



SIMPLY RICH

ZK™

The Quick Start Guide

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Before You Start

New to the Servlet Container (aka., Java Web Server)

Before developing Web applications in Java (and running ZK demo in your machine), you have to install a Servlet container first. Apache Tomcat is one of the most popular Servlet containers. It is easy to install and use.

| Prerequisites | Description |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Download | Installer for Windows: apache-tomcat-5.5.20.exe A list of all available versions: http://tomcat.apache.org/download-55.cgi |
| Documentation | http://tomcat.apache.org/tomcat-5.5-doc/index.html |

New to Java Language

You don't need to know Java to use ZK, since all rich user interface can be implemented in HTML-like markup language called ZUML. However, to complete a Web application, you or teammate need some basic knowledge about Java. Here are some good tutorial.

| Java | URLs |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Language Basic | http://java.sun.com/docs/books/tutorial/java/nutsandbolts/index.html |
| Class and Object | http://java.sun.com/docs/books/tutorial/java/concepts/index.html http://java.sun.com/docs/books/tutorial/java/javaOO/index.html http://java.sun.com/docs/books/tutorial/java/IandI/index.html |

New to Java Integrated Development Environment (IDE)

Eclipse is one of the most popular Java IDEs. With IDE, it is easier to develop and debug your Web applications. Moreover, you can understand ZK better by debugging through ZK's source codes.

The step-by-step setup guide can be found in one of our small talks:

<http://www.zkoss.org/smalltalks/eclipse/ek.html>

1. What to Download

| File | Description |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| zk-bin-std-3.5.0.tar.gz zk-bin-std-3.5.0.zip | The binary distribution of ZK with the minimal set of libraries that you need to enrich your Web applications with ZK. It is also called the standard edition. |
| zk-bin-prof-3.5.0.tar.gz zk-bin-prof-3.5.0.zip | The binary distribution of ZK, including the standard edition, JFreeChart, Google Maps, Jasper Reports, and layout components. It is also called the professional edition. |
| zk-bin-3.5.0.tar.gz zk-bin-3.5.0.zip | The binary distribution of ZK, including the professional edition, accessibility, the performance version of ZUL (zkmax.jar), and versatile plug-ins, such as Ruby, Groovy, JavaScript, MVEL and OGNL. It is also called the enterprise edition. |
| zk-demo-3.5.0.zip | Standalone zkdemo application in WAR and EAR format, and the source codes of zkdemo. It is the fastest way to test drive the features of ZK without configuring your Web server. |
| zk-javadoc-3.5.0.zip | The Java API document of ZK framework. |
| zk-src-3.5.0.tar.gz | The source codes of ZK framework. |

2. Run the Demo

The simplest way to test drive the power of ZK is to visit <http://www.zkoss.org/zkdemo/userguide>.

If you want to run the demo in your local server, you can follow the following steps.

1. Download `zk-demo-3.5.0.zip` from here (sourceforge.net).
2. After uncompressing the file, you can deploy `zkdemo.war` or `zkdemo.ear` to your Web or application server.

Most Web or application servers have a management console that allows you to deploy an application painlessly. Consult the corresponding manuals, or you can visit http://en.wikibooks.org/wiki/ZK/How-Tos#Installation_and_Configuration, where the ZK community maintains the installation guides for many Web or application servers.

For Tomcat server, you can copy it directly to the `$TOMCAT_DIR/webapps` directory, and then Tomcat will start the deployment automatically.

3. After `zkdemo.war` is deployed you can visit it at, say, <http://localhost:8080/zkdemo/userguide>. The port number depends on how you installed your Web or application servers. Some application servers deploy only the EAR file. That is, you have to deploy `zkdemo.ear` instead.

3. Installation

ZK consists of several libraries (the JAR files). There are two alternatives to install them.

First, you can bundle them with your Web application. In other words, copy them to the `WEB-INF/lib` directory of your Web application. The benefit is that you can deploy your Web application to any Web server without configuring the Web server.

Second, you can install them to your Web or application server. In other words, copy them to the shared directory of the Web or application server (for Tomcat, it is `shared/lib`). The benefit is that all Web applications deployed to the server can use ZK without bundled with ZK libraries.

Alternative 1: Bundle ZK into Your Web Application

By copying ZK libraries to your Web application (`WEB-INF/lib`), you can deploy your Web application to any Web or application server without configuring the server.

To bundle ZK libraries with the WAR file (the Web application)

1. Uncompress `zk-bin-3.5.0.zip` or `zk-bin-3.5.0.tar.gz`
2. Copy `dist/lib/*.jar`, `dist/lib/zkforge/*.jar`, and `dist/lib/ext/*.jar` to the `/WEB-INF/lib` directory in your Web application.
Libraries in `dist/lib/zkforge` and `dist/lib/ext` are optional. If you want to minimize the footprint of your Web application, refer to the next chapter for the description of these libraries.

To bundle ZK libraries with the EAR file (the Java EE application)

1. Uncompress `zk-bin-3.5.0.zip` or `zk-bin-3.5.0.tar.gz`
2. Copy `dist/lib/*.jar`, `dist/lib/zkforge/*.jar`, and `dist/lib/ext/*.jar` to the root directory in your Java EE application.
Libraries in `dist/lib/zkforge` and `dist/lib/ext` are optional. If you want to minimize the footprint of your Web application, refer to the next chapter for the description of these libraries.

Alternative 2: Install ZK to Be Shared by All Web Applications

The way to install ZK libraries to the shared directory varies from one Web server to another.

Install ZK on Tomcat

1. Download Tomcat from <http://tomcat.apache.org> and install it, if you haven't installed it yet.
2. Stop Tomcat.
3. Uncompress `zk-bin-3.5.0.zip` or `zk-bin-3.5.0.tar.gz`
4. Copy `dist/lib/*.jar`, `dist/lib/zkforge/*.jar`, and `dist/lib/ext/*.jar` to `$TOMCAT_HOME1/shared/lib`
Libraries in `dist/lib/zkforge` and `dist/lib/ext` are optional. If you want to minimize the footprint of your Web server, refer to the next chapter for the description of these libraries.
5. Re-start Tomcat.

Then, you can deploy your Web application, e.g., `demo/bin/zkdemo-min.war`, to Tomcat. It can be done by use of the Tomcat manager, or by copying it to `$TOMCAT_HOME/webapps` directly. If you prefer to copy directly, you have to stop Tomcat first. After deployed, you can run your Web application by visiting the corresponding URL, e.g., `http://localhost:8080/zkdemo/userguide`, depending on the configuration of your Web server.

Note: Tomcat 6.x, by default, doesn't load any classes from the `shared/lib` directory. To enable it, you have to specify the following in the `conf/catalina.properties` file:

```
shared.loader=${catalina.base}/shared/lib/*.jar
```

Install ZK on Jetty

1. Download Jetty from <http://www.mortbay.org/jetty/index.html> and install it², if you haven't installed it yet.
2. Stop Jetty.
3. Uncompress `zk-bin-3.5.0.zip` or `zk-bin-3.5.0.tar.gz`
4. Copy `dist/lib/*.jar`, `dist/lib/zkforge/*.jar`, and `dist/lib/ext/*.jar` to `$JETTY_HOME/ext`
Libraries in `dist/zkforge` and `dist/lib/ext` are optional. If you want to minimize the footprint of your Web server, refer to the next chapter for the description of these libraries.

¹ `$TOMCAT_HOME` is where you installed Tomcat.

² Refer to <http://docs.codehaus.org/display/JETTY/Jetty+Documentation>

5. Re-start Jetty.

Then, you can deploy your Web application, e.g., `demo/bin/zkdemo-min.war`, to Jetty by copying it to `$JETTY_HOME/webapps` directly. After deployed, you can run your Web application by visiting the corresponding URL, e.g., `http://localhost:8080/zkdemo/userguide`, depending on the configuration of your Web server.

Working with MySQL³

To open the connection under `zscript`, you have to put MySQL JDBC driver (`mysql-connector-*.jar`) under the `$TOMCAT_DIR/common/lib` directory.

³ <http://www.mysql.com>

4. The Content of Binary Distribution

This chapter describes the content of zk-bin-3.5.0.zip.

/doc

This directory holds the documents including copyrights and release notes.

/dist/lib

This directory holds the binary libraries required to run ZK.

/dist/lib/zkforge

This directory holds the components from ZK Forge, such as FCKeditor and Dojo. It is optional depending on whether you need them.

| File | Description |
|--------------|--------------------------------------------------------------------------|
| dojox.jar | Required if you want to use ZK DOJO components. Version: 0.4.1_1 |
| fckez.jar | Required if you want to use ZK FCKeditor components. Version: 2.6.1_1 |
| gmaps.jar | Required if you want to use ZK Google Maps components. Version: 2.0_8 |
| timeline.jar | Required if you want to use ZK Timeline components. Version: 1.2_1 |

/dist/lib/ext

This directory holds the external libraries required to run ZK. Since these libraries are common, you might have installed them in your container.

Here are optional jar files. You can choose whether to copy depending on your requirements.

| File | Description |
|------------------------|-------------------------------------------------|
| commons-fileupload.jar | Required if you want to upload files with them. |

| File | Description |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| commons-io.jar | Version: Commons Fileupload 1.2.1 and Commons IO 1.3.1 |
| jcommon.jar jfreechar.jar | Required if you want to use ZUL's chart component. Version: JFreeChart 1.0.9 and JCommon 1.0.12 <i>[not available in the standard edition]</i> |
| jasperreports.jar itext.jar jxl.jar poi.jar commons-collections.jar commons-logging.jar | Required if you want to use the jasperreport component. Version: Jasper Reports 2.0.4 (itext: 1.3.1, commons-collections: 2.1, commons-logging: 1.0.2, jxl: 2.6, poi: 3.0.1) Note: poi.jar is required if you want to use Apache POI to generate Microsoft Excel format. And, jxl.jar is required only if you want to use JExcelApi to generate the Microsoft Excel format. <i>[not available in the standard edition]</i> |
| bsh.jar | Required if you want scripting in Java interpreter (BeanShell). Version: BeanShell 2.0b4 |
| js.jar | Required if you want scripting in JavaScript (Rhino). Version: Rhino 1.6R5 <i>[not available in the standard and professional edition]</i> |
| groovy.jar | Required if you want scripting in Groovy. Version: Groovy 1.5.1 (groovy-all) <i>[not available in the standard and professional edition]</i> |
| jruby.jar | Required if you want scripting in Ruby (JRuby). Version: JRuby 1.0.1 (jruby-complete) <i>[not available in the standard and professional edition]</i> |
| jython.jar | Required if you want scripting in Python (Jython). Version: Jython 2.2.1 <i>[not available in the standard and professional edition]</i> |
| Filters.jar | Required if you want to use the <code>captcha</code> component. |

| File | Description |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Version: JH Labs Java Image Filters <i>[not available in the standard edition]</i> |
| mvel.jar | Required if you want to use MVEL to evaluate the expressions. Version: MVEL 1.2.21 (for Java 1.4 or above) <i>[not available in the standard and professional edition]</i> |
| ognl.jar | Required if you want to use OGNL to evaluate the expressions. Version: OGNL 2.6.9 <i>[not available in the standard and professional edition]</i> |

/dist/src

This directory holds the source codes in JAR format. These JAR files are used for debugging in IDE, such as Eclipse. You cannot build the binary libraries from these. Rather, download and uncompress `zk-src-3.5.0.tar.gz`.

/dist/xsd

This directory holds the XSD files that might be useful to develop ZK applications.

/dist/WEB-INF

This directory holds the TLD files. These TLD files are part of JAR files so they are loaded automatically. We put them here mainly for your reference only.

5. The Content of Demo Distribution

This chapter describes the content of zk-demo-3.5.0.zip.

/

This directory holds the executable: `zkdemo.war`, `zkdemo-min.war`, `zkdemos.ear` and `zkdemos-min.ear`. Refer to the **Installation** chapter for details.

/zkdemo

This directory holds the source codes of the live demo.

/MyApp

This directory holds an empty Web application which you can start your new Web application from.

6. My First ZK Application

Prepare WEB-INF/web.xml

Copy or merge the following content to the `web.xml` in the `WEB-INF` directory in your application. This step must be done once each time you created a new Web applications. Then, what you need to do is to copy files with `.zul` or `.zhtml` extension to the proper directories in your Web applications.

```
<web-app version="2.4" xmlns="http://java.sun.com/xml/ns/j2ee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/j2ee
http://java.sun.com/xml/ns/j2ee/web-app_2_4.xsd">

    <!-- //// -->
    <!-- ZK -->
    <listener>
        <description>Listener for cleanup when a session is destroyed</description>
        <listener-class>org.zkoss.zk.ui.http.HttpSessionListener</listener-class>
    </listener>
    <servlet>
        <description>ZK loader for evaluating ZK pages</description>
        <servlet-name>zkLoader</servlet-name>
        <servlet-class>org.zkoss.zk.ui.http.DHtmlLayoutServlet</servlet-class>

        <!-- Must. Specifies URI of the update engine
        (DHtmlUpdateServlet). -->
        <init-param>
            <param-name>update-uri</param-name>
            <param-value>/zkau</param-value>
        </init-param>
        <load-on-startup>1</load-on-startup><!-- MUST -->
    </servlet>
    <servlet-mapping>
        <servlet-name>zkLoader</servlet-name>
        <url-pattern>*.zul</url-pattern>
    </servlet-mapping>
    <servlet-mapping>
        <servlet-name>zkLoader</servlet-name>
        <url-pattern>*.zhtml</url-pattern>
    </servlet-mapping>
    <servlet>
        <description>The asynchronous update engine for ZK</description>
        <servlet-name>auEngine</servlet-name>
        <servlet-class>org.zkoss.zk.au.http.DHtmlUpdateServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>auEngine</servlet-name>
        <url-pattern>/zkau/*</url-pattern>
```

```

</servlet-mapping>
<!-- //// -->

<!-- MIME mapping -->
<mime-mapping>
    <extension>gif</extension>
    <mime-type>image/gif</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>html</extension>
    <mime-type>text/html</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>htm</extension>
    <mime-type>text/html</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>jad</extension>
    <mime-type>text/vnd.sun.j2me.app-descriptor</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>jpeg</extension>
    <mime-type>image/jpeg</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>jpg</extension>
    <mime-type>image/jpeg</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>js</extension>
    <mime-type>application/x-javascript</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>png</extension>
    <mime-type>image/png</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>txt</extension>
    <mime-type>text/plain</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>xml</extension>
    <mime-type>text/xml</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>zhtml</extension>
    <mime-type>text/html</mime-type>
</mime-mapping>
<mime-mapping>
    <extension>zul</extension>
    <mime-type>text/html</mime-type>
</mime-mapping>

```

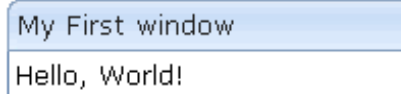
```
<welcome-file-list>
  <welcome-file>index.zul</welcome-file>
  <welcome-file>index.zhtml</welcome-file>
  <welcome-file>index.html</welcome-file>
  <welcome-file>index.htm</welcome-file>
</welcome-file-list>
</web-app>
```

My First Hello World

Create a file called `hello.zul` with the following content. Then, you could use the browser to see the result, say `http://localhost:8080/zkdemo/hello.zul`.

```
<window title="My First window" border="normal" width="200px">
  Hello, World!
</window>
```

Then, the result is depicted as follow.



Notice that, though the content of `hello.zul` is very similar to XUL⁴, it is actually written in ZUML. ZK Loader parses it into a valid HTML page which can be interpreted correctly by a regular browser, such as Internet Explorer and Mozilla Firefox. Refer to the Developer's Guide for more details.

⁴ <http://xul.sourceforge.net/mozilla.html>