Setting Up Your Home Internet Environment for MusicPath

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1. Introduction

In order to use MusicPath from a home environment, some configuration of your home WiFi router must be done. This is because home WiFi routers are designed to let users inside the home access systems outside (i.e., the internet at large) but to protect home computers from tampering and unwanted access from the outside world.

Some programs (such as many games and many video calling programs) use features of internet communication which allow them to “tunnel through” home routers so that home users can receive incoming video calls. Currently, MusicPath does not use these features, so a bit of preparation must be done before others MusicPath users can connect to a system running MusicPath at your home.

This document describes how to teach your home router to let incoming MusicPath calls reach your phone. Unfortunately, while the principles are the same for almost all routers, the details are different. This document uses the Bell Aliant Home Hub 3000 and the router used by City Wide Communications as specific examples.

2. Overview

Every device connected to the internet has a so-called IP number. When you connect your smart phone (or any other internet-enabled device, such as a laptop or desktop computer) to your home WiFi router, the router assigns an IP number (such as 192.168.1.100 or 192.168.2.32) to the device. Normally, if you use the device the next day, it will be given the same number. However, there is a chance it will not get the same number without configuring your router to do so. As we shall see below, it will be far more convenient, although not absolutely necessary, if you teach your router to always give your smart phone the same IP number whenever your phone connects to your home router. Methods for achieving this for some sample home WiFi routers are described below.

Once you know the IP number assigned to your smart phone, you must teach your router to send incoming MusicPath connections to that phone. (Your router is something like a switchboard at a large company, in that when a phone call comes in to such a switchboard, the switchboard operator must know where to forward the phone call.) Unlike giving your phone a fixed IP number at home, this must be carried out for you to be able to receive incoming MusicPath connections.

Teaching your router to perform this so-called port forwarding is described below. If you are unable to convince your router to do this port forwarding, you can still use MusicPath at home, but in that case you can only “call out” (which means your MusicPath friends must be somewhere where they can be “called in”).

The next section describes the first thing you must do. Following that are a number of sections (one per sample router) which describe the remainder of the steps. You need only read the section corresponding to your own home WiFi router.
If your home router is not one of the ones listed, you may be able to figure out how to configure your router by applying the ideas in those router-specific sections.

In all cases, these instructions must be carried out while you are at home and your WiFi router is turned on and functioning normally.

3. Connect Your Phone to Your Home WiFi

Step 1: connect your phone to your home WiFi, and to leave it connected for the rest of the steps described in this document. It is assumed that you already know how to do this.

4. Instructions for the Bell Aliant Home Hub 3000 WiFi Router

These instructions are designed for the Bell Aliant Home Hub 3000 router, as of February 2019. This is not the only WiFi router Aliant supplies to customers; if you have some other model of router, these instructions may not pertain to you.

4.1. Logging In to Your WiFi Router

Before you can teach your router anything, you must “log in” to it.

Step 2: connect to your WiFi router to tell it what you want to do. Start up your favourite web browser (on your phone, a laptop or a desktop) and type the number 192.168.2.1 into the address bar, as shown in Figure 4.1, and then press the Enter key. (If this does not show you your router administration page, try 192.168.1.1 or 192.168.0.1.)

![Browser Address Bar](image)

NOTE: if you use a JavaScript blocker, you may have to unblock JavaScript for the router’s web site. If you don’t know what that means, you probably don’t need to worry. If you do know what that means, you probably know how to unblock JavaScript for a given web site.

If you typed the correct address for your home router, you should see a greeting page, as shown in Figure 4.2. In the case of the Home Hub 3000 (and similar routers), look for a “Modem login” button or link (as shown by the red arrow in Figure 4.2). Clicking on the login button in the upper right hand corner brings up the login dialog shown in Figure 4.3.
At this point you should enter your password and click the “Log in” button. If you don’t know your password, there is a button on the front of the Home Hub 3000 which, when pressed, will show you the password on a small display.

Having successfully logged in, you will see a screen almost identical to that shown in Figure 4.2, except the upper-right button now says “Modem logout”.

### WiFi Router Administration Page

Figure 4.2

#### 4.2. Setting up Your Phone’s IP Number

It is not absolutely mandatory to do this step, but if you don’t, you may need to repeat Step 4 again in the future, should your router give your phone a different IP some day in the future. It will be much simpler and less confusing if you do this step!

**Step 3:** Having logged in, the operation we wish to perform is found (for the Home Hub 3000) under the “My devices” section (just the left of middle, toward the bottom in Figure 4.2).

Clicking on “My devices” brings up a screen similar to the one shown in Figure 4.4. Ensure that the “Primary Wi-Fi” (arrow #1) is selected (if not, click on that circle). Then look for your phone in the list of devices shown on the left (e.g., arrow #2).

(In Figure 4.4 device names have been blurred out for privacy, but you will see the computer and phone names for your home clearly when you do this.) Having found your
phone, click on the “Settings” pencil (arrow #3), which will bring up the screen shown in Figure 4.5.

Select Your Phone from the List of Connected Devices
Figure 4.4
Configure the Router to Always Give Your Phone the Same IP Number

Figure 4.5

When you see that screen, first click the “Reserved” button (arrow #1) and then write down the number ending at arrow #2 (in this case, 192.168.2.55). Then click “Save” at the bottom of the screen.

After following these instructions, whenever your phone is connected to your home WiFi it should always get the IP number which you wrote down in the previous step. (If you replace your router or do a “factory reset”, you will lose this setting and need to re-do these steps.)

4.3. Forwarding Incoming Connections to Your Phone

This section describes the procedure to configure your home router to forward incoming MusicPath calls to your phone. You must be logged into your home WiFi router, as described in Section 4.1, to perform this function.

Step 4: From the router home screen, click the “Advanced tools and settings” button, as shown in Figure 4.6.

Next click the “Port forwarding” arrow, as shown in Figure 4.7.

You should then see a screen as shown in Figure 4.8. Click on the + sign in front of “Create a new rule” as shown in the figure. After clicking the + sign, you should see the screen shown in Figure 4.9.
Go into the advanced tools page
Figure 4.6

Next we must create a port forwarding rule. Figure 4.10 shows six entries that must be created. Entry #1 is a “human-readable” name which can be more or less anything you like. It probably makes sense to call it “MusicPath” or something similar, so that in the future you will know what this rule is for. Entry #2 is a drop-down list, select “TCP”. Entry #3 is a text entry box, type in 8121. Entry #4 is also an entry box, type
Go into the “create port forwarding rule” screen
Figure 4.8

The Home Hub 3000 Port Forwarding Screen
Figure 4.9

in 8121. (IMPORTANT! These numbers must both be 8121!) Entry #5 is a text entry box, type in 8128. (Note: after you type that in and move to entry #6, the web browser will automatically fill in the greyed-out box to the right of entry #3.) Entry #6 tells the router to which of your home internet-enabled devices MusicPath information should be forwarded. At this point you can enter the IP number which you wrote down when following the instructions of Step 3 in the four boxes. Make sure you type the number in exactly! (Note: you could also select the name of your phone from the drop-down list, instead of entering the IP number, if you are 100% certain you know what the router calls your phone.) Next, click the “Create” button and you have created the needed port-forwarding rule. IMPORTANT: after clicking the “Create” button, you must click the “Save” button at the bottom of this screen; it is not shown in the screen capture of Figure 4.9 or Figure 4.10, but it is down there.

If you have correctly done all the steps in the previous section and this section, other MusicPath users should be able to make connections to you when you are at home and running MusicPath on your phone.

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5. Instructions for the City Wide Communications WiFi Router

These instructions are designed for the router supplied by City Wide Communications to their customers, as of March 2019. (It is not known if City Wide has other routers; if these instructions do not match your router please contact MusicPath for assistance.)

5.1. Logging In to Your WiFi Router

Before you can teach your router anything, you must “log in” to it.

**Step 2:** connect to your WiFi router to tell it what you want to do. Start up your favourite web browser (on your phone, a laptop or a desktop) and type the number 192.168.1.1 into the address bar, as shown in Figure 5.11, and then press the Enter key. (If this does not show you your router administration page, try 192.168.2.1 or 192.168.0.1.)
NOTE: if you use a JavaScript blocker, you may have to unblock JavaScript for the router’s web site. If you don’t know what that means, you probably don’t need to worry. If you do know what that means, you probably know how to unblock JavaScript for a given web site.

If you typed the correct address for your home router, you should see a login page, as shown in Figure 5.12. At this point you should enter your userid and password and click the “Login” button. Having successfully logged in, you should see the screen shown in Figure 5.13. (Note that the figure shows only the top of the screen, and some of the information has been blurred for privacy reasons.)
5.2. Setting up Your Phone's IP Number

It is not absolutely mandatory to do this step, but if you don’t, you may need to repeat Step 4 again in the future, should your router give your phone a different IP some day in the future. It will be much simpler and less confusing if you do this step!

**NOTE:** at time of writing, a peculiarity of the City Wide router (at least on the particular router used for these screenshots) requires particular care for this step. This is described in more detail in the very last paragraph of this subsection.

**Step 3:** Having logged in, click the “LAN Host” button, as pointed to by the red arrow in Figure 5.13. This will bring up a screen with a list of all computers currently (or recently) connected to the router; a sample of this screen is shown in Figure 5.14. Locate your phone in the list (by matching the choices in “Host name” to the name you have given your phone) and then write down the corresponding “MAC Address” and “IP Address”. For example, in Figure 5.14 you can see one of the rows lists a computer whose name ends in “iPhone”. (You might not have “phone” in the name of your phone, but presumably you can guess which entry corresponds to your phone. If your phone is currently connected to your wifi router, you need only scan the rows which have “Active” in the “Status” column.)

![Router Clients Screen](image)

Having written down the “MAC Address” and “IP Address” for your phone, click the “Network” button, which is directly above the “LAN Host” button you recently clicked. This brings up the screen shown in Figure 5.15, where there are two buttons of interest. The button to click for this step (Step 3) is the one with label “LAN”, pointed to by arrow 1.

Clicking this button should display a screen similar to the one shown in Figure 5.16.

![Router Clients Screen](image)

Having written down the “MAC Address” and “IP Address” for your phone, click the “Network” button, which is directly above the “LAN Host” button you recently clicked. This brings up the screen shown in Figure 5.15, where there are two buttons of interest. The button to click for this step (Step 3) is the one with label “LAN”, pointed to by arrow 1. Clicking this button should display a screen similar to the one shown in Figure 5.16.

![Router Clients Screen](image)

Figure 5.15 shows five arrows. After you press the “Add” button pointed to by arrow 1, you will see the text entry boxes (arrows 2 and 3) and the “Apply” button (arrow 4). At this point type the “MAC Address” which you wrote down earlier into the box pointed to by arrow 2, and the “IP Address” which you wrote down earlier into the box pointed to by arrow 3.
by arrow 3. Then click the “Apply” button and there should be a row added to the page, similar to the one shown in Figure 5.17. (That image shows an entry for a computer whose “MAC Address” starts with “00:e0” which has been assigned the IP 192.168.1.222.

Finally, click the “Save” button (arrow 5 in Figure 5.16) to complete this step.
Giving Your Phone a Permanent IP While at Home

Figure 5.17

NOTE: as mentioned at the beginning of this subsection, the router tested while writing this subsection has a peculiarity. You might think that you should finish up by clicking the “Save” button (arrow 5) or the adjacent “Save & Apply” button; don’t do that. (At least on the router used for these screenshots, clicking either of those two buttons deleted the recent entry.)

5.3. Forwarding Incoming Connections to Your Phone

This section describes the procedure to configure your home router to forward incoming MusicPath calls to your phone. You must be logged into your home WiFi router, as described in Section 5.1, to perform this function.

Step 4: From the router “Network” screen, as shown in Figure 5.15, click the “Port Forward” button, as pointed to by arrow 2. This brings you to the screen shown in Figure 5.18 (only the relevant top part of the screen is shown in the figure).

Router Port Forwarding Screen

Figure 5.18

Clicking the “Add” button showing in Figure 5.18 expands the screen, as seen in Figure 5.19 (again, only the relevant top part of the screen is shown). There are four entries to make on this screen. Arrow 1 points to a “Comment” field; this is just for your information, and can be essentially anything you like, but something like “MusicPath” would be a good choice. Arrow 2 points to a box in which you must enter the IP Address of your phone. Arrow 3 points to a box in which you must enter two numbers: 8121 in the
left-hand box and 8128 in the right-hand box. If the drop-down list pointed to by arrow 4 is not already “TCP&UDP”, then select that entry.

If you have completed these steps correctly, the middle of your screen should now look like Figure 5.20, except that you probably have an IP Address different from the one used in this example. Now click the “Apply” button as shown by arrow 5 in Figure 5.19. You screen should now have a row similar to the one shown in Figure 5.21, except again you probably have a different IP Address. If you made an error entering your information, you can select the check-box near the left side of the screen, click the “Edit” button, and re-enter the correct data.

There is no need to click the “Save & Apply” button at the bottom of this screen.
6. Other Router Makes and Models

Many companies sell home WiFi routers, and each of these companies have many router models, each of which might have its own unique way of administering the router. It is not possible for this document to describe how to forward ports in every router.

However, there is some help available. First, find out the brand and model of your router. This is often found on the first web page presented when you point your browser at 192.168.0.1, 192.168.1.1 or 192.168.2.1. Alternatively, you can go and look at the router itself, and see if you can find the (possibly) fine print giving the brand and specific model number. If all else fails, your Internet Service Provider (ISP) might help you with this.

Second, visit the web site https://portforward.com/. You may find that webpage educational, but the important information is at the left side in the “List of all Routers” link, which takes you to https://portforward.com/router.htm. Scroll down until you find your router’s brand and click the link. Then, select the particular model number, which will bring you to a webpage which shows how to forward ports on that model. The example forwards ports other than those required by MusicPath, so when you get to the step of entering the specific data, keep in mind that we want the TCP ports forwarded (at least, but both TCP and UDP will work as well), and we need ports 8121 and 8128 forwarded.

If all else fails, you may have to get the eight year old kid next door to help you.

7. An Alternative Approach — For Computer Experts Only!

This section is really only for people who are comfortable with the idea of configuring their router, and who know more about IP numbers and ports than what is covered in this document. If you aren’t such a person, you probably should not read this.

Some home routers allow you to forward ports using a technique called “port triggering”. Rather than setting up a port forwarding rule which forwards MusicPath information to one (and only one) device in your home, port triggering allows you to forward incoming MusicPath connections to any device in your home which is using MusicPath (just in case, for example, you have two phones, or you have a friend visiting who has their own phone with the MusicPath app installed).
NOTE: in any case, only one person at a time can receive incoming MusicPath connections in your home from the outside world.

To set this up, find the port triggering configuration web page of your home router. NOTE: many routers do not implement this feature, so you might not find it, no matter how hard you look!

If your router has such a feature, configure your router to forward ports 8121 and 8128 (or the range 8121–8128 if that is easier) when it is triggered by an outgoing connection on port 8120. Having done this, when you log into MusicPath you make an outgoing connection on port 8120, and this, together with the port triggering rule, tells your router to send incoming MusicPath connections to the phone logged into MusicPath.

If you choose this technique, there is no need to give your phone a fixed IP number at home, although you may still do that if desired.