Command-Line Arduino

Prerequisites

Install Arduino tools:

```
sudo apt install --reinstall arduino
```

Make sure your user id is in the “dialout” group.

Installation

The easiest way to install the Arduino command line utility is to download the latest release package from here, and just extract it into a directory in your path. It’s a single executable (built with Go), so it won’t clutter things up.

Getting Started

I used this as a reference. It has a lot more detail.

Configuration File

Before you run for the first time, create a configuration file:

```
arduino-cli config init
```

Create Sketch / Add Some Code

Create a new sketch:

```
arduino-cli sketch new MyFirstSketch
```

A boilerplate sketch file is generated for you:

MyFirstSketch.ino

```
void setup() {
}

void loop() {

```

```
}
```

Edit the generated file, and fill in some details:

MyFirstSketch.ino

```
void setup() {
    pinMode(LED_BUILTIN, OUTPUT);
}

void loop() {
    digitalWrite(LED_BUILTIN, HIGH);
    delay(1000);
    digitalWrite(LED_BUILTIN, LOW);
    delay(1000);
}
```

Connect a Board

Update local cache of available platforms:

```
arduino-cli core update-index
```

After connecting your board, check to see if it's recognized:

```
arduino-cli board list
```

Result should look something like this (I'm using an Uno):

```
Port         Type              Board Name  FQBN            Core
/dev/ttyACM0 Serial Port (USB) Arduino Uno arduino:avr:uno arduino:avr
```

Install the core for your board (refer to the first two segments of the FQBN):

```
arduino-cli core install arduino:avr
```

Compile and Upload the Sketch

Compile:

```
arduino-cli compile --fqbn arduino:avr:uno MyFirstSketch
```

Upload:

```
arduino-cli upload -p /dev/ttyACM0 --fqbn arduino:avr:uno MyFirstSketch
```

Makefile

This Makefile simplifies the compile and upload steps, and adds format, reset, and clean commands:

Makefile

```
ARDCMD=arduino-cli
FQBNSTR=arduino:avr:uno
PORT=/dev/ttyACM0
SKETCHNAME=MyFirstSketch
FORMATTER=clang-format -i

default:
    @echo 'Targets:'
    @echo '  compile  -- Compile sketch, but don''t upload it.'
    @echo '  upload   -- Compile and upload sketch.'
    @echo '  format   -- Beautify your sketch code.'
    @echo '  reset    -- Use to resolve Device Busy error.'
    @echo '  clean    -- Remove binaries and object files.'

compile:
    $(ARDCMD) compile --fqbn $(FQBNSTR) $(SKETCHNAME)

upload: compile
    $(ARDCMD) upload -p $(PORT) --fqbn $(FQBNSTR) $(SKETCHNAME)

format:
    $(FORMATTER) $(SKETCHNAME)/$(SKETCHNAME).ino

reset:
    fuser -k $(PORT)

clean:
    -rm -f $(SKETCHNAME)/*.hex
    -rm -f $(SKETCHNAME)/*.elf
```

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