# Required Downloads

* Download Apache HTTP Server:  
  <https://www.apachelounge.com/download/>
* Download VC++ Redistributed Package:  
  <https://aka.ms/vs/15/release/VC_redist.x64.exe>
* Download Apache Tomcat Server:  
  <https://tomcat.apache.org/download-90.cgi>
* Download mod\_jk:  
  <http://archive.apache.org/dist/tomcat/tomcat-connectors/jk/binaries/windows/tomcat-connectors-1.2.40-windows-x86_64-httpd-2.4.x.zips>

# Software & versions used for this setup

* Apache – 2.4
* Tomcat – 9.0.37(standalone)
* VC++ Redistributed – VC++ 2015
* mod\_jk.so – 1.2.40

# Tomcat Server Installation & Configurations

**Installation:**

Extract zip archive two times and rename each directory as following:  
apache-tomcat-9.0.37-server1(Application Server 1)  
apache-tomcat-9.0.37-server2(Application Server 2)  
  
**Configuration:**

Open **server.xml** file under conf directory:

* Look for SHUTDOWN port & configure port for each tomcat instance
* Look for AJP/1.3, uncomment AJP/1.3 & configure port for each tomcat instance.   
  Don’t forget to add secretRequired="false".
* Look for HTTP Connector & configure port for each tomcat instance

**apache-tomcat-9.0.37-server1:**

<Server port="8005" shutdown="SHUTDOWN">

<Connector port="8080" protocol="HTTP/1.1" connectionTimeout="20000" redirectPort="8443" />

<Connector protocol="AJP/1.3" address="0.0.0.0" port="8009" redirectPort="8443" secretRequired="false" />

**apache-tomcat-9.0.37-server2:**

<Server port="8004" shutdown="SHUTDOWN">

<Connector port="8079" protocol="HTTP/1.1" connectionTimeout="20000" redirectPort="8443" />

<Connector protocol="AJP/1.3" address="0.0.0.0" ="8008" redirectPort="8443" secretRequired="false" />

Run tomcat from **bin/startup.bat**

Open web browser & verify each tomcat instance:  
  
<http://localhost:8080/>  
<http://localhost:8079/>

<http://localhost:8080/examples/>

<http://localhost:8079/examples/>

# Visual C++ Redistributed Package Installation

Just like any regular software, install vc\_redist\_x64 by following instructions of installation wizard.

# Apache HTTP Server Installation & Configurations

**Installation:**  
Extract zip archive in current working directory.

Open **httpd.conf** file under conf directory:

* Change SRVROOT to current installation directory.  
  Define SRVROOT “D:/Configure-Tomcat-to-work-with-Apache/Apache24”
* Uncomment ServerName and add localhost  
  ServerName localhost:80
* Open command prompt, mount bin directory of apache & verify syntax of **httpf.conf**  
  httpd -t
* Install Apache as Windows Service:  
  httpd.exe -k install -n “Apache HTTP Server”
* Open services.msc  
  start “Apache HTTP Server”
* Open web browser and verify  
  <http://localhost:80/>

**Configurations**:

* Copy mod\_jk.so file inside modules directory
* Create following files under conf directory:   
  **workers.properties** – Configurations for both the tomcat servers  
  **mod\_jk.conf** – Loading & configuring **mod\_jk** module
* Add below lines in **httpd.conf**# Include mod\_jk configuration file  
  Include conf/mod\_jk.conf

**workers.properties**

worker.list=loadbalancer,status

worker.template1.type=ajp13

worker.template1.port=8009

worker.template1.lbfactor=1

worker.template1.ping\_mode=A

worker.template1.reply\_timeout=30000

worker.template1.socket\_connect\_timeout=10000

worker.template2.type=ajp13

worker.template2.port=8008

worker.template2.lbfactor=1

worker.template2.ping\_mode=A

worker.template2.reply\_timeout=30000

worker.template2.socket\_connect\_timeout=10000

worker.tomcat1.reference=worker.template1

worker.tomcat1.host=localhost

worker.tomcat2.reference=worker.template2

worker.tomcat2.host=localhost

worker.loadbalancer.type=lb

worker.loadbalancer.balanced\_workers=tomcat1,tomcat2

worker.loadbalancer.sticky\_session=1

worker.status.type=status

**mod\_jk.so**

# Load mod\_jk module

LoadModule jk\_module modules/mod\_jk.so

# Add the module

# AddModule mod\_jk.c

# Where to find workers.properties

JkWorkersFile conf/workers.properties

# Where to put jk shared memory

JkShmFile logs/mod\_jk.shm

# Where to put jk logs

JkLogFile logs/mod\_jk.log

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

JkLogLevel info

JkMount /status status

JkMount /\* loadbalancer

**RESTART Apache**

# With above configurations we have achieved

* Communication with Tomcat servers
* Load distribution between both the Tomcat servers

Open web browser and verify communication:  
<http://localhost/examples/>  
  
Verify load distribution:  
Check access log of each tomcat instance.

To check JK status:  
<http://localhost/status>

# Useful Command

Delete Windows Service:  
sc delete ApacheHTTPServer