

Apache Tomcat as a transport in CXF



Red Hat

R&D Project final Presentation

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13. June 2019, University of Neuchâtel

Project description

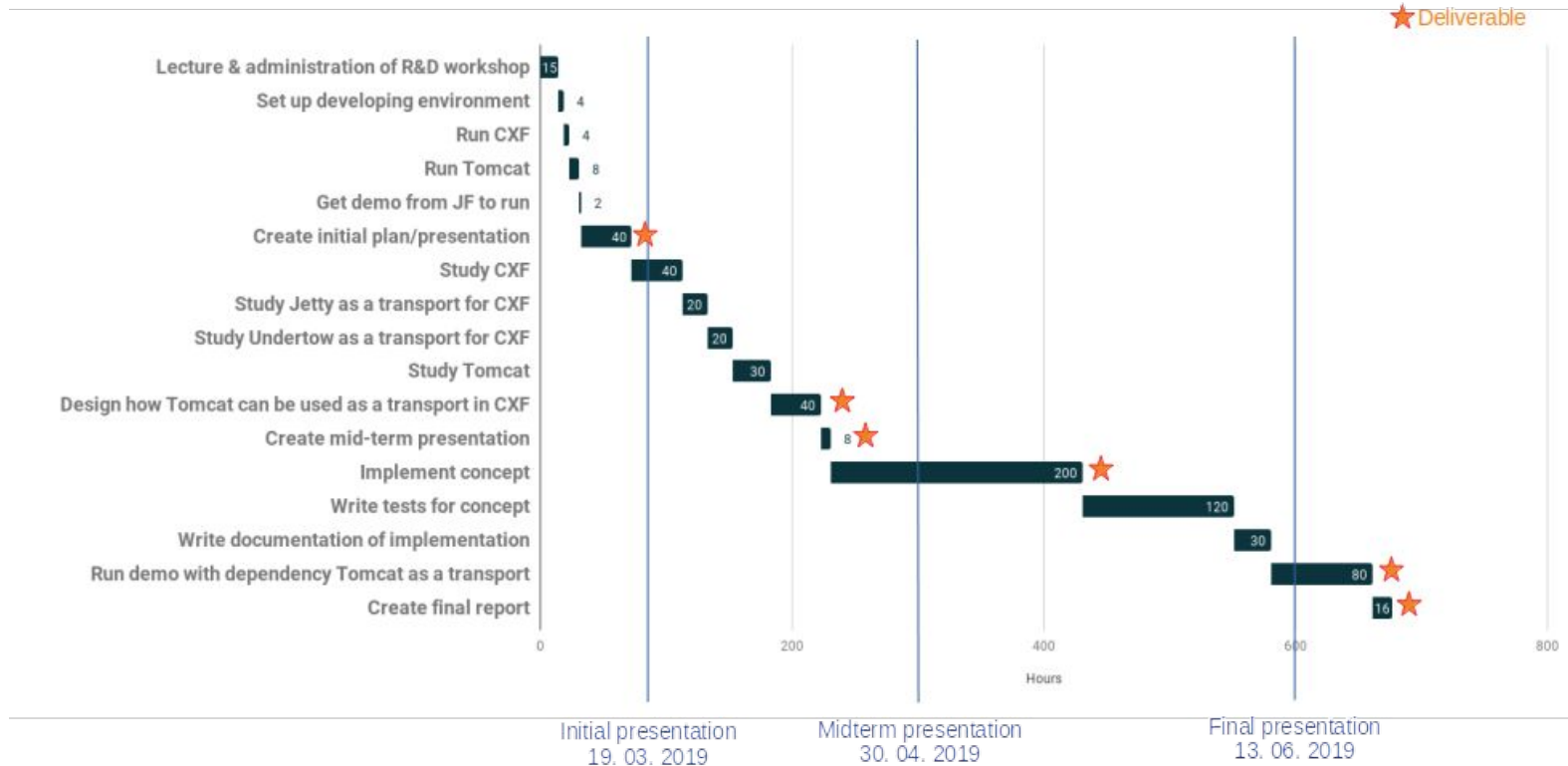
Integration between CXF and embedded Tomcat - is the initial goal of our project.

CXF is an open source java framework that makes writing messaging for applications easier.

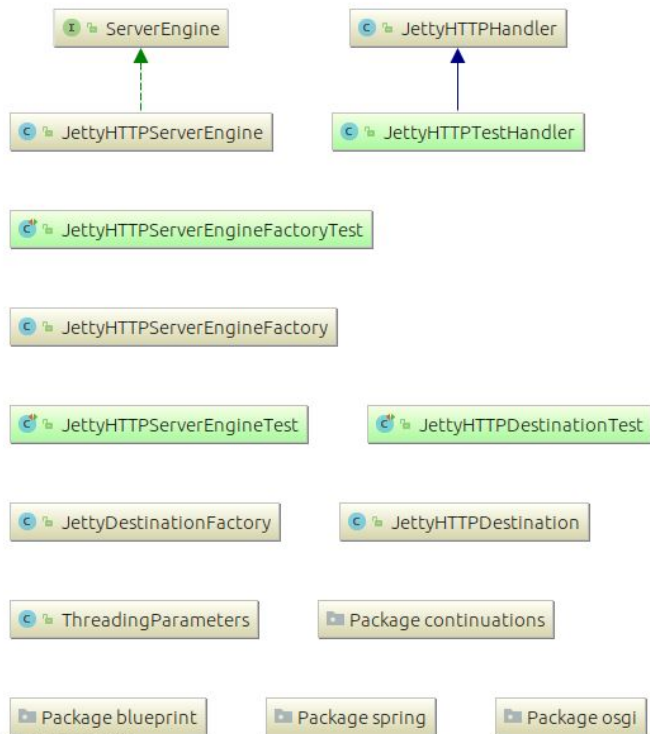
Tomcat is an open source java HTTP web server.

Existing servers as transports in CXF: Jetty and Undertow

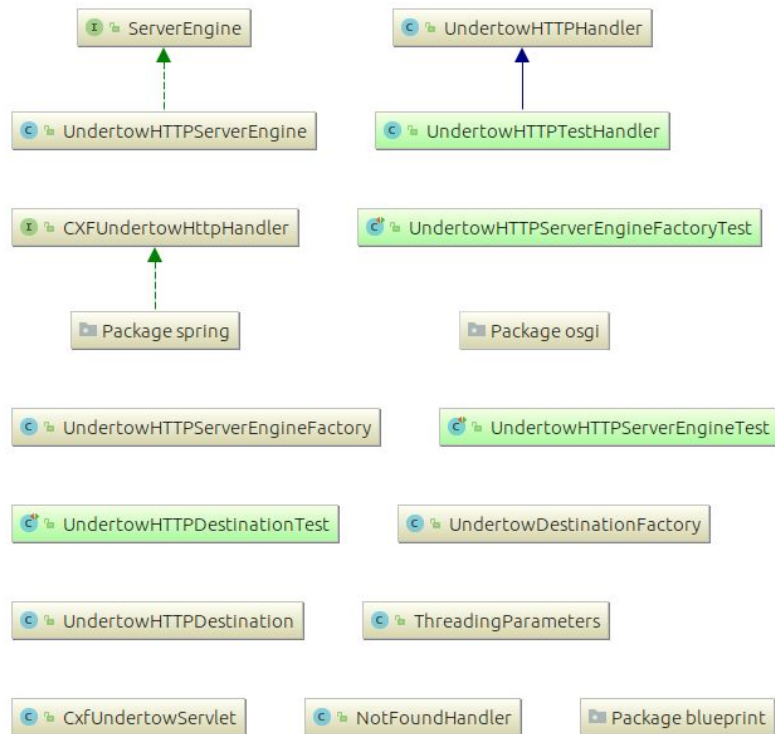
Timeline



Structure comparison for Jetty and Undertow

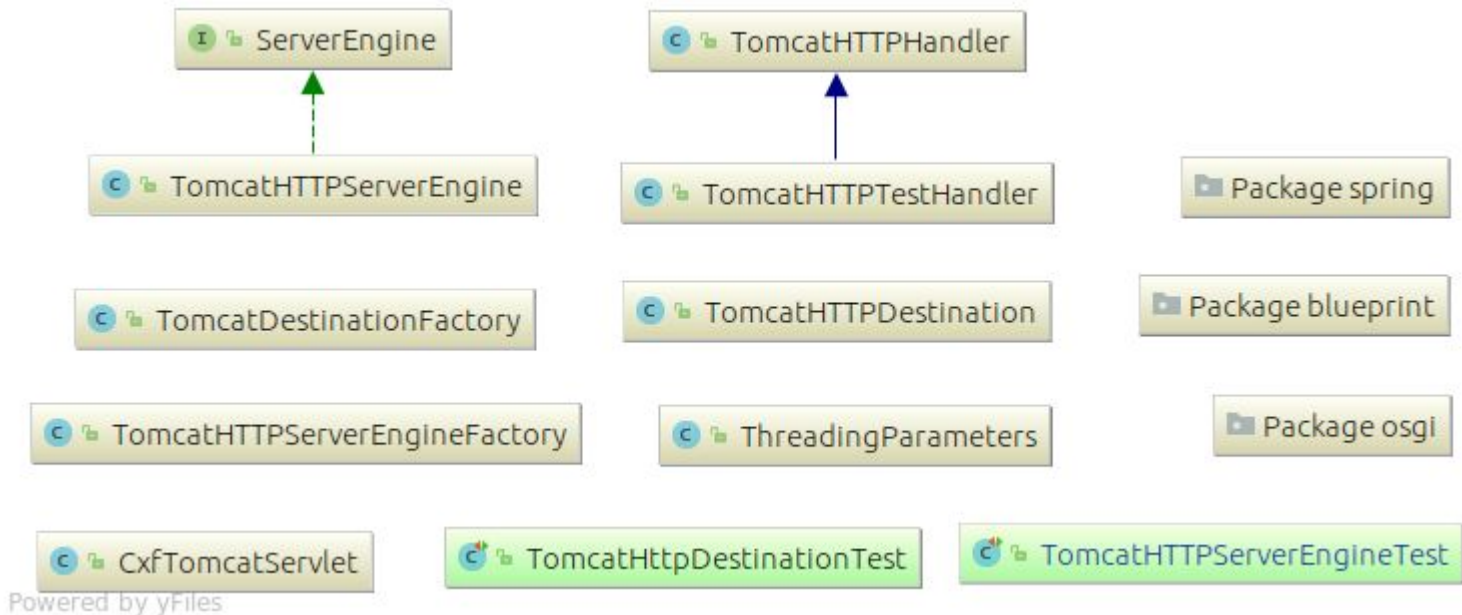


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Tomcat structure



Challenge in details of Jetty and Undertow implementations

Jetty and Undertow have very different implementations

Key differences:

- Jetty contains an integration test (EngineLifecycleTest)
- Jetty has a lot more unit tests
- Undertow contains omitted functionality found present in Jetty
- No Undertow Integration example was provided in a code base

Challenge in complexity of Tomcat

Tomcat is very complex

Tomcat namings for corresponding functionality classes is very different compared to Jetty and Undertow

=> Searching for solution often ended in looking for the incorrect element in Tomcat

=> Required a lot of advisory help from Red Hat

Time and estimations

Delays due to:

Poor code documentation led to increased time consumption

Transport original tests are not representative

Impact:

Took much longer to figure out request/response process flow

Difficult to replicate

Didn't know proper integration tests existed until randomly found several in a different package

Time and estimations

Delays due to:

Difficult to determine boundaries of implementations

Project structure is complex enough to discover useful realization details

Many customizable settings require strong diverse knowledge in connected topics

Impact:

TDD didn't work out

Dive into co-related topics for additional implementation details

Done so far

Fulfilled all primary goals. Explicitly, since last presentation:

Implemented an integration test with spring framework + HTTPS

Implemented many unit tests (test coverage: ~60%)

Proof of concept is working + SOAP

Demo

Missing implementations

Multiple servlets support

Multithreading parameters

TLS server parameters application

Setting multiple handlers (filters)

Further steps

Implement missing requirements (see previous slide)

Cover more of the integration tests similar to other realizations

Expand unit tests if necessary

Questions?

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Goals

1. Understand underlying principles of embedded Jetty and Undertow in CXF scope
2. Investigate the challenge of embedding apache tomcat into CXF
3. Design a solution and propose TDD approach
4. Develop the solution
5. Demonstrate it using a basic HTTP REST service for Tomcat

CXF

Apache CXF is an open-source, fully featured Web services framework.

Distributed under Apache licence

CXF is designed to be intuitive and easy to use. There are simple APIs to quickly build code-first services.

Maven plugins to make tooling integration easy, JAX-WS API support, Spring 2 support to configure everything instantly, and much more.

High performance with minimum computational overhead.

Origins in combination of Celtix and XFire:

- Celtix was a Java Enterprise Service Bus (ESB) runtime and set of APIs to make it easy to add transports, message formats, and security features.
- XFire was a high performance Java SOAP framework