**Integrated Ubuntu18.04 with i.MX8 VPU & GPU**

**Prerequisites**

To get a basic root file system, please refer to Winston – “How to create Ubuntu 18.04/16.04 SD card image for iMX8/iMX6”. Due to i.MX8 3D acceleration is only available on wayland infrastructure, please ignore x11/xfce installing. Next, we’ll do experiment on ROM-7720 product.

**GPU**

SD\_IMAGE = i.mx8 yocto formal release image.

ROOTFS = A root file system folder which created refer to Winston document.

GPU Libraries

Copy following file from yocto build environment in the ~/tmp/work/

sudo cp -Pra aarch64-mx8-poky-linux/libdrm/2.4.91.imx-r0/image/\* ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/imx-gpu-viv/1\_6.2.4.p4.0-aarch64-r0/image/\* ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/imx-dpu-g2d/1.7.0-r0/image/\* ROOTFS

sudo cp -r all-poky-linux/firmware-imx/1\_8.1-r0/image/\* ROOTFS

**Wayland environment**

You can copy a lot of files from SD\_IMAGE or build a new one on ROOTFS. In this step, we will show you how to build it.

Please chroot into the ROOTFS first.

apt-get update

apt-get -y install language-pack-en-base sudo ssh net-tools network-manager iputils-ping rsyslog bash-completion htop resolvconf dialog vim v4l-utils alsa-utils git gcc less resolvconf autoconf autopoint libtool bison flex gtk-doc-tools glib-2.0 libglib2.0-dev libpango1.0-dev libatk1.0-dev kmod pciutils

apt-get -y install libffi-dev libxml2-dev

wget https://wayland.freedesktop.org/releases/wayland-1.16.0.tar.xz

tar xvf ./wayland-1.16.0.tar.xz

cd wayland-1.16.0

./configure --disable-documentation prefix=/usr

make

make install

ldconfig

git clone https://source.codeaurora.org/external/imx/wayland-protocols-imx.git

cd wayland-protocols-imx/

git checkout e05c19d9520f0b1289cf0844d6e2f877114f39d5

./autogen.sh --prefix=/usr

make install

ldconfig

apt-get -y install libudev-dev libinput-dev libxkbcommon-dev libpam0g-dev

mkdir ~/weston

cd ~/weston

git clone https://source.codeaurora.org/external/imx/weston-imx.git

cd weston-imx

git checkout fb563901657b296c7c7c86d26602a622429e334f

./autogen.sh --prefix=/usr --disable-silent-rules --disable-dependency-tracking --enable-setuid-install --disable-rdp-compositor --enable-clients --enable-simple-clients --enable-demo-clients-install --disable-colord --enable-egl --enable-simple-egl-clients --enable-fbdev-compositor --disable-headless-compositor --enable-drm-compositor --enable-weston-launch --disable-lcms --disable-libunwind --with-pam --disable-vaapi-recorder --enable-wayland-compositor --without-webp --disable-x11-compositor --disable-xwayland --disable-imxg2d

make -j4 COMPOSITOR\_LIBS="-lGLESv2 -lEGL -lGAL -lwayland-server -lxkbcommon -lpixman-1"

make install

Copy following file from SD\_IMAGE to ROOTFS. The Wayland depends on galcore.ko

lib/{modules,firmware}

etc/{modprobe.d,modules-load.d,udev}

To launch Wayland, please enter commnad

export XDG\_RUNTIME\_DIR=/run/user/1000

sudo -E weston --tty=1

If you run weston as a root, please change the XDG\_RUNTIME\_DIR to

export XDG\_RUNTIME\_DIR=/tmp

**glmark2**

Copy following file from yocto build environment in the ~/tmp/work/ to ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/glmark2/2017.07+AUTOINC+ed20c633f1-r0/image/\* ROOTFS

sudo cp -Pra aarch64-poky-linux/libjpeg-turbo/1\_1.5.3-r0/image/\* ROOTFS

In present, it run on Wayland terminal only. If run it on debug console, the error occurred.



**GStreamer**

Please get this package from FSL version instead of apt-get install. There is a base gstremer plugins-base derived from building Wayland. Remove it first on ROOTFS.

sudo dpkg -r gstreamer1.0-plugins-base

sudo rm /usr/lib/aarch64-linux-gnu/libgst\*

Copy following file from yocto build environment in the ~/tmp/work/ to ROOTFS

sudo cp -Pra aarch64-poky-linux/gstreamer1.0/1.14.4.imx-r0/image/\* ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/gstreamer1.0-plugins-bad/1.14.4.imx-r0/image/\* ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/gstreamer1.0-plugins-base/1.14.4.imx-r0/image/\* ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/gstreamer1.0-plugins-good/1.14.4.imx-r0/image/\* ROOTFS

sudo cp -Pra aarch64-poky-linux/orc/0.4.28-r0/image/\* ROOTFS

sudo cp -Pra aarch64-poky-linux/imx-parser/4.4.5-r0/image/\* ROOTFS

sudo cp -Pra aarch64-mx8-poky-linux/imx-gst1.0-plugin/4.4.5-r0/image/\* ROOTFS

If it show error while playing video, please add those dependence libraries.

sudo cp -Pra ./aarch64-mx8-poky-linux/librsvg/2.40.20-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/openssl/1.0.2p-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/libwebp/0.6.1-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/libxv/1.0.11-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/gdk-pixbuf/2.36.11-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/libx11/1\_1.6.5-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/taglib/1.11.1-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/libjpeg-turbo/1\_1.5.3-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/sbc/1.3-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/curl/7.61.0-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/libxdamage/1\_1.1.4-r0/image/\* ROOTFS

sudo cp -Pra ./aarch64-poky-linux/speex/1.2.0-r0/image/\* ROOTFS

Regarding to video playback, some specific problems have yet to be solved.

* The tool Gstreamer is playable only on debug console. Trying to using this tool on Wayland terminal will get fracture effect.
* Failed to play video by using gplay tool.
* It’ll get error “Missing decoder: MPEG-4 AAC” during playback.

**About GStreamer library path**

When gst-laucher-1.0 be executed, it will check following setting:

* GST\_PLUGIN\_SYSTEM\_PATH\_1\_0
* ~/.cache/gstreamer-1.0/registry.x86\_64.bin

You may re-create registry.x86\_64.bin by run gst-inspect-1.0

**ROM-5720/ROM-5721**

For this product, it has some different libraries need to be concerned then ROM-7720. First, it has no “imx-dpu-g2d” library. Secondly, the video playback need “imx-vpu-hantro” and “imx-vpuwrap” libraries for hardware acceleration.

**How to play video? (ROM-5720/ROM-5721)**

All of following command should be executed successful without start weston.

adv@bionic\_arm64:sudo su

root@arm64:~/# gst-launch-1.0 playbin uri=file:VIDEO\_FILE\_PATH

root@arm64:~/# adv@bionic\_arm64:~$ gplay-1.0 VIDEO\_FILE\_PATH

**How to test 3D? (ROM-5720/ROM-5721)**

Please run this command before weston is launched.

root@arm64:~/# glmark2-es2-wayland

**ROM-5620**

**How to play video?**

All of following command should be executed successful after start weston.

adv@bionic\_arm64:sudo su

root@arm64:~/# gst-launch-1.0 playbin uri=file:VIDEO\_FILE\_PATH

root@arm64:~/# adv@bionic\_arm64:~$ gplay-1.0 VIDEO\_FILE\_PATH

ROM-3620

gst-launch-1.0 – Only available WITHOUT weston launched.

gplay-1.0 - Only available while weston launched.

glmark2-es2-wayland - Only available while weston launched.