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# **Core Toolchain Setup**

for MIOS32 application development on Linux

## **Preparation**

This document assumes that you have a relatively modern x86 based linux distribution. While it may work other distributions, it has only been tested on x86 Ubuntu 10.10. Many of the commands, especially "aptitude" are only available on Debian derived distributions like Ubuntu.

## **Linux Utilities**

#### subversion

You will need to install subversion to download the svn repository

• sudo aptitude install subversion

#### wget

Wget is a useful tool for downloading files from the Internet and can be downloaded with:

• sudo aptitude install wget

# **Required Stuff**

## **Download the MIOS32 repository**

Create a directory to download the toolchain to (  $\sim$ /midibox is my personal favourite). and download the repository:

- mkdir ~/midibox
- cd ~/midibox
- svn checkout svnmios.midibox.org/mios32

(If that doesn't work try:)

\* svn checkout svn://svnmios.midibox.org/mios32/

#### **Linux build utilities**

Terminal commands for installing basic build tools like "make":

- \* Debian/Ubuntu/Mint: sudo aptitude install build-essential
- \* Arch Linux/Manjaro: sudo pacman -S base-devel

#### **GNU Multiple Precision Library**

Terminal Commands:

- \* **Debian/Ubuntu/Mint:** sudo aptitude install libgmp3-dev (or lib32gmp3-dev for AMD64Version)
- \* Arch Linux/Manjaro: sudo pacman -S gmp

#### **MIOS32 Toolchain**

The MIDIbox community have created a modified GNU Compiler Collection, ready for use with the ARM Cortex M3 platform. The toolchain contains all of the tools required to build MIOS32 applications including GCC and NEWLIB.

The Toolchain has currently been compiled for Windows (2000+), Mac OS X (Leopard or newer) and Linux x86 (built on Ubuntu 10.10).

The download directory for the toolchain is http://www.midibox.org/mios32 toolchain

Download the latest "linux" file and extract into your favorite directory, If you extract into /usr/local the toolchain will create /usr/local/mios32\_toolchain and various sub-directories containing the toolchain files.

- cd /usr/local
- sudo wget http://www.midibox.org/mios32 toolchain/gcc-arm-none-eabi-xxxxxx.tar.bz2
- sudo tar zxvf gcc-arm-none-eabi-xxxxxx.tar.bz2

replace xxxxxxx with the date of the latest linux toolchain in http://www.midibox.org/mios32 toolchain

You now need to set the path variable for the toolchain bin directory (/usr/local/mios32\_toolchain/bin) this is covered in the next section

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## **Environment Variables**

If you are using the default bash shell then setting up path variables in the shell is quite easy, in a terminal window just type:

export VARIABLE NAME=something

and if you want to check to what the variable has been assigned, type:

echo \$VARIABLE NAME

this will print what's inside the variable. For example, type:

export MIOS32\_PATH=~/svn/mios32/trunk

to set up the mios32 folder path, then type

• echo \$MIOS32 PATH

### Adding to the path

To temporarily add the mios32\_toolchain bin directory to the path, type:

• export PATH=\$PATH:/usr/local/mios32 toolchain/bin

to check that the path variable has been assigned type:

• echo \$PATH

You should see the toolchain directory at the end of the path

### **Setup MIOS32 Environment**

The following commands will setup the build environment for MIOS32, you must change MIOS32\_PATH to be wherever you installed the svn repository:

- export MIOS32 PATH=~/midibox/mios32/trunk
- export MIOS32 BIN PATH=\$MIOS32 PATH/bin
- export MIOS32 GCC PREFIX=arm-none-eabi
- export MIOS32 FAMILY=STM32F10x
- export MIOS32 PROCESSOR=STM32F103RE
- export MIOS32\_BOARD=MBHP\_CORE\_STM32
- export MIOS32 LCD=universal

You can add these lines to your ~/.profile file to ensure that they are always set, the editor pico (or nano) is a fairly simple text editor but you may have your favourite.

#### If you know what you are Doing in Linux-you can do this systemwide:

open your filebrowser with sudo rights, for example type in terminal:

\* Linux Mint: sudo nemo \* Linux Arch: sudo thunar

the filebrowser now opens with root rights, navigate to the folder "etc" open the file "environment"

»> /etc/environment

Depending on the path where your toolchain is situated, the Example Content off this file is:

PATH="/home/autark/midibox/gcc-arm-none-eabi/bin"

MIOS32 PATH=/home/autark/midibox/mios32

MIOS32\_BIN\_PATH=/home/autark/midibox/mios32/bin

MIOS32\_BOARD=MBHP\_CORE\_STM32F4

MIOS32 FAMILY=STM32F4xx

MIOS32 GCC PREFIX=arm-none-eabi

MIOS32 PROCESSOR=STM32F407VG

MIOS32 LCD=universal

if you cant log after reboot, then mostly you messed up your "PATH" variable, in this case, boot with Linuxbootstick, and remove the PATH - line...

#### you can also add more folders to the PATH, they are separeted with a ":", for example:

\* PATH="/home/autark/midibox/gcc-arm-none-eabi/bin:/home/autark/program" here we also have a folder named "program", when you put in there "Mios Studio", then you can write in Terminal "Mios Studio" and mios studio will open

### **Building your first application**

Once you have completed the above steps, you should be able to build your first application.

- cd \$MIOS32 PATH/apps/tutorials/001 forwarding midi
- make

if this works great! If not, either you made a mistake (or I did!!)

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