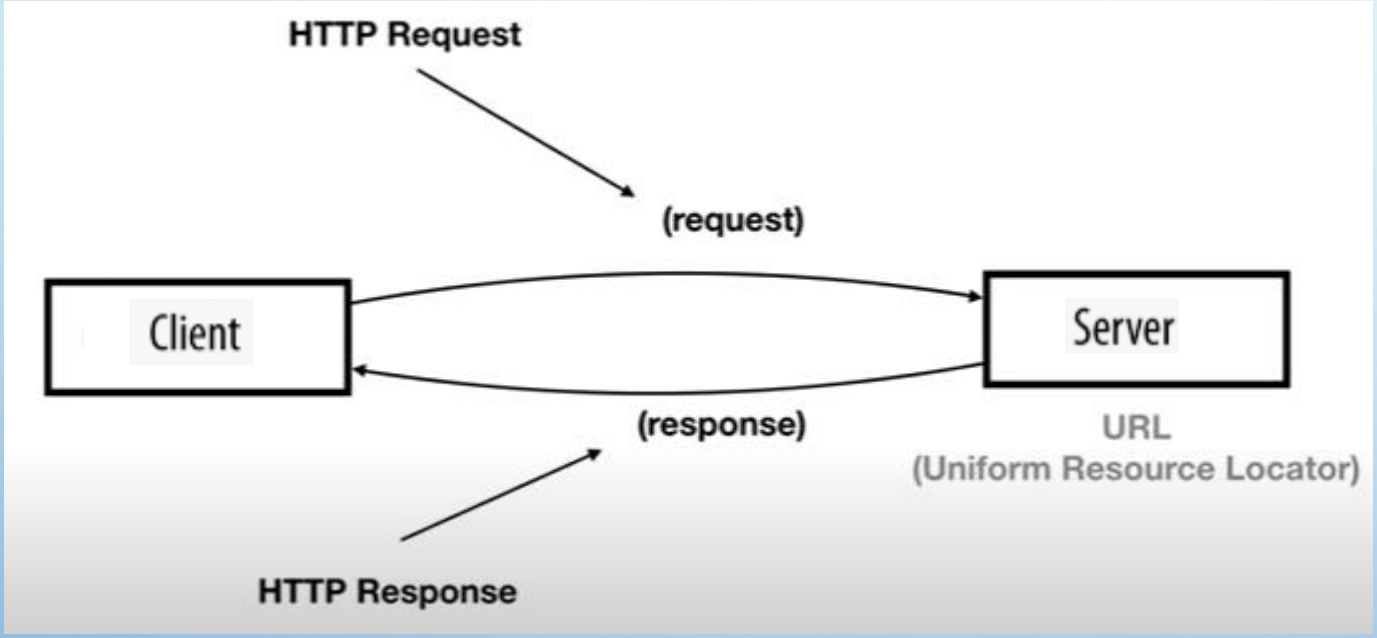
By Ayala Berkovich

JAVA WEB APPLICATION

By Ayala Berkovich

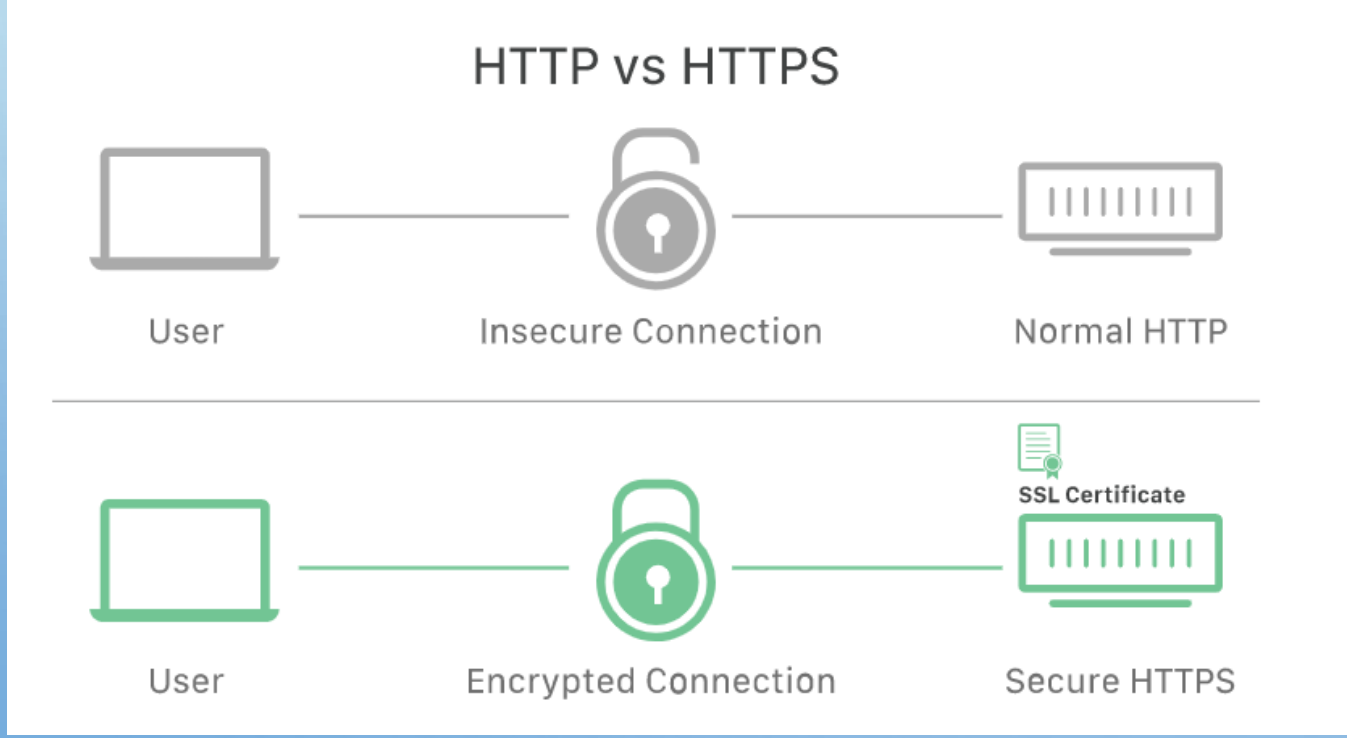
JAVA WEB



SERVER HAS ADDRESS ROW **URL** FOR FINDING SITE LOCATION

https://he.wikipedia.org/

By Ayala Berkovich

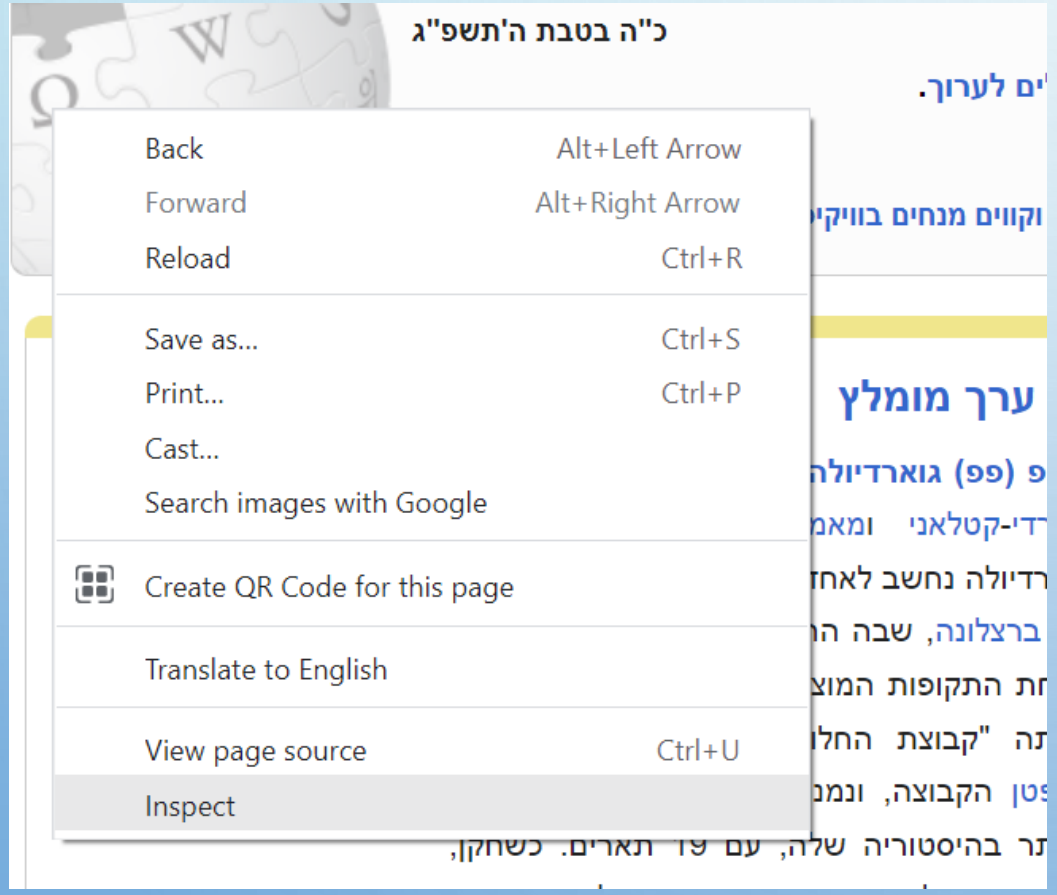


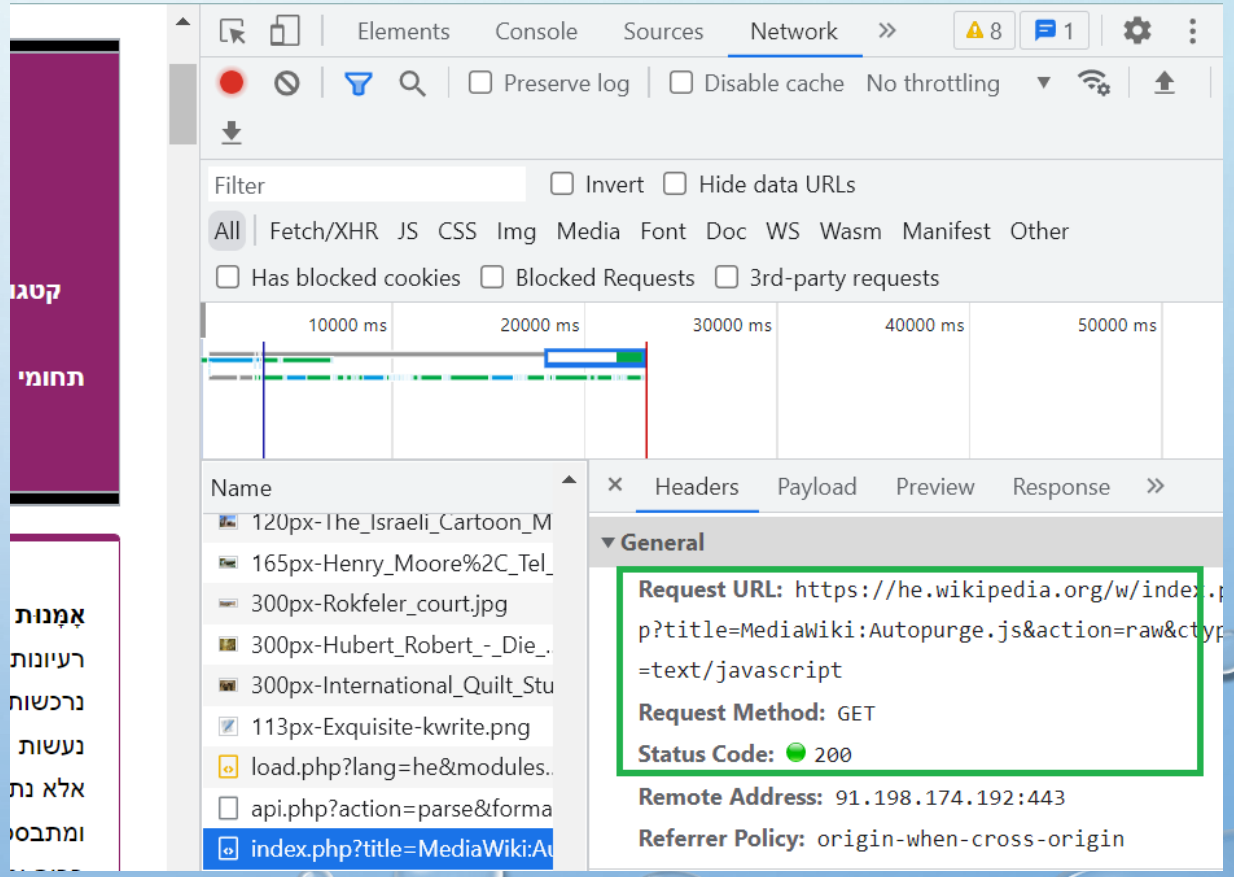
HTTP data is not encrypted, so can be intercepted by third parties to gather data passed between the two systems.

By Ayala Berkovich

JAVA WEB

https://he.wikipedia.org/





By Ayala Berkovich

JAVA WEB

HEADER INFORMATION:

Request URL: https://www.youtube.com/
Request Method: GET
Status Code: 200

- GET
- POST

METHOD **GET** – WE WANT JUST GET DATA FROM THE SERVER

METHOD **POST** – WE WANT UPDATE SOME DATA ON THE SERVER

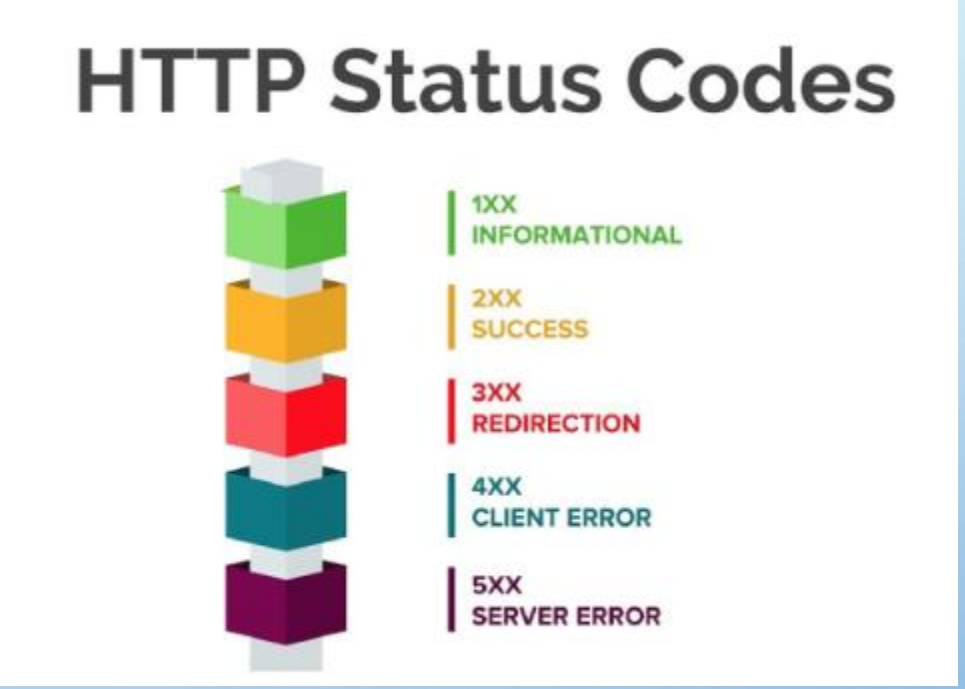
cache-control: private, s-maxage=0, max-age=0, m
st-revalidate
content-encoding: gzip
content-length: 596
content-type: text/javascript; charset=UTF-8
date: Wed, 18 Jan 2023 14:29:12 GMT

CONTENT - TYPE – TYPE OF RETURNED DATA(HTML/TEXT/…)

By Ayala Berkovich

JAVA WEB

Request URL: `https://www.youtube.com/`
Request Method: `GET`
Status Code: 200



By Ayala Berkovich

JAVA WEB

SOME HTTP STATUS CODE EXAMPLES:

The **102** Processing status code means that the server has accepted the full request but has not yet completed it and no response is available as of yet.

The **200** status - success

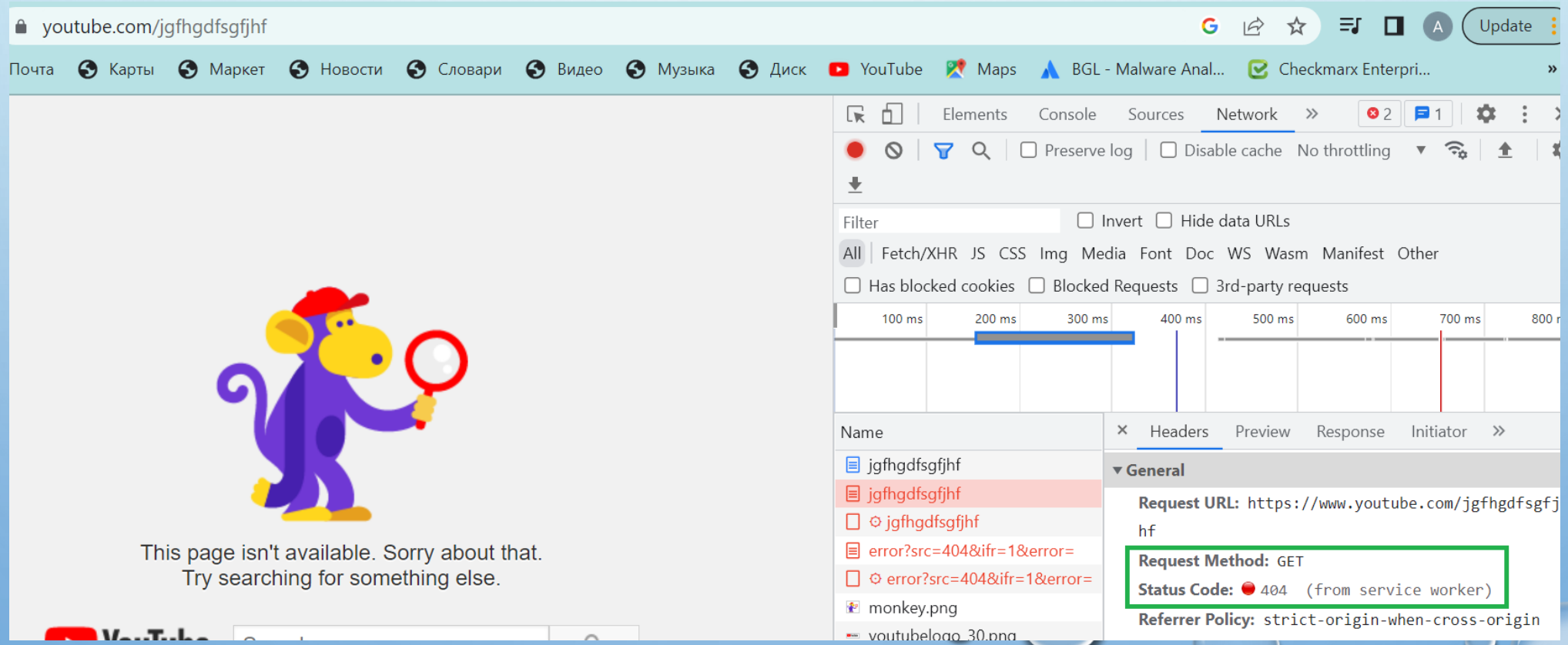
The **403** (Forbidden)-**you don't have permissions to access** , status code indicates that the server understood the request but refuses to authorize it...If authentication credentials were provided in the request, the server considers them insufficient to grant access.

The **301** - a browser redirects to the new URL and search engines update their links to the resource.

By Ayala Berkovich

JAVA WEB

404 STATUS – URL NOT EXIST….SITE NOT EXIST ON THE SERVER



By Ayala Berkovich

JAVA WEB

MOST POPULAR TYPE (CONTENT-TYPE) THAT BACK FROM SERVER IS : **HTML(HYPER TEXT MARKUP LANGUAGE)**

```html
<!DOCTYPE html>
<html>
<body>

<h2>Image as a Link</h2>

<p>The image is a link. You can click on it.</p>

<a href="default.asp">
<img src="smiley.gif" alt="HTML tutorial"
style="width:42px;height:42px;">
</a>

</body>
</html>
```

Output

Image as a Link

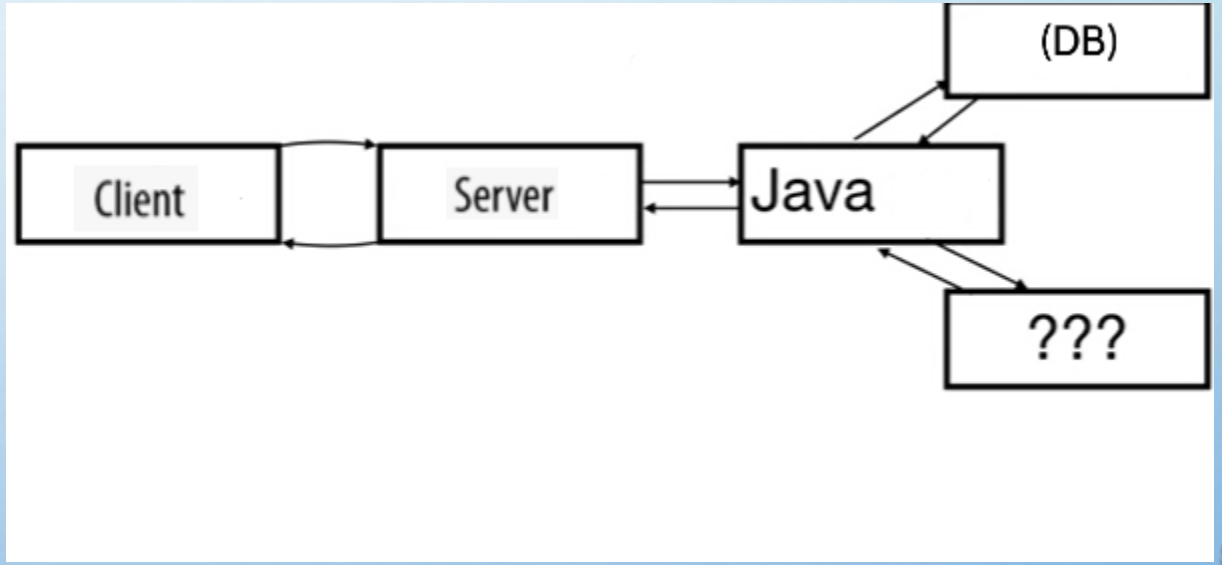
The image is a link. You can click on it.

By Ayala Berkovich

JAVA WEB

RESPONSE FROM SERVER CAN BE STATIC AND DYNAMIC.
STATIC IS JUST PAGE WHERE WE CAN DO OPERATIONS.
DYNAMIC CAN BE IN INTERACTION WITH USER

STRUCTURE OF CLIENT-SERVER APPLICATION:

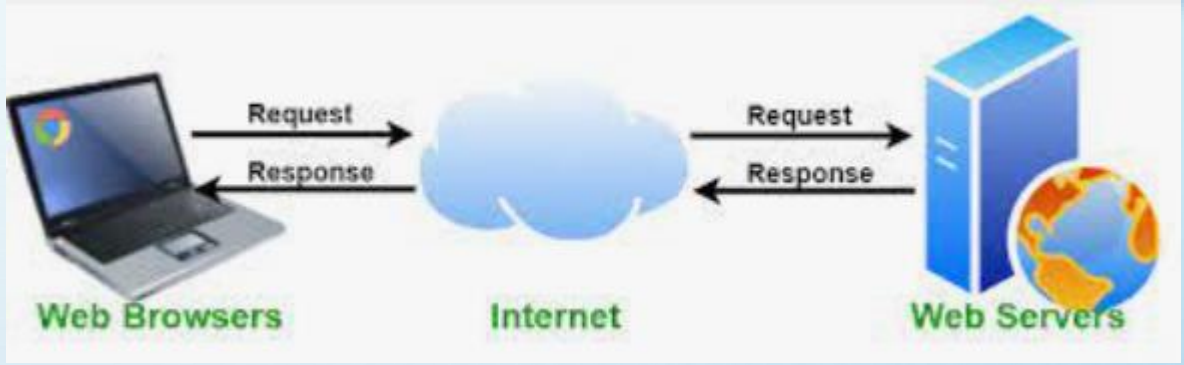


WE WILL USE NEXT TECHNOLOGIES FOR BUILDING WEB APPLICATION :

- Java
- Tomcat
- Сервлеты
- JSP
- JDBC
- Spring

By Ayala Berkovich

WEB SERVER



WHAT IS WEB SERVER?

WEB SERVER IS A COMPUTER THAT STORES WEB SERVER SOFTWARE AND A WEBSITE'S COMPONENT FILES (FOR EXAMPLE, HTML DOCUMENTS, IMAGES, CSS STYLESHEETS, AND JAVASCRIPT FILES). A WEB SERVER CONNECTS TO THE INTERNET AND SUPPORTS PHYSICAL DATA INTERCHANGE WITH OTHER DEVICES CONNECTED TO THE WEB.

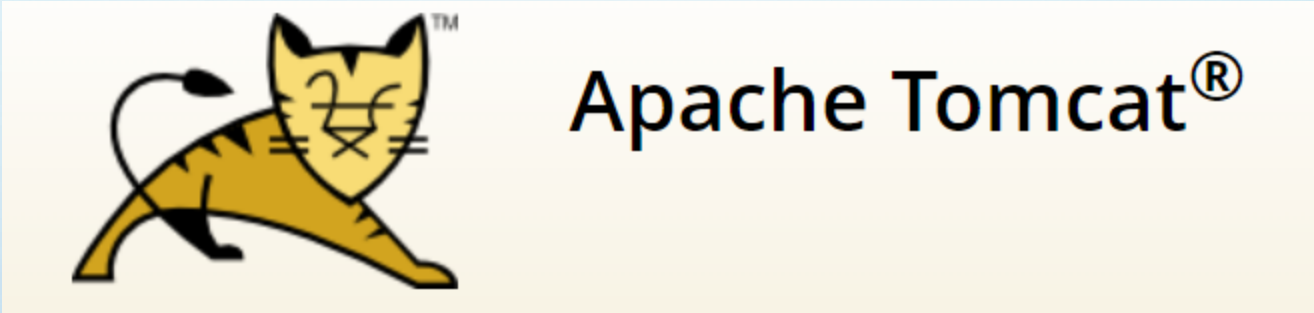
WHY IS WEB SERVER USED?

WEB SERVERS ARE PRIMARILY USED TO PROCESS AND MANAGE HTTP/HTTPS REQUESTS AND RESPONSES FROM THE CLIENT SYSTEM.

By Ayala Berkovich

TOMCAT SERVER

WHAT IS TOMCAT?



APACHE TOMCAT IS A POPULAR OPEN SOURCE WEB SERVER AND SERVLET CONTAINER FOR JAVA CODE.

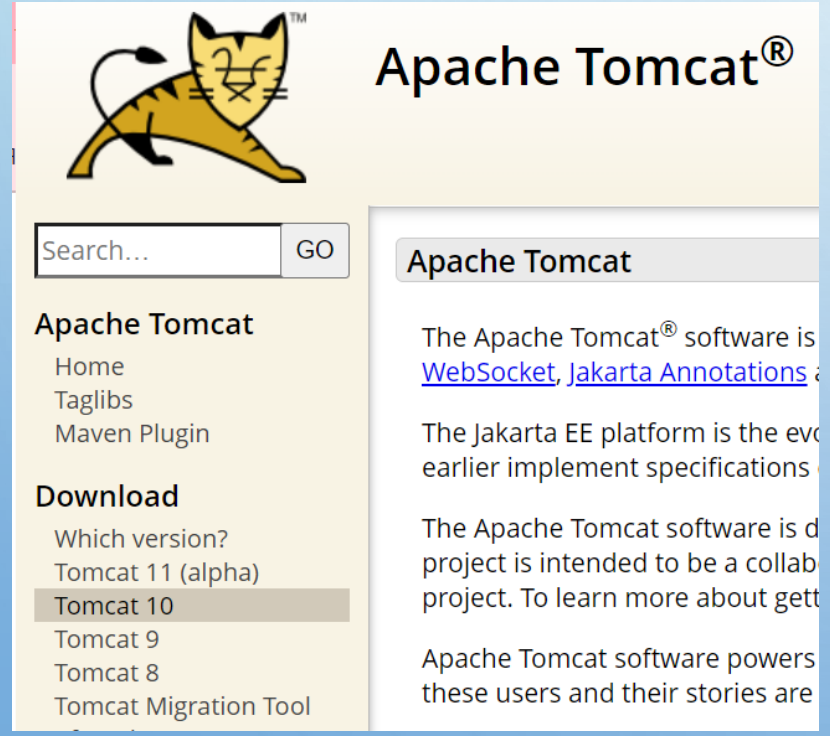
By Ayala Berkovich

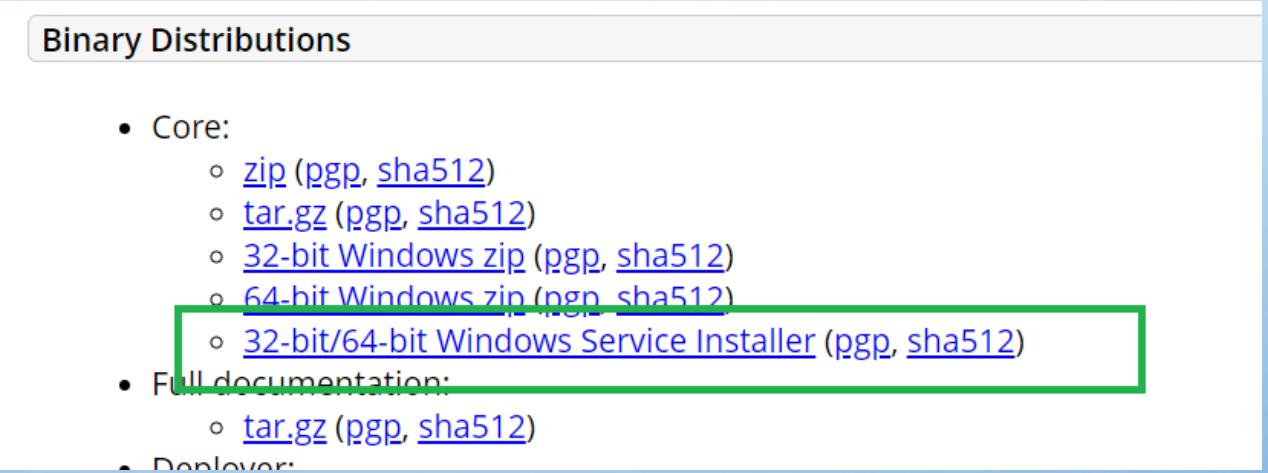
TOMCAT SERVER

HOW TO INSTALL TOMCAT?

SIGN IN GOOGLE :APACHE TOMCAT

Apache Tomcat® - Welcome!



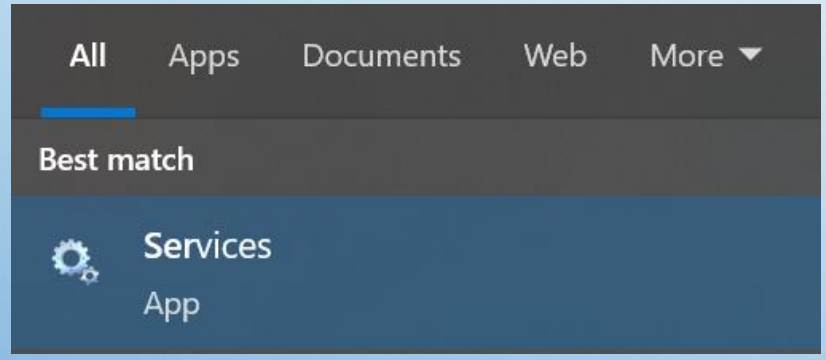


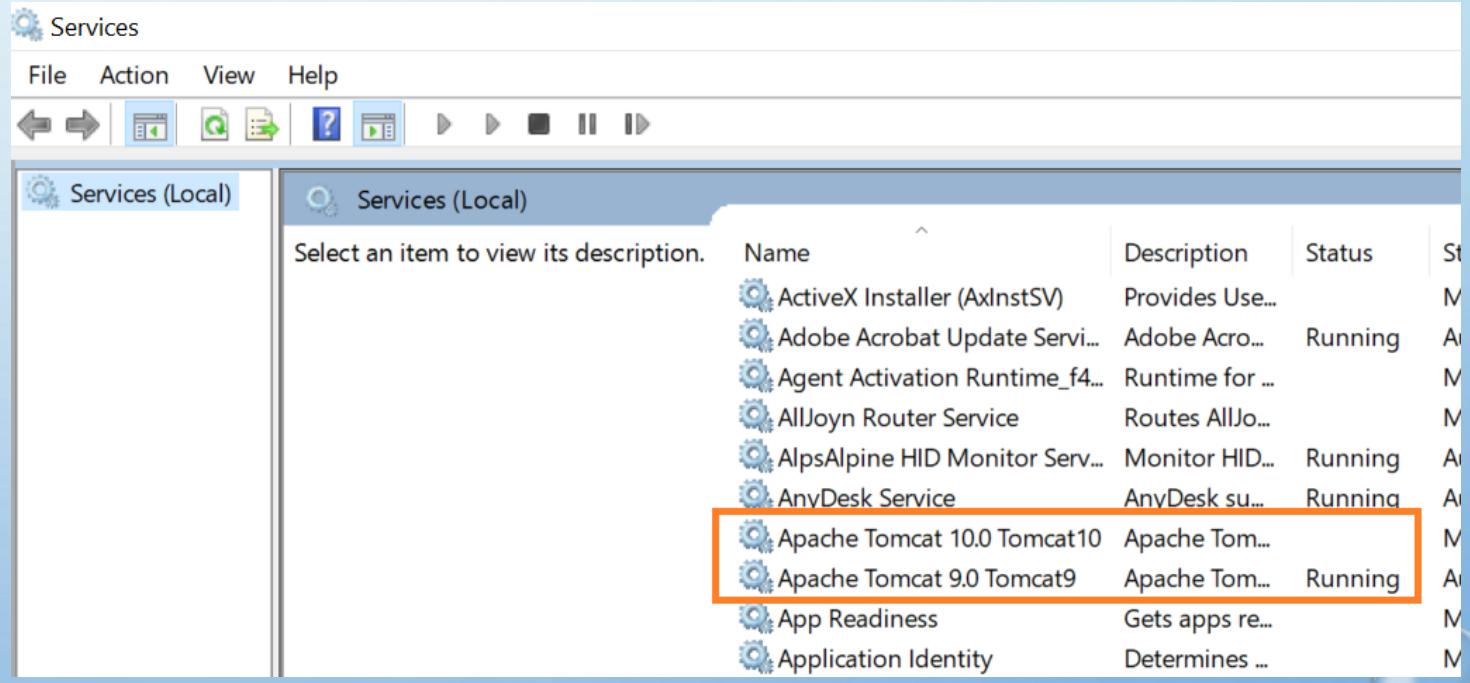
OPEN INSTALLED TOMCAT FILE

By Ayala Berkovich

TOMCAT SERVER

HOW TO CHECK THAT APACHE TOMCAT SERVER IS RUN?

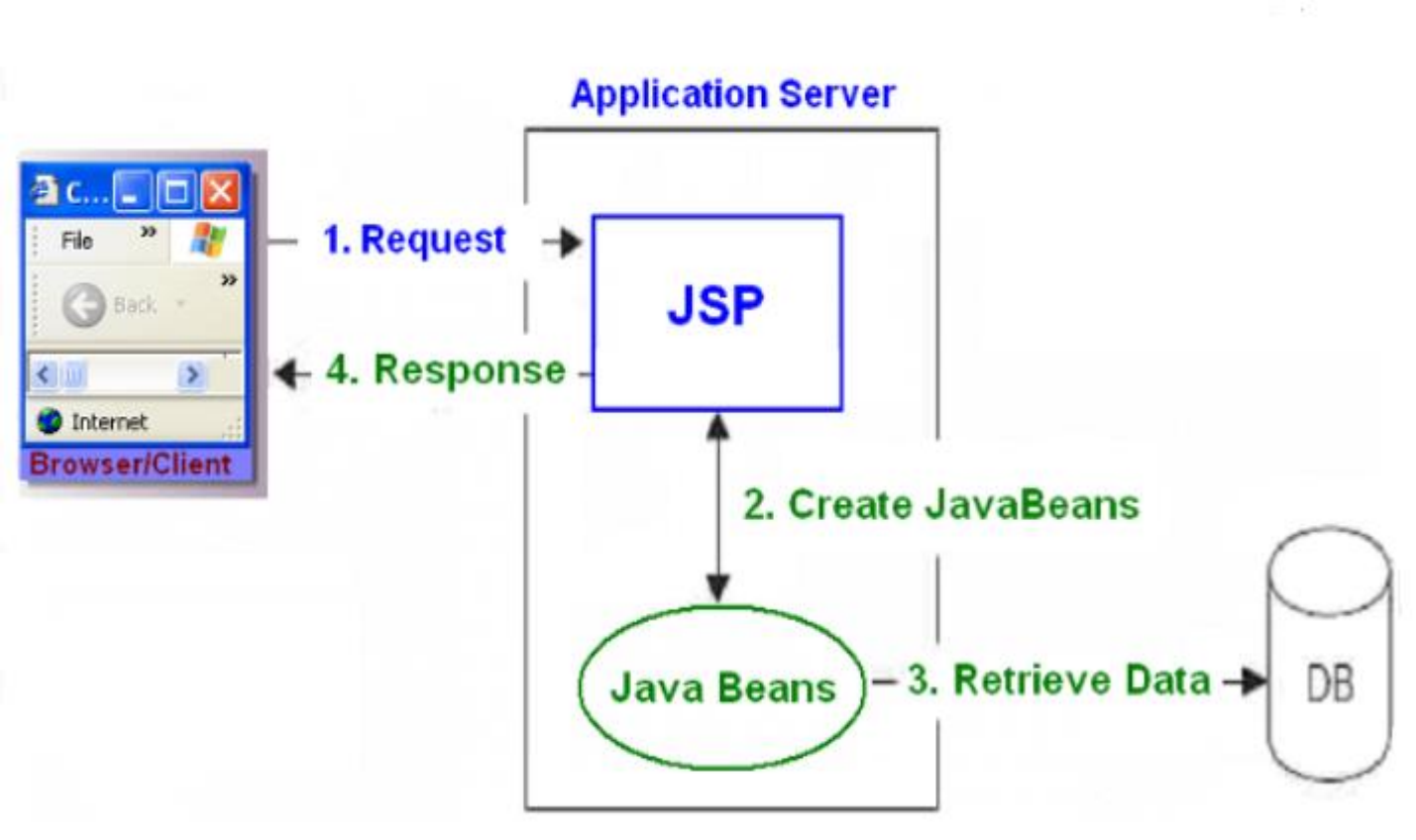




IF YOU HAVE MORE THAN ONE INSTALLED TOMCAT, PAY ATTENTION THAT JUST **ONLY ONE IN RUNNING STAGE.**

By Ayala Berkovich

J2EE – JAVA ENTERPRISE EDITION



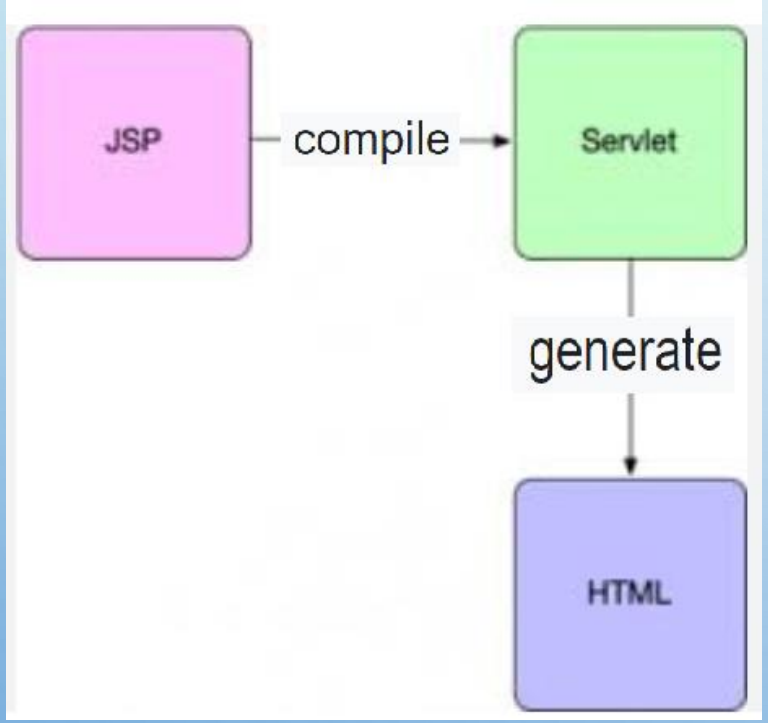
Used to build a web-based application or a websites.

The main concern technologies of the J2EE platform are Servlet, and JSP (Java Server Pages).

By Ayala Berkovich

JAVA SERVLETS

What is a Servlet ?



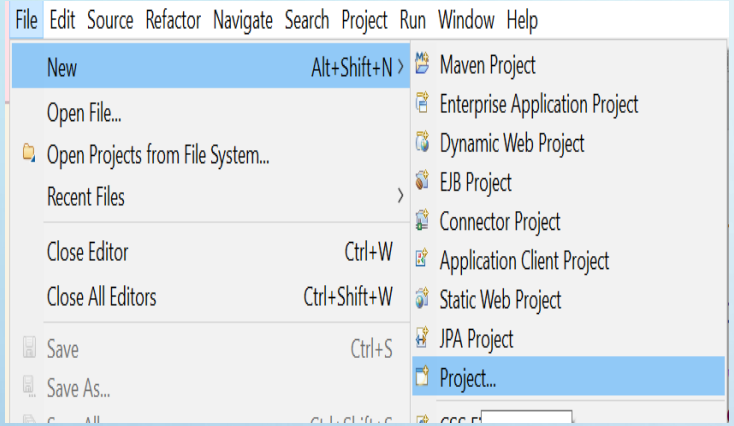
The **Servlet** is a Java class (used as an Controller) in a java Web Application. Its role is to manage the HTTP Request and generate an HTTP Response.

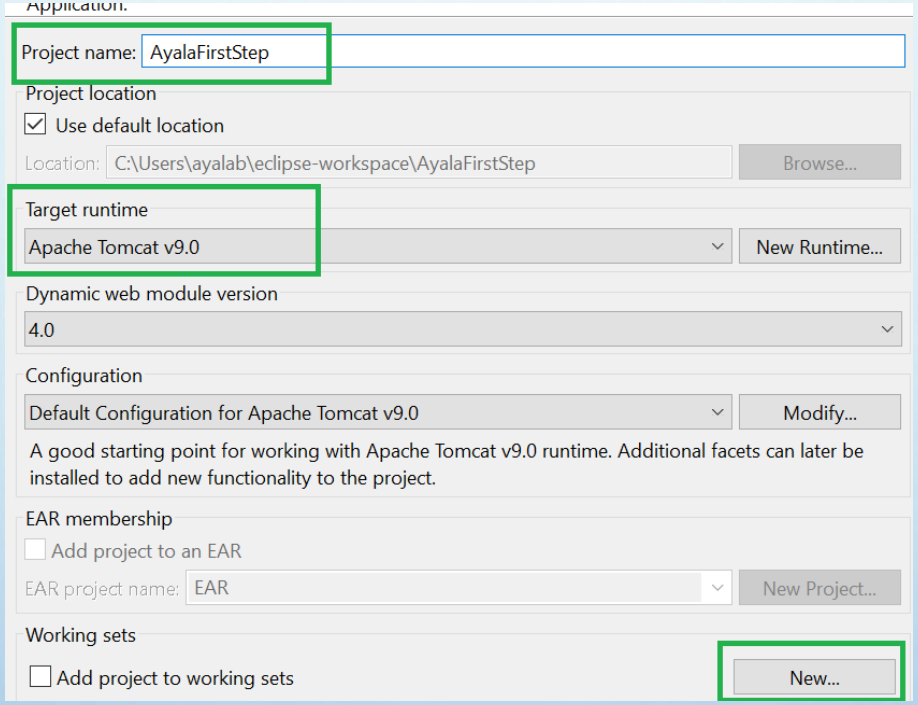
The **Servlet** is using **JavaBeans** to get its information from the database for instance.

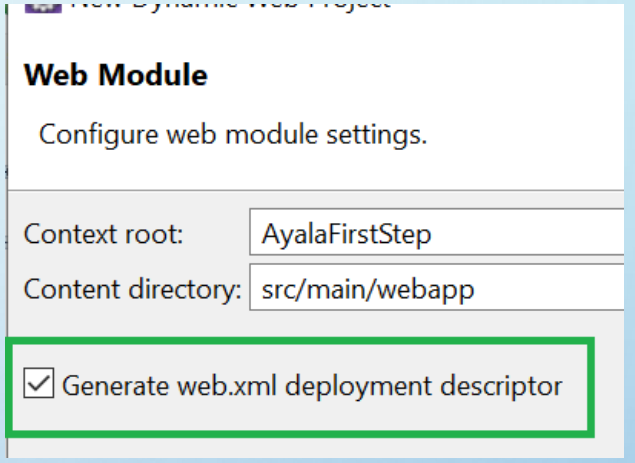
The **JavaBean** is a simple java class used to represent the model of your application.

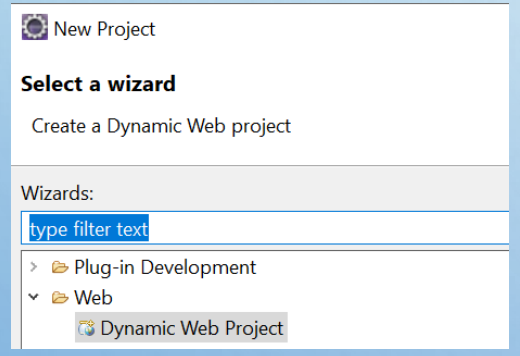
By Ayala Berkovich

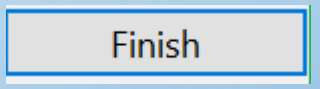
JAVA WEB APPLICATION(CREATE PROJECT)

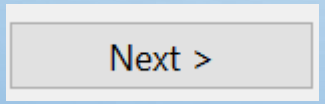


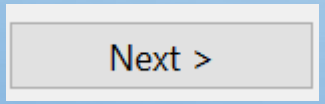




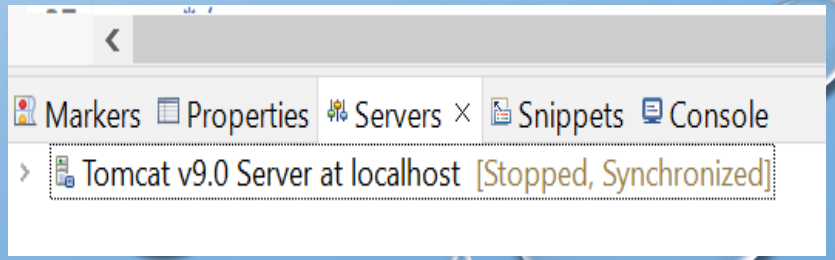






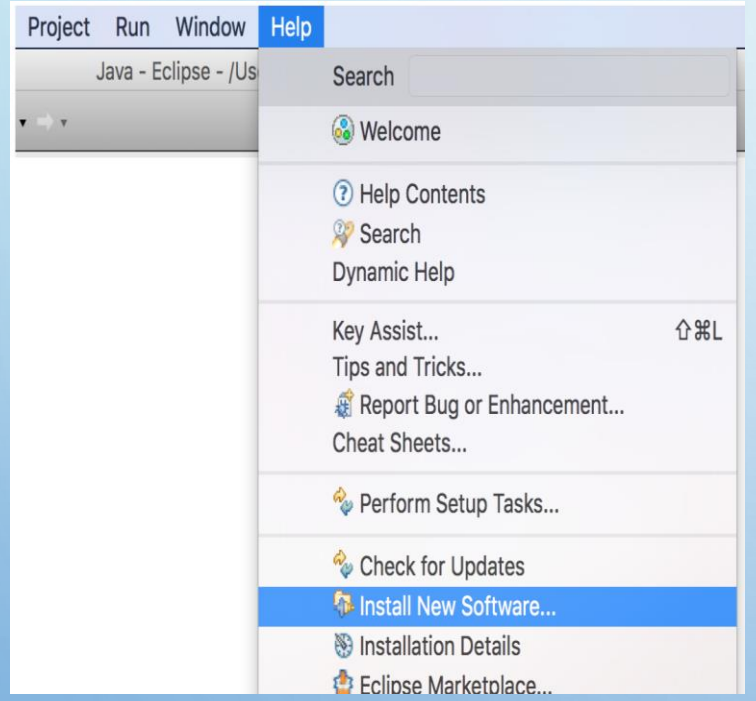


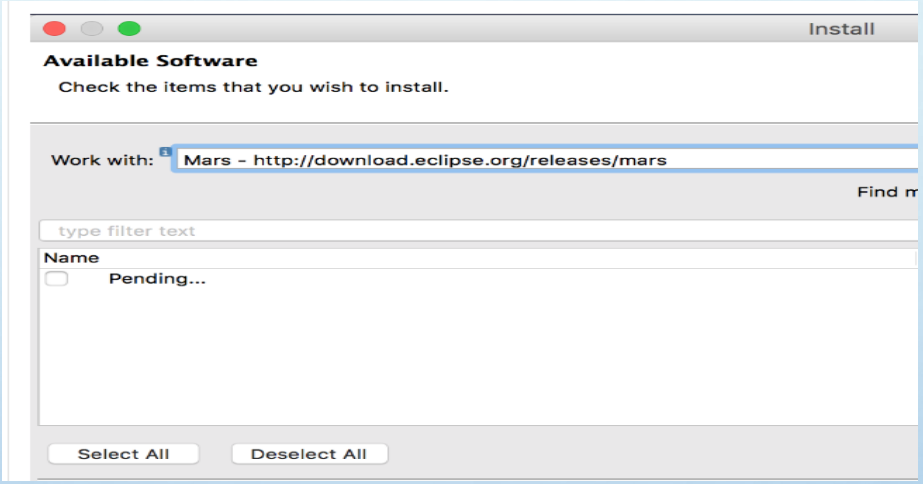
Define server (Apache Tomcat) that you will use



By Ayala Berkovich

IF DYNAMIC WEB PROJECT MISSING IN ECLIPSE ISSUE





http://download.eclipse.org/releases/mars

Step 3: Scroll down to find **"Web, XML, Java EE and OSGI Enterprise Development"** it.

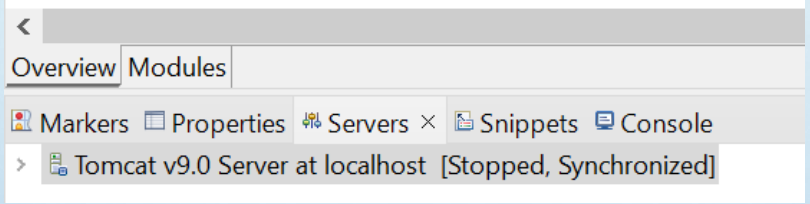
Step 5: Click next

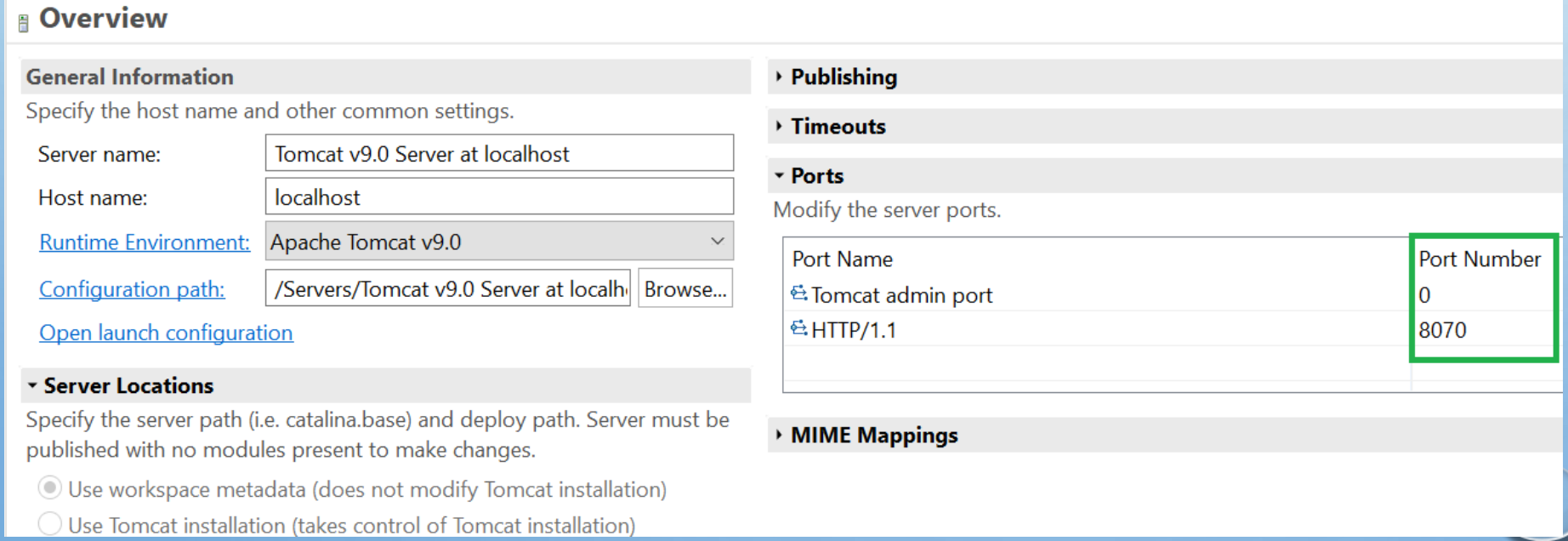
restart the Eclipse

By Ayala Berkovich

JAVA WEB APPLICATION

If Server Was not defined for new project needs to defined it:

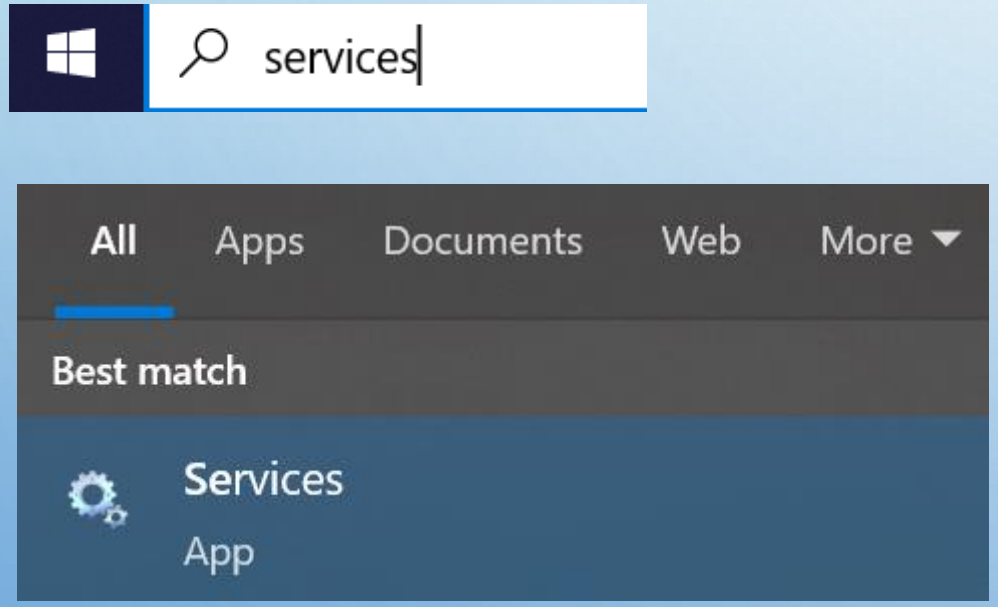


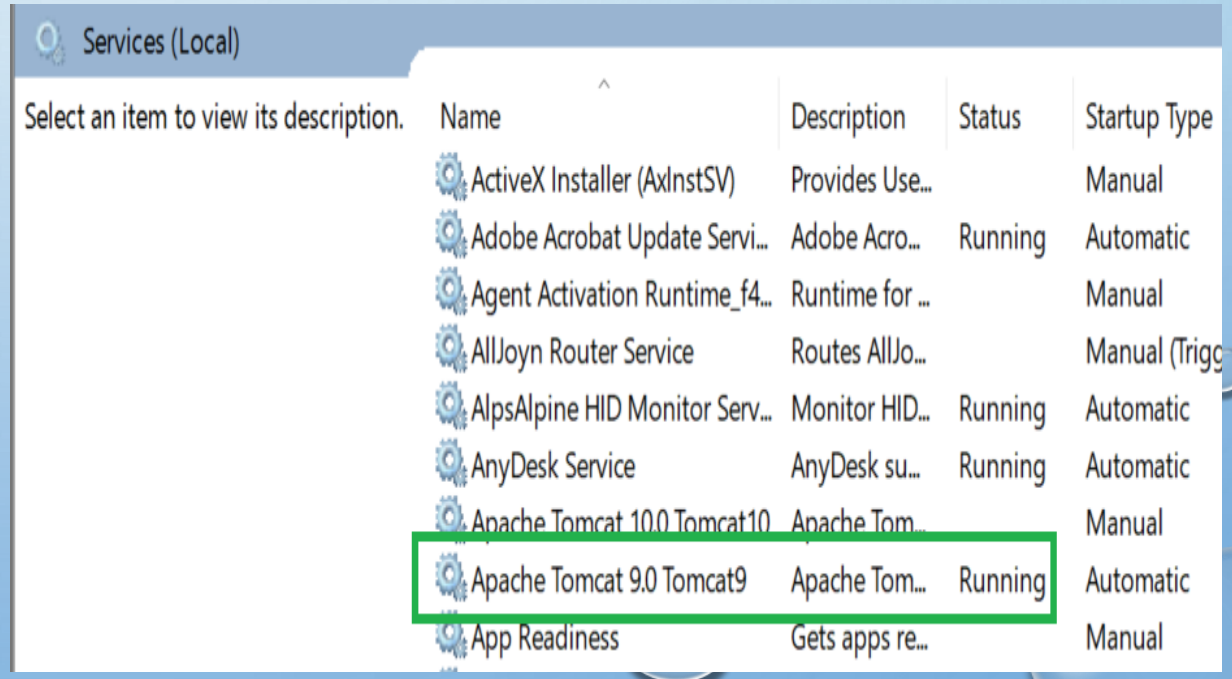


By Ayala Berkovich

JAVA WEB APPLICATION

CHECK IF APACHE TOMCAT SERVER IS RUN:

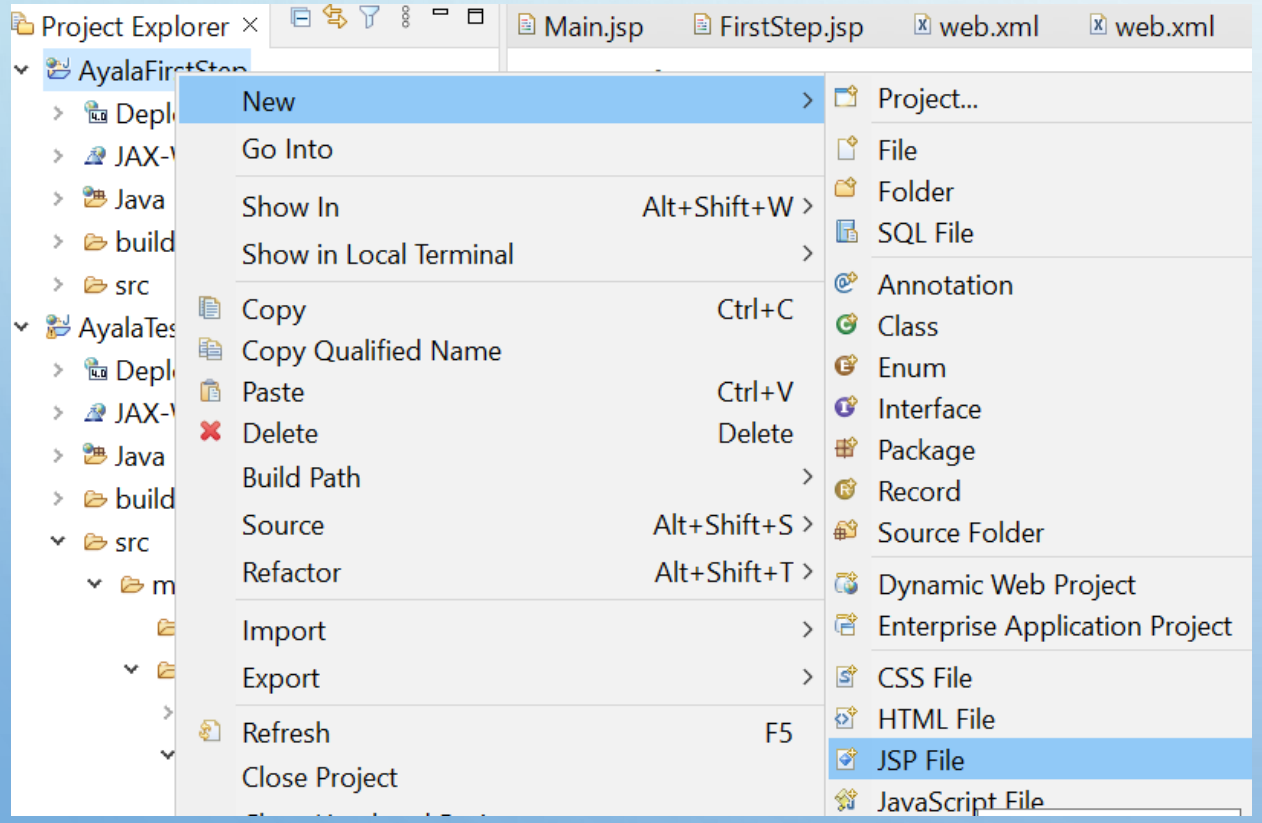


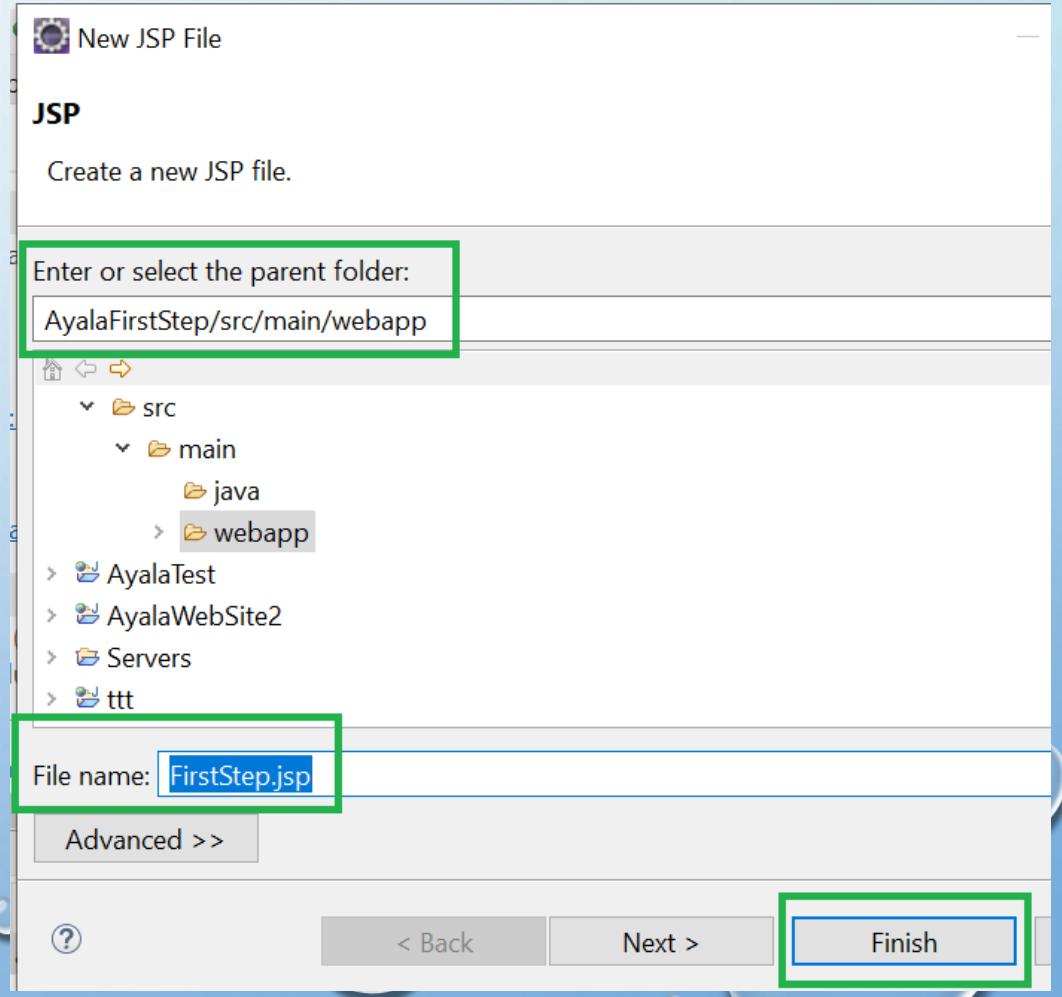


By Ayala Berkovich

JAVA WEB APPLICATION

LET'S CREATE JSP FILE … FIRST PAGE THAT WILL START OUR APPLICATION:

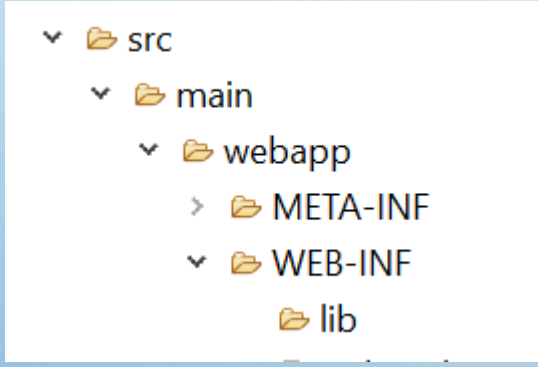


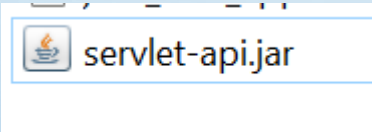


By Ayala Berkovich

JAVA WEB APPLICATION

PUT ON LIB DIRECTORY OF YOUR PROJECT:





DEFINE APACHE TOMCAT LOCATION:

PROJECT->PROPERTIES->NEW->APACHE->APACHE10->BROWSE->(TOMCAT LOCATION ON YOUR PC)

By Ayala Berkovich

JAVA WEB APPLICATION

ADD SOME PRINTING TEXT TO JSP:

Main.jsp | FirstStep.jsp | web.xml | web.xml | FirstStep

```
1  <%@ page language="java" contentType="text/htm
2  <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 T
3  <html>
4  <head>
5  <meta http-equiv="Content-Type" content="text/
6  <title>Insert title here</title>
7  </head>
8  <body>
9  <h1>
10 Hello smart girls!!!!!
11 </h1>
12 </body>
13 </html>
```

AND UPDATE WEB.XML FILE:

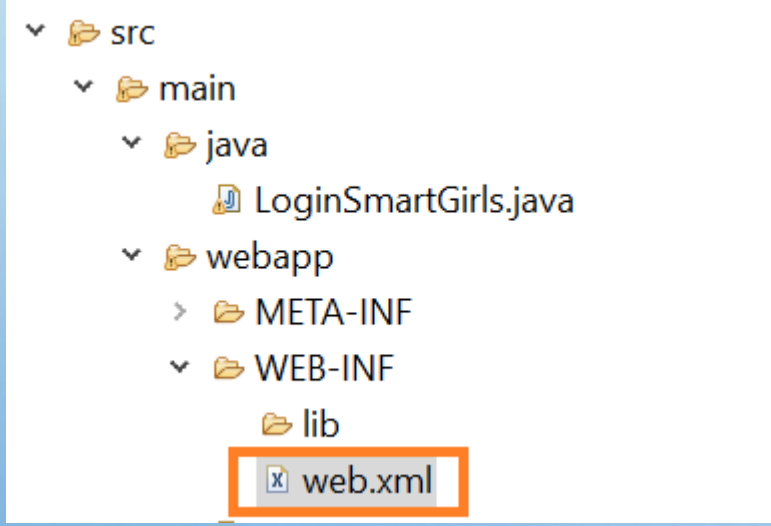
```
1  <?xml version="1.0" encoding="UTF-8"?>
2  <web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-in
3    <display-name>Fist Step Window</display-name>
4    <welcome-file-list>
5
6      <welcome-file>FirstStep.jsp</welcome-file>
7
8    </welcome-file-list>
9  </web-app>
```

*** The <display-name> is optional and allows for a short name to be associated with the servlet which can be potentially read by GUI tools.Good if it will be same name as .jsp file that you call.**

By Ayala Berkovich

WEB.XML

WEB. XML DEFINES MAPPINGS BETWEEN URL PATHS AND THE SERVLETS THAT HANDLE REQUESTS WITH THOSE PATHS.




```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://xmlns.jcp.or
3   <display-name>First Page</display-name>
4   <welcome-file-list>
5
6     <welcome-file>FirstStep.jsp</welcome-file>
7
8   </welcome-file-list>
9 </web-app>
```

By Ayala Berkovich

JSP

JSP IS A TECHNOLOGY WHICH IS USED TO CREATE DYNAMIC WEB APPLICATIONS.

```
<title>First Step Page</title>
</head>
<body style="background-color: gray;">
    <!-- <form method="post" action="LoginCheck">  -->
    <form method="get" action="LoginSmartGirls">
        <table
            style="width:70%;background-color: skyblue;margin-top:200px;margin-left:100px

            <tr>
                <td>
                    <h3 style="color:brown">Hello Smart Girls</h3>
                </td>
            </tr>
            <tr>
                <td>Say something?</td>
                <td><input type="text" name="someText"></td>
            </tr>
            <tr>
                <td></td>
                <td><input type="submit" name="login" value="Login"></td>

            </tr>
        </table>
    </form>
```

```
<title>First Step Page</title>
```

Title of the page

```
<form method="get" action="LoginSmartGirls">
```

Servlet that will work and which method it will use **get** or **post**.

By Ayala Berkovich

JSP

GET VS POST METHOD?

Both **GET** and **POST** method is used to transfer data from client to server in HTTP protocol but Main difference between POST and GET method is that
GET carries request parameter appended in **URL string** while

youtube.com/watch?v=53YnwVWLsBY

POST carries request parameter in **message body** which makes it **more secure** way of transferring data.

By Ayala Berkovich

Which method to define GET or **POST**?
What do you think?

GET is less secure compared to POST because data sent is part of the URL. So it's saved in browser history and server logs in plaintext.

POST is a little safer than GET because the parameters are not stored in browser history or in web server logs.

By Ayala Berkovich

SERVLET(JAVA BEAN)

```
/**
 * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
 */
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
    // TODO Auto-generated method stub
    String someText = request.getParameter("someText");
    HttpSession session = request.getSession();
    session.setAttribute("userText", someText);


    response.sendRedirect("SecondStep.jsp");


}

/**
 * @see HttpServlet#doPost(HttpServletRequest request, HttpServletResponse response)
 */
protected void doPost(HttpServletRequest request, HttpServletResponse response) throw
    // TODO Auto-generated method stub
    doGet(request, response);
}
```

By Ayala Berkovich

SERVLET(JAVA BEAN)

IF WE WANT SOME OPTIONS OF APPLICATION BEHAVIOR:

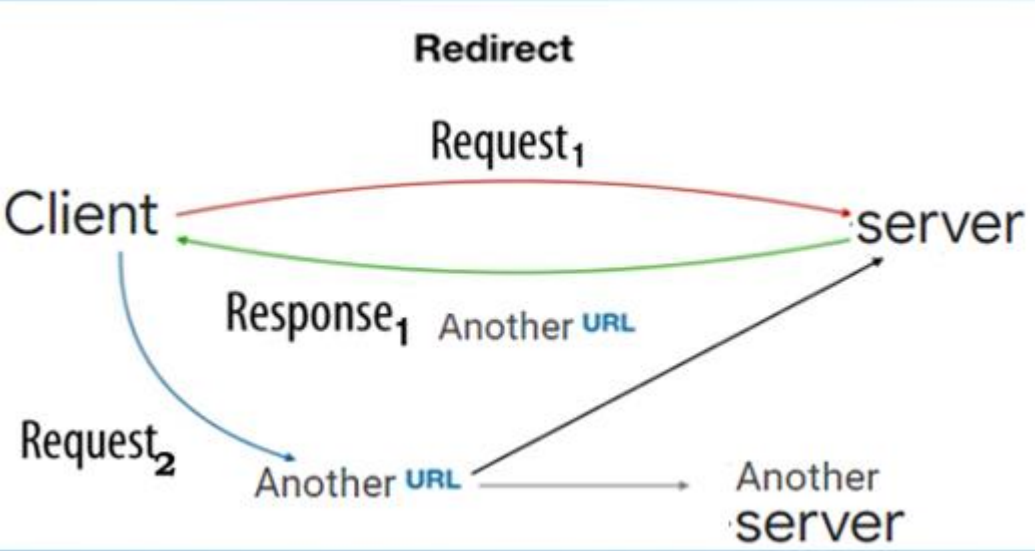
```
/**
 * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
 */
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws Servlet
    // TODO Auto-generated method stub
    String someText = request.getParameter("someText");
    HttpSession session = request.getSession();
    session.setAttribute("userText", someText);

    if(someText==null || someText.equals("")) {

        RequestDispatcher requestDispatcher = request.getRequestDispatcher("ReEnterText.jsp"
        if(requestDispatcher !=null )

            requestDispatcher.forward(request, response);

    }
    else

        response.sendRedirect("SecondStep.jsp");

}

/**
```

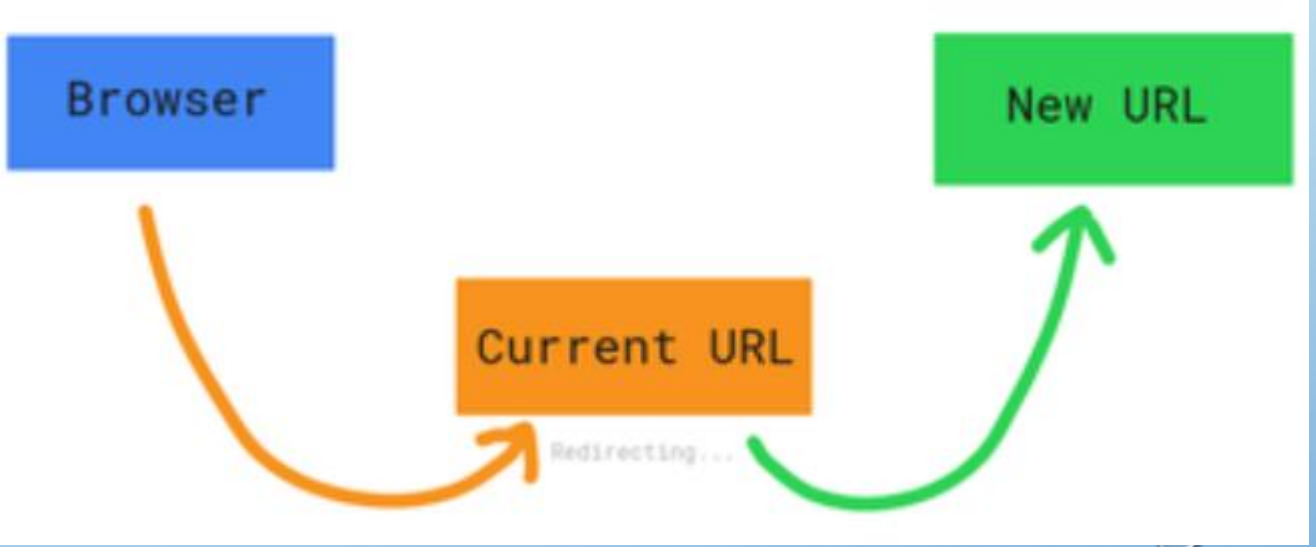
RequestDispatcher(forward) object is used to redirect to server resource located at a particular path

By Ayala Berkovich

SERVLET(JAVA BEAN)

Redirect & Forward

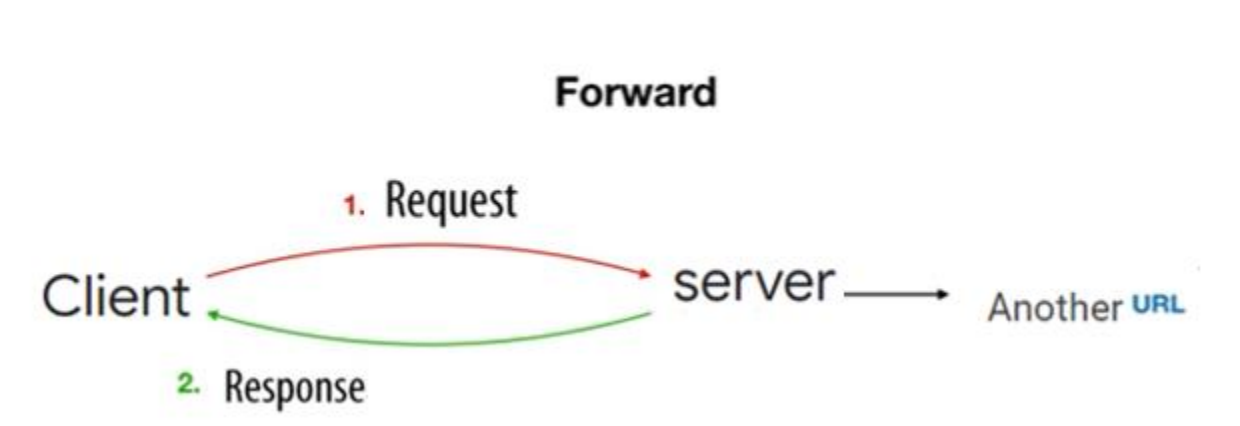




By Ayala Berkovich

SERVLET(JAVA BEAN)

Redirect & Forward



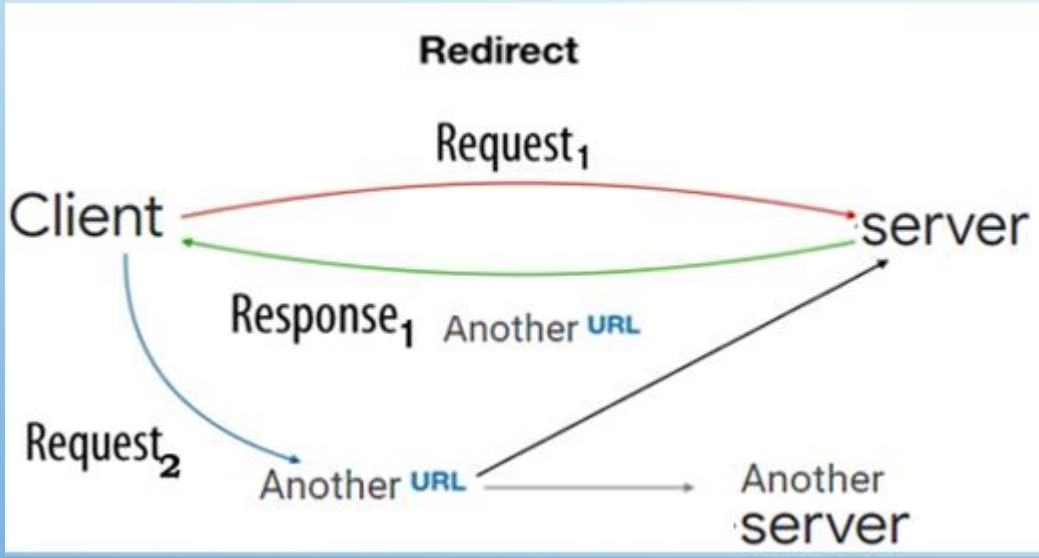
Server forward to another URL without send information about it to client.
Server send this forward just to **urls** that exist on this server!
Client just get response if request was success **status 200** or not.

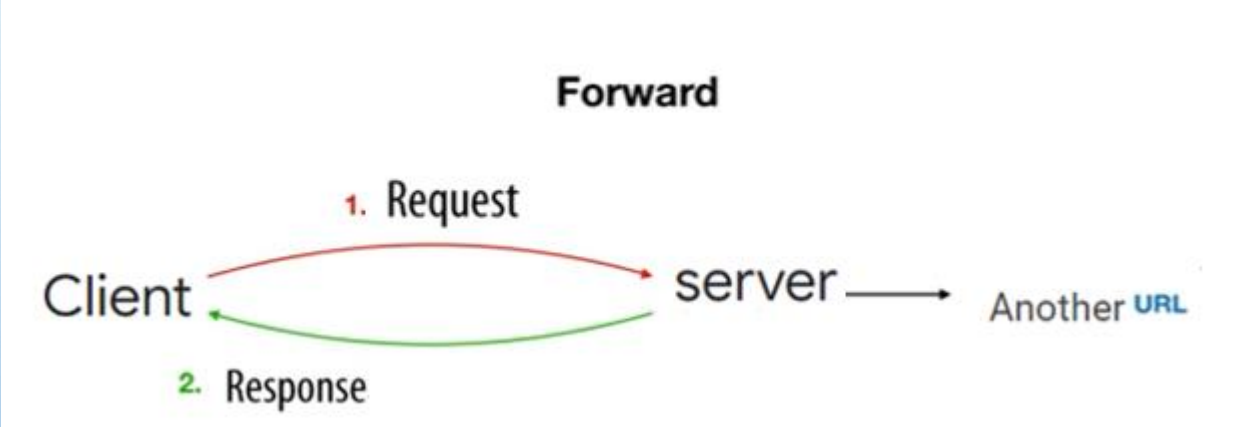
By Ayala Berkovich

SERVLET(JAVA BEAN)

The forward() method works at server side. The sendRedirect() method works at client side.

WHAT WORK MORE FAST REDIRECT OR FORWARD?





FORWARD WORK MORE FAST!

By Ayala Berkovich

SERVLET(JAVA BEAN)

WHAT IS SESSION?

HTTP - Stateless IT IS MEAN THAT HTTP CAN'T SAVE DATA BETWEEN REQUESTS

SESSION IS POSSIBILITY TO SAVE SOME DATA OF ALL REQUESTS.

```
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletE
    // TODO Auto-generated method stub
    String someText = request.getParameter("someText");
    HttpSession session = request.getSession();
    session.setAttribute("userText", someText);

    if(someText==null || someText.equals("")) {

        RequestDispatcher requestDispatcher = request.getRequestDispatcher("ReEnterText.jsp");
        if(requestDispatcher !=null )

            requestDispatcher.forward(request, response);
```

By Ayala Berkovich

SERVLET(JAVA BEAN)

USE OF SERVER BY MANY COUNT OF CLIENTS….SO HOW WE KNOW WHICH SESSION FOR WHICH CLIENT?

WE USE FOR THIS COOKIES

COOKIES IT IS INFORMATION THAT CLIENT SEND TO SERVER ALL TIME WITH REQUEST

By Ayala Berkovich

SERVLET(JAVA BEAN)

SERVER CREATE COOKIE(KEY:VALUE) WHEN WAS FIRST REQUEST FROM CLIENT AND SEND IT BACK TO CLIENT WITH RESPOSE…

AFTER THAT ALL TIME WHEN THIS CLIENT WILL REQUEST TO THS SERVER HE WILL SEND WITH REQUEST COOKIE INFORMATION.

By Ayala Berkovich

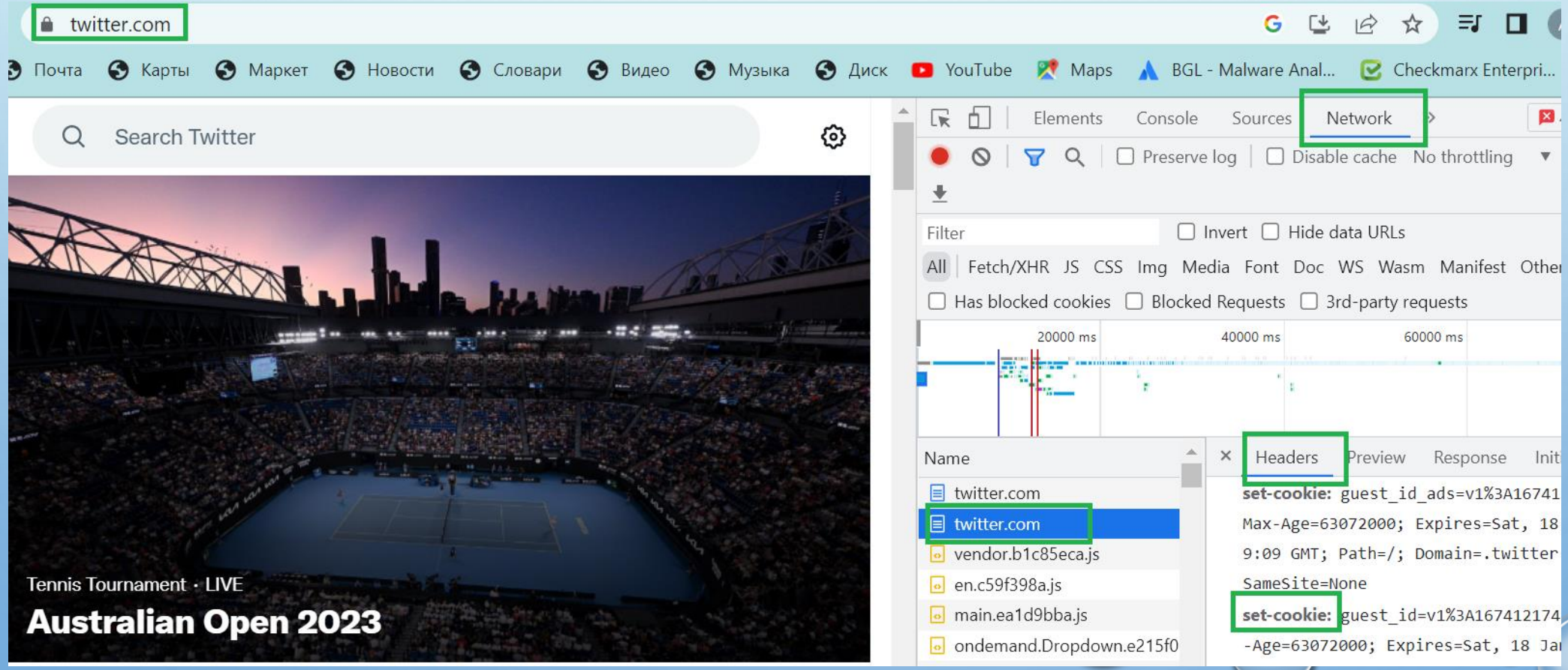
SERVLET(JAVA BEAN)

SERVER CAN

- CREATE COOKIES
- UPDATE COOKIES
- DELETE COOKIES THAT THIS SERVER CREATED

By Ayala Berkovich

SERVLET(JAVA BEAN)



By Ayala Berkovich

SERVLET(JAVA BEAN)

```
set-cookie: guest_id=v1%3A167412174936720836; Max
-Age=63072000; Expires=Sat, 18 Jan 2025 09:49:0
9 GMT; Path=/; Domain=.twitter.com; Secure; Sam
eSite=None
```

GUEST_ID- THIS COOKIE IS FOR AUTHENTICATION
MAX-AGE-

```
myCookie1.setMaxAge(24*60*60);// how many time it will be saved on the browser- 1 day
```

63072000 s (second) equals to:

6.3072E+16 ns (nanosecond)
63072000000000 us (microsecond)
63072000000 ms (millisecond)
63072000 s (second)
1051200 min (minute)
17520 h (hour)
730 d (day)
104.28571428571 week
2 year
0.2 decade
0.02 century
0.002 millennium

EXPIRES- WHEN COOKIES WILL BE DELETED ON BROUSER
DOMAIN- TO WHICH DOMAIN WAS CREATED

By Ayala Berkovich

SERVLET(JAVA BEAN)

```
set-cookie: guest_id=v1%3A167412174936720836; Max
-Age=63072000; Expires=Sat, 18 Jan 2025 09:49:0
9 GMT; Path=/; Domain=.twitter.com; Secure; Sam
eSite=None
```

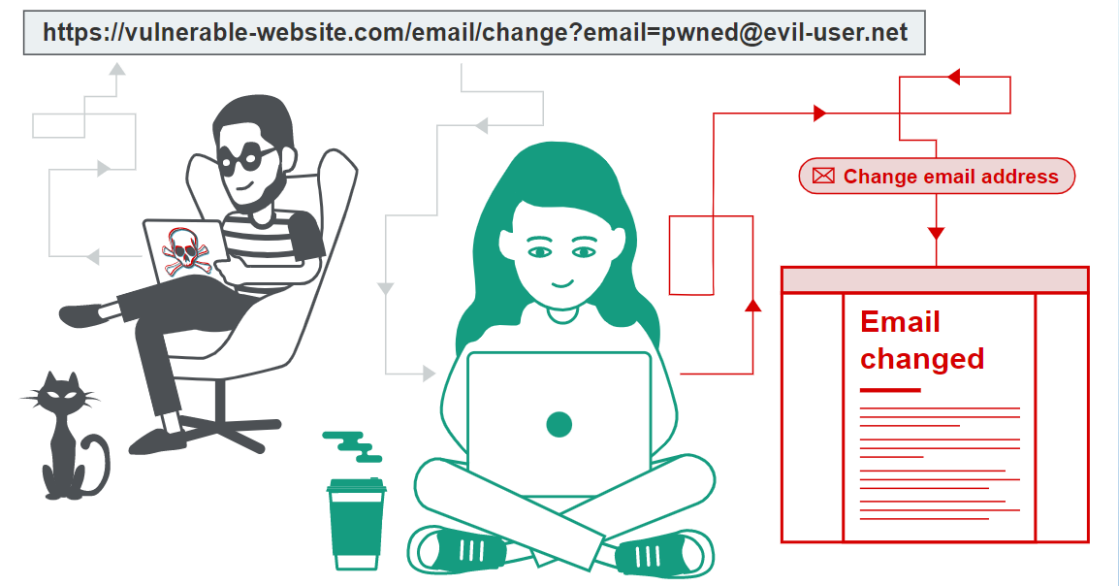
SECURE-

Secure flag is used to declare that the cookie may only be transmitted using a secure connection (SSL/HTTPS).
Note that this flag can only be set during an HTTPS connection. If it is set during an HTTP connection, the browser ignores it.

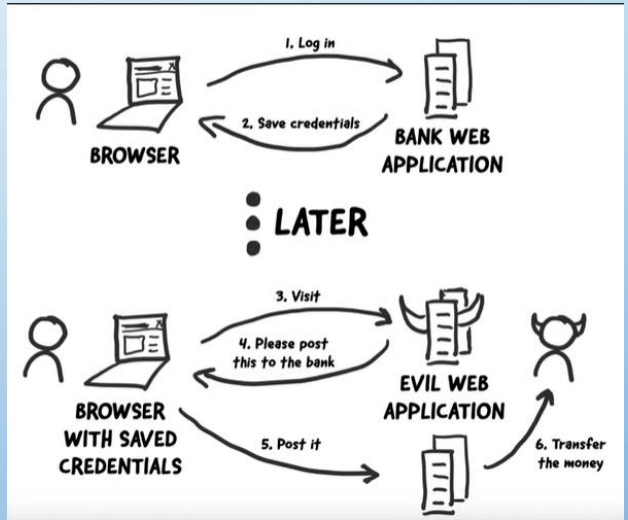
SAMESITE-

The *SameSite* flag is used to declare when web browsers should send the cookie, depending on how a visitor interacts with the site that set the cookie. This flag is used to help protect against **cross-site request forgery (CSRF)** attacks.

By Ayala Berkovich



Cross-site request forgery (also known as CSRF) is a web security vulnerability that allows an attacker to induce users to perform actions that they do not intend to perform.



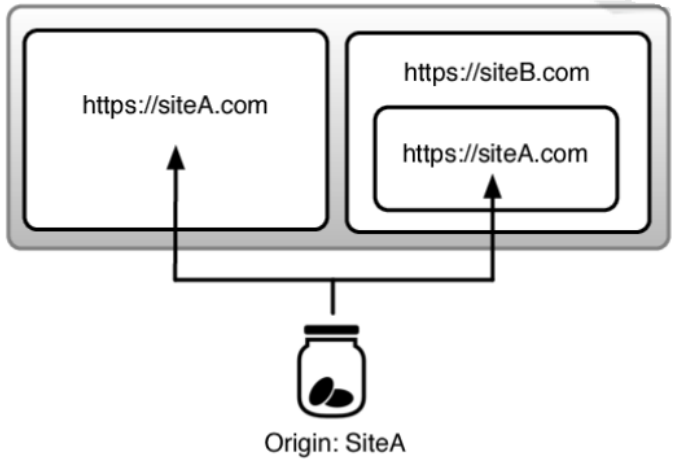

```
['httponly' => true, 'secure' => true, 'samesite'=>'Strict']);
```

- `SameSite=Strict`: The cookie is only sent if you are currently on the site that the cookie is set for. If you are on a different site and you click a link to a site that the cookie is set for, the cookie is *not* sent with the first request.

By Ayala Berkovich

SERVLET(JAVA BEAN)

```
set-cookie: guest_id=v1%3A167412174936720836; Max
-Age=63072000; Expires=Sat, 18 Jan 2025 09:49:0
9 GMT; Path=/; Domain=.twitter.com; Secure; Sam
eSite=None
```



- `SameSite=Strict` : The cookie is only sent if you are currently on the site that the cookie is set for. If you are on a different site and you click a link to a site that the cookie is set for, the cookie is *not* sent with the first request.

SAME ORIGIN POLICY – SERVER WILL SEE JUST COOKIES WITH SAME DOMAIN NAME

- `SameSite=Lax` : The cookie is *not* sent for embedded content but it *is* sent if you click on a link to a site that the cookie is set for. It is sent only with safe request types that do not change state, for example, GET.
- `SameSite=None` : The cookie is sent even for embedded content.

By Ayala Berkovich

HttpOnly flag -

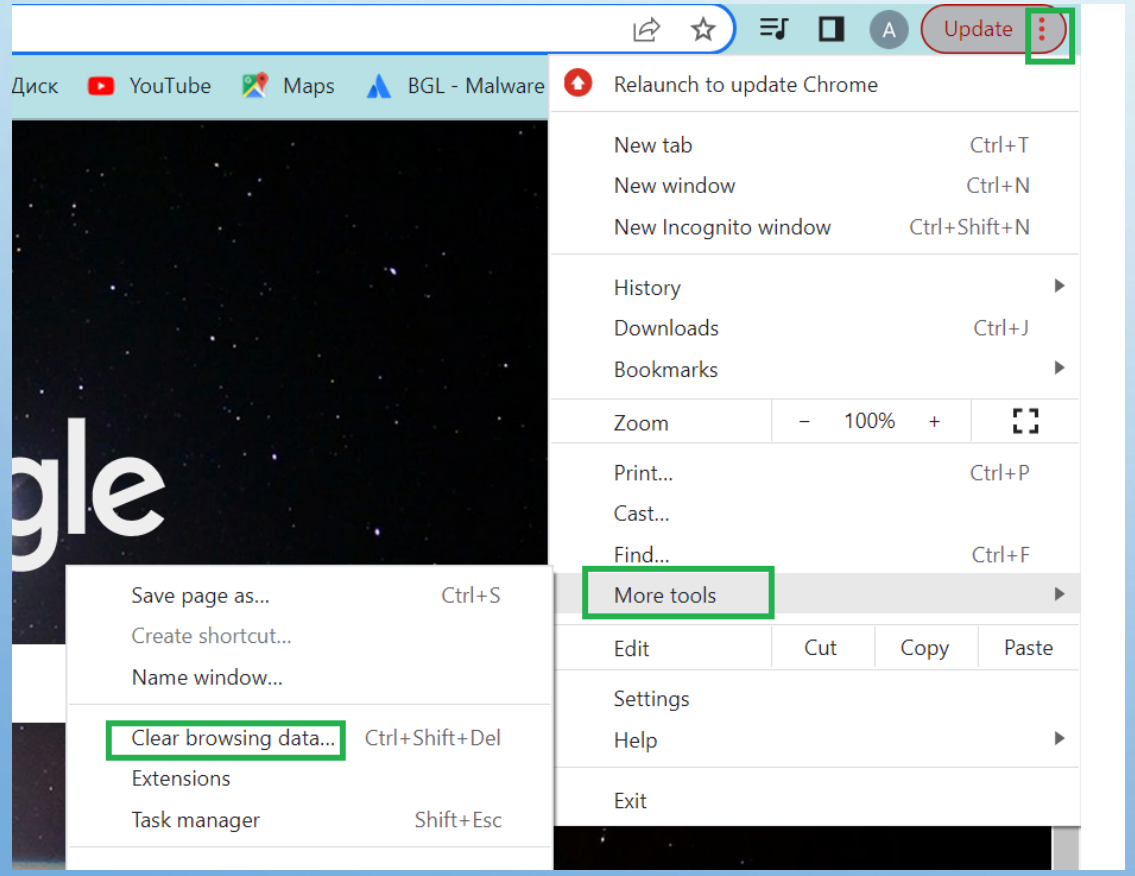
Using the HttpOnly tag when generating a cookie helps mitigate the risk of client-side scripts (Java Script) accessing the protected cookie, thus making these cookies more secure.
If the HttpOnly flag is included in the HTTP response header, the cookie cannot be accessed through the client-side script.

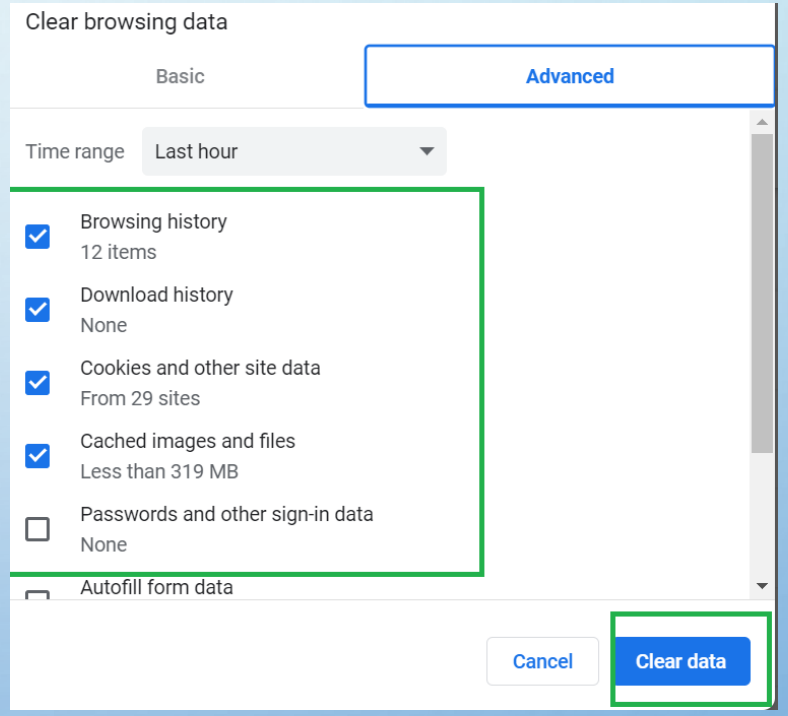
Default value for HTTPOnly flag is False

By Ayala Berkovich

SERVLET(JAVA BEAN)

HOW TO CLEAN COOKIES?





By Ayala Berkovich

SERVLET(JAVA BEAN)

CREATE COOKIE ON SERVLET :

```
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws Servl

    //cookie name:value

    Cookie myCookie1 = new Cookie("userName","Ayala");
    Cookie myCookie2 = new Cookie("user_Id","1234");

    myCookie1.setMaxAge(24*60*60);// how many time it will be saved on the browser- 1 day
    response.addCookie(myCookie1);

    myCookie2.setMaxAge(24*60*60);// how many time it will be saved on the browser- 1 day
    response.addCookie(myCookie2);
```

By Ayala Berkovich

SERVLET(JAVA BEAN)

GET COOKIE FROM SERVLET :

```
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws Servle
    Cookie[] cookies = request.getCookies();

    PrintWriter pw = response.getWriter();

    pw.println("<html>");


    for(Cookie cookie:cookies) {

        pw.print("<h1>" + cookie.getName() + ":" + cookie.getValue() + "</h1>");
    }

    pw.println("</html>");
}
```

By Ayala Berkovich

SERVLET(JAVA BEAN)

DELETE COOKIE FROM SERVLET :

```
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws Servle
    Cookie cookies = new Cookie("user_Id","");

    //delete cookie

    cookies.setMaxAge(0);
    //cookies.setMaxAge(-1); will remove cookie if client will close browser
    response.addCookie(cookies);
}
```

setMaxAge(0) - will delete cookie immediately
setMaxAge(-1) – will delete cookie if client will close browser

By Ayala Berkovich