Apache Geronimo

Using Apache Geronimo for Real World J2EE Applications

About the Speaker

- Working with Java from 1997
- Author of ‘Pro Apache Geronimo’
- Java CoE Director in US Technology
  - Center of Excellence
  - www.ustri.com

Acknowledgements

- Aaron Mulder (Chaiot Solutions)
  - http://www.chariotsolutions.com/javalab/presentatior
- Jim Jagielski (Covalent), Joe Bohn (IBM), Matt Hogstrom (IBM)
  - **Webcast: Geronimo v1.1.1 Overview: Management (Web) Console and Plugins** (http://tinyurl.com/qymc2)

Apache Geronimo

- An open source application server
  - J2EE 1.4 certified
  - Apache Licensed
  - Reuses the best ASF/BSD licensed code available today
- Consists of Best of Breed open source software like Apache Derby, Apache Tomcat, Open EJB, Active MQ etc

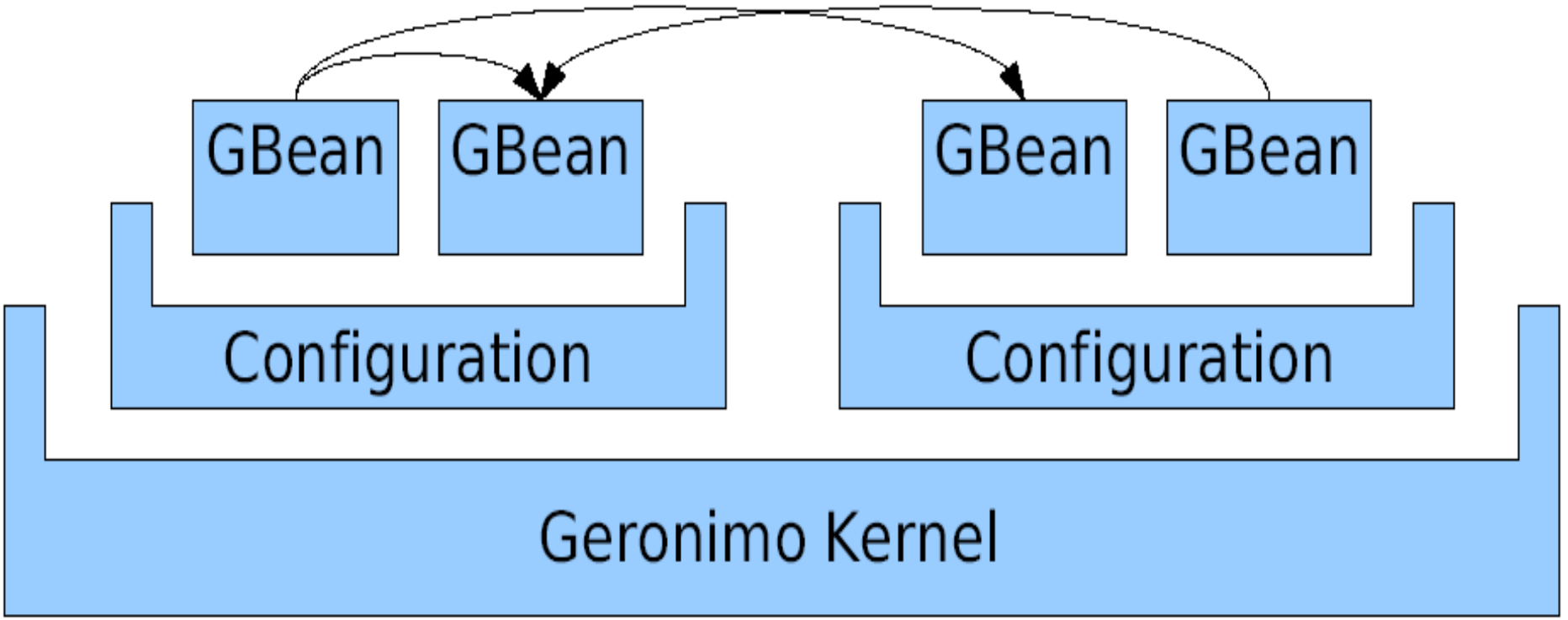
Geronimo - History

- Started as Apache Incubator project in Aug 2003
- Became a Top Level Apache project in May 2004
- Geronimo passed J2EE certification in Jan 2006
- Geronimo 1.1 released in June 2006
- Geronimo 1.1.1 released in Sep 2006

Geronimo – Design

- Modular Architecture
- Atomic unit of a service is a GBean
- GBeans are grouped into modules called Configurations
- Geronimo Kernel is a GBean manager
- Core Kernel Service knows how to load/unload services

Geronimo – Kernel



Geronimo – Kernel

- GBeans are exposed via JMX
- Kernel manages the dependencies of GBeans through IoC and Dependency Injection

```
<gbean name="GerConfigStore“ class="o.a.g.LocalConfigStore">
    <attribute name="root">
        config-store
    </attribute>
    <reference name="ServerInfo">
        <name>GerServerInfo</name>
    </reference>
</gbean>
```

Geronimo – Sample Configuration

(XML pseudocode)

<configuration name="BasicServer">

<GBean – ServerInfo

<GBean – URLFactory

<GBean – ConfigStore

<GBean – ConfigManager

<GBean – PersistentConfigList

<GBean – Repository

<GBean – Logging

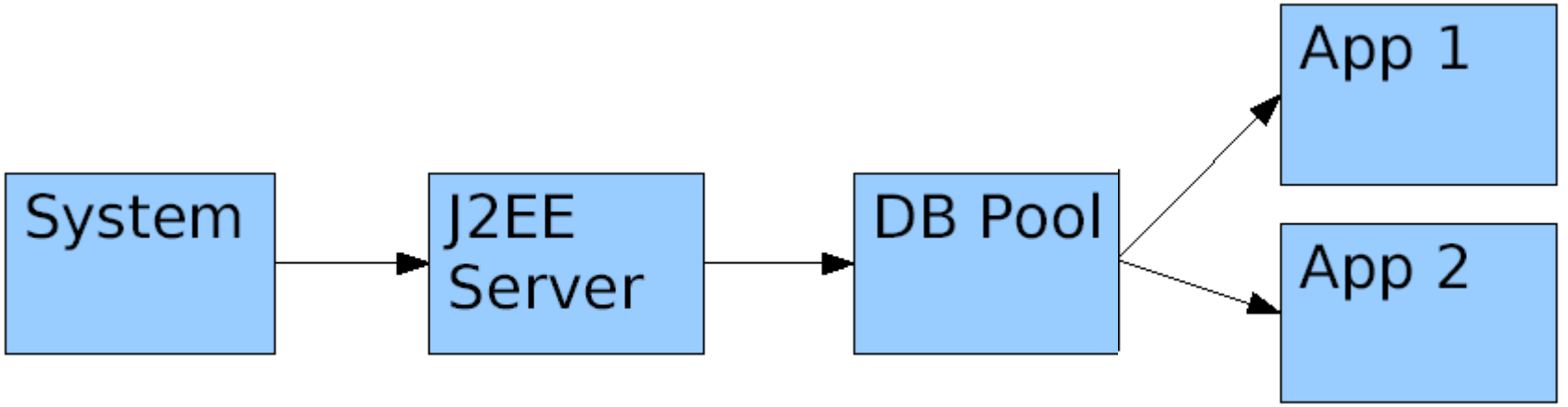
<GBean – RMI Registry

<GBean – JNDI Naming Server

</configuration>

Geronimo – Configurations

- Configuration has parent child relationship
- Classloaders follow configuration hierarchy
- Core Services, containers, deployed aplications are all configurations



Geronimo – Little-G

- Stripped down version of Geronimo
- Consists of a useful collection of features
  - Jetty or Tomcat Web Container
  - A transaction manager
  - Log4j based logging
  - Geronimo plug-in capability
  - Java Database Connectivity support via code from TranQL

Geronimo – Download and Use

- Download from http://geronimo.apache.org/downloads.html
- Install by simply unzipping the contents to a folder
- Start the server
  - startup.bat
  - java –jar bin/server.jar
- Is it running?
  - http://localhost:8080/console

Geronimo – Console

- View system information, configuration and utilization data, some stats
- Management capabilities for:
  - Connectors, DataSources, Message Brokers, Logs, Deployed Applications, etc...
- Wizards for several activities
  - Configuring access to Geronimo via Apache 2 HTTP
  - Creating Database Pools
  - Creating JMS Resource Groups
  - Creating Security Realms
  - Configuring keystores for SSL connectors

Geronimo – Deployment

- **Using Deploy Tool (CLI)**
  - **java -jar bin/deployer.jar help [command]**
  - **java -jar bin/deployer.jar deploy [archive] [plan]**
  - **java -jar bin/deployer.jar start [module name]**
  - **java -jar bin/deployer.jar stop [module name]**
  - **java -jar bin/deployer.jar undeploy [module name]**
  - **java -jar bin/deployer.jar list-modules**
- **Using console web application**
  - **Not available for Little-G**

Geronimo – Deployment Plans

- **XML documents that provide deployment information to Geronimo**
- **Deployments Plans can be used**
  - **For service modules (Configuration)**
  - **To provide server-specific deployment information for applications. This is very similar to J2EE deployment descriptors and can be used to override deployment descriptors packaged within the application package (WAR, EAR etc).**
- **Sample Deployment plan**

```
<?xml version="1.0" encoding="UTF-8"?>

    <web-app xmlns=http://geronimo... configId="MyWebApp“ parentId="J2EEServer">

    <context-root> /MyWebApp </context-root>

    <context-priority-classloader> false </context-priority-classloader>

</web-app>
```

Geronimo –Services

- Web container - Jetty and Tomcat
- EJB container - OpenEJB
- J2EE Connector container – Custom code
- JDBC Pools & JMS Resources – TranQL and Custom code
- Application Client container – Custom code
- JMS server – Active MQ
- Security & Transactions – HOWL, JOTM and Custom code
- Management & Deployment APIs – Custom code
- CORBA & Web Services – Axis, Scout, Yoko ORB and Custom code

Geronimo – For Real World Apps

- Web Applications
  - Jetty and Tomcat Integration
  - All J2EE 1.4 features supported
  - Security including HTTPS, certificates etc
- EJB Applications
  - Through OpenEJB integration
  - EJB 2.1 support
  - Full CMP support
  - Instant stubs via CGLib

Geronimo – For Real World Apps

- J2EE Connectors
  - Implemented using custom code
  - J2CA 1.5 support including Inbound Outbound Connectors, Work Manger, Thread Pools etc
  - JDBC pools, JMS Connection Factories, and JMS Destinations implemented using Connectors
- Enterprise Applications (EAR)
  - Deployment support for EARs
  - Web App ClassLoader under EJB/Connector ClassLoader

Geronimo – For Real World Apps

- J2EE Application Clients
  - Full support for application clients including JAAS, EJB References, Resource References etc
- JMS
  - Integration with ActiveMQ
  - Topics, Queues, Connection Factories etc
  - Full MDB support
- Java Mail
  - Using custom code
  - Can be used via Resource Reference

Geronimo – For Real World Apps

- Transactions
  - JOTM, HOWL, and custom code
  - Full JTA support
  - XA/2PC support
- Security
  - Using custom code
  - Includes support for properties file, DB, Kerberos, client certificate etc
  - Custom realm support

Geronimo – For Real World Apps

- CORBA
  - Supports uses JDK ORB
  - EJBs can be exposed via CORBA or consumed via CORBA including security support
  - Geronimo 1.2 will have its own ORB (YOKO ORB)
- Web Services
  - Uses Axis, Scout, and custom code
  - Support for JAXR, JAX-RPC etc
  - Session Beans and Servlets can be exposed as web service
  - Supports JSR 109 (TODO: CHECK)

Geronimo – For Real World Apps

- Advanced Features
  - JSR 77 support (JMX and MEJB)
  - JSR 88 support (Deployment API)
  - Clustering using WADI

Geronimo – Q&A