**COMPILATION ON DIFFERENT TARGETS**

Document outlining the compilation steps on different targets (x86 Ubuntu, Raspberry Pi, and BeagleBone), follow these general steps:

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# **Build steps for X86**

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Run the **make** command to compile your code:

$ make

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# **Build steps for BBB**

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## **Step 1: Environment Variables Setup**

1. **Set the ARCH and CROSS\_COMPILE** **environment Variables**

$ export ARCH=arm

$ export CROSS\_COMPILE=arm-linux-gnueabihf-

1. **Set the PATH to the Cross-Toolchain:**

$ export PATH=${HOME}/ela\_lab\_exercises/bbb\_build/toolchain/gcc-linaro-7.5.0-2019.12-x86\_64\_arm-linux-gnueabihf/bin/:$PATH

## **Step 2: Compilation**

$ make

## **Step 3:** **Transfer Binary file to target**

$ scp <binary\_file> <username>@<ip\_address>:<destination\_directory>

**Example**: $scp Child\_Process\_execve [root@10.10.3.233:/User\_Programs](mailto:root@10.10.3.233:/User_Programs)

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# **Build steps for Raspberry Pi 4B**

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## **Step 1: Environment Variables Setup**

1. **Set the ARCH and CROSS\_COMPILE environment Variables**

$ export ARCH=arm64

$ export CROSS\_COMPILE=aarch64-linux-gnu-

1. **Set the PATH to the Cross-Toolchain**

$ export PATH=${HOME}/ela\_lab\_exercises\_rpi/rpi\_build/toolchain/gcc-linaro-7.5.0-2019.12-x86\_64\_aarch64-linux-gnu/bin/:$PATH

## **Step 2: Compilation**

$ make

## **Step 3: Transfer Binary file to target**

$ scp <binary\_file> <username>@<ip\_address>:<destination\_directory>

**Example:** $scp Child\_Process\_execve [root@10.10.1.27:/User\_Programs](mailto:root@10.10.1.27:/User_Programs)

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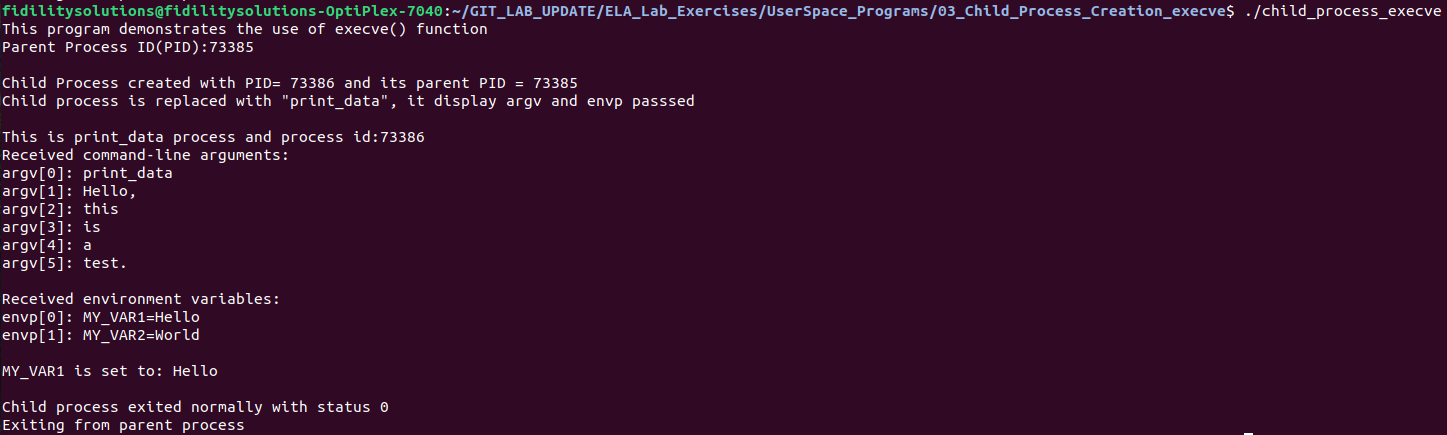
# **Running on Platform (X86, Raspberry Pi, BBB)**

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1. Once you're in the correct directory, execute the generated executable file using the **./filename** command.

$ ./filename

**Ex: ./Child\_Process\_execve**

1. The overall output will be as given below:

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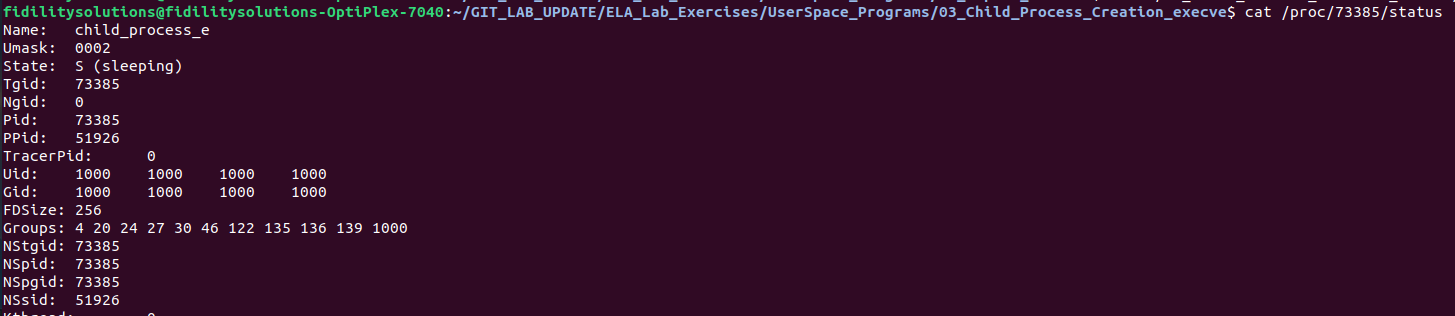
# **Understanding Processes Using /proc Interface and ps Command**

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## **Using /proc Interface**

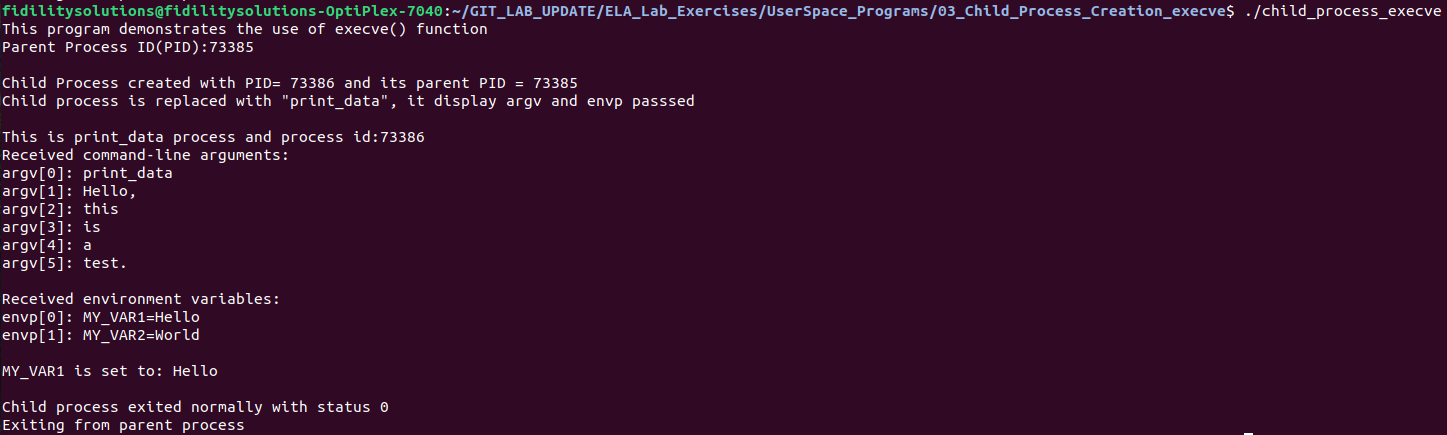
1. Identify the PID (Process ID) of a running process -> 73385
2. cat /proc/$pid/status

$ cat /proc/73385/status



## **Using ps Command**

$ ps aux

1. The following image showing the child process replaced with new program (“print\_data”).
2. The output from new program(print\_data) shows that the arguments and environment variable passed from execve process.
3. The image depicts entry of process present in process table: one main parent process and new process with print\_data “argument”.