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 OpenEmbedded
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
- glibc 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](http://bugzilla.yoctoproject.org)
The Cook's Tour

Openembedded Architecture Workflow
- Upstream Source
- Metadata/Inputs
- Build system
- Process steps (tasks)
- Output Image Data

Source Materials
- Upstream Project Releases
- Local Projects
- SCMs (optional)

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

Source Fetching
- Patch Application
- Config / Compile / Autconf 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!