Cross-compiling OpenJDK

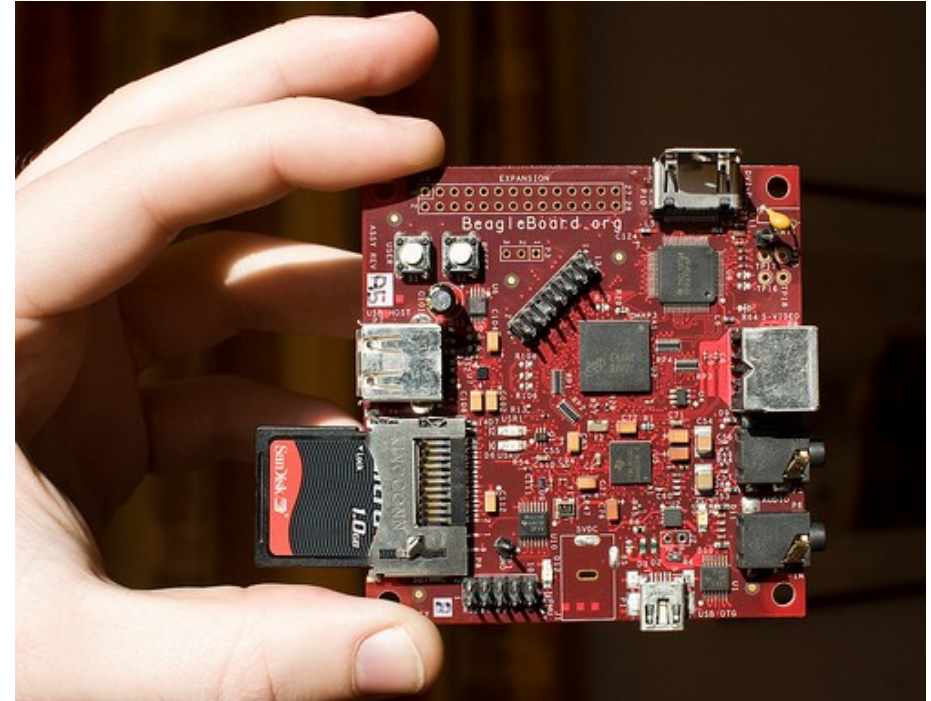↪tarent

Robert Schuster

Why?
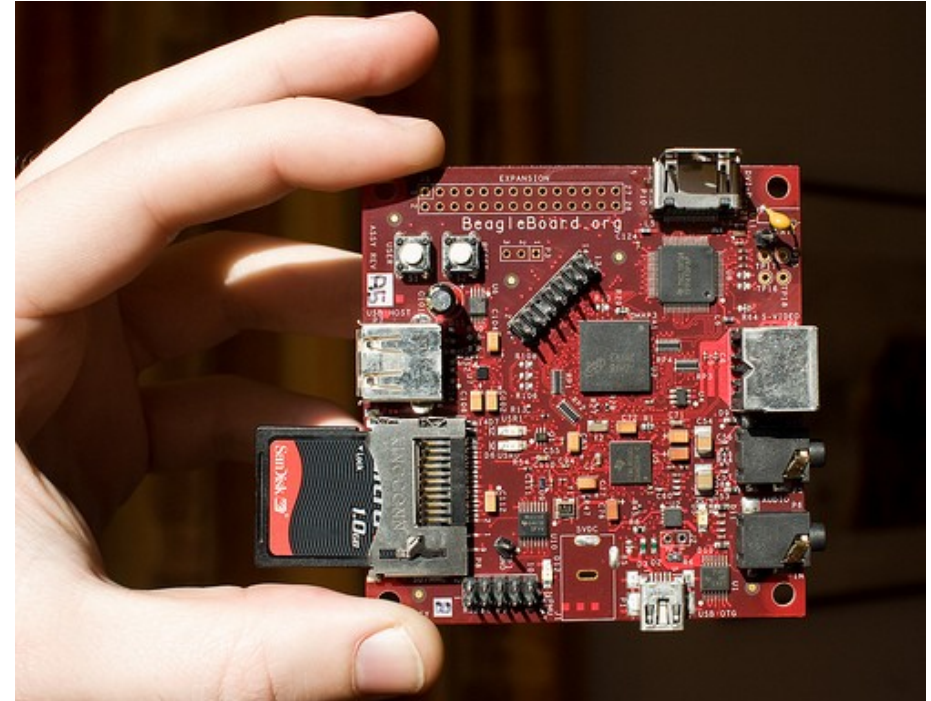
- **Beagleboard**

- **500 MHz**

- **256 MiB RAM**

- **FPU**

Why?

- **Beagleboard**

- **500 MHz**

- **256 MiB RAM**

- **FPU**

This was 2008!

Why?

- **On shelves:**

  – **ARM Cortex A9**

    - **Dual core**
    - **0.8-2.0 GHz**

- **Future:**

  – **ARM Cortex A15**

  – **Targeting in particular servers and heavy-duty wifi equipment**

IcedTea-OpenJDK relationship

↳tarent

- **Provides build harness for OpenJDK**

- **Makes build independent of non-free sw**

- **Usage of system provided libraries (zlib, libpng, …)**

- **Replacement for few non-free bits (color mgmt, WebStart launcher)**

IcedTea-OpenJDK relationship

- **Incubator/Testbed for new technologies**
  - **XRender support patches**
  - **C++-based interpreter (zero)**
  - **LLVM-based JIT (shark)**
  - **Architecture-specific enhancements**
    - **Thumb2EE port**
    - **MIPS/Loongson port**

IcedTea-OpenJDK relationship

↳ tarent

- **Strives for upstream (= OpenJDK) inclusion**

  - **Zero: October 2009**

  - **Shark: August 2010**

- **Earlier those implementations passed the TCK**

Practical outcome for packagers

- **IcedTea turns**

    make MANY=1 CRAZY=1 THINGS=1

    (including assumptions about existence of certain tools in path)

Practical outcome for packagers

↳tarent

- **...into**

    ./configure

    make

    make install

Practical outcome for packagers

↳tarent

- **...almost:**

  ./configure --crazy-things=here

- **But this really helps:**

  ./configure --help

Non-cross build

Prerequisite: GCJ or GNU Classpath-based VM

builds

Intermediate JDK

builds

Final JDK

´make'

Cross build

↳tarent

Prerequisite:
GCJ or GNU Classpath-based VM

builds → Intermediate JDK (Host binary)

builds → Intermediate JDK (Target binary)

Intermediate JDK → builds → Final JDK

Final JDK → links against → Intermediate JDK

Host binary

Target binary
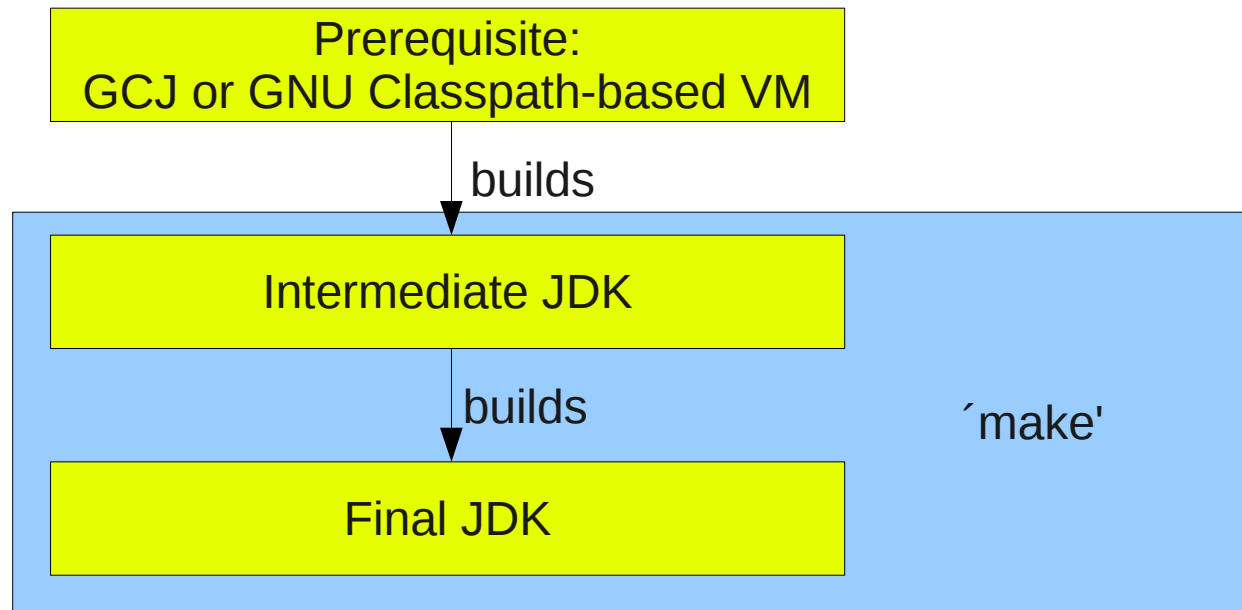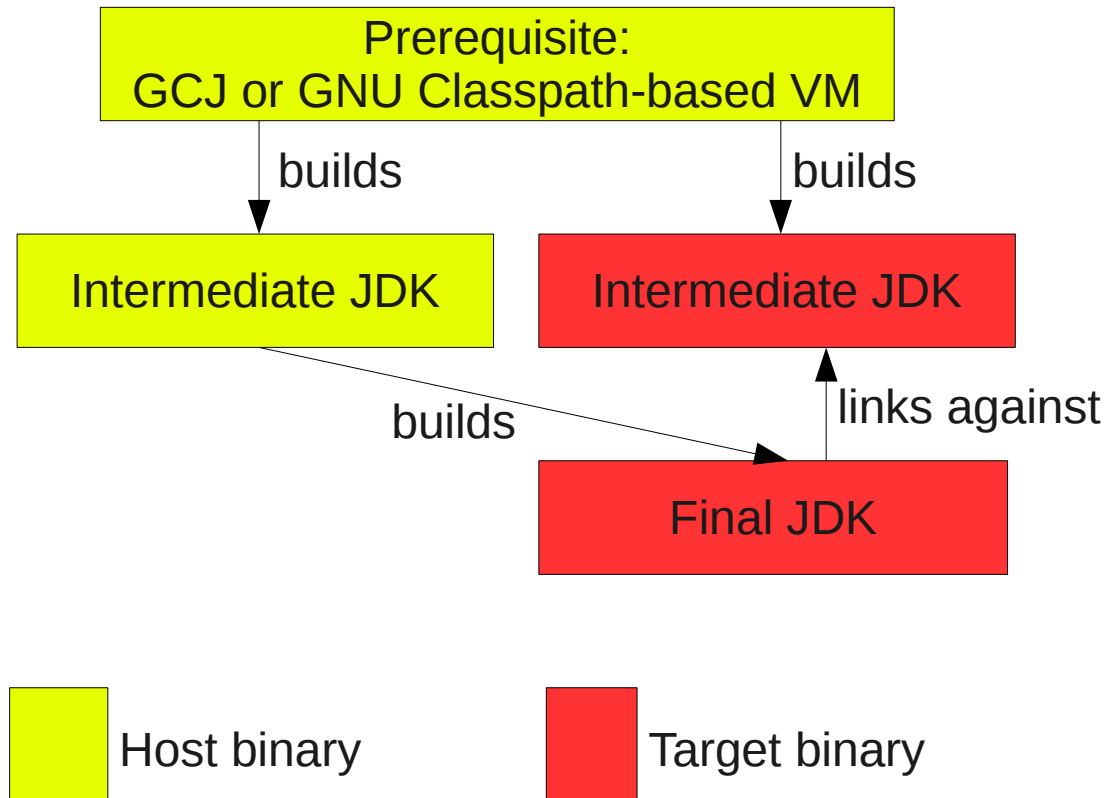
Main trick

- **Use internal make target which stops after intermediate JDK is built**

- **Symlink host intermediate JDK into build (overwriting a few binaries like 'java', 'javac' etc.)**

- **Continue the build**

Other important things

- **Patching away lots of platform checks involving native binaries**

- **Overriding compiler selection**

- **Overriding target machine selection (based on 'uname -m')**

- **Skipping the need for a few binary build helpers**

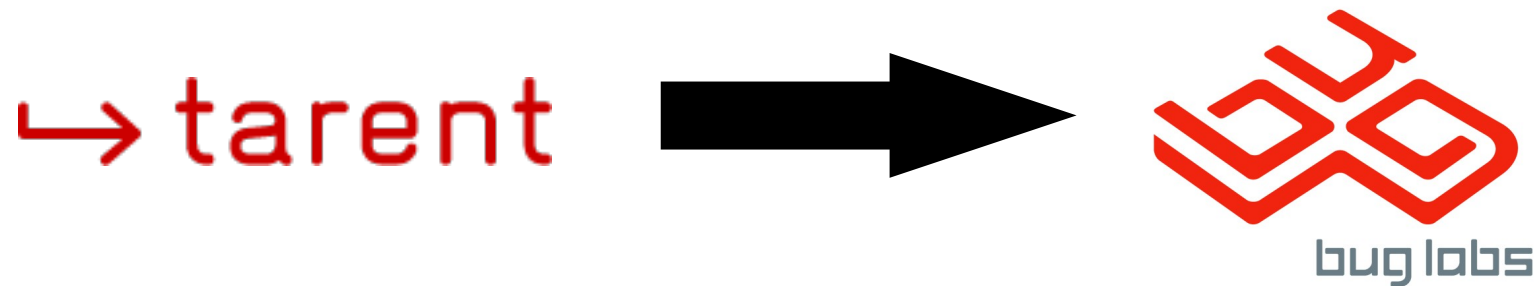- **...**

OpenEmbedded-specific

- **Proper packaging**

  – **JRE-only, docs, dbg, ...**

- **Fancy IcedTea build features:**

  – **Build 3 runtimes in one row using just one class library**

Who, what, where?

- **Part of contractual work for BugLabs**

- **100% OpenSource**

- **All patches are upstream in OpenEmbedded (stable + dev branch)**

Who, what, where?

- **Bringing IcedTea patches upstream is a long-term goal…**

- **…albeit a costly matter**

- **Involves turning quick hacks into nice solutions**

- **Nevertheless part of the changes are upstream**

Contributors

- **Xerxes Ranby (xranby)**

- **Henning Heinold (woglinde)**

- **Myself (rschuster/thebohemian)**

usually to be found in #oe and #jalimo
on irc.freenode.org

More information

- **Jalimo ML: jalimo.org**

- **OpenEmbedded-Dev ML: openembedded.org**

- **Speak to me :)**

Excursus: Zero

- **C++-based interpreter only runtime**

- **Depends on GNU/Linux + GCC**

  - **Should run otherwise unmodified on all arches supported by those**

- **TCK-approved**

- **Part of OpenJDK since 10/2009**

- **Courtesy of Gary Benson, Red Hat**

Excursus: Shark

- **LLVM-based JIT-compiler**

- **Runs on platforms where LLVM has good JIT support for**

- **TCK-approved**

- **Part of OpenJDK since 08/2010**

- **Again courtesy of Gary Benson, Red Hat**

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Q & A

Thanks for listening!

2010-10-27 ELCE Europe 2010