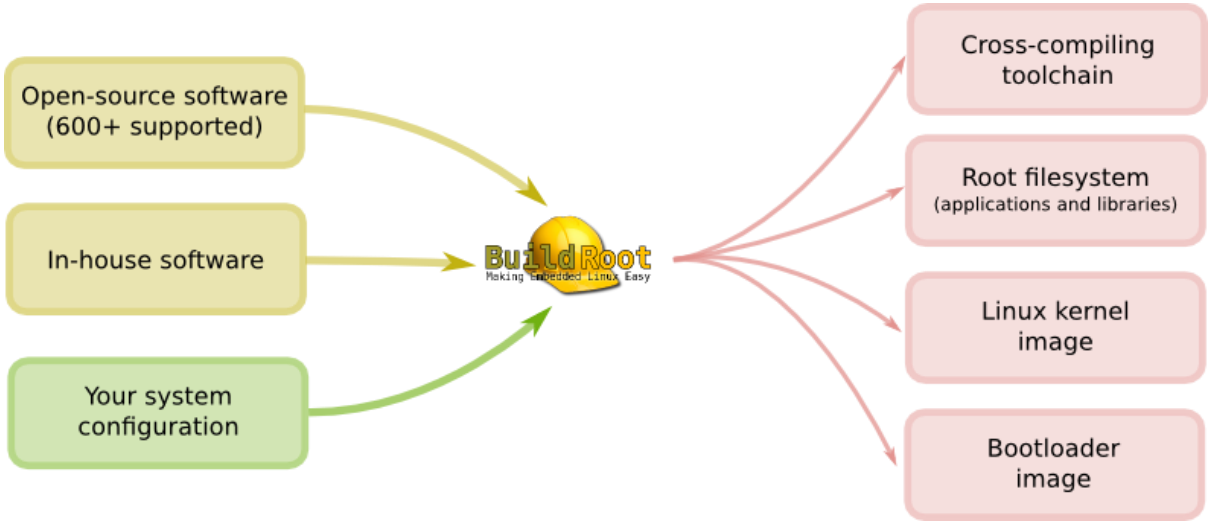
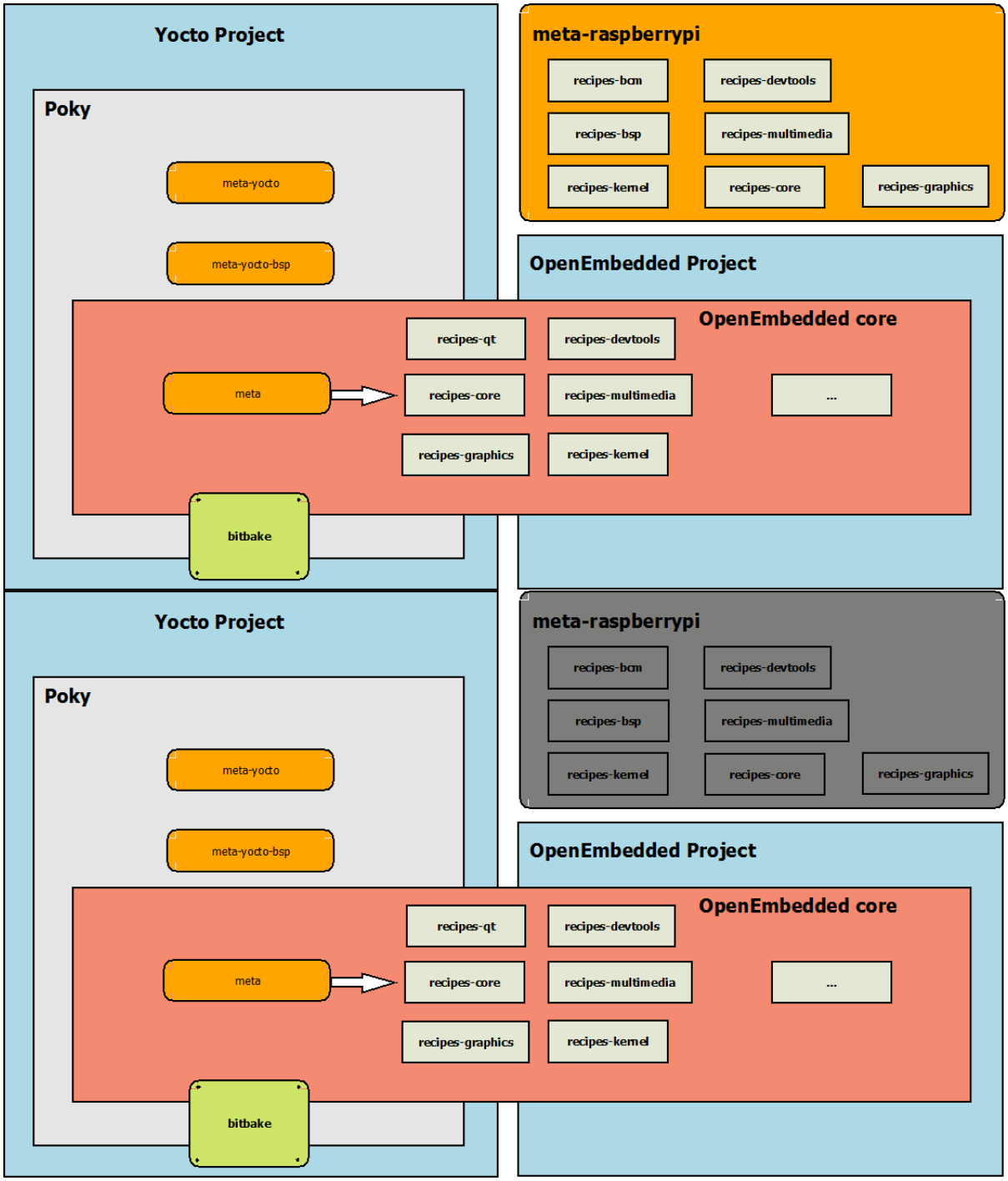
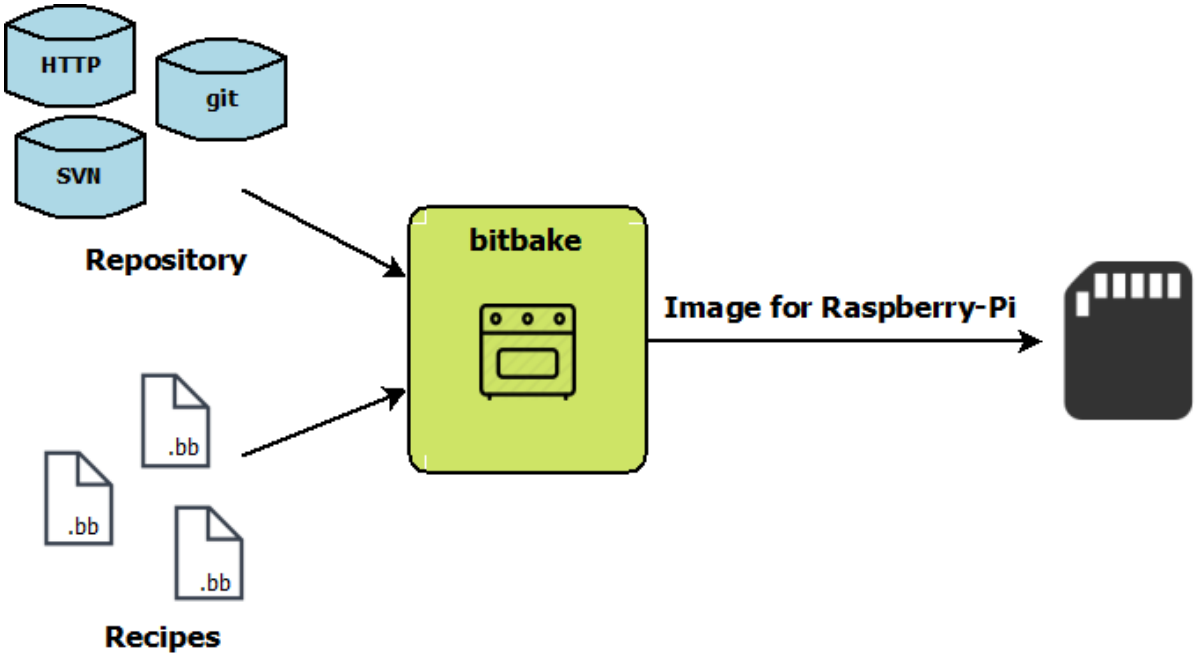
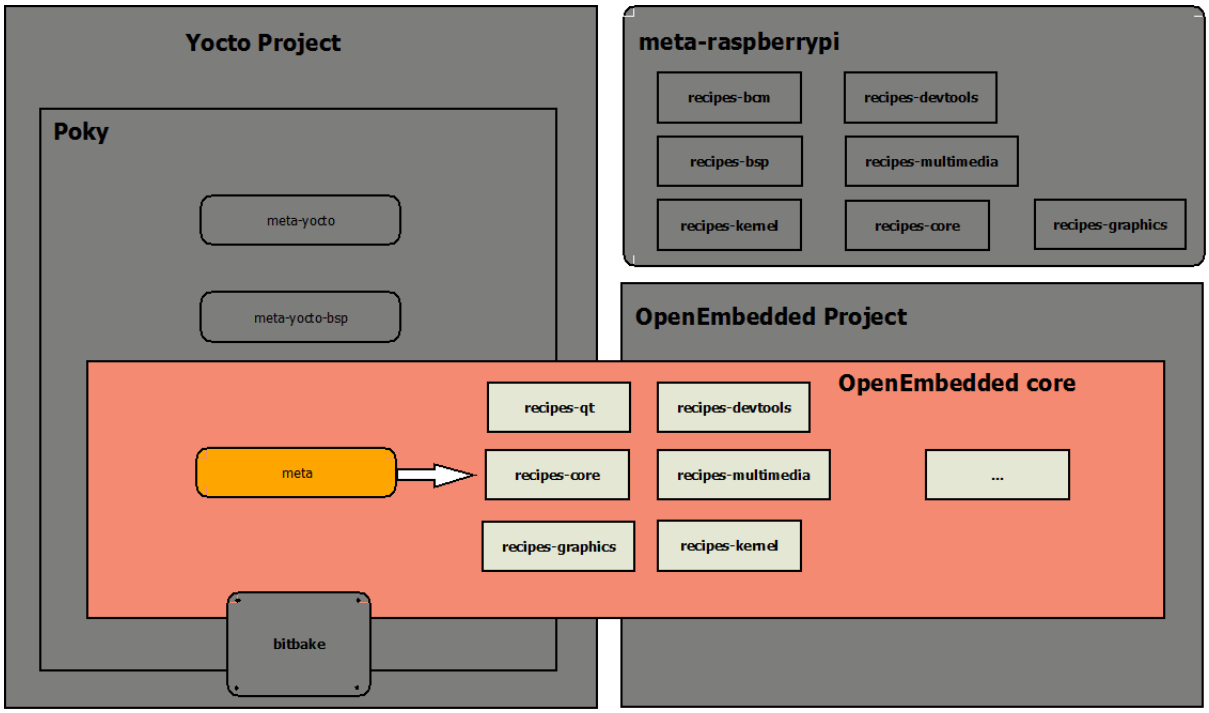
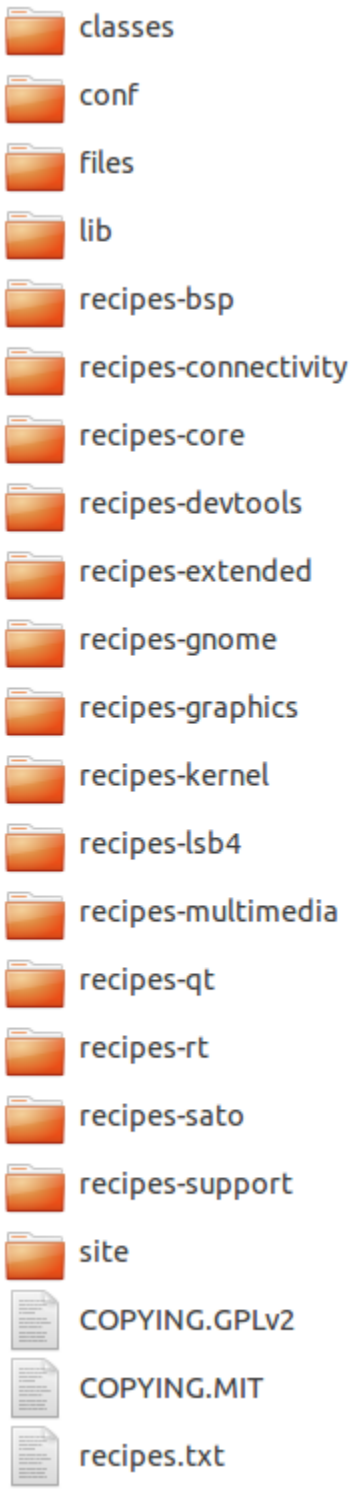
Chapter 1: Meeting the Yocto Project

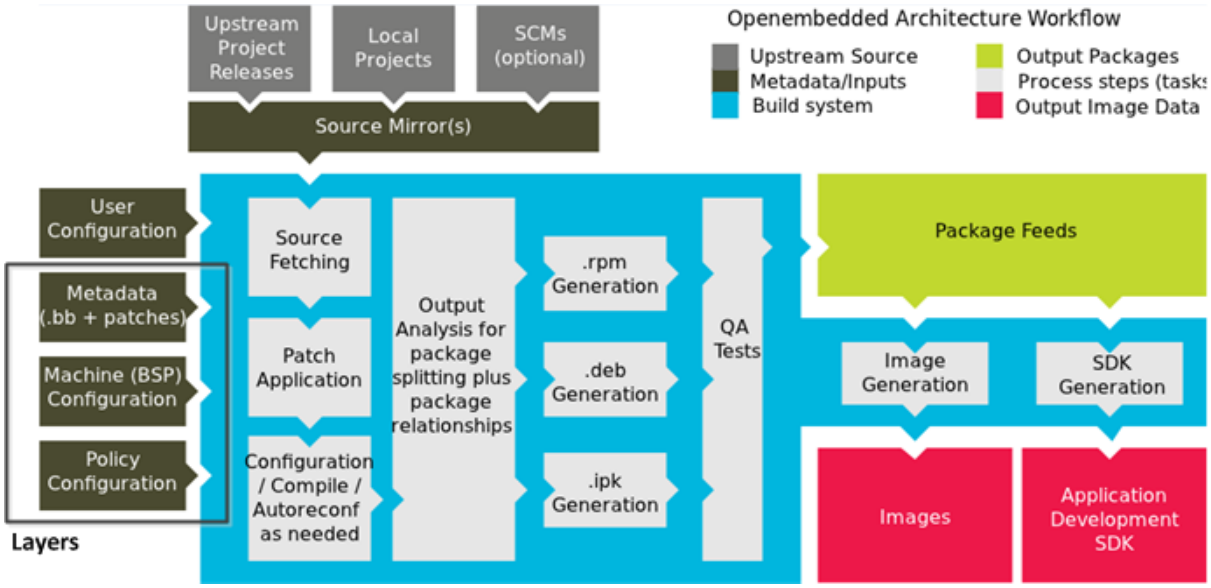



Yocto Project
Poky
meta-yocto
meta-yocto-bsp
meta
bitbake
meta-raspberrypi
recipes-bsp
recipes-devtools
recipes-multimedia
recipes-kernel
recipes-core
recipes-graphics
OpenEmbedded Project
OpenEmbedded core
recipes-qt
recipes-devtools
recipes-core
recipes-multimedia
...
recipes-graphics
recipes-kernel
Yocto Project
Poky
meta-yocto
meta-yocto-bsp
meta
bitbake
meta-raspberrypi
recipes-bsp
recipes-devtools
recipes-multimedia
recipes-kernel
recipes-core
recipes-graphics
OpenEmbedded Project
OpenEmbedded core
recipes-qt
recipes-devtools
recipes-core
recipes-multimedia
...
recipes-graphics
recipes-kernel

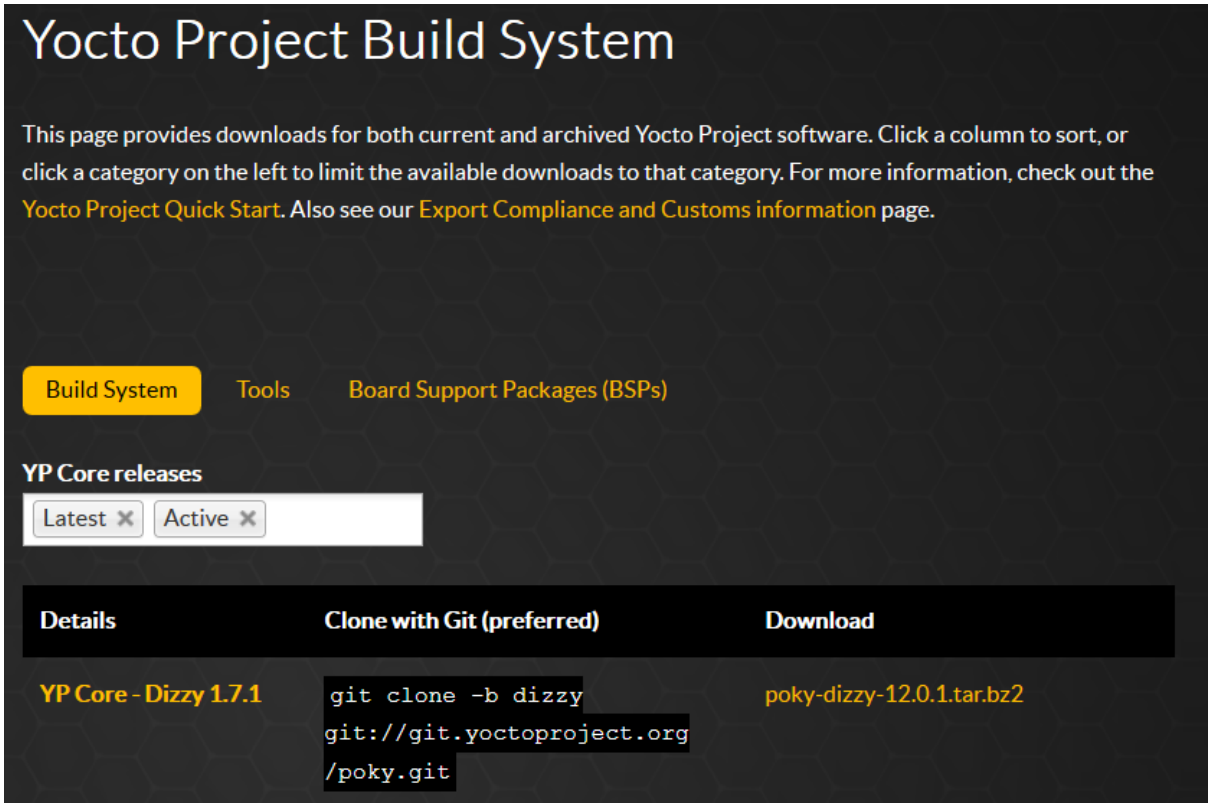

HTTP
git
SVN
Repository
bitbake
Image for Raspberry-Pi
.bb
.bb
.bb
Recipes

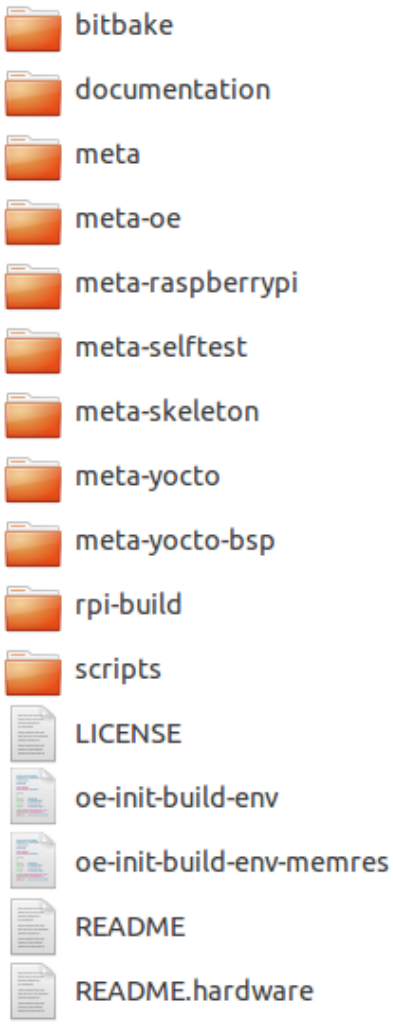

Yocto Project
Poky
meta-yocto
meta-yocto-bsp
meta
bitbake
meta-raspberrypi
recipes-bcm
recipes-devtools
recipes-bsp
recipes-multimedia
recipes-kernel
recipes-core
recipes-graphics
OpenEmbedded Project
OpenEmbedded core
recipes-qt
recipes-devtools
recipes-core
recipes-multimedia
...
recipes-graphics
recipes-kernel

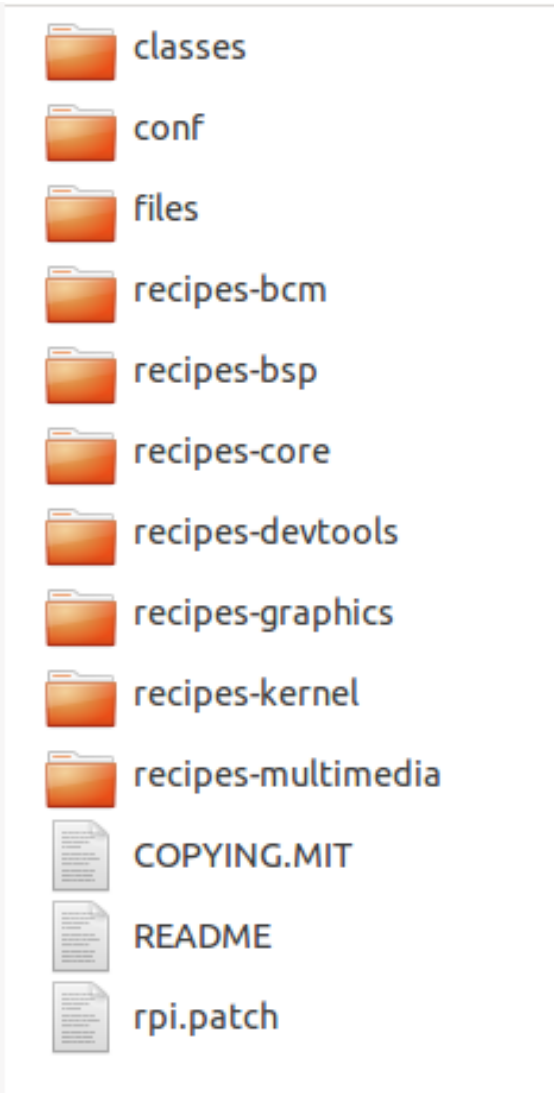

classes
conf
files
lib
recipes-bsp
recipes-connectivity
recipes-core
recipes-devtools
recipes-extended
recipes-gnome
recipes-graphics
recipes-kernel
recipes-lsb4
recipes-multimedia
recipes-qt
recipes-rt
recipes-sato
recipes-support
site
COPYING.GPLv2
COPYING.MIT
recipes.txt


Openembedded Architecture Workflow
Upstream Source
Metadata/Inputs
Build system
Output Packages
Process steps (tasks
Output Image Data
Upstream Project Releases
Local Projects
SCMs (optional)
Source Mirror(s)
User Configuration
Metadata (.bb + patches)
Machine (BSP) Configuration
Policy Configuration
Layers
Source Fetching
Patch Application
Configuration / Compile / Autoreconf as needed
Output Analysis for package splitting plus package relationships
.rpm Generation
.deb Generation
.ipk Generation
QA Tests
Package Feeds
Image Generation
SDK Generation
Images
Application Development SDK

Chapter 2: Building our First Poky Image for the Raspberry Pi




bitbake
documentation
meta
meta-oe
meta-raspberrypi
meta-selftest
meta-skeleton
meta-yocto
meta-yocto-bsp
rpi-build
scripts
LICENSE
oe-init-build-env
oe-init-build-env-memres
README
README.hardware


classes
conf
files
recipes-bcm
recipes-bsp
recipes-core
recipes-devtools
recipes-graphics
recipes-kernel
recipes-multimedia
COPYING.MIT
README
rpi.patch

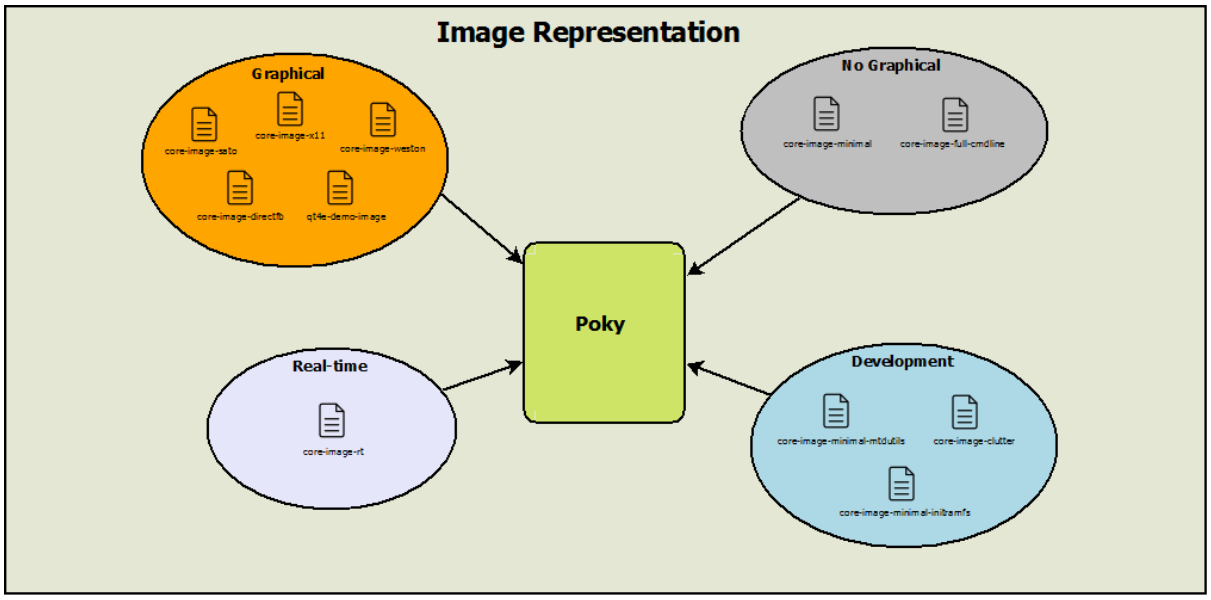
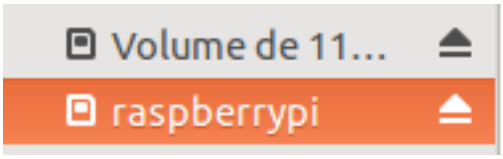
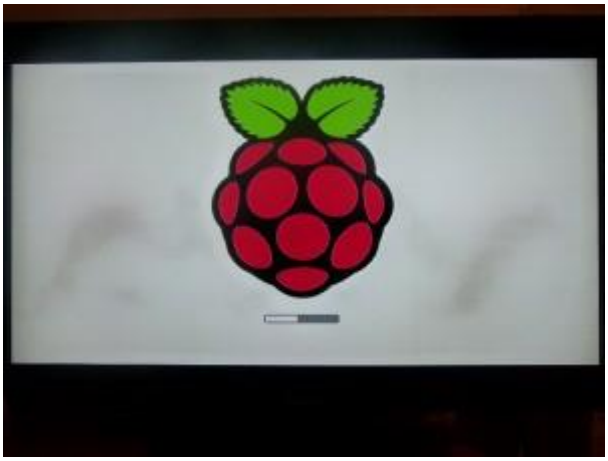
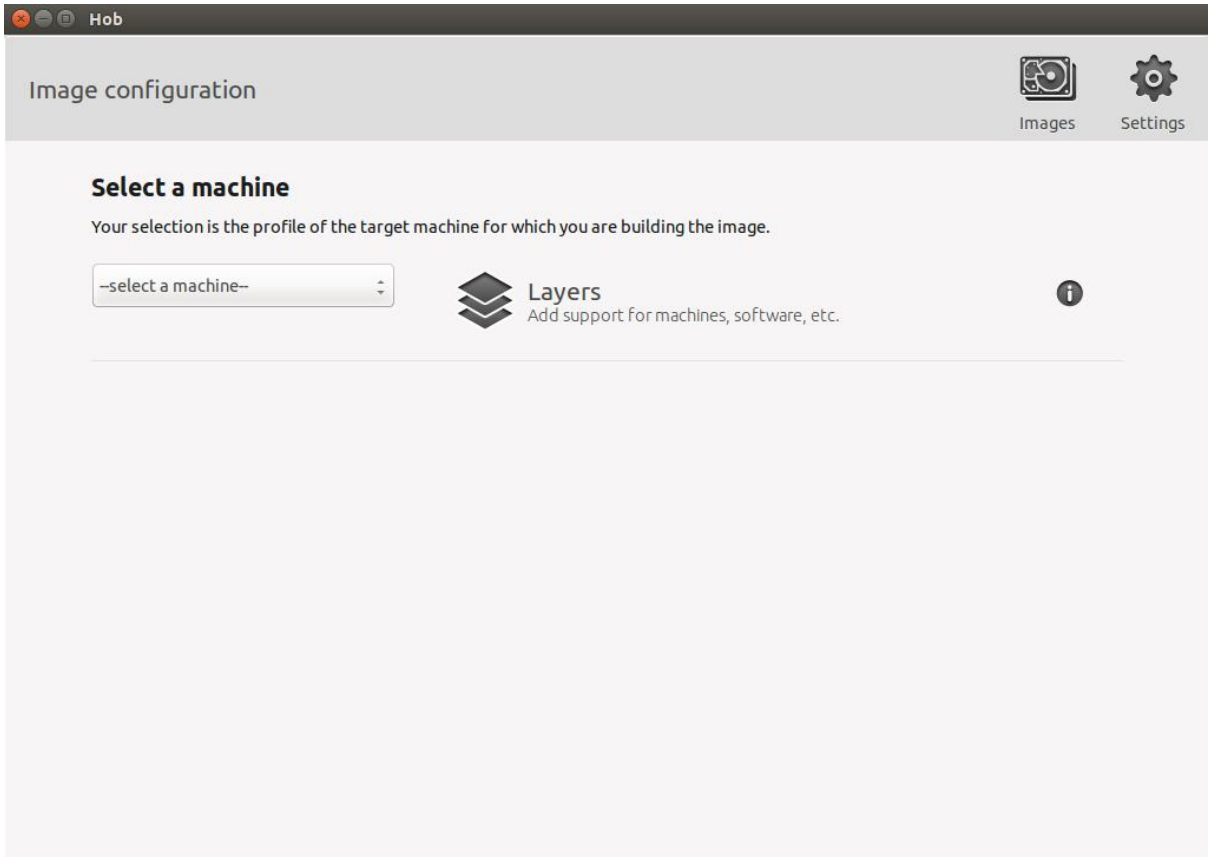


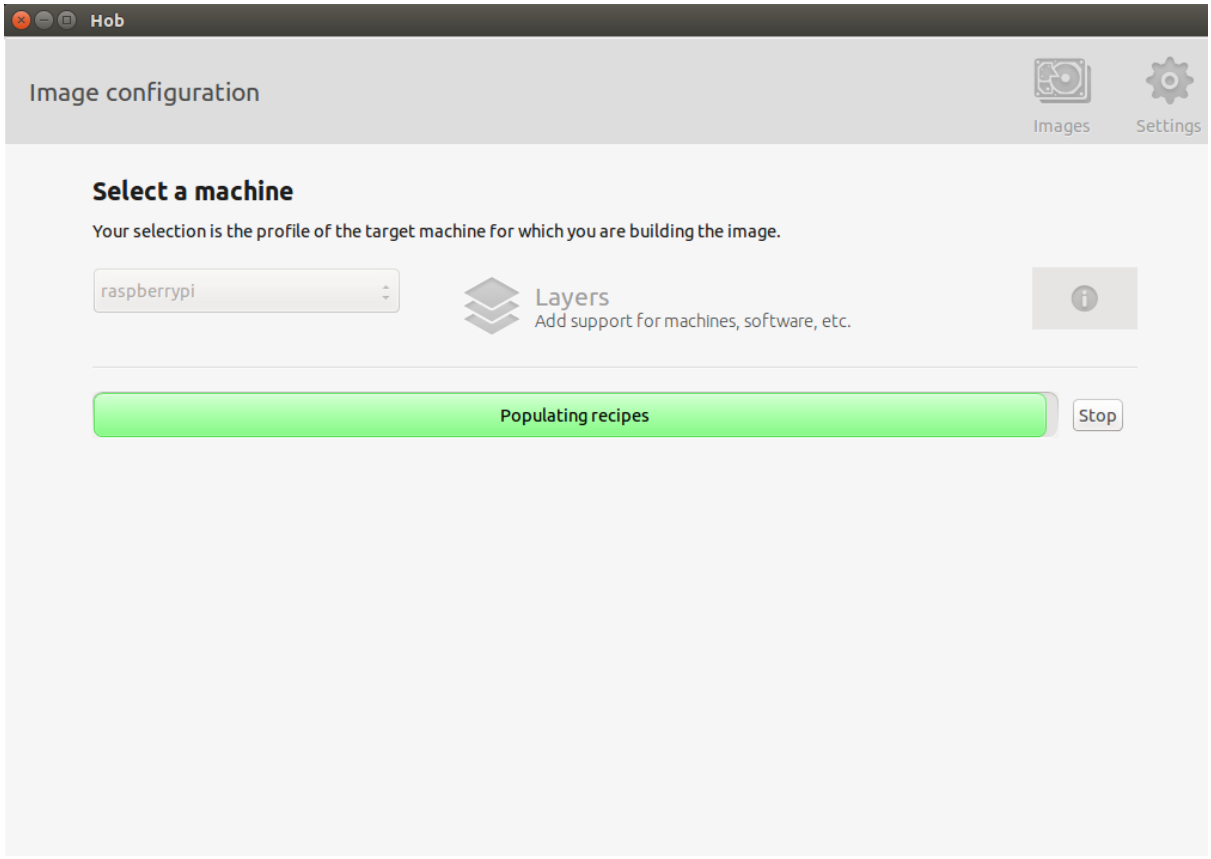
Image Representation
Graphical
core-image-sato
core-image-x11
core-image-weston
core-image-directfb
qt4e-demo-image
No Graphical
core-image-minimal
core-image-full-cmdline
Poky
Real-time
core-image-rt
Development
core-image-minimal-mtdutils
core-image-clutter
core-image-minimal-initramfs

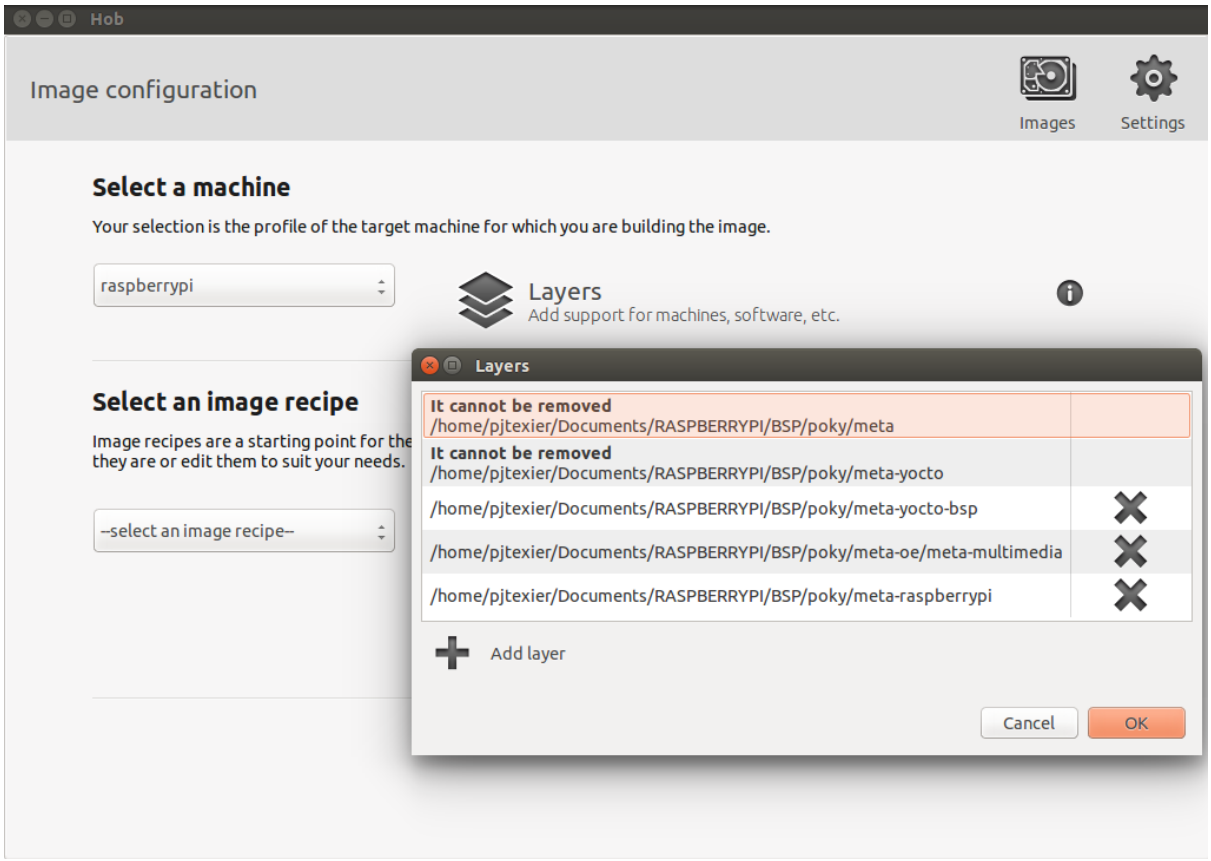

Volume de 11...
raspberrypi

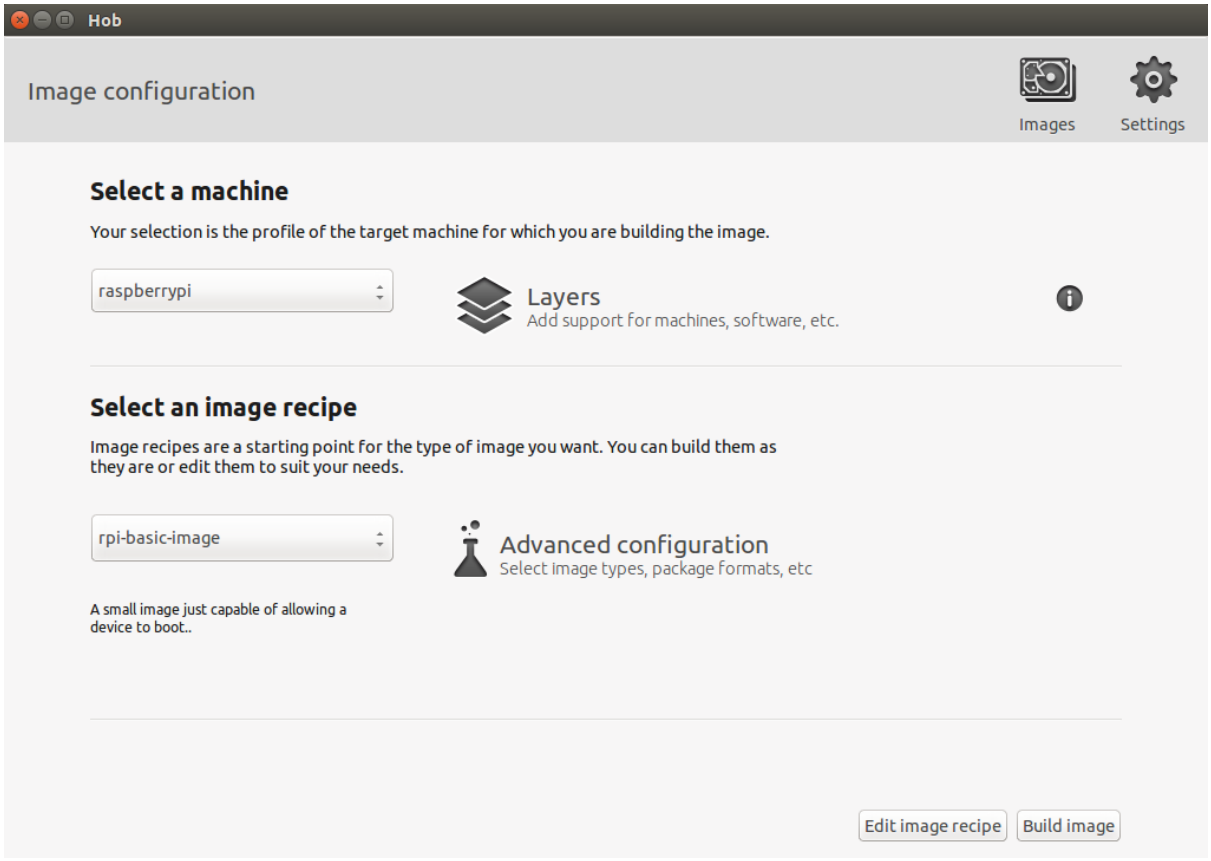


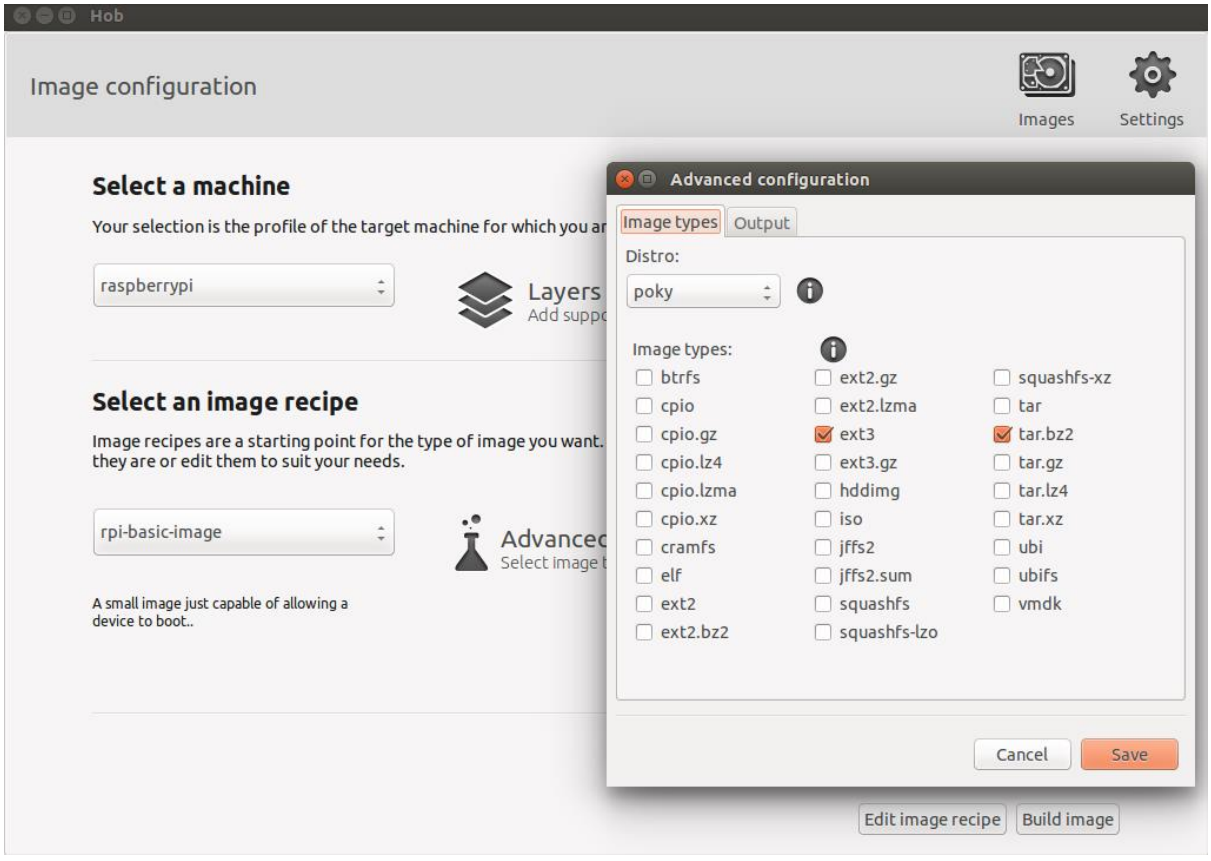
Chapter 3: Mastering baking with Hob and Toaster

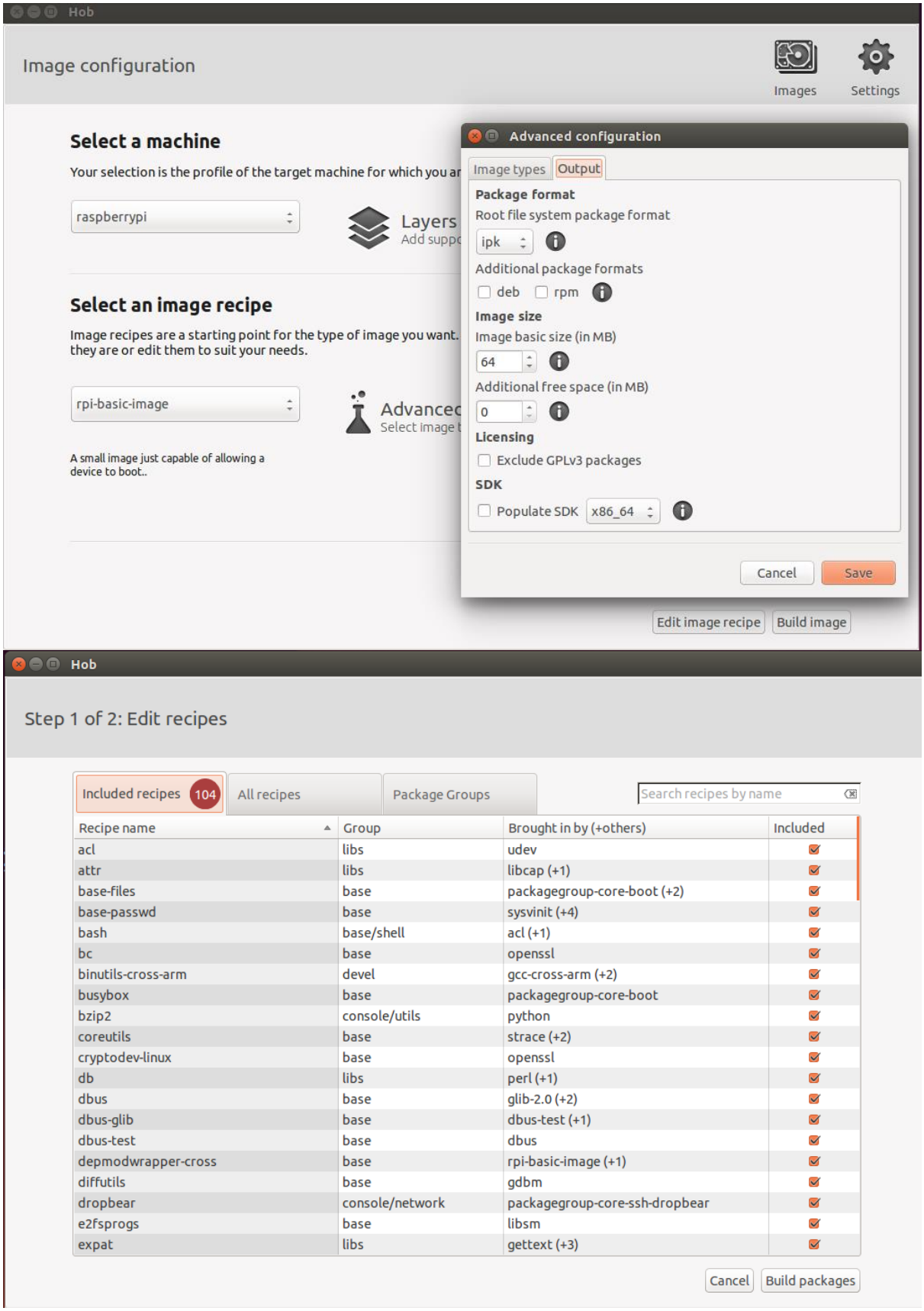


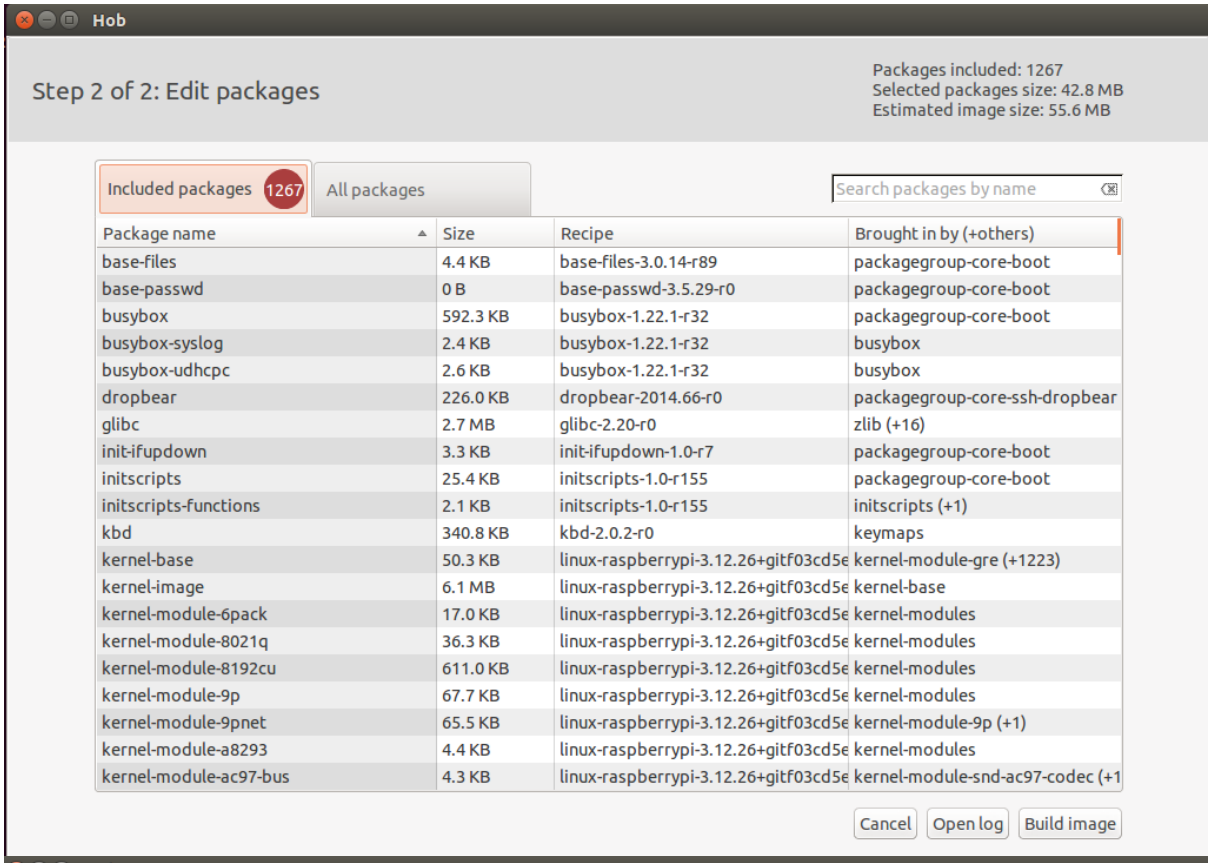

Hob
Image configuration
Images
Settings
Select a machine
Your selection is the profile of the target machine for which you are building the image.
raspberrypi
Layers
Add support for machines, software, etc.
Populating recipes
Stop

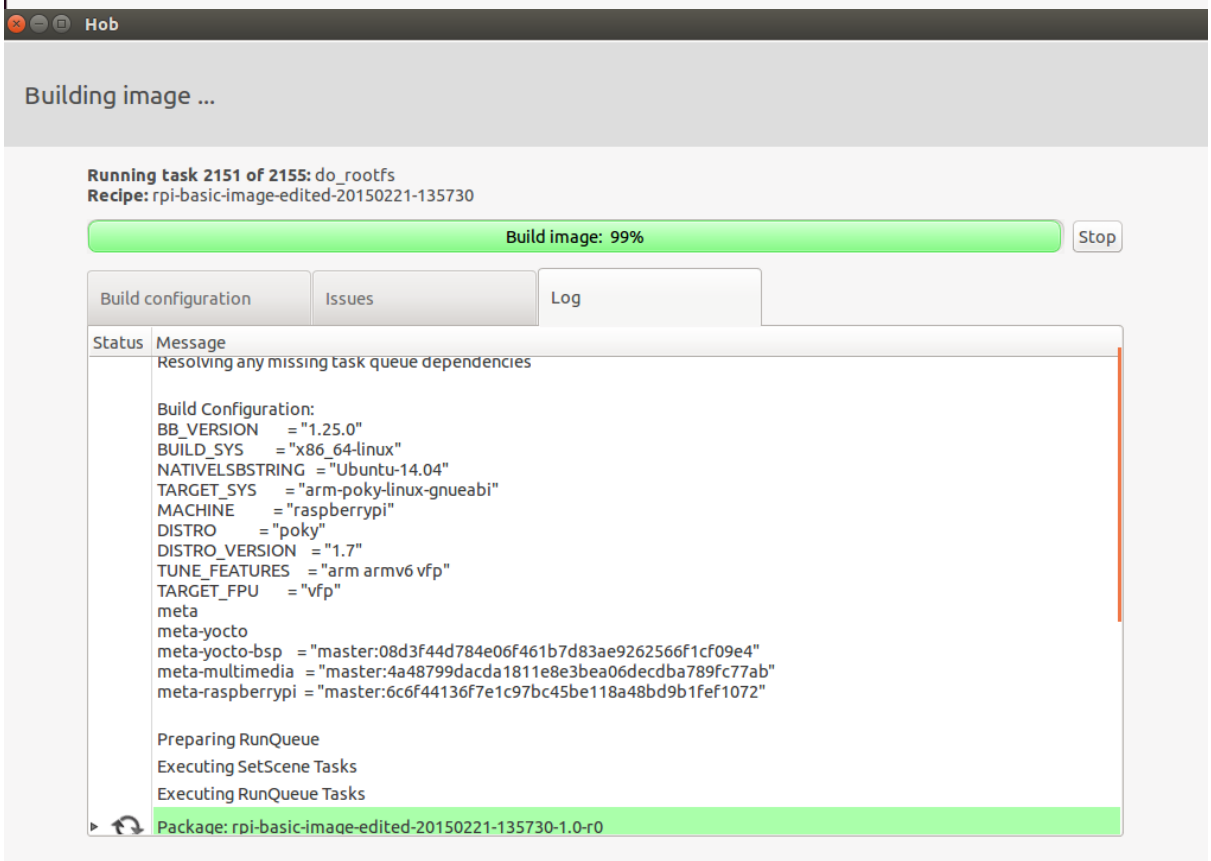

Hob
Image configuration
Images
Settings
Select a machine
Your selection is the profile of the target machine for which you are building the image.
raspberrypi
Layers
Add support for machines, software, etc.
Select an image recipe
Image recipes are a starting point for the
they are or edit them to suit your needs.
--select an image recipe--
Layers
It cannot be removed
/home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta
It cannot be removed
/home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-yocto
/home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-yocto-bsp
/home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-oe/meta-multimedia
/home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-raspberrypi
Add layer
Cancel
OK

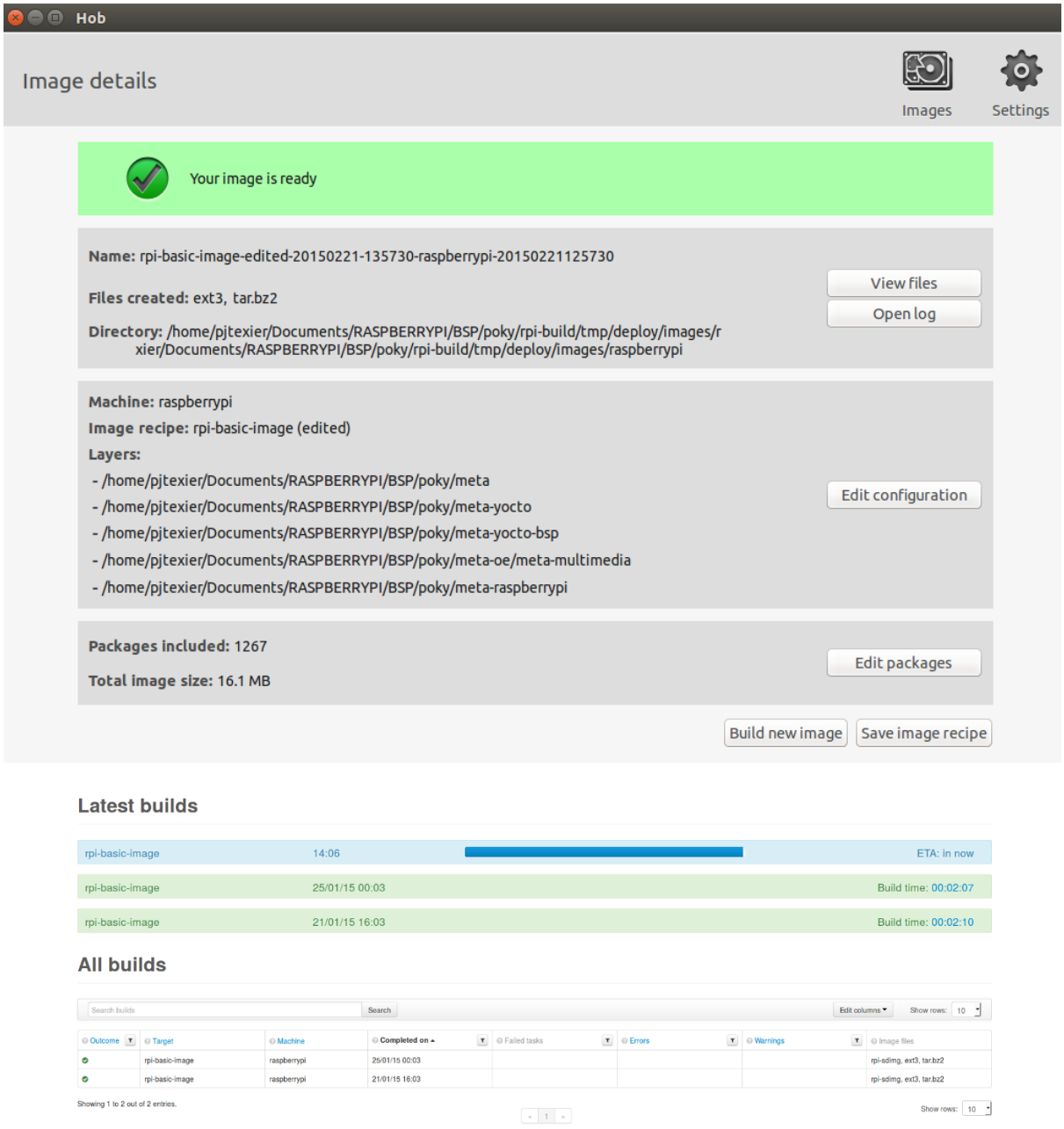

Hob
Image configuration
Images
Settings
Select a machine
Your selection is the profile of the target machine for which you are building the image.
raspberrypi
Layers
Add support for machines, software, etc.
Select an image recipe
Image recipes are a starting point for the type of image you want. You can build them as they are or edit them to suit your needs.
rpi-basic-image
Advanced configuration
Select image types, package formats, etc
A small image just capable of allowing a device to boot..
Edit image recipe
Build image


Hob
Image configuration
Images
Settings
Select a machine
Your selection is the profile of the target machine for which you ar
raspberrypi
Layers
Add suppo
Select an image recipe
Image recipes are a starting point for the type of image you want.
they are or edit them to suit your needs.
rpi-basic-image
Advanced
Select image t
A small image just capable of allowing a device to boot..
Edit image recipe
Build image
Advanced configuration
Image types
Output
Distro:
poky
Image types:
btrfs
cpio
cpio.gz
cpio.lz4
cpio.lzma
cpio.xz
cramfs
elf
ext2
ext2.bz2
ext2.gz
ext2.lzma
ext3
ext3.gz
hddimg
iso
jffs2
jffs2.sum
squashfs
squashfs-lzo
squashfs-xz
tar
tar.bz2
tar.gz
tar.lz4
tar.xz
ubi
ubifs
vmdk
Cancel
Save

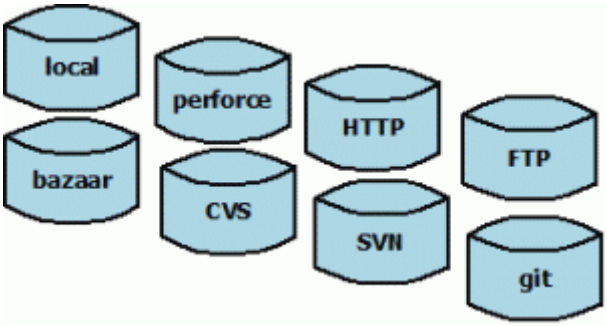

Hob
Image configuration
Images
Settings
Select a machine
Your selection is the profile of the target machine for which you ar
raspberrypi
Layers
Add suppo
Select an image recipe
Image recipes are a starting point for the type of image you want.
they are or edit them to suit your needs.
rpi-basic-image
Advanced
Select image t
A small image just capable of allowing a
device to boot..
Advanced configuration
Image types
Output
Package format
Root file system package format
ipk
Additional package formats
deb
rpm
Image size
Image basic size (in MB)
64
Additional free space (in MB)
0
Licensing
Exclude GPLv3 packages
SDK
Populate SDK
x86_64
Cancel
Save
Edit image recipe
Build image
Hob
Step 1 of 2: Edit recipes
Included recipes 104
All recipes
Package Groups
Search recipes by name
Recipe name
Group
Brought in by (+others)
Included
acl libs udev
attr libs libcap (+1)
base-files base packagegroup-core-boot (+2)
base-passwd base sysvinit (+4)
bash base/shell acl (+1)
bc base openssl
binutils-cross-arm devel gcc-cross-arm (+2)
busybox base packagegroup-core-boot
bzip2 console/utils python
coreutils base strace (+2)
cryptodev-linux base openssl
db libs perl (+1)
dbus base glib-2.0 (+2)
dbus-glib base dbus-test (+1)
dbus-test base dbus
depmodwrapper-cross base rpi-basic-image (+1)
diffutils base gdbm
dropbear console/network packagegroup-core-ssh-dropbear
e2fsprogs base libsm
expat libs gettext (+3)
Cancel
Build packages


Hob
Step 2 of 2: Edit packages
Packages included: 1267
Selected packages size: 42.8 MB
Estimated image size: 55.6 MB
Included packages 1267
All packages
Search packages by name
Package name | Size | Recipe | Brought in by (+others)
base-files | 4.4 KB | base-files-3.0.14-r89 | packagegroup-core-boot
base-passwd | 0 B | base-passwd-3.5.29-r0 | packagegroup-core-boot
busybox | 592.3 KB | busybox-1.22.1-r32 | packagegroup-core-boot
busybox-syslog | 2.4 KB | busybox-1.22.1-r32 | busybox
busybox-udhcpc | 2.6 KB | busybox-1.22.1-r32 | busybox
dropbear | 226.0 KB | dropbear-2014.66-r0 | packagegroup-core-ssh-dropbear
glibc | 2.7 MB | glibc-2.20-r0 | zlib (+16)
init-ifupdown | 3.3 KB | init-ifupdown-1.0-r7 | packagegroup-core-boot
initscripts | 25.4 KB | initscripts-1.0-r155 | packagegroup-core-boot
initscripts-functions | 2.1 KB | initscripts-1.0-r155 | initscripts (+1)
kbd | 340.8 KB | kbd-2.0.2-r0 | keymaps
kernel-base | 50.3 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-module-gre (+1223)
kernel-image | 6.1 MB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-base
kernel-module-6pack | 17.0 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-modules
kernel-module-8021q | 36.3 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-modules
kernel-module-8192cu | 611.0 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-modules
kernel-module-9p | 67.7 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-modules
kernel-module-9pnet | 65.5 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-module-9p (+1)
kernel-module-a8293 | 4.4 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-modules
kernel-module-ac97-bus | 4.3 KB | linux-raspberrypi-3.12.26+gitf03cd5e | kernel-module-snd-ac97-codec (+1
Cancel
Open log
Build image

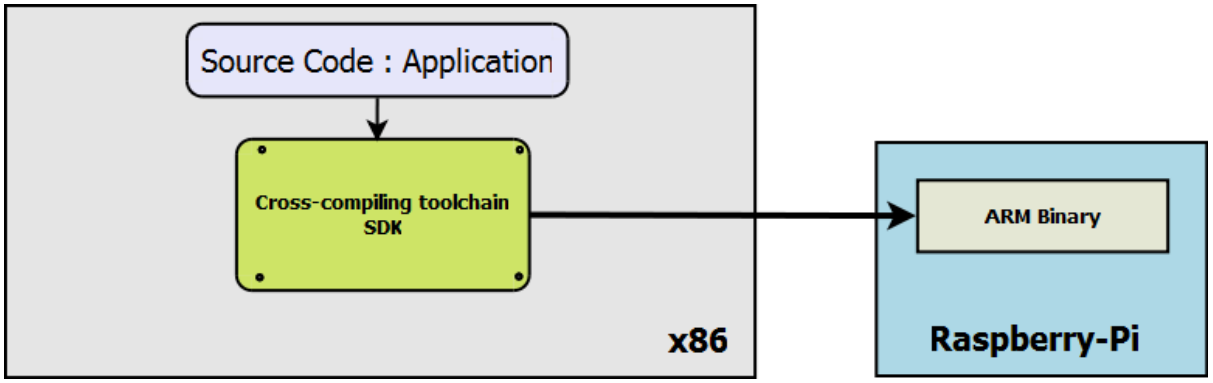

Hob
Building image ...
Running task 2151 of 2155: do_rootfs
Recipe: rpi-basic-image-edited-20150221-135730
Build image: 99%
Stop
Build configuration
Issues
Log
Status | Message
Resolving any missing task queue dependencies
Build Configuration:
BB_VERSION = "1.25.0"
BUILD_SYS = "x86_64-linux"
NATIVELSBSTRING = "Ubuntu-14.04"
TARGET_SYS = "arm-poky-linux-gnueabi"
MACHINE = "raspberrypi"
DISTRO = "poky"
DISTRO_VERSION = "1.7"
TUNE_FEATURES = "arm armv6 vfp"
TARGET_FPU = "vfp"
meta
meta-yocto
meta-yocto-bsp = "master:08d3f44d784e06f461b7d83ae9262566f1cf09e4"
meta-multimedia = "master:4a48799dacda1811e8e3bea06decdba789fc77ab"
meta-raspberrypi = "master:6c6f44136f7e1c97bc45be118a48bd9b1fef1072"
Preparing RunQueue
Executing SetScene Tasks
Executing RunQueue Tasks
Package: rpi-basic-image-edited-20150221-135730-1.0-r0

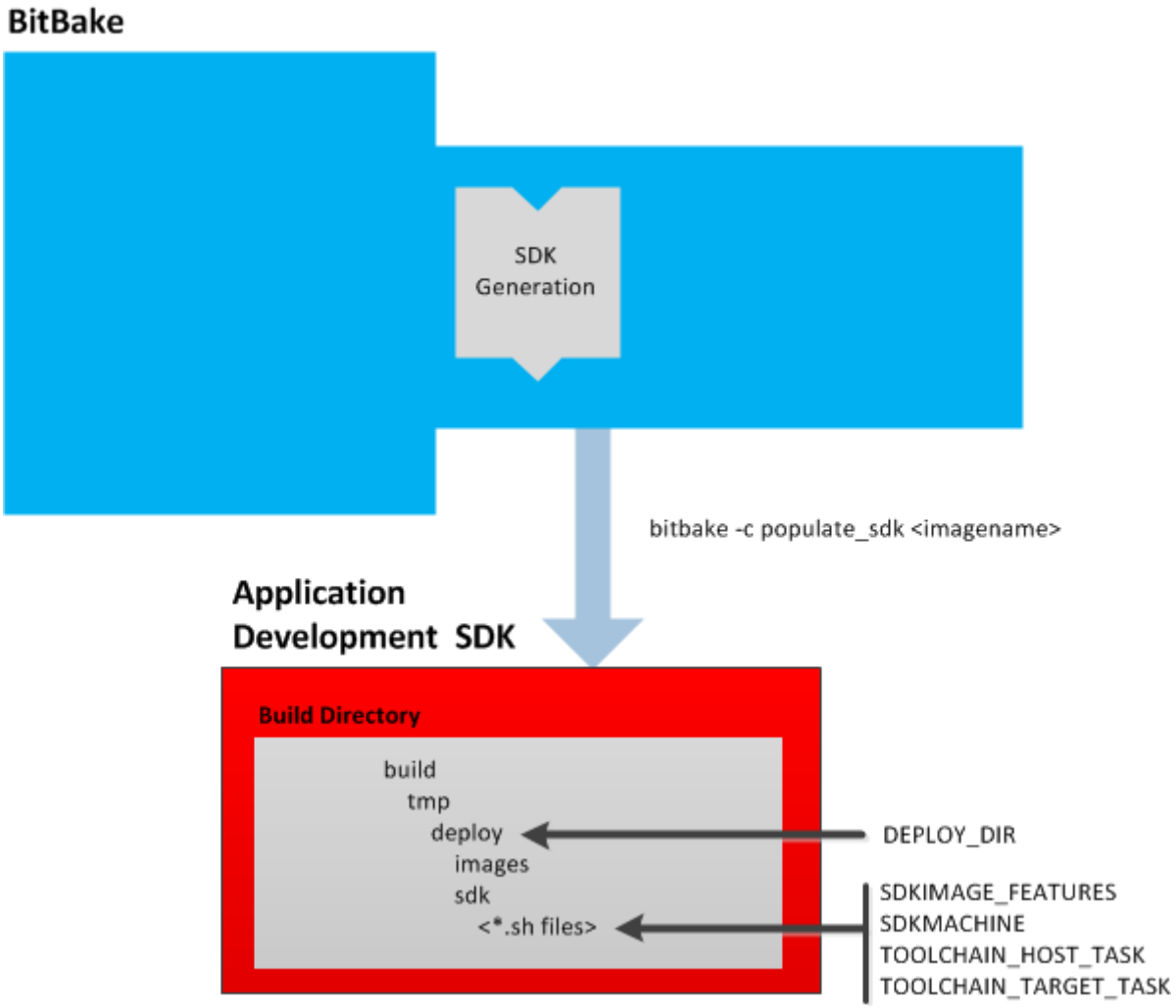

Hob
Image details
Images
Settings
Your image is ready
Name: rpi-basic-image-edited-20150221-135730-raspberrypi-20150221125730
Files created: ext3, tar.bz2
Directory: /home/pjtexier/Documents/RASPBERRYPI/BSP/poky/rpi-build/tmp/deploy/images/r
xier/Documents/RASPBERRYPI/BSP/poky/rpi-build/tmp/deploy/images/raspberrypi
View files
Open log
Machine: raspberrypi
Image recipe: rpi-basic-image (edited)
Layers:
- /home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta
- /home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-yocto
- /home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-yocto-bsp
- /home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-oe/meta-multimedia
- /home/pjtexier/Documents/RASPBERRYPI/BSP/poky/meta-raspberrypi
Edit configuration
Packages included: 1267
Total image size: 16.1 MB
Edit packages
Build new image
Save image recipe
Latest builds
rpi-basic-image 14:06 ETA: in now
rpi-basic-image 25/01/15 00:03 Build time: 00:02:07
rpi-basic-image 21/01/15 16:03 Build time: 00:02:10
All builds
Search builds
Search
Edit columns
Show rows: 10
Outcome
Target
Machine
Completed on
Failed tasks
Errors
Warnings
Image files
rpi-basic-image raspberrypi 25/01/15 00:03 rpi-sdimg, ext3, tar.bz2
rpi-basic-image raspberrypi 21/01/15 16:03 rpi-sdimg, ext3, tar.bz2
Showing 1 to 2 out of 2 entries.
Show rows: 10

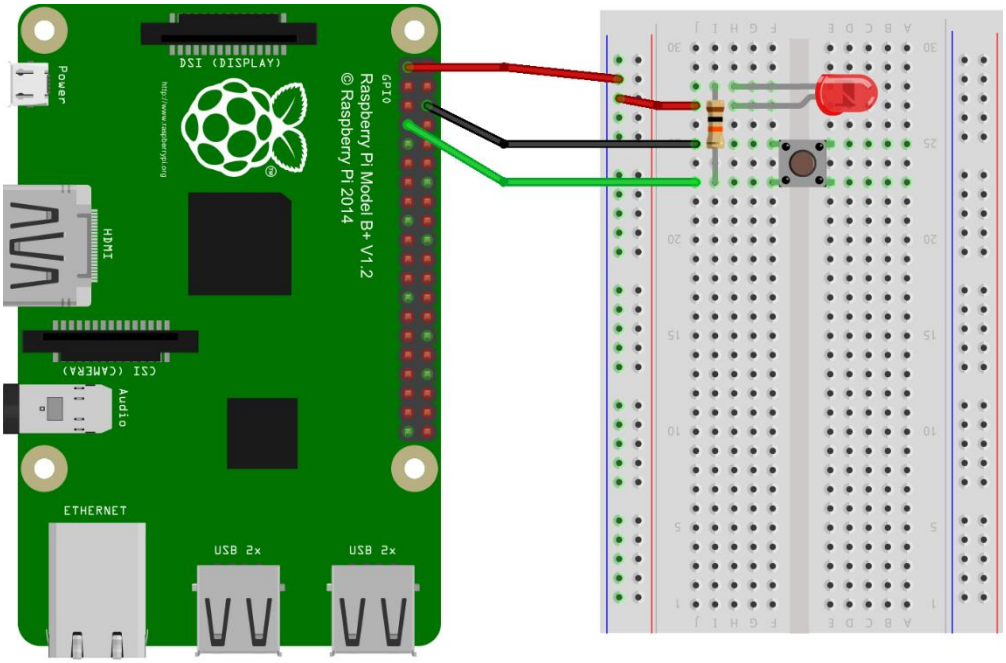
Chapter 4: Understanding BitBake



Chapter 5: Creating, Developing, and Deploying on the Raspberry Pi






DSI (DISPLAY)
Power
HDMI
CSI (CAMERA)
Audio
ETHERNET
USB 2x
USB 2x
GPIO
Raspberry Pi Model B+ V1.2
© Raspberry Pi 2014
fritzing

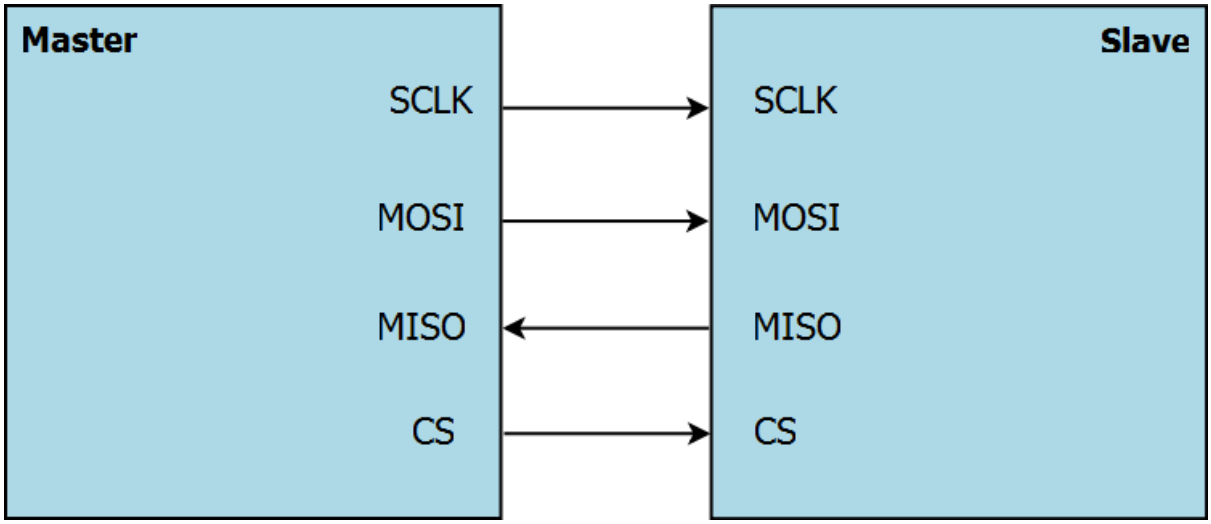
Chapter 6: Working with External Layers

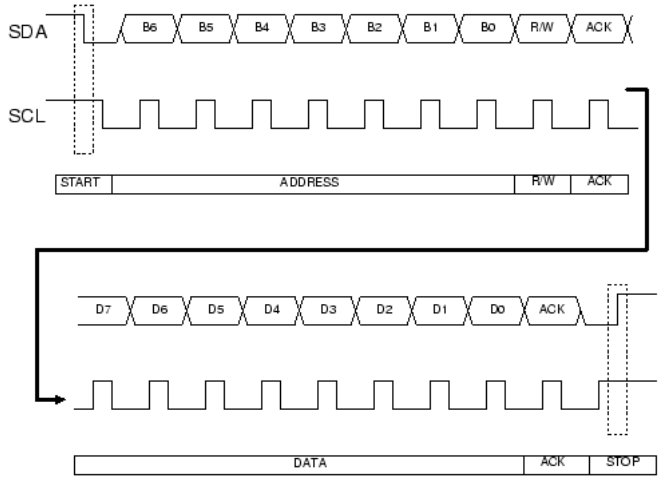
meta-parallella	Support for the Parallella board from Adapteva	Machine (BSP)	https://github.com/nathanrossi/meta-parallella.git
meta-picosam9	Picosam9 board support	Machine (BSP)	https://gitorious.org/picopc-tools/meta-picosam9.git
meta-qemu-bsps	layer for other qemu machines	Machine (BSP)	https://github.com/akuster/meta-qemu-bsps
meta-raspberrypi	Raspberry Pi board support	Machine (BSP)	git://git.yoctoproject.org/meta-raspberrypi
meta-renesas-rza1	Official BSP layer for Renesas RZ/A1 platforms	Machine (BSP)	git://github.com/renesas-rz/meta-renesas-rza1
meta-rockchip	Rockchip ARM hardware support	Machine (BSP)	git://github.com/linux-rockchip/meta-rockchip
meta-romley	Intel Romley platform BSP	Machine (BSP)	git://git.yoctoproject.org/meta-intel
meta-samsung	Samsung smartphone support	Machine (BSP)	git://github.com/shr-distribution/meta-smartphone.git
meta-sugarbay	Intel Sugar Bay platform BSP	Machine (BSP)	git://git.yoctoproject.org/meta-intel

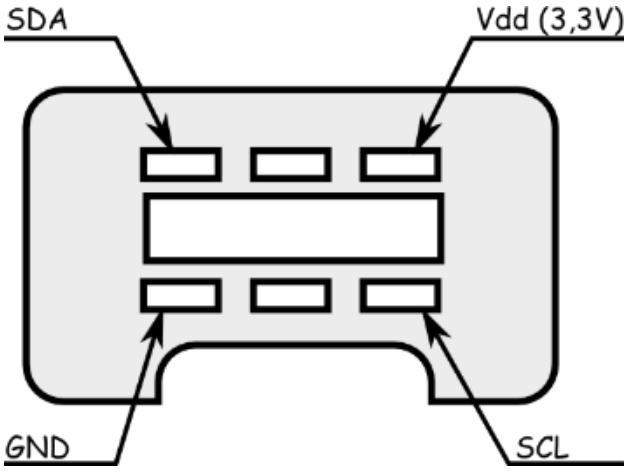
Chapter 7: Deploying a Custom Layer on the Raspberry Pi

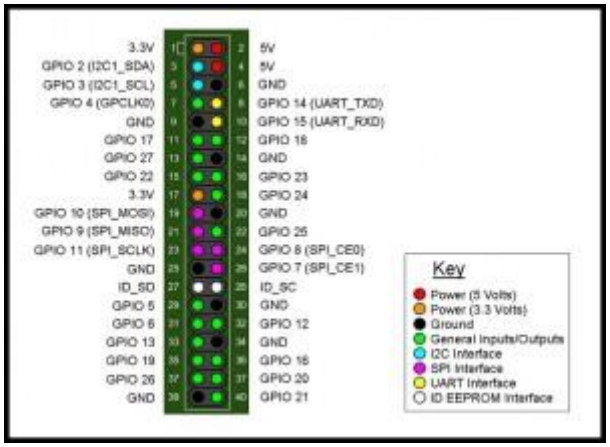
- ***allow-empty-password:*** Allows Dropbear and OpenSSH to accept root logins and logins from accounts having an empty password string.
- ***dbg-pkgs:*** Installs debug symbol packages for all packages installed in a given image.
- ***debug-tweaks:*** Makes an image suitable for development (e.g. allows root logins without passwords and enables post-installation logging). See the 'allow-empty-password', 'empty-root-password', and 'post-install-logging' features in this list for additional information.
- ***dev-pkgs:*** Installs development packages (headers and extra library links) for all packages installed in a given image.
- ***doc-pkgs:*** Installs documentation packages for all packages installed in a given image.
- ***empty-root-password:*** Sets the root password to an empty string, which allows logins with a blank password.
- ***package-management:*** Installs package management tools and preserves the package manager database.
- ***post-install-logging:*** Enables logging postinstall script runs to the `/var/log/postinstall.log` file on first boot of the image on the target system.
- ***ptest-pkgs:*** Installs ptest packages for all ptest-enabled recipes.
- ***read-only-rootfs:*** Creates an image whose root filesystem is read-only. See the "Creating a Read-Only Root Filesystem" section in the Yocto Project Development Manual for more information.
- ***splash:*** Enables showing a splash screen during boot. By default, this screen is provided by `psplash`, which does allow customization. If you prefer to use an alternative splash screen package, you can do so by setting the `SPLASH` variable to a different package name (or names) within the image recipe or at the distro configuration level.
- ***staticdev-pkgs:*** Installs static development packages, which are static libraries (i.e. `*.a` files), for all packages installed in a given image.

Chapter 8: Diving into the Raspberry Pi's Peripherals and Yocto Recipes



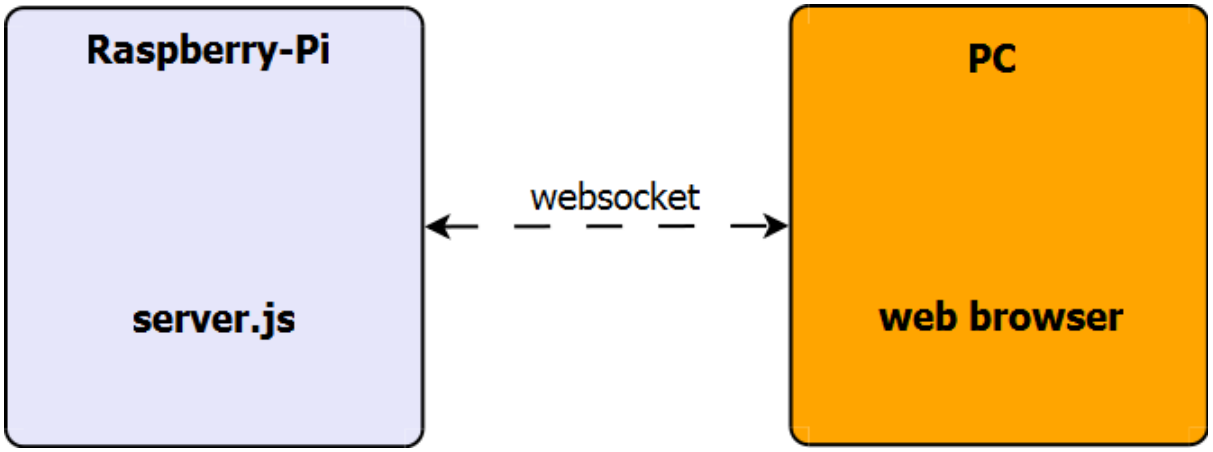


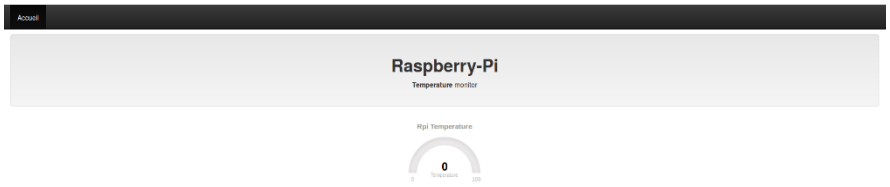


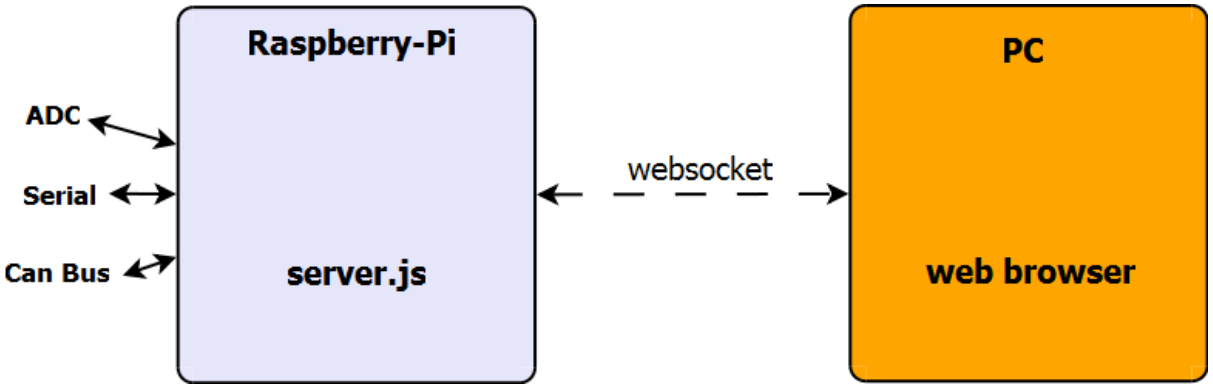


Data byte receive								Address
Joystick X								**0x00**
Joystick Y								**0x01**
Accelerometer X (bit 9 to bit 2 for 10-bit resolution)								**0x02**
Accelerometer Y (bit 9 to bit 2 for 10-bit resolution)								**0x03**
Accelerometer Z (bit 9 to bit 2 for 10-bit resolution)								**0x04**
Accel. Z bit 1	**Accel. Z bit 0**	**Accel. Y bit 1**	**Accel. Y bit 0**	**Accel. X bit 1**	**Accel. X bit 0**	**C-button**	**Z-button**	**0x05**

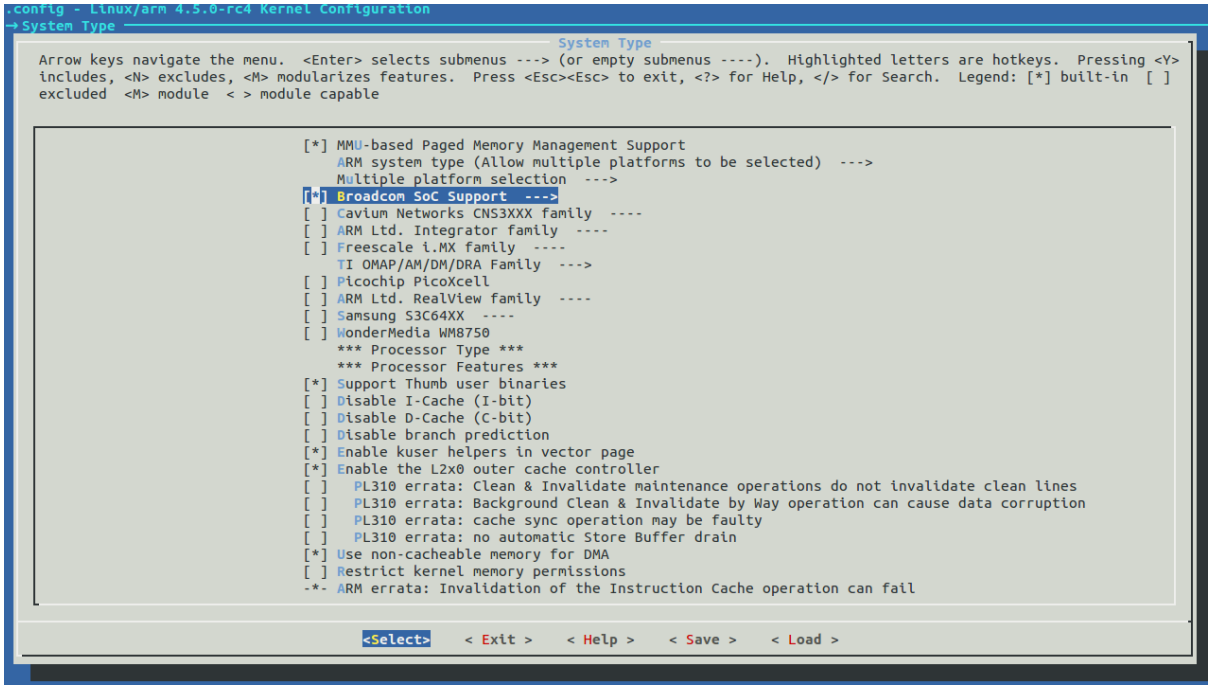
Chapter 9: Making a Media Hub on the Raspberry Pi

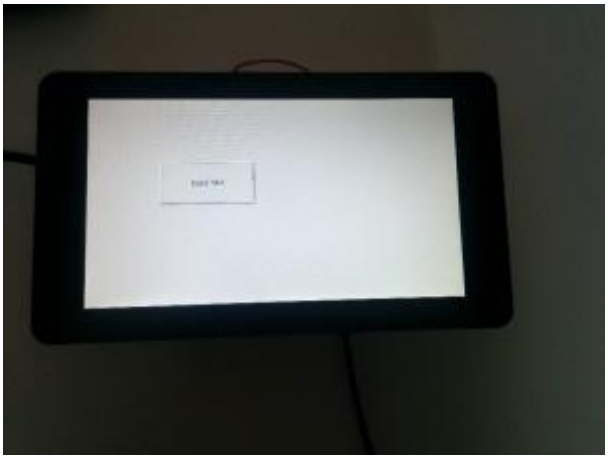






Chapter 10: Playing with an LCD Touchscreen and the Linux Kernel





Chapter 11: Contributing to the Raspberry Pi BSP Layer

- [yocto] [meta-raspberrypi][PATCH 0/5] Various upgrade/fixes from Technux *Petter Mabäcker*
  - [yocto] [meta-raspberrypi][PATCH 1/5] .gitignore: Ignore .swp files *Petter Mabäcker*
  - [yocto] [meta-raspberrypi][PATCH 2/5] linux-raspberrypi: Update 4.1 recipe to 4.1.15 *Petter Mabäcker*
  - [yocto] [meta-raspberrypi][PATCH 3/5] rpi-config: I2C support *Petter Mabäcker*
  - [yocto] [meta-raspberrypi][PATCH 4/5] pitft: Add basic support for PiTFT *Petter Mabäcker*
    - [yocto] [meta-raspberrypi][PATCH 4/5] pitft: Add basic support for PiTFT *Khem Raj*
      - [yocto] [meta-raspberrypi][PATCH 4/5] pitft: Add basic support for PiTFT *Andrei Gherzan*
      - [yocto] [meta-raspberrypi][PATCH 4/5] pitft: Add basic support for PiTFT *Petter Mabäcker*
      - [yocto] [meta-raspberrypi][PATCH 4/5] pitft: Add basic support for PiTFT *Khem Raj*
      - [yocto] [meta-raspberrypi][PATCH 4/5] pitft: Add basic support for PiTFT *Petter Mabäcker*
  - [yocto] [meta-raspberrypi][PATCH 5/5] pitft: Add PiTFT22 support *Petter Mabäcker*
  - [yocto] [meta-raspberrypi][PATCH 0/5] Various upgrade/fixes from Technux *Petter Mabäcker*

New Development

A minimal patch or commit message would be of the format:

```
Short log / Statement of what needed to be changed.

(Optional pointers to external resources, such as defect tracking)

The intent of your change.

(Optional, if it's not clear from above) how your change resolves the
issues in the first part.

Tag line(s) at the end.
```

For example:

```
foobar: Adjusted the foo setting in bar

When using foobar on systems with less than a gigabyte of RAM common
usage patterns often result in an Out-of-memory condition causing
slowdowns and unexpected application termination.

Low-memory systems should continue to function without running into
memory-starvation conditions with minimal cost to systems with more
available memory.  High-memory systems will be less able to use the
full extent of the system, a dynamically tunable option may be best,
long-term.

The foo setting in bar was decreased from X to X-50% in order to
ensure we don't exhaust all system memory with foobar threads.

Signed-off-by: Joe Developer <joe.developer@example.com>
```

openembedded / **meta-openembedded**

Watch 12 | Star 26 | Fork 53

Code | Issues 0 | Pull requests 0 | Wiki | Pulse | Graphs

Branch: **master** **meta-openembedded** / meta-oe / recipes-support / **fbset** /

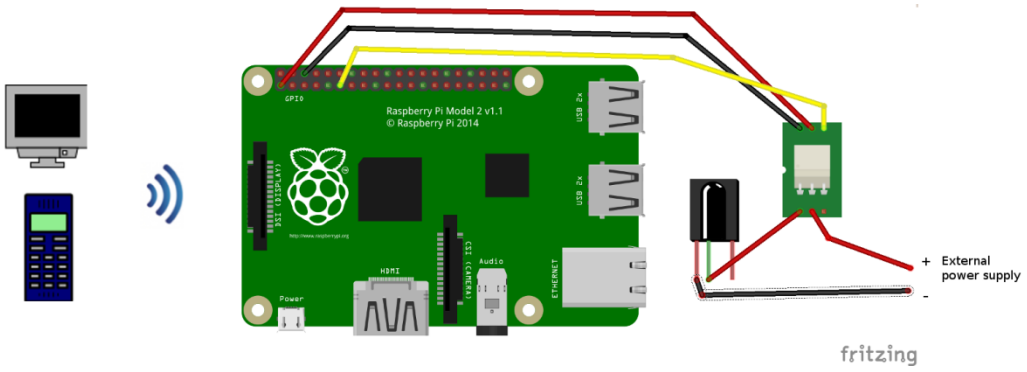
New file | Find file | History

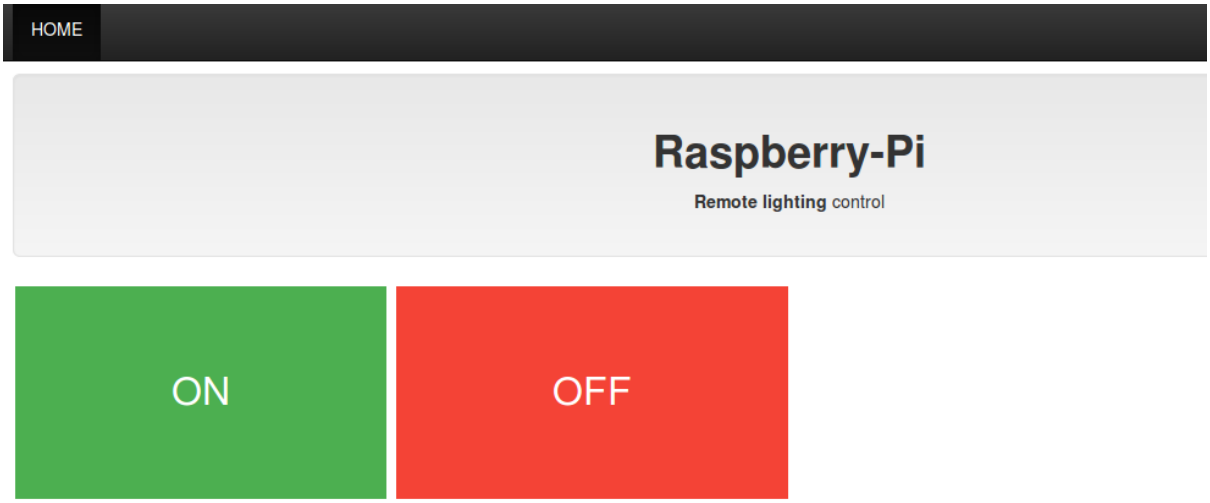
b40290 committed with **shr-project** fbset-modes: fix a warning about not existant S ... Latest commit a061682 on Apr 24, 2015

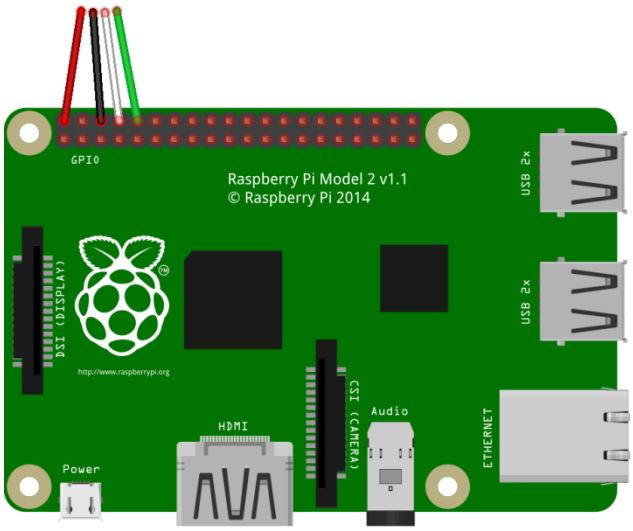
..

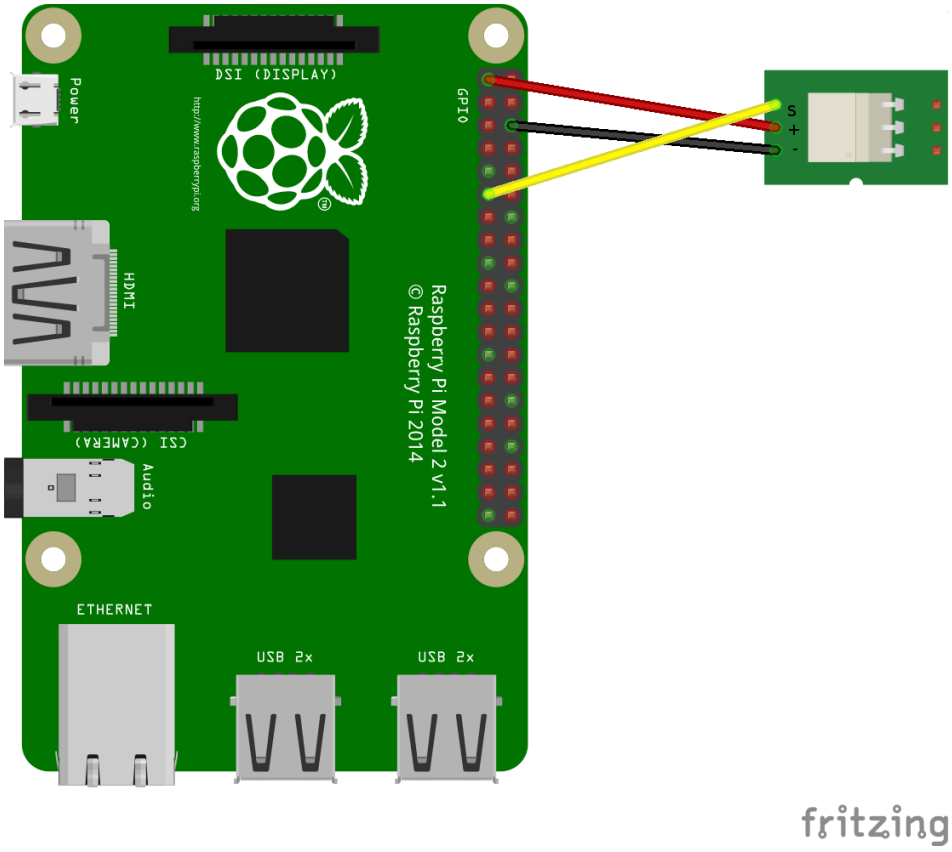
fbset-2.1	fbset: fix parallel build	2 years ago
fbset-modes	recipes,classes: import a lot of recipes from meta-shr	5 years ago
fbset-modes.bb	fbset-modes: fix a warning about not existant S	8 months ago
fbset_2.1.bb	fbset: the package doesn't use autotools at all	2 years ago

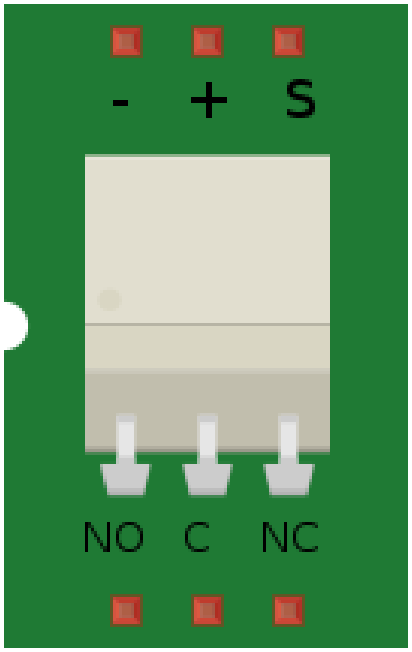
Chapter 12: Home Automation Project – Booting a Custom Image

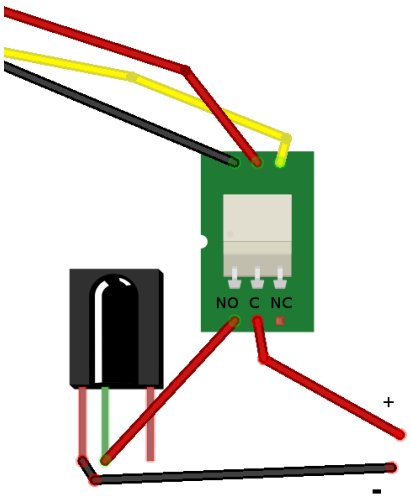





GPIO
Raspberry Pi Model 2 v1.1
© Raspberry Pi 2014
USB 2x
USB 2x
DSI (DISPLAY)
http://www.raspberrypi.org
CSI (CAMERA)
Audio
ETHERNET
HDMI
Power
fritzing


DSI (DISPLAY)
Power
http://www.raspberrypi.org
GPIO
S
+
-
HDMI
Raspberry Pi Model 2 v1.1
© Raspberry Pi 2014
CSI (CAMERA)
Audio
ETHERNET
USB 2x
USB 2x
fritzing





fritzing