

МІНІСТЕРСТВО ОСВІТИ ТА НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ УКРАЇНИ
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ ІМЕНІ ІГОРЯ СІКОРСЬКОГО»
ФАКУЛЬТЕТ ІНФОРМАТИКИ ТА ОБЧИСЛЮВАЛЬНОЇ ТЕХНІКИ
КАФЕДРА ОБЧИСЛЮВАЛЬНОЇ ТЕХНІКИ

ЗВІТ
з лабораторної роботи №4
з дисципліни «Архітектура Комп'ютера-2 Процесори»
на тему « Підготовка та налаштування плати ВВВ»

Виконав:
студент групи ІВ-93
Тарнавський М. О.
Номер залікової – 9330

Перевірив:
Нікольський С. С.

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```
mik@mik-VirtualBox:~/repos/linux-stable$ vml fragments/bbb.cfg
mik@mik-VirtualBox:~/repos/linux-stable$ ./scripts/kconfig/merge_config.sh arch/arm/configs/multi_v7_defconfig fragments/bbb.cfg
Using arch/arm/configs/multi_v7_defconfig as base
Merging fragments/bbb.cfg
Value of CONFIG_AM335X_PHY_USB is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_AM335X_PHY_USB=m
New value: CONFIG_AM335X_PHY_USB=y

Value of CONFIG_USB_MUSB_TUSB6010 is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_USB_MUSB_TUSB6010=m
New value: CONFIG_USB_MUSB_TUSB6010=y

Value of CONFIG_USB_MUSB_OMAP2PLUS is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_USB_MUSB_OMAP2PLUS=m
New value: CONFIG_USB_MUSB_OMAP2PLUS=y

Value of CONFIG_USB_MUSB_HDRC is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_USB_MUSB_HDRC=m
New value: CONFIG_USB_MUSB_HDRC=y

Value of CONFIG_USB_MUSB_DSPS is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_USB_MUSB_DSPS=m
New value: CONFIG_USB_MUSB_DSPS=y

Value of CONFIG_USB_MUSB_AM35X is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_USB_MUSB_AM35X=m
New value: CONFIG_USB_MUSB_AM35X=y

Value of CONFIG_USB_CONFIGFS is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_USB_CONFIGFS=m
New value: CONFIG_USB_CONFIGFS=y

Value of CONFIG_NOP_USB_XCEIV is redefined by fragment fragments/bbb.cfg:
Previous value: CONFIG_NOP_USB_XCEIV=m
New value: CONFIG_NOP_USB_XCEIV=y

HOSTCC scripts/basic/fixdep
HOSTCC scripts/kconfig/conf.o
YACC scripts/kconfig/zconf.tab.c
LEX scripts/kconfig/zconf.lex.c
HOSTCC scripts/kconfig/zconf.tab.o
HOSTLD scripts/kconfig/conf
scripts/kconfig/conf --alldefconfig Kconfig
#
# configuration written to .config
#
mik@mik-VirtualBox:~/repos/linux-stable$
```

<https://github.com/JadeRowan>

```

Unpacking qemu-utils (1:4.2-3ubuntu6.18) ...
Selecting previously unselected package sharutils.
Preparing to unpack .../22-sharutils_1%3a4.15.2-4build1_amd64.deb ...
Unpacking sharutils (1:4.15.2-4build1) ...
Selecting previously unselected package qemu-efi-aarch64.
Preparing to unpack .../23-qemu-efi-aarch64_0~20191122.bd85bf54-2ubuntu3.3_all.deb ...
Unpacking qemu-efi-aarch64 (0~20191122.bd85bf54-2ubuntu3.3) ...
Selecting previously unselected package qemu-efi-arm.
Preparing to unpack .../24-qemu-efi-arm_0~20191122.bd85bf54-2ubuntu3.3_all.deb ...
Unpacking qemu-efi-arm (0~20191122.bd85bf54-2ubuntu3.3) ...
Setting up libibverbs1:amd64 (28.0-1ubuntu1) ...
Setting up ibverbs-providers:amd64 (28.0-1ubuntu1) ...
Setting up qemu-system-gui:amd64 (1:4.2-3ubuntu6.18) ...
Setting up libspice-server1:amd64 (0.14.2-4ubuntu3.1) ...
Setting up libfdt1:amd64 (1.5.1-1) ...
Setting up qemu-efi-aarch64 (0~20191122.bd85bf54-2ubuntu3.3) ...
Setting up libusbredirparser1:amd64 (0.8.0-1) ...
Setting up libcacard0:amd64 (1:2.6.1-1) ...
Setting up libvirglrenderer1:amd64 (0.8.2-1ubuntu1) ...
Setting up qemu-system-data (1:4.2-3ubuntu6.18) ...
Setting up libslirp0:amd64 (4.1.0-2ubuntu2.2) ...
Setting up ipxe-qemu (1.0.0+git-20190109.133f4c4-0ubuntu3.2) ...
Setting up qemu-efi-arm (0~20191122.bd85bf54-2ubuntu3.3) ...
Setting up ipxe-qemu-256k-compatible-efi-roms (1.0.0+git-20150424.a25a16d-0ubuntu4) ...
Setting up sharutils (1:4.15.2-4build1) ...
Setting up libaio1:amd64 (0.3.112-5) ...
Setting up libpmem1:amd64 (1.8-1ubuntu1) ...
Setting up librdmacm1:amd64 (28.0-1ubuntu1) ...
Setting up librados2 (15.2.14-0ubuntu0.20.04.1) ...
Setting up librbd1 (15.2.14-0ubuntu0.20.04.1) ...
Setting up libiscsi7:amd64 (1.18.0-2) ...
Setting up qemu-block-extra:amd64 (1:4.2-3ubuntu6.18) ...
Setting up qemu-system-common (1:4.2-3ubuntu6.18) ...
Created symlink /etc/systemd/system/multi-user.target.wants/qemu-kvm.service → /lib/systemd/system/qemu-kvm.service.
Setting up qemu-system-arm (1:4.2-3ubuntu6.18) ...
Setting up qemu-utils (1:4.2-3ubuntu6.18) ...
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for install-info (6.7.0.dfsg.2-5) ...
mik@mik-VirtualBox:~/repos/busybox$ cd ~/repos/busybox
mik@mik-VirtualBox:~/repos/busybox$ cd _install
mik@mik-VirtualBox:~/repos/busybox/_install$ find . | cpio -o -H newc | gzip > ../rootfs.cpio.gz
118774 blocks
mik@mik-VirtualBox:~/repos/busybox/_install$

```

<https://github.com/JadeRowan>

```

mik@mik-VirtualBox: ~/repos/busybox
mik@mik-VirtualBox:~/repos/busybox/_install$ cd ..
mik@mik-VirtualBox:~/repos/busybox$ qemu-system-arm -kernel _install/boot/zImage -initrd rootfs.cpio.gz \
> -machine virt -nographic -m 512 \
> --append "root=/dev/ram0 rw console=ttyAMA0,115200 mem=512M"
[ 0.000000] Booting Linux on physical CPU 0x0
[ 0.000000] Linux version 4.19.218 (mik@mik-VirtualBox) (gcc version 8.3.0 (GNU Toolchain for the A-profile A
rchitecture 8.3-2019.03 (arm-rel-8.36))) #1 SMP Tue Nov 30 14:18:43 EET 2021
[ 0.000000] CPU: ARMv7 Processor [412fc0f1] revision 1 (ARMv7), cr=10c5387d
[ 0.000000] CPU: div instructions available: patching division code
[ 0.000000] CPU: PIPT / VIPT nonaliasing data cache, PIPT instruction cache
[ 0.000000] OF: fdt: Machine model: linux,dummy-virt
[ 0.000000] Memory policy: Data cache writealloc
[ 0.000000] efi: Getting EFI parameters from FDT:
[ 0.000000] efi: UEFI not found.
[ 0.000000] cma: Reserved 64 MiB at 0x5c000000
[ 0.000000] psci: probing for conduit method from DT.
[ 0.000000] psci: PSCIv0.2 detected in firmware.
[ 0.000000] psci: Using standard PSCI v0.2 function IDs
[ 0.000000] psci: Trusted OS migration not required
[ 0.000000] random: get_random_bytes called from start_kernel+0x9c/0x480 with crng_init=0
[ 0.000000] percpu: Embedded 16 pages/cpu s36620 r8192 d20724 u65536
[ 0.000000] Built 1 zonelists, mobility grouping on. Total pages: 130048
[ 0.000000] Kernel command line: root=/dev/ram0 rw console=ttyAMA0,115200 mem=512M
[ 0.000000] Dentry cache hash table entries: 65536 (order: 6, 262144 bytes)
[ 0.000000] Inode-cache hash table entries: 32768 (order: 5, 131072 bytes)
[ 0.000000] Memory: 406428K/524288K available (12288K kernel code, 1619K rwddata, 4784K rodata, 2048K init, 39
3K bss, 52324K reserved, 65536K cma-reserved, 0K highmem)
[ 0.000000] Virtual kernel memory layout:
[ 0.000000]   vector   : 0xffff0000 - 0xffff1000   ( 4 kB)
[ 0.000000]   fixmap   : 0xffc00000 - 0xffff0000   (3072 kB)
[ 0.000000]   vmalloc   : 0xe0800000 - 0xff800000   ( 496 MB)
[ 0.000000]   lowmem    : 0xc0000000 - 0xe0000000   ( 512 MB)
[ 0.000000]   pkmap    : 0xbfe00000 - 0xc0000000   ( 2 MB)
[ 0.000000]   modules  : 0xbf000000 - 0xbfe00000   ( 14 MB)
[ 0.000000]   .text    : 0x(ptrval) - 0x(ptrval)   (13280 kB)
[ 0.000000]   .init    : 0x(ptrval) - 0x(ptrval)   (2048 kB)
[ 0.000000]   .data    : 0x(ptrval) - 0x(ptrval)   (1620 kB)
[ 0.000000]   .bss    : 0x(ptrval) - 0x(ptrval)   ( 394 kB)
[ 0.000000] SLUB: HWalign=64, Order=0-3, MinObjects=0, CPUs=1, Nodes=1
[ 0.000000] rcu: Hierarchical RCU implementation.
[ 0.000000] rcu: RCU event tracing is enabled.
[ 0.000000] rcu: RCU restricting CPUs from NR_CPUS=16 to nr_cpu_ids=1.
[ 0.000000] rcu: Adjusting geometry for rcu_fanout_leaf=16, nr_cpu_ids=1
[ 0.000000] NR_IRQS: 16, nr_irqs: 16, preallocated irq: 16

```

<https://github.com/JadeRowan>


```
mik@mik-VirtualBox: ~/repos/busybox

/ # uname -a
Linux (none) 4.19.218 #1 SMP Tue Nov 30 14:18:43 EET 2021 armv7l GNU/Linux
/ # ls -l
total 0
drwxrwxr-x 2 1000 1000 0 Nov 30 12:56 bin
drwxrwxr-x 2 1000 1000 0 Nov 30 13:06 boot
drwxrwxr-x 3 1000 1000 0 Nov 30 13:19 dev
drwxrwxr-x 3 1000 1000 0 Nov 30 13:14 etc
lrwxrwxrwx 1 1000 1000 11 Nov 30 13:04 init -> bin/busybox
drwxrwxr-x 3 1000 1000 0 Nov 30 13:10 lib
lrwxrwxrwx 1 1000 1000 11 Nov 30 12:56 linuxrc -> bin/busybox
dr-xr-xr-x 90 root root 0 Jan 1 1970 proc
drwxrwxr-x 2 1000 1000 0 Nov 30 12:57 root
drwxrwxr-x 2 1000 1000 0 Nov 30 12:56/sbin
dr-xr-xr-x 12 root root 0 Nov 30 13:19 sys
drwxrwxr-x 2 1000 1000 0 Nov 30 12:57 tmp
drwxrwxr-x 4 1000 1000 0 Nov 30 12:56 usr

/ # dmesg | grep init
[ 0.000000] random: get_random_bytes called from start_kernel+0x9c/0x400 with crng_init=0
[ 0.000000] Memory: 406428K/524288K available (12288K kernel code, 1619K rwdata, 4784K rodata, 2048K init, 393K bss, 52324K reserved, 65536K cma-reserved, 0K highmem)
[ 0.000000] .init : 0x(ptrval) - 0x(ptrval) (2048 kB)
[ 0.073770] devtmpfs: initialized
[ 0.099547] pinctrl core: initialized pinctrl subsystem
[ 0.266265] SCSI subsystem initialized
[ 0.425263] Trying to unpack rootfs image as initramfs...
[ 1.993036] Freeing initrd memory: 25092K
[ 2.141093] SuperH (H)SCI(F) driver initialized
[ 2.143788] msm_serial: driver initialized
[ 2.144711] STMicroelectronics ASC driver initialized
[ 2.146980] STM32 USART driver initialized
[ 2.498200] Run /init as init process

BusyBox v1.31.1 (2021-11-30 14:53:00 EET) multi-call binary.
BusyBox is copyrighted by many authors between 1998-2015.
Licensed under GPLv2. See source distribution for detailed
copyright notices.

Usage: busybox [function [arguments]...]
or: busybox --list[-full]
or: busybox --show SCRIPT
or: busybox --install [-s] [DIR]
or: function [arguments]...

BusyBox is a multi-call binary that combines many common Unix
utilities into a single executable. Most people will create a
link to busybox for each function they wish to use and BusyBox
will act like whatever it was invoked as.

/ #
```

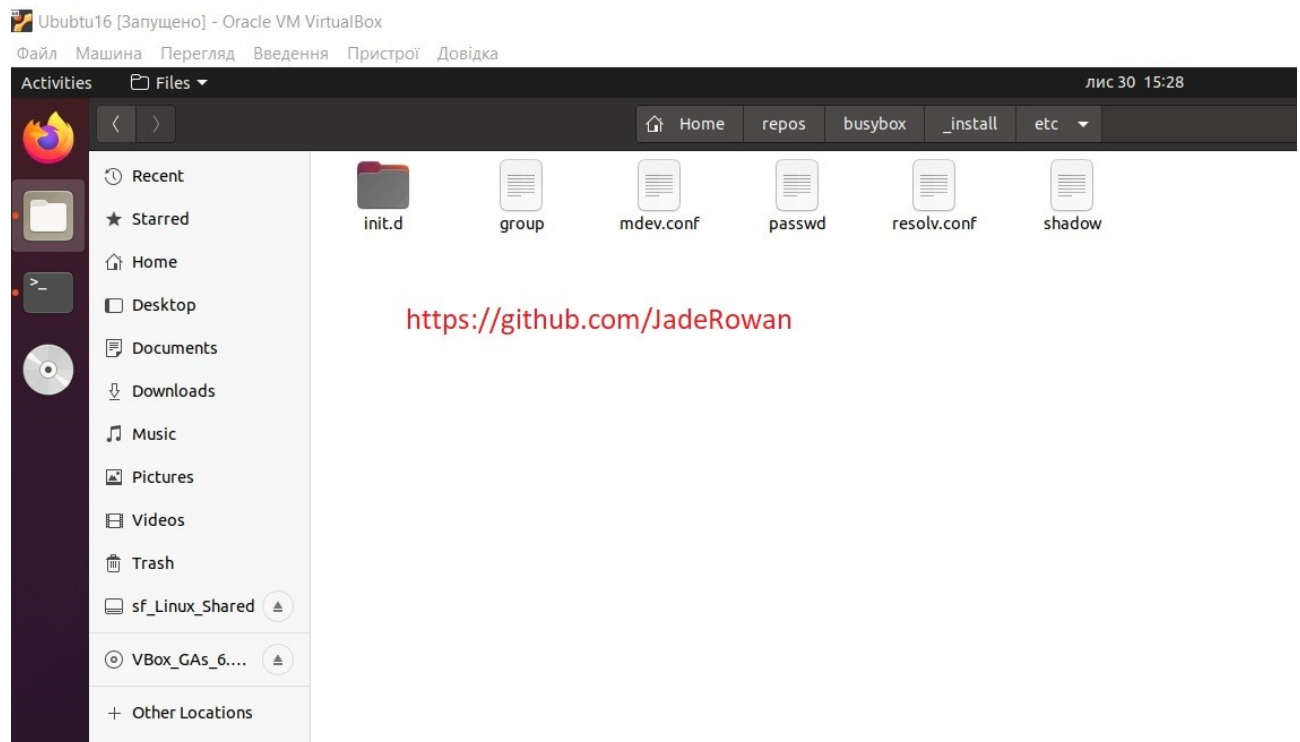
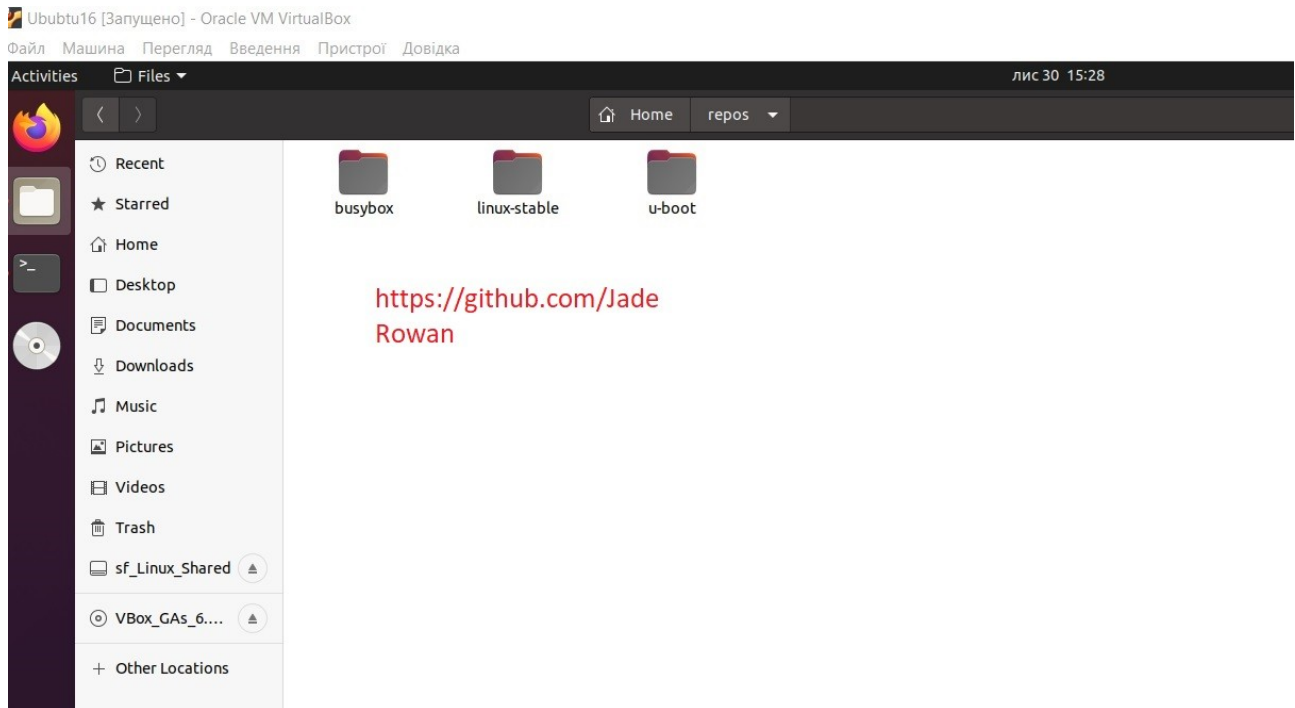
<https://github.com/JadeRowan>

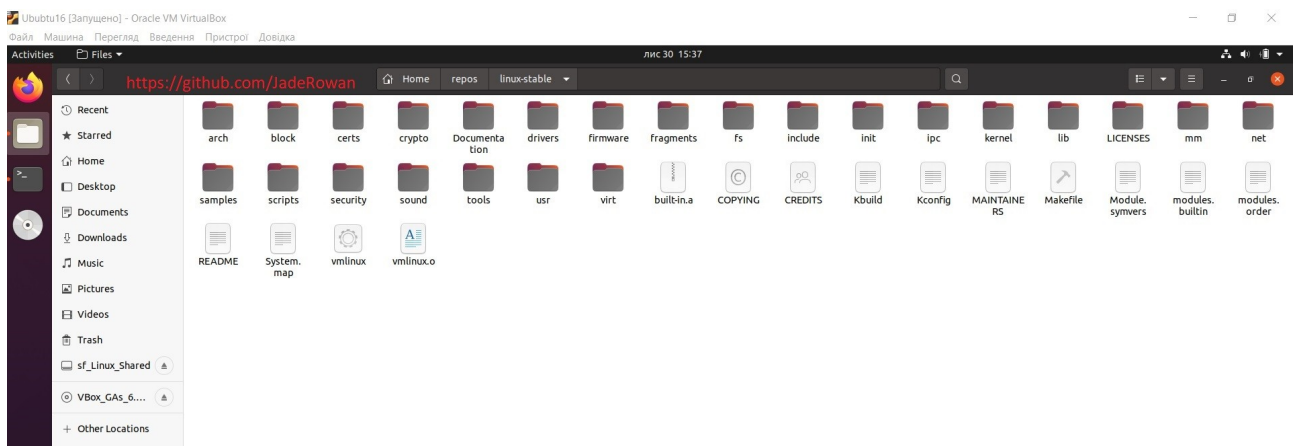
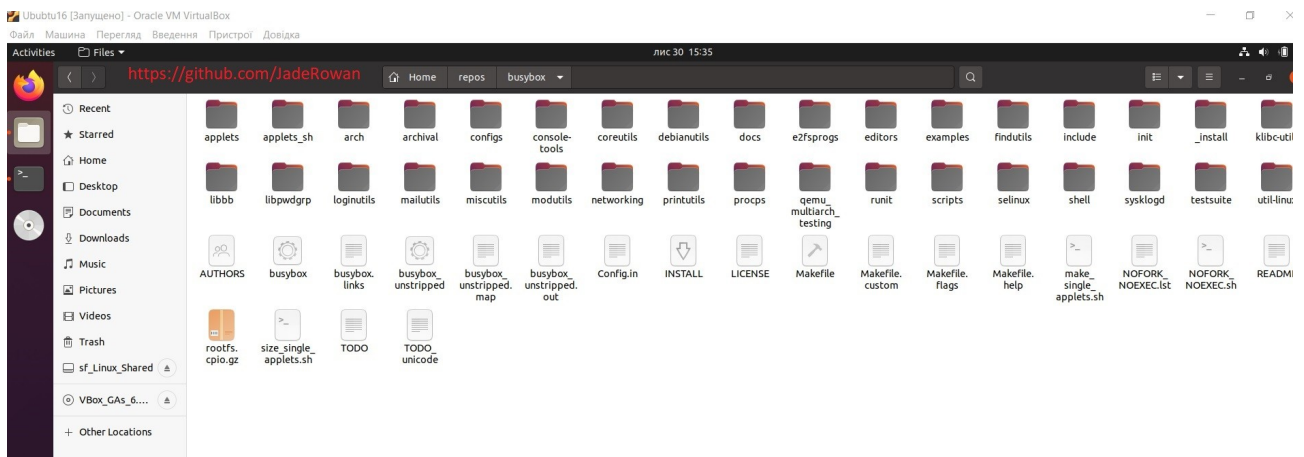
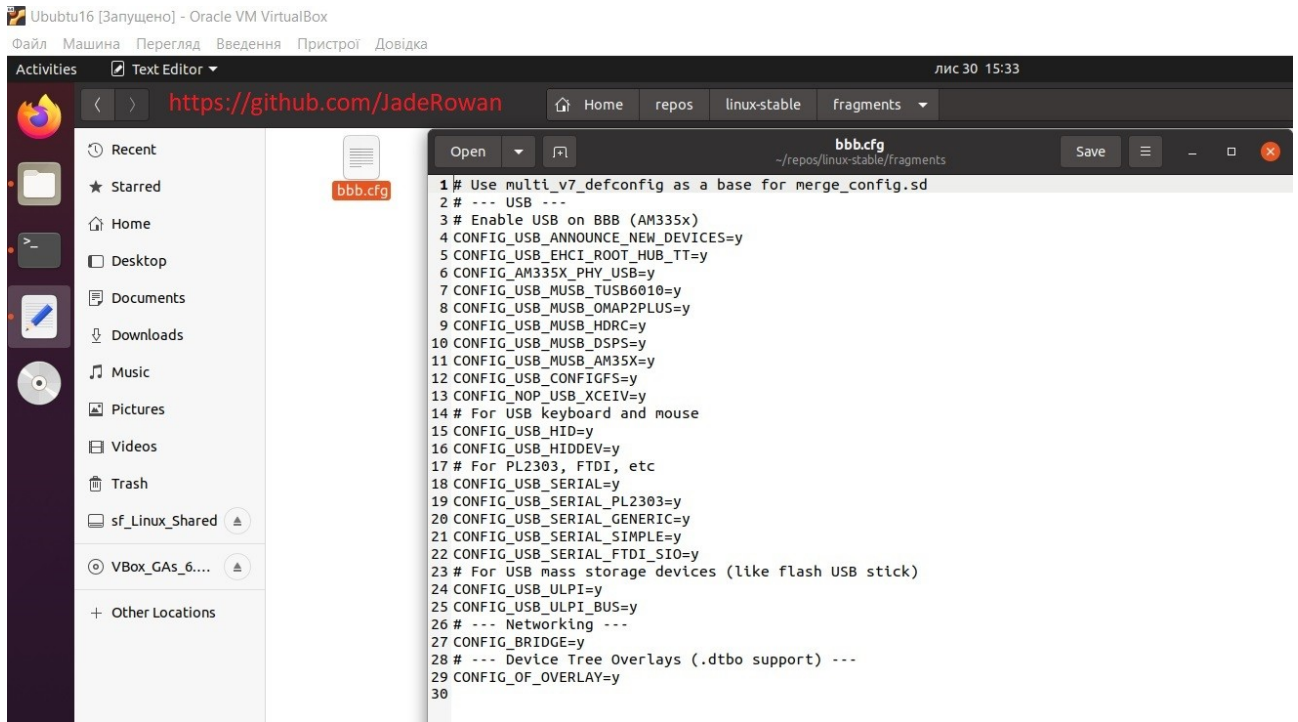
```
mik@mik-VirtualBox: ~/repos/busybox

[ 2.254958] usbserial: USB Serial support registered for pl2303
[ 2.255132] usbcore: registered new interface driver usb_serial_simple
[ 2.255393] usbserial: USB Serial support registered for carelink
[ 2.255639] usbserial: USB Serial support registered for zio
[ 2.256057] usbserial: USB Serial support registered for funsoft
[ 2.256317] usbserial: USB Serial support registered for flashloader
[ 2.256485] usbserial: USB Serial support registered for google
[ 2.256639] usbserial: USB Serial support registered for libtransistor
[ 2.256824] usbserial: USB Serial support registered for vivopay
[ 2.257071] usbserial: USB Serial support registered for moto_modem
[ 2.257523] usbserial: USB Serial support registered for motorola_tetra
[ 2.257793] usbserial: USB Serial support registered for novatel_gps
[ 2.258565] usbserial: USB Serial support registered for hp4x
[ 2.259617] usbserial: USB Serial support registered for suunto
[ 2.259840] usbserial: USB Serial support registered for siemens_mpi
[ 2.278754] rtc-pl031 9010000.pl031: rtc core: registered pl031 as rtc0
[ 2.280895] i2c /dev entries driver
[ 2.293894] sdhci: Secure Digital Host Controller Interface driver
[ 2.294428] sdhci: Copyright(c) Pierre Ossman
[ 2.299042] Synopsys Designware Multimedia Card Interface Driver
[ 2.301597] sdhci-pltfm: SDHCI platform and OF driver helper
[ 2.309178] ledtrig-cpu: registered to indicate activity on CPUs
[ 2.310310] usbcore: registered new interface driver usbhid
[ 2.310519] usbhid: USB HID core driver
[ 2.315089] NET: Registered protocol family 10
[ 2.322879] Segment Routing with IPv6
[ 2.323862] sit: IPv6, IPv4 and MPLS over IPv4 tunneling driver
[ 2.331714] NET: Registered protocol family 17
[ 2.332769] can: controller area network core (rev 20170425 abi 9)
[ 2.333575] NET: Registered protocol family 29
[ 2.333818] can: raw protocol (rev 20170425)
[ 2.334129] can: broadcast manager protocol (rev 20170425 t)
[ 2.334441] can: netlink gateway (rev 20170425) max_hops=1
[ 2.336113] Key type dns_resolver registered
[ 2.336745] ThumbEE CPU extension supported.
[ 2.336992] Registering SWP/SWPB emulation handler
[ 2.343279] Loading compiled-in X.509 certificates
[ 2.353894] input: gpio-keys as /devices/platform/gpio-keys/input/input0
[ 2.366426] rtc-pl031 9010000.pl031: setting system clock to 2021-11-30 13:19:11 UTC (1638278351)
[ 2.379506] uart-pl011 9000000.pl011: no DMA platform data
[ 2.483434] Freeing unused kernel memory: 2048K
[ 2.498200] Run /init as init process

Please press Enter to activate this console.
```

<https://github.com/JadeRowan>






```

Activities  Terminal ▾

See also <https://ccache.dev>.
mik@mik-VirtualBox:~/repos/busybox$ ccache -V
ccache version 3.7.7

Copyright (C) 2002-2007 Andrew Tridgell
Copyright (C) 2009-2020 Joel Rosdahl

This program is free software; you can redistribute it and/or modify it under
the terms of the GNU General Public License as published by the Free Software
Foundation; either version 3 of the License, or (at your option) any later
version.
mik@mik-VirtualBox:~/repos/busybox$ ccache -p
(default) base_dir =
(default) cache_dir = /home/mik/.ccache
(default) cache_dir_levels = 2
(default) compiler =
(default) compiler_check = mtime
(default) compression = false
(default) compression_level = 6
(default) cpp_extension =
(default) debug = false
(default) depend_mode = false
(default) direct_mode = true
(default) disable = false
(default) extra_files_to_hash =
(default) hard_link = false
(default) hash_dir = true
(default) ignore_headers_in_manifest =
(default) keep_comments_cpp = false
(default) limit_multiple = 0.8
(default) log_file =
(default) max_files = 0
(/home/mik/.ccache/ccache.conf) max_size = 5.0G
(default) path =
(default) pch_external_checksum = false
(default) prefix_command =
(default) prefix_command_cpp =
(default) read_only = false
(default) read_only_direct = false
(default) recache = false
(default) run_second_cpp = true
(default) sloppiness =
(default) stats = true
(default) temporary_dir =
(default) umask =

```

<https://github.com/JadeRowan>



Висновки:

Підготували середовище для плати BBB. Виконали завдання з файлу **BBB_-Platform_Bring_Up** з першого і до 3.1