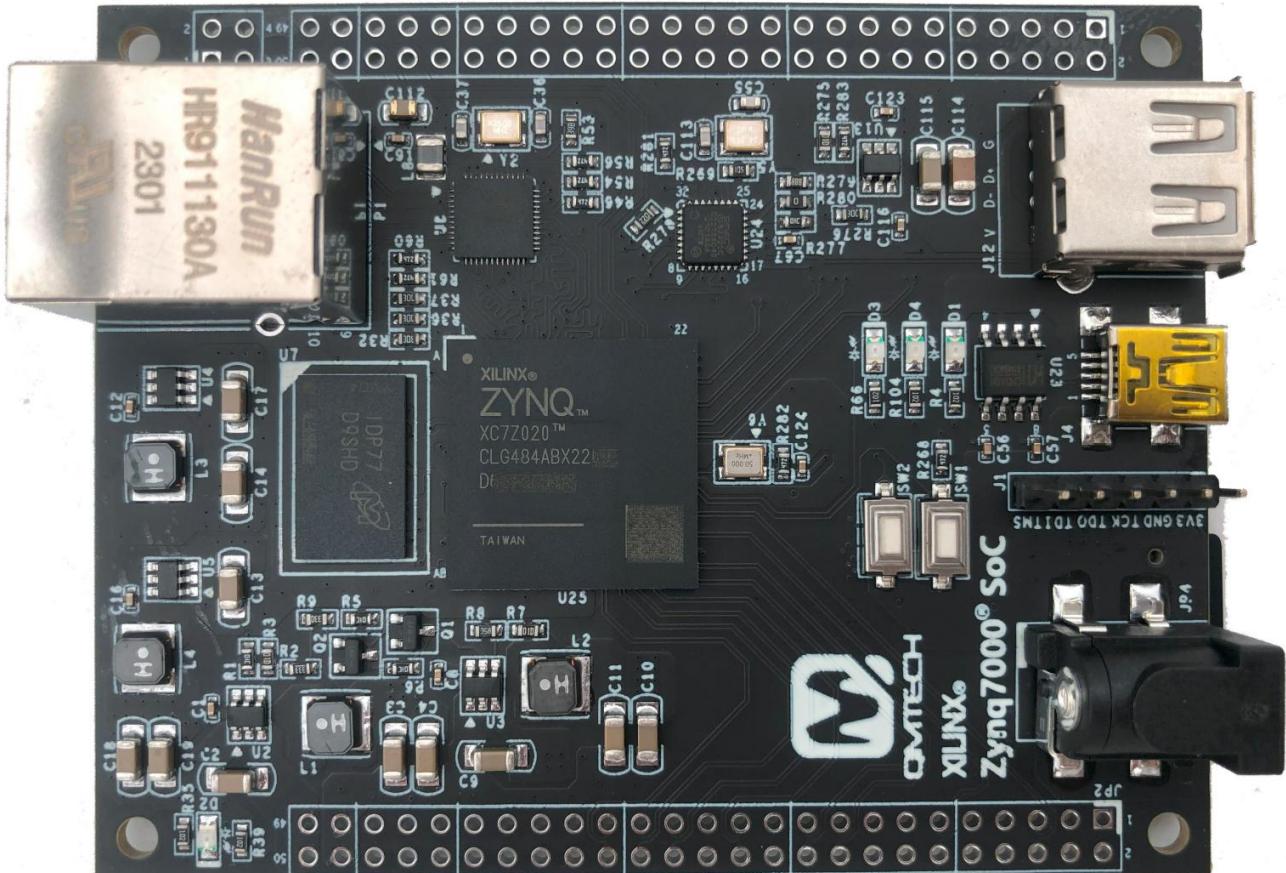


QMTECH ZYNQ XC7Z020 STARTER KIT

USER MANUAL



Preface

The QMTECH® ZYNQ7000 Starter Kit uses Xilinx Zynq®-7000 device which integrates the software programmability of an ARM®-based processor with the hardware programmability of an FPGA, enabling key analytics and hardware acceleration while integrating CPU, DSP, ASSP, and mixed signal functionality on a single device. Consisting of single-core Zynq-7000S and dual-core Zynq-7000 devices, the Zynq-7000 family is the best price to performance-per-watt, fully scalable SoC platform for your unique application requirements.

Table of Contents

1. INTRODUCTION	3
1.1 DOCUMENT SCOPE	3
2. GETTING STARTED	3
2.1 STEPS TO CUSTOMIZE THE PETALINUX	4
2.2 TEST THE LINUX ENVIRONMENT	18
3. REFERENCE	19
4. REVISION	20

上海腾脉电子有限公司



QMTECH

QMTECH ZYNQ7000 Starter Kit

User Manual(PetaLinux) V01

1. Introduction

1.1 Document Scope

This user manual introduces the procedure to make the PetaLinux environment running on the QMTECH XC7Z020 Starter Kit. The PetaLinux environment mainly covers three parts: u-boot, Linux OS and file system. All of those parts are developed with PetaLinux 2019.2 under Ubuntu 18.04.1 (64bit) environment. The prerequisites before working with the PetaLinux are shown as below:

1. Preferred and verified Ubuntu version is Ubuntu 18.04.1 (64bit).

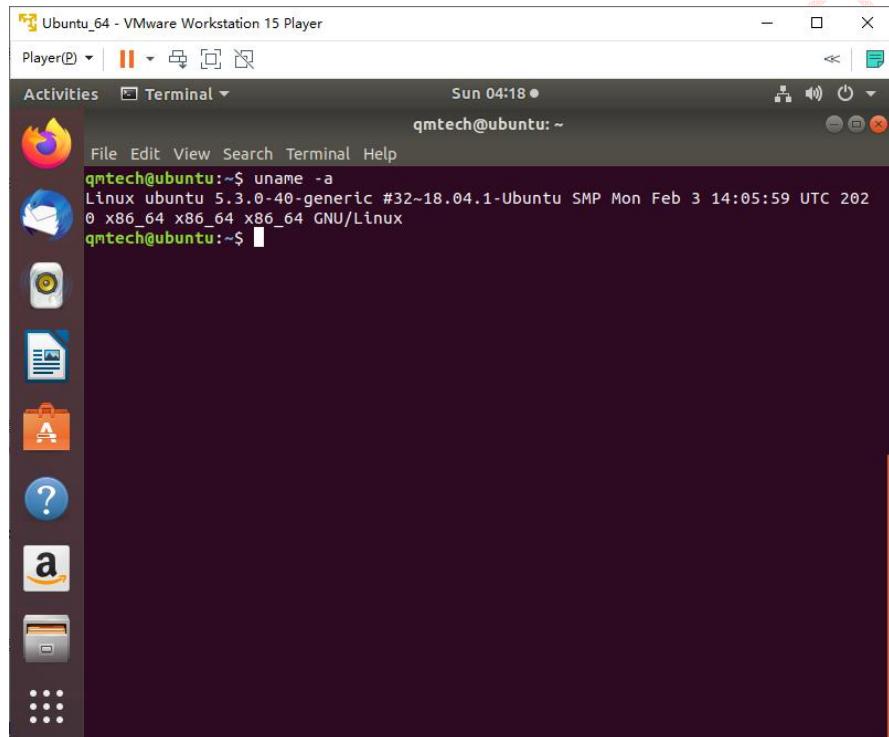


Figure 1-1. Ubuntu Version

2. Users shall install the required packages before install the PetaLinux 2019.2 in Ubuntu. The detailed required packages are mentioned in **UG1144: Table 2: Packages and Linux Workstation Environments**.
Notification: Users need to have root access to install the required packages mentioned in that table. The PetaLinux tools need to be installed as a non-root user.
3. Users shall have the basic knowledge about the usage of the Linux environment. Know how to use the cross-compile toolchain including arm-gcc-linux, makefile, etc.

2. Getting Started

This chapter describes the detailed steps to create a customized PetaLinux. Comparing to the existing ZYNQ development board e.g. Xilinx ZC702, there are many differences in the QMTECH ZYNQ7000 Starter Kit. For example, there's only one 16bit width DDR3 memory chip connected to PS ARM core. Hence, the u-boot/ Linux device tree for the Starter Kit needs to be updated here.

2.1 Steps to Customize the PetaLinux

The first step is to customize the hardware info required by PetaLinux. The hardware info could be retrieved from below Vivado project:

\$QMTECH_XC7Z2020_STARTER_KIT_V01\PetaLinux\Project01_PetaLinux.zip

Below image shows the customized ZYNQ system in Vivado 2018.3. Make sure the project could successfully pass the three steps: Synthesis, implementation and Generate Bitstream.

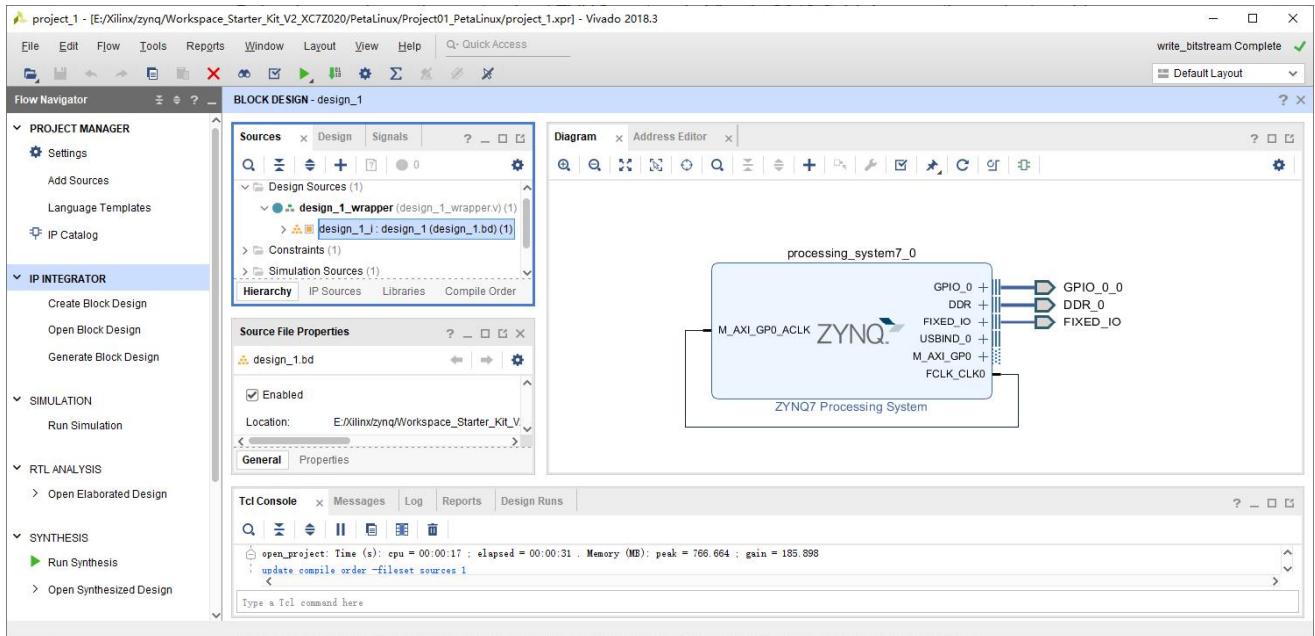


Figure 2-1. Modifications

Then users could retrieve the customized hardware info by clicking the [File] -> [Export] -> [Export Hardware]. And remember check the [Include Bitstream] before click the [OK] button.

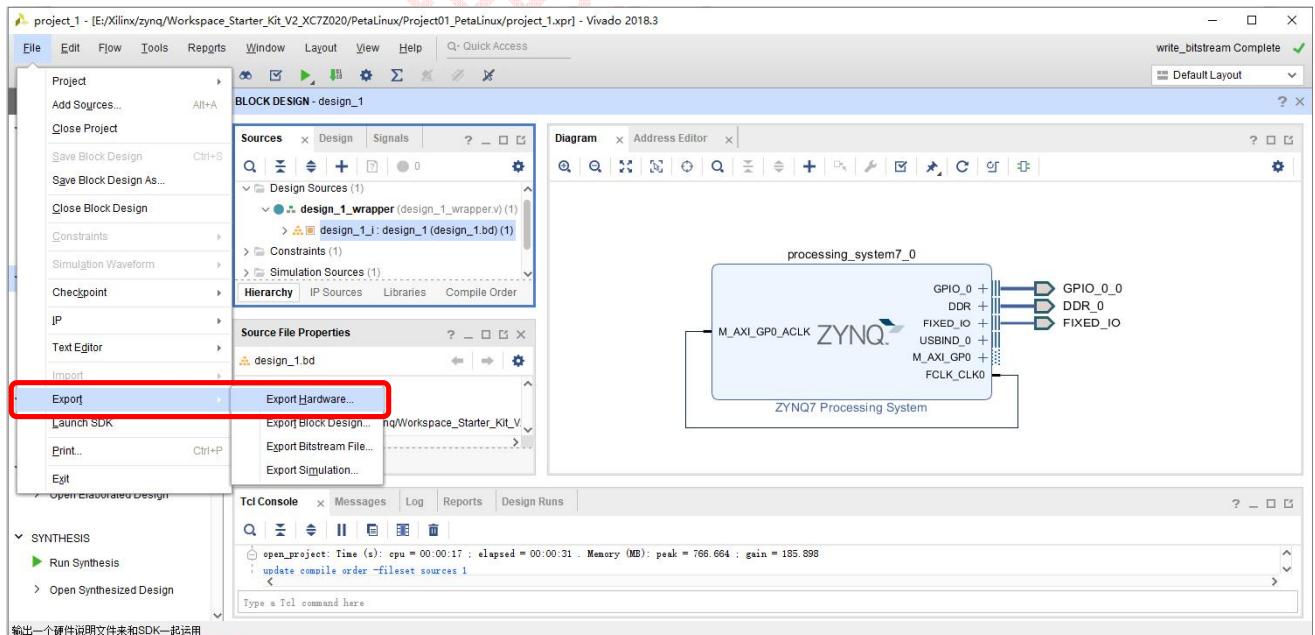


Figure 2-2. Export Hardware Info



QMTECH

QMTECH ZYNQ7000 Starter Kit

User Manual(PetaLinux) V01

The generated hardware info file could be found here:

\$QMTECH_XC7Z2020_STARTER_KIT_V01\PetaLinux\Project01_PetaLinux\project_1.sdk\design_1_wrapper.hdf

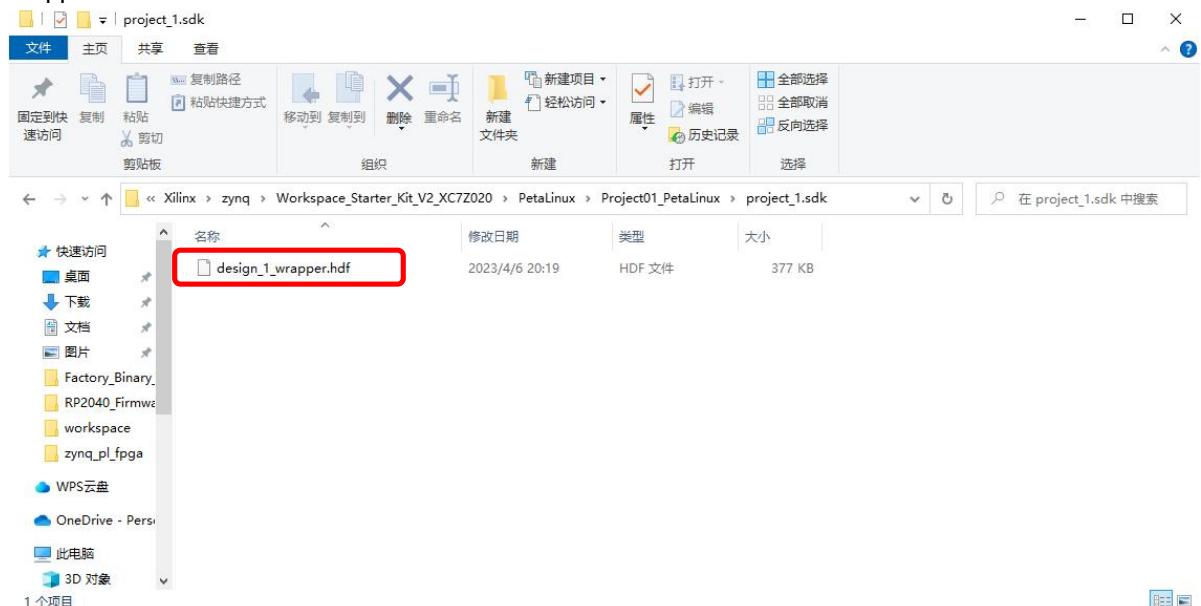


Figure 2-3. Target Hardware Info File

Copy the design_1_wrapper.hdf file into Ubuntu environment. E.g. put the file in folder \$workspace/PetaLinux_workspace/Linux_base_Starter_Kit_V02_XC7Z020.sdk/.

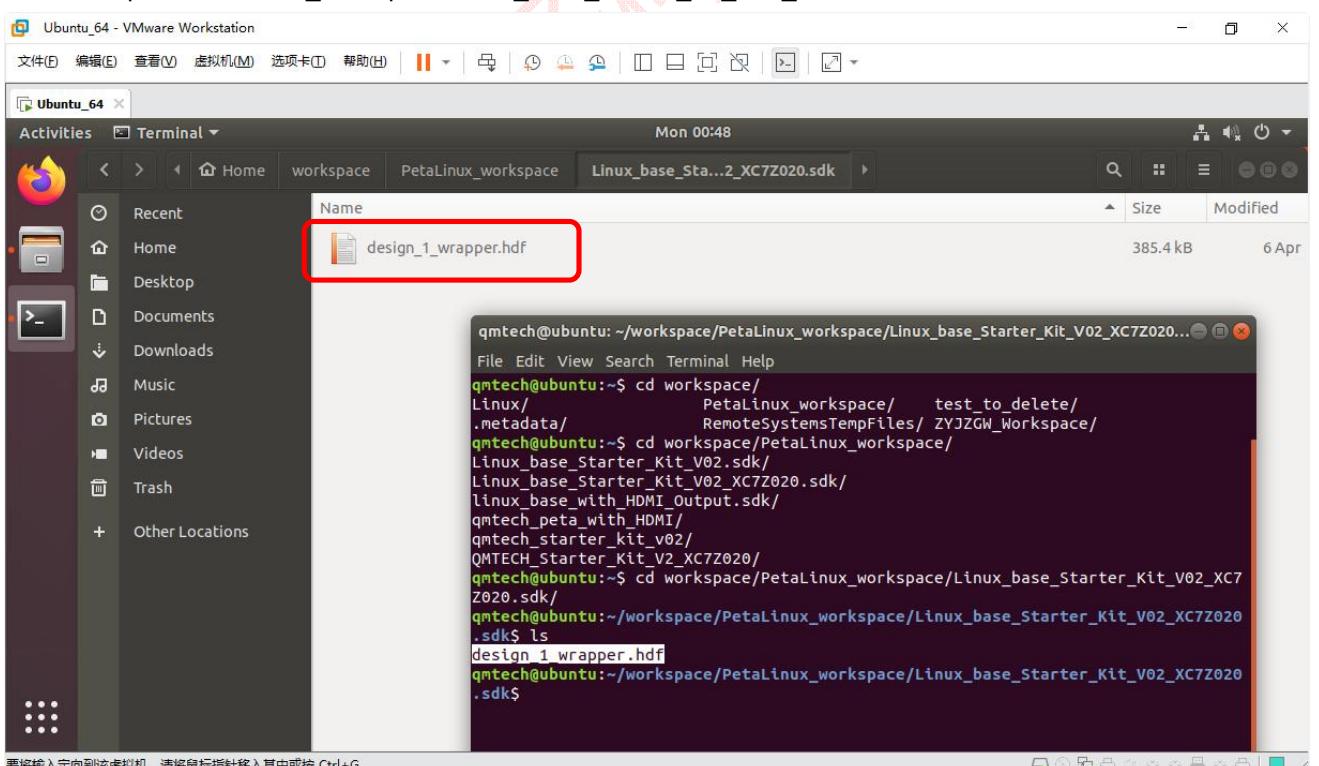


Figure 2-4. Import Hardware Info File

In our example, the PetaLinux 2019.2 package is installed in folder /opt/pkg/petalinux. Users need change the below commands according to the detailed directory that contains the PetaLinux.

Type command in the terminal to **source** the PetaLinux: `/opt/pkg/petalinux/settings.sh`. Create a new folder named as **QMTECH_Starter_Kit_V2_XC7Z020** by typing command: `petalinux-create --type project --template zynq --name QMTECH_Starter_Kit_V2_XC7Z020`. This new folder is in the same directory as the `Linux_base_Starter_Kit_V02_XC7Z020.sdk` and used as the PetaLinux workspace.

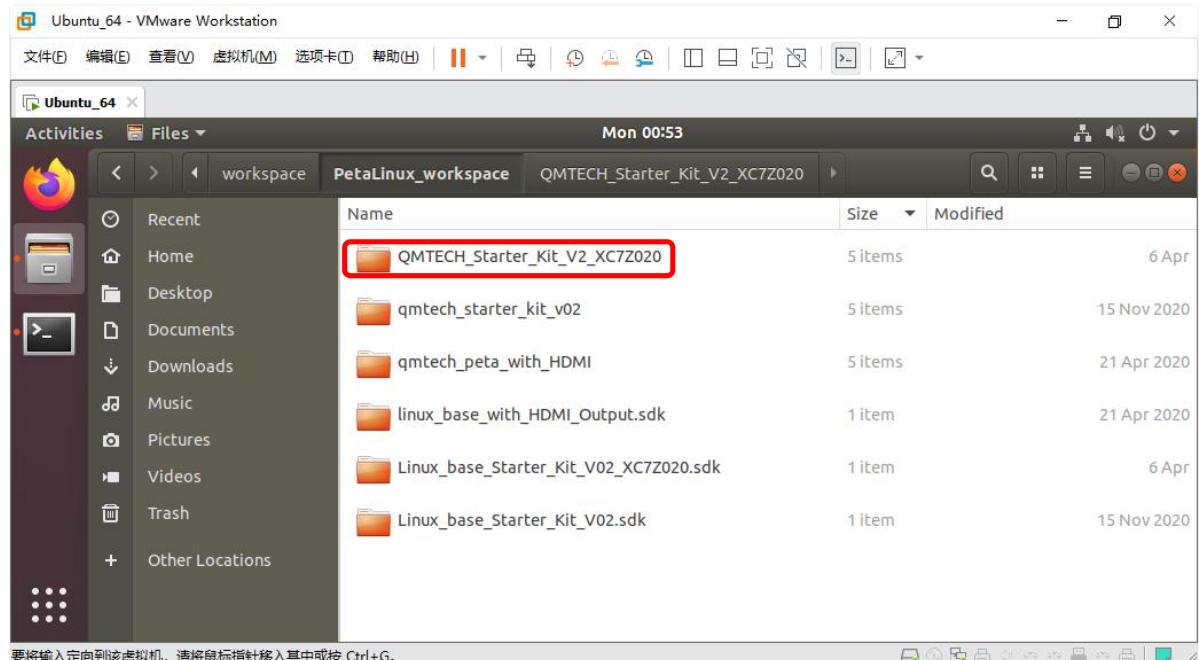


Figure 2-5. Create PetaLinux Working Folder

Then enter into the folder **QMTECH_Starter_Kit_V2_XC7Z020**.

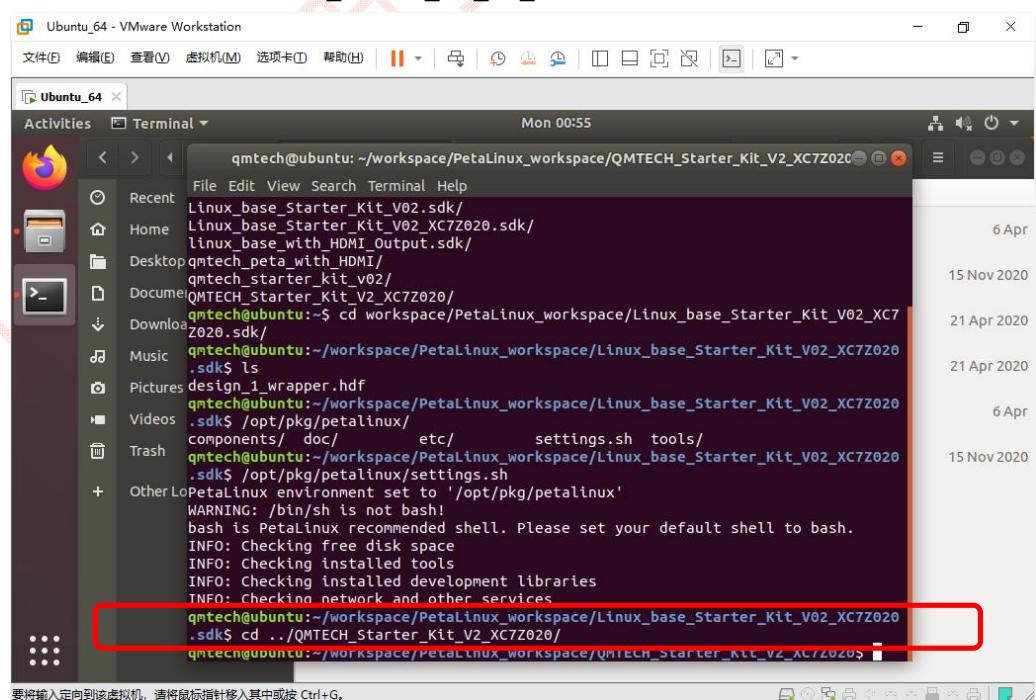


Figure 2-6. Enter Workspace

Import the hardware info into PetaLinux by command: **petalinux-config --get-hw-description ./linux_base_Starter_Kit_V02_XC7Z020.sdk**. Below configuration image will display and nothing needs to be changed here.

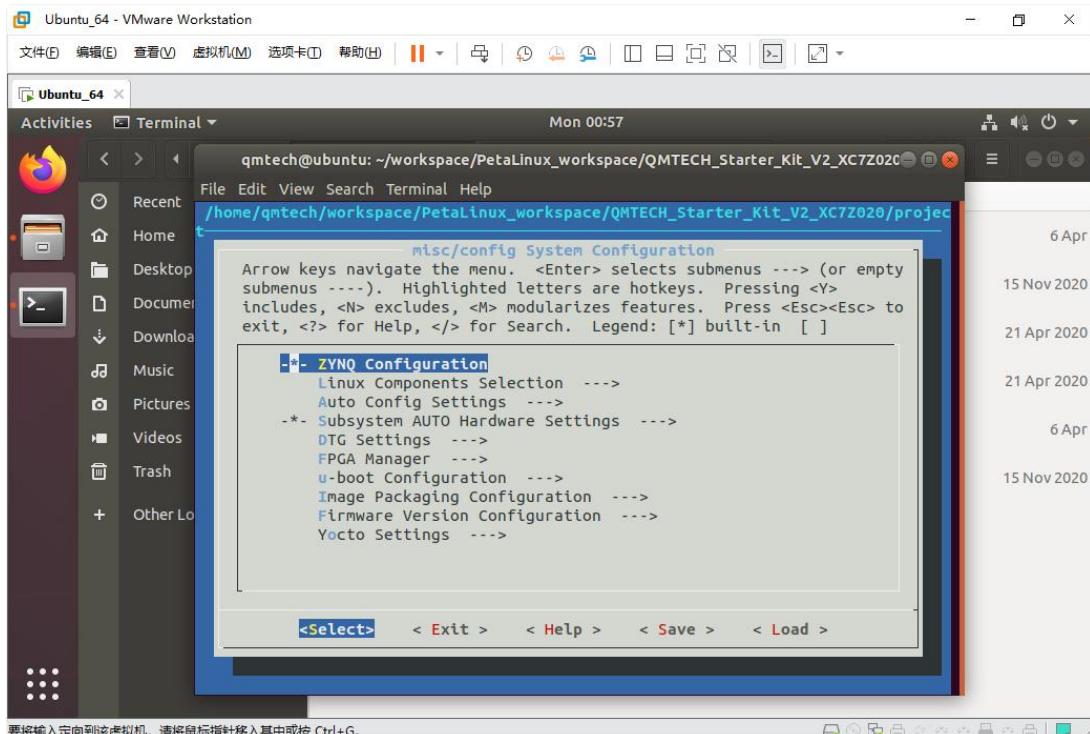


Figure 2-7. ZYNQ Configuration

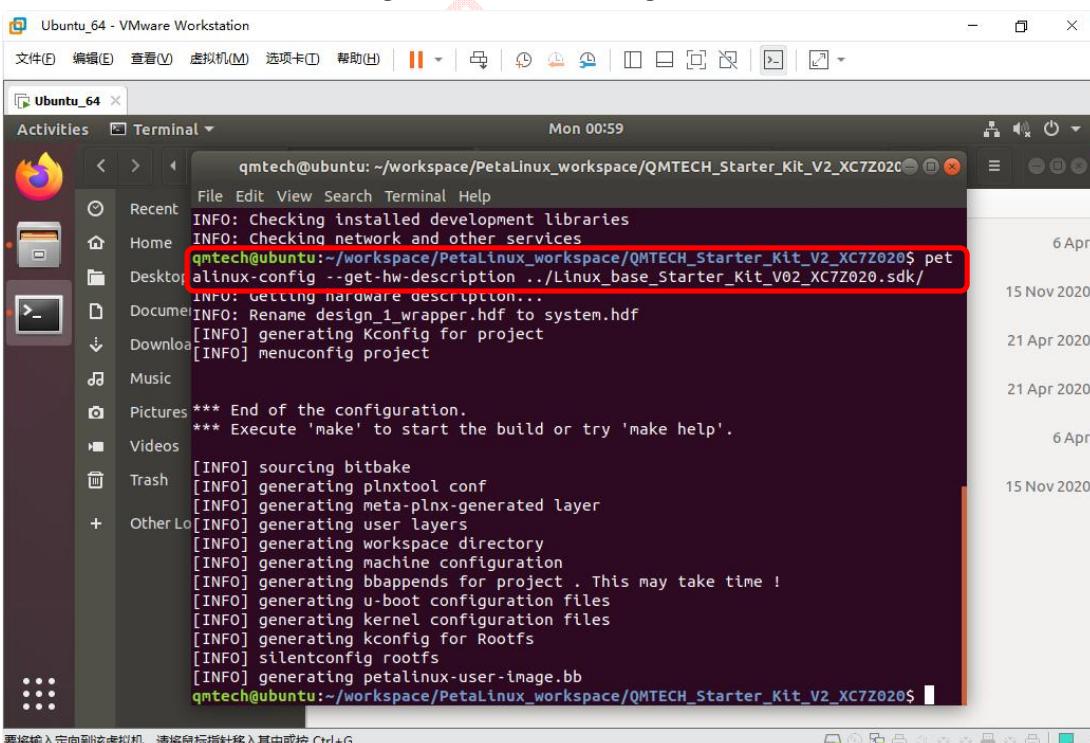


Figure 2-8. Import Hardware Info

Once the hardware info is successfully imported, users may start to configure the PetaLinux kernel by command: **petalinux-config -c kernel**

This step may take a really long time. Be patient here and make sure the VM's network status is perfect.

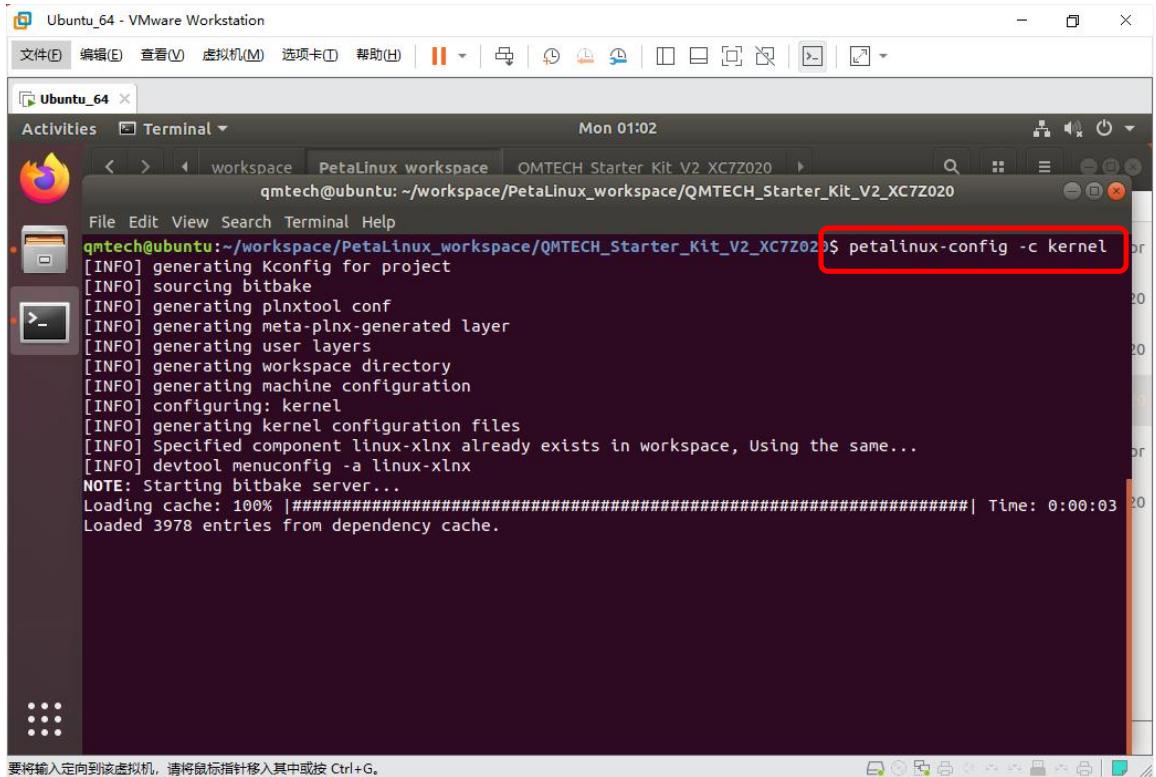


Figure 2-9. Configure PetaLinux Kernel

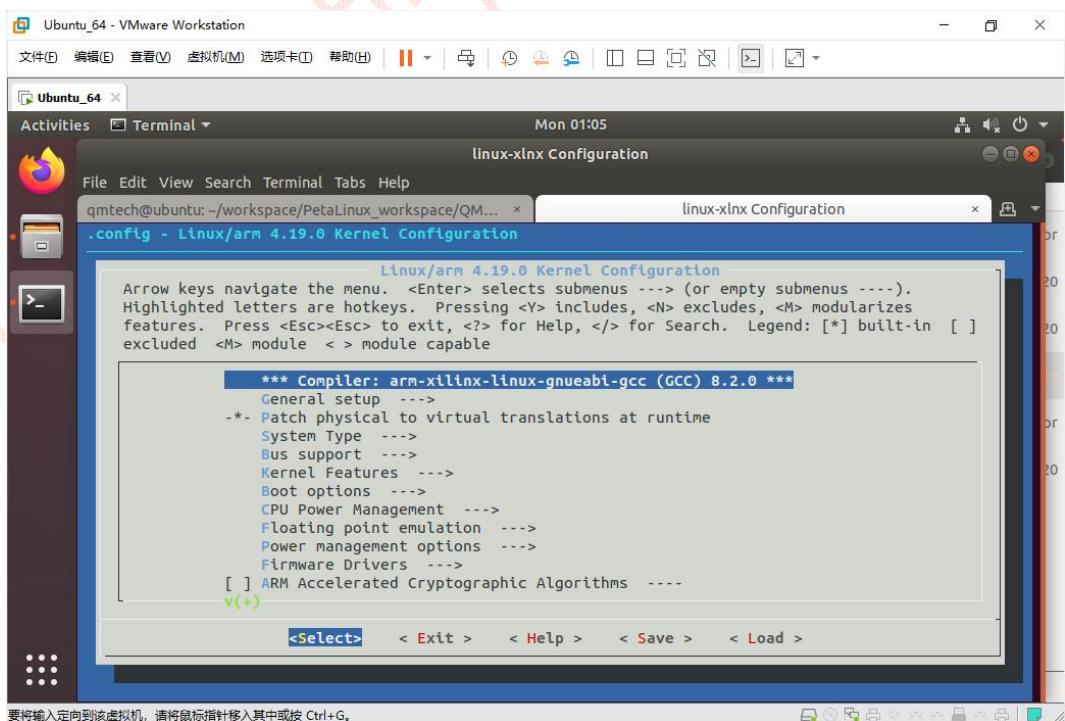


Figure 2-10. No Need to change the Kernel Configurations

Once the PetaLinux Kernel info is successfully configured, users may start to configure the PetaLinux file system by command: **petalinux-config -c rootfs**

Below image will display and nothing needs to be changed here.

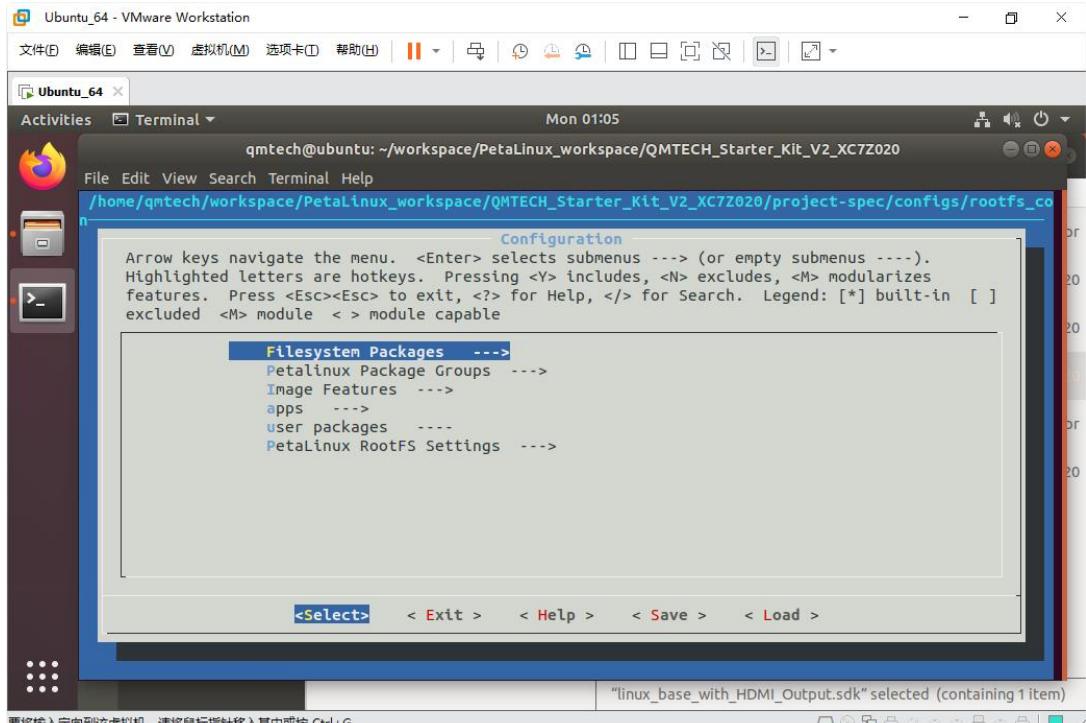


Figure 2-11. No Need to change the rootfs

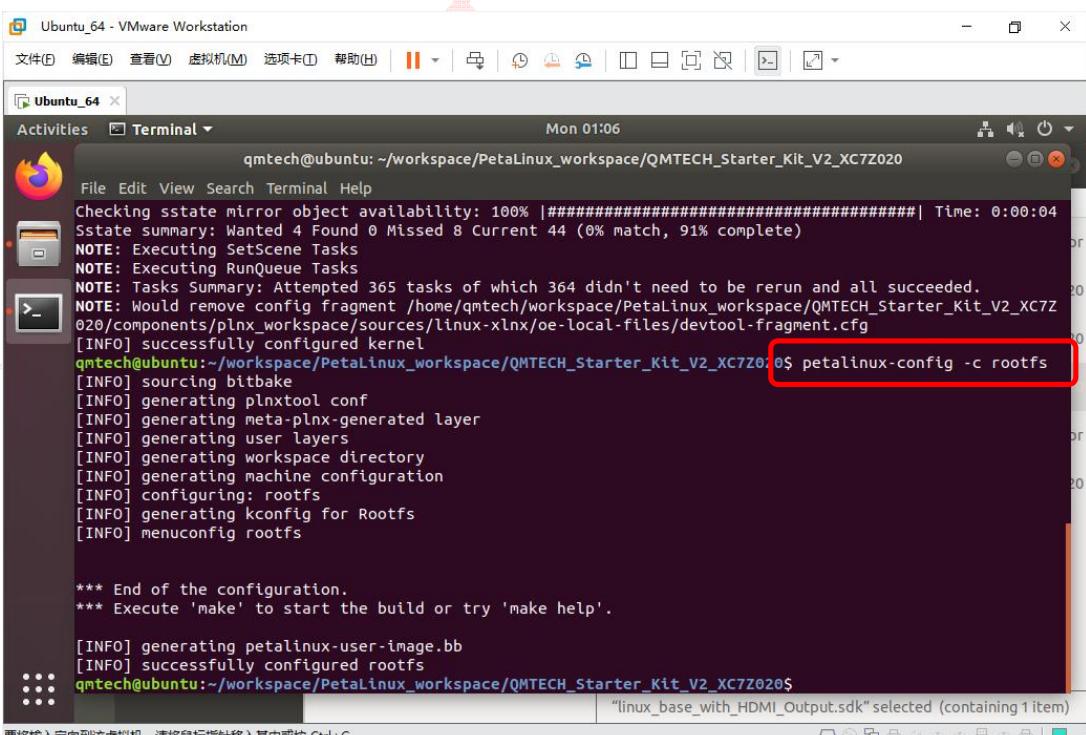


Figure 2-12. Configure RootFS

Add the device tree file \$QMTECH_XC7Z020_STARTER_KIT_V01\PetaLinux\system-user.dtsi into below folder: **/project-spec/meta-user/recipes-bsp/device-tree/files/system-user.dtsi**

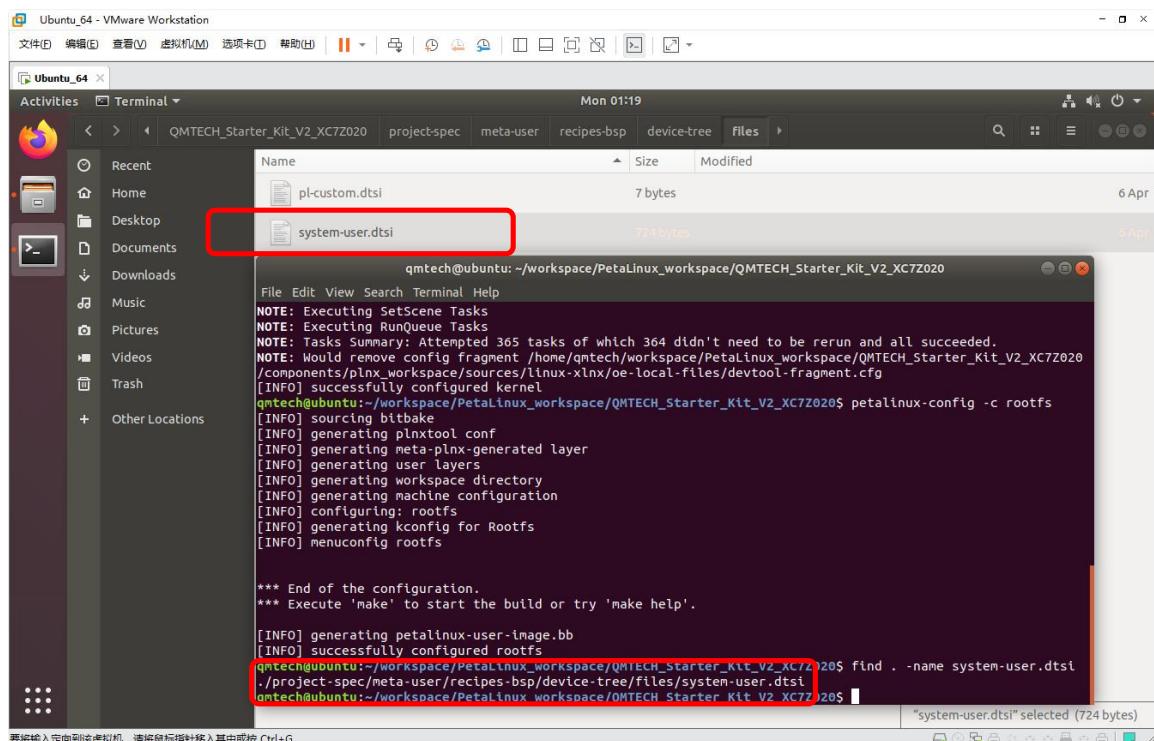


Figure 2-13. Update Device Tree File

Start to build the PetaLinux by command: **petalinux-build**

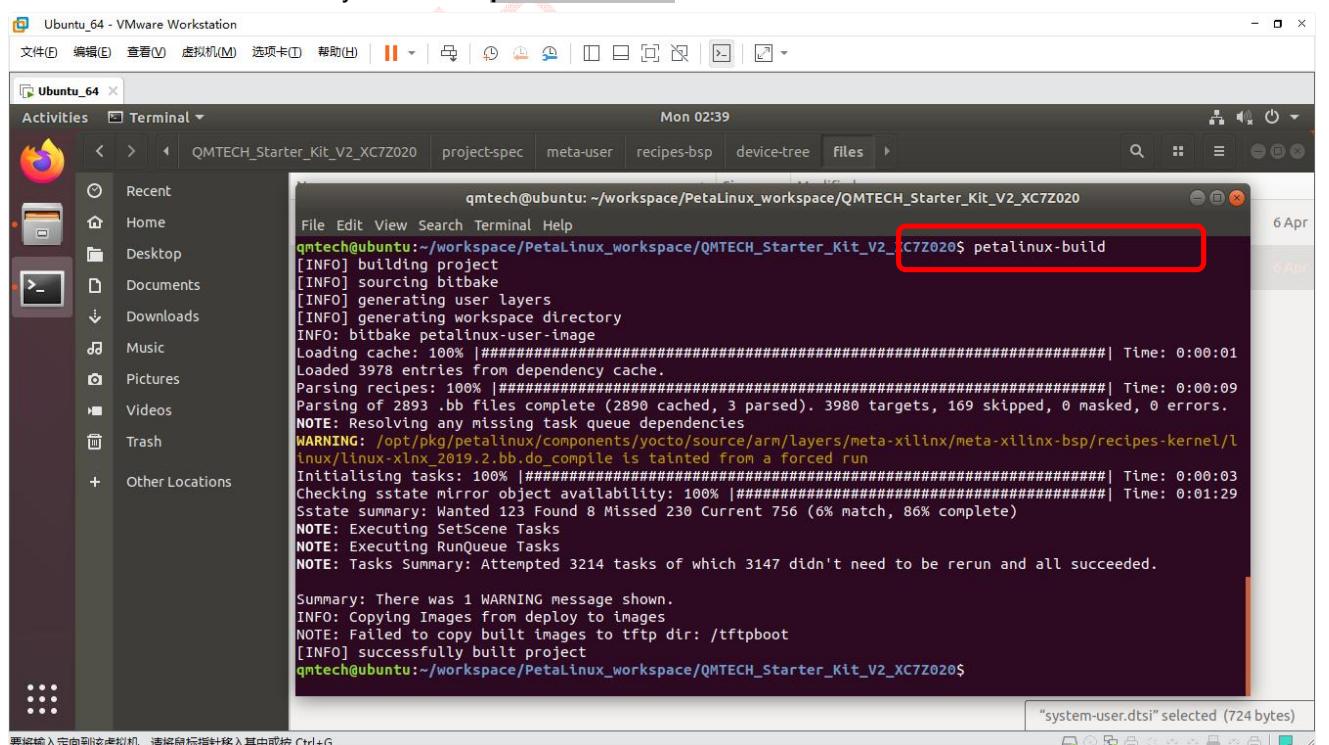


Figure 2-14. Build PetaLinux

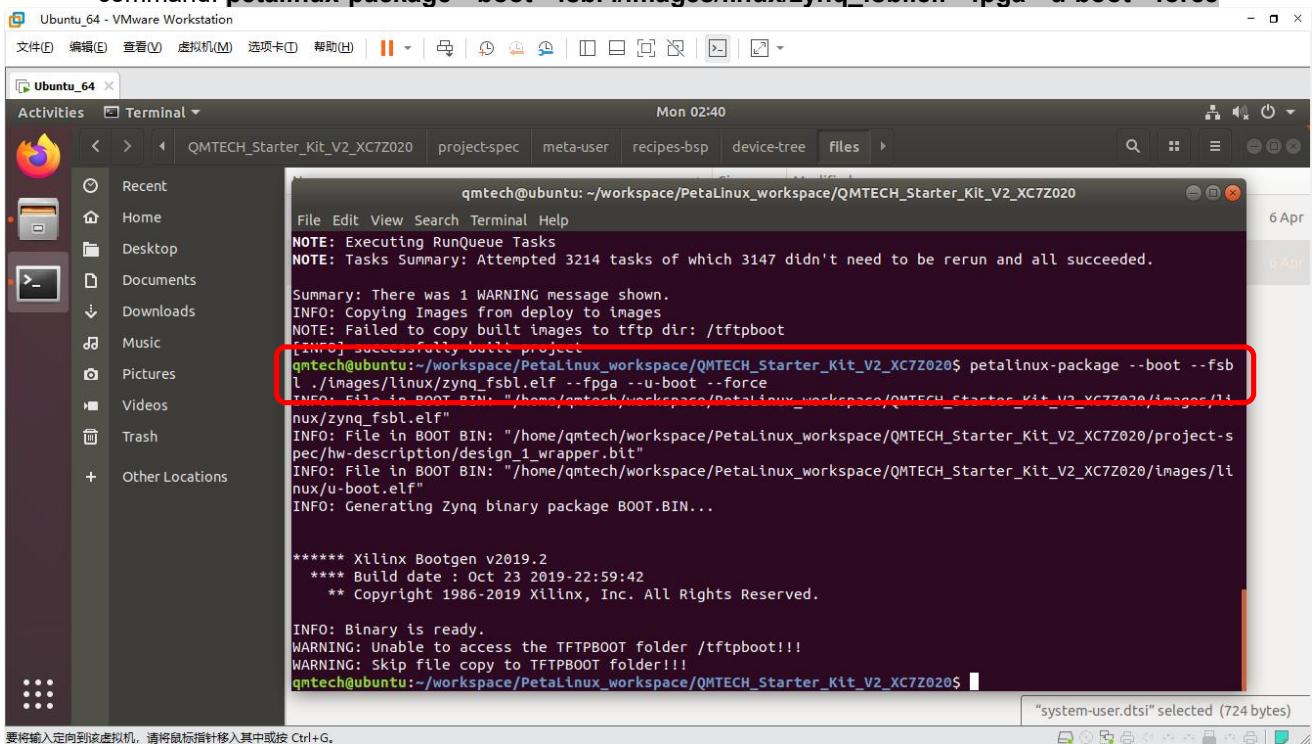


QMTECH

QMTECH ZYNQ7000 Starter Kit

User Manual(PetaLinux) V01

After the PetaLinux is successfully built, users could generate the target BOOT.bin and image.ub by command: **petalinux-package --boot --fsbl ./images/linux/zynq_fsbl.elf --fpga -u-boot --force**



```
qmtech@ubuntu:~/workspace/PetaLinux_workspace/QMTECH_Starter_Kit_V2_XC7Z020$ petalinux-package --boot --fsbl ./images/linux/zynq_fsbl.elf --fpga -u-boot --force
```

Figure 2-15. Generate Target Binaries

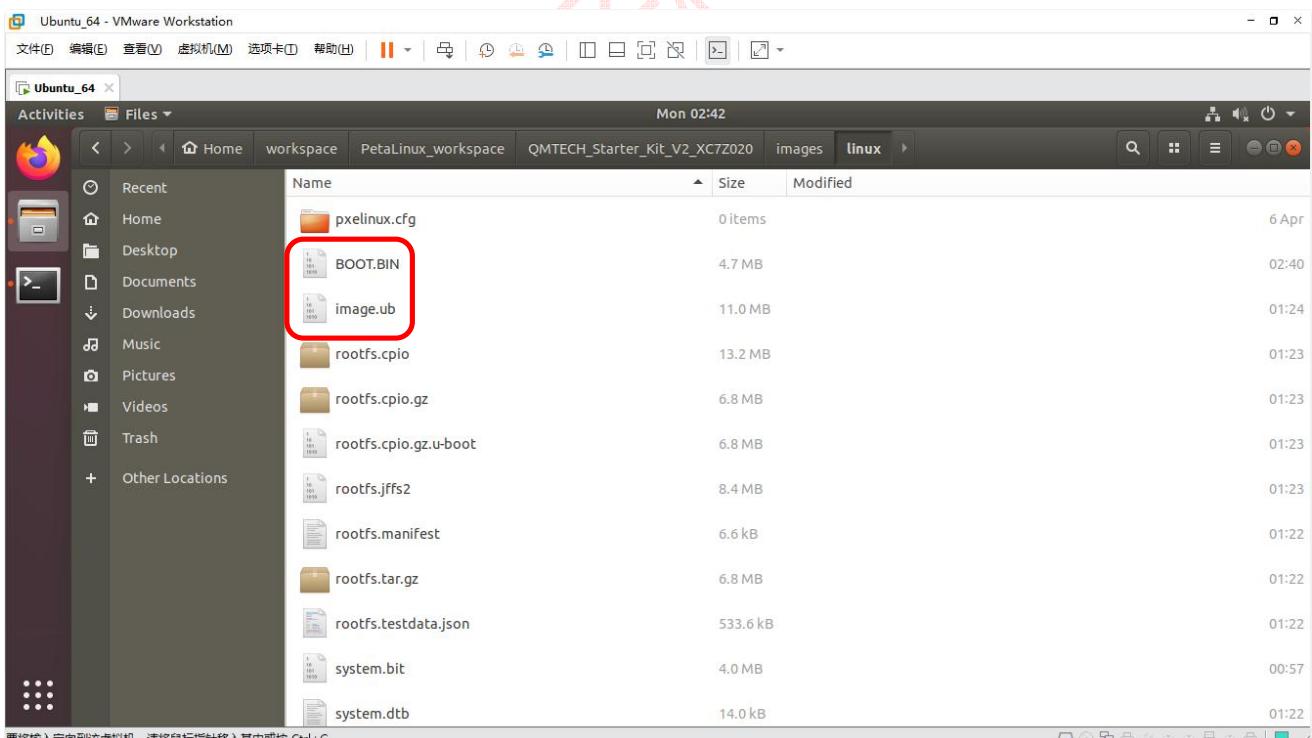
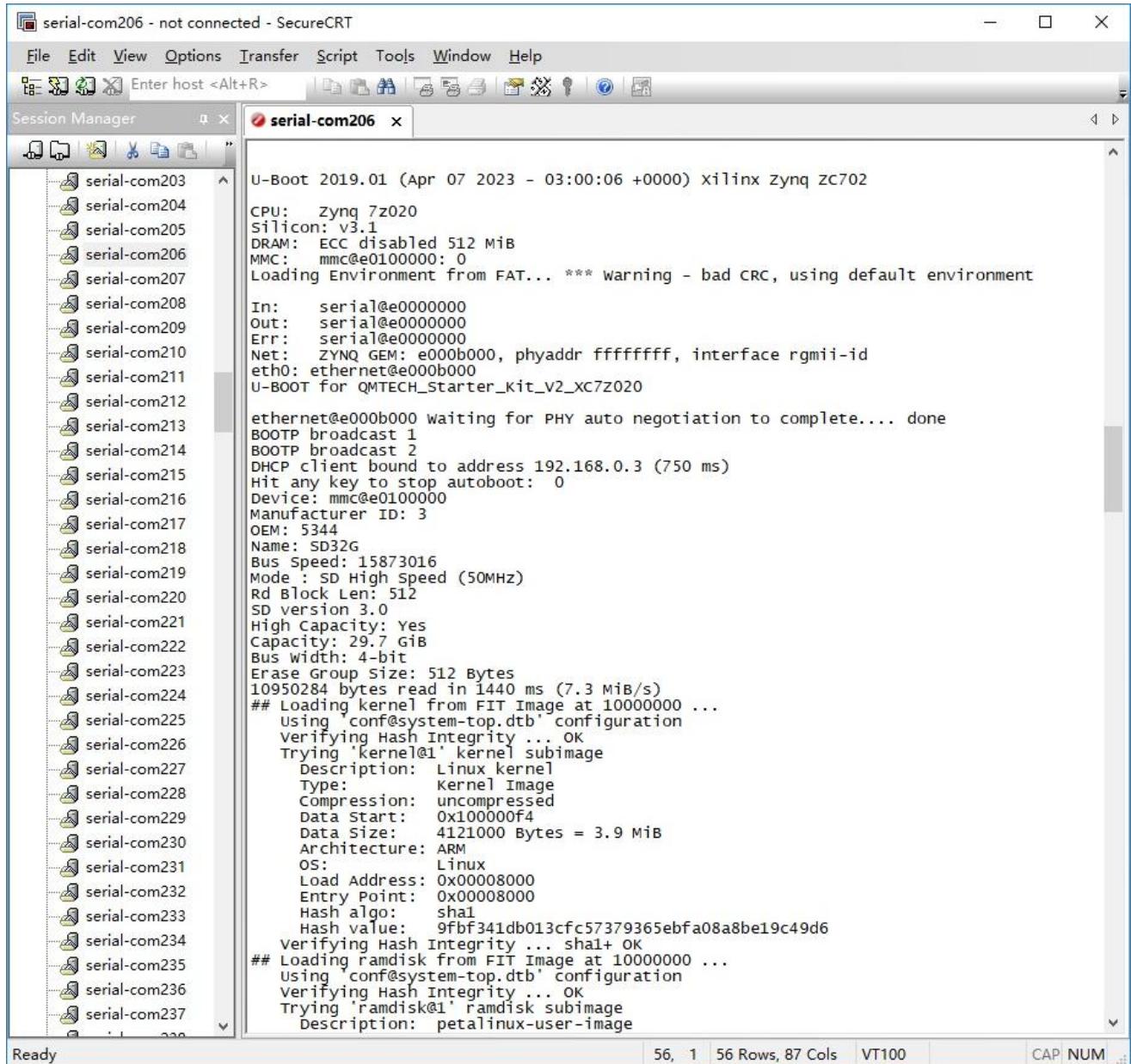


Figure 2-16. Binary Images



Copy the BOOT.bin and image.ub into MicroSD card and then insert the MicroSD card into ZYNQ7000 Starter Kit. Plug the MiniUSB cable into the board and then power on the board. Below image shows the serial output from the board.



The screenshot shows the SecureCRT application interface. The title bar reads "serial-com206 - not connected - SecureCRT". The menu bar includes File, Edit, View, Options, Transfer, Script, Tools, Window, and Help. A toolbar with various icons is located above the session list. The session list on the left shows multiple serial ports (serial-com203 to serial-com237). The main window displays the boot log for serial-com206:

```
U-Boot 2019.01 (Apr 07 2023 - 03:00:06 +0000) xilinx zynq ZC702
CPU:  Zynq 7z2020
Silicon: v3.1
DRAM:  ECC disabled 512 MiB
MMC:  mmc@e0100000: 0
Loading Environment from FAT... *** Warning - bad CRC, using default environment
In:   serial@e0000000
Out:  serial@e0000000
Err:  serial@e0000000
Net:  ZYNQ GEM: e000b000, phyaddr ffffffff, interface rgmii-id
eth0: ethernet@e000b000
U-BOOT for QMTECH_Starter_Kit_V2_XC7Z2020

ethernet@e000b000 Waiting for PHY auto negotiation to complete.... done
BOOTP broadcast 1
BOOTP broadcast 2
DHCP client bound to address 192.168.0.3 (750 ms)
Hit any key to stop autoboot: 0
Device: mmc@e0100000
Manufacturer ID: 3
OEM: 5344
Name: SD32G
Bus Speed: 15873016
Mode : SD High Speed (50MHz)
Rd Block Len: 512
SD Version 3.0
High Capacity: Yes
Capacity: 29.7 GiB
Bus Width: 4-bit
Erase Group Size: 512 Bytes
10950284 bytes read in 1440 ms (7.3 MiB/s)
## Loading kernel from FIT Image at 10000000 ...
Using 'conf@system-top.dtb' configuration
Verifying Hash Integrity ... OK
Trying 'kernel@1' kernel subimage
  Description: Linux kernel
  Type: Kernel Image
  Compression: uncompressed
  Data Start: 0x100000f4
  Data Size: 4121000 Bytes = 3.9 MiB
  Architecture: ARM
  OS: Linux
  Load Address: 0x00008000
  Entry Point: 0x00008000
  Hash algo: sha1
  Hash value: 9fbf341db013cfc57379365ebfa08a8be19c49d6
Verifying Hash Integrity ... sha1+ OK
## Loading ramdisk from FIT Image at 10000000 ...
Using 'conf@system-top.dtb' configuration
Verifying Hash Integrity ... OK
Trying 'ramdisk@1' ramdisk subimage
  Description: petalinux-user-image
```

The bottom status bar shows "Ready", "56, 1", "56 Rows, 87 Cols", "VT100", "CAP NUM", and a scroll bar.



serial-com206 - not connected - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

Session Manager

serial-com206

```

Trying 'ramdisk@1' ramdisk subimage
Description: petalinux-user-image
Type: RAMDisk Image
Compression: gzip compressed
Data Start: 0x103f1b24
Data Size: 6813148 Bytes = 6.5 MiB
Architecture: ARM
OS: Linux
Load Address: unavailable
Entry Point: unavailable
Hash algo: sha1
Hash value: 463ab1c88d2a5a180852db3fcbf675fa29dfdc9
Verifying Hash Integrity ... sha1+ OK
## Loading fdt from FIT Image at 10000000 ...
Using 'conf@system-top.dtb' configuration
Verifying Hash Integrity ... OK
Trying 'fdt@system-top.dtb' fdt subimage
Description: Flattened Device Tree blob
Type: Flat Device Tree
Compression: uncompressed
Data Start: 0x103ee39c
Data Size: 14023 Bytes = 13.7 KiB
Architecture: ARM
Hash algo: sha1
Hash value: 9874e10521117a174bfba6aa1a1783ba18e41ed7
Verifying Hash Integrity ... sha1+ OK
Booting using the fdt blob at 0x103ee39c
Loading Kernel Image ... OK
Loading Ramdisk to 07980000, end 07fff5dc ... OK
Loading Device Tree to 07979000, end 0797f6c6 ... OK

Starting kernel ...

Booting Linux on physical CPU 0x0
Linux version 4.19.0-xilinx-v2019.2 (oe-user@oe-host) (gcc version 8.2.0 (GCC)) #1 SMP
PREEMPT Thu Apr 6 12:56:42 UTC 2023
CPU: ARMV7 Processor [413fc090] revision 0 (ARMV7), cr=18c5387d
CPU: PIPT / VIPT nonaliasing data cache, VIPT aliasing instruction cache
OF: fdt: Machine model: xlnx,zynq-7000
earlycon: cdns0 at MMIO 0xe0000000 (options '115200n8')
bootconsole [cdns0] enabled
Memory policy: Data cache writealloc
cma: Reserved 16 MiB at 0x1f000000
random: get_random_bytes called from start_kernel+0x80/0x3c4 with crng_init=0
percpu: Embedded 16 pages/cpu @ (ptrval) s35916 r8192 d21428 u65536
Built 1 zonelists, mobility grouping on. Total pages: 130048
Kernel command line: console=ttyPS0,115200 earlycon
Dentry cache hash table entries: 65536 (order: 6, 262144 bytes)
Inode-cache hash table entries: 32768 (order: 5, 131072 bytes)
Memory: 486464K/524288K available (6144K kernel code, 204K rwdata, 1604K rodata, 1024K
init, 132K bss, 21440K reserved, 16384K cma-reserved, 0K highmem)
Virtual kernel memory layout:
    vector : 0xfffff0000 - 0xfffff1000   ( 4 kB)
    fixmap : 0xfc000000 - 0xfffff00000  (3072 kB)
    vmalloc : 0xe0000000 - 0xff8000000  ( 496 MB)
    lowmem : 0xc0000000 - 0xe00000000  ( 512 MB)

```

Ready | 56, 1 | 56 Rows, 87 Cols | VT100 | CAP NUM ...



serial-com206 - not connected - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Session Manager

serial-com206

```

vmlalloc : 0xe0800000 - 0xff800000 ( 496 MB)
lowmem : 0xc0000000 - 0xe0000000 ( 512 MB)
pkmap : 0xbfe00000 - 0xc0000000 ( 2 MB)
modules : 0xbff00000 - 0xbfe00000 ( 14 MB)
    .text : 0x(ptrval) - 0x(ptrval) (7136 kB)
    .init : 0x(ptrval) - 0x(ptrval) (1024 kB)
    .data : 0x(ptrval) - 0x(ptrval) ( 205 kB)
    .bss : 0x(ptrval) - 0x(ptrval) ( 133 kB)
rcu: Preemptible hierarchical RCU implementation.
rcu:   RCU restricting CPUs from NR_CPUS=4 to nr_cpu_ids=2.
      Tasks RCU enabled.
rcu: Adjusting geometry for rcu_fanout_leaf=16, nr_cpu_ids=2
NR_IRQS: 16, nr_irqs: 16, preallocated irqs: 16
efuse mapped to (ptrval)
slcr mapped to (ptrval)
L2C: platform modifies aux control register: 0x72360000 -> 0x72760000
L2C: DT/platform modifies aux control register: 0x72360000 -> 0x72760000
L2C-310 erratum 769419 enabled
L2C-310 enabling early BRESP for Cortex-A9
L2C-310 full line of zeros enabled for cortex-A9
L2C-310 ID prefetch enabled, offset 1 lines
L2C-310 dynamic clock gating enabled, standby mode enabled
L2C-310 cache controller enabled, 8 ways, 512 kB
L2C-310: CACHE_ID 0x410000C8, AUX_CTRL 0x76760001
zynq_clock_init: clkc starts at (ptrval)
Zynq clock init
sched_clock: 64 bits at 333MHz, resolution 3ns, wraps every 4398046511103ns
clocksource: arm_global_timer: mask: 0xfffffffffffffff max_cycles: 0x4ce07af025, max_idle_ns: 440795209040 ns
Switching to timer-based delay loop, resolution 3ns
clocksource: ttc_clocksource: mask: 0xffff max_cycles: 0xffff, max_idle_ns: 537538477 ns
timer #0 at (ptrval), irq=17
Console: colour dummy device 80x30
Calibrating delay loop (skipped), value calculated using timer frequency.. 666.66 BogoMIPS (lpj=333333)
pid_max: default: 32768 minimum: 301
Mount-cache hash table entries: 1024 (order: 0, 4096 bytes)
Mountpoint-cache hash table entries: 1024 (order: 0, 4096 bytes)
CPU: Testing write buffer coherency: ok
CPU0: Spectre v2: using BPIALL workaround
CPU0: thread -1, cpu 0, socket 0, mpidr 80000000
Setting up static identity map for 0x100000 - 0x100060
rcu: Hierarchical SRCU implementation.
Smp: Bringing up secondary CPUs...
CPU1: thread -1, cpu 1, socket 0, mpidr 80000001
CPU1: Spectre v2: using BPIALL workaround
Smp: Brought up 1 node, 2 CPUs
SMP: Total of 2 processors activated (1333.33 BogoMIPS).
CPU: All CPU(s) started in SVC mode.
devtmpfs: initialized
VFP support v0.3: implementor 41 architecture 3 part 30 variant 9 rev 4
clocksource: jiffies: mask: 0xffffffff max_cycles: 0xffffffff, max_idle_ns: 19112604462
750000 ns
futex hash table entries: 512 (order: 3, 32768 bytes)
pinctrl core: initialized pinctrl subsystem

```

Ready

56, 1 | 56 Rows, 87 Cols | VT100 | CAP NUM ...



serial-com206 - not connected - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

Session Manager

serial-com206

```

futex hash table entries: 512 (order: 3, 32768 bytes)
pinctrl core: initialized pinctrl subsystem
NET: Registered protocol family 16
DMA: preallocated 256 KiB pool for atomic coherent allocations
cpuidle: using governor menu
hw-breakpoint: found 5 (+1 reserved) breakpoint and 1 watchpoint registers.
hw-breakpoint: maximum watchpoint size is 4 bytes.
zynq-ocm f800c000.ocmc: ZYNQ OCM pool: 256 KiB @ 0x(ptrval)
zynq-pinctrl 700.pinctrl: zynq pinctrl initialized
e0000000.serial: ttysP0 at MMIO 0xe0000000 (irq = 25, base_baud = 6249999) is a xuartps
console [ttysP0] enabled
console [ttysP0] enabled
bootconsole [cdns0] disabled
bootconsole [cdns0] disabled
vgaarb: loaded
SCSI subsystem initialized
usbcore: registered new interface driver usbfs
usbcore: registered new interface driver hub
usbcore: registered new device driver usb
media: Linux media interface: v0.10
videodev: Linux video capture interface: v2.00
pps_core: LinuxPPS API ver. 1 registered
pps_core: Software ver. 5.3.6 - Copyright 2005-2007 Rodolfo Giometti <giometti@linux.it>
PTP clock support registered
EDAC MC: Ver: 3.0.0
FPGA manager framework
Advanced Linux Sound Architecture Driver Initialized.
clocksource: Switched to clocksource arm_global_timer
NET: Registered protocol family 2
tcp_listen_portaddr_hash hash table entries: 512 (order: 0, 6144 bytes)
TCP established hash table entries: 4096 (order: 2, 16384 bytes)
TCP bind hash table entries: 4096 (order: 3, 32768 bytes)
TCP: Hash tables configured (established 4096 bind 4096)
UDP hash table entries: 256 (order: 1, 8192 bytes)
UDP-Lite hash table entries: 256 (order: 1, 8192 bytes)
NET: Registered protocol family 1
RPC: Registered named UNIX socket transport module.
RPC: Registered udp transport module.
RPC: Registered tcp transport module.
RPC: Registered tcp NFSv4.1 backchannel transport module.
Trying to unpack rootfs image as initramfs...
Freeing initrd memory: 6656K
hw perfevents: no interrupt-affinity property for /pmu@f8891000, guessing.
hw perfevents: enabled with armv7_cortex_a9 PMU driver, 7 counters available
workingset: timestamp_bits=30 max_order=17 bucket_order=0
jffs2: version 2.2. (NAND) (SUMMARY) 漏 2001-2006 Red Hat, Inc.
io scheduler noop registered
io scheduler deadline registered
io scheduler cfq registered (default)
io scheduler mq-deadline registered
io scheduler kyber registered
dma-p1330 f8003000.dmac: Loaded driver for PL330 DMAC-241330
dma-p1330 f8003000.dmac: DBUFF-128x8bytes Num_Chans-8 Num_Periph-4 Num_Events-16
brd: module loaded
loop: module loaded

```

Ready | 56, 1 | 56 Rows, 87 Cols | VT100 | CAP NUM ...



QMTECH

QMTECH ZYNQ7000 Starter Kit

User Manual(PetaLinux) V01

serial-com206 - not connected - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

Session Manager

serial-com206

```

brd: module loaded
loop: module loaded
libphy: Fixed MDIO Bus: probed
CAN device driver interface
libphy: MACB_mii_bus: probed
RTL8211E Gigabit Ethernet e000b000.ethernet-ffffffffff:00: attached PHY driver [RTL8211E]
Gigabit Ethernet (mii_bus:phy_addr=e000b000.ethernet-ffffffffff:00, irq=_POLL)
macb e000b000.ethernet eth0: Cadence GEM rev 0x00020118 at 0xe000b000 irq 26 (00:0a:35:00:1e:53)
e1000e: Intel(R) PRO/1000 Network Driver - 3.2.6-k
e1000e: copyright(c) 1999 - 2015 Intel corporation.
ehci_hcd: USB 2.0 'Enhanced' Host Controller (EHCI) Driver
ehci_pci: EHCI PCI platform driver
usbcore: registered new interface driver usb-storage
chipidea-usb2 e0002000.usb: e0002000.usb supply vbus not found, using dummy regulator
chipidea-usb2 e0002000.usb: Linked as a consumer to regulator.0
ULPI transceiver vendor/product ID 0x0424/0x0007
Found SMSC USB3320 ULPI transceiver.
ULPI integrity check: passed.
ci_hdrc ci_hdrc.0: EHCI Host Controller
ci_hdrc ci_hdrc.0: new USB bus registered, assigned bus number 1
ci_hdrc ci_hdrc.0: USB 2.0 started, EHCI 1.00
hub 1-0:1.0: USB hub found
hub 1-0:1.0: 1 port detected
i2c /dev entries driver
cdns-wdt f8005000.watchdog: Xilinx watchdog Timer with timeout 10s
EDAC MC: ECC not enabled
Xilinx Zynq Cpuidle Driver started
sdhci: Secure Digital Host Controller Interface driver
sdhci: Copyright(c) Pierre Ossman
sdhci-pltfm: SDHCI platform and OF driver helper
mmc0: SDHCI controller on e0100000.mmc [e0100000.mmc] using ADMA
ledtrig-cpu: registered to indicate activity on CPUs
usbcore: registered new interface driver ushid
usbhid: USB HID core driver
fpga_manager fpga0: xilinx zynq FPGA Manager registered
NET: Registered protocol family 10
Segment Routing with IPv6
sit: IPv6, IPv4 and MPLS over IPv4 tunneling driver
NET: Registered protocol family 17
can: controller area network core (rev 20170425 abi 9)
NET: Registered protocol family 29
can: raw protocol (rev 20170425)
can: broadcast manager protocol (rev 20170425 t)
can: netlink gateway (rev 20170425) max_hops=1
Registering SWP/SWPB emulation handler
of-fpga-region fpga-full: FPGA Region probed
hctosys: unable to open rtc device (rtc0)
of_cfs_init
of_cfs_init: OK
ALSA device list:
No soundcards found.
Freeing unused kernel memory: 1024K
Run /init as init process
INIT: mmc0: new high speed SDHC card at address 5048
mmcblk0: mmc0:5048 SD32G 29.7 GiB

```

Ready 56, 1 56 Rows, 87 Cols VT100 CAP NUM





```
serial-com206 - not connected - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R> Session Manager serial-com206
serial-com203 serial-com204 serial-com205 serial-com206 serial-com207 serial-com208 serial-com209 serial-com210 serial-com211 serial-com212 serial-com213 serial-com214 serial-com215 serial-com216 serial-com217 serial-com218 serial-com219 serial-com220 serial-com221 serial-com222 serial-com223 serial-com224 serial-com225 serial-com226 serial-com227 serial-com228 serial-com229 serial-com230 serial-com231 serial-com232 serial-com233 serial-com234 serial-com235 serial-com236 serial-com237
INIT: mmc0: new high speed SDHC card at address 5048
mmcblk0: mmc0:5048 SD32G 29.7 GiB
version 2.88 booting mmcblk0: p1
Starting udev
udevd[737]: starting version 3.2.5
random: udevd: uninitialized urandom read (16 bytes read)
random: udevd: uninitialized urandom read (16 bytes read)
random: udevd: uninitialized urandom read (16 bytes read)
udevd[738]: starting eudev-3.2.5
FAT-fs (mmcblk0p1): volume was not properly unmounted. Some data may be corrupt. Please
run fsck.
hwclock: can't open '/dev/misc/rtc': No such file or directory
Fri Apr 7 02:59:52 UTC 2023
hwclock: can't open '/dev/misc/rtc': No such file or directory
urandom_read: 2 callbacks suppressed
random: dd: uninitialized urandom read (512 bytes read)
Configuring packages on first boot...
(This may take several minutes. Please do not power off the machine.)
Running postinst /etc/rpm-postinsts/100-sysvinit-inittab...
update-rc.d: /etc/init.d/run-postinsts exists during rc.d purge (continuing)
    Removing any system startup links for run-postinsts ...
    /etc/rcS.d/s99run-postinsts
INIT: Entering runlevel: 5
Configuring network interfaces... IPV6: ADDRCONF(NETDEV_UP): eth0: link is not ready
udhcpc: started, v1.29.2
udhcpc: sending discover
macb e000b000.ethernet eth0: link up (100/FULL)
IPv6: ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
udhcpc: sending discover
udhcpc: sending select for 192.168.0.3
udhcpc: lease of 192.168.0.3 obtained, lease time 7200
/etc/udhcpc.d/50default: Adding DNS 192.168.0.1
done.
starting haveged: haveged: listening socket at 3
haveged: haveged starting up

Starting Dropbear SSH server: random: dropbearkey: uninitialized urandom read (32 bytes
read)
Generating 2048 bit rsa key, this may take a while...
random: dropbearkey: uninitialized urandom read (32 bytes read)
haveged: haveged: ver: 1.9.4; arch: generic; vend: ; build: (gcc 8.2.0 CTV); collect: 1
28K
haveged: haveged: cpu: (VC); data: 16K (D); inst: 16K (D); idx: 12/40; sz: 15012/57848
haveged: haveged: tot tests(BA8): A:1/1 B:1/1 continuous tests(B): last entropy estima
te 8.00134
haveged: haveged: fills: 0, generated: 0
random: crng init done
Public key portion is:
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQCi1d3CAF3IYu5g139X05P293SKwf+2fPTbBFsmPH60dNloj3
ZIC9G8hb9DMZmiLmKpuwbASQ0qjuh56heDskP15+P+SVZeV2wIAF5AT9HHNAPEb47X0a3wcsHwa506hAkD1cQro
```

Figure 2-17. PetaLinux Boot Log

```

serial-com206 - not connected - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Session Manager serial-com206
random: crng init done
Public key portion is:
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQc1ld3CAF3IYu5g139X05P293SKwf+2fPTbBFsmPH60dNioj3
ZIC9G8hb9DMZm1LmkpuwbASQ0qjuh56hedskP15+P+SV2eV2w1Af5AT9HHNAPEb47X0a3wcsHwa506hAkD1cqro
yfruncr0lQMX8+QL7GcqWCNY7SDXumsTpRkMNkOxrVA29CW8UXPHB2DV73DSIFdn8owDHUt2JCKLf+NGU90QQC
K3Xk47+Mr0mjBLNyIKJ69G0vmcm5hzkvuye121/vP/PIJVAVVVXXJ34eNHKzKPMyJ34Nyuh253nN8dggnlGqx20
Fingerprint: sha1!! b4:e2:67:5f:21:b3:fc:40:f4:13:99:62:17:66:74:ca:dc:5e:1d:c2
dropbear.
hwclock: can't open '/dev/misc/rtc': No such file or directory
Starting internet superserver: ineted.
Starting syslogd/klogd: done
Starting tcf-agent: Ok
PetaLinux 2019.2 QMTECH_Starter_Kit_V2_XC7Z020 /dev/ttys0
QMTECH_Starter_Kit_V2_XC7Z020 login: root
Password:
root@QMTECH_Starter_Kit_V2_XC7Z020:~# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:0A:35:00:1E:53
          inet  addr:192.168.0.3  Bcast:255.255.255.255  Mask:255.255.255.0
          inet6 addr: fe80::20a:35ff:fe00:1e53/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:13 errors:0 dropped:0 overruns:0 frame:0
          TX packets:19 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1696 (1.6 Kib)  TX bytes:2560 (2.5 Kib)
          Interrupt:26 Base address:0xb000

root@QMTECH_Starter_Kit_V2_XC7Z020:~# ping 192.168.0.2
PING 192.168.0.2 (192.168.0.2): 56 data bytes
64 bytes from 192.168.0.2: seq=0 ttl=128 time=0.662 ms
64 bytes from 192.168.0.2: seq=1 ttl=128 time=0.552 ms
64 bytes from 192.168.0.2: seq=2 ttl=128 time=0.941 ms
64 bytes from 192.168.0.2: seq=3 ttl=128 time=0.957 ms
...
-- 192.168.0.2 ping statistics --
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.552/0.778/0.957 ms
root@QMTECH_Starter_Kit_V2_XC7Z020:~# usb 1-1: new high-speed USB device number 2 using
ci_hdrc
usb-storage 1-1:1.0: USB Mass Storage device detected
scsi host0: usb-storage 1-1:1.0
scsi 0:0:0:0: Direct-Access     USB2.0    Flashdisk      1100 PQ: 0 ANSI: 0 CCS
sd 0:0:0:0: Attached scsi generic sg0 type 0
sd 0:0:0:0: [sda] 1968128 512-byte Logical blocks: (1.01 GB/961 MiB)
sd 0:0:0:0: [sda] Write Protect is off
sd 0:0:0:0: [sda] No Caching mode page found
sd 0:0:0:0: [sda] Assuming drive cache: write through
sda: sda1
sd 0:0:0:0: [sda] Attached SCSI removable disk
FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please run
fsck.
root@QMTECH_Starter_Kit_V2_XC7Z020:~# usb 1-1: USB disconnect, device number 2

```

Figure 2-18. Log Info

2.2 Test the Linux Environment

Plug the ethernet cable into the Starter Kit and power on it. The above log will be displayed on the terminal tool when the ethernet link is ready. Users may type ethernet test related commands to check the status of ethernet interface.

Users could also test the USB host port function by plugging USB disk. USB storage device emulation info can also be found in the above image.



3. Reference

- [1] ug585-Zynq-7000-TRM.pdf
- [2] ds187-XC7Z010-XC7Z020-Data-Sheet.pdf
- [3] ug865-Zynq-7000-Pkg-Pinout.pdf
- [4] MT41K256M16TW-107:P.pdf
- [5] tps563201.pdf

上海同微电子有限公司



QMTECH

QMTECH ZYNQ7000 Starter Kit

User Manual(PetaLinux) V01

4. Revision

Doc. Rev.	Date	Comments
0.1	26/03/2023	Initial Version.
1.0	30/03/2023	V1.0 Formal Release.

日之光
上海嘉謀子科技有限公司



QMTECH

QMTECH ZYNQ7000 Starter Kit

User Manual(PetaLinux) V01