

AIM-Edge ncox/ncon
Jetpack 6.0 Developer Image Refresh

User Manual

5 September 2024
Version 2.0

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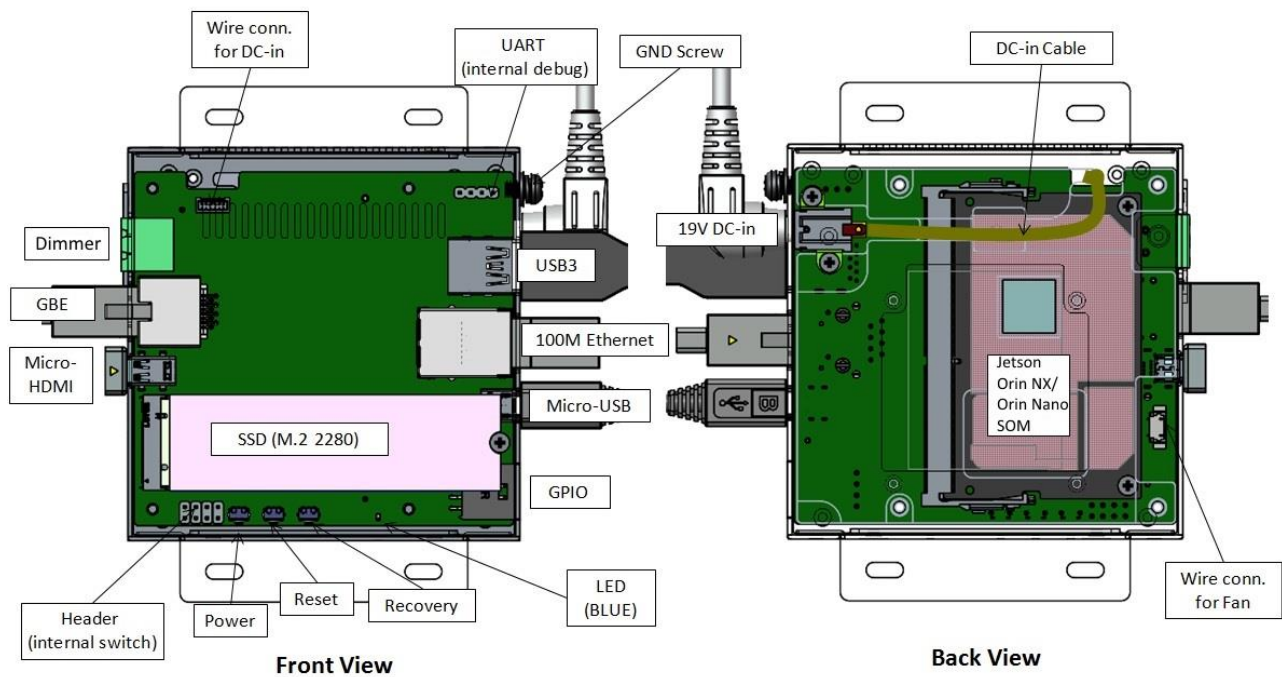
Revision History

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.
2023/11/13	1.6	Rename the pre-installed docker image to AIMobile docker
2024/09/05	2.0	Upgrade to Jetpack 6.0

1. Introduction

This document is to describe how to download Jetpack 6.0 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_6.0_V03](#) in the example below), two files will be there, they are the image file ([O1_dev_6.0_V03.tar.bz2](#)) and the root filesystem backup package ([nvme0n1p1.tar.gz](#)).

Lin.StevenYY 林彥宇 AIM > O1_dev_6.0 > O1_dev_6.0_V03

名稱 ▾	修改時間 ▾ ▾	修改者 ▾	檔案大小 ▾
 O1_dev_6.0_V03_OTA	3 分鐘前	Lin.StevenYY 林彥宇	13 個項目
 O1_dev_6.0_V03.tar.bz2	3 分鐘前	Lin.StevenYY 林彥宇	836 MB
 MD5	3 分鐘前	Lin.StevenYY 林彥宇	496 個位元組
 nvme0n1p1.tar.gz	3 分鐘前	Lin.StevenYY 林彥宇	14.1 GB

2. Download all files to Linux Host PC/NB, and extract the image file ([O1_dev_6.0_V03.tar.bz2](#)) with the command “`tar -jxvf O1_dev_6.0_V03.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_6.0_V03/](#)).

名稱	大小	封裝後大...	修改日期
bootloader	680 308 934	680 534 ...	2024-08-...
rootfs	102 923 661	102 985 ...	2024-07-...
tools	565 370 702	565 401 ...	2024-07-...
nv_tegra	1 706	2 048	2024-07-...
kernel	43 756 320	43 757 0...	2024-07-...
l4t_flash_from_kernel.sh	40 067	40 448	2024-07-...
p3768-0000-p3767-0000-a0.conf	4 652	5 120	2024-07-...
O1_flash.sh	89	512	2024-07-...
p3767.conf.common	8 187	8 192	2024-07-...
l4t_flash_prerequisites.sh	2 488	2 560	2024-07-...
jetson-orin-nano-devkit.conf	1 902	2 048	2024-07-...
flash.sh	145 498	145 920	2024-07-...

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_6.0_V03/). 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.

```
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 074: ID 0955:7323 NVidia Corp.
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

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. AIMobile Container Usage

Please check [readme.txt](#) on Ubuntu desktop about pre-installed AIMobile container usage including how to relocate the container image.

The AIMobile container image is pre-installed to root file system, it takes around 13GB, and it can be removed with “[docker system prune -af](#)” command.

```
aim@AIM-dev-4737:~$ docker images
REPOSITORY          TAG          IMAGE ID       CREATED        SIZE
aimobile/l4t-jetpack r35.4.1     353b9824dd21  2 weeks ago   12.9GB
```

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.

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).

3.7. Root Filesystem Package in Parts

If user meets problem on downloading OTA image file because of slow internet speed, we split the nvme0n1p1.tar.gz file to 2GB files to ease the downloading process. After all split files are downloaded, they can be combined with the command below.

```
cat nvme0n1p1.tar.gz-part* > nvme0n1p1.tar.gz
```

Lin.StevenYY 林彥宇 AIM > O1_dev_6.0 > O1_dev_6.0_V03

名稱 ↑	修改時間	修改者	檔案大小
 nvme0n1p1.tar.gz-part00	大約一小時前	Lin.StevenYY 林彥宇	2 GB
 nvme0n1p1.tar.gz-part01	大約一小時前	Lin.StevenYY 林彥宇	2 GB
 nvme0n1p1.tar.gz-part02	大約一小時前	Lin.StevenYY 林彥宇	2 GB
 nvme0n1p1.tar.gz-part03	大約一小時前	Lin.StevenYY 林彥宇	2 GB
 nvme0n1p1.tar.gz-part04	50 分鐘前	Lin.StevenYY 林彥宇	2 GB
 nvme0n1p1.tar.gz-part05	50 分鐘前	Lin.StevenYY 林彥宇	2 GB
 nvme0n1p1.tar.gz-part06	46 分鐘前	Lin.StevenYY 林彥宇	2 GB

4. Known Issue

N/A

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