

GNU Classpath

A long living GNU project goes public

LinuxTag 2005



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Overview

- What is it?
- State of affairs
- Compatibility
- Related projects
- Future

What is GNU Classpath?

- implementation of Java class library as free software
- base for other projects
- not:
 - JDK replacement, virtual machine, compiler
- part of our RCS:
 - gjdoc (javadoc replacement)
 - javah, javap, serialver, rmic, rmiregistry

Facts about GNU Classpath

- founded 1998
- ~30 active developer
- ~750 000 lines of code (Java + C)
- every two months a new 0.x release
 - currently 0.15
- many many projects around

Projects around us

AegisVM

Jaos

 Jupiter

gcj

IBM Jikes RVM

kissme

JamVM



JAmiga

 *JamaicaVM*



Kaffe

Sable
M

Jnode 



MAUVE

<http://sources.redhat.com/mauve/>

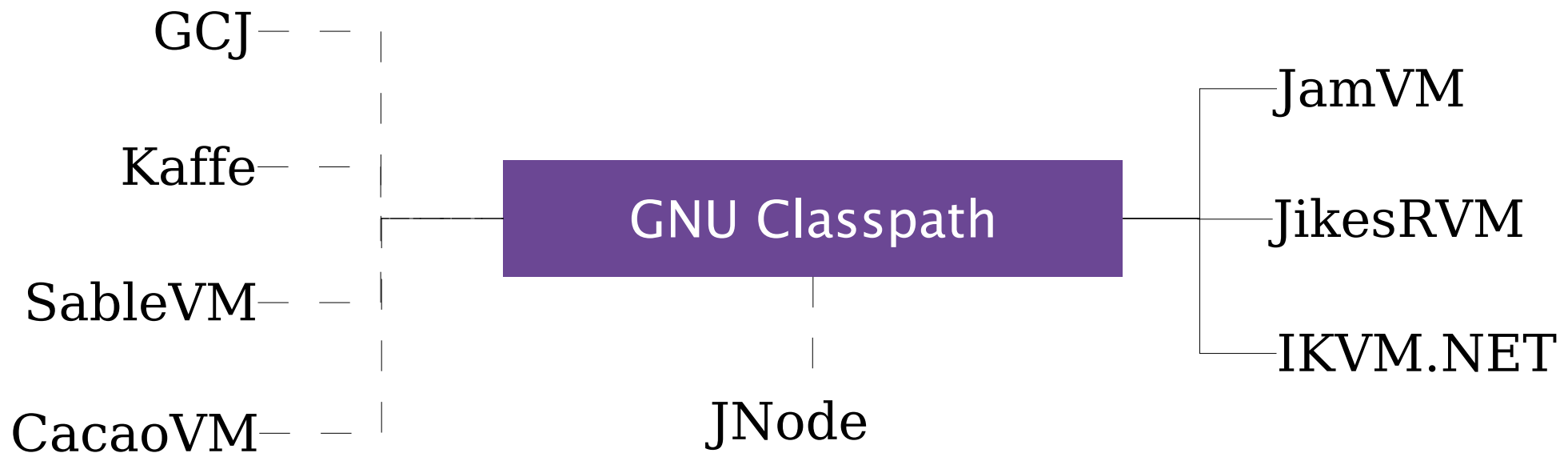
IKVM.NET

Apache Harmony
The Apache Software Foundation
 <http://www.apache.org/>

Apache
Gump



The GNU Classpath Idea



————— “out of the box” (goal)

- - - - - keeps private copy

How far are you?

- ~ 83% coverage of 1.4 API
- mostly stable:
 - java.{ lang | math | io | nio | rmi | security | util }
- call for action
 - AWT peers
 - Swing
 - Beans
 - Corba

How is the progress?

- good
 - AWT/Swing, Corba, debugging interface (JDWP)
- will be integrated soon
 - GNU Crypto
- future incorporation
 - Tritonus (Java Sound API)
 - JMX API
 - maybe: JacORB

What about Java 5 support?

- *generics-branch* created since fall 2004
- support of the new language features
- new APIs
- compilable since decembre 2004
- ran for the first time in may 2005 with JamVM 1.3.0
- compilers
 - ECJ (compiler of Eclipse 3.1)
 - GCJX (expected at end of 2005)

What works already?

- Eclipse
- Tomcat
- OpenOffice2.0
- ...



Eclipse Platform

Version: 3.1.0

Build id: Gentoo Linux eclipse-sdk-3.1_pre5

(c) Copyright Eclipse contributors and others 2000, 2004. All rights reserved.

Visit <http://www.eclipse.org/platform>This product includes software developed by the
Apache Software Foundation <http://www.apache.org/>

```
http.agent=gnu-classpath/null (libgcj/4.0.0)
java.class.path=/home/rob/tmp/native-eclipse/eclipse-3.1/./startu
java.class.version=46.0
java.ext.dirs=/home/rob/INSTALL/gcc4/share/java/ext
java.fullversion=GNU libgcj 4.0.0
java.home=/home/rob/INSTALL/gcc4
java.io.tmpdir=/tmp
java.library.path=
java.runtime.version=1.4.2
java.specification.name=Java(tm) Platform API Specification
java.specification.vendor=Sun Microsystems Inc.
java.specification.version=1.4
java.vendor=Free Software Foundation, Inc.
java.vendor.url=http://gcc.gnu.org/java/
java.version=1.4.2
java.vm.info=GNU libgcj 4.0.0
java.vm.name=GNU libgcj
java.vm.specification.name=Java(tm) Virtual Machine Specification
java.vm.specification.vendor=Sun Microsystems Inc.
java.vm.specification.version=1.0
java.vm.vendor=Free Software Foundation, Inc.
java.vm.version=4.0.0
```

/	Welcome to Tomcat	true	0	Start Stop Reload Undeploy
/admin	Tomcat Administration Application	true	0	Start Stop Reload Undeploy
/balancer		true	0	Start Stop Reload Undeploy
/jsp-examples	JSP 2.0 Examples	true	0	Start Stop Reload Undeploy
/manager	Tomcat Manager Application	true	0	Start Stop Reload Undeploy
/servlets-examples	Servlet 2.4 Examples	true	0	Start Stop Reload Undeploy
/tomcat-docs	Tomcat Documentation	true	0	Start Stop Reload Undeploy
/webdav	Webdav Content Management	true	0	Start Stop Reload Undeploy

Deploy**Deploy directory or WAR file located on server**Context Path (optional): XML Configuration file URL: WAR or Directory URL: **WAR file to deploy**Select WAR file to upload **Server Information**

Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture
Apache Tomcat/5.0.27	null	Kaffe.org project	Linux	2.6.6-1-686	i686



...

<FirstName> <LastName>

<Company>

<Street>

<City>, <State> <Zip>

05/04/05

Subject: <Subject>

To Whom it May Concern

<ENTER YOUR TEXT HERE>

Letter Wizard

Steps

1. Page design

2. Letterhead layout

3. Printed items

4. Recipient and sender

5. Footer

6. Name and location

Please choose the type of letter and page design

 Business letter

Page design

Elegant

 Use letterhead paper with pre-printed elements Formal personal letter

Page design

Elegant

 Personal letter

Page design

Bottle

This wizard helps you to create a letter template. You can then use the template as the basis for writing letters as often as desired.

Help

< Back

Next >

Finish

Cancel

What about compatibility?

- Mauve

- free test suite (GNU GPL)
- more than 175 000 tests



MAUVE

<http://sources.redhat.com/mauve/>

- Apache Gump

- integration tests
- loads software from RCS, compiles and runs tests
- ~800 packages (eg. Jakarta)



- japitools

- binary compatibility

- still trying to get access to “TCK”

Related projects



Kaffe

gcj

Apache Harmony



The Apache Software Foundation

<http://www.apache.org/>

IKVM.NET

Jnode 

Kaffe OpenVM

- first free VM (Januar 1996)
- run on ~50 platforms (“NetBSD of JVMs”)
- uses GNU Classpath since 2003
 - “out of the box” support is imminent
- strong integration
 - JacORB, Tritonus, GNU Crypto, ...
- meant as a real JDK replacement

GCJ

- GNU Compiler for Java
 - part of the GCC
- compiler and runtime environment (GJ)
- ahead-of-time compiler
 - {source- and bytecode} → machine language
- JNI
 - C++ ~ Java
- in use in Fedora Core 4
- more details: attend Andrew Haley's talk

IKVM.NET

- Java environment based on .NET (Mono and Microsoft .NET)
- bytecode to CIL translation
 - dynamic interpretation at runtime
 - compiler (Jar -> .NET Assembly)

JNode

- operating system written in Java
- available as free software since 2004
- only (x86-) Assembler and Java
- JIT-compiler, interpreter in Java
- uses GNU Classpath

Apache Harmony

- goal: 100% J2SE 5.0 compatible
- no source code, but a lot of fuzz ;-)
- maybe an existing VM is adopted
- usage of GNU Classpath is very likely
 - problems are more of legal nature
- cooperation between ASF and GNU (!)

What's next?

- Eclipse plugin for GCJ
- cairo support for Graphics2D
- display applets using gcjwebplugin
- GNU Autotools support

Ever more?

- platform support
 - Kaffe and GCJ on MIPS:



Getting into the distributions!

- already included in
 - Fedora Core 4
- imminent
 - Debian GNU/Linux
 - Ubuntu
- plans
 - ???*

... and to all the others

*Please get in touch
with us!
We are glad to help.

Roundup

- Classpath is a class library
- raw work mostly done
- Mauve is primary compatibility test tool
- active community around
- ready to get into distributions

How you can help

- Any help is greatly appreciated
 - Test Java programs on free Virtual Machines
 - Write test cases for Mauve
 - Write intellegible documentation
 - Implement library classes
 - Fund development
- How to proceed
 - Look at the task list
 - <http://classpath.org>
 - Both easy and tricky tasks
 - Ask us for details: classpath@gnu.org
 - Copyrights must get assigned to FSF
 - Happy hacking!

Do you want to know more?

- details
 - paper accompanying this presentation (still in German)
- homepage
 - www.classpath.org
- news
 - planet.classpath.org
- here at LinuxTag
 - just ask me questions

Do not miss this!

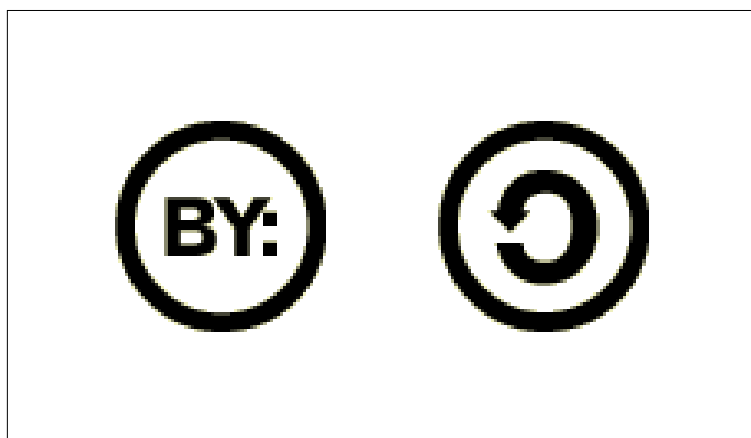
13.30 o'clock

Andrew Haley

GCJ and Classpath: A Free
Implementation of the Java
Programming Language

Thanks!

Some rights reserved ;-)



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