State of OpenEmbedded Internal Toolchain and SDKs

Khem Raj

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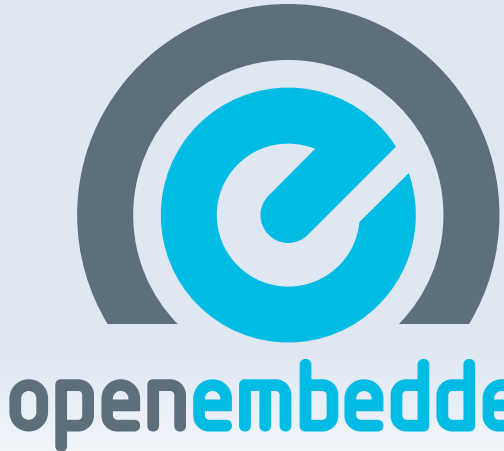

Agenda

- Introduction
- Internal Toolchain
  - Current state
  - Features
  - Pains
- SDKs
  - Build your own SDK
  - Using SDK
- Q & A

What is OpenEmbedded ?

- Framework to build Embedded Linux distributions
- Meta-data describing how to build software
- Includes tools to help build various RFS types.
- Learn more at http://www.openembedded.org
- http://wiki.openembedded.net/index.php/Mailing_lists
- IRC channel #oe on irc.freenode.net

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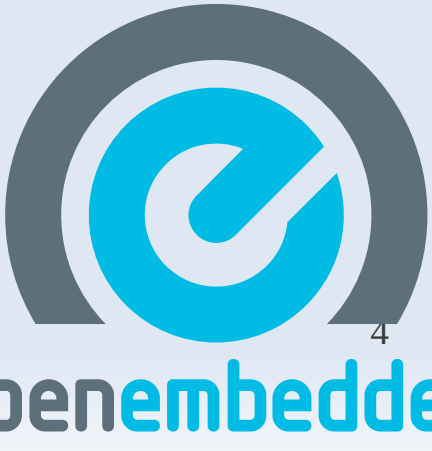
Internal Toolchain

- GNU Toolchain based
  - Supports C, C++, Fortran, objective-C
  - Choice of system C libraries
    - Glibc, eglibc, uClibc



Internal Toolchain

- Multiple versions of Toolchain components available
  - GCC 4.5, 4.4, 4.3, 4.2
  - Glibc 2.10.1, 2.9
  - Eglibc 2.12, 2.11, 2.10, 2.9
  - uClibc 0.9.30, 0.9.31, git
    - Option to select threading model (NPTL/LT)
- Distributions select sane combinations

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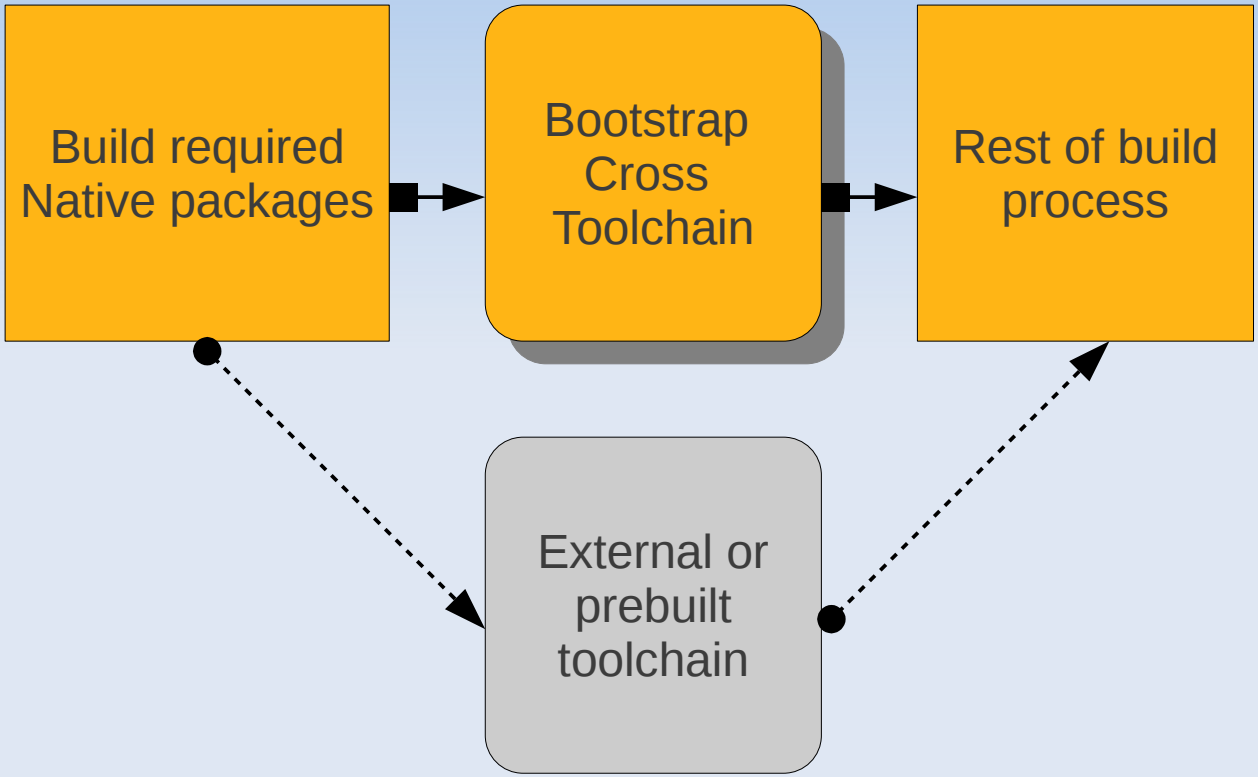
Internal Toolchain



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Internal Toolchain

- Supports Multiple architectures
  - ARM, MIPS/MIPS64, powerpc, x86, SuperH …
- Detects host include poisoning
- ARM
  - Can be configured for hardfp or softfp floating ABI
  - Chosen by setting ARM_FP_ABI = {hardfp|softfp}
    - Only supported with gcc 4.5
  - Linaro gcc 4.5 improvements
- MIPS
  - Configured with –with-mips-plt

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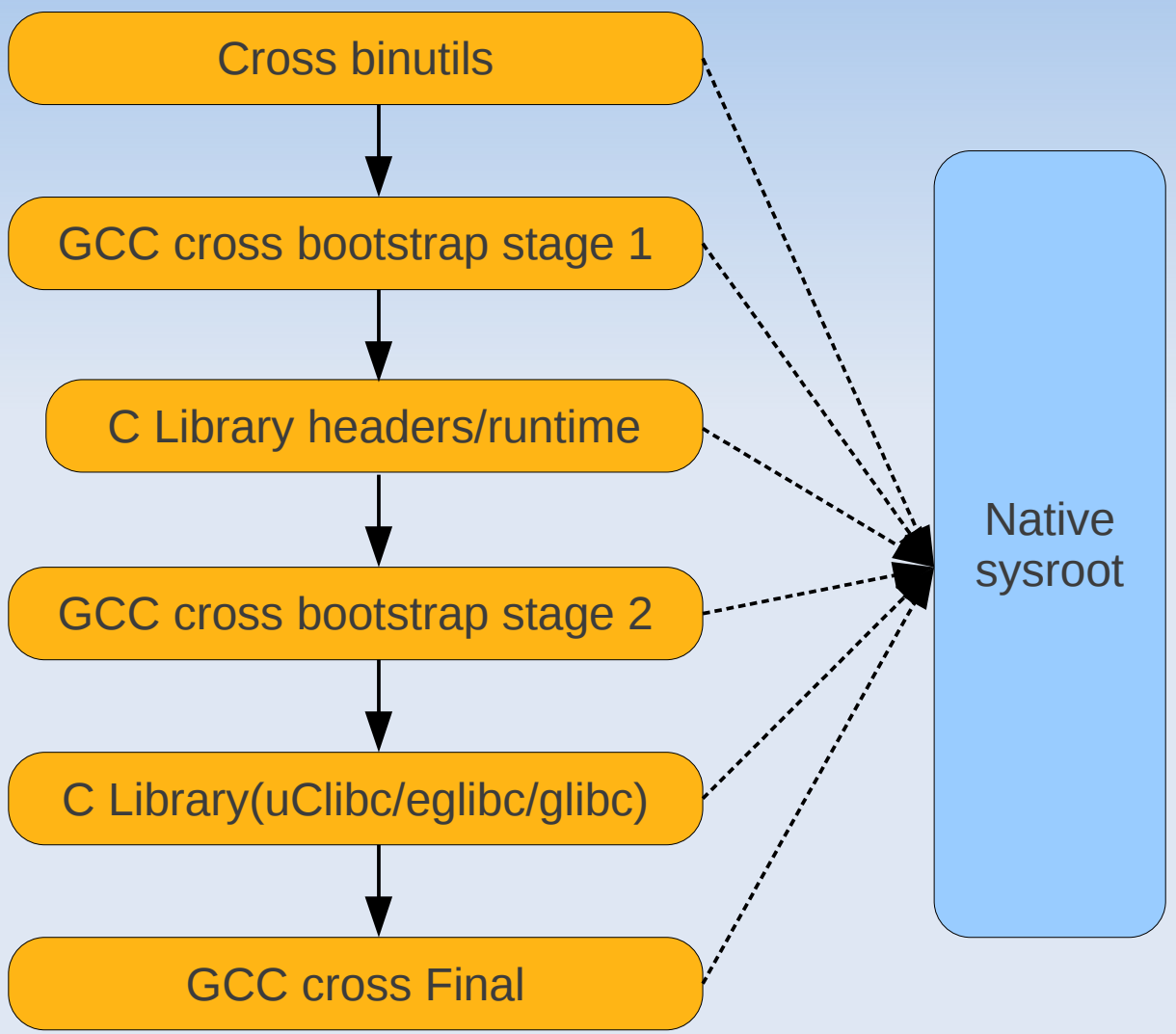
Internal Toolchain



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Internal Toolchain - Niggles

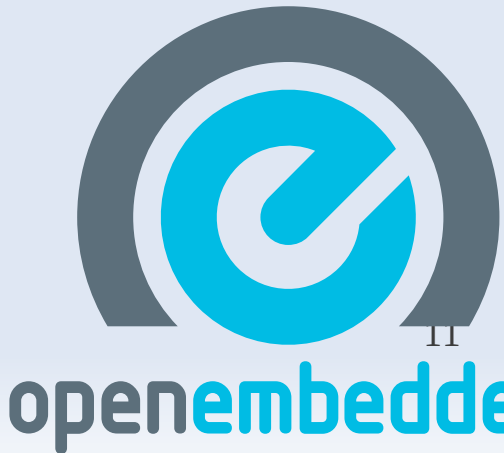
- Rebuilding not so straightforward
- Target support libraries and headers intertwined with cross compiler
- No support for multilibs

OpenEmbedded SDK

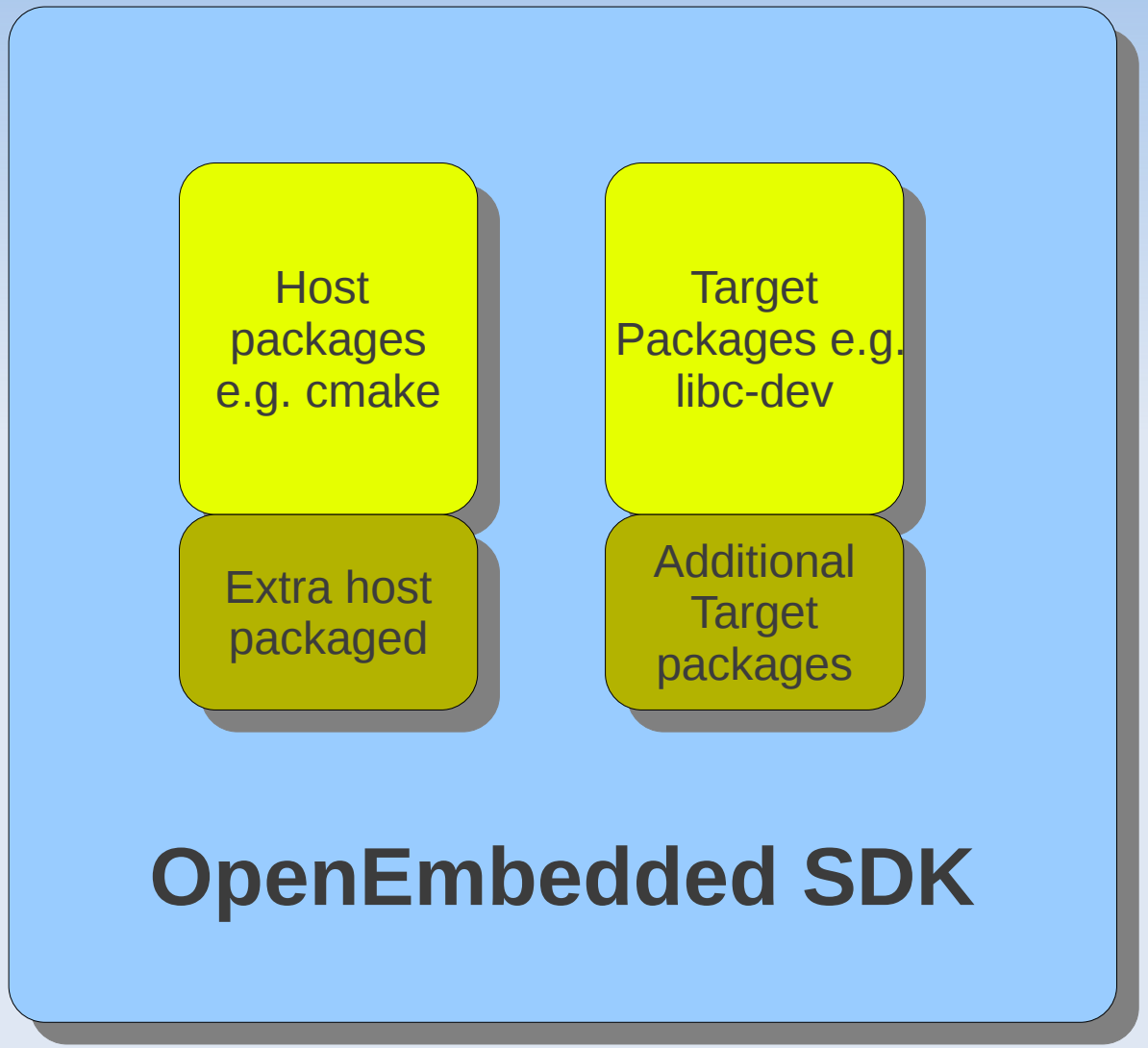
- Some SDKs pre-exist in OE metadata
  - meta-toolchain, meta-toolchain-qte, meta-toolchain-shr etc.
- But thats not all

OpenEmbedded SDK

- OE's SDK generation is easily customizable
- SDK has
  - Host packages e.g. cmake, qemu
  - Target packages e.g. libc headers/libraries



OpenEmbedded SDK



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Creating your own SDK

- Host side
  - Create sdk recipes that need to be part of SDK

```
BBCLASSEXTEND = “sdk”
```

  - Create new task in recipes/tasks task-<YOURS>-toolchain-host.bb
  - Append your packages-<sdk> to RDEPENDS_${PN}
    - `RDEPENDS_${PN} += "your-recipe-sdk”`

Creating Your own SDK

- Target side
  - -dev packages provide headers/libraries and other useful files for development
  - Create a new task task-<YOUR>-toolchain-target.bb
  - Append -dev packages of your recipe to RDEPENDS_${PN} along with task-sdk-bare

```
RDEPENDS_${PN} += "your-lib-dev”
```

Creating your own SDK

- Create meta-toolchain-<YOUR>.bb in recipes/meta
- Set TOOLCHAIN_TARGET_TASK = "task-<YOUR>-toolchain-target"
- Set TOOLCHAIN_HOST_TASK = "task-<YOUR>-toolchain-host"
- Add require meta-toolchain.bb
- Set SDK_SUFFIX to something

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Creating your own SDK

```
bitbake meta-toolchain-<YOUR>
```

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Using SDK

- Untar SDK tarball

```
tar -C / -xjf angstrom-armv5te-linux-gnueabi-
toolchain-qte.tar.bz2
```

- Source the setup script

```
source /usr/local/angstrom/arm/environment-setup
```

- SDK is configured !!

Future

- Use OpenEmbedded Core Features
- Multilib support
- Upgrade to gcc 4.6
- Enable gold along with GNU ld
- Automatic regression testing

QA

Thank you