

# Blackboard Help

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## Tomcat 7

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### Tomcat 7 migration

In Release 9.1 SP 14, the bundled Tomcat application server has been updated to Tomcat 7 to take advantage of new improvements, such as the Web application memory leak detection and prevention. In most circumstances this change will have no impact; however, some third-party Building Blocks may require some minor changes to work with this release.

These changes relate to additional strictness in attribute parsing and reserved words in EL language, a change in tag library declaration syntax, and a recommended change to prevent regression of context startup performance.

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### Annotation scanning

To ensure that startup performance is not impacted by Servlet 3.0 annotation scanning, the `WEB-INF/web.xml` file of all building blocks must be updated to include a metadata-complete attribute. Two options are available:

- Update to a minimum version of the Servlet 2.5 specification.
- Add the attribute.

```
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
         version="2.5" metadata-complete="true">
```

Alternatively, update to Servlet 3.0 and include the `absolute-ordering` element:

```
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

```
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee  
http://java.sun.com/xml/ns/javaee/web-app\_3\_0.xsd"  
version="3.0"  
metadata-complete="true">  
<absolute-ordering />
```

To learn more about the annotation scanning changes, see [http://tomcat.apache.org/migration-7.html#Annotation\\_scanning](http://tomcat.apache.org/migration-7.html#Annotation_scanning).

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## Spaces between attributes

When compiling a JSP, you may receive the error 'The JSP specification requires that an attribute name is preceded by whitespace'. Attributes previously could continue with no space, for example:

```
attributeOne="value1"attributeTwo="value2"
```

For Jasper to successfully compile, spaces need to be added in any JSP that has this problem. To learn more, see Tomcat bug 49297: [https://issues.apache.org/bugzilla/show\\_bug.cgi?id=49297](https://issues.apache.org/bugzilla/show_bug.cgi?id=49297)

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## Java reserved words in Expression Language

Expression Language tags cannot include statements that are valid Java reserved words. For example, a Bean may have a getter named `getDefault()`, an EL language expression would previously be able to access this with the following:

```
bean.default
```

However, this violates the reserved word strictness introduced in this release. Uses of reserved words must be updated to use the method explicitly:

```
bean.getDefault()
```

To learn more, see Tomcat bug 49217: [https://issues.apache.org/bugzilla/show\\_bug.cgi?id=49217](https://issues.apache.org/bugzilla/show_bug.cgi?id=49217)

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## Tag library declarations

Tag library declarations in `WEB-INF/web.xml` could previously be an immediate child of the `web-app` element:

```
<taglib>
  <taglib-uri>/tagLibUri</taglib-uri>
  <taglib-location>/WEB-INF/config/taglibs/tagLib.tld</taglib-
location>
</taglib>
```

Tomcat 7 no longer supports this configuration. Custom tag libraries declared in this way must be included in a `jsp-config` element:

```
<jsp-config>
  <taglib>
    <taglib-uri>/tagLibUri</taglib-uri>
    <taglib-location>/WEB-INF/config/taglibs/tagLib.tld</taglib-
location>
  </taglib>
</jsp-config>
```

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## Learn more

To learn more about the potential breaking changes caused by the migration from Tomcat 6 to 7, see [http://tomcat.apache.org/migration-7...6.0.x\\_to\\_7.0.x](http://tomcat.apache.org/migration-7...6.0.x_to_7.0.x).