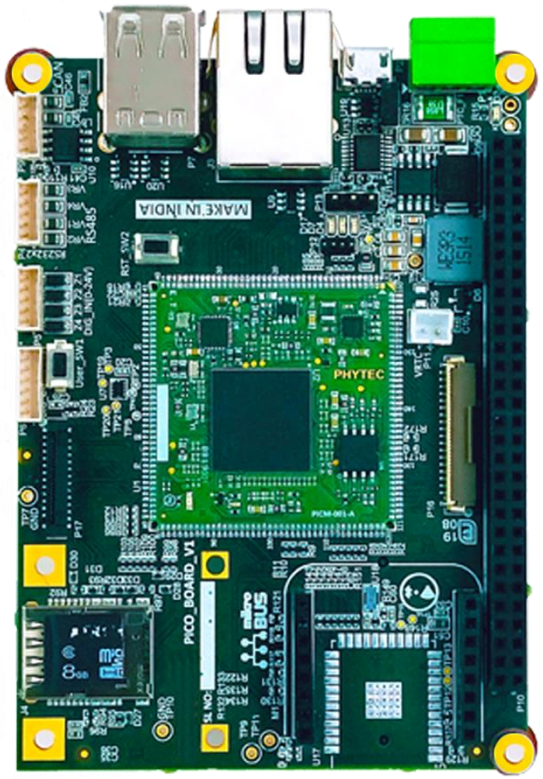
Yocto (C1)

Yocto ARCH

Agenda

- Hardware Intro
- Build Systems
- Selecting Build System
- Yocto ARCH

RuggedBOARD



- A5D2x @500MHz
- Cortex - A5
- 64MB Ram
- 32MB Flash
- 2 x RS232
- 1x RS485
- 1 x CAN
- 1 x Ethernet
- TFT & Cap Touch
- 1 x MicroSD Slot
- 2 x USB
- DC & USB Power
- Expansion Header
- mikroBUS Conn.
- mPCIe conn.
- Micro Sim Slot

open source hardware

open source initiative

Industrial Grade Hardware for IIoT

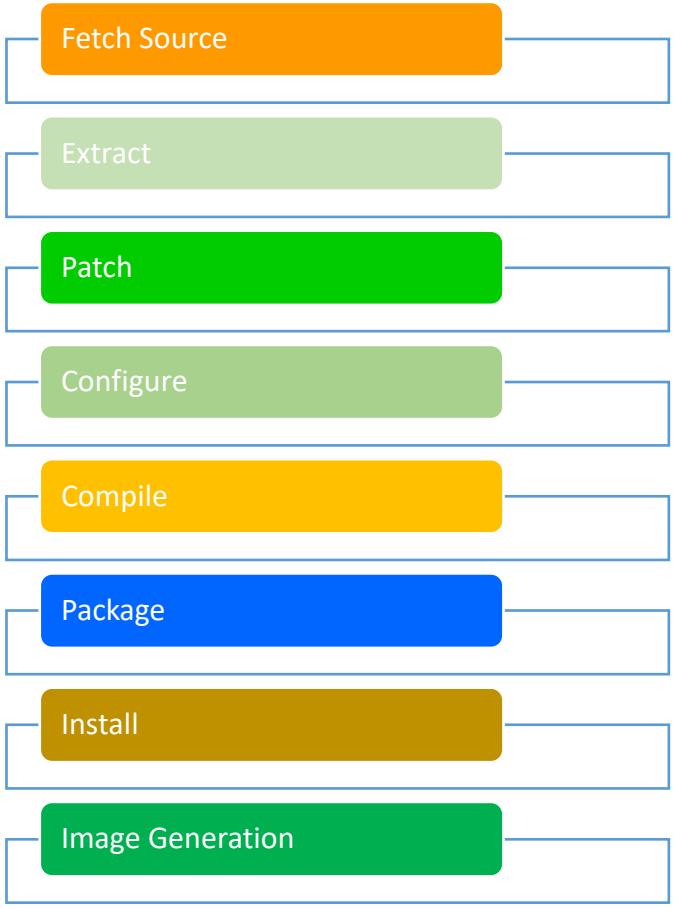
https://Community.ruggedboard.com

Linux Build Systems

Build Systems List

- Crosstool-ng
- Scratchbox
- OpenWRT
- PTXdist
- LTIB
- Buildroot
- Open Embedded
- Yocto Project

Build System Functions



Which Build-System for my project ?

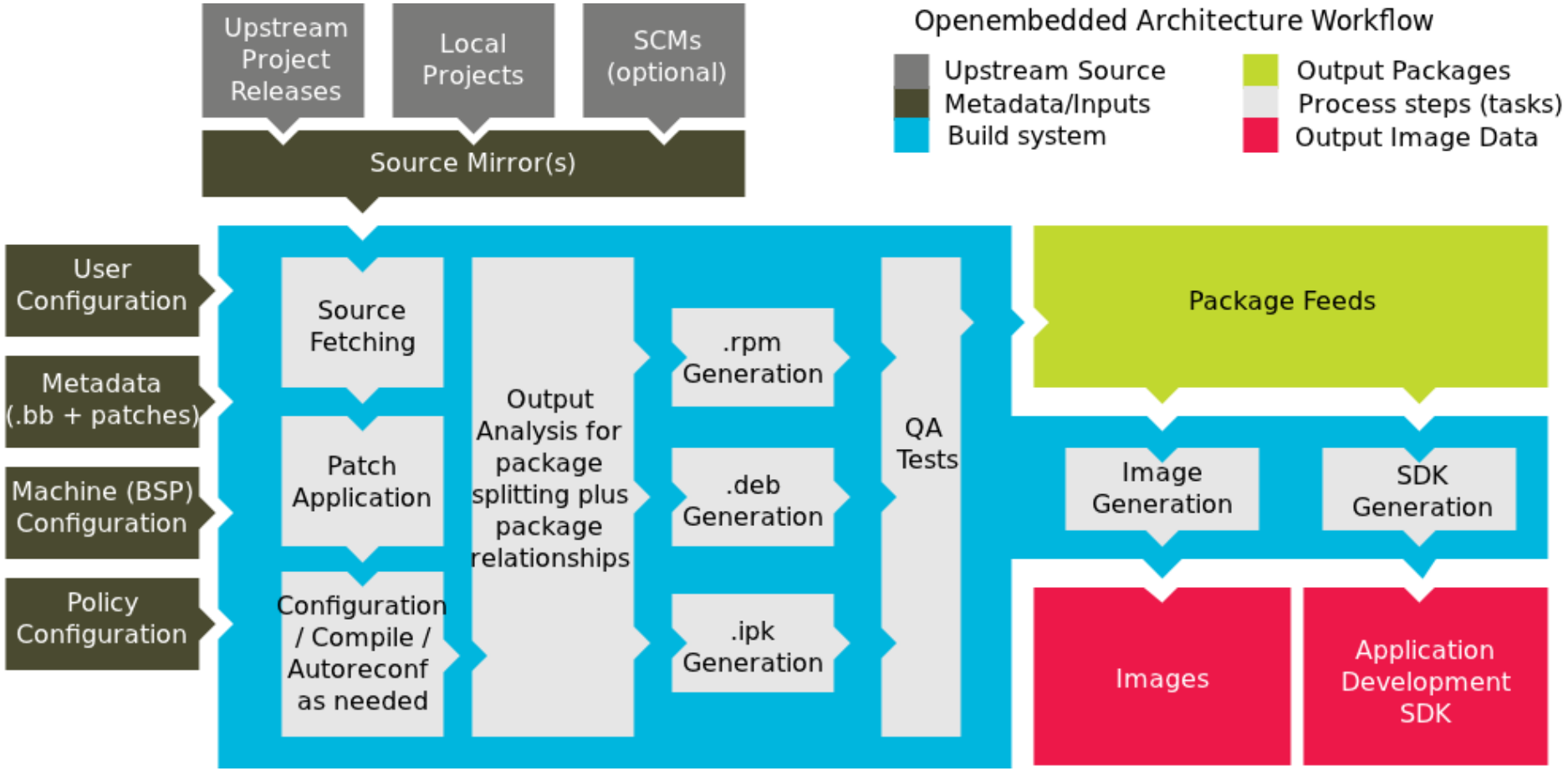
BuildRoot
Making Embedded Linux Easy

/

yocto
PROJECT

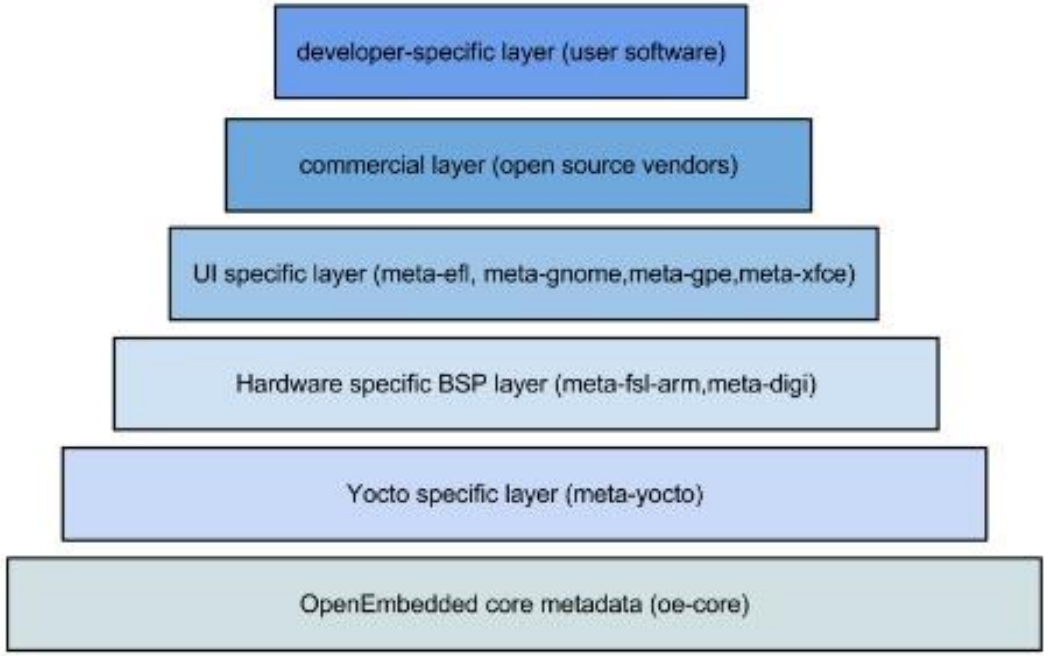
Feature	BuildRoot	Yocto
Small / Simple	Yes	No
Binary Distribution	No	Yes
Build Tool	Make	Bitbake
Focused	Minimal RootFS	Complete Distribution
Arch	Packages	Layered
SDK	No	Yes
Package Mgmt	No (Partially)	Yes
Learning curve	Small	More time required

Yocto ARCH


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
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

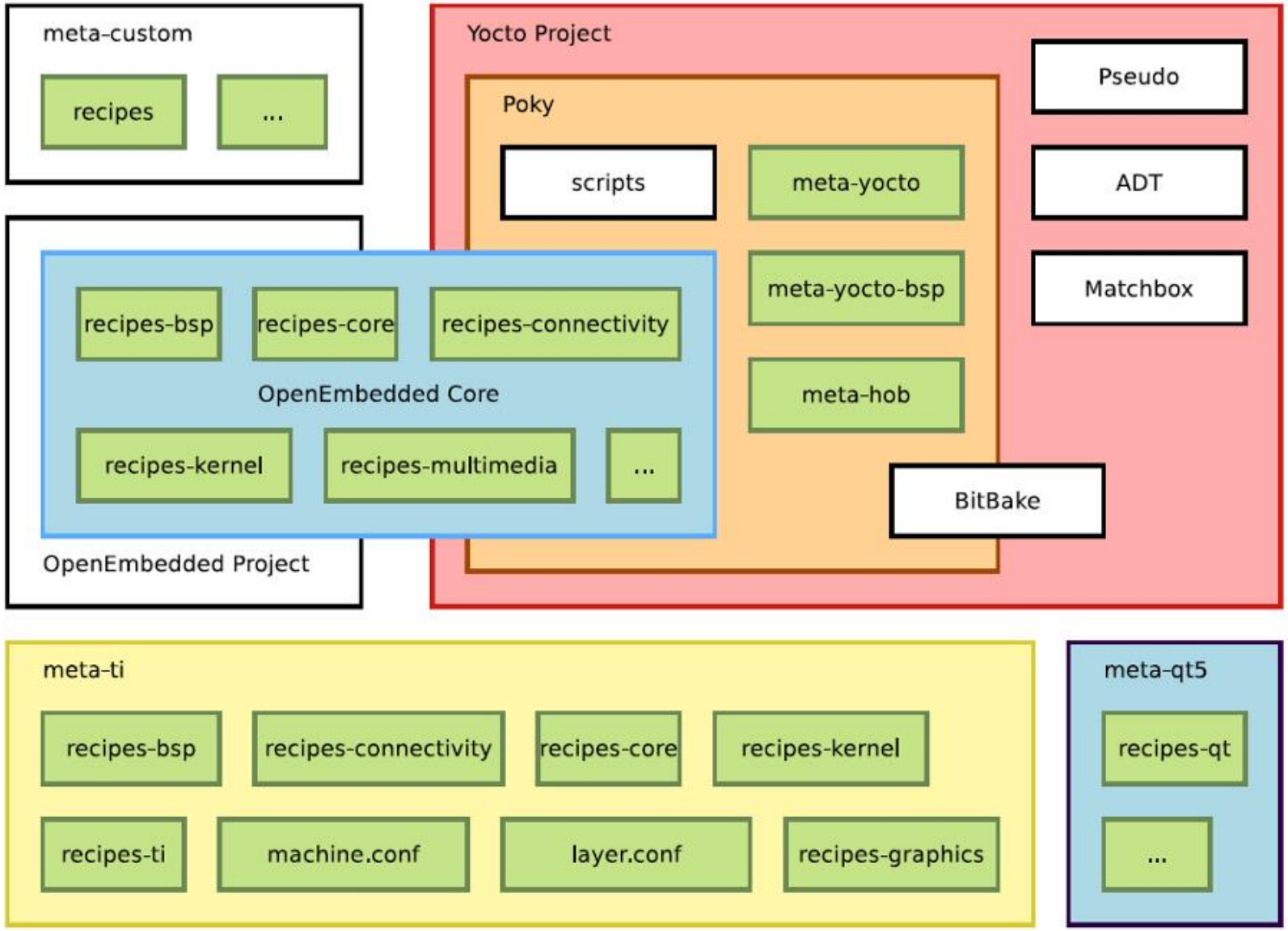
Yocto Layers Overview

Collection of recipes that contain extensions and customizations to base systems.



They are directories to look for recipes and added to **BBLAYERS** in `build/conf/bblayers.conf`

Yocto Building Blocks



Yocto Components

BitBake:
Python program extending Linux make tool capabilities.

Bitbake process commands which can be specified using bb files.
bbfile can be supported using other components/files listed below:

a. Recipes:

Describes package info, version, dependencies, source, compilation & installation path on target.

b. Configuration File:

This file defines all configuration options for machine, compiler, distribution, general and user. (conf/bitbake.conf is sample configuration file)

c. Classes:

.bbclass files contain common information for metadata files.

classes/base.bbclass file is the base class and defines common task (like fetch, upack, configure, compile, install & packing) for all receipies & layers

d. Layers:

Organized group of metadata to acheive a independent module.

Ex. BSP Layer, UI Layer

e. Append Files:

.bbappend fies add or extend build information to an existing recipe file, every append file uses same basefile name as recipe file (formfactor_0.0.bb, formfactor_0.0.bbappend)

COMPILING Yocto for RuggedBOARD:

#Install host packages

$ sudo apt-get install gawk wget git-core diffstat unzip texinfo gcc-multilib \
build-essential chrpath socat libsdl1.2-dev xterm

#Download source

$ mkdir yocto_rba5d2x
$ cd yocto_rba5d2x
$ mkdir sources
$ cd sources
$ git clone https://github.com/rugged-board/poky.git -b sumo-rba5d2x
$ git clone git://git.openembedded.org/meta-openembedded -b sumo
$ git clone https://github.com/rugged-board/meta-rba5d2x.git -b sumo-rba5d2x

#Continue next slide ……

Yocto Compilation

#Configure for RuggedBOARD-A5D2x

$ source sources/poky/oe-init-build-env

$ vi conf/local.conf

Edit MACHINE ?= "rugged-board-a5d2x-sd1“

#Compile

$ bitbake rb-sd-core-image-minimal # For SD Card Images

Or

$ bitbake rb-nor-core-image-minimal # For NOR Flash Images

#Images for SD Card

$ cd tmp/deploy/images/rugged-board-a5d2x-sd1/

#Follow Boot from SD Card Tutorial..

#Images for NOR

$ cd tmp/deploy/images/rugged-board-a5d2x/

#Follow NOR Flashing Tutorial..

Experiments

1. Download the minicom from github and try to configure, compile & test the binary
2. Install bitbake tool
3. Create simple recipe to define few task
4. Test the recipe
5. Create .bbclass file and use it in the first recipe file

Open Discussions

Connect-us