Pivotal

BUILT FOR THE SPEED OF BUSINESS

Apache Tomcat 8

Mark Thomas

Pivotal

Agenda

- Introductions

- Java EE 7

- Tomcat specific changes

- Timescales

- Final thoughts

- Questions

Pivotal

Introductions

- markt at the Apache Software Foundation

- Apache Tomcat committer

- Developed the majority of Tomcat 7 and Tomcat 8

- ASF security team member

- ASF infrastructure volunteer

- Consultant Software Engineer at Pivotal

- Member of Servlet, WebSocket and EL expert groups

- Pivotal security team lead

Pivotal™

Java EE 7

Pivotal™

Java EE 7

- Servlet 3.1

- JSP 2.3

- Unified Expression Language 3.0

- WebSocket 1.0

Pivotal™

Java EE 7

- Little / no demand for other Java EE 7 components in Tomcat
  - Java Authentication SPI for Containers (JASPIC JSR 196) Servlet profile

- Web container – Apache TomEE

- J2EE container – Apache Geronimo

Pivotal™

Servlet 3.1

- I am part of the Expert Group

- New features
  - Non-blocking IO
  - HTTP upgrade
  - Change session ID on authentication
  - Protection for uncovered HTTP methods

Pivotal™

Servlet 3.1

- Improvements
  - Clarified some ambiguities
  - Fixes some typos

- Dropped features
  - Multi-tenant
  - Overlays

Pivotal™

JSP 2.3

- There is no JSP expert group

- JSP 2.3 is a maintenance release

- Changes
  - Updates in light of EL specification changes
  - JSPs should only respond to HEAD, GET or POST

Pivotal

UEL 3.0

- I am part of the Expert Group

- Significant changes

- Changed direction a few times

- Make sure anything you refer to is written based on the final version

Pivotal

UEL 3.0

- Access to static methods and fields

- Lambda expressions
  - ((x,y)->x+y)(3,4) evaluates to 7
  - fact = n -> n==0? 1: n*fact(n-1); fact(5) evaluates to 120

- Collection operators
  - filter, map, sorted, forEach, …

- Constructors

- Assignment

Pivotal

WebSocket 1.0

- I am part of the Expert Group

- Tomcat 7 already supported WebSocket
  - Uses own API

- Tomcat 8 supports the new API

- Tomcat 7 (as of 7.0.43)
  - Supports the new API
  - The old API has been deprecated

- WebSocket 1.0 is for clients and servers

Pivotal™

WebSocket 1.0

- Additional features compared to the old Tomcat 7 API
  - Encoding / decoding
  - Annotations

- Differences
  - Tomcat 7's implementation is blocking within a Frame
  - WebSocket 1.0 is non-blocking although some writes do block

- Non-blocking
  - Works with the BIO connector but is not really non-blocking
  - Fundamentally changes the API

Pivotal™

Tomcat Specific Changes

Pivotal™

Tomcat Specific Changes

- Resources
  - Aliases
  - VirtualDirContext / VirtualWepappLoader
  - External repositories for the WebappClassLoader
  - Servlet 3.0 resource JARS

- Tomcat 7 implements each of these slightly differently
  - Very fragile
  - Servlet 3.1 overlays were going to be difficult

Pivotal ™

Tomcat Specific Changes

- New resources implementation
  - Much cleaner implementation
  - Overlays now simple to implement (but have been dropped)
  - Still some areas for possible further work (class loader)

- NIO connector is now the default

- Additional diagnostic information in the Manager
  - SSL ciphers
  - May be back-ported to Tomcat 7
  - Ideas for additional features

Pivotal™

Tomcat Specific Changes

- API changing clean-up
  - Remove duplicated functionality
  - Move Manager, Loader and Resources from Container to Context
  - Move Mapper from Connector to Service

- Code clean-up
  - Reduce warnings
  - IDE, FindBugs, Javadoc, Checkstyle, etc

Pivotal

Tomcat Specific Changes

- Commons DBCP 2.x / Pool 2.x
  - Much better performance on multi-core systems
  - Exposes some information on pool state via JMX

Pivotal™

Progress

- Servlet 3.1
  - Complete

- JSP 2.3
  - Complete

- UEL 3.0
  - Complete

- WebSocket 1.0
  - Complete

Pivotal™

Timescales

- Tomcat 8.0.0-RC1 released 6 August 2013

- Tomcat 8.0.0-RC3 vote happening as I type this slide
  - 8.0.0-RC2 not released

- 8.0.0 expected fairly soon (month or two)

- The first stable 8.0.x release ?

- Best guess: Q2 2014

Pivotal™

Final Thoughts

- Speed of progress to stability depends on the community

- Help wanted!
    - Download the latest 8.0.x release and test it
    - Comment on the discussions on the user and dev lists
    - Report any bugs you find
    - Bug reports with patches especially welcome
    - Coding (new features, bug fixes, clean-up, de-duplication, unit tests)
    - Documentation

Pivotal

Questions

Pivotal™

Pivotal

BUILT FOR THE SPEED OF BUSINESS