

INTRODUCTION TO THE

yocto .

PROJECT

Yocto Project Dev Day

The Yocto Project Developer Day is a one day, hands-on training event that puts you in direct contact with Yocto Project technical experts and developers, held in conjunction with the Embedded Linux Conference.



About Mii



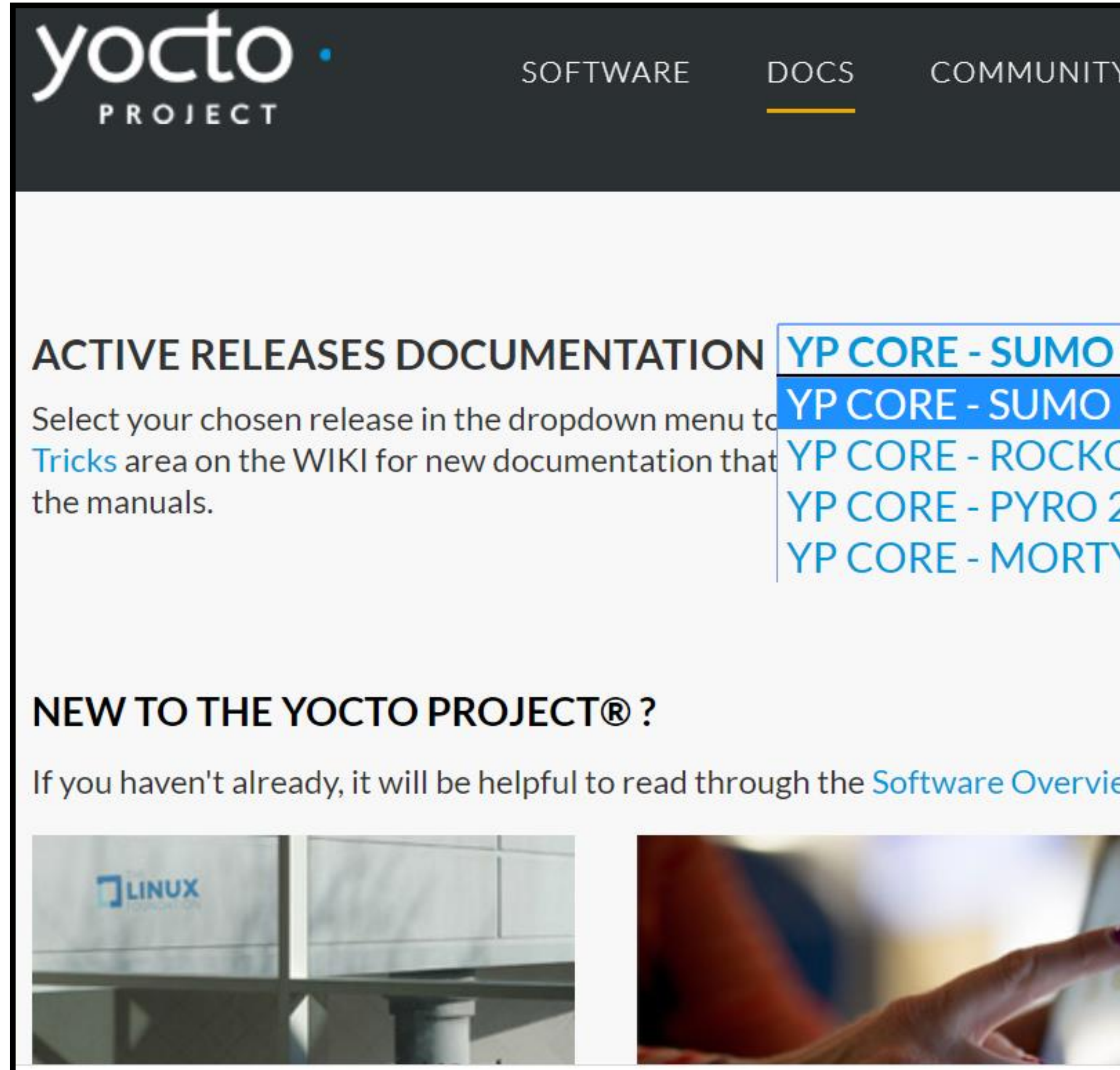
Stephano Cetola

Open Source Firmware
Person

What is The Yocto Project?

The Yocto Project is an open source project that helps developers create custom Linux-based systems that are designed for embedded products regardless of the product's hardware architecture.

--Yocto Project Overview Documentation



The screenshot shows the top navigation bar of the Yocto Project website. The logo "yocto PROJECT" is on the left. To its right are the links "SOFTWARE", "DOCS" (which is underlined), and "COMMUNITY". Below the navigation bar, the main content area features a section titled "ACTIVE RELEASES DOCUMENTATION". Under this title, there is a dropdown menu with the following options: "YP CORE - SUMO", "YP CORE - SUMO", "YP CORE - ROCKO", "YP CORE - PYRO 2", and "YP CORE - MORTY". Below the dropdown, there is a paragraph of text: "Select your chosen release in the dropdown menu to [Tricks](#) area on the WIKI for new documentation that the manuals." Below this paragraph is another section titled "NEW TO THE YOCTO PROJECT® ?". Under this title, there is a paragraph of text: "If you haven't already, it will be helpful to read through the [Software Overview](#)". At the bottom of the screenshot, there are two images: the left one shows a close-up of a white surface with the "LINUX" logo, and the right one shows a hand pointing at a screen.

Check out the manual(s)

- Yocto Mega-Manual
- BitBake Manual
- Yocto Project Website

www.yoctoproject.org/docs/latest/mega-manual/mega-manual.html

www.yoctoproject.org/docs/current/bitbake-user-manual/bitbake-user-manual.html



Yocto Project Building Blocks

Collaboration in the Open Source Embedded Community

Open Embedded

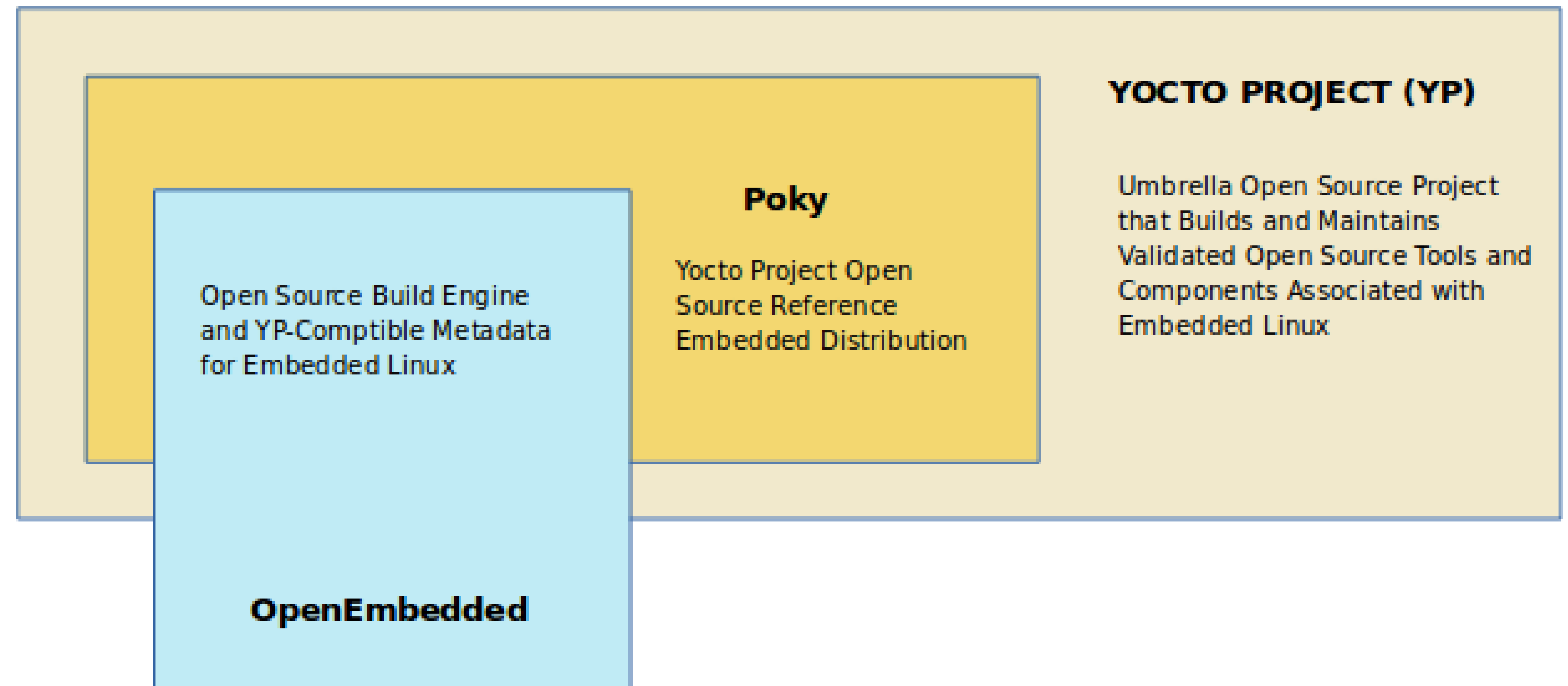
A line drawn in the sand of a rolling release.

BitBake Build Tool

Make-like build tool with modern-day features.

Poky Reference Distro

The base distro for a well tested system.



Levels of Separation

Yocto in Practice

DISTRO

musl
systemd
x11

MACHINE

kernel
bootloader
drivers

RECIPE

scripts
applications
support

IMAGE

console
manufacturing
kiosk web ui

A stack of recipe cards with a black label that says 'RECIPES' in white capital letters. The top card is handwritten and titled 'Pork Chalupas'. It includes instructions like 'from Grams', 'cooking time 6-8 hours', and a list of ingredients: '1 lb. pinto beans', '3 cloves garlic', '3 T. chile pwd.', '1 lg. onion, chopped', 'cumin', and 'jalapenos'.

RECIPES

Keep it Simple

SRC_URI

DEPENDS, RDEPENDS

EXTRA_OECONF, EXTRA_OEMAKE

FILES_*

Images Start Small

You might not need the kitchen sink.

Start small and scale when you need it.

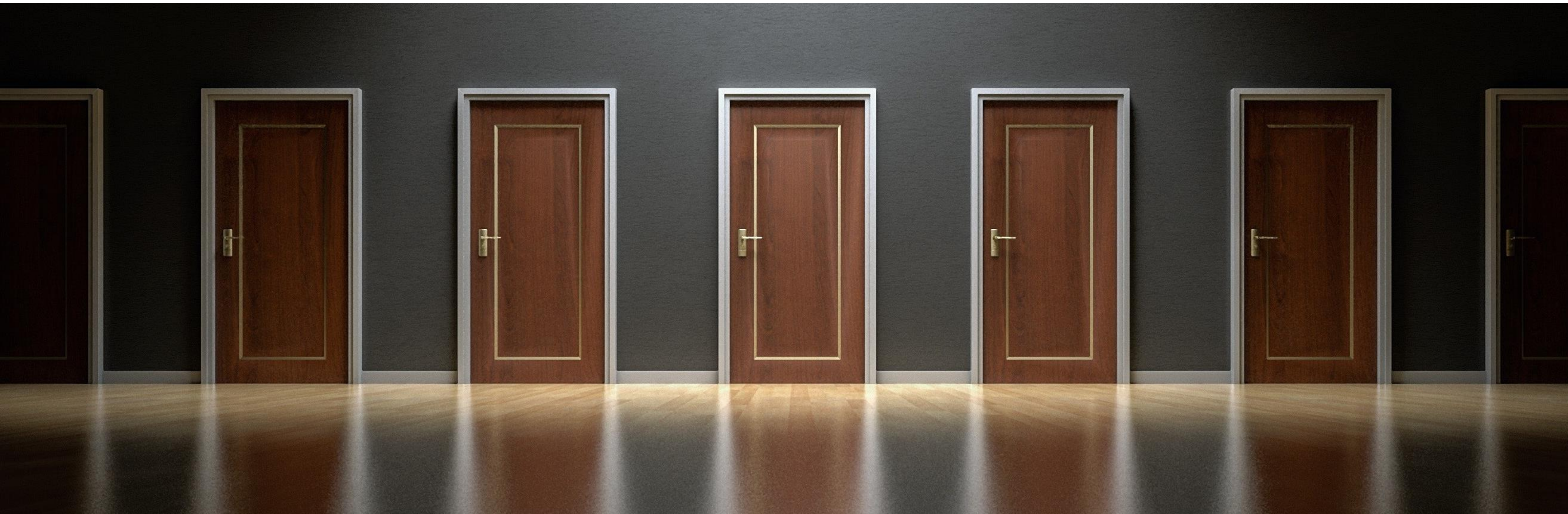


Choose the *right* tools

- **devtool** for recipe creating & editing
- **wic** for image creation & management
- see the **scripts folder** for more!



Why use the Yocto Project?



Yocto Builds Packages

So you don't have to.

- **do_packagedata**
Creates package metadata used by the build system to generate the final packages
- **do_package**
Analyzes the content of the holding area and splits it into subsets based on available packages and files
- **do_package_write_rpm**
Creates the actual RPM packages and places them in the Package Feed area
- **do_populate_lic**
Writes license information for the recipe that is collected later when the image is constructed
- **do_populate_sysroot**
Copies a subset of files installed by do_install into the sysroot in order to make them available to other recipes

- **do_populate_sysroot_setscene**

Yocto cached your sysroots for you. You're welcome.

- **do_populate_lic_setscene**

Because you're not changing your licensing between builds right?

- **do_package_write_rpm_setscene**

No change to the package? Write it out again from cache.

- **do_packagedata_setscene**

Same goes for the meta-data. Update the RPM package feed with cached data.

SSTATE
Caches
Packages

...and so much more!

Yocto Ecosystem

Continuous Integration

autobuilder.yoctoproject.org

Tested Images & SDKs

downloads.yoctoproject.org

Patch Tests & Bug Tracking

patchwork.openembedded.org

bugzilla.yoctoproject.org

Ready-made Recipes

layers.openembedded.org



Yocto Project CI

AUTOBUILDER

X86

ARM

MIPS

PPC

MINIMAL

X11

SATO (MATCHBOX)

MULTIPLE TESTS



Multi Arch

Multi Image

Multi Feature

~~Multiverse~~

Feature Tests

lsb	musl	no-X11	systemd	rpm	intel-gpl	deb	ulibc
X11	non-gpl3	ipk	SysVinit	wic	eclipse	plugins	

Releases

Build History

Error Reports

Image Tests

eSDK Tests

OE Self tests

Before you ship-it...



runqemu

if you cannot emulate it it probably won't boot



Image Tests (runtime)

now that it boots, will it work?



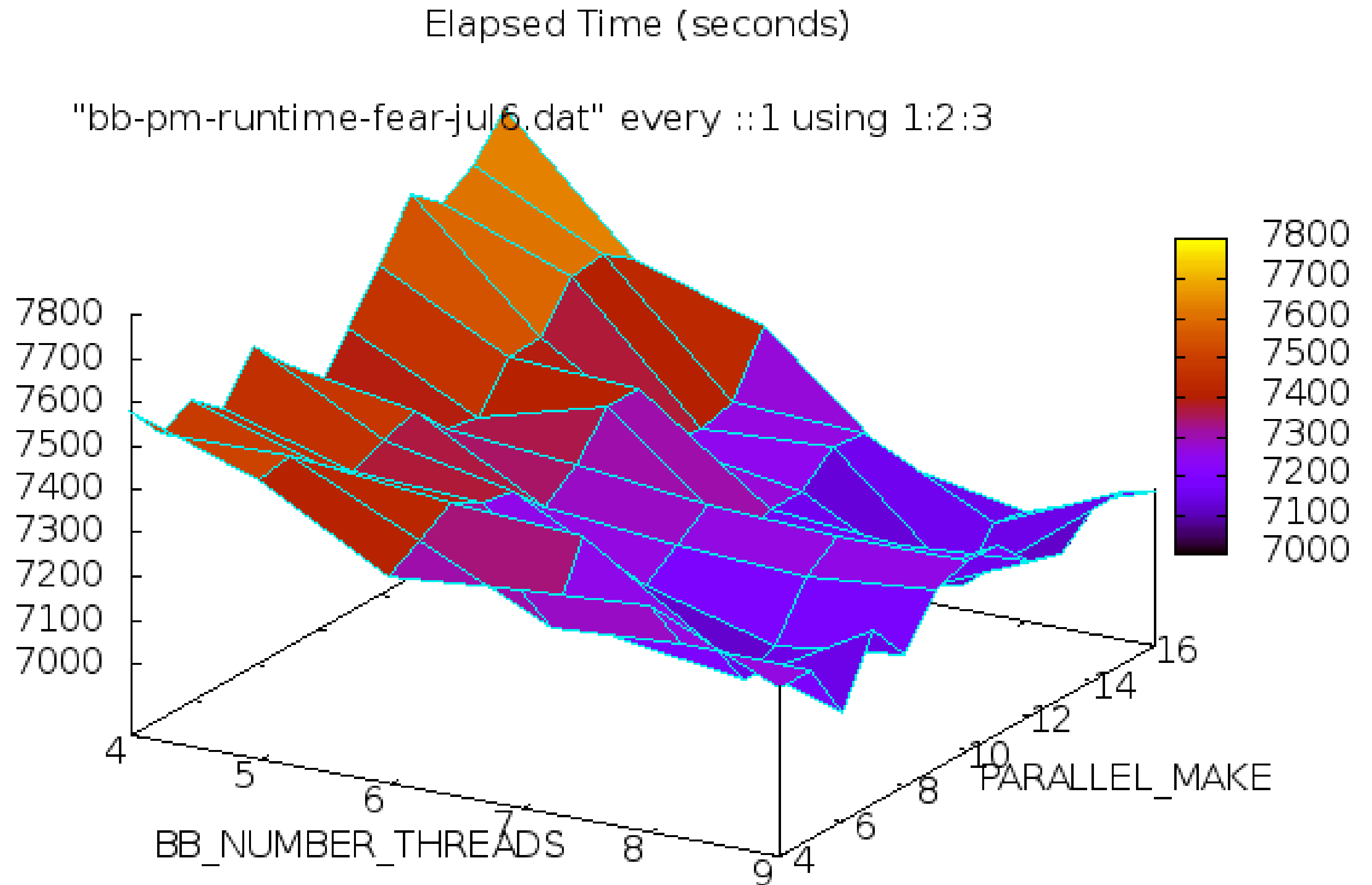
License Manifest File

build/tmp/deploy/licenses



Tune Your Builds

- Collect build metrics
- Identify bottlenecks
- Optimize builds for scale



https://wiki.yoctoproject.org/wiki/Build_Performance

Questions?

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#OE #Yocto (IRC)

