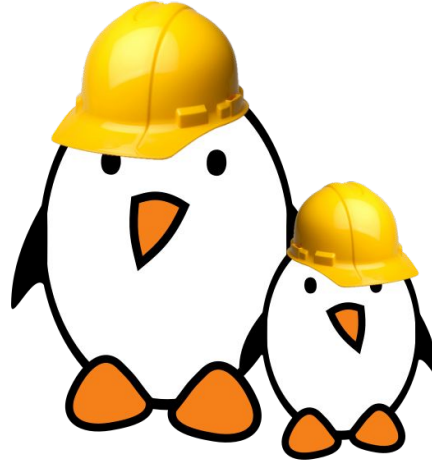# Buildroot workshop

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Agenda

1. About Buildroot
2. Install Buildroot
3. QEMU Boot CD

What

- Buildroot makes embedded Linux easy.
- Uses same build system as Linux kernel.
- Gives you control and full control of your options.

Why

- If you need a lightweight linux OS, you can slim down as much as you want.
- Nice environment for experimenting with kernel patches / features.
- Small memory footprint.

How

- You know buildroot uses the Linux kernel.
- Combined with Busybox we get access to other common unix tools.
- Buildroot also has it's own packages, not binary ones but source packages which you have to build.

Installing the dependencies - https://git.io/vykyL

```
apt-get update
apt-get install -y wget build-essential libncurses5-dev gcc-multilib
apt-get install -y cpio python unzip rsync bc
```

```
dnf install -y wget tar make gcc ncurses-devel which
dnf install -y bzip2 gcc-c++ bc cpio patch perl python rsync unzip bison cmake flex
dnf install -y glibc.i686 libgcc.i686 libstdc++.i686 glibc-devel.i686 perl-Thread-Queue
dnf install -y perl-Data-Dumper perl-ExtUtils-MakeMaker findutils
```

Getting the source - https://git.io/vykyn

```
wget https://buildroot.org/downloads/buildroot-2016.11.2.tar.gz

tar xvf buildroot-2016.11.2.tar.gz
```

Building Buildroot - https://git.io/vykyS

```
# Kernel base configuration
make qemu_x86_64_defconfig


# Pick configuration options
make menuconfig
make


make busybox-menuconfig
```

Create a bootable ISO - https://git.io/vykS4

```
mkdir -pv CD_root/boot
cp ./output/build/linux-*/arch/x86_64/boot/bzImage CD_root/boot/
sudo tar -C CD_root -xf output/images/rootfs.tar
sudo chown -R $USER:$USER CD_root
cp -r output/host/usr/share/syslinux CD_root/isolinux

cat > CD_root/isolinux/isolinux.cfg <<EOL
display boot.txt
default aOS
ui vesamenu.c32
menu BACKGROUND splash.png
label    aOS
    kernel /boot/bzImage
    APPEND root=/dev/sda
EOL
cat > CD_root/isolinux/boot.txt <<EOL
nuug workshop boot text
EOL
cp output/images/rootfs.* CD_root/
wget https://www.nuug.no/images/NUUG-logo-2-150x290.png
mv NUUG-logo-2-150x290.png CD_root/isolinux/splash.png

mkisofs -o nuug-workshop-os.iso -b isolinux/isolinux.bin -c isolinux/boot.cat -no-emul-boot -boot-load-size 4 -boot-info-table CD_root
```

Boot ISO - https://git.io/vykSV

```
qemu-system-x86_64 -boot d -cdrom nuug-workshop-os.iso -m 128
```

Summary

Thanks for attending, any questions?

References

- [Step by step installation guide](#)
- [Buildroot Workshop - LSM2012_BuildrootTutorial_Petazzoni.pdf](#)
- [Quick kernel hacking with QEMU + buildroot](#)
- [Buildroot x86 installer](#)