

Apache Geronimo

Open Source Application Server

NY Java SIG

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Apache Geronimo

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

Agenda

- Introduction to Geronimo & the ASF
- How to install/start/stop Geronimo
- Geronimo feature status report
- The Geronimo security system
- Q&A



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Apache Geronimo

Introduction to Geronimo & the ASF

Geir Magnusson Jr.
Geronimo co-founder
Chair of the Geronimo PMC



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What is Open Source?

Not just “code is available”

Simple motivation :

*When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves. **

* <http://www.opensource.org/>



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Open Source (cont)

- Community
 - Healthy and diverse?
- Licensing
 - What license?
- Intellectual Property (IP)
 - Origination? Any encumbrance?



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The Apache Software Foundation

- 501(c)3 non-profit U.S. corporation
- Founded in 1999
- 1100 committers
- 25 projects
- Countless subprojects



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ASF (cont)

- Community
 - most important factor
 - Apache Incubator oversees community for new projects
- Licensing
 - the Apache License v2.0
 - <http://www.apache.org/licensing/>
- Intellectual Property (IP)
 - Documentation and administration (CLA, CCLA, SG)
 - Apache Incubator project there to ensure IP oversight



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Apache Geronimo Project

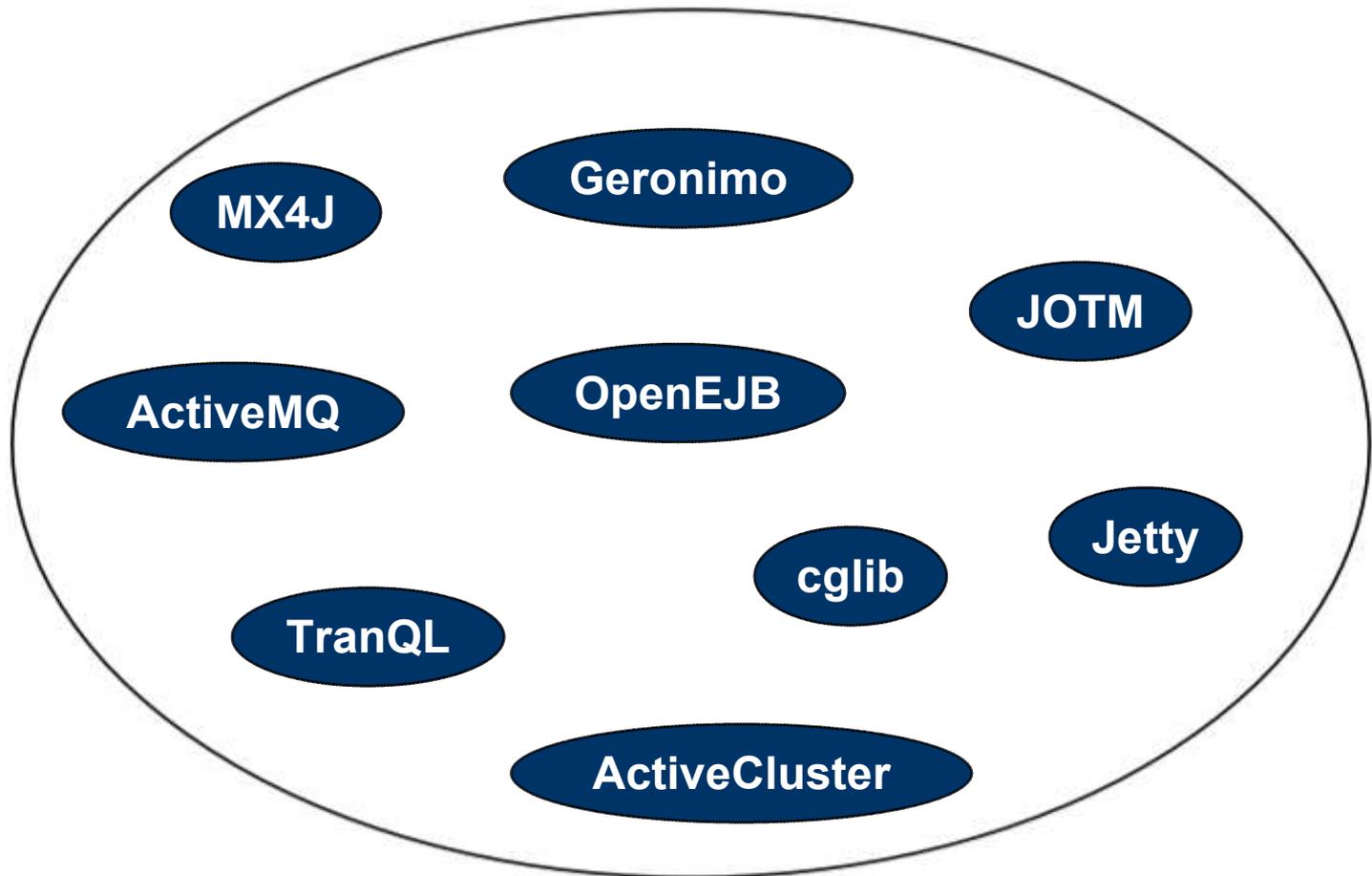
- Founded in August of 2003
- Goals :
 - Compatible implementation of J2EE 1.4
 - Apache License
 - Best of breed technology
 - Strong, diverse, collaborative community



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Collaborative Community “Mosaic”



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Status

- Stable kernel
- 3 milestone releases (more later)
- Growing community (slowly)
- Commercial acceptance of software
- Working towards certification



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Committers

- Aaron Mulder
- Bruce Snyder
- Davanum Srinivas
- David Jencks
- Gianni D'Amour
- Jacek Laskowski
- Jan Bartel
- Jeremy Boynes
- Srinath Perera
- Alan Cabrera
- Dain Sundstrom
- David Blevins
- Geir Magnusson Jr
- Greg Wilkins
- James Strachan
- Jason Dillon
- Jules Gosnell
- Simone Bordot

And we're always looking for more!

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Installation & Operation

Aaron Mulder

Geronimo committer



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Geronimo Installation

- Download a .zip or .tar file from the web site
- Unpack it to create a new Geronimo directory with a standard configuration
- There's also an installer available that lets you pick custom network ports, change the admin account, etc.
- Installer runs with `java -jar installer.jar`



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Starting Geronimo

- From the Geronimo directory, run
`java -jar bin/server.jar`
 - Can actually be double-clicked or run from anywhere
- If you get a stack trace, read the top part of it carefully
 - Most likely it is a `BindException` (“address in use”), because something else is listening on one of the same network ports (8080, 1099, etc.)



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Stopping Geronimo

- What can I say?
 - Ctrl-C
 - “kill -9” also works...

- A shutdown command is overdue :)



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Geronimo Configurations

- Each service or application is a named configuration in Geronimo
 - JDBC Pool, JMS Server, J2EE Server, etc.
- When Geronimo starts, it starts the configurations that were running last time Geronimo was running
- You can use the deploy tool to start or stop configurations by name



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Status Report

Aaron Mulder

Geronimo committer



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High-Level Overview

- Geronimo will be J2EE certified, and will not be released until it's certified
- Milestone release are available as key features are ready for testing & feedback
 - Most recent: Milestone 3, 11/10/2004
- Currently many core features “work” and the rest “mostly work”
- Value-added features are a bit behind



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The Kernel

- The heart of Geronimo is a lightweight container
- It holds Geronimo Beans, or GBeans
- All services and application components are run as GBeans
- GBeans are configurable and manageable, but not too onerous to develop



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The Kernel, cont.

- Supports standard J2EE Management interface
- Supports standard J2EE Deployment interface
- GBeans are configured via an XML deployment plan
- J2EE applications also use a Geronimo deployment plan (“server-specific DD”)



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Configurations/ClassLoaders

- GBeans are grouped into configurations (each of which has a deployment plan)
- Each application is a configuration too
- Configurations are arranged into a hierarchy
- ClassLoaders follow the configuration hierarchy
- Used to add server-level stuff to an app



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Deployment Plans

- Based on XML Schemas not DTDs (just like the standard J2EE 1.4 deployment descriptors)
- Specific schemas are referenced using namespaces
- A single deployment plan may include content from multiple namespaces / schemas



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Web App Service

- As of M3, Jetty is the only web app service
- Tomcat will likely be available in M4
- All Servlet 2.4/JSP 2.0 features are supported
- Configuration options include HTTPS, network ports, etc.
 - options still subject to change



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Web App Deployment Plan

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app
  xmlns="http://geronimo.apache.org/xml/ns/web/jetty"
  xmlns:naming="http://geronimo.apache.org/xml/ns/naming"
  configId="MyWebApp"
  parentId="SomeConnector">
  <context-root>myapp</context-root>
  <context-priority-classloader>true
    </context-priority-classloader>
  <security ...>
  <naming:resource-ref>
    <naming:ref-name>jms/AConnectionFactory</naming:ref-name>
    <naming:resource-link>
      MyConnectionFactory
    </naming:resource-link>
  </naming:resource-ref>
</web-app>
```



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EJB Service

- OpenEJB is the current EJB service
- Supports *most* of EJB 2.1
- EJB QL is not yet complete (simple stuff supported, not CMR navigation, etc.)
- MDB's were a bit broken due to a bug in M3, but are generally working (for JMS and non-JMS providers)
- EJB support is one of the weaker areas of M3



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J2EE Connector Service

- Provided by a custom Geronimo module
- J2CA 1.5 is fully supported
- Inbound and outbound connectors work
- JMS resources and JDBC pools are implemented using connectors
- Provides thread pools to connectors that want to listen on network ports, deliver messages, etc.



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Connector Deployment Plan

```
<connector ...>
  <resourceadapter>
    <outbound-resourceadapter>
      <connection-definition>
        <connectionfactory-interface>
          javax.sql.DataSource</connectionfactory-interface>
        <connectiondefinition-instance>
          <name>PostgreSQLDataSource</name>
          <config-property-setting name="Driver">
            org.postgresql.Driver</config-property-setting>
          <connectionmanager>
            <single-pool>
              <max-size>10</max-size>
              <match-one/>
            </single-pool>
          </connectionmanager>
        </connectiondefinition-instance>
      </connection-definition>
    </outbound-resourceadapter>
  </resourceadapter>
</connector>
```



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Application Clients

- Geronimo includes an application client container (with support for resource and EJB references, etc.)
- “plain J2SE” clients can also connect using JAAS to authenticate and JNDI to look up server-side resources (but not all of them work remotely)
- Current J2SE authentication is a bit clunky



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J2EE Applications (EARs)

- EAR deployment works fine
- May include shared libs on the server filesystem and reference them from an EAR
- May include resources to deploy with the application (JDBC/JMS, etc.)
- EAR ClassLoader hierarchy puts web apps under EJBs & Connectors



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Web Services

- Currently provided by Axis
- No support as of M3, at best partial support for J2EE web services in current tree
- SAAJ and JAX-RPC support working
- No JAXR yet
- This is the other significant weak point as far as spec compliance in M3



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J2EE Deployment

- The operational aspects work well (deploy, undeploy, redeploy, etc.)
- Currently only supports client & server on the same machine, but remote client support is coming soon
- Configuration aspect (supporting deployment plan GUI builders) is behind (the plans need to stabilize)



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J2EE Management

- Management EJB is MIA as of M3
 - Mostly supported in current tree
- Naming and JMX support are working well
- GBeans are made into MBeans and exposed via JMX under the covers
 - GBeans need no JMX awareness whatsoever to make this work!



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Transactions

- Full JTA support, including recovery
- Uses HOWL as the transaction logger, with a custom Geronimo Transaction Manager
- XA support has been tested with Derby and ActiveMQ
- No JTS support yet



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Security

- Can configure realms and map users and/or groups to J2EE roles
- Works with web apps, EJBs, remote clients, etc.
- Common security elements in each module's deployment plan
- More detail on the specifics in the security section of this talk



JDBC Connection Pools

- Configured using a TranQL Connector
- Can be deployed as a standalone Connector module, and referenced from many applications
- Can also be deployed as part of an application, and started/stopped with that application
- May provide the option to enforce scope



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JMS Connections & Destinations

- Provided by ActiveMQ
- The JMS server is deployed as a GBean
- Connection factories and destinations are configured as an ActiveMQ Connector
- Typically the server is deployed as part of the core Geronimo configuration
- Resources may be top-level or in an app



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Other Resources

- URL resources are supported
- JavaMail is not yet supported.
 - We hope Sun will open up their JavaMail implementation
 - Work was started on a Geronimo implementation, but it's a tough spec and slow going



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Deploy Tool

- Used to deploy GBean configurations as well as application modules
- Uses the J2EE Deployment API; most functional when connecting to a running server (can only distribute while offline)
- Typical syntax:

```
java -jar bin/deployer.jar deploy [archive] [plan]
```
- Some operations use the configuration name



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Documentation

- Latest “howtos” are on the Wiki
- Several Geronimo books are on the way
 - The first two chapters of Geronimo: A Developer's Notebook are online at <http://today.java.net/pub/a/today/2004/08/02/geronimo.html>
 - An electronic version of Apache Geronimo Development and Deployment is online at <http://chariotsolutions.com/geronimo/> (currently covering the M3 release)



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Building from Source

- Source is in Subversion
 - Checkout procedure is on the web site
- Build procedure on the Wiki
 - Build requires Maven
 - First build takes around 30 minutes
 - The build process is not always smooth due to the number of projects we depend on
 - Can build some of those projects inline or download as dependencies



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J2EE Compliance

- Several Geronimo developers have access to the J2EE TCK and are actively testing
- We can't say much more than “we're working on it, and it's not compliant yet”
- The first full release of Geronimo will be J2EE compliant



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Recap: Missing Features

- A proper management console
- Clustering
- Full access from remote machines
- Previously mentioned
 - Complete CMP support
 - J2EE Web Services, JAXR, etc.
 - Configuration area of J2EE Deployment
 - JavaMail



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Recap: Working Today

- Web Apps
- J2EE Connectors
- Most EJBs
- Security, transactions, threads, etc.
- JDBC pools, JMS resources
- Deploy Tool
- JMX Monitoring/Management
- GBeans



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Security

Alan Cabrera

Geronimo co-founder



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