

STM32MP157x-DK2

Outils nécessaires :

- ❖ Cable micro USB Type-B vers USB Type-A (entre l'ordinateur et le port ST-LINK/V2-1 de la carte)
:
- ❖ Cable USB Type-C vers USB Type-C : alimentation 5V/3A
- ❖ Cable USB Type-C vers USB Type-A (entre ordinateur et le port OTG de la carte) :

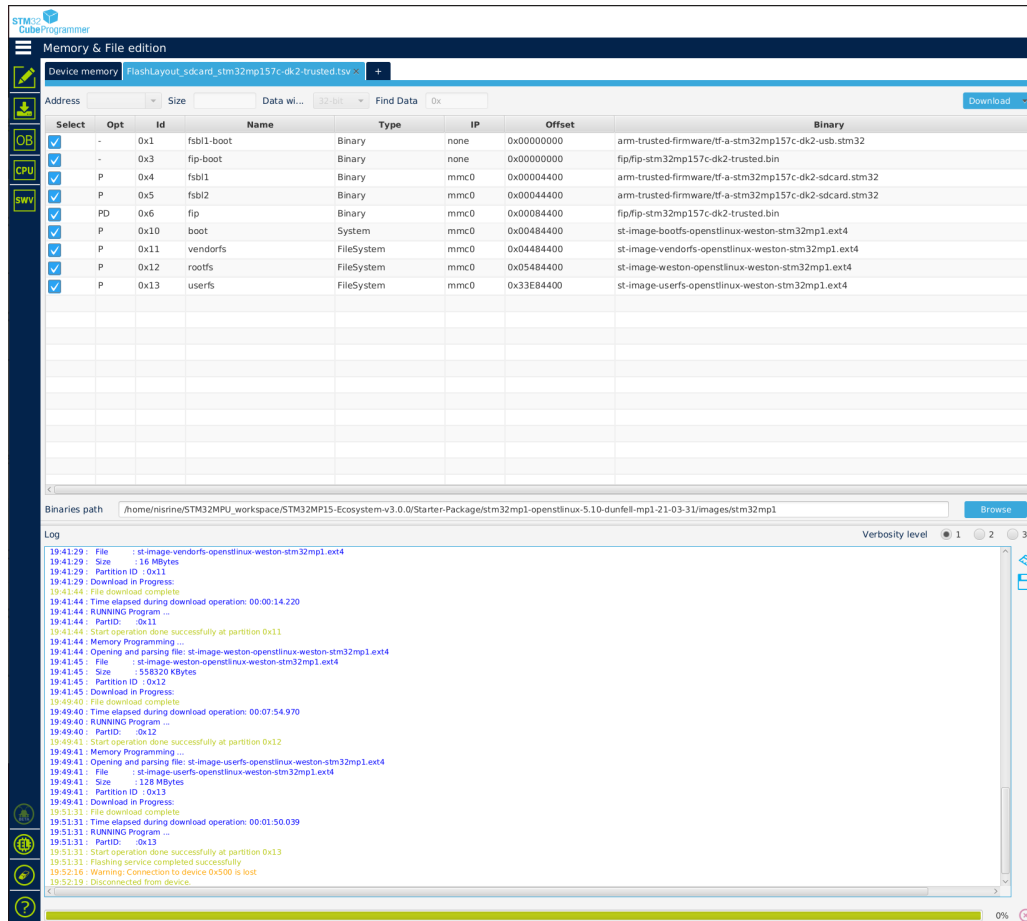
Starter-Package & Developer-Package

Let's start

Suivre :

https://wiki.st.com/stm32mpu/wiki/Getting_started/STM32MP1_boards/STM32MP157x-DK2/Let%27s_start

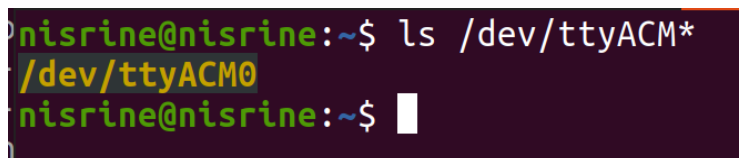
boot off off
connect



download
boot on on
reset

Commande de base :

- Vérification de la bonne détection Stlink : `ls /dev/ttyACM*`



- Terminal pour stm32mp1 : `minicom -D /dev/ttyACM0`
❏ `cat /etc/build`

```

root@stm32mp1:~# cat /etc/build
-----
Build Configuration: |
-----
BB_VERSION = 1.46.0
BUILD_SYS = x86_64-linux
NATIVELSBSTRING = universal
TARGET_SYS = arm-ostl-linux-gnueabi
MACHINE = stm32mp1
DISTRO = openstlinux-weston
DISTRO_VERSION = 3.1-openstlinux-5.10-dunfell-mp1-21-03-31
TUNE_FEATURES = arm vfp cortexa7 neon vfpv4 thumb callconvention-hard
TARGET_FPU = hard
MANIFESTVERSION = ostl-21-03-31-rc4-2-g7ef7d27
DISTRO_CODENAME = dunfell
ACCEPT_EULA_stm32mp1 = 1
GCCVERSION = 9.%
PREFERRED_PROVIDER_virtual/kernel = linux-stm32mp
PREFERRED_VERSION_linux-stm32mp =
-----
Layer Revisions: |
-----
meta-python      = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-oe           = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-gnome        = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-initramfs    = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-multimedia   = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-networking   = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-webserver    = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-fileystems   = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-perl         = default.xml:5bba79488b7d393d2258d6e917f7bf7b0d7c4073
meta-st-stm32mp   = default.xml:2e80e33539a193c6a8add6131c4c760009c49cea
meta-qt5          = default.xml:0d8eb956015acdea7e77cd6672d08dce18061510
meta-st-openstlinux = default.xml:673d7ee4572e3faadec3e43d5f0fa004465b78d9
meta              = default.xml:72431ee8de5e3a53d259cebf420a7713ac9e1f14

```

- ❑ **uname -a**
- ❑ **cat /proc/version**
- ❑ **df -h**

```

root@stm32mp1:~# uname -a
Linux stm32mp1 5.10.10 #1 SMP PREEMPT Sat Jan 23 15:04:06 UTC 2021 armv7l armv7lx
root@stm32mp1:~# cat /proc/version
Linux version 5.10.10 (oe-user@oe-host) (arm-ostl-linux-gnueabi-gcc (GCC) 9.3.0,1
root@stm32mp1:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        147M   0   147M   0% /dev
/dev/mmcblk0p6  690M  424M  219M  66% /
tmpfs           214M   64K  214M   1% /dev/shm
tmpfs           214M   8.8M  205M   5% /run
tmpfs           214M    0   214M   0% /sys/fs/cgroup
tmpfs           214M   20K  214M   1% /tmp
/dev/mmcblk0p4   58M   14M   40M  27% /boot
/dev/mmcblk0p5   15M   6.8M   6.7M  51% /vendor
tmpfs           214M  148K  214M   1% /var/volatile
/dev/mmcblk0p7  14G   39M  13G   1% /usr/local
tmpfs           43M    0   43M   0% /run/user/0

```

- **ip addr show**

```
root@stm32mp1:~# ip addr show eth0
2: eth0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc mq state DOWN group 0
    link/ether 00:80:e1:42:54:2f brd ff:ff:ff:ff:ff:ff
    altname ethernet0
root@stm32mp1:~# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc mq state DOWN group 0
    link/ether 00:80:e1:42:54:2f brd ff:ff:ff:ff:ff:ff
    altname ethernet0
3: wlan0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 00:9d:6b:97:97:88 brd ff:ff:ff:ff:ff:ff
4: usb0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group 0
    link/ether 86:61:92:3d:04:56 brd ff:ff:ff:ff:ff:ff
    inet 192.168.7.1/24 brd 192.168.7.255 scope global usb0
        valid_lft forever preferred_lft forever
    inet6 fe80::8461:92ff:fe3d:456/64 scope link
        valid_lft forever preferred_lft forever
```

Develop on Arm® Cortex®-A7

Suivre :

https://wiki.st.com/stm32mpu/wiki/Getting_started/STM32MP1_boards/STM32MP157x-DK2/Develop_on_Arm%C2%AE_Cortex%C2%AE-A7

Aide sur la partie : Create a simple hello-world application

Prérequis :

Installations nécessaires :

- ❖ Let's Start
- ❖ Develop on ARM Cortex-A7 [Install the SDK et Create a simple hello-world application]

Voir : https://wiki.st.com/stm32mpu/wiki/Getting_started/STM32MP1_boards/STM32MP157x-DK2/Let%27s_start

Terminal 1 - Commandes

- émulation terminal stm32mp1 : **minicom -D /dev/ttyACM0**
- Affichage interfaces réseaux IP : **ifconfig**

```
root@stm32mp1:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:80:E1:42:54:2F
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:56 Base address:0x4000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:372 errors:0 dropped:0 overruns:0 frame:0
          TX packets:372 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:23104 (22.5 KiB)  TX bytes:23104 (22.5 KiB)

usb0      Link encap:Ethernet  HWaddr DE:62:D4:EA:CF:B1
          inet addr:192.168.7.1  Bcast:192.168.7.255  Mask:255.255.255.0
          inet6 addr: fe80::dc62:d4ff:feea:cfb1/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:30 errors:0 dropped:0 overruns:0 frame:0
          TX packets:46 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4304 (4.2 KiB)  TX bytes:9162 (8.9 KiB)

root@stm32mp1:~#
```

CTRL-A Z for help | 115200 8N1 | NOR | Minicom 2.7.1 | VT102 | Déconne | stm32mp1-openstlinux-21-03

❖ Donc inet addr : 192.168.7.1

[Laisser terminal 1 ouvert]...

Terminal 2 - SSH

- Installation SSH

```

nirine@nirine:~$ sudo dpkg --configure -a
nirine@nirine:~$ sudo apt-get install openssh-server
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances
Lecture des informations d'état... Fait
Les paquets supplémentaires suivants seront installés :
  ncurses-term openssh-sftp-server postfix ssh-import-id
Paquets suggérés :
  molly-guard monkeysphere ssh-askpass procmail postfix-mysql
  postfix-pgsql postfix-ldap postfix-pcre postfix-lmdb
  postfix-sqlite sasl2-bin | dovecot-common resolvconf
  postfix-cdb postfix-doc
Les NOUVEAUX paquets suivants seront installés :

```

- **Vérification SSH : `systemctl status sshd`**

```

nirine@nirine:~$ systemctl status sshd
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; >
   Active: active (running) since Mon 2021-04-19 11:43:33 CES >
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 15919 (sshd)
     Tasks: 1 (limit: 9374)
    Memory: 1.5M
    CGroup: /system.slice/ssh.service
            └─15919 sshd: /usr/sbin/sshd -D [listener] 0 of 10>

avril 19 11:43:33 nirine systemd[1]: Starting OpenBSD Secure S>
avril 19 11:43:33 nirine sshd[15919]: Server listening on 0.0.>
avril 19 11:43:33 nirine sshd[15919]: Server listening on :: p>
avril 19 11:43:33 nirine systemd[1]: Started OpenBSD Secure Sh>
lines 1-15/15 (END)

```

- **Connexion en SSH à stm32mp1 : `ssh root@192.168.7.1`**
- **Se placer dans local : `cd /usr/local`**

```

root@stm32mp1:/usr/local# ls
?@?@?          Linux-A7-examples  lost+found  west
on-start-at-startup
Cube-M4-examples  demo              projects

```

[Laisser terminal 2 ouvert]...

Terminal 3 : Code source

- Si erreur avec le GTK ajouter :
`/usr/include/gtk-3.0`
`/usr/include/glib-2.0`
`/usr/lib/x86_64-linux-gnu/glib-2.0/include`
`"/usr/include/pango-1.0`
`"/usr/include/harfbuzz`
`"/usr/include/cairo`
`"/usr/include/gdk-pixbuf-2.0`
`"/usr/include/atk-1.0"`
- Mise en place de l'environnement : `source`
[STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/SDK/environment-setup-cortexa7t2hf-neon-vfpv4-ostl-linux-gnueabi](#)

- Vérification : **\$CC --version**

```
nisrine@nisrine:~$ $CC --version
arm-ostl-linux-gnueabi-gcc (GCC) 9.3.0
Copyright (C) 2019 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

- Se placer dans le dossier où se trouve le code source : **cd STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/stm32mp1-openstlinux-21-03-31/sources/gtk_hello_world_example**

```
nisrine@nisrine:~$ cd STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/stm32mp1-openstlinux-21-03-31/sources/gtk_hello_world_example
```

- Compilation : **make**

```
nisrine@nisrine:~/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/stm32mp1-openstlinux-21-03-31/sources/gtk_hello_world_example$ ls
gtk_hello_world.c  Makefile
nisrine@nisrine:~/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/stm32mp1-openstlinux-21-03-31/sources/gtk_hello_world_example$ make
arm-ostl-linux-gnueabi-gcc -mthumb -mcpu=cortex-a7 -mfpu=neon-vfpv4 -mfloat-abi=hard -mcpu=cortex-a7 -ssysroot=/home/nisrine/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/SDK/sysroots/cortexa7t2hf-neon-vfpv4-ostl-linux-gnueabi -o gtk_hello_world gtk_hello_world.c -O2 -pipe -g -feliminate-unused-debug-types -Wall -pthread -I/home/nisrine/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/SDK/sysroots/cortexa7t2hf-neon-vfpv4-ostl-linux-gnueabi/usr/include/gtk-3.0 -I/home/nisrine/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/SDK/sysroots/cortexa7t2hf-neon-vfpv4-ostl-linux-gnueabi/usr/include/at-spi2-atk/2.0 -I/home/nisrine/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/SDK/sysroots/cortexa7t2hf-neon-vfpv4-ostl-linux-gnueabi/usr/include/at-spi-2.0 -I/home/nisrine/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/SDK/sysroots/cortexa7t2hf-neon-vfpv4-ostl-linux-gnueabi/usr/include/dbus-1.0 -I/home/nisrine/STM32MPU_w
```

- Transfert de l'exécutable sur le stm32mp1 : **scp gtk_hello_world root@192.168.7.1:/usr/local**

```
-openstlinux-21-03-31/sources/gtk_hello_world_example$ ls
gtk_hello_world  gtk_hello_world.c  Makefile
nisrine@nisrine:~/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/stm32mp1-openstlinux-21-03-31/sources/gtk_hello_world_example$ scp gtk_hello_world root@192.168.7.1:/usr/local
gtk_hello_world 100% 25KB 2.6MB/s 00:00
nisrine@nisrine:~/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Developer-Package/stm32mp1-openstlinux-21-03-31/sources/gtk_hello_world_example$
```

[Revenir sur terminal 2]

Terminal 2 - SSH

- Vérification du transfert

```
root@stm32mp1:/usr/local# ls
?@?@?          gtk_hello_world
Cube-M4-examples  lost+found
Linux-A7-examples projects
demo             weston-start-at-startup
root@stm32mp1:/usr/local#
```

- Exécution du code sur stm32mp1 : **./gtk_hello_world**

Distribution-Package

```
nisrine@nisrine:~$ cd /usr/bin
```

```
nisrine@nisrine:/usr/bin$ sudo ln -s /usr/bin/python2.7 /usr/bin/python
```

```
nisrine@nisrine:/usr/bin$ ls
```

['	mdir
2to3-2.7	mdu
a2ping	mendex
a5toa4	mesa-overlay-control.py
aa-enabled	mesg
aa-exec	mf
aarch64-linux-gnu-addr2line	mflua
aarch64-linux-gnu-ar	mflujit
aarch64-linux-gnu-as	mflujit-nowin
aarch64-linux-gnu-c++filt	mflua-nowin
aarch64-linux-gnu-cpp	mf-nowin
aarch64-linux-gnu-cpp-9	mformat
aarch64-linux-gnu-dwp	mfplain
aarch64-linux-gnu-elfedit	mft
aarch64-linux-gnu-gcc	migrate-pubring-from-classic-gpg
aarch64-linux-gnu-gcc-9	miktex-afm2tfm

```
nisrine@nisrine:~/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Distribution-Package/openstlin  
nix-5.10-dunfell-mp1-21-03-31$ repo sync  
Fetching: 100% (8/8), done in 3m37.048s  
Checking out: 100% (8/8), done in 2.990s  
repo sync has finished successfully.
```

```
nisrine@nisrine:/media/nisrine/cfc5600c-314c-42da-b94f-97b298eb19f6/nisrine/STM32MPU_  
workspace/STM32MP15-Ecosystem-v3.0.0/Distribution-Package/openstlinux-5.10-dunfell-mp  
1-21-03-31$ DISTRO=openstlinux-weston MACHINE=stm32mp1 source layers/meta-st/scripts/  
envsetup.sh
```

```
[HOST DISTRIB check]  
Linux Distrib: Ubuntu  
Linux Release: 20.04
```

Required packages for Linux Distrib:

build-essential chrpath cpio debianutils diffstat gawk gcc-multilib git iputils-ping
libegl1-mesa libgmp-dev libmpc-dev libstdc++12-dev libssl-dev pylint python3 python3-gi
t python3-jinja2 python3-pexpect python3-pip socat texinfo unzip wget xterm xz-utils

Missing required packages detected:

gcc-multilib

To update your Linux Distribution packages, two proposals:

- 1) run again envsetup.sh script with '--pkg-update' option
- OR
- 2) before running envsetup.sh script, launch first in your Linux console:

```
sudo apt-get update
```

```
sudo apt-get install gcc-multilib
```

Check aborted: exiting now...

```
nisrine@nisrine:/media/nisrine/cfc5600c-314c-42da-b94f-97b298eb19f6/nisrine/STM32MPU_  
workspace/STM32MP15-Ecosystem-v3.0.0/Distribution-Package/openstlinux-5.10-dunfell-mp  
1-21-03-31$ sudo apt-get install gcc-multilib
```

```
[sudo] Mot de passe de nisrine :
```

```
Lecture des listes de paquets... Fait
```

```
Construction de l'arbre des dépendances
```



```

Veuillez utiliser « sudo apt autoremove » pour les supprimer.
Les paquets suivants seront ENLEVÉS :
  g++-9-arm-linux-gnueabi g++-arm-linux-gnueabi gcc-9-aarch64-linux-gnu
  gcc-9-arm-linux-gnueabi gcc-9-arm-linux-gnueabihf gcc-aarch64-linux-gnu
  gcc-arm-linux-gnueabi gcc-arm-linux-gnueabihf
Les NOUVEAUX paquets suivants seront installés :
  gcc-multilib
0 mis à jour, 1 nouvellement installés, 8 à enlever et 3 non mis à jour.
Il est nécessaire de prendre 0 o/1 516 o dans les archives.
Après cette opération, 100 Mo d'espace disque seront libérés.
Souhaitez-vous continuer ? [O/n] O
(Lecture de la base de données... 301008 fichiers et répertoires déjà installés.)
Suppression de g++-arm-linux-gnueabi (4:9.3.0-1ubuntu2) ...
Suppression de g++-9-arm-linux-gnueabi (9.3.0-17ubuntu1~20.04cross2) ...
Suppression de gcc-aarch64-linux-gnu (4:9.3.0-1ubuntu2) ...
Suppression de gcc-9-aarch64-linux-gnu (9.3.0-17ubuntu1~20.04cross2) ...
Suppression de gcc-arm-linux-gnueabi (4:9.3.0-1ubuntu2) ...
Suppression de gcc-9-arm-linux-gnueabi (9.3.0-17ubuntu1~20.04cross2) ...
Suppression de gcc-arm-linux-gnueabihf (4:9.3.0-1ubuntu2) ...
Suppression de gcc-9-arm-linux-gnueabihf (9.3.0-17ubuntu1~20.04cross2) ...
Sélection du paquet gcc-multilib précédemment désélectionné.
(Lecture de la base de données... 300819 fichiers et répertoires déjà installés.)
Préparation du dépaquetage de .../gcc-multilib_4%3a9.3.0-1ubuntu2_amd64.deb ...
Dépaquetage de gcc-multilib (4:9.3.0-1ubuntu2) ...
Paramétrage de gcc-multilib (4:9.3.0-1ubuntu2) ...
Traitement des actions différées (« triggers ») pour man-db (2.9.1-1) ...
nlsrine@nlsrine:/media/nlsrine/cfc5600c-314c-42da-b94f-97b298eb19f6/nlsrine/STM32MPU
workspace/STM32MP15-Ecosystem-v3.0.0/Distribution-Package/openstlinux-5.10-dunfell-m
1-21-02-216

```

```
nlsrine@nlsrine:/media/nlsrine/cfc5600c-314c-42da-b94f-97b298eb19f6/nlsrine/STM32MPU_workspace/STM32MP15-Ecosystem-v3.0.0/Distribution-Package/openstlinux-5.10-dunfell-mp1-21-03-31$ DISTRO=openstlinux-weston MACHINE=stm32mp1 source layers/meta-st/scripts/envsetup.sh
[HOST DISTRIB check]
Linux Distrib: Ubuntu
Linux Release: 20.04
```

Required packages for Linux Distrib:
build-essential chrpath cpio debianutils diffstat gawk gcc-multilib git iputils-ping libegl1-mesa libgmp-dev libmpc-dev libSDL1.2-dev libssl-dev pylint python3 python3-git python3-jinja2 python3-pexpect python3-pip socat texinfo unzip wget xterm xz-utils

Check OK: all required packages are installed on host.

[source layers/openembedded-core/oe-init-build-env][with previous config]

=====
Configuration files have been created for the following configuration:

```
DISTRO           : openstlinux-weston
DISTRO_CODENAME  : dunfell
MACHINE          : stm32mp1
BB_NUMBER_THREADS : <no-custom-config-set>
PARALLEL_MAKE    : <no-custom-config-set>

BUILDDIR         : build-openstlinuxweston-stm32mp1
DOWNLOAD_DIR     : <disable>
SSTATE_DIR       : <disable>

SOURCE_MIRROR_URL : <no-custom-config-set>
SSTATE_MIRRORS    : <disable>

WITH_EULA_ACCEPTED: NO
```

=====