Soul2Bela

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1 Introduction

This is a tutorial on how to make SOUL code run on a Bela / Bela Mini. Until now, it has been tested with a Bela Mini only and only on macOS.

2 Prerequisites

Here's what you need to make SOUL run on a Bela.

- Establish connection between your computer and Bela. You can find a tutorial on it here.

- The soul binaries, which can be found here. The version I used is **0.8.947**. Download **binaries-linux-combined.zip** from there.

- Unzip the file. The binary that is important for us is in `linux/bela`.

3 Some Terminology

If you're not familiar with working in the terminal, it might be a bit intimidating at first. So here's at least some clarification on the commands you have to use. Please omit the angular brackets.

- `ssh`: Sets up a connection to some other networking device. In our case, it's the Bela.

- `scp <sourceDirectory> <destinationDirectory>`: Copying a file from a source directory to a destination directory

- `sudo`: In some cases, the OS restricts a user from performing certain commands. `sudo` bypasses that.

- `apt`: Advanced Package Tool, essentially a package manager for Linux.

- `cd <directory-you-want-to-switch-to>` Changes to the specified child directory.

- `mkdir <folderName>` Creates a new folder.

4 Manual SSH connection

Open the terminal application on your computer, and type:

- `ssh root@192.168.7.2`

- You should get a response in the terminal saying that you're now connected and all commands you type in that window are performed on the Bela. Keep that window open, you will need it.

5 Installing the Necessary Packages

This is the part where you can most likely make mistakes, so be a bit careful. We basically need to have the Bela connected to the Internet. Since the IT at AAU is a bit cautious with their protocols, you want to connect your computer to a hotspot on your phone or make the installation in a different network, e.g. at home. A tutorial on this can be found here, in section **Sharing wifi over USB with Bela**.
Also note that you cannot access the Bela via the browser-based IDE in that mode.
Sometimes, these commands will terminate silently, i.e. you will not get a notification in your terminal when it's done. You will however see progress bars, so that should be a good indication for when it's done. If you can move your caret in the terminal using the arrow keys, then you're good to go.
Once you're done with that, run the following commands:

- `apt-get update`: This updates the apt package manager.

- `apt-get install libfreetype6`

- `apt-get install libxext6`

- `apt-get install libxinerama1`

Now, you should have all the libraries you need.

- Revert the IP and DHCP document to its original state and restart the networking service as described in the tutorial.

6 Copying the SOUL binaries

Establish a new `ssh` connection again.
Next, open another terminal window and type:

- `cd <directory-where-your-soul2bela-binary-is-located>`

- `scp soul root@192.168.7.2:/bin`

- Switch to the terminal window that operates the Bela.

- `cd /` Now you're in the root directory of the Bela's OS.

- `cd /bin` This is where the binaries live.

- `ls -a` Lists all the files in the current directory. You should see `soul` in that list.

- To check if everything works, type `soul --help`. You should see a list of descriptions for the soul command line tool.

- In the terminal window operating the Bela, type `cd /Bela/projects/`

- `mkdir soul` This creates creates a folder for your soul patches to keep things tidy.

- Next, download a small patch that only outputs white noise here.

- In a different terminal window, `scp` the noiseMaker.soul and noiseMaker.soulpatch files to the directory you just created: `root@192.168.7.2:/root/Bela/projects/soul`

- In the terminal window operating the Bela, type `soul play noiseMaker.soulpatch --nogui`

- The `--nogui` flag is important, otherwise it will try to launch a GUI on the Bela, which wouldn't work.

- You should see a report that the compilation was succesful and hear noise coming out of the Bela's audio output.

- You can also modify the patch using Bela's online IDE. As of now, you cannot create new soul patches, so you have to copy them manually as defined above. Once these are copied, you can modify them.

- Also, you cannot run soul patches from within the online IDE like you can with C++ projects, so keep your terminal window open at all times and use the commands mentioned above.