Real-time Linux for Jetson Nano (L4T 32.3.1)

Install required packages

```
sudo apt-get update
sudo apt-get install libncurses5-dev
sudo apt-get install build-essential bc
sudo apt-get install lbzip2
sudo apt-get install qemu-user-static
```

Create build folder

```
mkdir $HOME/jetson_nano
cd $HOME/jetson_nano
```

Download the following files in the jetson_nano folder:

L4T Jetson Driver Package
https://developer.nvidia.com/embedded/dlc/r32-3-1_Release_v1.0/t210ref_release_aarch64/Tegra210_Linux_R32.3.1_aarch64.tbz2

L4T Sample Root File System
https://developer.nvidia.com/embedded/dlc/r32-3-1_Release_v1.0/t210ref_release_aarch64/Tegra_Linux_Sample-Root-Filesystem_R32.3.1_aarch64.tbz2

L4T Sources:
https://developer.nvidia.com/embedded/dlc/r32-3-1_Release_v1.0/Sources/T210/public_sources.tbz2

GCC Tool Chain for 64-bit BSP
https://developer.nvidia.com/embedded/dlc/l4t-gcc-7-3-1-toolchain-64-bit

Extract files

```
sudo tar xpf Tegra210_Linux_R32.3.1_aarch64.tbz2
cd Linux_for_Tegra/rootfs/
sudo tar xpf ../../Tegra_Linux_Sample-Root-Filesystem_R32.3.1_aarch64.tbz2
cd ../../
tar -xvf gcc-linaro-7.3.1-2018.05-x86_64_aarch64-linux-gnu.tar.xz
sudo tar -xjf public_sources.tbz2
tar -xjf Linux_for_Tegra/source/public/kernel_src.tbz2
```

Apply PREEMPT-RT patches

```
cd kernel/kernel-4.9/
./scripts/rt-patch.sh apply-patches
```

Compile kernel

```
TEGRA_KERNEL_OUT=jetson_nano_kernel
mkdir $TEGRA_KERNEL_OUT
export CROSS_COMPILE=$HOME/jetson_nano/gcc-linaro-7.3.1-2018.05-x86_64_aarch64-linux-gnu/bin/aarch64-linux-gnu-
make ARCH=arm64 O=$TEGRA_KERNEL_OUT tegra_defconfig
make ARCH=arm64 O=$TEGRA_KERNEL_OUT menuconfig
```

Kernel Features -> Preemption Model: Fully Preemptible Kernel (RT)
Kernel Features -> Timer frequency: 1000 HZ

```
make ARCH=arm64 O=$TEGRA_KERNEL_OUT -j4

sudo cp jetson_nano_kernel/arch/arm64/boot/Image $HOME/jetson_nano/Linux_for_Tegra/kernel/Image
sudo cp -r jetson_nano_kernel/arch/arm64/boot/dts/* $HOME/jetson_nano/Linux_for_Tegra/kernel/dtb/
sudo make ARCH=arm64 O=$TEGRA_KERNEL_OUT modules_install
```

```
INSTALL_MOD_PATH=$HOME/jetson_nano/Linux_for_Tegra/rootfs/
cd $HOME/jetson_nano/Linux_for_Tegra/rootfs/
sudo tar --owner root --group root -cjf kernel_supplements.tbz2 lib/modules
sudo mv kernel_supplements.tbz2  ../kernel/

cd ..
sudo ./apply_binaries.sh
```

Generate Jetson Nano image

```
cd tools
sudo ./jetson-disk-image-creator.sh -o jetson_nano.img -s 14G -b jetson-nano -r 200
```

The `-r 200` parameter is the revision number of the Jetson Nano module to be used:
100 for revision A01
200 for revision A02
300 for revision B00 Ir B01

Reference: https://docs.nvidia.com/jetson/l4t/Tegra Linux Driver Package Development Guide/flashing.html#wwpID0E0PG0HA

Flash the image to the micro SD card using Etcher
To finsih, install Jetson SDK components using SDK manager