

Zturn Board Petalinux Development Manual

V1.0



Revision History

Version	Description	Date
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Chapter 1 Overview

1.1 Overview

Petalinux is an embedded Linux Development Kit launched by Xilinx company, including Linux kernel, u-boot, device tree, rootfs and other source codes, which can generate, configure and compile conveniently by customers.

This manual will start from the environment building, step by step to introduce how to develop petalinux2018.3. The commands on the development host in this manual are explained with Ubuntu 16.04 as an example.

1.2 Computer configuration

Petalinux is a large software with high requirements for computer hardware configuration.

Computer configuration requirements:

- (1) Requires more than 8 GB of memory.
- (2) Require CPU above Pentium 4 and 2GHz.
- (3) More than 100GB hard disk required.
- (4) Operating system Ubuntu 16.04.

To install petalinux, we need 8GB of memory, more than 2GB of CPU frequency, and more than 100GB of hard disk

Chapter 2 Build Petalinux Development Environment

2.1 Preparation before installation

Download petalinux-v2018.3-final-installer.run. Petalinux can be downloaded on Xilinx official website, but you need to register an account before downloading.

2.2 Install the dependency library of petalinux

The installation of petalinux requires some dependency libraries. According to the dependency libraries required by petalinux2018.3, install the dependency libraries as follows.

```
# sudo apt-get install tofrodos iproute2 gawk
# sudo apt-get install gcc git make
# sudo apt-get install xvfb
# sudo apt-get install net-tools libncurses5-dev tftpd
# sudo apt-get install zlib1g-dev zlib1g-dev:i386 libssl-dev
# sudo apt-get install flex bison libselinux1
# sudo apt-get install gnupg wget diffstat chrpath socat xterm
# sudo apt-get install autoconf libtool tar unzip texinfo
# sudo apt-get install zlib1g-dev gcc-multilib build-essential
# sudo apt-get install libsdl1.2-dev libglib2.0-dev
# sudo apt-get install screen pax gzip tar
```

2.3 Install petalinux2018.3

Execute the following command to install petalinux2018.3. During the installation, there will be prompts such as petalinux end user license agreement (EULA). You need to press keyboard "q", then press "y" to confirm the license. The "<workdir>" in this article is used to represent the working directory on the ubuntu16.04 system, for example "/home/xxx/workspace/", please ensure the directory access permission. Copy

“petalinux-v2018.3-final-installer.run” to the working directory “<workdir>”.

```
# mkdir -p petalinux
# ./petalinux-v2018.3-final-installer.run /home/myir/petalinux
```

After the installation of petalinux, you need to configure the startup environment of petalinux. Enter the following command to configure the petalinux command function.

```
# source petalinux/settings.sh
```

Chapter 3 Compile Peatlinux System

3.1 Compile petalinux

Copy “zturn-7z010.bsp” or “zturn-7z020.bsp” from the product CD to the ubuntu16.04 system. The < workdir > is used to represent the working directory on the ubuntu16.04 system, for example “/home/xxx/ workspace/”, please ensure the directory access permission.

```
# mkdir -p <WORKDIR>
# cp -a <DVDROM>/04-Linux_Source/ Petalinux/ zturn-7z010.bsp <WORKDIR>
# cd <WORKDIR>
# petalinux-create -t project -s zturn-7z010.bsp
# cd zturn
# petalinux-build
```

It takes a long time to compile petalinux, waiting for the compilation of petalinux to complete. After the compilation of petalinu is completed, enter the following command to generate the “boot.bin” file.

```
# petalinux-package --boot --fsbl images/linux/zynq_fsbl.elf
--u-boot=images/linux/u-boot.elf --fpga images/linux/system.bit
```

After the steps are completed, the image files “boot.bin, image.ub, rootfs.tar.gz” will be generated in the “images /linux” directory.

3.2 Make TF card for boot

Format the TF card into two partitions, the first partition is FAT32 and the second

partition is ext4. It is recommended that the first partition be set at about 500M and the rest be used for the second partition. Copy "BOOT.BIN, image.ub" to the first partition. Execute the following command to copy the contents of rootfs.tar.gz to the second partition.

```
# sudo tar -xvf rootfs.tar.gz -C /media/rootfs
```

By inserting the TF card into the development board, you can start the Linux system compiled by petalinux.

3.3 Compile u-boot

Use petalinux to compile u-boot.

```
# petalinux-build -c u-boot -x distclean  
# petalinux-build -c u-boot
```

After the compilation of u-boot, enter the following command to generate the required image file "boot.bin" in the images/linux directory.

3.3 Compile linux

Use petalinux to compile linux.

```
# petalinux-build -c linux -x distclean  
# petalinux-build -c linux
```

After the compilation of linux, the image file "Image.ub" will be generated in the images/linux directory.

3.4 Compile devicetree

Use petalinux to compile devicetree.

```
# petalinux-build -c device-tree -x distclean  
# petalinux-build -c device-tree
```

After the compilation of device-tree, the image file "Image.ub" will be generated in the images/linux directory.

3.5 Compile rootfs file system

Use petalinux to compile rootfs

```
# petalinux-config -c rootfs  
# petalinux-build -c rootfs
```

After the compilation of rootfs, the image file "rootfs.tar.gz" will be generated in the images/linux directory.

Chapter 4 Burn Petalinux System

Because of there has no EMMC on the Zturn Board, we only support to flash Rootfs to SD card.

4.1 Start burning

(1)Enter to ubuntu16.04 system of computer, use “fdisk” command to format the TF card into two partitions, It is recommended that the first partition be set at about 500M and the rest be used for the second partition.

```
# fdisk /dev/sdb
```

(2)the first partition is FAT32 and the second partition is ext4.

```
# mkfs.vfat /dev/sdb1  
# mkfs.ext4 /dev/sdb2
```

(3)Execute the following command to copy the contents of rootfs.tar.gz to the second partition.

```
# sudo tar -xvf rootfs.tar.gz -C /media/rootfs
```

(4)Copy "BOOT.BIN, image.ub, rootfs.tar.gz" in the petalinux “images/linux” folder to the first partition of the TF card. The required files are shown in the following table:

File Name	Description
BOOT.BIN	System boot program, including fsbl and u-boot.
image.ub	Linux kernel.
rootfs.tar.gz	Root file system, ready to burn to the file system of EMMC

Table 4-1

Appendix 1 Warranty & Technical Support Services

MYIR Tech Limited is a global provider of ARM hardware and software tools, design solutions for embedded applications. We support our customers in a wide range of services to accelerate your time to market.

MYIR is an ARM Connected Community Member and work closely with ARM and many semiconductor vendors. We sell products ranging from board level products such as development boards, single board computers and CPU modules to help with your evaluation, prototype, and system integration or creating your own applications. Our products are used widely in industrial control, medical devices, consumer electronic, telecommunication systems, Human Machine Interface (HMI) and more other embedded applications. MYIR has an experienced team and provides custom design services based on ARM processors to help customers make your idea a reality.

The contents below introduce to customers the warranty and technical support services provided by MYIR as well as the matters needing attention in using MYIR's products.

Service Guarantee

MYIR regards the product quality as the life of an enterprise. We strictly check and control the core board design, the procurement of components, production control, product testing, packaging, shipping and other aspects and strive to provide products with best quality to customers. We believe that only quality products and excellent services can ensure the long-term cooperation and mutual benefit.

Price

MYIR insists on providing customers with the most valuable products. We do not pursue excess profits which we think only for short-time cooperation. Instead, we hope to establish long-term cooperation and win-win business with customers. So we will offer reasonable prices in the hope of making the business greater with the customers together hand in hand.

Delivery Time

MYIR will always keep a certain stock for its regular products. If your order quantity is less than the amount of inventory, the delivery time would be within three days; if your order

quantity is greater than the number of inventory, the delivery time would be always four to six weeks. If for any urgent delivery, we can negotiate with customer and try to supply the goods in advance.

Technical Support

MYIR has a professional technical support team. Customer can contact us by email (support@myirtech.com), we will try to reply you within 48 hours. For mass production and customized products, we will specify person to follow the case and ensure the smooth production.

After-sale Service

MYIR offers one year free technical support and after-sales maintenance service from the purchase date. The service covers:

1. Technical support service

- a) MYIR offers technical support for the hardware and software materials which have provided to customers;
- b) To help customers compile and run the source code we offer;
- c) To help customers solve problems occurred during operations if users follow the user manual documents;
- d) To judge whether the failure exists;
- e) To provide free software upgrading service.

However, the following situations are not included in the scope of our free technical support service:

- a) Hardware or software problems occurred during customers' own development;
- b) Problems occurred when customers compile or run the OS which is tailored by themselves;
- c) Problems occurred during customers' own applications development;
- d) Problems occurred during the modification of MYIR's software source code.

2. After-sales maintenance service

The products except LCD, which are not used properly, will take the twelve months free maintenance service since the purchase date. But following situations are not included in the scope of our free maintenance service:

- a) The warranty period is expired;

- b) The customer cannot provide proof-of-purchase or the product has no serial number;
- c) The customer has not followed the instruction of the manual which has caused the damage the product;
- d) Due to the natural disasters (unexpected matters), or natural attrition of the components, or unexpected matters leads the defects of appearance/function;
- e) Due to the power supply, bump, leaking of the roof, pets, moist, impurities into the boards, all those reasons which have caused the damage of the products or defects of appearance;
- f) Due to unauthorized weld or dismantle parts or repair the products which has caused the damage of the products or defects of appearance;
- g) Due to unauthorized installation of the software, system or incorrect configuration or computer virus which has caused the damage of products.

Warm tips:

- 1) MYIR does not supply maintenance service to LCD. We suggest the customer first check the LCD when receiving the goods. In case the LCD cannot run or no display, customer should contact MYIR within 7 business days from the moment get the goods.
- 2) Please do not use finger nails or hard sharp object to touch the surface of the LCD.
- 3) MYIR suggests user purchasing a piece of special wiper to wipe the LCD after long time use, please avoid clean the surface with fingers or hands to leave fingerprint.
- 4) Do not clean the surface of the screen with chemicals.
- 5) Please read through the product user manual before you using MYIR's products.
- 6) For any maintenance service, customers should communicate with MYIR to confirm the issue first. MYIR's support team will judge the failure to see if the goods need to be returned for repair service, we will issue you RMA number for return maintenance service after confirmation.

3. Maintenance period and charges

- a) MYIR will test the products within three days after receipt of the returned goods and inform customer the testing result. Then we will arrange shipment within one week for the repaired goods to the customer. For any special failure, we will negotiate with customers

to confirm the maintenance period.

b) For products within warranty period and caused by quality problem, MYIR offers free maintenance service; for products within warranty period but out of free maintenance service scope, MYIR provides maintenance service but shall charge some basic material cost; for products out of warranty period, MYIR provides maintenance service but shall charge some basic material cost and handling fee.

4. Shipping cost

During the warranty period, the shipping cost which delivered to MYIR should be responsible by user; MYIR will pay for the return shipping cost to users when the product is repaired. If the warranty period is expired, all the shipping cost will be responsible by users.

5. Products Life Cycle

MYIR will always select mainstream chips for our design, thus to ensure at least ten years continuous supply; if meeting some main chip stopping production, we will inform customers in time and assist customers with products updating and upgrading.

Value-added Services

1. MYIR provides services of driver development base on MYIR's products, like serial port, USB, Ethernet, LCD, etc.
2. MYIR provides the services of OS porting, BSP drivers' development, API software development, etc.
3. MYIR provides other products supporting services like power adapter, LCD panel, etc.
4. ODM/OEM services.



MYIR Tech Limited

Room 1306, Wensheng Center, Wenjin Plaza,

North Wenjin Road, Luohu District, Shenzhen, China 518020

Support Email: support@myirtech.com

Sales Email: sales@myirtech.com

Phone: +86-755-22984836

Fax: +86-755-25532724

Website: www.myirtech.com



