This guide has been tested at Ubuntu 18.04 LTS a GNU/Linux distribution there is a general M2OS Guide that can be also consulted (http://m2os.unican.es/wp-content/uploads/INSTALL.pdf).

In order to ease the read of the following instructions, the following environment variables will be assumed: $EPIPHANY_SDK = folder of the Epiphany's SDK $M2OS = folder of the M2OS

M2OS Installation

Follow the instructions from the INSTALL.md.

Parallella board configuration

The Parallella board needs a SD card with an OS. Parabuntu is the choice selected for this project.

For heavy use of the Parallella board the usage of a fan dissipating heat is recommended. The Parallella board has an ARM processor (aka Zynq) and an Epiphany many-core which individual cores are called eCores.

The Parallella board is connected to the same local network as the computer compiling M2OS and the executables for the eCores.

Compile/Copy executables

This steps are done at the main computer.

A project file (*.gpr) is needed to generate the desirable executables for the Epiphany's eCore architecture running under M2OS. There is a project file that can be used as an example at `$(M2OS)/tests/api_m2os/test_api_m2os_epiphany.gpr`. The compilation is realised using the **grpbuild** to that grp file.

The `test_api_m2os_epiphany.gpr` file is used to compile all the tests used to check the correct behaviour of M2OS. A cross-compiler is used to generate the executables for the Epiphany's eCore architecture.

The compilation of the code using the project file **test_api_m2os_epiphany.gpr** can be done using the script `$(M2OS)/scripts/tests_and_releases/parallella/epiphany/build_and_scp_api_tests.sh` where the gpr is build and the resulting executables are copied to the Parallella board. The program **sshpass** must be installed to copy the executables to the Parallella board's through a local network with that script.

The main constants that can be modified to suit to any porpoise are: $M2OS_DIR is the folder of the M2OS installation. $PARALLELLA_DIR is the folder where the elf are going to be placed. $PARALLELLA_USER is the user of the Linux distribution account used at the Parallella board. $PARALLELLA_PASS is the password of the Linux distribution account used at the Parallella board. $PARALLELLA_IP is the IP used for the Parallella board.

Parallella execution

This steps are done at the Parallella board.

Zynq is where the Parabuntu is executing and the only processor that could have a console output, none Epiphany's eCore can communicate though a console.

To simulate a console output for every Epiphany eCore a console simulator is implemented. The Epiphany console output is a shared memory of Zynq which will be printed at the console. Each eCore has a region at this shared memory.

There is a **loader.c** file at `$(M2OS)/scripts/tests_and_releases/parallella` that initialize the Epiphany many-core, load the executables, start the execution and show a formatted console output of the eCores.

The number of eCores needed for the test should be set at the N_CORES constant of **loader.c** (Noticing that the eCores used are in row order). For the M2OS test 16 eCores must be used.

The executables generated by this script are cross compiled for the Epiphany's architecture and must be launch at an Epiphany eCore. So the **loader.c** must be build and run at Zynq at `$(M2OS)/scripts/tests_and_releases/parallella/` there are two scripts: **parallela_build_loader.sh** to build de **loader.c** file and **parallela_load_and_display.sh** to execute it.