ever need. More than 8GB is not used ever.
- Make sure you are installing to an SSD and not a spinning disk. The NUCs we recommend have an M.2 SSD slot for just this purpose. ROCK's installer will use a tiny bit of it for the operating system, and the rest for the Roon Database.
- **The SSD can not be used for music content**. If you want music content in this device, use another disk (see below about "internal storage").
- The SSD can be 64GB or larger -- note that larger SSDs tend to be faster due to how the chips are laid out (after 256GB, it doesn't matter... for now). It is extremely rare you will need more than 64GB of storage on this SSD. ROCK will not use it.
- Internal storage (for music content) can be any size, and can be an SSD or a spinning disk.
- Internal storage (for music content) WILL be reformatted, so don't put your music on it and expect it to work.. you will need to copy your music to it via the network share exposed, or via Roon drag/drop import.
- External storage (USB) is also supported.
- External storage (USB) can be most popular filesystem formats, and will not be formatted, so you can put your music on it and just plug it into the box. Filesystems supported: EXT2/3/4 VFAT/FAT32/FAT16/EXFAT NTFS HFSPLUS HFS.
- ROCK can also mount SMB shares (but not AFP or NFS).
- USB DACs are supported, as are the built-in audio devices on the machine. We have tested the built-in devices briefly, but have not done serious tests to check for their SQ. These built-in devices can differ based on your exact hardware configuration, so we don't plan on doing SQ test in the future. All audio devices are supported in exclusive mode.

Which NUC do I need?

Here is an example on how to read recent (this scheme is used since the 5th generation) NUC model names:

NUC7i7BNH should be read as **NUC, 7, i7, BN, H**

- **NUC** == NUC
- **7** => 7th generation
- **i7** => i7 cpu, i3 for i3, i5 for i5, i7 for i7, C for Celeron, P for Pentium
- **BN** => model name -- this name is arbitrary

- **H** => a slot for 2.5" hard drive. There is also **K** for no-hard-drive slot, and **B/E** for board-only and embedded models-- but those are not consumer models.

Now that you can understand those model names, and you read the requirements plus what we have tested above, you can figure out what NUCs will most likely work. You can find the models for all the NUCs here.

If this is still not enough information, you should wait to see what works for other Roon members, or go with the NUC7i7BNH, as that is the best NUC that we've used.

Will ROCK run on my existing hardware? How about this other hardware?

We have only tested with the above mentioned NUCs. It may work with other machines, but the drivers needed may not exist there. Try it out and let us know. **We can not comment on whether any different hardware will work, as we have not tested it. We will not make any guesses, educated as they might be.**

If you do manage to get it to run, that's great, but we can not guarantee it will continue to work with future builds. **Consider yourself warned.**

ROCK is great, but I want to do X Y and Z.

Please read this. It was written by a member of our community that summed up our thoughts on this very well.

Step 1: Preparing to Install ROCK on NUC Hardware

Note: No treatment of installing ROCK on the NUC would be complete without references to the excellent Youtube videos on the subject prepared by Hans Beekhuyzen. We recommend you watch all three in their entirety:

- Roon Core for the Intel NUC Part 1 (Introduction)
- Roon Core for the Intel NUC Part 2 (Installation)
- Roon Rock for the Intel NUC Part 3 (Usage)

Roon Optimized Core Kit (ROCK) comes with a “factory reset” disk image, that is meant to be flashed onto a USB flash drive. When the device is booted from this USB flash drive, it will partition, format, and initialize your SSD.

Prepare your NUC

- Install a 64GB or larger SSD into the M.2 Slot.
- Install 4GB or more of RAM.
- Optionally, install a 2.5" internal SATA disk. You can only use 1, so don't bother with more.
    - For more information about storage options for use with ROCK, see here.
- Plug in a monitor via HDMI, and a USB keyboard. A mouse can be helpful to configure your BIOS, but it is not required.
- Plug in an ethernet cable to attach the NUC to your network. You can change to a wifi connection later if you really feel you must, but initially you need to be hardwired.

- Plug in the NUC power cable and connect to the mains. The front panel lights should come on.
- Press the power button on the front panel.

At this point, there's no operating system on the NUC, but it should boot and you should see the Intel welcome/splash screen. Note that this screen should also have the correct keyboard shortcuts for entering the BIOS which you'll need in the next section.

Before moving forward, note that you will also need:

- An existing internet connected computer (Mac, Windows, or Linux) with a USB port
- A USB flash drive (this should be formatted FAT or FAT32)

Step 2: Updating and Configuring the BIOS On Your NUC

Before installing ROCK, it's critical your NUC's BIOS is updated and properly configured. This section explains the correct settings step-by-step.

You should only need to do this once, during the initial configuration of ROCK.

Download The Latest BIOS

The first step is to visit Intel's website and download the latest BIOS for your device. You can find the latest BIOS by visiting Intel's Download Center and searching for your NUC's model (ie "`NUC7i3`").

You must download the BIOS as a `.BIO` file - this is the mandatory format you will require.

Once you've downloaded the `.BIO` file, save it to your USB flash drive.

Update Your NUC's BIOS

Note: Intel's original instructions are here, if you would like to review them.

- Plug the USB drive with `.BIO` file into your NUC.
- Connect your monitor and keyboard
- Boot the NUC and press F7 when the splash screen prompt is displayed
- Select the USB drive and press `Enter`
- Select the `.BIO` file and press `Enter`
- Confirm you want to update the BIOS by pressing `Enter`

The BIOS update should take a few minutes. Once it's complete, remove the USB drive and reboot.

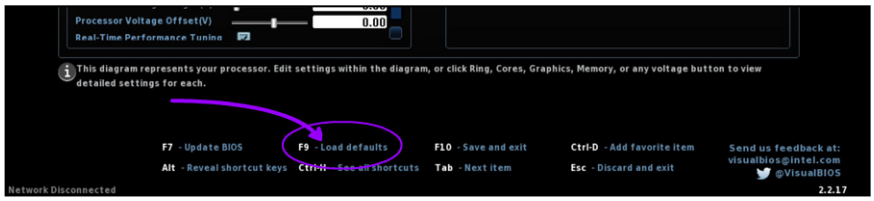
For now, leave the monitor and keyboard attached -- you'll need them in the next step.

Note: If your NUC is not recognizing the USB drive, make sure it's formatted FAT or FAT32!

Configure Your BIOS for ROCK

You'll need to make a couple of quick changes to your NUC's BIOS in order for ROCK to work properly. At this point, your monitor and keyboard should still be attached to the NUC.

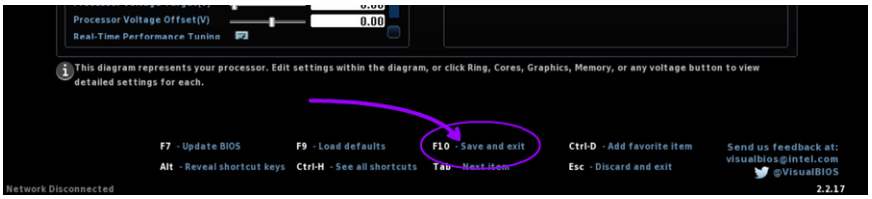
- Boot the NUC and press F2 during startup to entire the BIOS configuration screen
- In the BIOS configuration screen, start by setting your BIOS to the factory defaults by pressing F9



Once you've restored your BIOS settings to the default, make the following changes:

- Set the proper Boot Settings (you may need to click "Advanced" first):
    - Use **`Legacy`**, not **`UEFI`**
    - Set the boot order to boot from your SSD first (you can drag the drives into the proper order if you're using a mouse. Otherwise you can use the **+** and **–** keys
    - Disable Network Boot
    - Enable USB Boot but make sure the SSD has boot priority
    - You may need to enable the M.2 slot, depending on the BIOS version
    - Save your BIOS changes

Note: Make sure you save your BIOS settings by hitting the F10 Key!



Step 3: Imaging Your NUC with the ROCK Factory Reset Image

To install ROCK, you will first need to download the factory reset disk image to another computer (like a Windows PC or a Mac). You can download the image from here.

After the download, this file has an extension of ".img.gz" -- you do not need to decompress/unzip it.

Creating the Factory Reset USB flash drive (using a Mac/PC, not the NUC):

Now that you've downloaded the image to another computer, you will need to write this image to a USB flash drive.

Windows / Mac OS / Linux

- Plug in your USB flash drive (it must be larger than the factory reset image size -- 1GB is more than enough).
- Download and install Etcher from https://etcher.io/.
- Start Etcher.

- From the Etcher application interface, select your `.img.gz` file as "the image".
- From the Etcher application interface, select your USB flash drive as "the drive".
- Click on "Flash!".

Linux Command Line

- Uncompress your .img.gz file by running gzip -d roonbox-linuxx64-nuc3-usb-factoryreset.img.gz, which will leave you with a .img file.
- Plug in your USB flash drive (it must be larger than the factory reset image size -- 1GB is more than enough).
- Run `sudo dmesg` to determine the device name given to your USB flash drive. It will be something like `/dev/sdb`.
- Unmount any directory your flash drive was mounted to.
- Run `sudo dd bs=10485760 if=roonbox-linuxx64-nuc3-usb-factoryreset.img of=/dev/sdb` (replace "`sdb`" with the appropriate device name). This can take a few minutes, depending on the speed of your USB flash drive.

Installing the Factory Reset Image on Your NUC

- Turn off your NUC.
- Unplug any USB storage you might have plugged into it. You can plug it back in after your install.
- Insert the USB flash drive you just prepared into a front panel USB connector of the NUC.
- Turn on the NUC and press the F10 key on your keyboard. Continue to hold the F10 key down until you appear at a menu that is asking you which device you'd like to boot from.
- Select the USB flash drive.
- Follow the instructions to install this base version of Roon OS. This procedure can take a few minutes, depending on the performance of your USB flash drive and the SSD to which you are installing.
- Once it is done installing, unplug the USB flash drive and hit ENTER to reboot.
- On next boot, don't hold F10. Your NUC should boot from the SSD, and a few seconds later, you should see a Roon message displaying the IP address of the NUC. This IP address should be entered in a web browser (on another computer) in order to complete ROCK setup (installing Codecs).

Note: If you don't see an IP address, you're not on the network. Is your ethernet cable plugged in? You can change to a wifi connection later if you really feel you must, but initially you need to be hardwired.

Step 4: Resolving Codec Issues

Roon does not ship with patented codecs such as MP3 and AAC.

- On Android/iOS, Roon does not decode audio formats.
- On Windows/Mac, it uses the built-in system codecs.
- On Linux, Roon expects to find the codecs installed as part of the Linux based operating system.

- On Roon Core Partner hardware devices, the partner is expected to license the codecs required and provide them in their operating system.

Because Roon OS is optimized to do nothing but run Roon in the most efficient manner possible, it lacks the general purpose packages that come along with a large server or desktop Linux OS install.

Missing Codecs?

If you visit the web UI of Roon OS, it will most likely tell you that you are missing codecs.

To rectify this situation, you will need to make the codecs accessible to Roon OS. This is done by placing the `ffmpeg` file in the `Codecs` folder of Roon OS's shared `data` directory.

How To Add Codecs: Step By Step

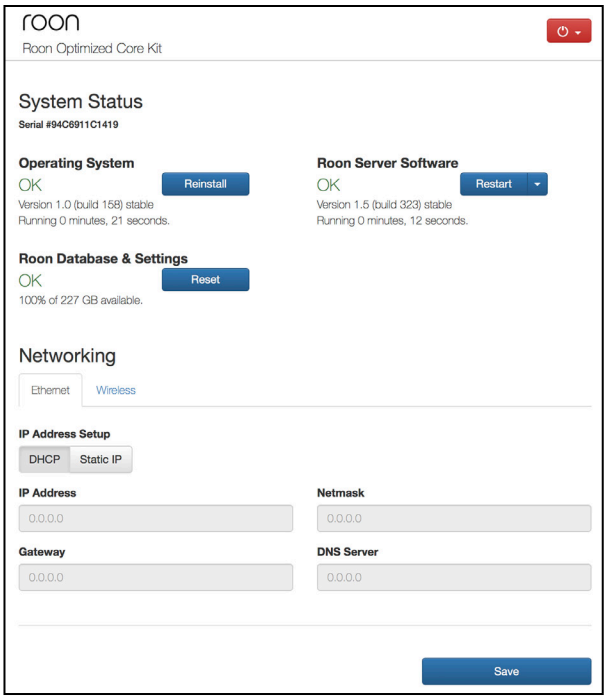
1. **Download `ffmpeg`** - Roon will need access to the required codecs via the `/Data/Codecs/` directory. You will need to download these codecs on another computer before placing them on ROCK. Get the file here: https://cdn.computeraudiophile.com/article-images/2017/0601/ffmpeg.zip. Now uncompress the file. Remember, no additional files from that package are required, only `ffmpeg`.
2. **Connect To Roon OS** - Roon OS exposes a shared network folder called `Data`. You can access this SMB share this way:
   - **Windows** - In Windows Explorer, type `\\ROCK\`
   - **MacOS** - In Finder, click *Go*, then *Connect To Server*. Then type `smb://ROCK/` and connect as a Guest

   Note: In either case, you can also replace `ROCK` with the IP address of your Roon OS device.
3. **Copy Codecs to Roon OS** - Place the `ffmpeg` file in the `Codecs` folder, which you can find in Roon OS's `Data` directory.

Step 5: Restarting Your Core via Roon OS Web Configuration

Any device that runs Roon OS includes a web-based administration tool, where you can:

- Reboot or power off your Roon OS device
- Confirm your device's Serial Number
- Confirm what version of Roon OS you're running, and reinstall the latest update
- Stop or Restart the Roon Server software running on Roon OS
- Configure network settings for Ethernet and Wifi
- Reset your Roon database and settings (warning: this is permanent, and will erase your Roon database)

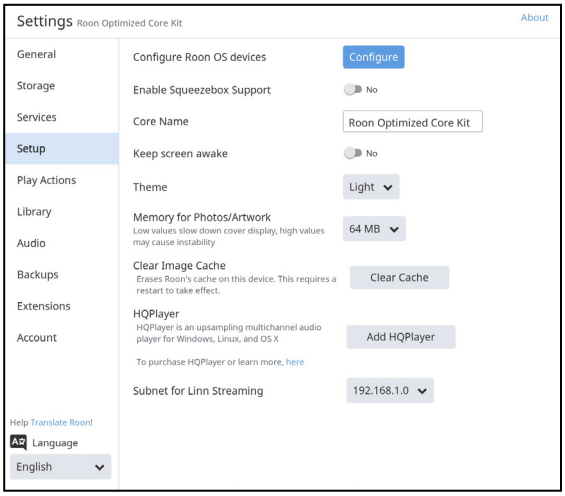


Option 1:

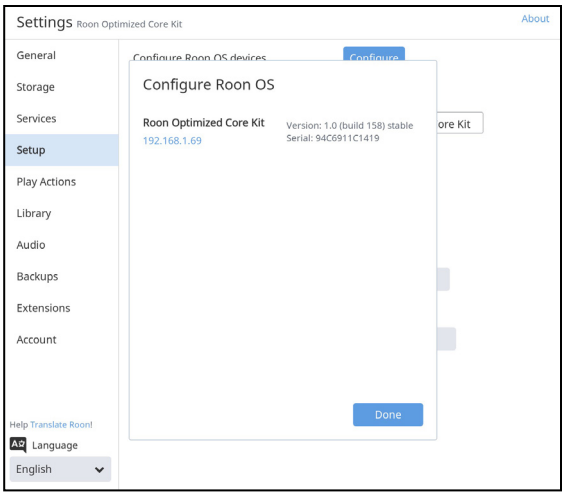
Simply point your Mac/PC browser to the IP address of your NUC. On the *Roon OS Web Configuration* screen shown above, click on *Restart*. Now your ROCK will 'see' its Codecs.

Option 2:

Alternatively, using a Roon Remote, go to *Settings* -> *Setup* as shown below, and click on *Configure*.



Select the ROCK Server …



And you'll see the same *Roon OS Web Configuration* screen we pictured earlier on in Step 5.

And ... You're Done!

You're all done now! You have a working Roon OS Server. Now you can proceed to put your music on it - and/or migrate your Roon database from a Roon system you previously ran on a Mac, Linux or PC.

Migrating an Existing Roon Database To ROCK

If you're setting up ROCK, and your Roon Core had previously been running on Mac, Windows, or Linux, the next thing you'll want to do is to migrate your Roon database.

Your database includes your playlists, edits, play history, tags, settings, and more. This guide will walk you through the process.

Backup Your Database

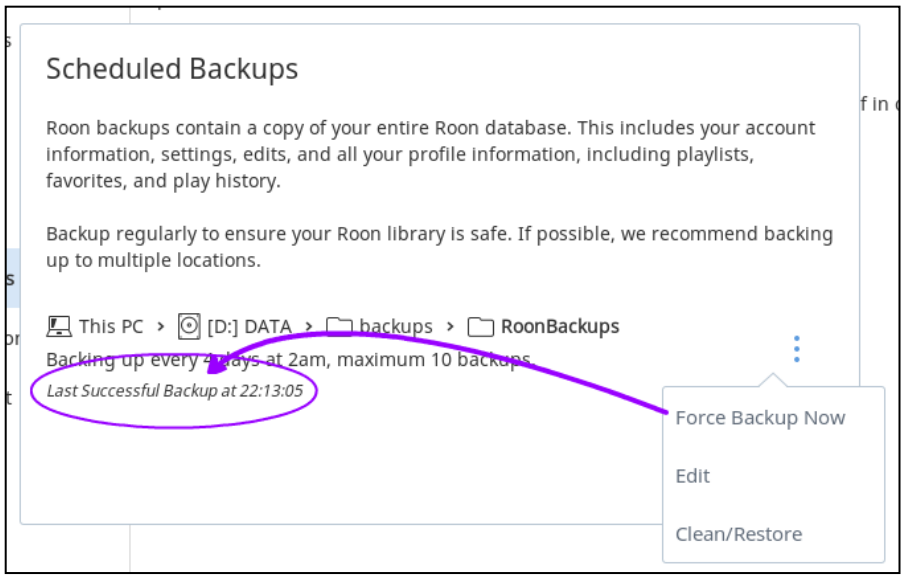
In order to migrate to ROCK, the first step is to backup your database. To do this, we strongly recommend you connect a USB drive directly to your existing Core, or use a NAS or other network storage device on your local network.

Note: While Dropbox is a good way to keep an incremental backup in the cloud, we don't recommend it for this migration, as you will be transferring an entire copy of your database, and Dropbox will be significantly slower than USB or network storage.

If you already have a scheduled backup:

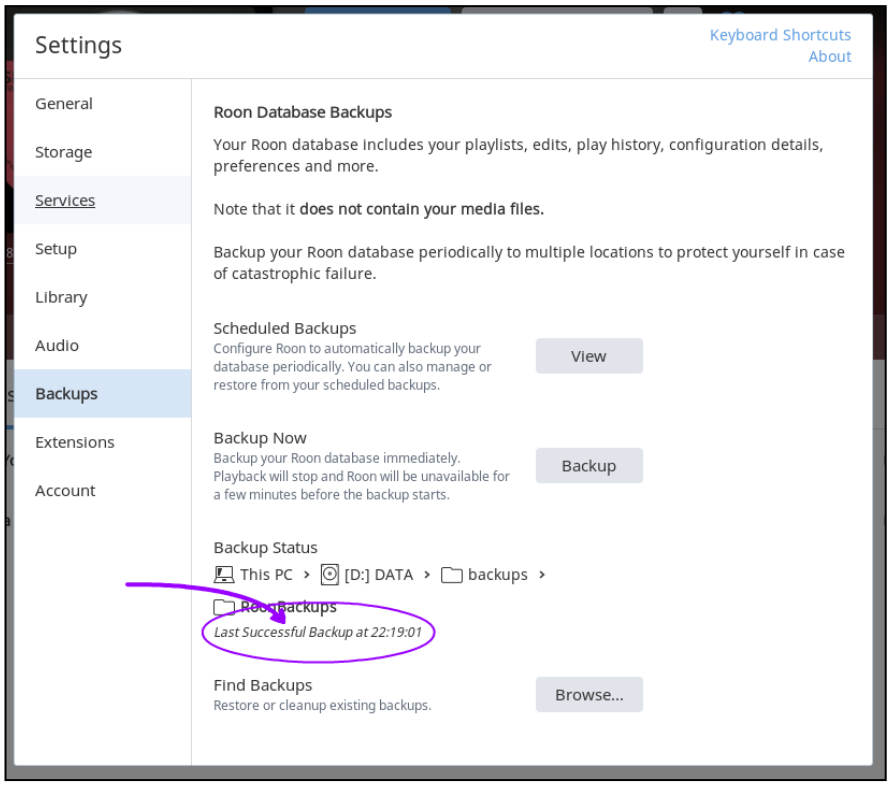
- If you've already scheduled Roon to backup to local or network storage storage, go to the Backup tab of Settings.
- Click *Scheduled Backup*.
- Click the 3 dots icon ⋮ and select "Force Backup Now".
- When the backup completes you should see "*Last Successful Backup*" at the bottom of the Window.

- Shut down your Roon Core.



If you would like to create a new backup:

- Go to the Backup tab of Settings.
- Click the "Backup" button next to Backup Now.
- When the backup completes you should see "*Last Successful Backup*" at the bottom of the Window.
- Shut down your Roon Core.



Restore Your Database

Now that your Roon database is fully backed up, it's time to copy it to ROCK.

At this point, ROCK should already be set up. If you haven't done that yet, start here.

To Restore Your Roon Database To ROCK:

- Ensure the backup you created above is accessible to ROCK.
    - If you backed up to a USB drive, connect it to ROCK.
    - If you backed up to network storage, ensure you know the address, log in, and password for your NAS or network storage device.
- Connect to ROCK by launching Roon on any Mac, Windows PC, iPad, or Android tablet (*note: we don't recommend using an iPhone or Android phone for this process*).
- Since this is your first time launching ROCK, you will be asked to log-in when you connect. Instead of logging in, click "Restore A Backup" in the lower-left hand corner.
- Use Roon's file browser to locate the `/RoonBackups` folder you created in Step 1.
    - If you created a USB backup, it should be connected to your NUC and you can navigate to it.
    - If you backed up to network storage, you can find the *RoonBackups* folder by clicking *Add Network Share* and entering the details for your NAS.

Configuration

There are a few other considerations once your database has been restored to ROCK.

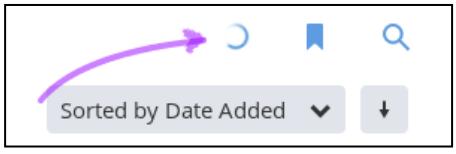
Storage

In many cases you will need to re-configure Roon to find your storage devices. This could happen, for example, because your USB drive has a different path now it is connected to ROCK.

If you need to update your storage configuration after restoring your database, please follow these instructions:

Edit Your Storage Configuration

- Confirm you're running the latest version of Roon You can check this by clicking *About* on the Settings page
- Make sure you have a recent backup. Instructions on how to conduct a backup are here.
- Confirm that any current file imports have completed. You must wait until existing imports are completed, or you will experience data loss. You can monitor this process by clicking the spinner in the top-right of Roon. If there is no spinner, all imports have completed.



When moving files between locations, drives, or machines, it is best to avoid letting Roon see two copies of the same file at the same time:

- In Roon's **`Settings > Storage`**, disable all old storage folders that contain the files that have been relocated.
- In Roon's **`Settings > Storage`**, edit these disabled folders, update the folder location and re-enable it.

Note: Be sure to follow the instructions above to *edit* your existing storage configuration. Adding a new storage configuration without removing the old configuration can cause file identification issues.

Audio

Network audio devices (such as Roon Ready devices, Roon Bridge, Squeezebox, HQPlayer, etc) should work without any further changes after restoring.

If you previously had an audio device directly connected to the machine running your Core, you can connect that device to ROCK and configure it like normal.

If you'd prefer to keep the audio device connected to the machine that was previously running your Core, you can also install Roon Bridge on that machine in order to make it accessible to ROCK over your network.

License

Your Roon license can easily be transferred between devices. If you need to log in after restoring your backup to ROCK, your license should automatically be transferred over, or you will be prompted to move it over.

Previous Core Machine

Once ROCK is up and running, you may want to continue running Roon as a remote on the Windows or macOS machine that previously ran your Core.

In that case, we recommend renaming or deleting the Roon database folder on that machine. You can find the Roon database folder here.

Please make sure you have a backup of your database before deleting it.

Storage Basics

ROCK offers a few different options for storing your music, each with advantages and disadvantages.

Whatever storage configuration you're using with ROCK, you'll want to read this information about importing your music into Roon.

If you are using internal or USB storage, you will also want to read this info about copying music to ROCK.

Internal Storage

If your NUC has space for an internal hard drive, this can be an appealing, high performance option.

Advantages include:

- High performance
- No additional devices or USB drives connected to your Core

There are a few disadvantages to using the NUCs internal storage, including:

- The internal drive is formatted from the web interface when you first set up ROCK, so you won't be able pre-load music onto the drive -- you'll start with an empty drive, and copy your music over later
- The largest hard disk that you can currently fit in a NUC is 2TB, and the largest SSD is 4TB (and very expensive).
- It's more work to replace an internal drive if it fails, since you need to open up the NUC to swap it.

External Storage (USB)

If you don't mind connecting a USB drive to your Core, this is an extremely flexible option.

Advantages include:

- High performance
- You choose how and when to format the drive
- No copying of music required after setting up ROCK
- Easy to replace in case of drive failure
- Easy to upgrade at a later date

The only real disadvantage of external storage is that you will need to have the USB drive connected to your Core.

Network Storage (NAS)

Like any other Roon Core, ROCK supports SMB network storage, and will work with most NAS devices.

If you already own a NAS, this is a good option as it will use the device you already own, and won't require any copying of your media or formatting of your drives.

Disadvantages of network storage include:

- Susceptibility to networking issues.
- Most NAS devices do a poor job reporting changes to Roon, which may necessitate more frequent rescans in order to detect newly added content.
- Some NAS models exhibit poor performance when compared to USB or internal drives, particularly WD MyCloud and Drobo products.

USB Storage - Best Practice

If you're going to directly connect a USB drive to your Core, you will have some options about how you want to format your drive.

We recommend USB drives connected to ROCK be formatted exFAT.

Advantages of using exFAT include:

- Cross platform compatibility (macOS, Windows, Linux).
- No limits on drive size or file size.

ROCK will also work with NTFS, FAT32, and ext2/3/4 drives, but if you are starting fresh with USB storage, our recommendation would be to use exFAT.

Using ROCK's Data Directory

Roon OS automatically exposes a shared network folder (SMB share) called **`/Data`**. Be careful modifying files or folders in this directory , as this could lead to permanent data corruption and/or loss.

Some reasons you might want to access the shared **`/Data`** folder include:

- Accessing internal or USB storage connected to Roon OS
- Copying music to internal or USB storage connected to Roon OS
- Adding codecs required by Roon
- Replacing or accessing Roon's database
- Accessing Logs

Accessing Roon OS's Data Directory

With ROCK running on your network, you can access Roon OS's **`/Data`** directory like any other SMB share.

- **Windows** - In Windows Explorer, type **`\\ROCK\`**
- **MacOS** - In Finder, click *Go*, then *Connect To Server*. Then type **`smb://ROCK/`** and connect as a Guest

In either case, you can also replace **`ROCK`** with the IP address of your Roon OS device.

These instructions assume you are using ROCK -- if you are using Nucleus or another product based on Roon OS, consult your product documentation for the correct host name, or just use the device's IP address.

Accessing Storage and Importing Music

If you've connected a USB hard drive to Roon OS, or if your Roon OS device has an internal hard drive for storing media, you can access this storage using Roon OS's Data directory. Once you've accessed Roon OS's data directory, all your connected storage should appear under the **`/Storage`** folder.

Roon OS will assign a unique folder name for each shared folder based on it's volume name, model number, serial number, etc.

If you want to import music, connect to Roon OS's **`/Data`** directory, find the folder you want to copy music to in the **`Storage`** folder, and copy your music over. Then, you can set up Roon to watch your media by following these instructions.

You can also use Roon OS's Storage folder like a "Mini NAS", to provide network access to files that are not "watched" by Roon.

Adding Codecs

ROCK requires that codecs are installed in order for your Roon Core to function properly. You will want to place the **`ffmpeg`** file into the **`Codecs`** folder in Roon OS's **`/Data`** share.

For more information about installing Codecs, see here.

Accessing Logs

Logs for your Roon Core can also be accessed via Roon OS's **`/Data`** folder. You'll find the **`Logs`** folder in the **`RoonServer`** folder.

If you need to provide logs to Support, please follow the instructions here.

Accessing Roon's Database

If you are migrating your Roon database to Roon OS, we recommend using Roon's backup feature, as described here.

Roon OS's **`/Data`** share allows access to Roon's database, in the **`RoonServer`** folder. While it is possible to swap or replace your Roon database via the **`/Data`** share, **do not modify the Roon database stored in the `RoonServer` folder unless you know what you're doing, as data loss is possible.**

Note: If you are accessing or copying your Roon database, you must first stop Roon Server via Roon OS's web interface.

Importing

ROCK makes it easy to import new music, no matter where you store your collection.

There are two different ways to import new music and both are described below. Either method will work whether you're using internal storage, external storage, or network storage.

For more information about setting up storage with ROCK, please read this article.

Before You Start

This article assumes you've set up some kind of storage with ROCK. If you haven't done that yet, you'll want to read this first.

This article also assumes you're using ROCK's internal storage or an external USB drive connected directly to ROCK. More information about adding a folder and importing your music can be found here.

If you're using a NAS or some other kind of network storage, read no further -- you can import your media by saving it directly to the NAS. More information on setting up a NAS with Roon here.

Note that if you're using USB storage with ROCK, you can also copy music to your USB drive before connecting it, as opposed to copying it over the network as described below. Just make sure your drive is formatted properly.

Method #1: Drag And Drop on to the Roon application on Mac/PC

You can always drag and drop music files into Roon on Mac and PC. Roon will copy these files to the storage locations you've configured on your Core.

If you've configured Roon to watch music in more than one folder, Roon will ask which folder you want to save to, and will then copy your files to the Roon Imports folder, where it saved to a folder based on the time of import and the device imported from.

If you'd rather manage the folder hierarchy yourself, go on to Method #2.

Method #2: Importing To Network Folder

ROCK exposes a network share on your network using SMB, just like a NAS. By accessing this share, you can copy files directly to ROCK.

In this share is a folder called **`Storage`**, and inside that are all your drives (USB or internal storage) connected to the ROCK machine.

macOS

To connect to ROCK, open Finder, then click the Go menu. Select *Connect To Server*.

On the Connect To Server window, type:

- **`smb://rock/data or smb://rock.local/data`** if the former did not work

Connect as a guest and you'll be able to find your drives in the **`Storage`** folder.

Click to View Video

Windows

To connect to ROCK, open explorer and type **`//rock/data`** or in the address bar.

Connect as a guest and you'll be able to find your drives devices in the **`Storage`** folder.

Click to View Video

Recovery

Troubleshooting information to help you get ROCK booting if something's gone wrong. This will help ensure your database isn't overwritten.

Users are expected to try to recover their data and/or reinstall using the web UI if their device is unusable.

However, if you can't even boot up ROCK and get to the web UI, then doing a recovery via the USB flash drive ROCK installer is an option you can try.

When booting with this installer, an option is presented to allow you to install from scratch or to recover a previous install of Roon OS.

While reinstalling will blow away all your databases and settings, recovering only re-writes your partition table and rewrites the base operating system. The Roon software and all settings and databases are kept as they were.

This should help you get to the point where you can get to the web UI, where you can investigate further.

10.5 Nucleus: The Music Appliance

Introduction

What is Nucleus?

At the heart of every Roon system is a Roon Core. This is the brain behind the entire Roon experience – it manages your music collection, streams to your audio devices, and stores the Roon database. Nucleus was developed by the Roon team to provide a silent, high-performance, power-efficient appliance to host the Roon Core. Every aspect of the hardware, operating system, and software is optimized to make Nucleus the very best way to run Roon.

Roon account

Nucleus requires a Roon account with a valid subscription, which you can purchase at https://roonlabs.com/

If you're trying Roon for the first time, getting started is a snap. Just connect and power up Nucleus, install the Roon or Roon Remote app on your devices, sign up for a Roon account, and you're all set. If you already use Roon on another device, there's one extra (optional) step: Nucleus will take the place of your existing Roon Core, so you can migrate your Roon database from the computer you're using now to your Nucleus, or you can start from scratch.

Controlling Nucleus

Nucleus has no display or interactive components. To experience Roon, you will use the Roon app on a Mac or Windows PC, or the Roon Remote app for iPad, iPhone, or Android devices. **Note: Only Mac, Windows, and tablets provide access to all of Roon's features.** Due to their smaller screens, the Roon Remote app on phones has a limited feature set.

Playing audio

There are three ways to use Nucleus to play audio, and you can use any or all of these at the same time. The first is connecting an integrated audio component, DAC, or headphone amp via one of the two USB ports. The second is to use the HDMI port to connect to an audio/video receiver (AVR) or other device which supports multi-channel audio over HDMI. The third (and most flexible) is to stream to your audio device(s) over your network; Nucleus supports many different types of networked audio devices, including Roon Ready products, AirPlay, Sonos, Google/Chromecast-compatible, Devialet AIR, Meridian Sooloos, Squeezebox, and selected KEF products.

Storing your music files

Nucleus can manage your music files three different ways, and you're free to mix and match these as well. The first is to connect an external hard disk drive (HDD) or solid state drive (SSD) via USB. The

second is to install an optional internal HDD or SSD. The third is to store your files on a network attached storage (NAS) device, which Nucleus will access over your network.

What's in the box?

- 1 Nucleus or Nucleus+
- 4 screws for mounting an optional internal HDD or SSD
- Quick Start Guide
- 1 Power supply (to be connected to Nucleus)
- 1 Power cord (to be connected to the power supply)
- 1 female to male straight-line adapter for the power supply (only if power supply has right angle)

Back panel layout

1. **Power button and Power LED**
    - Press power button once to turn on the unit or to initiate a clean shutdown.
    - A dim white LED will be lit when the unit is powered on.
    - Hold the power button for 4 seconds to hard power off.
2. **Power connector**
    - Connect the power supply here.
3. **HDMI port**
    - This port can be used as a multichannel audio output.
    - This port can be used for diagnostics by the Roon support team.
4. **Ethernet port**
    - Connect your Nucleus to your network via an ethernet cable
    - Note: the lights here should be on and blink even when the unit is not turned on.

5. **USB 3.0 ports (2)**
    - Can be used for connecting:
        - USB storage drive
        - USB audio device
        - USB network adapter
6. **Thunderbolt port**
    - Currently not active. May become active in a future firmware update.

Setup

Connect and power up Nucleus

Note: No treatment of working with the Nucleus would be complete without a reference to the excellent Youtube video on the subject prepared by Hans Beekhuyzen. We recommend you watch it:

- Roonlabs Nucleus+ Roon Server

The first step is making power and network connections and starting Nucleus. Follow these steps to connect and start your Nucleus:

1. Before connecting power, connect one end of an ethernet cable (not included) to the LAN port on the back panel of the Nucleus. Connect the other end to your ethernet router or switch.

2. Next, connect the power supply to Nucleus and plug the power supply into the wall. At this point, even though you have not turned on the Nucleus, a green LED (which may be blinking randomly) will be illuminated on the ethernet port.

3. Finally, power up the Nucleus by pressing the power button on the back of the unit. Just one quick press is all that is needed, and a dim white LED should light up immediately above the button.

   Note: Some Nucleus units come with a power supply with a right angle plug and a straight barrel adapter. Be careful when inserting the power **in and out** of the back of the unit. We've had reports of people being pretty rough with this and breaking the port.

Troubleshooting

White power LED does not light up:

- Confirm that the power supply is plugged into the Nucleus
- Confirm that the power cord is plugged into the power supply
- Confirm that the power cord is plugged into a working power outlet
- Did you press the power switch? If not, please do so once. If that does not help, try holding the power switch for 5 seconds, then release it. If that does not help, try pressing it once again briefly.

White power LED is on, but green LED is not illuminated on the ethernet port:

- Confirm that your ethernet cable is plugged into the Nucleus
- Confirm that your ethernet cable is plugged into a router or switch
- Confirm that your ethernet cable is not damaged or dysfunctional

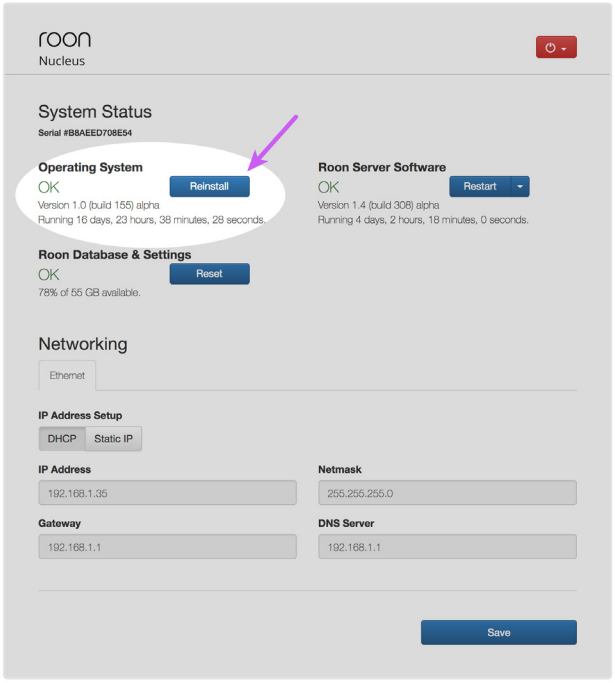
Power connection is very unstable -- even touching it lightly causes the Nucleus to shutdown/reboot:

- Confirm that your power connector is plugged in well and nothing is obstructing the end of the plug.
- If your power supply came with a separate barrel connector, try not using it. Be careful when pulling it out later, as it can be easy to break the unit when applying force to the right angle connector incorrectly.

Update Nucleus firmware

Before using Roon with Nucleus for the first time it's important to make sure your firmware is up to date. In certain cases, running older firmware could result in data loss or a failed migration.

1. To start, connect to the Nucleus Web Administration Interface.
2. Next, look for the **Operating System** section and click '`Reinstall`'.



After installing the latest software, the Nucleus will reboot. This can take a few minutes or longer, depending on your internet connection. Once completed, it will tell you that the latest software has been successfully installed.

Prepare your storage and audio devices

Nucleus will discover devices connected via USB, HMDI, and ethernet at any time, but it's simplest to have these devices connected and powered on before you get started.

Storage

Roon can watch multiple storage locations for files at the same time. That means you can simultaneously use any (or all) of the following storage locations:

1. **Devices connected directly to Nucleus by USB**
   If your music is stored on an external USB drive, plug it into your Nucleus now. Nucleus supports USB drives pre-formatted as EXT2/3/4, VFAT/FAT32/FAT16/exFAT, NTFS, or HFS/HFS+.

   Note: HFS/HFS+ (also known as "Mac OS Journaled") is read-only, which means that Nucleus will not be able to make changes or store new music on the USB drive.

2. **A hard disk drive (HDD) or solid-state drive (SSD) connected inside the Nucleus via SATA**
   If you have a 2.5" hard drive you'd like to use as internal storage, install it in Nucleus now using these instructions.

3. **Network shares (such as a NAS)**
   For now, just make sure the NAS is turned on and plugged into your network. If you have a username/password for your share, take note of it now. We highly recommend connecting networked storage via ethernet always.

Audio Devices

Roon can output audio to devices in the following ways:

1. **Devices connected directly to Nucleus by USB**
   If you plan to use a DAC, headphone amp, A/V receiver, integrated amplifier, or active speaker system connected directly to Nucleus via USB, connect them to one of the ports on the back panel of the Nucleus and make sure it's powered on.

2. **Devices connected directly to Nucleus by HDMI**
   If you have an A/V receiver or other device with an HDMI audio input, you can connect the HDMI output on the back panel of the Nucleus to it. The HDMI output supports both stereo and multi-channel audio content.

3. **Network audio devices**
   More and more audio devices of all kinds (active speakers, DACs, integrated amplifiers, and A/V receivers) have networking capabilities. If you have any Roon Ready, AirPlay, Sonos, Chromecast or other supported streaming audio devices, you should check that they are connected to your network (via ethernet or WiFi as appropriate) and powered on. We recommend connecting networked audio devices via ethernet if possible.

Start using Nucleus

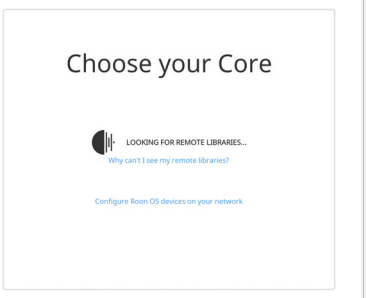
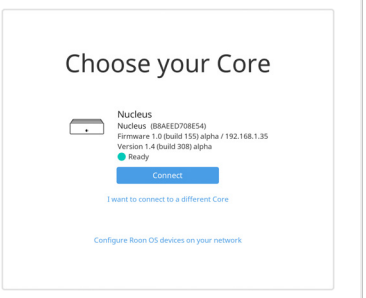
Now that your equipment is connected, it's time to install the Roon app (for Mac and Windows PC) and/or the Roon Remote app for iPad, iPhone, and Android devices, and connect to Nucleus. From here, you can migrate an older Roon installation to Nucleus as well.

Connecting to the Nucleus on your network

To find the Nucleus on the network, install the free **Roon** app on any Mac or Windows PC (available here) or the **Roon Remote** app for Apple iPad or Android Tablet (available from the App Store and Play Store, respectively). After installation, launch the app from any of these devices and it will automatically discover Nucleus over your home network.

When connecting from Mac or PC, first select '`Continue`' under "`I want to use this Mac/PC as a remote control`" before you see the screen below. Tablets do not require this step.

On the "`Choose your Core`" screen, your Nucleus unit should automatically be listed.

While locating Nucleus	*When Nucleus is located*
	

Option 1: Use Roon

Once Roon has found your Nucleus, just click on "`Connect`" button next to the Nucleus.

From here, you can either:

Log in

If you are new to Roon, or want to start from scratch, continue to the First Launch Guide.

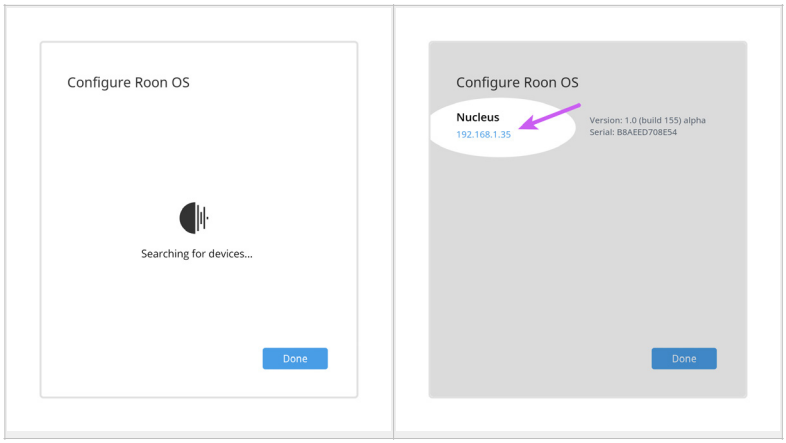
Migrate from an existing Roon installation

If you have already been running Roon, and want to preserve your play history and playlists from another Roon Core, you'll want to move over your existing Roon database & settings by following the Migration guide.

Option 2: Load the Nucleus Web Administration Interface

To get to the Nucleus Web Administration Interface, you need to click on "`Configure Roon OS devices on your network`", which will show you a screen like this:

While locating Nucleus	*When Nucleus is located*



Your Nucleus should be automatically found and listed. Click on its IP address as shown and the Nucleus Web Administration Interface will open in a web browser.

Troubleshooting

Roon Remote is not found in Apple App Store or Google Play Store

- Make sure your Apple or Android device meets the minimum requirements.
- Confirm that your device is actually what you think it is. This is a very common issue, so double check the hardware model numbers printed on the back of the device.
    - Apple devices have a model number that starts with the letter **`A`** followed by 4 digits. For example, **`A1203`**.
    - iPhones and iPads can be checked here.

*Nucleus not showing up in "**`Choose your Core`**" or "**`Configure Roon OS`**" screen*

- Confirm that your Nucleus has been turned on. The white LED above the power button should be lit.
- Confirm that your ethernet cable is plugged into the Nucleus and that the LEDs on the ethernet port are on and blinking.
- Confirm that your ethernet cable is not damaged or dysfunctional
- Confirm that your Roon Remote is connected to the network. WiFi is fine, as long as it is the same router as your ethernet network.
- In a multi-LAN or subnet setup, auto-discovery will not work. You can locate the Nucleus's IP from your DHCP server (your router most likely) and enter that IP into the remote via the "**`Why Can't I see my remote Libraries?`**" link.

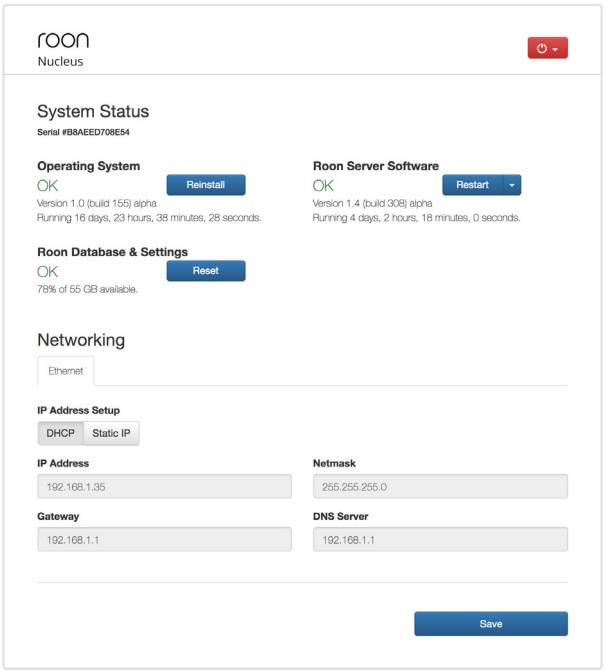
Maintenance

Nucleus comes with an administrative interface that can be loaded using any web browser.

You can use a web browser to perform operations like configuring settings, updating firmware, formatting internal storage, and resetting to factory settings. To access the interface, you must first find the IP address of the Nucleus on your network.

To use Roon to help you load up the Nucleus Web Administrative Interface, visit the Connecting to Nucleus guide.

Using the Web Administration Interface



Functions:

The following functions can be performed from the Web Administration Interface:

Reboot or power off

At the top right is a red button, which can be used to reboot or power off the Nucleus.

Reinstall RoonOS and RoonServer

Next to the **Operating System** section is a '`Reinstall`' button that installs the latest firmware available for Nucleus, even if you are up to date. This operation can take several minutes depending on your internet connection. This button will *always* reinstall the latest firmware, even if you are already running the latest.

Reinstalling the software will not affect your settings or your Roon Database.

Stop and Restart Roon Server

Next to the **Roon Server Software** section is a button/drop-down that lets you stop/start or restart Roon Server. Stopping Roon Server can be useful before doing a large import.

Reset all Settings / Databases

It is possible to reset all Nucleus settings, Roon settings, and your Roon database back to "factory defaults". To do this, click '`Reset`' next to the **Roon Database & Settings** section.

This will not make any changes to your internal storage.

Format internal storage

If you have a hard disk drive (HDD) or solid state drive (SSD) installed in the Nucleus, it must be formatted by Roon OS before it can be used. More information on internal storage can be found here.

Setting a static IP address

Like most networked devices, Nucleus defaults to DHCP for the configuration of its network interface.

To configure the interface manually, change the **IP Address Setup** to '`Static IP`", then manually enter **IP Address**, **Netmask**, **Gateway**, and **DNS Server**.

Note: Incorrect static IP settings could render your Nucleus unreachable on your network. A thorough understanding of networking principles and familiarity with the host network are strongly recommended if you intend to configure your network interface manually.

If you accidentally enter an incorrect static IP and your machine is left unreachable, you can use a second network interface to help get out of this situation (because it will be configured by default to use DHCP).

Configuring a second network interface

If you use a USB network adapter with Nucleus, it will populate itself with a second network interface. This second interface will appear as a new tab under the **Networking** section and can be configured the same way as the onboard gigabit ethernet port.

roon

The music player for music lovers

User Guide