

Lierda IC610 yocto 开发指导

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文件修订历史

文档版本	变更日期	修订人	审核人	变更内容
Rev1.0	25-03-15	YQA		初始版本
Rev1.1	25-03-15	YQA		修改 downloads.tar.gz 下载地址

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1 引言

本文档依托 IC610 evk，旨在介绍 yocto 搭建及交叉编译器构建。



2 IC610 Yocto 环境搭建

开发环境要求：Ubuntu2004 及以上。

2.1 开发环境准备：

```
sudo apt-get update

sudo apt-get install gawk wget git diffstat unzip texinfo gcc-multilib chrpath socat cpio
python3 python3-pip python3-pexpect libssl-dev libgmp-dev libmpc-dev lz4 zstd
build-essential libncurses-dev libncurses5 libyaml-dev libssl-dev coreutils bsdmainutils
sed curl bc lrzsz corkscrew cvs subversion mercurial nfs-common nfs-kernel-server
libarchive-zip-perl dos2unix texi2html libxml2-utils
```

2.2 Yocto 源码准备

ic610-sdk\src\stm32mp2_yocto_v24.11.06.tar.gz 为 yocto 源码将该压缩包复制到
ubunut 下，

```
ubuntu$ tar -zxvf stm32mp2_yocto_v24.11.06.tar.gz
ubuntu$ cd stm32mp2_yocto_v24.11.06
```

2.3 编译镜像

```
stm32mp2_yocto_v24.11.06$ source layers/meta-st/scripts/envsetup.sh
```

```
yqa@yqa-ubuntu2004:~/stm32mp2_yocto_v24.11.06$ source layers/meta-st/scripts/envsetup.sh
[HOST DISTRI check]
Linux Distrib: Ubuntu
Linux Release: 20.04

Required packages for Linux Distrib:
bsdmainutils build-essential chrpath cpio debianutils diffstat gawk gcc-multilib git git-lfs iputils-ping libegl-mesa libgmp-dev libmpc-
thon3-jinja2 python3-pexpect python3-pip socat texinfo unzip wget xterm xz-utils zstd

Missing required packages detected:
git-lfs

[WARNING] Following required packages are not installed:
git-lfs

ST recommends to install these packages (provided by openEmbedded/yocto) for openSTLinux build

Feel free to update your distribution, or to ignore the WARNING (at your risk)...
would you ignore this warning ? (y/n) y
Ignoring missing required packages for openSTLinux build...

[BUILD_DIR configuration]
1. build-openstlinuxweston-stm32mp2 - DISTRO is 'openstlinux-weston' and MACHINE is 'stm32mp2'
2. NEW - *** SET NEW DISTRO AND MACHINE BUILD CONFIG ***
which one would you like? [build-openstlinuxweston-stm32mp2]
Selected BUILD_DIR: build-openstlinuxweston-stm32mp2
[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 : scarthgap
MACHINE : stm32mp2
BB_NUMBER_THREADS : <no-custom-config-set>
PARALLEL_MAKE : <no-custom-config-set>

BUILDDIR : build-openstlinuxweston-stm32mp2
DOWNLOAD_DIR : <disable>
SSTATE_DIR : <disable>

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

WITH_EULA_ACCEPTED: YES

=====

Available images for openSTLinux layers are:

- official openSTLinux images:
  st-image-weston - openSTLinux weston image with basic wayland support (if enable in distro)

- Other openSTLinux images:
  - Supported images:
    st-image-core - openSTLinux core image

You can now run 'bitbake <image>'

yqa@yqa-ubuntu2004:~/stm32mp2_yocto_v24.11.06/build-openstlinuxweston-stm32mp2$
```

注意：

在新的终端中必须再次执行 `source layers/meta-st/scripts/envsetup.sh`

yocto 首次编译需要从服务器下载相关源码，下载过程因网络问题较慢或多次报错，
downloads.tar.gz 为已经下载完成的源码包，下载地址为：

链接: https://pan.baidu.com/s/1aLAYkFt9EHsLCr793oJ_YA 提取码: fwf8

下载后，将其复制到 `stm32mp2_yocto_v24.11.06/build-openstlinuxweston-stm32mp2`
下解压即可。

```
build-openstlinuxweston-stm32mp2$ tar -zxvf downloads.tar.gz
```

编译 weston 镜像：

```
build-openstlinuxweston-stm32mp2$ bitbake st-image-weston
```

编译完成后 `tmp-glibc/deploy/images/stm32mp2/`下生成全部镜像：

`st-image-weston-openstlinux-weston-stm32mp2.rootfs.ext4` 为文件系统

`st-image-userfs-openstlinux-weston-stm32mp2.userfs.ext4`

st-image-vendorfs-openstlinux-weston-stm32mp2.vendorfs.ext4

以上生成的镜像替换 sdk 下源码下 src-ic610 /ic610-images/下原文件即可

生成交叉编译器：

```
build-openstlinuxweston-stm32mp2$ bitbake -c populate_sdk st-image-weston
```

生成交叉编译器安装包：

```
tmp-glibc/deploy/sdk/meta-toolchain-openstlinux-weston-stm32mp2.rootfs-x86_64-toolchain-5.0.3-snapshot.sh
```

交叉编译器安装参考《Lierda+IC610+EVK 软件应用开发指导_Rev1.0》2.1 交叉编译器准备。

2.4 Yocto 下 qt 交叉编译

编译 qt 镜像 X-LINUX-QT image

```
stm32mp2_yocto_v24.11.06/build-openstlinuxweston-stm32mp2$ bitbake st-image-qt
```

编译完成后 tmp-glibc/deploy/images/stm32mp2 下生成 qt 相关文件系统：

```
st-image-qt-openstlinux-weston-stm32mp2.rootfs.ext4
```

```
st-image-qt-userfs-openstlinux-weston-stm32mp2.userfs.ext4
```

编译 qt 交叉编译器 X-LINUX-QT SDK:

```
build-openstlinuxweston-stm32mp2$ bitbake -c populate_sdk meta-toolchain-qt6
```

编译完成后生成 qt 交叉编译：

```
tmp-glibc/deploy/sdk/meta-toolchain-qt6-openstlinux-weston-stm32mp2.rootfs-x86_64-toolchain-5.0.3-snapshot.sh
```

2.5 Yocto 添加第三方软件

```
build-openstlinuxweston-stm32mp2$ bitbake -s
```

bitbake -s 为显示所有可用的配方(recipes)及其版本信息，根据显示的配方可添加到配置文件。

添加第三方软件修改配置文件：

```
build-openstlinuxweston-stm32mp2$ vim conf/local.conf
```

文件系统镜像添加：

```
IMAGE_INSTALL:append = " protobuf protobuf-compiler protobuf-dev "
```

交叉编译器添加：

```
TOOLCHAIN_TARGET_TASK:append = " boost json-c "
```

2.6 Yocto 添加 layer

若 bitbake -s 查询后未找到需要的相关工具可手动添加到 yocot 下, 如添加 tpm2-tools 到文件系统下, tpm2-tools 在 meta-security 下, 从 yocot 官方下载到 layers。

```
~/stm32mp2_yocto_v24.11.06$ cd layers
stm32mp2_yocto_v24.11.06/layers$ git clone git://git.yoctoproject.org/meta-security
stm32mp2_yocto_v24.11.06/layers$ cd meta-security
```

当前使用的 yocto 版本为 scarthgap, 故下载的 meta-security 必须切换到相同的版本分支。

```
layers/meta-security$ git branch scarthgap remotes/origin/scarthgap
Branch 'scarthgap' set up to track remote branch 'scarthgap' from 'origin'.
layers/meta-security$ git checkout scarthgap
layers/meta-security$ cd ../..
~/stm32mp2_yocto_v24.11.06$ source layers/meta-st/scripts/envsetup.sh
```

添加 meta-security meta-tpm

```
build-openstlinuxweston-stm32mp2$ bitbake-layers add-layer ../layers/meta-security
build-openstlinuxweston-stm32mp2$
bitbake-layers add-layer ../layers/meta-security/meta-tpm
```

如上添加完成 conf/bblayers.conf 下自动添加

```

classes COPYING.MIT dynamic-layers lib meta-hardening meta-integrify meta-tpm recipes-compliance recipes-ids recipes-mm recipes-
conf bus kss meta-hardening meta-parse README.md recipes-cora recipes-kernel recipes-perf recipes-
yqa@yqa-ubuntu2004:~/stm32mp2_yocto_v24.11.06/layers/meta-security$ cd ../..
yqa@yqa-ubuntu2004:~/stm32mp2_yocto_v24.11.06$ cd build-openstlinuxweston-stm32mp2/
yqa@yqa-ubuntu2004:~/stm32mp2_yocto_v24.11.06/build-openstlinuxweston-stm32mp2$ git diff
diff --git a/build-openstlinuxweston-stm32mp2/conf/bblayers.conf b/build-openstlinuxweston-stm32mp2/conf/bblayers.conf
index 3ab95c6..cf1e3bc 100644
--- a/build-openstlinuxweston-stm32mp2/conf/bblayers.conf
+++ b/build-openstlinuxweston-stm32mp2/conf/bblayers.conf
@@ -54,6 +54,8 @@ BBLAYERS += " \
    "${POKY}" \
    /home/yqa/stm32mp2_yocto_v24.11.06/layers/meta-qt6 \
    /home/yqa/stm32mp2_yocto_v24.11.06/layers/meta-st/meta-st-x-linux-qt \
+   /home/yqa/stm32mp2_yocto_v24.11.06/layers/meta-security \
+   /home/yqa/stm32mp2_yocto_v24.11.06/layers/meta-security/meta-tpm \
    # BSP dependencies"
BBLAYERS += "/home/yqa/stm32mp2_yocto_v24.11.06/layers/meta-openembedded/meta-oe"
diff --git a/build-openstlinuxweston-stm32mp2/conf/local.conf b/build-openstlinuxweston-stm32mp2/conf/local.conf
index ef4d6a1..22ff111 100644
--- a/build-openstlinuxweston-stm32mp2/conf/local.conf
+++ b/build-openstlinuxweston-stm32mp2/conf/local.conf
@@ -328,5 +328,6 @@ HOSTTOOLS += "xz truncate"
ACCEPT_EULA_stm32mp2 = "1"
CONNECTIVITY_CHECK_URLS = ""
SERVER_TIMEOUT = "60"

```

使用 bitbake -s 可查询配方名称。

```
build-openstlinuxweston-stm32mp2$ vim conf/local.conf
```

IMAGE_INSTALL:append 添加 tpm2-tools tpm2-tss tpm2-abrmd rng-tools

```

BSP dependencies
BBLAYERS += "/home/yqa/stm32mp2_yocto_v24.11.06/layers/meta-openembedded/meta-oe"
diff --git a/build-openstlinuxweston-stm32mp2/conf/local.conf b/build-openstlinuxweston-stm32mp2/conf/local.conf
index ef4d6a1..6058cb0 100644
--- a/build-openstlinuxweston-stm32mp2/conf/local.conf
+++ b/build-openstlinuxweston-stm32mp2/conf/local.conf
@@ -328,5 +328,6 @@ HOSTTOOLS += "xz truncate"
ACCEPT_EULA_stm32mp2 = "1"
CONNECTIVITY_CHECK_URLS = ""
SERVER_TIMEOUT = "60"
IMAGE_INSTALL:append = " boost [json-c curl protobuf protobuf-compiler protobuf-dev openssl openssl-bin openssl-dev iperf2 iperf3 tpm2-tools tpm2-tss tpm2-abrmd rng-tools"
POLCHAIN_TARGET_TASK:append = " boost [json-c curl protobuf protobuf-compiler protobuf-dev openssl openssl-bin openssl-dev iperf2 iperf3 tpm2-tools tpm2-tss tpm2-abrmd rng-tools"
diff --git a/layers/meta-qt6 b/layers/meta-qt6

```

重新编译镜像即可。