



DEVELOPMENT GUIDE

AMOS-820

Linux BSP v4.1.3

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Revision History

Version	Date	Remarks
1.00	03/13/2018	Initial release



Table of Contents

1. Introduction	1
1.1 BSP Package Content	1
1.1.1 Source Code Folder Contents	1
1.1.2 Firmware Folder Contents	1
1.1.3 Document Folder Contents	1
1.1.4 Tools Folder Contents	1
1.2 Version Information and Supported Features	2
2. Build Environment Setup	3
2.1 Configuring Linux Host Machine	3
3. Image Build	4
3.1 Extracting the AMOS-820 BSP	4
3.2 Upgrading the BSP patch to v4.1.3	4
3.3 Machine Configuration	4
3.4 Building a Firmware Installer	4

1. Introduction

This Development Guide explains how to set up the necessary build environment in order for users to customize the Linux kernel and create their own system image for an AMOS-820 system (Bare board: VAB-820 with NXP i.MX 6Quad Cortex-A9 processor).

The AMOS-820 Linux BSP v4.1.3 is developed based on the NXP fsl-yocto-L4.1.15_1.1.0-ga (Yocto 2.0 Jethro) and enables hardware features that are defined on the AMOS-820 system.

1.1 BSP Package Content

There are four folders in the package as listed below.

Source_code	Description
VIA_iMX_Yocto2.0_SRC_v4.1.1.tar.bz2	Source code
VIA_iMX_Yocto2.0_patch_v4.1.3.tar.gz	v4.1.3 patch file
Firmware folder	Description
VAB-820_Yocto2.0_BIN_v4.1.3.tar.gz	Yocto EVK system image and installation script files
Document folder	Description
AMOS-820_Linux_EVK_v4.1.3_Quick_Start_Guide_v1.00_20180313.pdf	Quick Start Guide
AMOS-820_Linux_BSP_v4.1.3_Development_Guide_v1.00_20180313.pdf	Development Guide
Tools folder	Description
BT_Config.zip	Bluetooth A2DP configuring file

AMOS-820 Linux BSP content

1.1.1 Source Code Folder Contents

VIA_iMX_Yocto2.0_SRC_v4.1.1.tar.bz2: A complete and static Yocto BSP including the VAB-820 meta-files and all the pre-downloaded required software packages to enable a complete offline build.

VIA_iMX_Yocto2.0_patch_4.1.3.tar.gz: A complete and static Yocto BSP patch including the updated VAB-820 meta-files to enable a complete offline build.

1.1.2 Firmware Folder Contents

VAB-820_Yocto2.0_BIN_v4.1.3.tar.gz: contains installation script files and the precompiled U-boot and image for evaluating the AMOS-820 system.

1.1.3 Document Folder Contents

AMOS-820_Linux_BSP_v4.1.3_Development_Guide_v1.00_20180213: This Development Guide explains how to set up the necessary build environment in order for users to customize the Linux kernel and create their own system image for an AMOS-820 system.

AMOS-820_Linux_EVK_v4.1.3_Quick_Start_Guide_v1.00_20180213.pdf: The Quick Start Guide provides an overview of how to boot the Android EVK system image on the AMOS-820 system and configure the supported hardware functions in the build.

1.1.4 Tools Folder Contents

BT_Config.zip: contains the Bluetooth A2DP configuring file.

1.2 Version Information and Supported Features

- U-Boot version: 2015.04
- Kernel version: 4.1.15
- Evaluation image: OpenEmbedded-core built with Yocto 2.0 Jethro
- Development based on NXP fsl-yocto-L4.1.15_1.1.0-ga (Yocto 2.0 Jethro)
- Supports SPI with eMMC or Micro SD boot (default)
- Supports HDMI display
- Supports HDMI audio output
- Supports CVBS
- Supports COM1 DTE mode, COM2 as debug port
- Supports 2 FlexCAN TX/RX
- Supports Gigabit Ethernet
- Supports Line-in, Line-out, and Mic-in
- Supports VNT9271 USB Wi-Fi dongle
- Supports EMIO-1541 miniPCle Wi-Fi module
- Supports EMIO-2531 miniPCle Wi-Fi & Bluetooth module
 - o Supports Bluetooth A2DP and SPP profile
- Supports EMIO-2550 miniPCle Mobile Broadband module
- Supports Watchdog Timer, GPIO and RTC

2. Build Environment Setup

This section guides you through setting up the build environment for development. All instructions are based on using Ubuntu 12.04 LTS and later versions.

To make sure that the build process completes successfully, we recommend at least 120GB of disk space and 15GB of combined memory and swap space on the host machine.

2.1 Configuring Linux Host Machine

The following packages are required for the Yocto development environment. The required packages can be installed using the bash script below:

```
#!/bin/bash

# Install dependant packages
$ sudo apt-get install gawk wget git-core diffstat unzip texinfo gcc-multilib build-essential chrpath socat

$ sudo apt-get install libstdc++6-dev xterm sed cvs subversion coreutils texi2html docbook-utils python-pysqlite2 help2man make gcc g++ desktop-file-utils libgl1-mesa-dev libglul-mesa-dev mercurial autoconf automake groff curl lzop asciidocw
```

The tool to create images for use with the U-Boot boot loader, “mkimage”, is provided by different packages in Ubuntu 12.04 and in newer Ubuntu releases.

On the Ubuntu 12.04 install the code/text as below:

```
$ sudo apt-get install u-boot-tools
```

On the Ubuntu 14.04 and newer versions install the code/text as below:

```
$ sudo apt-get install uboot-mkimage
```

3. Image Build

The section explains how to use the source code to build and update the u-boot and image to the firmware installer on the AMOS-820 system.

3.1 Extracting the AMOS-820 BSP

Use the following command to extract the contents of the base BSP folder.

```
$ tar xvf VIA_iMX_Yocto2.0_SRC_v4.1.1.tar.bz2
```

3.2 Upgrading the BSP patch to v4.1.3

First, remove the **via-release-bsp/sources** folder, next extract the BSP patch **VIA_iMX_Yocto2.0_patch_4.1.3.tar.gz**, then finally patch the BSP into the **/via-release-bsp/** folder.

```
$ rm -rf via-release-bsp/sources/
$ tar xvf VIA_iMX_Yocto2.0_patch_4.1.3.tar.gz -C ./via-release-bsp
```

3.3 Machine Configuration

The **via-setup-release.sh** script creates the build directory with the Yocto configuration files for your target machine.

This script has the following optional parameter:

- **-b**: set the name of the build directory. For example “-b build-vab820” in the command below.

```
$ cd via-release-bsp
$ MACHINE=imx6qvab820 source via-setup-release.sh -b build-vab820
```

3.4 Building a Firmware Installer

This BSP provides the “via-image-gui” Yocto image as default. Use the “bitbake” command to create the U-boot and image file.

```
$ via-release-bsp/build-vab820$ bitbake via-image-gui
```

After the compilation, the **via-release-bsp/build-vab820/tmp/deploy/images/imx6qvab820/FirmwareInstall/image**, directory will contain the resulting binaries, as shown in the table below.

Binary	Description
u-boot.bin	U-Boot boot loader
rootfs.tgz	Root file system
boot/ imx6q-vab820.dtb	device tree
boot/ zImage	Kernel image

Binary files generated by bitbake

Extract EVK/ VAB820_Yocto2.0_BIN_v4.1.3.tar.gz file.

Next to copy the new image folder to /sd_installer to replace the original image folder in order to update Firmware Installer.



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