FSL Community BSP Release Notes Documentation

Release 1.7 (Draft document)

FSL Community BSP Team

October 28, 2014

This document has the release notes of the FSL Community BSP 1.7 (Draft document) which is a community effort to improve Freescale's SoCs support in the OpenEmbedded and Yocto Project projects.

> **Warning:** This document is still in **draft** stage and *shouldn't be considered finished*. In case you wish to contribute with suggestions, fixes or comments please get in touch through the meta-freescale mailing list.

If you want to make part of FSL Community BSP access http://freescale.github.io and find links to this document, how to contribute, and how to download both the source code and several pre-built images.

CHAPTER

ONE

WHAT IS THE FSL COMMUNITY BSP

The FSL Community BSP is a community-driven project to provide and maintain Board Support Package (BSP) metadata layers for use in the OpenEmbedded and Yocto Project projects with Freescale's SoCs.

The FSL Community BSP follows the same Yocto Project's *release schedule* and the *branch naming*, since release 1.3 (denzil).

See the Yocto Project Release for details on the Yocto Project.

1.1 Motivation

The FSL Community BSP started with the goal of making the use of OpenEmbeedded and Yocto Project projects, with Freescale's SoCs, easier and providing an example of how to assemble an easy-to-use platform to base products on.

The project provides:

- common environment configuration;
- download several layers with repo;
- common place; for discussion regarding Freescale SoCs (kernels, bootloaders, user space packages (BSP in general), bugs, how-tos, and so on.

1.2 What the FSL Community BSP is not

The FSL Community BSP does not have a professional support team. The members of this community have full-time jobs and work on the project on spare time. Most of them are working with Freescale SoCs in their full-time job, it means most of them can provide a professional support if requested.

The provided source code is not supposed to have production quality. It is a reference BSP and platform for people to build products on top of it. Because of that, expect to have an adjustment cycle for your product when you decide to use it as a reference for your next product.

The project is a community-driven work and it is NOT an official Freescale support channel.

1.3 What you can expect

- You can expect help when you post a question, but please, be patient. Wait for at least 2 days until thinking nobody cares about your problem. Most of time people do reply when they know the answer, or try to provide advice. In case you are ignored, probably nobody knows the answer;
- The stable branch is supported for six months after the release date (following the Yocto Project's release schedule);
- The upstreaming takes place as fast as possible and any needed adjustment is going to be made accordingly.

1.4 What the community expects from you

The community does expect that you contribute back by:

- replying when you know the answer for a question in the mailing list;
- reviewing the patches sent to mailing list;
- testing new patches that affect you directly or indirectly;
- reporting bugs you may find;
- upstreaming bug fixes;
- upstreaming features that may be good for community.

CHAPTER

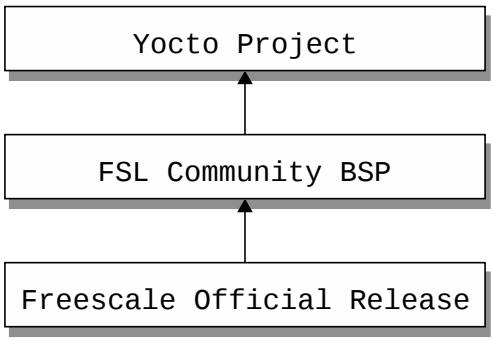
TWO

UPSTREAM

The FSL Community BSP provides a BSP, test images, and demos for Freescale reference boards and 3rd party boards based on Freescale's SoCs. Besides the BSP, a Linux-based operating system has several other packages such as ssh client/server, window managers, applications, and so on. These packages are not part of the BSP, in other words, when using FSL Community BSP we are also using applications, tools and metadata from other projects such as OpenEmbedded and Poky.

The FSL Community BSP always has a stable and a development version. You may face errors that are not caused by FSL Community BSP's layers, but by the OpenEmbedded's or Poky's metadata. In this case, the error must be fixed in the layer it belongs.

The following image shows the upstream levels:



2.1 Main branch names

- master-next: this branch is used to keep the patches to be built by the autobuilder for the very first built test. Do not expect to have a clear merging schedule, or to have a stable project;
- master: this is the branch where development takes place. Any new feature or bug fix must be merged here first. This is the development of the next stable branch;
- dizzy: the latest stable branch. This branch only accepts bug fixes, and is supported for 6 months after the release date.

There are other branches which are the previous stable branches. They are kept online for users' convenience, and you cannot expect backports or bug fixes.

2.2 Upstreaming cycle

Additionally to the normal upstreaming process when working with any Yocto Project's layer, we have the BSP upstreaming cycle.

The BSP upstreaming cycle starts just after a Freescale Official Release is published in git.freescale.com. The patches to adapt the recipes from **meta-fsl-bsp-release** are sent for review and comments to the **meta-freescale** mailing list and are merged in the **meta-fsl-arm**, **meta-fsl-demos** layers or upstreamed to Yocto Project accordingly.

A more detailed step-by-step is shown below:

1. New Freescale Official Release is published;
2. The patches are sent to **meta-freescale**;
3. After the review process, the patches are merged in the proper layer's *master-next* branch;
4. Source code is built by the autobuilder;
5. After one week in *master-next*, it is merged in *master*;
6. Freescale internally bases the next Freescale Official Release in community source code;
7. Back to step 1.

It means Freescale uses the FSL Community BSP source code with its bug fixes, improvements, and any new features to create the *next* Freescale Official Release.

Freescale uses the latest stable branch from Yocto Project to base the *next* Freescale Official Release. When this release is published, it is rebased and reworked to be merged in the current development branch.

CHAPTER

THREE

THE DIFFERENCES BETWEEN FSL COMMUNITY BSP AND FREESCALE OFFICIAL RELEASE

The goal of both projects are different. See below the main points of divergence.

3.1 Freescale Official Release

The Freescale Official Release is intended to provide a static base for Freescale to test and validate the BSP modules in the Freescale evaluation boards and it is developed internally by Freescale. The set of supported boards vary from release to release and is listed in the Freescale Official Release‘s release notes for the respective version. The release points to a static revision of every included layer so, after release it does not receive updates and bug fixes.

3.2 FSL Community BSP

The FSL Community BSP is a reference system that can be used as a base for products and is an open project that accepts contributions from the community. It supports a wide range of boards which goes from Freescale evaluation boards (**meta-fsl-arm** layer) to 3rd party boards (**meta-fsl-arm-extra**). The release is a “*moving target*”, so there are updates on top of the released source code, such as addition of new features and of bug fixes.

Table 3.1: Comparative between Freescale Official Release and FSL Community BSP

	Freescale Official Release	FSL Community BSP
Intended use	Reference system for BSP modules test and validation on Freescale Reference Boards	Reference system for use as base for any project for all supported boards
Code	Static. Only include any bug fixes on the upcoming release	Updates. Receives bug fixes and has security issues fixed often
Contribution	Indirect contribution via FSL Community BSP. After revision, contribution may be merged in upcoming release	Open, everyone is welcome to contribute to the project
Board Support	Limited, as it supports just the Freescale evaluation boards listed in the Release Notes	Extended, as it supports both Freescale evaluation boards and 3rd party boards. See *Supported Board List*
Yocto Project Compatible	No	Yes
Support	i.MX Community	meta-freescale
Repository	git.freescale.com	github.com/Freescale

CHAPTER

FOUR

SCOPE

4.1 FSL Community BSP Scope

The scope of the FSL Community BSP includes the meta layers:

- meta-fsl-arm: provides the base support and Freescale ARM reference boards;
- meta-fsl-arm-extra: provides support for 3rd party and partner boards;
- meta-fsl-demos: provides images recipes, demo recipes, and packagegroups used to easy the development with Yocto Project.
- Documentation provides the source code for FSL Community BSP Release Notes (RN), User Guide (UG) and Frequently Asked Questions (FAQ)

4.2 Kernel Release Notes

The FSL Community BSP includes support for several kernel providers. Each machine may have a different Linux Kernel provider.

For the **linux-imx** provider, Freescale has a release notes document for each version released. This document has a list of known issues, new features, list of kernel arguments, and the linux-imx kernel scope for each Freescale Reference Board. This document is present into the Document Bundle provided by Freescale.

See the respective Linux Kernel provider for your machine in section *Linux Kernel*

4.3 Different Product SoC Families

Currently, the FSL Community BSP includes the following Product SoC Families:

- **i.MX Application Processors (imx)**: Regarding the i.MX Freescale Page: *i.MX applications processors are multicore ARM®-based solutions for multimedia and display applications with scalability, high performance, and low power capabilities.*
- **Vybrid Controller Solutions based on ARM® Cores (vybrid)**: Regarding the Vybrid Freescale Page: *Vybrid controller solutions are built on an asymmetrical-multiprocessing architecture using ARM® cores as the anchor for the platform, and are ideal for many industrial applications.*
- **Layerscape Architecture (ls)**: Regarding the Layerscape Freescale Page: *delivers unprecedented efficiency and scale for the smarter, more capable networks of tomorrow.*

Freescale groups a set of SoCs which target different markets in product families. Those are grouped according to their SoC features and internal hardware capabilities.

The Yocto Project's tools have the required capabilities to differentiate the architectures and BSP components for the different SoC families. In this perspective, the FSL Community BSP can support a wide range of architectures and product lines which go across several markets.

For the FSL Community BSP, the different SoCs, from all product lines manufactured by Freescale, can be seen as different machines, thus easing the use of same architecture across different markets.

4.4 Supported Board List

Please, see the next table for the complete supported board list.

Table 4.1: Supported machines in FSL Community BSP

Machine	Name	SoC	Layer
cfa10036	Crystalfontz CFA-10036	i.MX28	meta-fsl-arm-extra
cfa10037	Crystalfontz CFA-10037	i.MX28	meta-fsl-arm-extra
cfa10049	Crystalfontz CFA-10049	i.MX28	meta-fsl-arm-extra
cfa10055	Crystalfontz CFA-10055	i.MX28	meta-fsl-arm-extra
cfa10056	Crystalfontz CFA-10056	i.MX28	meta-fsl-arm-extra
cfa10057	Crystalfontz CFA-10057	i.MX28	meta-fsl-arm-extra
cfa10058	Crystalfontz CFA-10058	i.MX28	meta-fsl-arm-extra
cgtqmx6	Congatec Qmx6	i.MX6Q	meta-fsl-arm-extra
cubox-i	SolidRun CuBox-i and HummingBoard	i.MX6 Q/DL	meta-fsl-arm-extra
imx233-olinuxino-maxi	OLIMEX iMX233-OLinuXino-Maxi	i.MX23	meta-fsl-arm-extra
imx233-olinuxino-micro	OLIMEX iMX233-OLinuXino-Micro	i.MX23	meta-fsl-arm-extra
imx233-olinuxino-mini	OLIMEX iMX233-OLinuXino-Mini	i.MX23	meta-fsl-arm-extra
imx233-olinuxino-nano	OLIMEX iMX233-OLinuXino-Nano	i.MX23	meta-fsl-arm-extra
imx23evk	Freescale i.MX23 Evaluation Kit	i.MX23	meta-fsl-arm
imx28evk	Freescale i.MX28 Evaluation Kit	i.MX28	meta-fsl-arm
imx31pdk	Freescale i.MX31 Platform Development Kit	i.MX31	meta-fsl-arm
imx35pdk	Freescale i.MX35 Platform Development Kit	i.MX35	meta-fsl-arm
imx51evk	Freescale i.MX51 Evaluation Kit	i.MX51	meta-fsl-arm
imx53ard	Freescale i.MX53 SABRE Automotive Board	i.MX53	meta-fsl-arm
imx53qsb	Freescale i.MX53 Quick Start Board	i.MX53	meta-fsl-arm

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Table 4.1 – continued from previous page

Machine	Name	SoC	Layer
imx6dl-riotboard	RIoTboard	i.MX6S	meta-fsl-arm-extra
imx6dlsabreauto	Freescale i.MX6DL SABRE Automotive	i.MX6DL	meta-fsl-arm
imx6dlsabresd	Freescale i.MX6DL SABRE Smart Device	i.MX6DL	meta-fsl-arm
imx6qsabreauto	Freescale i.MX6Q SABRE Automotive	i.MX6Q	meta-fsl-arm
imx6qsabrelite	Boundary Devices i.MX6Q SABRE Lite	i.MX6Q	meta-fsl-arm-extra
imx6qsabresd	Freescale i.MX6Q SABRE Smart Device	i.MX6Q	meta-fsl-arm
imx6slevk	Freescale i.MX6SL Evaluation Kit	i.MX6SL	meta-fsl-arm
imx6solosabreauto	Freescale i.MX6Solo SABRE Automotive	i.MX6S	meta-fsl-arm
imx6solosabresd	Freescale i.MX6Solo SABRE Smart Device	i.MX6S	meta-fsl-arm
ls1021aqds	Freescale LS1021AQDS board	ls102xa	meta-fsl-arm
ls1021atwr	Freescale LS1021ATWR board	ls102xa	meta-fsl-arm
m28evk	DENX M28 SoM Evaluation Kit	i.MX28	meta-fsl-arm-extra
m53evk	DENX M53 SoM Evaluation Kit	i.MX53	meta-fsl-arm-extra
nitrogen6x	Boundary Devices Nitrogen6X	i.MX6Q	meta-fsl-arm-extra
nitrogen6x-lite	Boundary Devices Nitrogen6X Lite	i.MX6 Solo	meta-fsl-arm-extra
pcl052	Phytec Cosmic Vybrid Development Kit	vf60	meta-fsl-arm-extra
pcm052	Phytec phyCORE Vybrid Development Kit	vf60	meta-fsl-arm-extra
quartz	Device Solutions Quartz Vybrid Development Kit	vf60	meta-fsl-arm-extra
twr-vf65gs10	Freescale Vybrid TWR-VF65GS10	vf60	meta-fsl-arm
wandboard-dual	Wandboard i.MX6 Wandboard Duallite	i.MX6DL	meta-fsl-arm-extra
wandboard-quad	Wandboard i.MX6 Wandboard Quad	i.MX6Q	meta-fsl-arm-extra
wandboard-solo	Wandboard i.MX6 Wandboard Solo	i.MX6S	meta-fsl-arm-extra

CHAPTER

FIVE

MACHINE MAINTAINERS

Since FSL Community BSP Release 1.6 (Daisy), the maintainer field in machine configuration files of **meta-fsl-arm** and **meta-fsl-arm-extra** is mandatory for any new board to be added.

So now on, every new board must have someone assigned as maintainer. This ensures, in long term, all boards with a maintainer assigned. Current orphan boards are not going to be removed unless it causes maintenance problem and the fix is not straightforward.

The maintainer duties:

- The one with casting vote when a deadlock is faced.
- Responsible to keep that machine working (that means, booting and with some stability)
- Keep kernel, u-boot updated/tested/working.
- Keep release notes updated
- Keep test cycle updated
- Keep the most usual images building and booting

When a build error is detected, the maintainer will "fix" it. For those maintainers with kernel control (meta-fsl-arm-extra), it is expected that they properly fix the kernel issue (when it's a kernel issue). However, anything out of community control should be worked around anyway.

5.1 Machines with maintainers

Table 5.1: Machines with maintainers

Machine	Name
cfa10036	Crystalfontz CFA-10036
cfa10037	Crystalfontz CFA-10037
cfa10049	Crystalfontz CFA-10049
cfa10055	Crystalfontz CFA-10055
cfa10056	Crystalfontz CFA-10056
cfa10057	Crystalfontz CFA-10057
cfa10058	Crystalfontz CFA-10058
cgtqmx6	Congatec Qmx6
cubox-i	SolidRun CuBox-i and HummingBoard
imx23evk	Freescale i.MX23 Evaluation Kit

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Table 5.1 – continued from previous page

Machine	Name
imx28evk	Freescale i.MX28 Evaluation Kit
imx51evk	Freescale i.MX51 Evaluation Kit
imx53ard	Freescale i.MX53 SABRE Automotive Board
imx53qsb	Freescale i.MX53 Quick Start Board
imx6dl-riotboard	RIoTboard
imx6dlsabreauto	Freescale i.MX6DL SABRE Automotive
imx6dlsabresd	Freescale i.MX6DL SABRE Smart Device
imx6qsabreauto	Freescale i.MX6Q SABRE Automotive
imx6qsabrelite	Boundary Devices i.MX6Q SABRE Lite
imx6qsabresd	Freescale i.MX6Q SABRE Smart Device
imx6slevk	Freescale i.MX6SL Evaluation Kit
imx6solosabresd	Freescale i.MX6Solo SABRE Smart Device
ls1021aqds	Freescale LS1021AQDS board
ls1021atwr	Freescale LS1021ATWR board
nitrogen6x	Boundary Devices Nitrogen6X
nitrogen6x-lite	Boundary Devices Nitrogen6X Lite
pcl052	Phytec Cosmic Vybrid Development Kit
pcm052	Phytec phyCORE Vybrid Development Kit
quartz	Device Solutions Quartz Vybrid Development Kit
twr-vf65gs10	Freescale Vybrid TWR-VF65GS10

5.2 Machines without a maintainer

Table 5.2: Machines without a maintainer

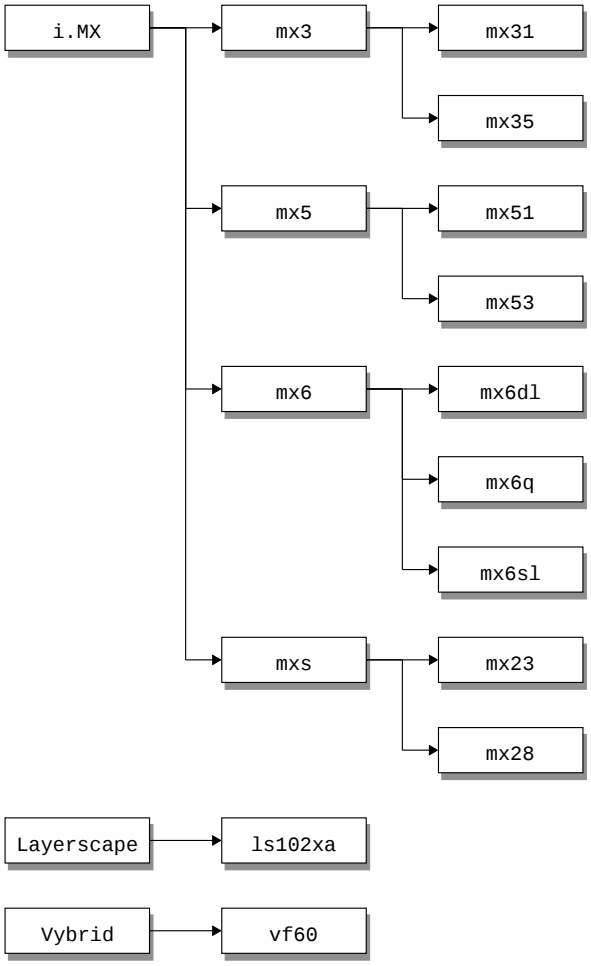
Machine	Name
imx233-olinuxino-maxi	OLIMEX iMX233-OLinuXino-Maxi
imx233-olinuxino-micro	OLIMEX iMX233-OLinuXino-Micro
imx233-olinuxino-mini	OLIMEX iMX233-OLinuXino-Mini
imx233-olinuxino-nano	OLIMEX iMX233-OLinuXino-Nano
imx31pdk	Freescale i.MX31 Platform Development Kit
imx35pdk	Freescale i.MX35 Platform Development Kit
imx6solosabreauto	Freescale i.MX6Solo SABRE Automotive
m28evk	DENX M28 SoM Evaluation Kit
m53evk	DENX M53 SoM Evaluation Kit
wandboard-dual	Wandboard i.MX6 Wandboard Duallite
wandboard-quad	Wandboard i.MX6 Wandboard Quad
wandboard-solo	Wandboard i.MX6 Wandboard Solo

CHAPTER

SIX

SOC HIERARCHY

The following tree shows the SoC hierarchy:



CHAPTER

SEVEN

LINUX KERNEL

FSL Community BSP supports the following sources for Linux Kernel:

- **linux-boundary**: Linux kernel for Boundary Devices boards.
- **linux-cfa**: Linux kernel for Crystalfontz boards.
- **linux-congatec**: linux-congatec version 3.10.17-r0.
- **linux-cubox-i**: Linux kernel that is based on Linaro's 3.14 releases, with full support for the i.MX6 features.
- **linux-denx**: DENX mainline based Linux kernel.
- **linux-fslc**: Linux kernel based on mainline kernel used by FSL Community BSP in order to provide support for some backported features and fixes, or because it was applied in linux-next and takes some time to become part of a stable version, or because it is not applicable for upstreaming.
- **linux-imx**: Linux Kernel provided and supported by Freescale with focus on i.MX Family Reference Boards. It includes support for many IPs such as GPU, VPU and IPU.
- **linux-ls1**: Linux Kernel provided and supported by Freescale with focus on Layerscape1 Family Boards.
- **linux-timesys**: Linux Kernel with added drivers and board support for Vybrid-based platforms.
- **linux-wandboard**: Linux kernel for Wandboard.

7.1 Default Linux Providers

The following table shows the default version of Linux Kernel provided by FSL Community BSP for each supported machine.

Table 7.1: Default Linux kernel version for each supported machine

Board	Kernel Provider	Kernel Version
cfa10036	linux-cfa	3.12
cfa10037	linux-cfa	3.12
cfa10049	linux-cfa	3.12
cfa10055	linux-cfa	3.12

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Table 7.1 – continued from previous page

Board	Kernel Provider	Kernel Version
cfa10056	linux-cfa	3.12
cfa10057	linux-cfa	3.12
cfa10058	linux-cfa	3.12
cgtqmx6	linux-congatec	3.10.17
cubox-i	linux-cubox-i	3.14.14
imx233-olinuxino-maxi	linux-fslc	3.17+git
imx233-olinuxino-micro	linux-fslc	3.17+git
imx233-olinuxino-mini	linux-fslc	3.17+git
imx233-olinuxino-nano	linux-fslc	3.17+git
imx23evk	linux-fslc	3.17+git
imx28evk	linux-imx	2.6.35.3
imx31pdk	linux-fslc	3.17+git
imx35pdk	linux-fslc	3.17+git
imx51evk	linux-imx	2.6.35.3
imx53ard	linux-imx	2.6.35.3
imx53qsb	linux-imx	2.6.35.3
imx6dl-riotboard	linux-fslc	3.17+git
imx6dlsabreauto	linux-imx	3.10.17
imx6dlsabresd	linux-imx	3.10.17
imx6qsabreauto	linux-imx	3.10.17
imx6qsabrelite	linux-boundary	3.10.17
imx6qsabresd	linux-imx	3.10.17
imx6slevk	linux-imx	3.10.17
imx6solosabreauto	linux-imx	3.10.17
imx6solosabresd	linux-imx	3.10.17
ls1021aqds	linux-ls1	3.12
ls1021atwr	linux-ls1	3.12
m28evk	linux-fslc	3.17+git
m53evk	linux-denx	3.9
nitrogen6x	linux-boundary	3.10.17
nitrogen6x-lite	linux-boundary	3.10.17
pcl052	linux-timesys	3.0.15
pcm052	linux-timesys	3.0.15
quartz	linux-timesys	3.0.15
twr-vf65gs10	linux-timesys	3.0.15
wandboard-dual	linux-wandboard	3.10.17
wandboard-quad	linux-wandboard	3.10.17
wandboard-solo	linux-wandboard	3.10.17

CHAPTER

EIGHT

BOOTLOADERS

FSL Community BSP supports barebox and u-boot as bootloaders.

- **barebox**: Barebox - a bootloader that inherits the best of U-Boot and the Linux kernel
- **u-boot-boundary**: Universal Boot Loader for embedded devices.
- **u-boot-congatec**: Universal Boot Loader for embedded devices.
- **u-boot-cubox-i**: Universal Boot Loader for embedded devices.
- **u-boot-fslc**: U-boot bootloader for Freescale ARM platforms
- **u-boot-imx**: bootloader for imx platforms
- **u-boot-ls1**: Universal Boot Loader for embedded devices.
- **u-boot-timesys**: bootloader for Vybrid platforms

The following table shows the default bootloaders (and their versions) for the supported boards.

Table 8.1: Default bootloader version for each supported machine

Board	Bootloader	Bootloader version
cfa10036	barebox	2013.08.0
cfa10037	barebox	2013.08.0
cfa10049	barebox	2013.08.0
cfa10055	barebox	2013.08.0
cfa10056	barebox	2013.08.0
cfa10057	barebox	2013.08.0
cfa10058	barebox	2013.08.0
cgtqmx6	u-boot-congatec	2013.04
cubox-i	u-boot-cubox-i	v2013.10+git
imx233-olinuxino-maxi	u-boot-fslc	v2014.10+git
imx233-olinuxino-micro	u-boot-fslc	v2014.10+git
imx233-olinuxino-mini	u-boot-fslc	v2014.10+git
imx233-olinuxino-nano	u-boot-fslc	v2014.10+git
imx23evk	u-boot-fslc	v2014.10+git
imx28evk	u-boot-fslc	v2014.10+git
imx31pdk	u-boot-fslc	v2014.10+git
imx35pdk	u-boot-fslc	v2014.10+git
imx51evk	u-boot-fslc	v2014.10+git

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Table 8.1 – continued from previous page

Board	Bootloader	Bootloader version
imx53ard	u-boot-fslc	v2014.10+git
imx53qsb	u-boot-fslc	v2014.10+git
imx6dl-riotboard	u-boot-fslc	v2014.10+git
imx6dlsabreauto	u-boot-fslc	v2014.10+git
imx6dlsabresd	u-boot-fslc	v2014.10+git
imx6qsabreauto	u-boot-fslc	v2014.10+git
imx6qsabrelite	u-boot-boundary	v2014.07+git
imx6qsabresd	u-boot-fslc	v2014.10+git
imx6slevk	u-boot-fslc	v2014.10+git
imx6solosabreauto	u-boot-imx	2013.04
imx6solosabresd	u-boot-imx	2013.04
ls1021aqds	u-boot-ls1	2013.10
ls1021atwr	u-boot-ls1	2013.10
m28evk	u-boot-fslc	v2014.10+git
m53evk	u-boot-fslc	v2014.10+git
nitrogen6x	u-boot-boundary	v2014.07+git
nitrogen6x-lite	u-boot-boundary	v2014.07+git
pcl052	u-boot-timesys	v2011.12
pcm052	u-boot-timesys	v2011.12
quartz	u-boot-timesys	v2011.12
twr-vf65gs10	u-boot-fslc	v2014.10+git
wandboard-dual	u-boot-fslc	v2014.10+git
wandboard-quad	u-boot-fslc	v2014.10+git
wandboard-solo	u-boot-fslc	v2014.10+git

CHAPTER

NINE

USER SPACE PACKAGES

There is a huge number of user space packages provided by the Yocto Project. The following table shows some version for few highlighted packages.

Table 9.1: Main user space package versions

Package	Board/SoC Family	Version
gstreamer	All	0.10.36
gstreamer1.0	All	1.4.1
libdrm	All	2.4.54
udev	All	182

CHAPTER

TEN

FREESCALE USER SPACE PACKAGES

This section shows the version package for each board. Those packages provide hardware acceleration for GPU or VPU, hardware optimization or some hardware test tools.

- **Hardware acceleration** is achieved using a different core for processing some specific task. In this case, GPU or VPU.
- **Hardware optimization** is achieved with some changes in source code in order to get a better performance for a specific task on a specific hardware. For example, audio decode made by software, but with optimizations for ARM.
- **Hardware-specific** is applicable when the package was designed to be executed on a specific hardware, and it does not make sense on other hardware. For example, imx-test is a test package for imx boards. It can be cross-compiled for any other core, although it will only behave as expect if executed on imx boards.

The package version and variety varies on *SoC Hierarchy*. For example, machines with i.MX28 SoC does not have VPU, the recipe imx-vpu is not needed. There are differences, as well, in GPU support recipes.

10.1 Version by *SoC Hierarchy*

The following table shows the version of each package depending on the *SoC Hierarchy*.

Table 10.1: User space package version by SoC hierarchy

Package name	ls102xa	mx28	mx5	mx6q / mx6dl	mx6sl	vf60
amd-gpu-bin-mx51	–	–	11.09.01	–	–	–
amd-gpu-x11-bin-mx51	–	–	11.09.01	–	–	–
directfb	1.7.4	1.7.4	1.7.4	1.6.3	1.6.3	1.7.4
directfb-examples	1.7.0	1.7.0	1.7.0	1.6.0	1.6.0	1.7.0
firmware-imx	–	–	3.0.35-4.0.0	3.10.17-1.0.0	3.10.17-1.0.0	–
fsl-alsa-plugins	–	–	–	1.0.25	1.0.25	–
gpu-viv-bin-mx6q	–	–	–	3.10.17-1.0.1-hfp	3.10.17-1.0.1-hfp	–
gpu-viv-g2d	–	–	–	3.10.17-1.0.0	3.10.17-1.0.0	–
gst-fsl-plugin	–	3.0.11	3.0.11	3.0.11	3.0.11	–
gstreamer1.0-plugins-imx	–	–	–	0.9.9	–	–
imx-lib	–	–	11.09.02	3.10.17-1.0.0	3.10.17-1.0.0	–
imx-test	00.00.00	00.00.00	3.10.17-1.0.0	3.10.17-1.0.0	3.10.17-1.0.0	00.00.00
imx-uuc	0.5	0.5	0.5	0.5	0.5	0.5
imx-vpu	–	–	11.09.02	3.10.17-1.0.0	3.10.17-1.0.0	–
libfslcodec	–	4.0.1	4.0.1	4.0.1	4.0.1	–
libfslparser	–	4.0.1	4.0.1	4.0.1	4.0.1	–
libfslvpuwrap	–	–	–	1.0.46	–	–
libmcc	–	–	–	–	–	1.05
libz160	–	–	11.09.01	–	–	–
mqxboot	–	–	–	–	–	1.0
mxsldr	0.0.0+git	0.0.0+git	0.0.0+git	0.0.0+git	0.0.0+git	0.0.0+git
xf86-video-imxfb	–	–	11.09.01	–	–	–
xf86-video-imxfb-vivante	–	–	–	3.10.17-1.0.1	3.10.17-1.0.1	–

10.2 Hardware relation by *SoC Hierarchy*

The following table shows how packages interact with hardware depending on the *SoC Hierarchy*

Table 10.2: Hardware dependant packages

Package Name	mx28	mx5	mx6	vf60
imx-test	HW-specific	HW-specific	HW-specific	–
gst-fsl-plugin	HW-specific	HW-specific	HW-specific	–
libfslcodec	HW optimization	HW acceleration	HW acceleration	–
libfslparser	HW optimization	HW optimization	HW optimization	–
imx-vpu	–	HW acceleration	HW acceleration	–
imx-lib	–	HW acceleration	HW acceleration	–
firmware-imx	–	HW-specific	HW-specific	–
mxsldr	HW-specific	–	–	–
gpu-viv-g2d	–	–	HW acceleration	–
xf86-video-imxfb-vivante	–	–	HW acceleration	–
gpu-viv-bin-mx6q	–	–	HW acceleration	–
directfb	–	–	HW acceleration	–
directfb-examples	–	–	HW acceleration	–
xf86-video-imxfb	–	HW acceleration	–	–
amd-gpu-bin-mx51	–	HW acceleration	–	–
libz160	–	HW acceleration	–	–
amd-gpu-x11-bin-mx51	–	HW acceleration	–	–
libfslvpuwrap	–	–	HW acceleration	–
fsl-alsa-plugins	–	–	HW-specific	–
gstreamer1.0-plugins-imx	–	–	HW acceleration	–
imx-uuc	HW-specific	HW-specific	HW-specific	–
libmcc	–	–	–	
mqxboot	–	–	–	HW-specific

CHAPTER

ELEVEN

PACKAGEGROUPS AND IMAGES

The FSL Community BSP provides a list of PACKAGEGROUPS and images intended to ease the initial development of custom applications.

The main goal is not to provide a production solution, on the contrary, it should be seen as an example of package set for a specific IP development, and an example of initial generic development and test images.

11.1 PACKAGEGROUPS

The following list shows the current PACKAGEGROUPs available in Dizzy when using FSL Community BSP.

You can understand what a PACKAGEGROUPS is and learn how to use it in Yocto Project Development Manual

- **packagegroup-fsl-gstreamer**: Freescale's package group which provides audio, video, and debug gstreamer's plugins with the required hardware acceleration (if supported by the SoC).
- **packagegroup-fsl-gstreamer-full**: Freescale's package group which provides audio, video, and debug gstreamer's plugins (including good and bad ones) with the required hardware acceleration (if supported by the SoC).
- **packagegroup-fsl-mfgtool**: Freescale Manufacturing Tool requirements.
- **packagegroup-fsl-tools-benchmark**: Freescale's package group which provides a set of benchmark applications.
- **packagegroup-fsl-tools-gpu**: Freescale's package group used to add the packages which provides GPU support.
- **packagegroup-fsl-tools-gpu-external**: Freescale's package group which provides graphic packages used to test the several hardware accelerated graphics APIs including packages not provided by Freescale.
- **packagegroup-fsl-tools-testapps**: Freescale's package group provides a set of packages and utilities for hardware test.
- **packagegroup-fslc-gstreamer1.0**: Freescale package group which provides audio, video, networking and debug GStreamer plugins with the required hardware acceleration (if supported by the SoC).

- **packagegroup-fslc-gstreamer1.0-full**: Freescale package group which provides all GStreamer plugins from the base, good, and bad packages, as well as the ugly and libav ones if commercial packages are whitelisted, and plugins for the required hardware acceleration (if supported by the SoC).

11.2 Images

The following images are provided by FSL Community BSP only. See the list of Yocto Project's reference images in Yocto Project Reference Manual

- **fsl-image-machine-test**: A console-only image that includes gstreamer packages, Freescale's multimedia packages (VPU and GPU) when available, and test and benchmark applications.
- **fsl-image-mfgtool-initramfs**: Small image to be used with Manufacturing Tool (mfgtool) in a production environment.
- **fsl-image-multimedia**: A console-only image that includes gstreamer packages and Freescale's multimedia packages (VPU and GPU) when available for the specific machine.
- **fsl-image-multimedia-full**: A console-only image that includes gstreamer packages and Freescale's multimedia packages (VPU and GPU) when available for the specific machine.
- **qt-in-use-image**: qt-in-use-image version 1.0-r0.
- **qte-in-use-image**: qte-in-use-image version 1.0-r0.

CHAPTER

TWELVE

TEST RESULTS

Freescale has a complete test cycle for the BSP released. It includes tests for Linux Kernel for the GPU package and for the VPU package (and all other package needed by the BSP, such as imx-lib).

The results and known issues, from Linux Kernel, GPU and VPU packages can be found in the Freescale Release Notes (Download tab of freescale.com/imx).

For boards from meta-fsl-arm-extra, the test cycle is performed by each mantainer.

CHAPTER

THIRTEEN

ACKNOWLEDGEMENTS

The FSL BSP Community is a community effort of keeping and mantaining a Freescale boards/chips layer for the Yocto Project.

13.1 Dizzy Source Code

The statistics can be seen at the FSL Community BSP website. It has not been included here as it changes every time bug fixes are included during the maintenance cycle of the release and it would be outdated most of time.

CHAPTER

FOURTEEN

KNOWN ISSUES

The list of known issues for the FSL Community BSP can be seen at the following URL:

https://bugzilla.yoctoproject.org/buglist.cgi?quicksearch=meta-fsl-arm

It has not been included here as it changes every time bug fixes are included during the maintenance cycle of the release and it would be outdated most of time.