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The Yocto Project

Embedded Linux

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Slogan

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

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Introduction

- Yocto = 10^-24
- The aim is to eventually decrease the size of Embedded Linux by avoiding unnecessary libraries
- It also gives us a possibility to add customized libraries/drivers

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Yocto Project (General)

- Basically developed over Python
- It used “Poky” as the build system
  - *bitbake* is the build tool
- Supports multiple core/thread build
- Supported by IBM and OpenEmbedded group
- Basic examples are provided by default for boards like BeagleBoard

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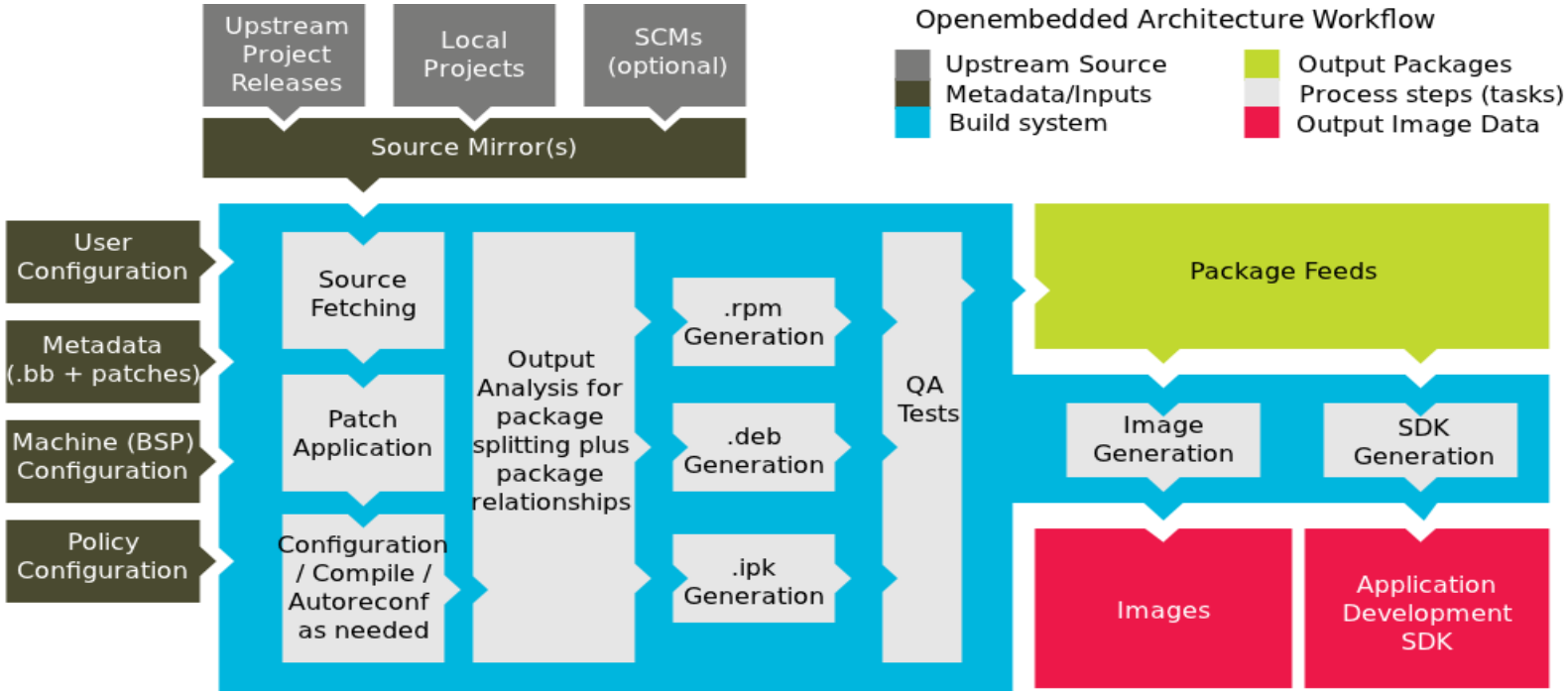
Yocto Project (in Depth)



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Customized Layer for Build

- It's multi-layered
  - *meta-fhjoanneum* – Main layer
    - r*ecipes-fhjoanneum* – Company Specific
    - *recipes-raspberrypi – Machine Specific*
    - c*onf – Configuration files*
      - *layer.conf* – Add about directory structure so that its available for build
      - *include/tune-armv6.inc* – Processor specific
      - *machine/raspberrypi.conf* – Machine specific
      - *distro/kapfenberg.conf* – Distribution specific

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Adding layer to build

```
# We have a conf and classes directory, add to BBPATH
BBPATH := "${BBPATH}:${LAYERDIR}"
# We have a packages directory, add to BBFILES
BBFILES := "${BBFILES} ${LAYERDIR}/recipes-*/*/*.bb \
${LAYERDIR}/recipes-*/*/*.bbappend"
BBFILE_COLLECTIONS += "fh-joannuem"
BBFILE_PATTERN_fhjoanneum := "^${LAYERDIR}/"
BBFILE_PRIORITY_fhjoanneum := "5"
```

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Machine specific Parameters

- IMAGE_FEATURES += "package-management"
- EXTRA_IMAGEDEPENDS += "u-boot"
- IMAGE_FSTYPES += "tar.bz2"
- SERIAL_CONSOLE = "115200 ttyS0"
- UBOOT_MACHINE = "raspberrypi_config"
- MACHINE_FEATURES = "usbgadget usbhost ext2 touchscreen keyboard serial alsa"
- MACHINE_EXTRA_RRECOMMENDS = " kernel-modules"
- KERNEL_IMAGETYPE = "uImage"

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Distribution Specific Parameters

```
require conf/distro/poky.conf
DISTRO = "kapfenberg"
TARGET_VENDOR = "-kapfenberg"
DISTRO_FEATURES_append = " systemd"
VIRTUAL-RUNTIME_init_manager = "systemd"
DISTRO_FEATURES_BACKFILL_CONSIDERED = "sysvinit"
```

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Use-case

- Assume we develop different products
  - Same machine
  - Same Build system
  - Different distributions
- Decreases the development time
- Provides a tool chain for third party development

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References

- https://www.ibm.com/developerworks/library/
- https://www.yoctoproject.org/
- https://www.yoctoproject.org/documentation/build-appliance-manual

Any Questions?

Thank You!