The OpenJDK Project
Past And Present

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Agenda

What Is the OpenJDK Project?
How Is It Run?
How Can I Contribute?
Where Now and Next?

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What Is The OpenJDK Project?

- *The* Open Source Java project
  - Started by Sun in 2006
  - Released Hotspot JVM and Class Library (JDK)
    - under GPL
    - with Classpath Exception
  - Still basis of Sun/Oracle proprietary Java
- Other contributors include
  - Red Hat, SAP, IBM
- http://openjdk.java.net

What Is The OpenJDK Project? (2)

- Distributes mainline OpenJDK releases
  - JDK9 (dev)
  - JDK8, JDK7 (update)
  - JDK6 (Oracle eol – security patches only)
- Produces many OpenJDK versions/variants
  - ports
    - operating system – Linux/Windows/AIX/Solaris/OSX/BSD
    - cpu – x86_32/x86_64/AArch64/ppc/SPARC/zero
  - R&D variants
    - Lambda, DaVinci, Jigsaw, Graal, Sumatra

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What Else Is OpenJDK?

- The Reference Implementation of Java SE

  - Strictly only since JDK7

- Java SE based on Java Language Spec

  - available online or as a printed book

- Each JDK defined by JCP using JSRs

  - R&D projects pave the way for new JSRs

- Conformance ensured by JCK

  - Every JSR required to provide a TCK

  - JCK freely available for GPL derived works

    - But *not* to other Free java projects

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What is IcedTea?

Original code base included non-free code

- provided as binary 'plugs'
- Red Hat IcedTea replaced plugs with free code
  - with help from Sun/Oracle and others
    - Free OpenJDK6 in June 2008
    - Free OpenJDK7 in April 2009
  - Most widely distributed Free Java runtime
- Initially patch-based
  - Download OpenJDK as release bundles
  - patch src + make tree then build

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What Else is IcedTea?

OpenJDK7+ code is now fully free

- IcedTea src/make tree changes upstreamed
- Red Hat now build OpenJDK from cloned repositories
  - pull down upstream changes
  - still maintain variant code base to support . . .
- IcedTea Contributions
  - Zero
    - Interpreter-only ports
  - Shark
    - adds JIT compilation to Zero using LLVM
  - Enable other Java runtimes – Cacao, JamVM etc

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Governance & Protocols

- Governing Board
  - Project's (non-technical) High Court
    - OpenJDK Lead: Mark Reinhold (Oracle)
    - Chair: Georges Saab (Oracle)
    - Vice Chair: John Duimovich (IBM)
    - At Large: Doug Lea (Community), Andrew Haley (Red Hat)
- Project follows Bylaws
  - http://openjdk.java.net/bylaws
  - Essentially a democratic process
    - Propose/Nominate, Vote (several counting models)

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Governance Structures

- Groups
  - Participants sharing interest in a common topic
- Projects
  - Collaborative effort to produce a shared artifact
    - not just code, also docs, specs or whatever
- Project Roles
  - Project Lead & Project Members
    - Participant/Contributor -> Author-> Committer -> Reviewer
      - n.b. -> requires votes
  - OpenJDK Project Lead & Members
    - Can vote on new groups, projects and members

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Planning, Engineering & Release Control

- Opening code =\= opening engineering process
  - Oracle staff still do most of the work
  - many legitimate systematic obstacles to open process
- New development is driving change
  - especially ppc-aix Port, AArch64 Port, Shenandoah
- Oracle are cooperating to open up processes
  - New JIRA instance for bug management
  - Cross-distributor security group
  - London JUG Adopt-a-JSR and Adopt-OpenJDK
    - https://java.net/projects/ljc-london-jug/pages/Home

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Getting Involved

- Start with the OpenJDK web site

  - http://openjdk.java.net

  - FAQ, IRC, Wiki

  - Projects, Groups, Census

  - Source and Bundles

- Find out more on the Wiki

  - http://wiki.openjdk.java.net

- Browse the code!

  - http://hg.openjdk.java.net

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Why all these hg forests!?

- To manage many up/downstream relationships

  - hg repos are cheap!

- Release forests

  - add in upstream then pull downstream

    - features, fixes, security fixes
    - jdk9/jdk9 > jdk8u/jdk8u > jdk7u/jdk7u > jdk6/jdk6

- Development and staging forests

  - push <-> pull

    - jdk9/jdk9 > jdk9/jdk9-gate > jdk9/jdk9-dev > jdk9/jdk9-dev-gate
    - jdk8u/jdk8u > jdk8u/jdk8u-gate
    - jdk8u/jdk8u > aarch64-port/jdk8

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Getting More Involved

- Pick a project and join the mail list
  - e.g. hotspot-gc-dev@openjdk.java.net
- Propose a fix or feature and get feedback
  - if it's a good idea
    - Find a Sponsor
      - i.e. a Committer for the project
    - Become a Contributor
      - sign the Oracle Contributor Agreement
    - Raise a Bug
      - assigned to your sponsor
    - Submit a patch
      - for bigger changes a WebRev (or LJUG's BetterRev?)

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Getting Deeply Involved

- Propose a Project
    - Submit a JDK Enhancement Proposal (JEP)
        - http://openjdk.java.net/jeps/0
    - JEP 1 describes process
- Build Consensus
    - OpenJDK and Group Leads
    - Area Leads
        - (informally appointed cross-Group experts)
- Ensure proposal is "funded"
    - Guarantee adequate resources
    - Guarantee adequate committers

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Oracle-Centred Developments

- Da Vinci Machine

    - invokedynamic & dynamic methods

    - supports JRuby, Clojure, et al + Nashorn

- Lambda

- Jigsaw

    - Penrose (Jigsaw/OSGi)

- Graal/Truffle

    - Ruby et al

- Sumatra

    - Offload work to GPUs

Non-Oracle-Centred Developments

- Zero & Shark

    - upstreamed into JDK7

- ppc-aix Port

    - upstreamed into JDK9

- AArch64 Port

- Shenandoah GC

- Memory Model Update (JEP 188)

- <Your Project Here>

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How can we work together?

- Red Hat wants your research input
  - Advisor/Industrial Partner for research projects
  - Supervisor for MSc/PhD level Interns
  - Sponsor for OpenJDK project proposals
  - Sponsor for contributions
- OpenJDK is Open Source
  - Open requires community
  - So please join in as users and contributors

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Questions?

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