

# Apache 2 with Tomcat 6

## How To Configure

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### How to Connect Tomcat 6 to Apache HTTP Server 2

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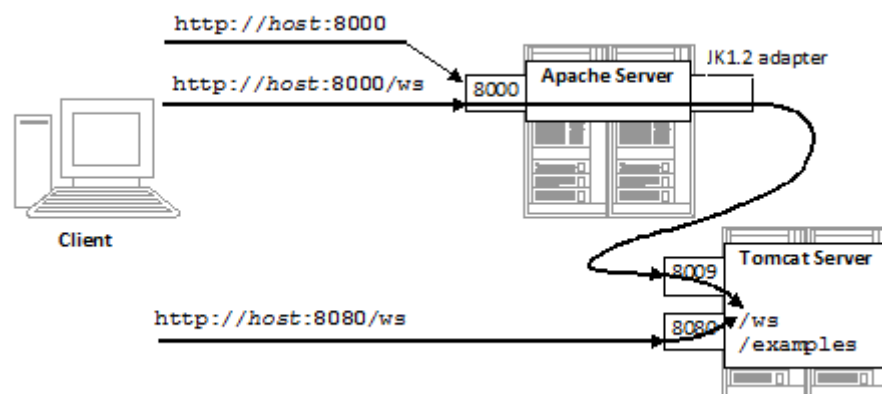
Tomcat can be run as a *standalone* server. However, in a production environment, Tomcat is often run as an *add-on* to the Apache HTTP Server (or Microsoft IIS) - as the Java servlet/JSP container. In this combination, Tomcat executes the Java servlets and JSPs, the Apache serves the static HTML pages and performs other server-side functions such as CGI, PHP, SSI, etc. The reasons Tomcat is not often used as a standalone server for production are (extracted from "tomcat-apache-howto"):

- Tomcat is not as fast as Apache when it comes to static pages.
- Tomcat is not as configurable as Apache.
- Tomcat is not as robust as Apache.
- Tomcat may not address many sites' need for functionality found only in Apache modules (e.g. Perl, PHP, etc.).

To configure Tomcat to work with Apache HTTP Server, you should first read the documentation provided in Tomcat *thoroughly*, and read the "Tomcat Connector" documents @ <http://tomcat.apache.org/connectors-doc/>.

To run Tomcat together with Apache:

- Apache needs to load a "adapter" module, which uses a certain protocol, such as Apache JServ Protocol (AJP) v1.2, v1.3, or WARP v1.0, to communicate with the Tomcat, via another TCP port (port 8009 in the default configuration).
- When Apache receives an HTTP request, it checks if the request belongs to Tomcat. If so, it lets the adapter takes the request and forwards it to Tomcat, as illustrated below.



There are a few adapter modules available, such as Apache JServ Protocol (AJP) v1.2 "JServ" module

(outdated), AJP v1.3 "JK 1.2" module (in use) and "JK 2" module (deprecated). I will only describe the JK1.2 module with Apache 2 here.

The step-by-step procedure is as follow:

### Step 0.1: Install Apache HTTP Server

Refer to "[Apache HTTP Server - How To](#)". I shall assume that Apache is installed in directory "c:\apache", and runs on port 8000.

### Step 0.2: Install Tomcat

Refer to "[Tomcat - How To](#)". I shall assume that Tomcat is installed in directory "c:\tomcat", runs on port 8080, and has a web context with URL Path called "/ws", which maps to document base directory at "d:\workshop".

### Step 1: Download the Apache-Tomcat Connector

An Apache-Tomcat connector - JK1.2 module - which is an adapter module used by Apache to communicate with Tomcat (using AJP v1.3 protocol through TCP port 8009), can be downloaded from Tomcat mother site @ [tomcat.apache.org](http://tomcat.apache.org) (⇒ Download ⇒ Tomcat Connectors ⇒ JK 1.2 ⇒ JK 1.2 Binary Releases ⇒ win32 ⇒ jk-1.2.25 ⇒ "mod\_jk-apache-2.2.4.so").

Rename the downloaded module to "mod\_jk.so" and move into directory "c:\apache\modules".

### Step 2: Configure Apache

We need to configure the Apache HTTP Server to load and initialize the JK module.

Create a configuration file called "mod\_jk.conf" as follows and place it in "c:\tomcat\conf":

```
# Load mod_jk module
# Update this path to match your modules location
LoadModule jk_module modules/mod_jk.so

# Where to find workers.properties
# Update this path to match your conf directory location
JkWorkersFile c:/tomcat/conf/workers.properties

# Where to put jk logs
# Update this path to match your logs directory location
JkLogFile c:/tomcat/logs/mod_jk.log

# Set the jk log level [debug/error/info]
JkLogLevel info

# Select the log format
JkLogStampFormat "[%a %b %d %H:%M:%S %Y]"

# JkOptions indicate to send SSL KEY SIZE,
JkOptions +ForwardKeySize +ForwardURICompat -ForwardDirectories

# JkRequestLogFormat set the request format
JkRequestLogFormat "%w %V %T"

# Send everything for context /ws to worker ajp13
JkMount /ws ajp13
JkMount /ws/* ajp13

# Send everything for context /jsp-examples to worker ajp13
```

```
JkMount /jsp-examples ajp13
JkMount /jsp-examples/* ajp13

# Send everything for context /servlets-examples to worker ajp13
JkMount /servlets-examples ajp13
JkMount /servlets-examples/* ajp13
```

For each web context that is to be forwarded from Apache to Tomcat, include two JkMount statements as shown. In the above configuration, Apache forwards all requests to web contexts "/jsp-examples", "/servlets-examples", and "/ws" to Tomcat, via a "worker" called "ajp13".

Include the above configuration directives into the Apache's configuration by adding the following include statement at the end of "c:\apache\conf\httpd.conf":

```
include c:/tomcat/conf/mod_jk.conf
```

Note: Unix's forward slash is used as the directory separator instead of backward slash (because Apache was originally built for Unix). The include statement simply appends all the statements from the file "c:\tomcat\conf\mod\_jk.conf" into "httpd.conf". (You can of course add those statements into "httpd.conf" directly.)

Next, observe that the configuration refers to a *worker file* called "workers.properties", and forward certain requests to a *JK worker* called "ajp13". Create the "workers.properties" file and place it in "c:\tomcat\conf" as follows:

```
# Define 1 real worker named ajp13
worker.list=ajp13

# Set properties for worker named ajp13 to use ajp13 protocol,
# and run on port 8009
worker.ajp13.type=ajp13
worker.ajp13.host=localhost
worker.ajp13.port=8009
worker.ajp13.lbfactor=50
worker.ajp13.cachesize=10
worker.ajp13.cache_timeout=600
worker.ajp13.socket_keepalive=1
worker.ajp13.socket_timeout=300
```

Note: The JkMount statements forward the requests to a worker called "ajp13", which is defined in this "workers.properties".

### Step 3: Configure Tomcat

The default configuration in Tomcat's "conf\server.xml" starts the AJP1.3 service via the following configuration, on TCP port 8009 (remove the comments if these lines are commented).

```
<!-- Define an AJP 1.3 Connector on port 8009 -->
<Connector port="8009" enableLookups="false" redirectPort="8443" protocol="AJP/1.3" />
```

### Step 4: Start the Apache with the JK module

```
c:\apache\bin> httpd -k install
c:\apache\bin> httpd -k start
```

### Step 5: Start the Tomcat server

```
c:\tomcat\bin> startup
```

Observe that AJP1.3 service is initiated and the ajp13 worker is listening at port 8009.

```
....  
Sep 26, 2006 1:16:50 PM org.apache.jk.common.ChannelSocket init  
INFO: JK: ajp13 listening on /0.0.0.0:8009  
Sep 26, 2006 1:16:50 PM org.apache.jk.server.JkMain start  
INFO: Jk running ID=0 time=0/120 config=null  
....
```

### Step 6: Verify the Installation

Issue the following URLs to access the web context `/ws`, `/servlet-examples`, and `/jsp-examples` that are defined in Tomcat (running in port 8080), but accessed via the Apache (running in port 8000).

<code>http://hostname:8080/ws</code>	Access Tomcat directly
<code>http://hostname:8000/ws</code>	Access Tomcat via Apache
<code>http://hostname:8000/servlets-examples</code>	Try servlet examples via Apache
<code>http://hostname:8000/jsp-examples</code>	Try JSP examples via Apache

## REFERENCES & RESOURCES

- Apache-Tomcat Connectors @ <http://tomcat.apache.org/download-connectors.cgi>
- Apache-Tomcat Connectors Documentation
- Apache mother site @ [www.apache.org](http://www.apache.org)
- Tomcat mother site @ [tomcat.apache.org](http://tomcat.apache.org)

Latest version tested: Apache 2.2.4 / Tomcat 6.0.18 / JK 1.2.25

Last modified: April, 2009

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