AIM-Edge ncox/ncon

Jetpack 5.1.2 Developer Image Refresh

User Manual

24 October 2023

Version 1.5

Content

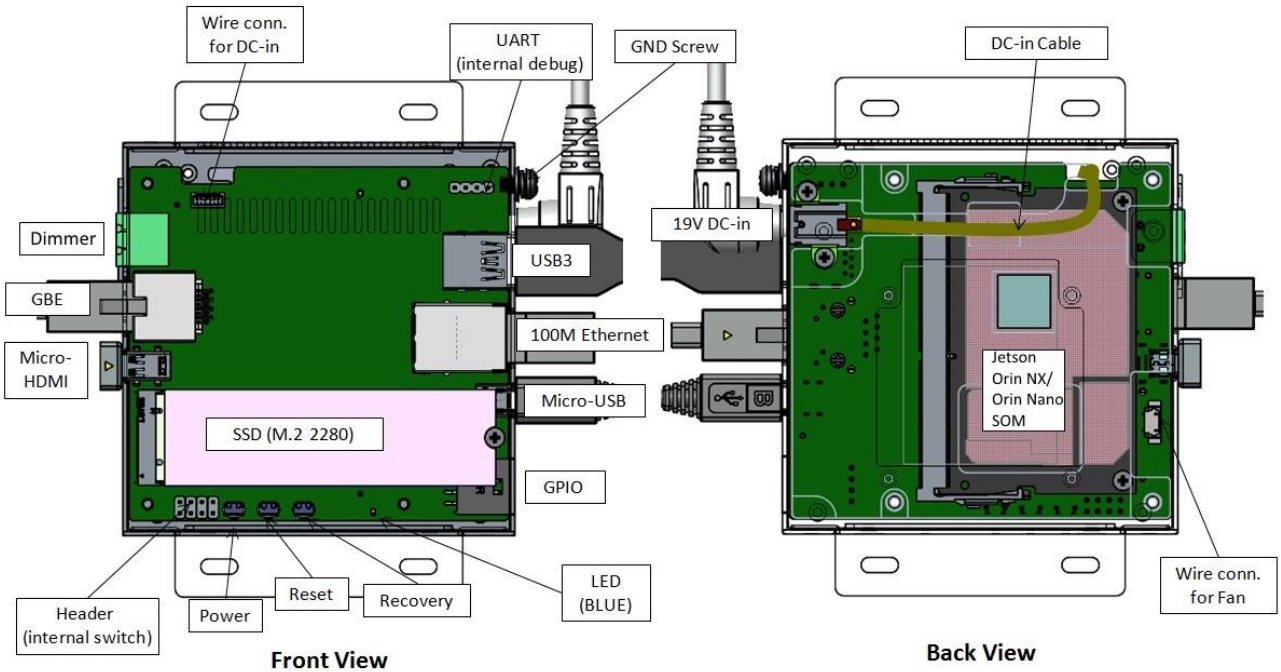
Revision History

Date	Version	Modification
2023/7/7	1.0	Creation
2023/10/2	1.1	1. Modified for Jetpack 5.1.2 2. Add a known issue for boot logo disappear
2023/10/3	1.2	Add image backup/restore command
2023/10/4	1.3	Wording modification
2023/10/18	1.4	Add warning message to restore image to the same type SoM only
2023/10/24	1.5	The image refresh package is split to image file and root filesystem package.

1. Introduction

This document is to describe how to download Jetpack 5.1.2 system image to AIM-Edge ncox/ncon device, including hardware requirement, download environment & image preparation and download procedures.

2. Board Overview



3. Getting Started

3.1. Hardware Requirement

1. Linux Host PC/Notebook with Ubuntu Linux X64 20.04 or 18.04
2. USB Type-A to Micro USB cable (to connect Host PC/NB to AIM-Edge ncox/ncon)

3.2. Download Image & Root FileSystem Backup Package

1. Check the OneDrive URL provided by AIMobile for image refresh package (O1_dev_5.1.2_V05 in the example below), two files will be there, they are the image file (O1_dev_5.1.2_V05.tar.bz2) and the root filesystem backup package (nvme0n1p1.tar.gz).

2. Download all files to Linux Host PC/NB, and extract the image file (O1_dev_5.1.2_V05.tar.bz2) with the command "tar -jxvf O1_dev_5.1.2_V05.tar.bz2". The image burning script O1_flash.sh and the prerequisites script l4t_flash_prerequisites.sh is in the extracted file folder (O1_dev_5.1.2_V05/).

名稱	大小	封裝後大...	修改日期	模式
bootloader	617 733 679	617 975 ...	2023-10-...	0rwxrwx...
rootfs	4 865 050	4 880 384	2023-10-...	0rwxr-xr-x
nv_tegra	1 627	2 048	2023-07-...	0rwxrwx...
kernel	35 781 422	35 783 1...	2023-07-...	0rwxrwx...
tools	182 103 826	182 136 ...	2023-06-...	0rwxrwx...
O1_flash.sh	89	512	2023-10-...	0rwxr-xr-x
jetson-orin-nano-devkit.conf	3 548	3 584	2023-10-...	0rw-rw-r...
flash.sh	135 549	135 680	2023-09-...	0rwxrwx...
p3767.conf.common	7 753	8 192	2023-08-...	0rw-rw-r...
l4t_flash_prerequisites.sh	2 304	2 560	2023-07-...	0rwxrwx...

3. Move the root filesystem backup package (nvme0n1p1.tar.gz) to the sub folder "./tools/backup_restore/images/" of the image package extracted folder (O1_dev_5.1.2_V05/). The root filesystem backup package will be used as a base of the image refresh process.

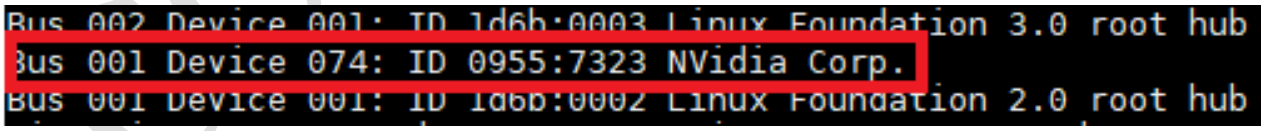
3.3. Image Refresh Procedures

1. Run prerequisites script(l4t_flash_prerequisites.sh) on Linux Host PC to prepare download environment, it only needs to do once on the Linux Host PC/NB.
2. Connect Linux Host PC/NB to AIM-Edge ncox/ncon device with USB Type-A to Micro USB cable
3. Put ncox/ncon to force USB recovery mode. (check Section 3.4 below)
4. Enter the extracted image refresh package folder on Linux Host PC/NB and execute O1_flash.sh to download image to ncox/ncon, it takes around 15 minutes.
5. After image is refreshed, ncox/ncon will reboot automatically.

3.4. Enter Force USB Recovery Mode

To update your device, you must be in Force USB Recovery Mode so that you can transfer system image to the Jetson device. To place device in Force USB Recovery Mode,

1. Power down the device. If connected, remove the DC power from the device. The device must be powered OFF, and not in a suspend or sleep state.
2. Connect the Micro-B plug on the USB cable to the Recovery (USB Micro-B) Port on the device and the other end to an available USB port on the host PC.
3. Connect the power adapter to the device.
4. With the system powered on:
   - Press and hold the RECOVERY button with paperclip.
   - While pressing the RECOVERY button, press and release the RESET button with paperclip.
   - Wait 2 seconds and release the RECOVERY button.
5. After ncox/ncon enter Force USB Recovery Mode, if it connected to Linux Host PC/NB already, execute “lsusb” command on Host PC/NB, a “0955:7323 NVidia Corp.” device will appear. If not, perform Step 4 above again.



Jetson SoM	USB ID
Orin NX 16GB	0955:7323
Orin NX 8GB	0955:7423
Orin Nano 8GB	0955:7523
Orin Nano 4GB	0955:7623

3.5. NVidia Container Usage

Please check readme.txt on Ubuntu desktop about NVidia container/docker usage including how to relocate the container image.
The NVidia container image is pre-installed to root file system, it takes around 12.5GB, and it can be removed with "docker system prune -af" command.

```
aim@AIM-dev-5476:~$ docker images
REPOSITORY                    TAG       IMAGE ID       CREATED       SIZE
nvcr.io/nvidia/l4t-jetpack    r35.3.1   149f3db37256   9 days ago    11.8GB
nvcr.io/nvidia/l4t-base       r35.3.1   023a91e93759   5 weeks ago   708MB
```

3.6. Image Backup/Restore

To backup/restore the device image to host machine, you can use the tool script in the image refresh package. The command is as below, and the image backup folder is at "./tools/backup_restore/images" under the image refresh package extracted folder. Besides, it needs to put ncox/ncon to force USB recovery mode (refer to section 3.4) before restore image.

If the target device image BSP version is Jetpack 5.1.1,
Backup Image:

```
sudo ./tools/backup_restore/l4t_backup_restore.sh -b p3509-a02+p3767-0000
```

Restore Image:

```
sudo ./tools/backup_restore/l4t_backup_restore.sh -r p3509-a02+p3767-0000
```

If the target device image BSP version is Jetpack 5.1.2,
Backup Image:

```
sudo ./tools/backup_restore/l4t_backup_restore.sh -b jetson-orin-nano-devkit
```

Restore Image:

```
sudo ./tools/backup_restore/l4t_backup_restore.sh -r jetson-orin-nano-devkit
```

Warning: The backup image should be restored to the same type of SoM only (e.g., Orin NX 16G to Orin NX 16G is OK, not Orin NX 8G or Orin Nano).

4. Known Issue

4.1. Bootloader Screen Disappear

Because of NVidia BSP limitation, the bootloader screen may not appear if no HDMI display connected while refreshing image. To solve the symptom, it needs to refresh the image with a display attached with HDMI cable.