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Apache Tomcat 9

Early Preview

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Introduction

- Apache Tomcat committer since December 2003
 - markt@apache.org
- Tomcat 8 release manager
- Member of the Servlet, WebSocket and EL expert groups
- Consultant Software Engineer @ Pivotal
- Currently focused on Apache Tomcat 9

Agenda

- Specification mandated new features
- Tomcat specific new features
- Tomcat features removed
- Internal changes

Specification changes

Specifications

- JavaEE 8
 - Java SE 8
- Servlet 4.0
- WebSocket 2.0?
- EL 3.1?
- JSP 2.4?

Specifications

JavaEE 8

- Key elements
 - HTML 5.0
 - HTTP 2.0
 - Simplification
 - Better integration for managed beans
 - Better infrastructure for the cloud

Specifications

Servlet 4.0

- Work is starting
- HTTP 2.0
 - a.k.a. SPDY
- HTTP 2.0 closest SPDY v4
- Tomcat has an initial SPDY v2 implementation
 - Most browsers have dropped SPDY v2 support

Specifications

WebSocket 2.0

- Work has not started
- Assuming 2.0
 - Could be 1.2
- Standardize extension support
 - Compression
 - Multiplexing

Specifications

EL 3.1

- Work has not started
- Nothing obvious to do here
- Java 8 lambda alignment?
- Most issues opened against UEL are implementation bugs
- Expect minor changes and clarifications

Specifications

JSP 2.4

- There is no JSP expert group
- Just an other maintenance release
- Issues to resolve with EL 3.0 and JSPs
 - Imports (definition and resolution)

Specifications

Other

- Tomcat 9 isn't going to implement the web profile
 - Lack of demand
 - TomEE
- JASPIC
 - Very little demand
 - There are benefits to implementing it
 - In the nice to have category

Tomcat New Features

Tomcat New Features

- Server Name Indication (SNI) support
 - All HTTPS connectors
- Other possibilities
 - HTTP upgrade support for AJP
- Suggestions welcome
 - Suggestions with patches are even better ;)

Removed Features

Removed Features

BIO HTTP and BIO AJP connectors

- Both WebSocket and Servlet 3.1 require non-blocking IO
- BIO connectors currently pretend to be non-blocking
 - Creates complexity
 - No scalability benefits
 - Opportunity for things to break
- Therefore decided to remove them

Removed Features

BIO HTTP and BIO AJP connectors

- NIO implementation remains the default
 - HTTP and AJP
- NIO2 introduced in Tomcat 8
- APR/native still available
 - Requires native library

Removed Features

Comet

- Proprietary interface for asynchronous I/O
- Users are moving (have moved) to WebSocket
- Adds complexity to all the connectors
- Therefore decided to remove it

Internal Changes

Internal Changes

Connectors

- HTTP 2.0 support is going to add complexity
- Connectors are already complex
- Connector code is fragile in some areas
- Aim to clean the code up before starting on HTTP 2.0

Internal Changes

Connectors

- Removed
 - BIO
 - Comet
- Implementation specific per connector code
 - Move to Endpoint
- Implementation specific per connection code
 - Move to SocketWrapper

Internal Changes

Connectors

- Reduce duplication
 - HTTP upgrade reduced to 3 classes from 12
 - Removed ~400 lines (of ~120,000)
- Similar refactoring possible for HTTP and AJP
 - Similar reductions in numbers of classes
 - Greater reduction in lines of code

Internal Changes

WebSocket

- Refactor I/O implementation
 - Direct to Tomcat's I/O layer
 - Not via Servlet 3.1 non-blocking API
- Simpler
- Faster
- Extension support likely to require refactoring

Internal Changes

Other

- Remove use of system properties for configuration
 - Move to per Context / Host / Server / Connector
 - May keep the system property for one version as a default
- Make RFC 6265 CookieProcessor the default
 - Note UTF-8 extension

Get Involved

Get Involved

- Ask questions
 - users@tomcat.apache.org
- Report bugs
 - <https://issues.apache.org/bugzilla>
- Provide patches
 - <https://issues.apache.org/bugzilla>
 - GitHub pull request

Get Involved

- Development
 - <https://svn.apache.org/repos/asf/tomcat/trunk> (9.0.x)
 - dev@tomcat.apache.org
- Update the wiki
 - <https://wiki.apache.org/tomcat>
- You don't need to be an expert
- Documentation needs patches too

Questions

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