The Yocto Project Overview and Update

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Agenda

- **What is the Yocto Project**
  - Overview
  - Community
- **Current Release Status**
  - Stable Releases
  - 1.4 Status
  - Futures
- **Usage**
  - Block Diagram
  - Layers
  - Build App / Hob Demo

A Collaboration Space

- **A Collaboration Space for many Projects**
- **Build system, tools and content**
- **ARM, MIPS, PPC, and x86**
- **A common place for BSPs**
- **Eclipse plugin for app and system development**
- **Application development SDK customized for each specific device**

- *It's not an embedded Linux distribution*
- *It creates a custom one for you.*

Content in the Yocto Project

- **Internet paths to project sources**
- **Patches for building embedded devices**
- **License information**
- **Build profiles (tiny, minimal, graphical, LSB)**
- **Build Appliance**
- **Example projects – NAS, Web-Kiosk, Trusted**

What makes it different

- **Android**
- **Linaro**
- **Desktop / Server**
- **Others**

Designed for the long term

- **Easy to hack something up but...**
- **What do you do when you need to**
  - Provide complete sources and build instructions
  - Evaluate hardware, optimization tuning, kernel version
  - Filter for license versions (non-GPLv3)
  - Get Commercial support
  - Enable Real Time
  - Security
  - Source Offer
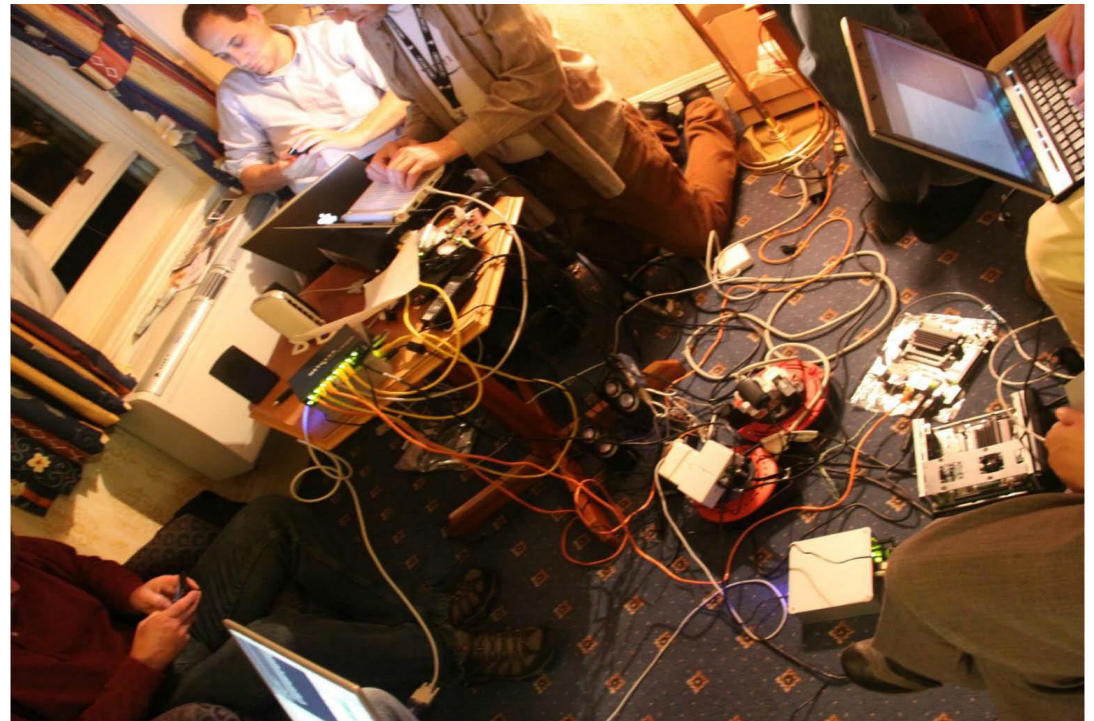
Who are we?

- **Individual Developers**
- **Embedded hardware companies**
- **Embedded OSVs**
- **Architects & maintainers from OpenEmedded**

Who's Involved on the Advisory Board?

provides strategic direction

Yocto Project Ecosystem

- **Participants and Compatible**
    - Yocto Project Participant is appropriate for organizations who use and support the Yocto Project publicly.
    - Yocto Project Compatible is appropriate for products, BSPs and other OE-compatible layers, and related open-source projects.
- **Introduced last year @ ELC-E**
- **19 Participants**
- **5 Compatible Projects:**
    - The Angstrom Distribution
    - The Poky Distribution
    - Enea Linux
   - Mentor Embedded Linux
    - Wind River Linux 5

Following the Community

- **Three well-known professional embedded Linux trainers have created and are teaching Yocto Project material**
  - Linux Foundation (http://training.linuxfoundation.org/)
  - Robert PJ Day (crashcourse.ca)
  - Feabhas (http://www.feabhas.net/)
- **Number of views on video sharing social media sites (YouTube, Vimeo, and YouKu) has approximately quadrupled in the past 12 months**
- **Yocto Project Twitter account has about 2x followers from 12 months ago.**
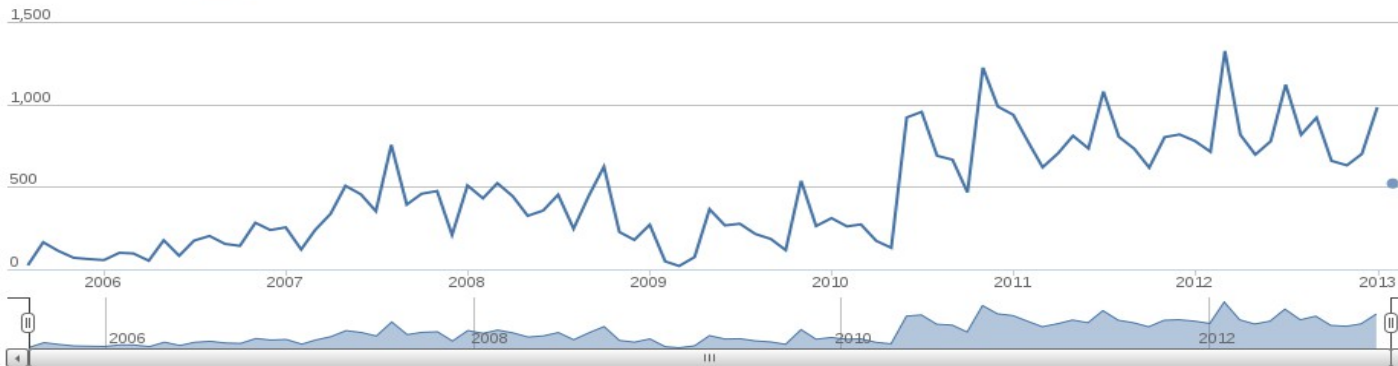- **Facebook and Google+ are both 3x.**

Release Status

- **1.3 Features**
- **1.4 Features**
- **~6000 commits**
- **178 Developers from 72 domains**
- **Multiple Stable Release**
  - 1.2.1, 1.2.2
  - 1.3.1 imminent
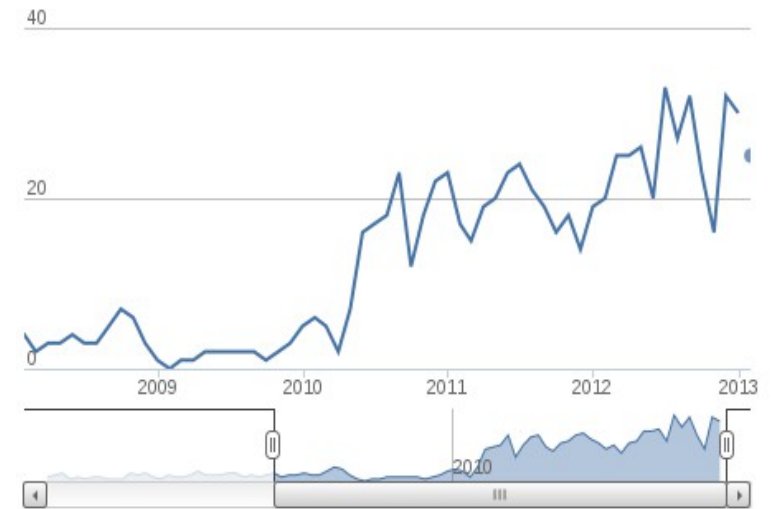
Yocto Project 1.2.2

- **Final release for Denzil-7.0 (1.2)**
- **Patches will be accepted from the Community**
- **Bug Fixed / Backported**
    - 1.2.1 – 35
    - 1.2.2 – 40
- **14 CVEs address**

Yocto Project 1.3 (Danny-8.0) Features

- **Kernel: 3.4.11 – LTSI Intercept**
- **GCC: 4.7**
- **eglibc 2.16**
- **Package updates**
- **Over 500 bugs fixed**
- **Eclipse support for "Juno"**
- **Workflow improvements to Hob**
- **Shared State improvements**
- **Additional Multilib enablement**
- **Command Line interface vastly improved**
- **1.3.1 Stable release – End of Feb**
  - 76 commits
  - 8 CVEs addressed

Yocto Project 1.4 Coming Soon! (Mid-April)

- **Kernel: 3.8 along with 3.4 LTSI Convergence**
- **eglibc 2.17**
- **Package Updates**
- **Systemd as init system alternative**
- **SMART package management**
- **Wayland**
- **Improved documentation**
    - Kernel
    - Deploying Yocto Project in a Work Group
- **WebHob**
- **Eclipse on Windows / Mac**
- **PR Server – no more PR bumps**
- **Performance**
    - pseudo, sstate

SMART Package Management

- **Replaces Zypper**
  - Dependencies (C++, boost, sat-solver)
  - Hardcoded architectures in libzypp
  - No hinting / recommends
- **Why not Yum – rpm5 vs rpm4**
- **Uses Python, lighter weight & smaller footprint**
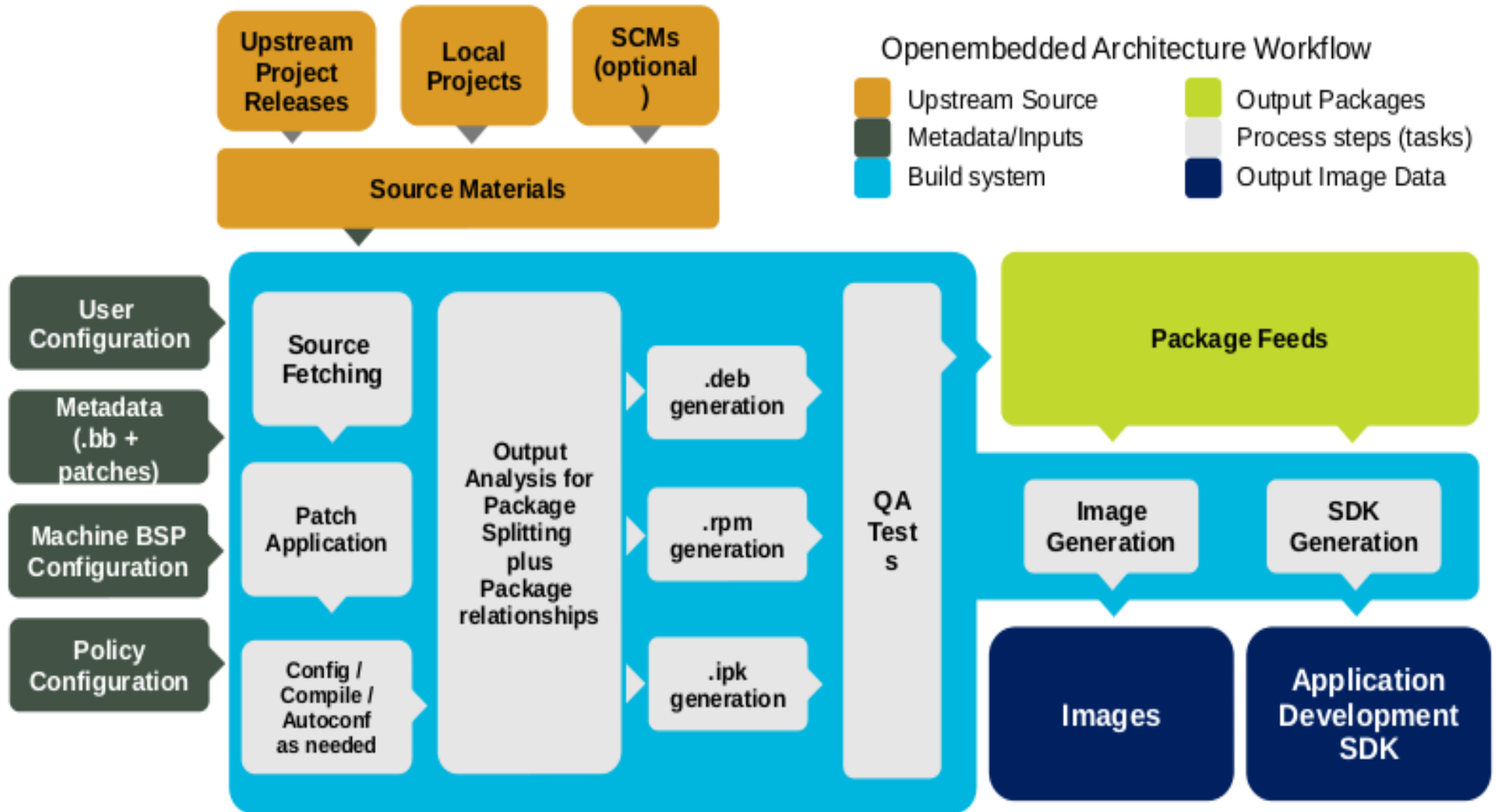- **Upstream is open to change**

Wayland Support

- **Protocol for a compositor**
- **Weston recipe for reference implementation**
  - Minimal and fast compositor
- **Can run on KMS, x11, or openGL**
  - Uses DISTRO_FEATURES

Future Plans

- **Updater**
  - single blob, not package management
  - git.fenrus.org
- **Genext2fs Support for rootfs**
  - Symlinks in libext2 – thanks to Darren Hart
  - Ext4 support to genext2fs
- **Web Hob**
- **Security Scanning**
  - Bastille
  - Compiler / Linker flags
- **Please submit your RFEs to http://bugzilla.yoctoproject.org**

The Cook's Tour

Openembedded Architecture Workflow

Legend:
- Upstream Source
- Metadata/Inputs
- Build system
- Output Packages
- Process steps (tasks)
- Output Image Data

Upstream Project Releases · Local Projects · SCMs (optional) → Source Materials

User Configuration · Metadata (.bb + patches) · Machine BSP Configuration · Policy Configuration

Source Fetching → Patch Application → Config / Compile / Autoconf as needed → Output Analysis for Package Splitting plus Package relationships → .deb generation / .rpm generation / .ipk generation → QA Tests → Package Feeds → Image Generation / SDK Generation → Images / Application Development SDK

Build Appliance / Hob 2 Demo

- **Vmware image bootable on Windows / MacOS or Linux**
- **Build by OE-Core and Bitbake**
- **Quick start to build and test basic images.**

Other Talks / Activities this week

- **We had a great Yocto Project Developer Day at the beginning of the week**
- **About 13 talks this week some already happened, look for more if you are interested**

Take Action Now

- **It's not an embedded Linux distribution – it creates a custom one for you**
  - Lets you customize your embedded Linux OS
  - Helps set up the embedded app developer
  - Both device and app development models supported
- **Getting started is easy**
  - Download the software today
  - Be sure you read the Quick Start to set up your system to use the Yocto Project
  - Build, test on QEMU or real hardware, develop apps

Join the community

- **#yocto on freenode.irc.net**
- http://www.yoctoproject.org
- http://wiki.yoctoproject.org
- **Development through public mailing lists:**
  - yocto@yoctoproject.org, poky@yoctoproject.org **http://lists.yoctoproject.org**
  - openembedded-core@lists.openembedded.org
- **Git Code repositories**
  - git://git.yoctoproject.org
  - git://git.openembedded.org
- **Bug reporting and features requests via**
  - http://bugzilla.yoctoproject.org

Thank you for your participation!