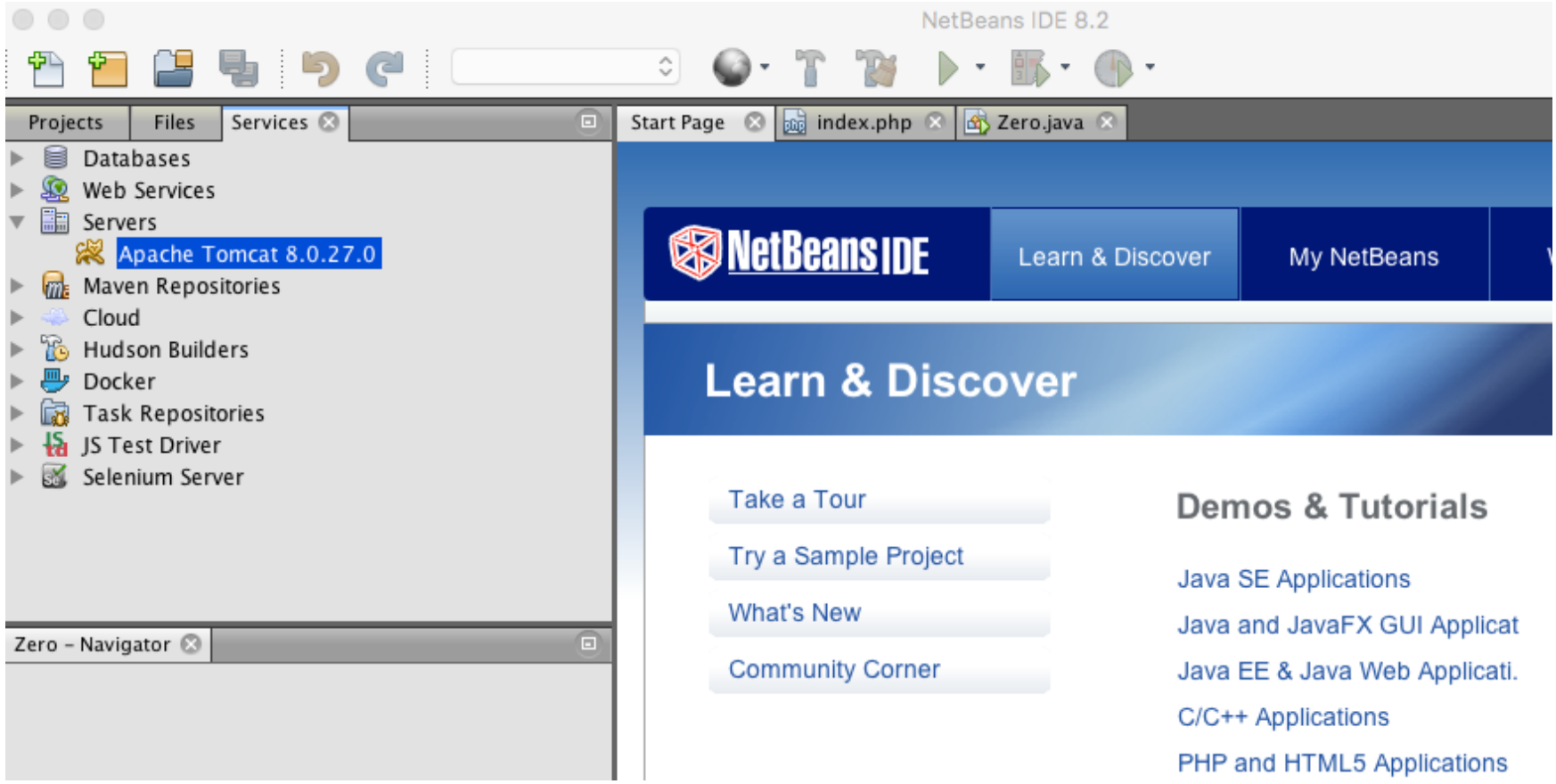
Q

How can you develop and deploy a servlet using Netbeans ?

Apache Tomcat in Netbeans 8.2



https://www.oracle.com/technetwork/pt/java/javase/downloads/jdk-netbeans-jsp-3413153-ptb.html

Create new web project

Zero - NetBeans IDE 8.2

Projects | Files | Services | Start Page | index.php | Zero.java

- _LodeBoxController
- _LodeScreenshotGrabber2
- _LodeServerController
- Clipboard demo
- PhpProject1
  - Source Files
    - index.php
  - Include Path
- RailwayManager
- RailwayManager2
- Zero
  - Source Packages
    - zero
      - Zero.java
  - Libraries

Navigator

Members

- Zero
  - main(String[] args)

New Project

Steps

1. **Choose Project**
2. ...

Choose Project

Categories:

- Java
- JavaFX
- Java Web
- Java EE
- HTML5/JavaScript
- Java ME Embedded
- Maven
- PHP
- Groovy
- C/C++

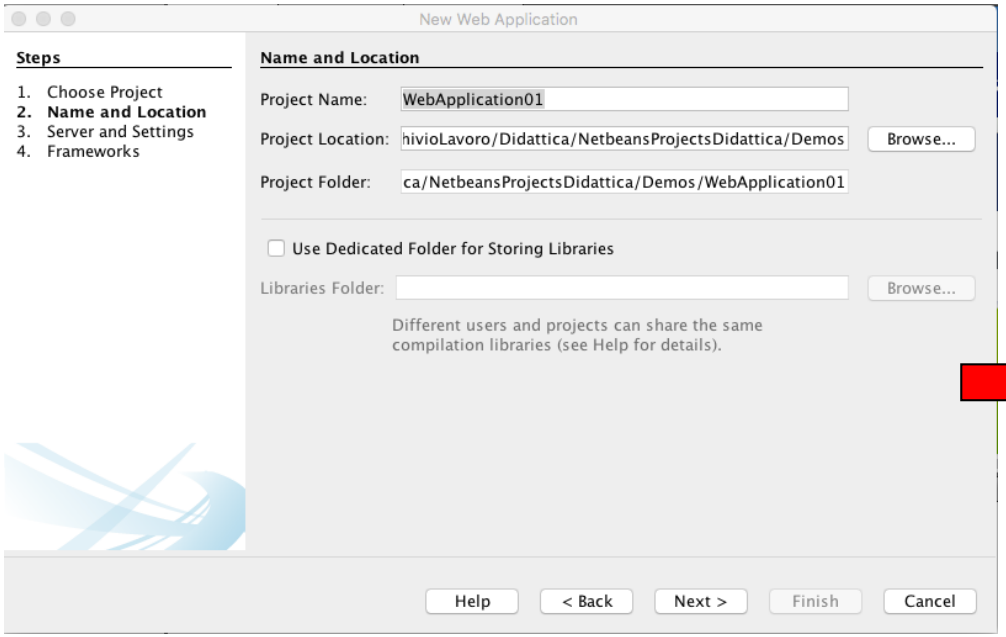
Projects:

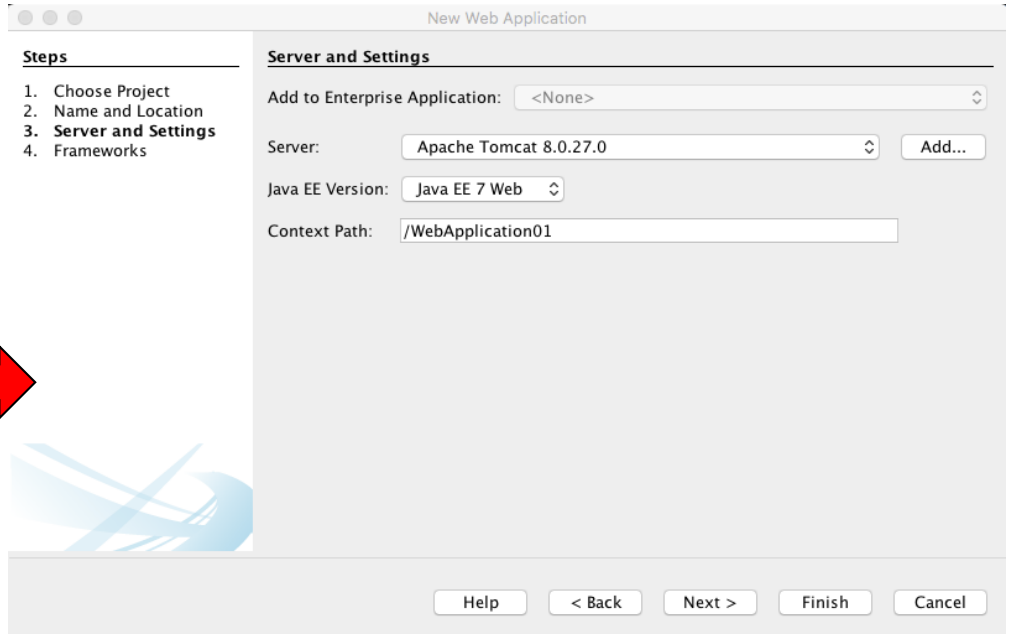
- Web Application
- Web Application with Existing Sources
- Web Free-Form Application

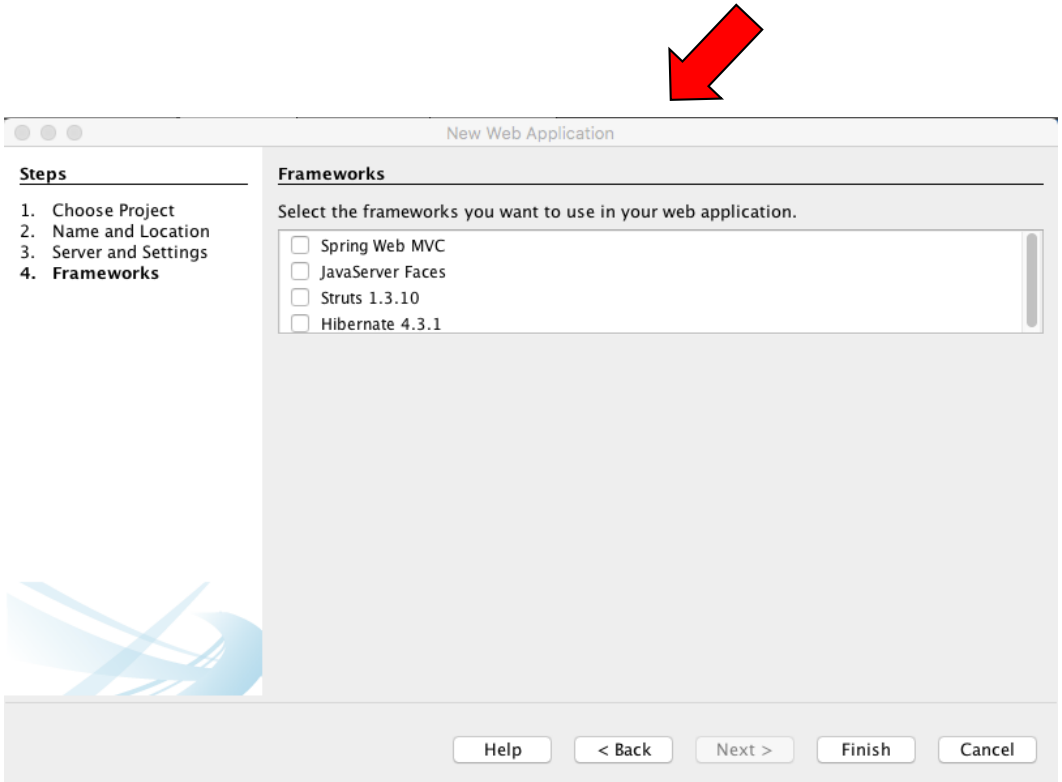
Description:

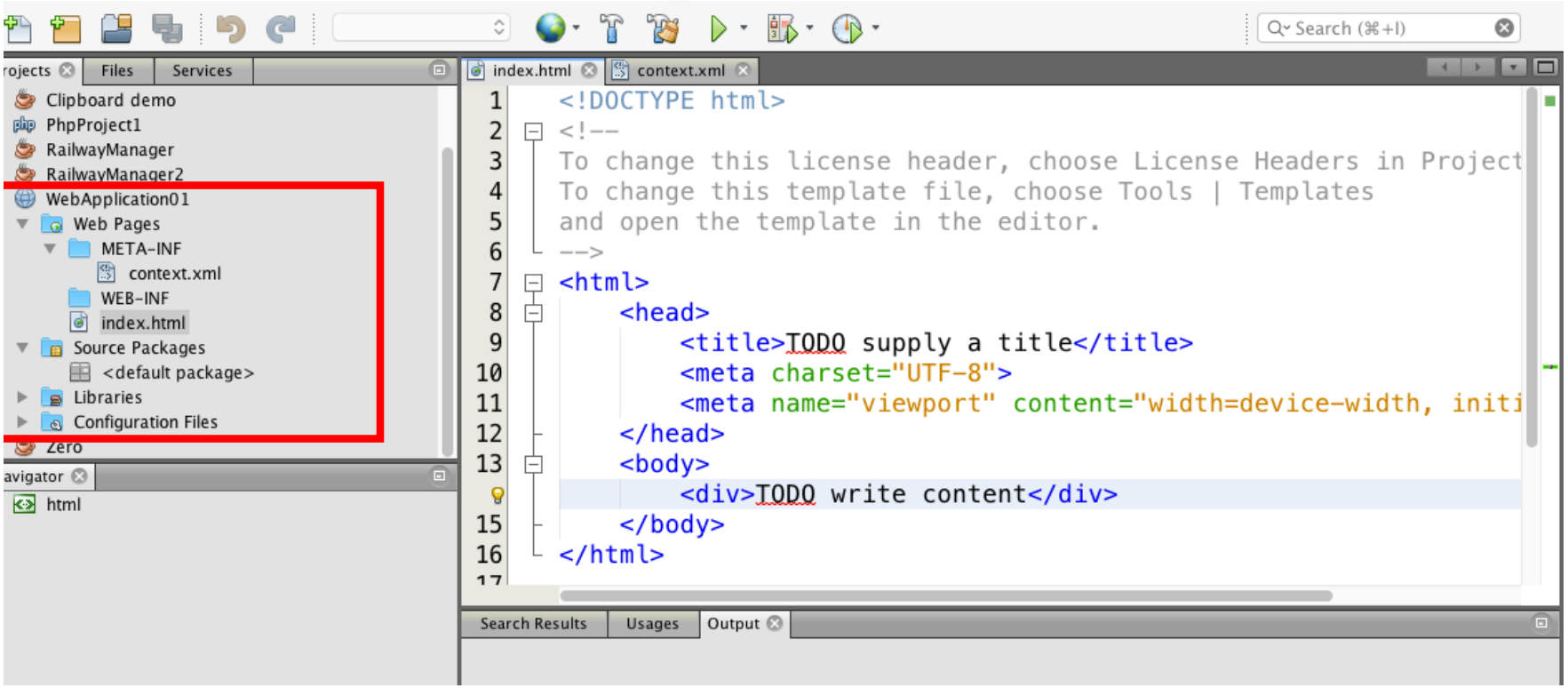
Creates an empty Web application in a standard IDE project. A standard project uses an **IDE-generated build script** to build, run, and debug your project.

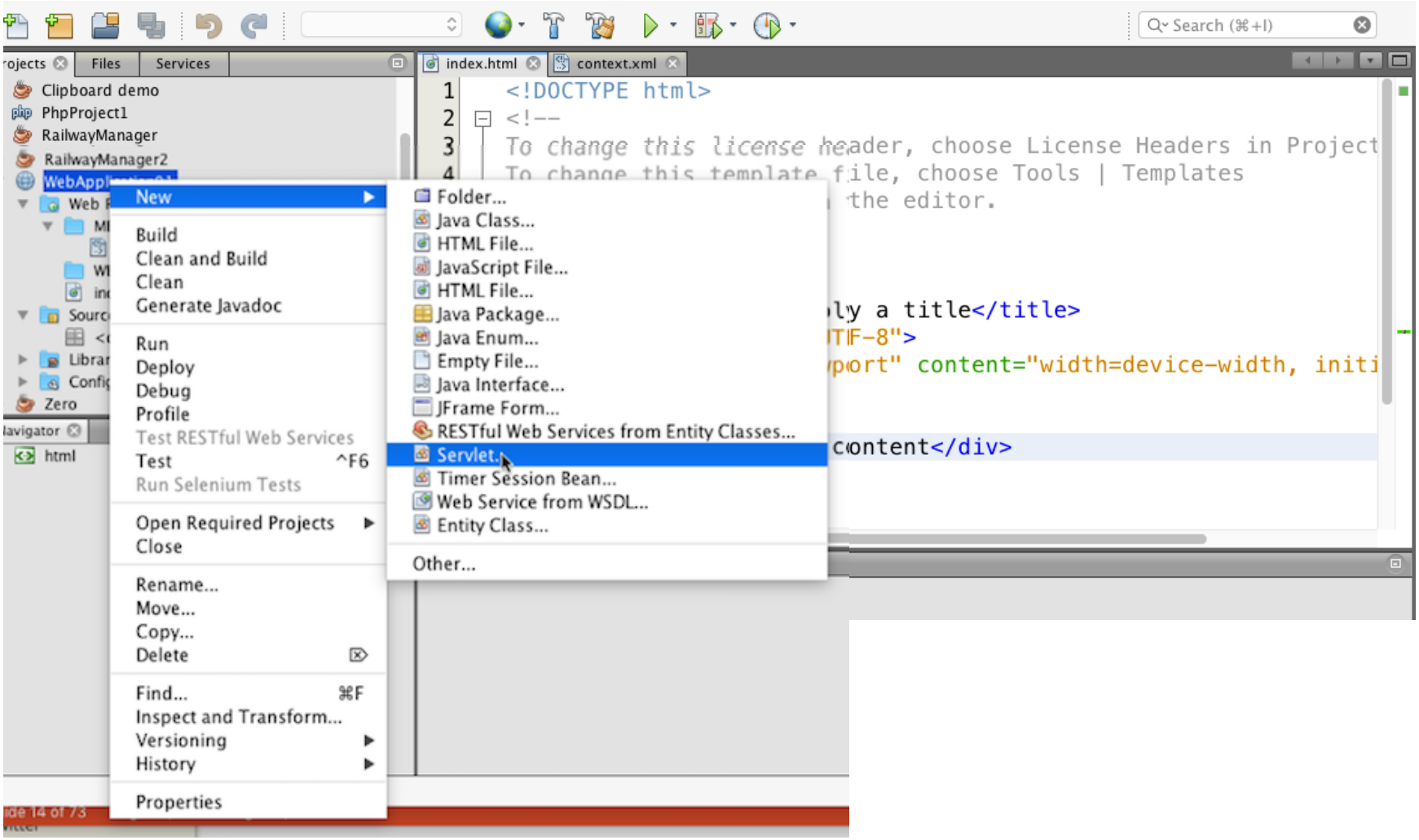
Help | < Back | Next > | Finish | Cancel


New Web Application
Steps
1. Choose Project
2. Name and Location
3. Server and Settings
4. Frameworks
Name and Location
Project Name: WebApplication01
Project Location: hivioLavoro/Didattica/NetbeansProjectsDidattica/Demos
Browse...
Project Folder: ca/NetbeansProjectsDidattica/Demos/WebApplication01
Use Dedicated Folder for Storing Libraries
Libraries Folder:
Browse...
Different users and projects can share the same compilation libraries (see Help for details).
Help
< Back
Next >
Finish
Cancel


New Web Application
Steps
1. Choose Project
2. Name and Location
3. Server and Settings
4. Frameworks
Server and Settings
Add to Enterprise Application: <None>
Server: Apache Tomcat 8.0.27.0
Add...
Java EE Version: Java EE 7 Web
Context Path: /WebApplication01
Help
< Back
Next >
Finish
Cancel


New Web Application
Steps
1. Choose Project
2. Name and Location
3. Server and Settings
4. Frameworks
Frameworks
Select the frameworks you want to use in your web application.
Spring Web MVC
JavaServer Faces
Struts 1.3.10
Hibernate 4.3.1
Help
< Back
Next >
Finish
Cancel


Search (⌘+I)
Files
Services
Clipboard demo
PhpProject1
RailwayManager
RailwayManager2
WebApplication01
Web Pages
META-INF
context.xml
WEB-INF
index.html
Source Packages
<default package>
Libraries
Configuration Files
Zero
avigator
html
index.html
context.xml
<!DOCTYPE html>
<!--
To change this license header, choose License Headers in Project
To change this template file, choose Tools | Templates
and open the template in the editor.
-->
<html>
<head>
<title>TODO supply a title</title>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initi
</head>
<body>
TODO write content
</body>
</html>
Search Results
Usages
Output


Search (⌘+I)
Files
Services
Clipboard demo
PhpProject1
RailwayManager
RailwayManager2
Zero
index.html
context.xml
<!DOCTYPE html>
<!--
To change this license header, choose License Headers in Project
To change this template file, choose Tools | Templates
the editor.
ly a title</title>
TF-8">
port" content="width=device-width, initi
content
New
Build
Clean and Build
Clean
Generate Javadoc
Run
Deploy
Debug
Profile
Test RESTful Web Services
Test ^F6
Run Selenium Tests
Open Required Projects
Close
Rename...
Move...
Copy...
Delete
Find... ⌘F
Inspect and Transform...
Versioning
History
Properties
Folder...
Java Class...
HTML File...
JavaScript File...
HTML File...
Java Package...
Java Enum...
Empty File...
Java Interface...
JFrame Form...
RESTful Web Services from Entity Classes...
Servlet...
Timer Session Bean...
Web Service from WSDL...
Entity Class...
Other...

New Servlet

Steps

1. Choose File Type
2. **Name and Location**
3. Configure Servlet Deployment

Name and Location

Class Name: ReadPost

Project: WebApplication01

Location: Source Packages

Package: it.unitn.disi.ronchet.myservlets

Created File: ios/WebApplication01/src/java/it/unitn/disi/ronchet/myservlets/ReadPost.java

Help

New Servlet

Steps

1. Choose File Type
2. Name and Location
3. **Configure Servlet Deployment**

Configure Servlet Deployment

Register the Servlet with the application by giving the Servlet an internal name (Servlet Name). Then specify patterns that identify the URLs that invoke the Servlet. Separate multiple patterns with commas.

☐ Add information to deployment descriptor (web.xml)

Class Name: it.unitn.disi.ronchet.myservlets.ReadPost

Servlet Name: ReadPost

URL Pattern(s): /ReadPost

Initialization Parameters:

Name	Value

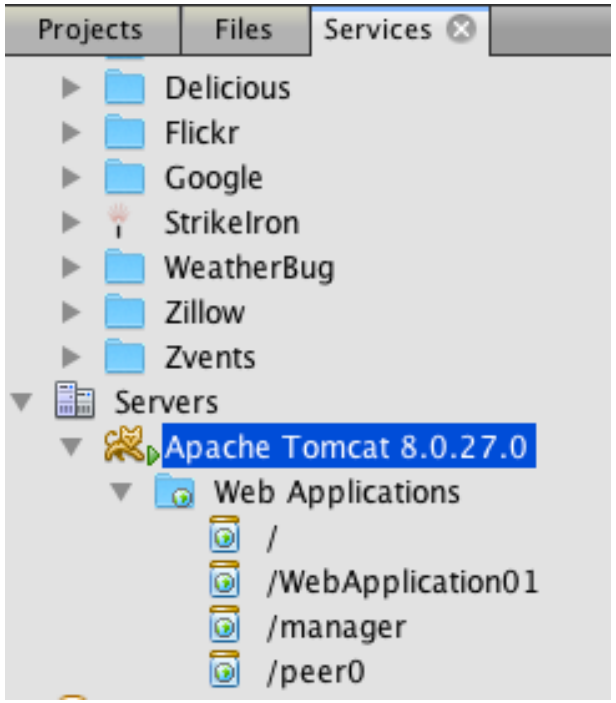
New

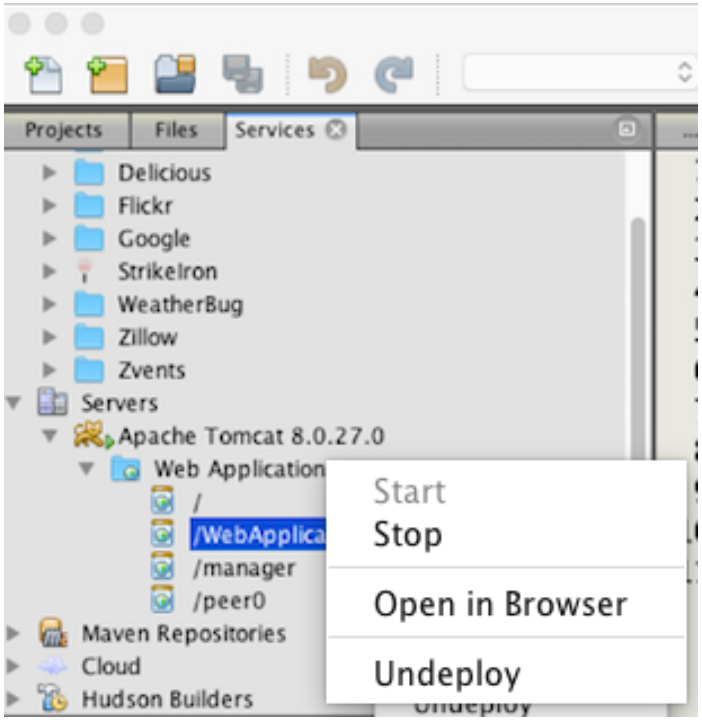
Edit...

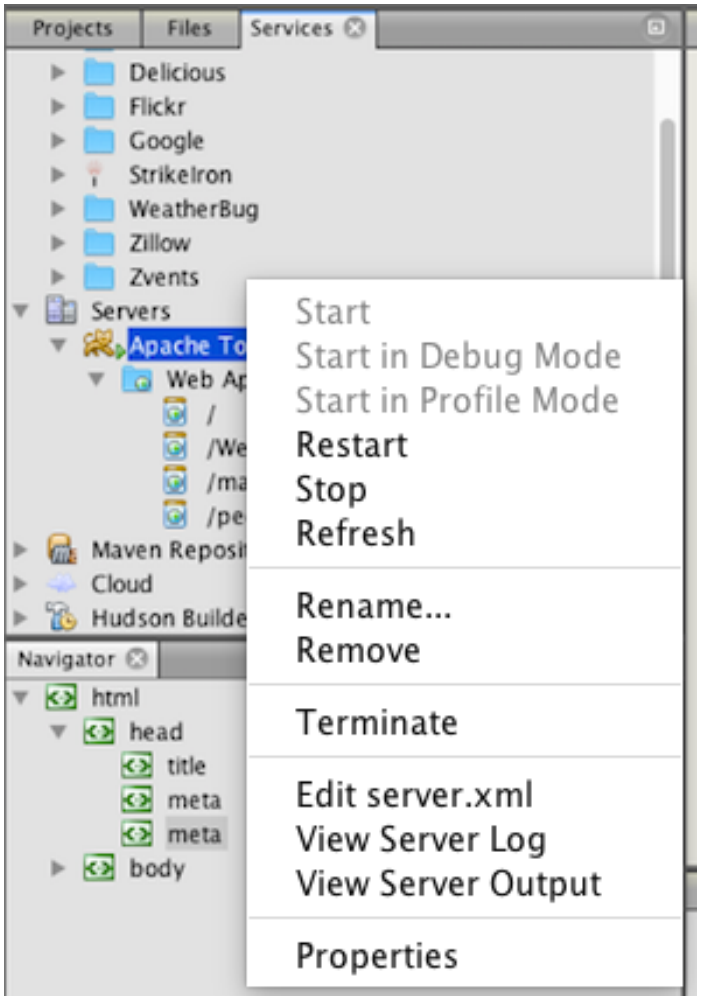
Delete

Help < Back Next > Finish Cancel

Netbeans Services







Starting and stopping Tomcat
Undeploying WebApps

```
@Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
}
@Override
    public void destroy() {
        log("destroy executed");
}
@Override
    public void init() {
        log("init executed");
}
```

Logging

Search Results | Usages | Output | HTTP Server Monitor

WebApplication01 (run) | Apache Tomcat 8.0.27.0 Log | Apache Tomcat 8.0.27.0

```
INFO [http-nio-8084-exec-146] org.apache.catalina.core.ApplicationContext.log Demo1: ===>/Applic
INFO [http-nio-8084-exec-147] org.apache.catalina.core.ApplicationContext.log Demo1: init execut
INFO [http-nio-8084-exec-147] org.apache.catalina.core.ApplicationContext.log Demo1: /Users/ronc
INFO [http-nio-8084-exec-147] org.apache.catalina.core.ApplicationContext.log Demo1: doGet execu
INFO [http-nio-8084-exec-148] org.apache.catalina.core.ApplicationContext.log Demo1: doGet execu
```

Q

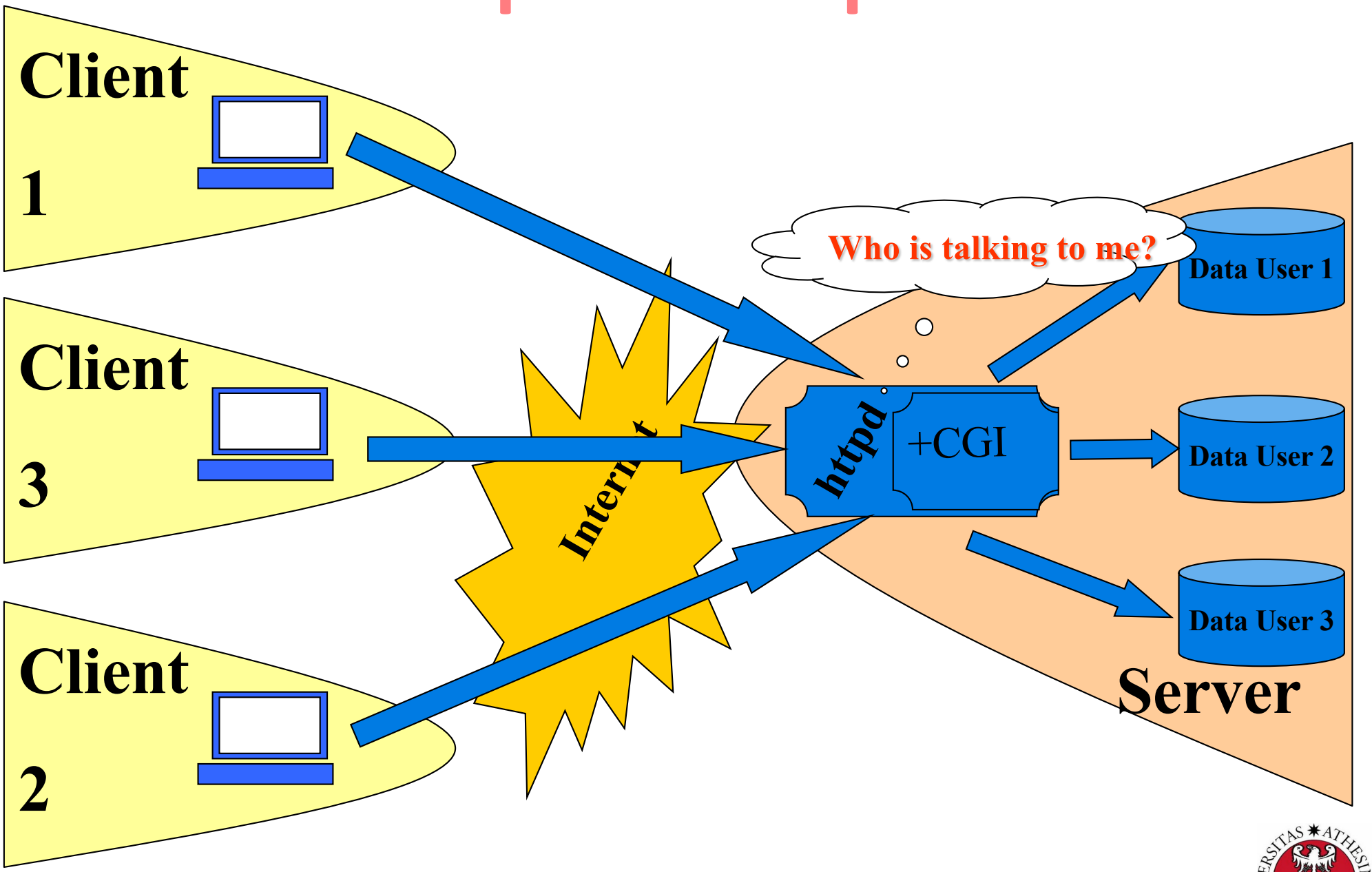
What is the HTTP state problem?

HTTP is stateless

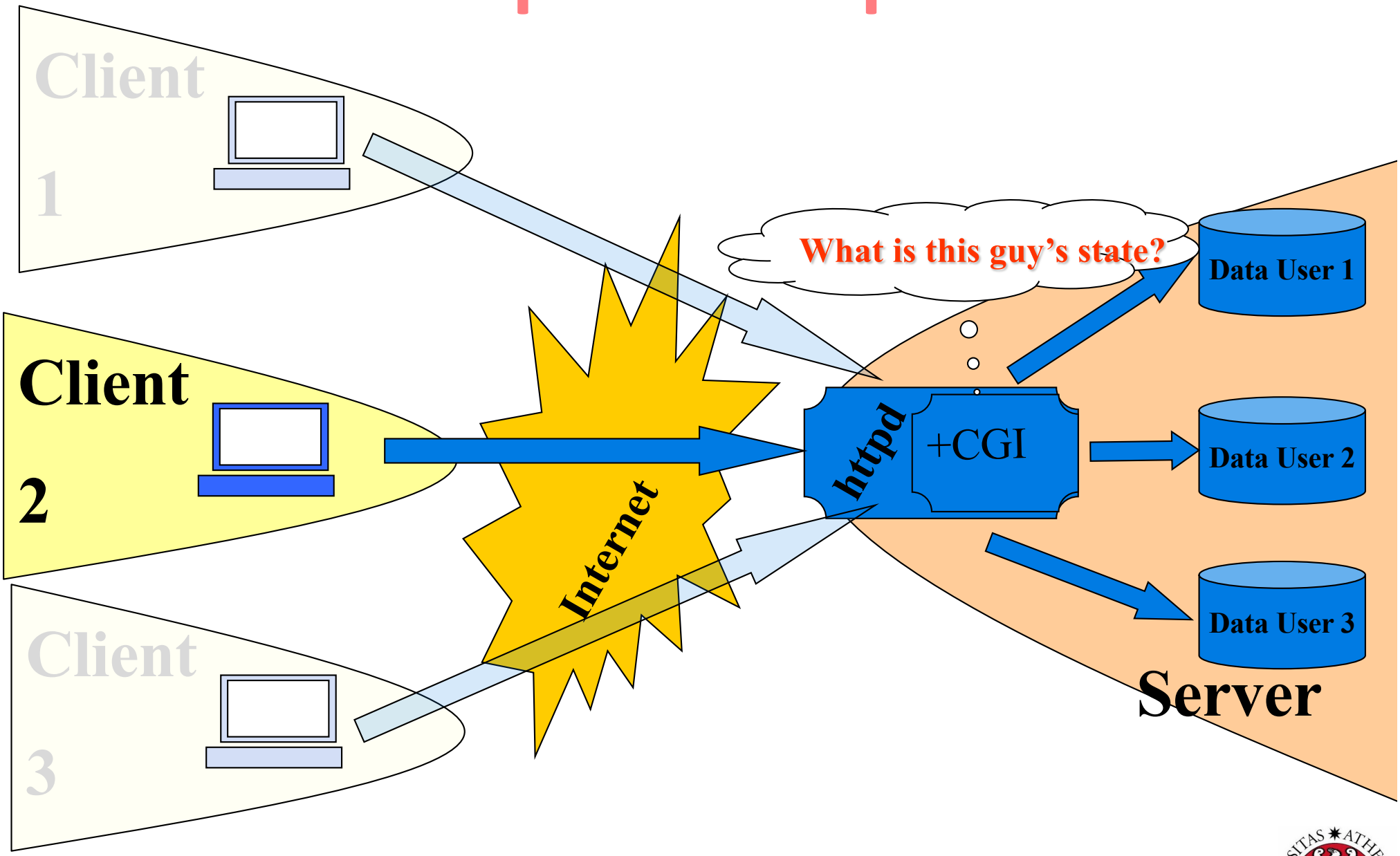
How can we keep track of who is who, and which state of the process s/he is at?

There is no way of doing it server-side…

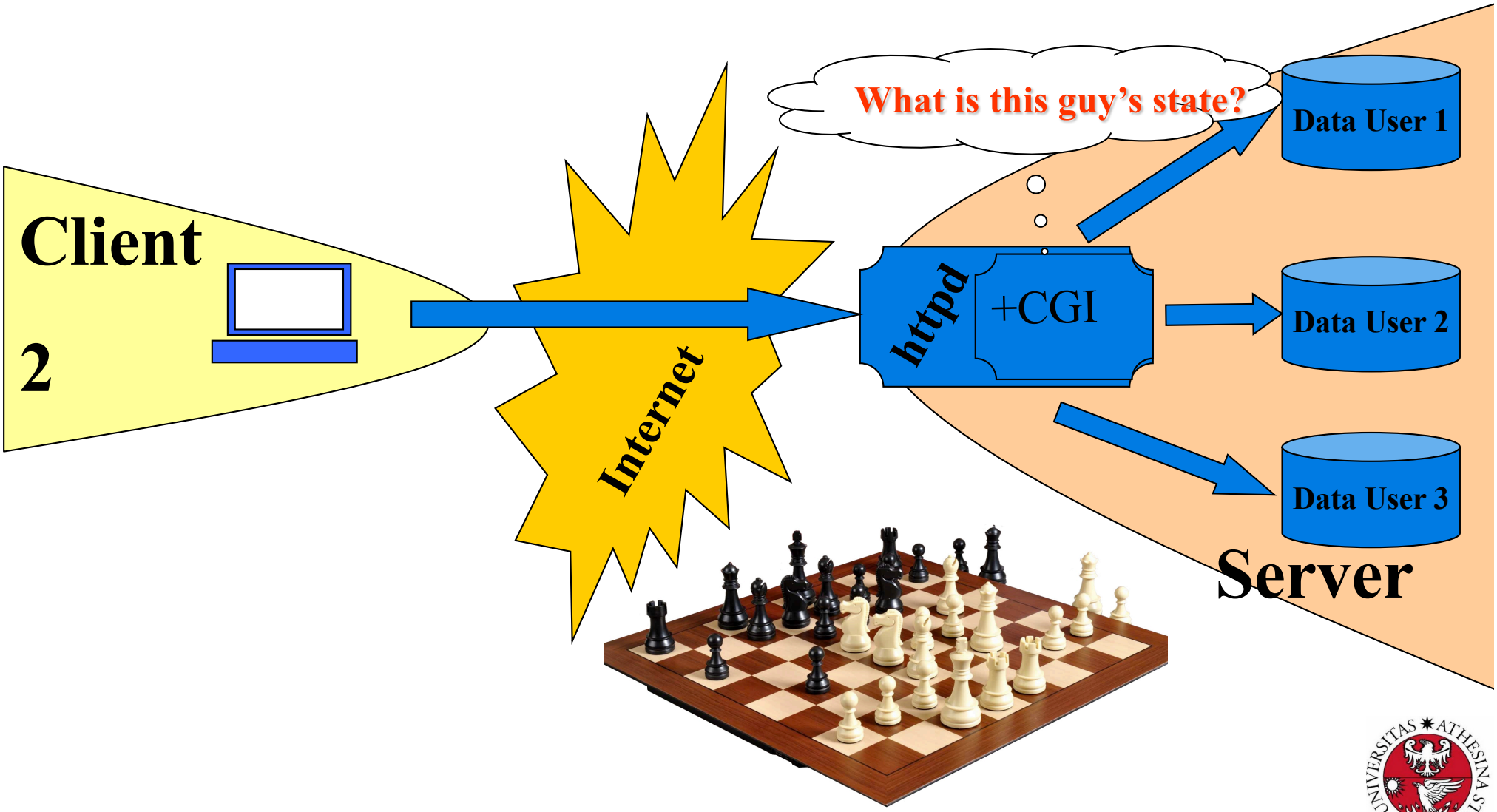
The state problem: part 1



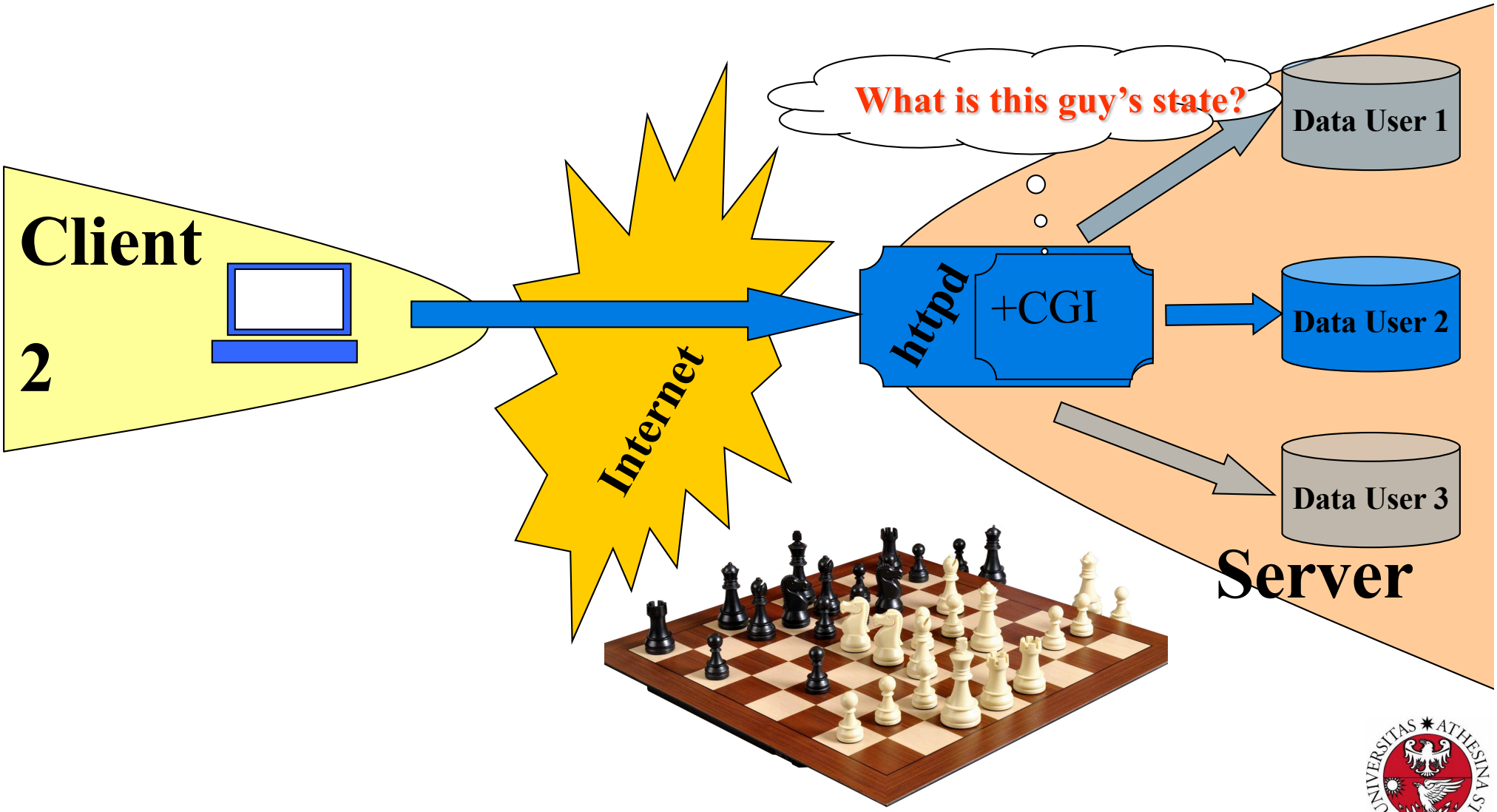
The state problem: part 2



The state problem: part 2 - example



The state problem: part 2 - example

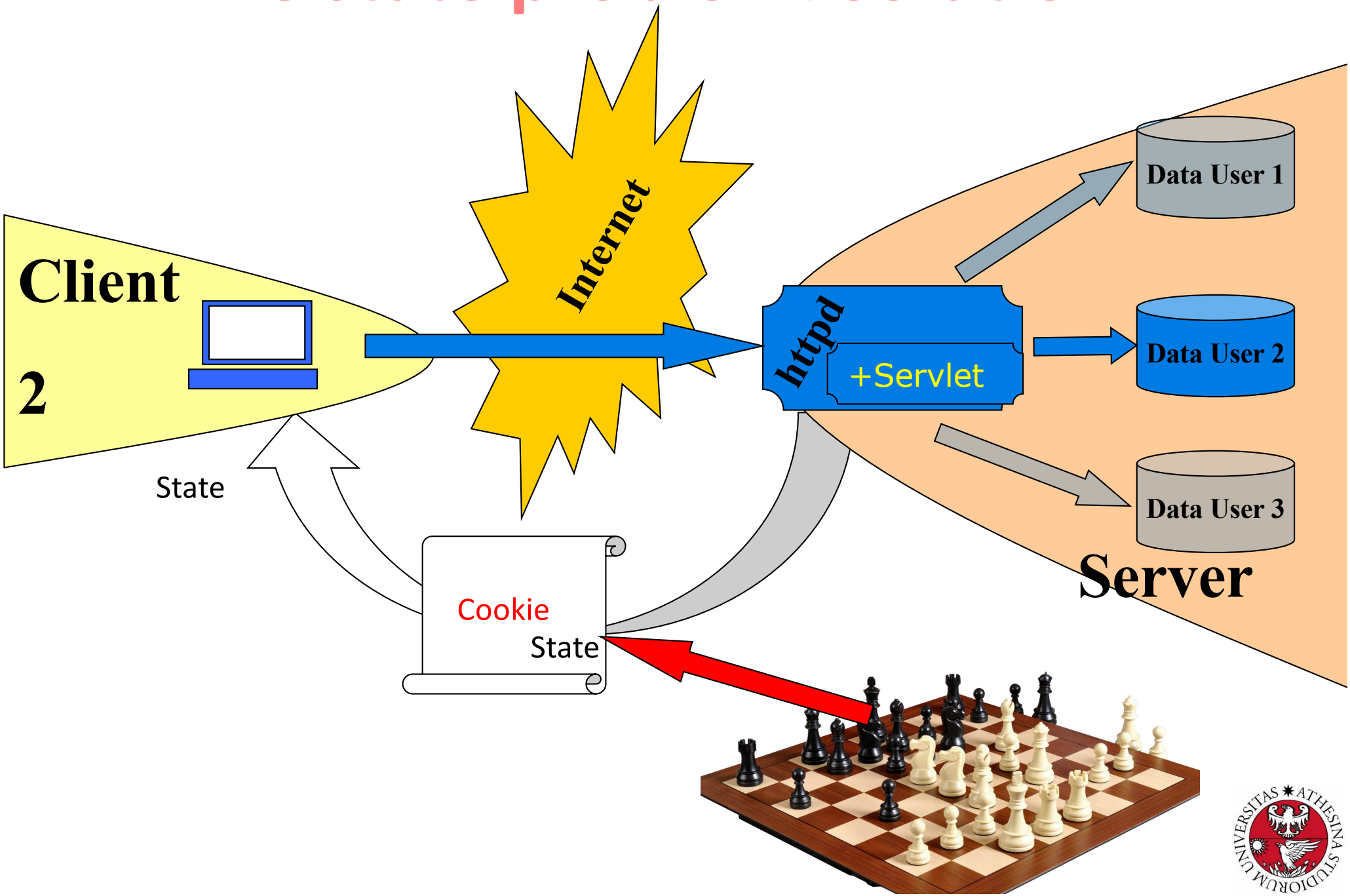


Q

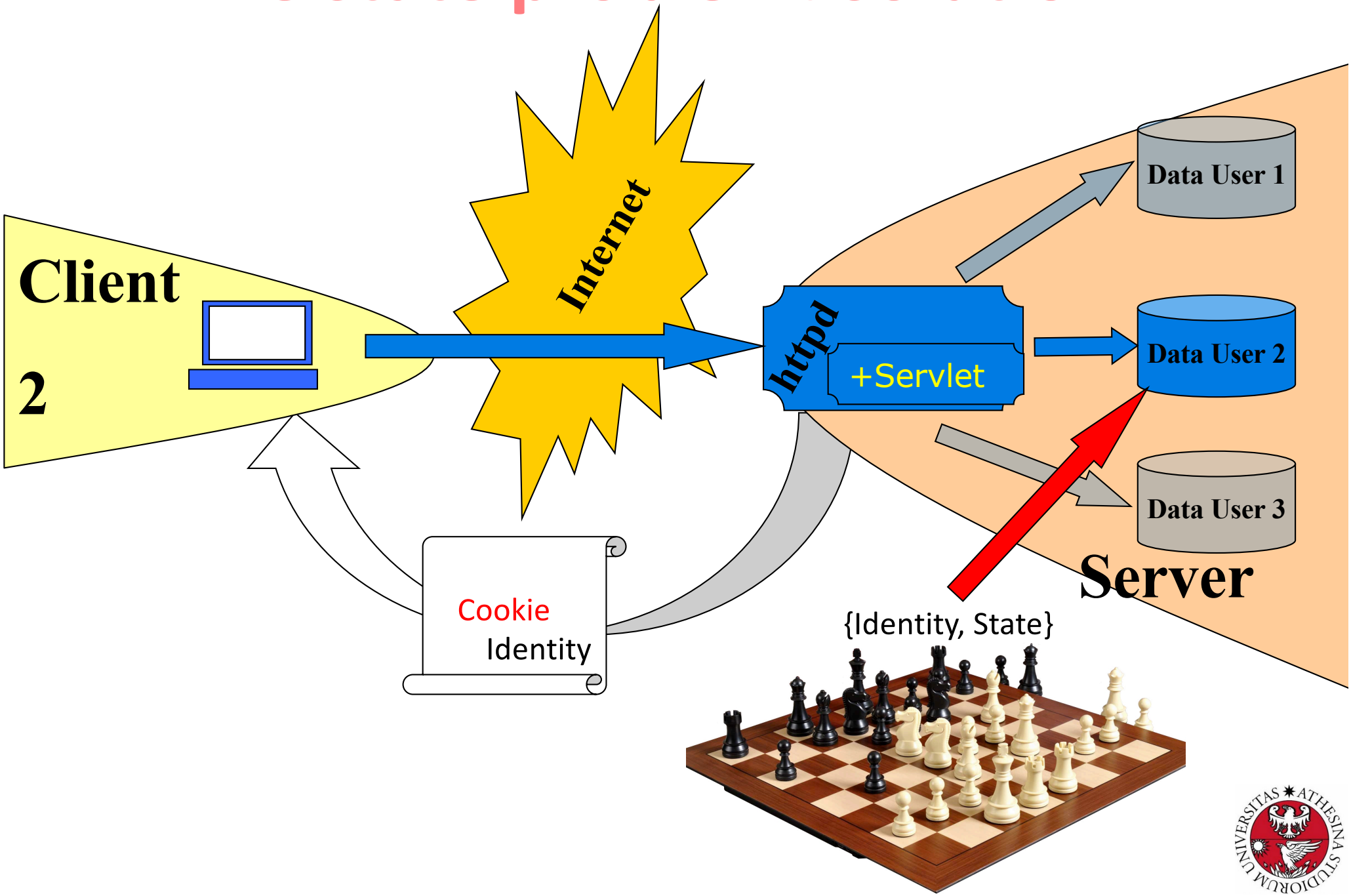
What are cookies ?

How do they dolve the state problem?

The state problem: solution 1



The state problem: solution 2



Keeping the state by using cookies

The idea:

	User ID	State (Map)
cookie1	User 1	
cookie2	User 2	
cookie3	User 3	

Key	Value
name	Object 1
address	Object 2
cart	Object 3

Key	Value
name	Object 1
address	Object 2
cart	Object 3

Key	Value
name	Object 1
address	Object 2
cart	Object 3

MEMORY

Cookies:

A Cookie is a small amount of information sent by a servlet to a Web browser, saved by the browser, and later sent back to the server.

A cookie's value can uniquely identify a client, so cookies are commonly used for session management.

A cookie has a name, a single value, and optional attributes such as a comment, path and domain qualifiers, a maximum age, and a version number.

Cookies

- The servlet sends cookies to the browser by using the HttpServletResponse.addCookie(javax.servlet.http.Cookie) method, which adds fields to HTTP response headers to send cookies to the browser, one at a time. The browser is expected to support 20 cookies for each Web server, 300 cookies total, and may limit cookie size to 4 KB each.

- The browser returns cookies to the servlet by adding fields to HTTP request headers. Cookies can be retrieved from a request by using the HttpServletRequest.getCookies() method.

Q

Which operations can we perform on cookies ?

main operations on cookies

String getName() / void setName(String s)

String getValue() / void setValue(String s)

boolean getSecure / setSecure(boolean b) (encript the cookie)

int getMaxAge() / void setMaxAge(int i) (Positive: seconds to live. Zero: delete cookie. Negative: only as long as browser quits.

Control cookie scope: Normally, cookies are returned only to the exact hostname that sent them.

- String getDomain() / setDomain(String s):
- instruct the browser to return them to other hosts within the same domain.
- String getPath() / void setPath(String s)
- restrict the path of URL which can obtain the cookie

Placing Cookies in the Response Headers

The cookie is added to the Set-Cookie response header by means of the addCookie method of HttpServletResponse. Here's an example:

```
  Cookie userCookie = new Cookie("user",
"uid1234");
  response.addCookie(userCookie);
// before opening the body of response!
// i.e. before any out.print
```

Reading Cookies from the Client

- **To read the cookies that come back from the client, you call getCookies on the HttpServletRequest. This returns an array of Cookie objects corresponding to the values that came in on the Cookie HTTP request header.**

- **Once you have this array, you typically loop down it, calling getName on each Cookie until you find one matching the name you have in mind. You then call getValue on the matching Cookie, doing some processing specific to the resultant value.**

Cookies

Demo: Cookies in action

Output

Chrome

Safari

Let's meet...

localhost:8084/WebAp...

Error

Hi! What is your name? Marco Submit

localhost:8084/WebAppWith

Hi! What is your name? Pietro Submit

localhost:8084/WebAp...

Hi Marco, nice to meet you!
Delete Cookies? Yes, Delete No, Do not

localhost:8084/WebA

Hi Pietro, nice to meet you!
Delete Cookies? Yes, Delete No, Do not

5 times

2 times

Hi Marco, welcome back! (2)
Delete Cookies? Yes, Delete No, Do not

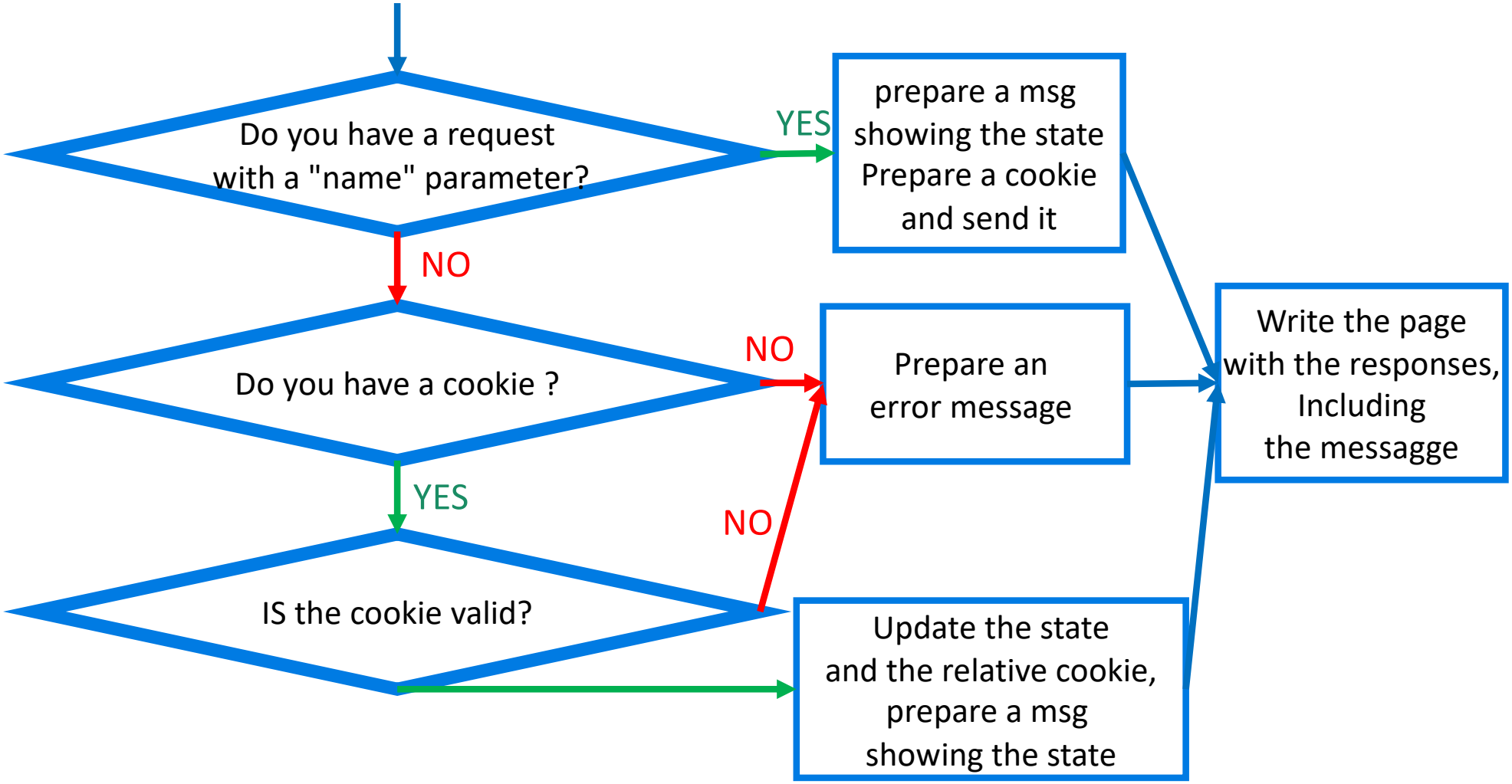
localhost:8084/WebAp

Hi Pietro, welcome back! (5)
Delete Cookies? Yes, Delete No, Do not

All cookies have been deleted
Go to the initial page.

Sorry, we do not know each other...
Please introduce yourself.
What is your name? Submit

Cookies in action - outline



Cookies in action - 1

... Page | index.html | Welcome.java | WhatsYourNameFragment.html | DeleteCookiesFragment.html | DeleteCookies.java...

```html
<!DOCTYPE html>
<html>
    <head>
        <title>Let's meet...</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <form method="GET" action="welcome">
            <label for="name">Hi! What is your name?</label>
            <input type="text" name="name">
            <input type="submit" >
        </form>
    </body>
</html>
```

... Page | index.html | Welcome.java | WhatsYourNameFragment.html | DeleteCookiesFragment.html

```html
        <form method="GET" action="welcome">
            <label for="name">What is your name?</label>
            <input type="text" name="name" value="">
            <input type="submit" >
        </form>
```

Cookies in action - 2

```
... Page | index.html | Welcome.java | WhatsYourNameFragment.html | DeleteCookiesFragment.html | DeleteCookies.java...
<form method="GET" action="deleteCookies">
    Delete Cookies?
    <input type="submit" value="Yes, Delete">
    <input type="submit" value="No, Do not" formaction="welcome" >
</form>
```

```
Files | Servi...
WebAppWithCookies
  Web Pages
    META-INF
    WEB-INF
      CookiesHaveBe
      DeleteCookiesF
      WhatsYourNam
      index.html
  Source Packages
    it.unitn.disi.ron
      DeleteCooki
      Welcome.jav
  Test Packages
Navigator

...java | WhatsYourNameFragment.html | DeleteCookiesFragment.html | DeleteCookies.java | CookiesHaveBeenDeleted.html
<!DOCTYPE html>
<html>
    <head>
        <title>Cookies have been deleted</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        All cookies have been deleted <br>
        Go to the <a href="/WebAppWithCookies/welcome">initial page</a>.
    </body>
</html>
```

Cookies in action - 3

```
package it.unitn.disi.ronchet.myservlets;

import …

@WebServlet(urlPatterns = {"/welcome"})
public class Welcome extends HttpServlet {

    String msg;
    boolean isInitialIteration ;

    private void dealWithInvalidCookie() {
        msg = "Sorry, we do not know each other...<br>"
                + "Please introduce yourself.<br>";
        isInitialIteration = true;
    }
```

Cookies in action - 4

```
protected void doGet(HttpServletRequest request,
`             HttpServletResponse response)
              throws ServletException, IOException {
        isInitialIteration=false;
        // manage params and cookies
        String name = request.getParameter("name");
        if (name != null && ! name.equals("")) {
            // there is the right parameter,
            // no need to read cookie, but we set them
            log("name != null && ! name.equals(\"\")");
            Cookie cookie = new Cookie("name", name);
            msg = "Hi " + name + ", nice to meet you!";
            response.addCookie(cookie); // identity
            Cookie cookie1 = new Cookie("counter", "0");
            response.addCookie(cookie1); // state
            // finished! Go to end
        } else {
```

Cookies in action - 5

```
} else {
    // no parameter, let's try with cookies
    Cookie cookies[] = request.getCookies();
    if (cookies==null || cookies.length == 0) {
        // no cookies
        log(”no cookies found");
        dealWithInvalidCookie();
    } else {
        Cookie n_Cookie=null; // cookie con il nome
        Cookie c_Cookie=null; // cookie con il contatore
        for (Cookie c:cookies) {
            String cookieName = c.getName();
            if (cookieName.equals("name")) {
                n_Cookie=c;
            } else if (cookieName.equals("counter")) {
                c_Cookie=c;
            }
        }
        if (n_Cookie==null) {
            log ("valid cookies not found");
            // invalid cookie
            dealWithInvalidCookie();                    } else
```

Cookies in action - 6

```
            } else {
                // ok, the cookie is good!
                String userName=n_Cookie.getValue();
                String counterAsString=c_Cookie.getValue();
                log ("name == "+userName);
                // let's update the counter, and the cookie
                int counter=Integer.valueOf(counterAsString)+1;
                c_Cookie.setValue(""+counter);
                response.addCookie(c_Cookie);
                msg = "Hi " + userName + ", welcome back! (”
                       +counter+")";}
        }
    }
```

Cookies in action - 7

```
// prepare response and send it
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            out.println("<!DOCTYPE html>");
            out.println("<html><body>");
            out.println(msg);
            if (isInitialIteration) {
                request.getRequestDispatcher(
                    "WhatsYourNameFragment.html")
                        .include(request, response);
            } else {
                request.getRequestDispatcher(
                    "DeleteCookiesFragment.html")
                        .include(request, response);
            }
            out.println("</body></html>");
        }

    }
```

Cookies in action – 8 - deleteCookies

```
@WebServlet(name = "DeleteCookies",
       urlPatterns = {"/deleteCookies"})
public class DeleteCookies extends HttpServlet {

    protected void doGet(HttpServletRequest request,
              HttpServletResponse response)
              throws ServletException, IOException {
        Cookie cookies[]=request.getCookies();
        if (cookies != null) {
            for (Cookie c : cookies) {
                c.setMaxAge(0);
                response.addCookie(c);
            }
        }
        response.setContentType("text/html;charset=UTF-8");
        request.getRequestDispatcher(
              "CookiesHaveBeenDeleted.html")
                .include(request, response);
    }
}
```