IAAS Exercises

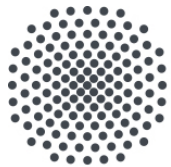# Cloud Computing:
Concepts & Technologies

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Exercise Sheet 2

Task 1 – Setup Tomcat

Purpose of Tomcat directories

directory	purpose
bin	binaries to startup and shutdown the server
conf	system-wide configuration files
webapps	contains web appications to be deployed
lib	system wide JAR files, accessible by all webapps
logs	default directory for log files
work	working directory used for JSP-to-Servlet conversion

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Configure Tomcat

- Change the running port of the application to 80

    - [TOMCAT_HOME]/conf/server.xml

    - `<Service name="Catalina"><`**`Connector port="80"`**` protocol="HTTP/1.1" …/>`

- Activate automatic reload

    - [TOMCAT_HOME]/conf/context.xml

    - `<Context `**`reloadable="true"`**`>`

- Directory listing

    - [TOMCAT_HOME]/conf/web.xml

    - servlet… default… listings - set to true

Run Tomcat

- Windows:
    - cd [TOMCAT_HOME]\bin
    - startup

- Unix
    - cd [TOMCAT_HOME]/bin
    - ./startup.sh

- Or use Catalina to see output

Web-UI

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Home   Documentation   Configuration   Examples   Wiki   Mailing Lists   Find Help

Apache Tomcat/9.0.12

THE APACHE® SOFTWARE FOUNDATION
http://www.apache.org/

If you're seeing this, you've successfully installed Tomcat. Congratulations!

Recommended Reading:

Security Considerations HOW-TO

Manager Application HOW-TO

Clustering/Session Replication HOW-TO

Server Status

Manager App

Host Manager

Developer Quick Start

| Tomcat Setup | Realms & AAA | Examples | Servlet Specifications |
| First Web Application | JDBC DataSources | | Tomcat Versions |

Managing Tomcat

For security, access to the manager webapp is restricted. Users are defined in:

`$CATALINA_HOME/conf/tomcat-users.xml`

In Tomcat 9.0 access to the manager application is split between different users.
Read more...

Release Notes

Changelog

Migration Guide

Documentation

Tomcat 9.0 Documentation

Tomcat 9.0 Configuration

Tomcat Wiki

Find additional important configuration information in:

`$CATALINA_HOME/RUNNING.txt`

Developers may be interested in:

Tomcat 9.0 Bug Database

Getting Help

FAQ and **Mailing Lists**

The following mailing lists are available:

tomcat-announce
Important announcements, releases, security vulnerability notifications. (Low volume).

tomcat-users
User support and discussion

taglibs-user
User support and discussion for Apache Taglibs

tomcat-dev
Development mailing list, including commit

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Live Demo

Exercise Sheet 2

Task 2 – Tomcat Manager App

Access Tomcat Manager App

1. Add a role

   ▪ `conf/tomcat-users.xml`

   ▪ `<role rolename="`**`manager-gui`**`"/>`

2. Add an user

   ▪ `conf/tomcat-users.xml`

   ▪ `<user username="admin" password="secret" roles="`**`manager-gui`**`"/>`

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Exercise Sheet 2

Task 3 – Add First HTML

1. Create a folder (i.e helloworld) under webapps

2. Write a simple HTML file

3. Put it here: webapps/helloworld/index.html

4. Go to localhost/helloworld

Live Demo

Exercise Sheet 2

Task 4 – Write a Servlet

Write a Servlet

- Create `[TOMCAT_HOME]/webapps/`**`[name]/WEB-INF/classes`**

- [name]: Is called context root (or document base directory) of your webapp
  It contains all files and resources that are visible to users

- WEB-INF: Although, this is not visible. This is where you keep your application's web descriptor file (web.xml)

- WEB-INF/classes: This is where you keep all the Java classes such as servlet class-files

- Goto http://localhost/[name] → if directory-listing is enabled you see the directories, otherwise a 404 Not Found error message

Write a Servlet…

```java
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
import java.util.Date;

public class [ClassNameOfServlet] extends HttpServlet {
    @Override
    public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws IOException, ServletException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
        try {
            out.println("<html>");
            out.println("<head><title>Hello, world</title></head>");
            out.println("<body>");
            out.println("<h1>Hello, world!</h1>");
            out.println("<h2>" + new Date() + "</h2>");
            out.println("</body></html>");
        } finally {
            out.close();
        }
    }
}
```

Compiling and Deploying the Servlet

→ `javac -cp lib/servlet-api.jar [ClassNameOfServlet].java`

- Put resulting class file into webapp/[name]/WEB-INF/classes

- Configure URL-mapping in webapps/[name]/WEB-INF/web.xml or as Annotation in servlet (Tomcat 7/Servlet 3.0 upwards)

- Go to http://localhost/[name]/[url-pattern]

Live Demo

Exercise Sheet 2

Task 5 – Add a JSP File

Live Demo

Exercise Sheet 2

Task 6 – Automated Restart

Bash-Script

```
#!/bin/sh

./shutdown.sh

./startup.sh
```

Safe as [TOMCAT_HOME]/bin/restart.sh

```
cd [TOMCAT_HOME]/bin

chmod +x restart.sh

./restart.sh
```

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Live Demo