Why Tomcat Matters for Jakarta EE

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Jakarta EE Developer Advocate
Eclipse Foundation
Why This Talk?
Key Takeaway

The top 5 runtimes/implementations being used:

1. Apache Tomcat - 42%
2. WildFly - 18%
3. Quarkus - 16%
4. InforSuit Application server - 15%
5. Eclipse jetty - 13%

2023 Jakarta EE Developer Survey
Jakarta EE 8

javax.* -> jakarta.*

2019 2020/2021 2022
NEW RELEASE

Jakarta EE 10

Community-Driven

Modernized  Simplified  Lightweight
Final Specification

- Specification Document
- API
- TCK

Compatible Implementation(s)
Jakarta EE 10 Web Profile

- Authentication 3.0
- Concurrency 3.0
- CDI 4.0
- Expression Language 5.0
- Faces 4.0
- Security 3.0
- Servlet 6.0
- Standard Tag Libraries 3.0
- Persistence 3.1
- Server Pages 3.1
- WebSocket 2.1
- Bean Validation 3.0
- Debugging Support 2.0
- Enterprise Beans Lite 4.0
- Managed Beans 2.0
- Transactions 2.0
- RESTful Web Services 3.1
- JSON Processing 2.1
- JSON Binding 3.0
- Annotations 2.1
- Interceptors 2.1
- Dependency Injection 2.0
- CDI Lite 4.0

Updated

Not Updated

New
Jakarta EE 10 Core Profile

- RESTful Web Services 3.1
- JSON Processing 2.1
- JSON Binding 3.0
- Annotations 2.1
- Interceptors 2.1
- Dependency Injection 2.0
- CDI Lite 4.0
Jakarta EE 11
Jakarta EE 10 Platform

- Authorization 2.1
- Activation 2.1
- Batch 2.1
- Connectors 2.1
- Mail 2.1
- Messaging 3.1
- Enterprise Beans 4.0
- Authentication 3.0
- Concurrency 3.0
- CDI 4.0
- Expression Language 5.0
- Faces 4.0
- Security 3.0
- Servlet 6.0
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- Expression Language 6.0
- Faces 5.0
- Security 4.0
- Servlet 6.1
- Standard Tag Libraries 3.0
- Data 1.0
- Persistence 3.2
- Pages 4.0
- WebSocket 2.2
- Validation 3.1
- Debugging Support 2.0
- Enterprise Beans Lite 4.0
- CDI Lite 4.1
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- Dependency Injection 2.0
- Transactions 2.0

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RESTful Web Services 4.0
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Annotations 3.0
Interceptors 2.2
Dependency Injection 2.0
CDI Lite 4.1

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Jakarta EE 11

API source level: Java SE 21
API binary level: Java SE 21
TCK run with: Java SE 21
Release Cadence

~6-9 Months after the latest LTS of Java
Milestone 1

December 5, 2023
Jakarta EE 11
H1, 2024
Performance and Developer Productivity
Cross-Cutting Concerns
Removed
Replaced by CDI
SecurityManager

Removed

JEP 411: Deprecate the Security Manager for Removal
Optional Features
Jakarta EE Platform
Jakarta EE Web Profile
Jakarta EE Core Profile

- CORBA
- XML Web Services
- XML Binding
- SOAP
- OMG
- RMI-IIOP
- Java IDL
Apache Tomcat
Jakarta EE 11 Platform

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Updated
Not Updated
New
Remove SecurityManager references

Clarifications
Jakarta Authentication 3.1

https://jakarta.ee/specifications/authentication/3.1/
Deprecations

JavaBeans API dependency Optional

Support for Optional via OptionalELResolver

Add Support for Java Records
Jakarta Expression Language 6.0

https://jakarta.ee/specifications/expression-language/6.0/
Remove SecurityManager references
Control status code and response body sending a redirect
Convenience attributes, constants, and methods
Clarifications
Jakarta Servlet 6.1

https://jakarta.ee/specifications/servlet/6.1/
Align with Jakarta Servlet and Jakarta Expression Language
Remove all deprecated code from Jakarta Servlet 3.1
Jakarta Pages 4.0

https://jakarta.ee/specifications/pages/4.0/
Remove SecurityManager references
Minor updates and clarifications
Jakarta WebSocket 2.2

https://jakarta.ee/specifications/websocket/2.2/
Remove the ManagedBeans Annotation
Jakarta Annotations 3.0

https://jakarta.ee/specifications/annotations/3.0/
<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
<th>Date</th>
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<tr>
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<td>Update details on how to include dependabot PRs in a release</td>
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<td>.maven</td>
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<td>Last year</td>
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<td>2 months ago</td>
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<td>2 months ago</td>
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<td>demos</td>
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<td>3 weeks ago</td>
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<tr>
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<td>Updating to version 10.0.17-SNAPSHOT</td>
<td>2 months ago</td>
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<tr>
<td>jetty-gcloud</td>
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</tbody>
</table>

**About**

Eclipse Jetty® - Web Container & Clients
- supports HTTP2, HTTP/1.1, HTTP/1.0, websocket, servlets, and more

**Releases**

- Latest: 12.0.1
- 71 releases
- 12.0.1 Latest on Aug 30
builds on
2023-09-28T09:56:47.704+02:00  INFO 6297  --- [main] com.example.demo.DemoApplication : Starting DemoApplication v0.0.1-SNAPSHOT using Java 19.0.2 with PID 6297 (/Users/ivar/Downloads/demo/target/demo-0.0.1-SNAPSHOT.jar started by ivar in /Users/ivar/Downloads/demo)
2023-09-28T09:56:47.705+02:00  INFO 6297  --- [main] com.example.demo.DemoApplication : No active profile set, falling back to 1 default profile: "default"
2023-09-28T09:56:48.184+02:00  INFO 6297  --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port(s): 8080 (http)
2023-09-28T09:56:48.190+02:00  INFO 6297  --- [main] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2023-09-28T09:56:48.230+02:00  INFO 6297  --- [main] o.a.c.c.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2023-09-28T09:56:48.231+02:00  INFO 6297  --- [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 498 ms
2023-09-28T09:56:48.407+02:00  INFO 6297  --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path '
2023-09-28T09:56:48.416+02:00  INFO 6297  --- [main] com.example.demo.DemoApplication : Started DemoApplication in 0.892 seconds (process running for 1.131)
Jakarta EE 9.1 Web Profile

- Authentication 2.0
- Concurrency 2.0
- CDI 3.0
- Expression Language 4.0
- Faces 3.0
- Security 2.0
- Servlet 5.0
- Standard Tag Libraries 2.0
- Persistence 3.0
- Server Pages 3.0
- RESTful Web Services 3.0
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- Transactions 2.0
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Apache TomEE

Now Jakarta EE 9.1 Web Profile Certified!

Apache TomEE, pronounced “Tommy”, is an all-Apache Jakarta EE 9.1 certified application server extends Apache Tomcat that is assembled from a vanilla Apache Tomcat zip file. We start with Apache Tomcat, add our jars, and zip up the rest. The result is Tomcat plus EE features – TomEE.
Final Release – javax namespace

**apache-tomee-8.0.15**

Stable and ready for production, Apache TomEE 8.0 implements Java EE 8 / Jakarta EE 8 and supports the javax namespace. Runs on Java 8 or higher.

Final Release – Jakarta namespace

**apache-tomee-9.1.0**

Jakarta EE 9.1 Web Profile & MicroProfile 5 compliant and supports the new jakarta namespace. Runs on Java 11 or higher.
Demo
javax.* -> jakarta.*
Eclipse Transformer

Apache Tomcat Migration Tool

https://github.com/eclipse/transformer

https://tomcat.apache.org/download-migration.cgi
Apache Tomcat Migration Tool

https://tomcat.apache.org/download-migration.cgi
<table>
<thead>
<tr>
<th>Category</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorization 3.0</td>
<td></td>
</tr>
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<td>Activation 2.1</td>
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<td>Batch 2.1</td>
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</table>

**Updated**

**Not Updated**

**New**
Jakarta Data 1.0

Standardizes the repository pattern for data access

https://jakarta.ee/specifications/data/1.0/
@Repository
public interface GreetingRepository extends CrudRepository<Greeting, Long> {
    Optional<Greeting> findByName(String name);
}
Demo
An Opportunity

Jakarta Data implementation
Summary
javax.* -> jakarta.*
NEW RELEASE

Jakarta EE 10

Community-Driven

Modernized  Simplified  Lightweight

JAKARTA EE
<table>
<thead>
<tr>
<th>Component</th>
<th>Jakarta EE 10 Platform</th>
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<tbody>
<tr>
<td>Authorization 2.1</td>
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<td>CDI Lite 4.0</td>
<td>New</td>
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</table>

- **Updated** indicates components that have been updated in Jakarta EE 10.0.
- **Not Updated** indicates components that have not been updated in Jakarta EE 10.0.
- **New** indicates new components introduced in Jakarta EE 10.0.
Performance and Developer Productivity
Jakarta EE 11
API source level: Java SE 21
API binary level: Java SE 21
TCK run with: Java SE 21
Jakarta EE
https://jakarta.ee

Specifications
https://jakarta.ee/specifications/

Ivar’s Hashtag Jakarta EE
https://www.agilejava.eu/category/jakarta-ee/

Demo Code
https://github.com/ivargrimstad/dukes-data
Jakarta EE Overview

Course available on LinkedIn Learning