



November 22, 2018. Linux BSP for Renesas R-Car V3M/V3H, Release 4.0 Base

Linux BSP for Renesas R-Car V3M/V3H, Release 4.0 Base Release Notes

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1. Introduction

This report contains information about Linux BSP for Renesas R-Car V3M/V3H package including install and usage instructions and restrictions of the current release.

2. Contacts

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3. Revision History

| Date | Rev | Description of Changes | By | Affiliation |
|-------------------|-----|---|------------------|-----------------|
| September 21 2018 | 1.0 | Initial version | Roman Meshkevich | Cogent Embedded |
| October 17 2018 | 1.1 | Update test information, change log, versioning | Andrey Dolnikov | Cogent Embedded |
| November 22 2018 | 2.0 | Update to release 4.0 | Dmitry Shifrin | Cogent Embedded |

4. Terminology / Glossary

| Term | Definition |
|-------------|--------------------------------------|
| HDMI | High-Definition Multimedia Interface |
| USB | Universal Serial Bus |
| NFS | Network File System |
| LCD | Liquid-crystal display |

5. Reference documents

| Rev | Document |
|-----|---|
| 1.0 | Yocto BSP 4.0 for Renesas R-CAR V3M and V3H SoCs. Test plan |
| 1.0 | Yocto BSP 4.0 for Renesas R-CAR V3M and V3H SoCs. Test report |

6. Change History

6.1 Revision 3.0 Base

1. Fixed cropping issue in test application that shows camera sensor image (utest-cam-imr-drm).
2. Changed CMA assignment. CMA memory can be changed in runtime by modifying Linux kernel parameters.
3. QoS was enabled on V3H. By default V3H uses QoS version 20180901.
4. Fixed ca-certification yocto recipe.
5. Added option to capture and save camera sensor images in utest-cam-imr-drm test application.
6. QSPI driver: fixed issues related to non-block aligned access (used in JFFS2), DMA support for read operations.
7. Added support camera sensors: AR0143, AR0233, 0x3A, GM4200, IMX390.

6.2 Revision 4.0 Base

1. Yocto: Updated base version to 2.4.2
2. Linux kernel: Updated version to 4.14

7. Package structure

Linux BSP for Renesas R-Car V3M/V3H package is :

- *yocto_src*: Snapshot of all Yocto layers required to build BSP from the scratch.
- *scripts*: contains script files that allow to build current release.
- *sdk*: contains Linux and Windows SDK for application development.
 - *poky-glibc-x86_64-core-image-minimal-aarch64-toolchain-2.4.2.sh* – self-extracting Linux SDK
 - *poky-glibc-x86_64-core-image-minimal-aarch64-toolchain-2.4.2.zip* – Windows SDK
- *boards*: contains an archive that includes 4 directories for Condor, Eagle, V3M Starter Kit and V3H Starter Kit. Each with:
 - Linux kernel and corresponding device tree files:
 - “Image-<revision-id>-<board name>-<build time>.bin”
 - “Image-<revision-id>-<board name + extension name if applicable>-<build time>.dtb”
 - Root filesystem tarball named
“core-image-minimal-<board name>-<buildtime>.rootfs.tar.bz2”
Note that Linux kernel image and corresponding device tree files are also located under ‘/boot’ directory.
This document is included into rootfs under ‘root’ directory.
 - Manifest file named “core-image-minimal-<board name>-<buildtime>.rootfs.manifest”
 - Firmware images including u-boot, cr7 loader, ARM Trusted Firmware, CA53 Loader, Loader (boot parameters, certification).

8. Supported elements and known issues

This chapter describes SoC IP blocks and software components supported by the current BSP version. For more details and test results please see “Yocto BSP 4.0 for Renesas R-CAR V3M and V3H SoCs. Test report”.

8.1 Supported elements

| Supported item | Description and comments |
|--|---|
| HDMI + display unit | Supported |
| PCI-E + NVME | Supported. PCI-E x2 performance issues |
| ISP (UIO driver) | Supported |
| IMP (UIO driver) – tested with CNN block | Supported |
| CAN / CANFD | Supported |
| CPU | Supported. System freeze after multiple on/off of CPU cores |
| Ethernet | Supported. V3H Ethernet performance less then 1GB/s |
| IMR v412 driver | Supported |
| IMR uio driver | Supported |
| QSPI | Supported |
| PMIC | Supported |
| Uboot | OK |
| Rootfs complexity | OK |
| Linux loading | OK |
| Kernel modules load/unload | OK |

8.2 Camera sensor support

This table contains summary of all supported cameras

| Board | Extention board | Extention function | Kernel dtb | Camera type | Max supported cameras | Tested | Notes |
|--------|-----------------|--------------------|---------------------------|---------------|-----------------------|--------|---|
| eagle | n/a | - | Image-r8a77970-eagle.dtb | imi21 / imi20 | 4 | + | |
| condor | n/a | - | Image-r8a77980-condor.dtb | imi21 / imi20 | 4 | + | |
| v3hsk | vbm v2 gmsl | - | Image-r8a77980-vbm-v2.dtb | imi21 / imi20 | 4 | + | Power 9V |
| v3hsk | vb 4ch | - | Image-r8a77980-vb-4ch.dtb | lmi23 / imi24 | 4 | + | Power 11V |
| v3hsk | vb 8ch | - | Image-r8a77980-vb-8ch.dtb | lmi23 / imi24 | 8 | + | Power 11V |
| v3hsk | vbm v3 fpdlink | - | Image-r8a77980-vbm-v3.dtb | lmi23 / imi24 | 4 | + | Power 11V |
| v3msk | vbm v2 gmsl | - | Image-r8a77970-vbm-v2.dtb | imi21 / imi20 | 4 | + | Power 9V |
| v3msk | vbm v3 fpdlink | - | Image-r8a77970-vbm-v3.dtb | imi24 | 4 | + | power 11 V 4 cameras simultaneously can cause artifacts due to lack of bandwidth |
| v3msk | vbm v3 fpdlink | - | Image-r8a77970-vbm-v3.dtb | imi23 | 4 | + | power 11 V |

8.3 Known issues

1. PCI-E + NVME – Write performance is about 370MB/s. Such value is closer to PCI-E x1 than PCI-E x2
2. Move offline issue – System freeze after multiple on/off of CPU cores.
3. V3H Ethernet performance – TCP stream receiving rate is about 700MBit/s