# 1st exercise

NXSOL-OJT-2024

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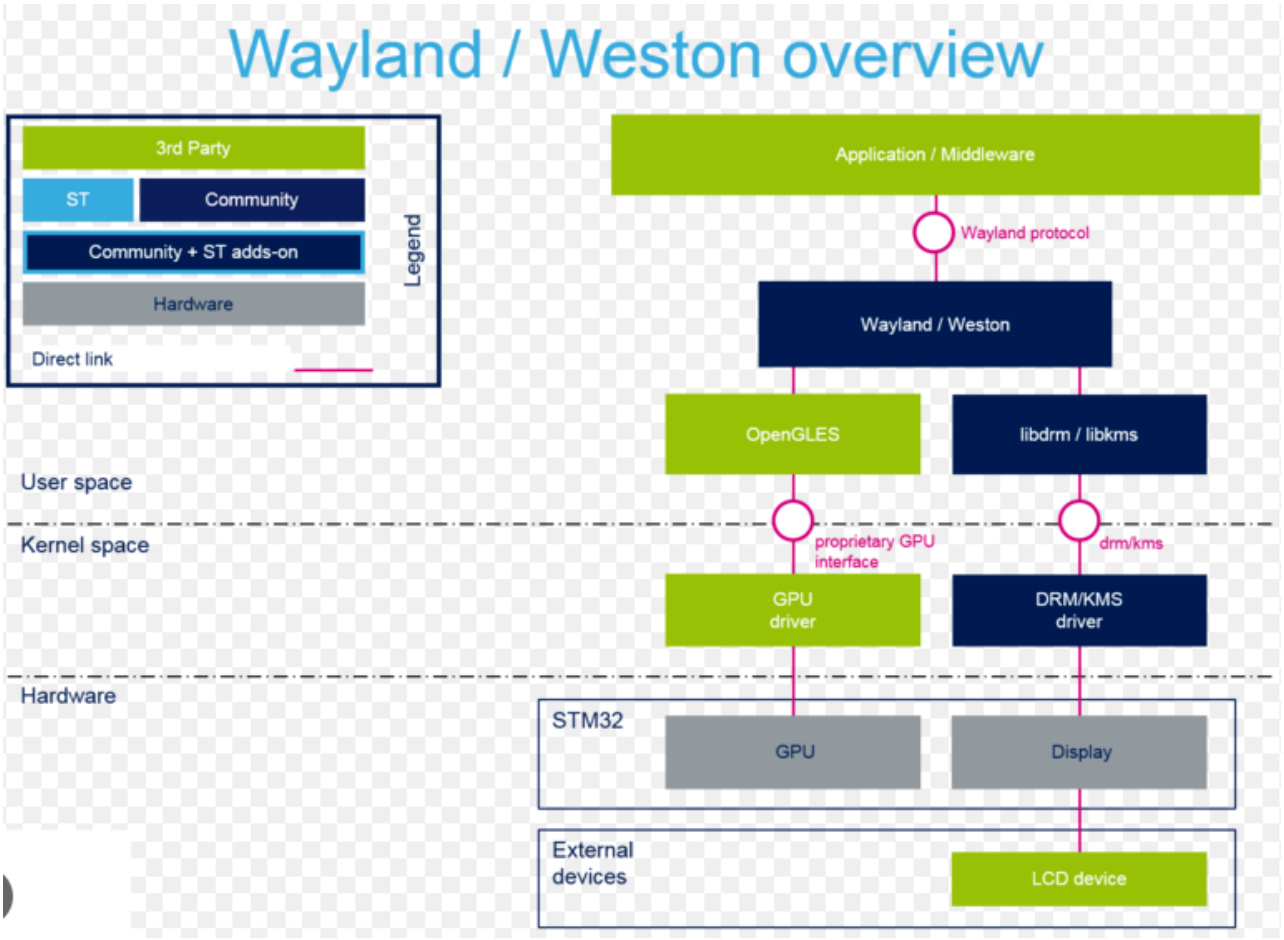
# 1 1: Create and execute the image of Arm64 Weston/ wayland

## 1.1 What is Weston/wayland?




- Wayland is a **protocol** that defines the communication between a display server (compositor) and its clients (applications). It's the modern replacement for the older X11 protocol used by the X Window System.
- Weston is the reference **implementation** of a Wayland compositor. In the Wayland architecture, the compositor is a key component that manages the display, controls window positioning, and handles input events, among other tasks.

## 1.2 Environment setup

Install dependencies using apt-get install

```
sudo apt-get update
sudo apt-get install gawk wget git-core diffstat unzip texinfo gcc-multilib build-
essential chrpath socat cpio python3 python3-pip python3-pexpect xz-utils debianutils
iputils-ping python3-git python3-jinja2 libegl1-mesa libsdl1.2-dev xterm python3-
subunit
mesa-common-dev lz4
```

## 1.3 Source download

Download poky (kirkstone) because dunfell results in some issues

```
git clone -b kirkstone git://git.yoctoproject.org/poky.git
```

## 1.4 Modify

Modify this line in `mybuild/conf/local.conf` so that ARM64 is used

```
MACHINE ?= "qemuarm64"
```

`Optional` (It works well without these line because of the default setting)

```
ISTRO_FEATURES:append = " wayland"
CORE_IMAGE_EXTRA_INSTALL += "wayland weston"
```

## 1.5 How to build

Build using Poky and Bitbake.

`source poky/oe-init-build-env` ←Sets the build environment

```
source poky/oe-init-build-env  mybuild
```

```
cd mybuild
bitbake -k core-image-weston
```

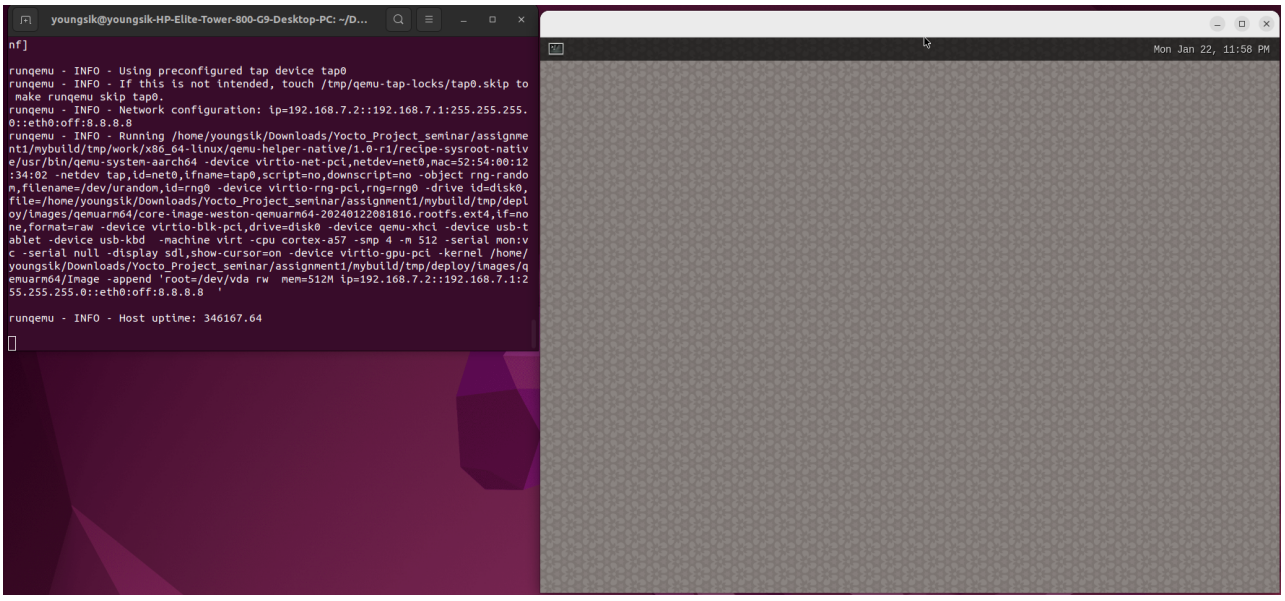
## 1.6 How to run

Run the built image using QEMU

```
runqemu qemuarm64
```

QEMU is a free and open-source emulator. It emulates a computer's processor through dynamic binary translation and provides a set of different hardware

## 1.7 Results




## 1.8 Trouble shoot

- Got an error saying it cannot continue the build without lz4, and solved it by installing lz4
- Got an error because of using DISTRO_FEATURES as described the official document of Dunfell and solved it by using **DISTRO_FEATURES:append = " wayland"** from the kirkstone document

# 2 2:

## 2.1 source 와 ./ 의 차이는?

- `Source` is used to execute the environment setup script (e.g. source oe-init-build-env)
- Using `./` does not achieve this

## 2.2 Embedded Linux GUI 의 종류와 각각의 설명 (요약)

### 2.2.1 1. Qt for Embedded Linux

- **Description**: Qt for Embedded Linux is a popular framework that offers a comprehensive set of tools and libraries for developing GUIs. It's known for its rich set of features and cross-platform support.

### 2.2.2 2. GTK+ (GIMP Toolkit)

- **Description**: GTK+ is a free and open-source cross-platform widget toolkit for creating graphical user interfaces. It’s part of the GNU Project and originally developed for the GIMP image editor.

### 2.2.3 3. X Window System (X11)

- **Description**: X11 is a windowing system for bitmap displays. It is the standard window system for UNIX and UNIX-like operating systems, including Linux.

### 2.2.4 4. Wayland

- **Description**: Wayland is a modern protocol for a display server, intended as a simpler replacement for X11. It’s gaining popularity in the Linux world for its efficiency.

### 2.2.5 5. FLTK (Fast Light Toolkit)

- **Description**: FLTK is a lightweight, cross-platform GUI toolkit. It’s known for its small size and speed, making it suitable for embedded systems with limited resources.

### 2.2.6 6. Embedded Wizard

- **Description**: Embedded Wizard is a tool for developing high-performance GUIs specifically for embedded systems.