

# دوره آموزشی جاوا EE

(۱)

مدرس: اسماعیل صادقی



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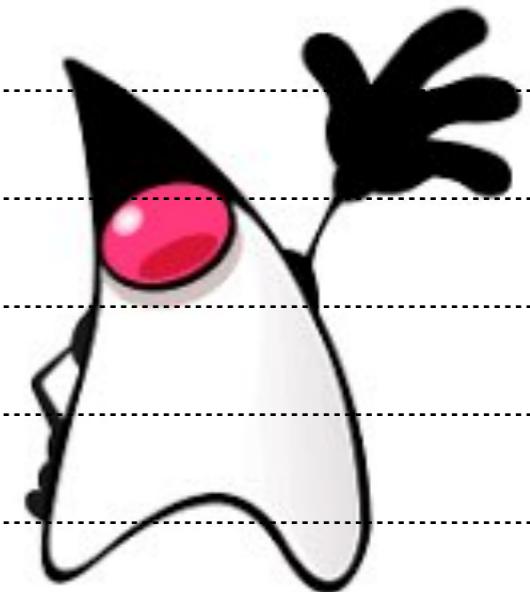
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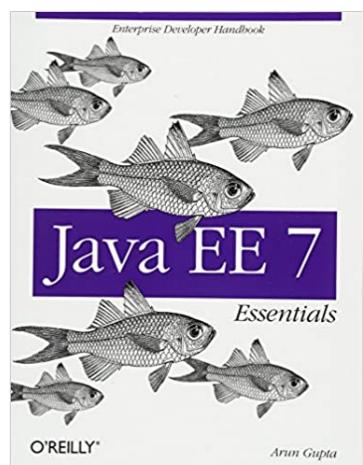
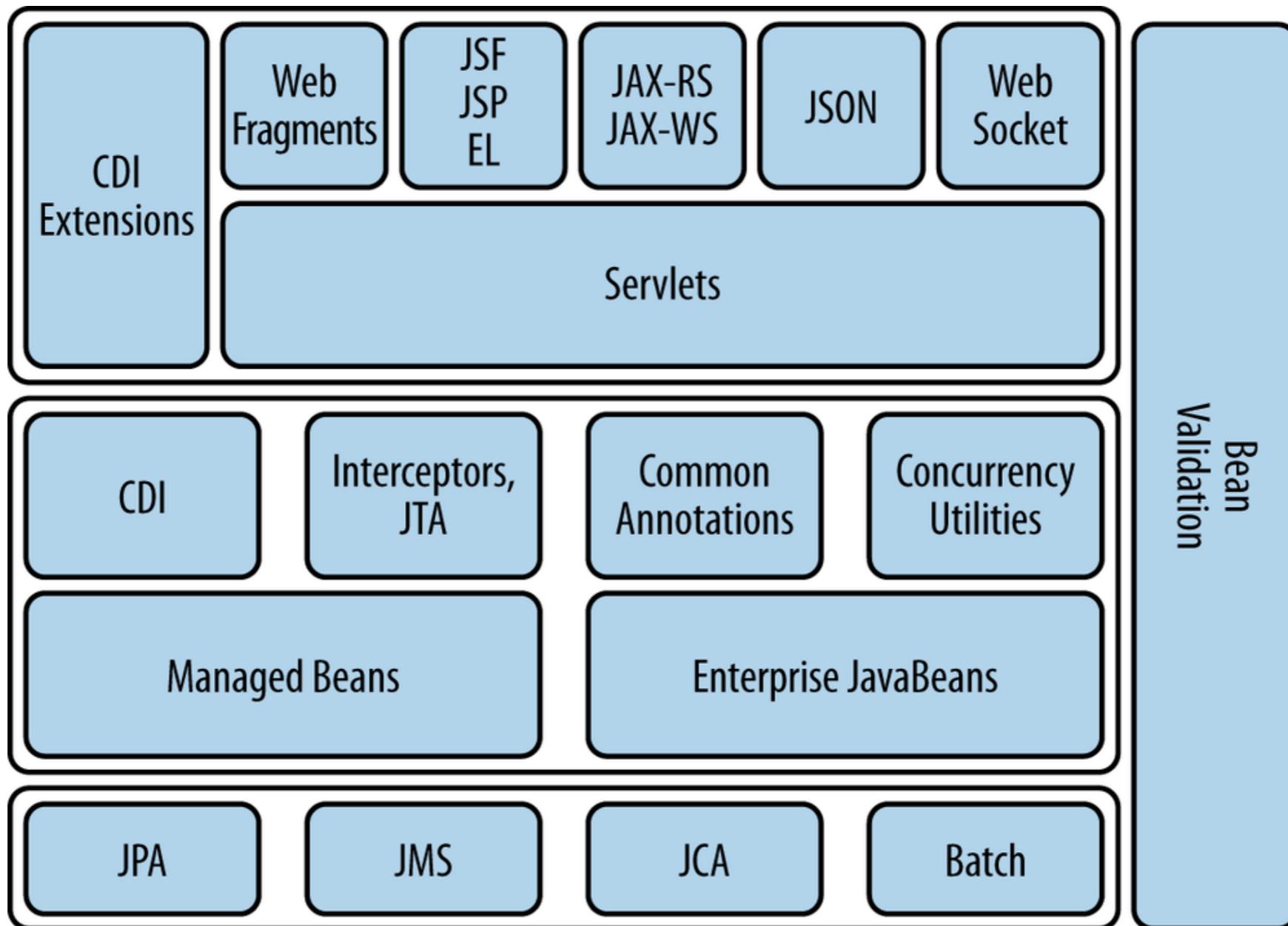
# Java EE Architecture

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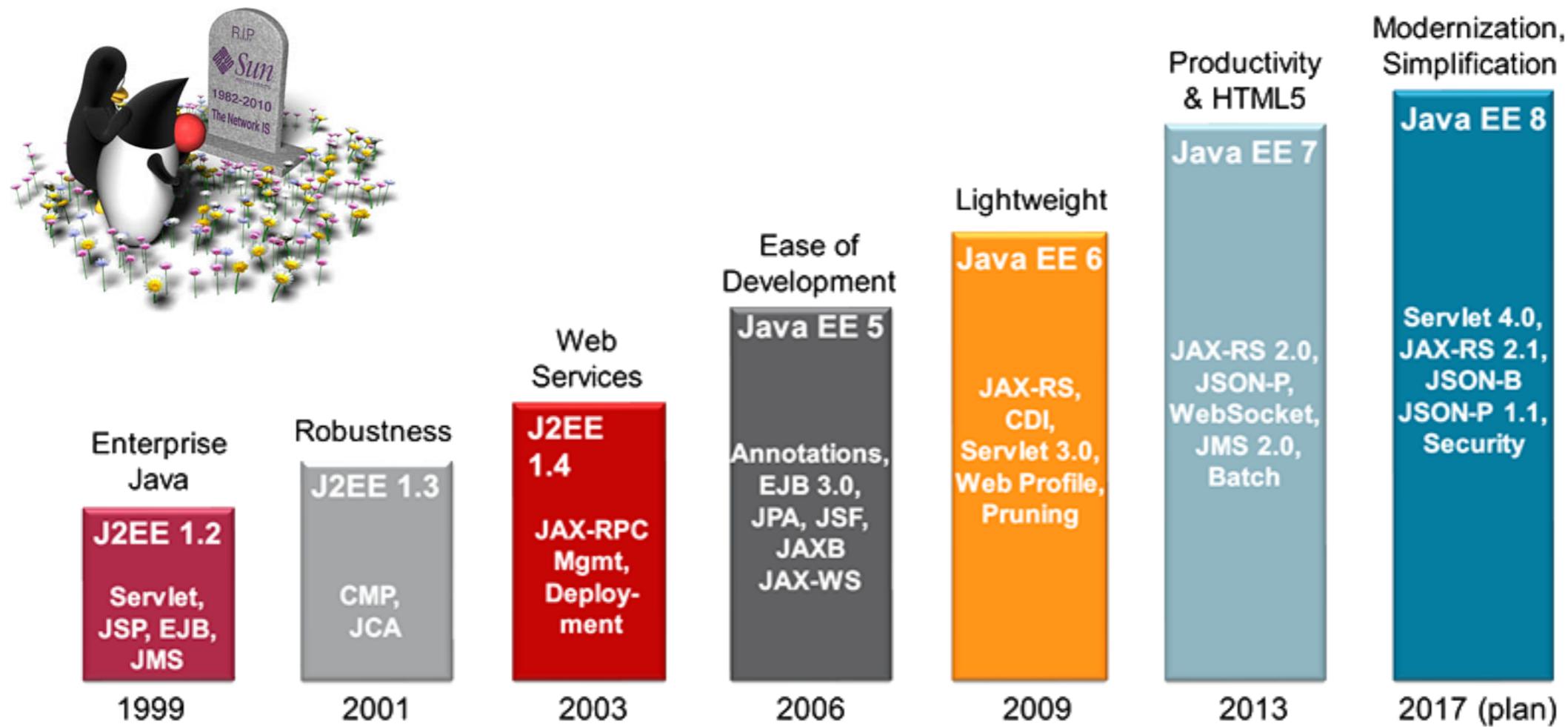
- Web Specification
- Web Service Specification
- Enterprise Specification
- Other Specification (validation, Connector, Batch)



# The Java EE stack



# Java EE Version History



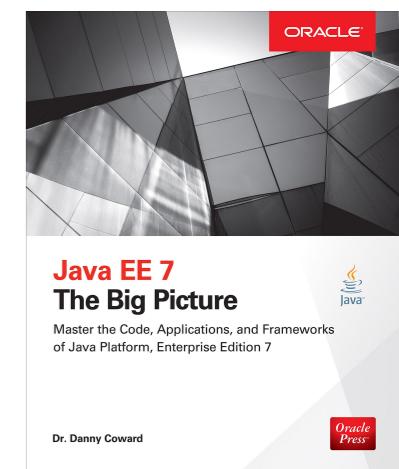
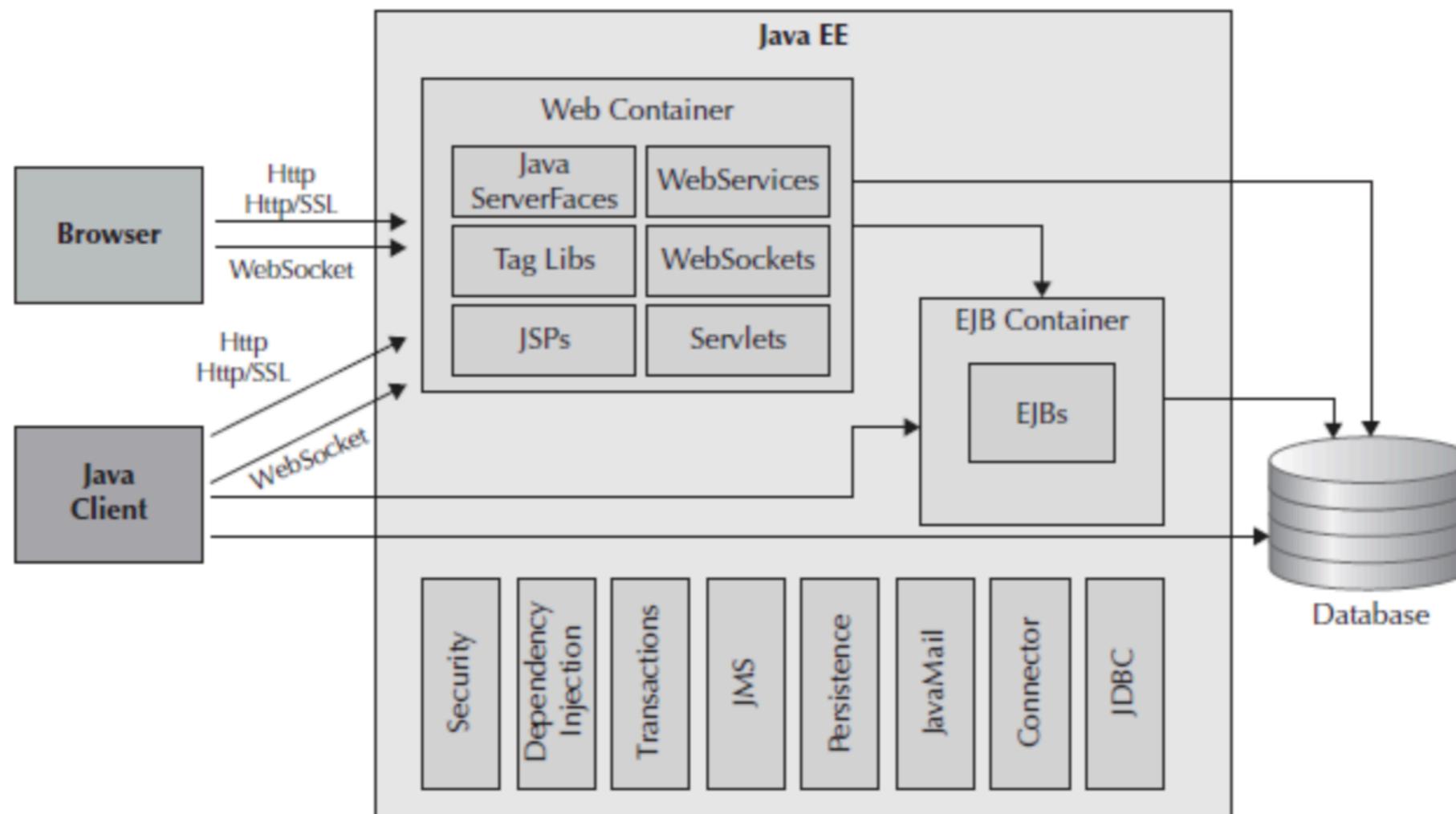
# Java EE to Jakarta EE

|               | Java EE                                 | Jakarta EE                                    |
|---------------|---|---|
| Owner         | Oracle                                  | Eclipse Foundation<br>(Jakarta EE WG)         |
| Standardise   | JCP<br>(Java Community<br>Process)      | JESP<br>(Jakarta EE Specification<br>Process) |
| Specification | JSR<br>(Java Specification<br>Requests) | EE4J Project                                  |



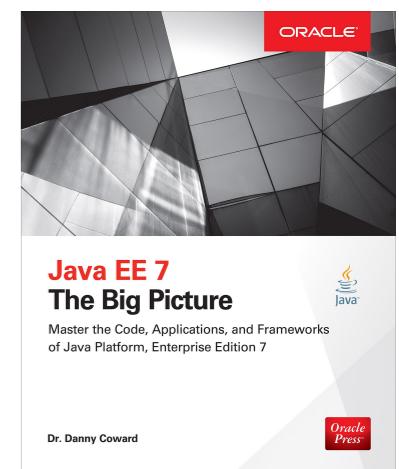
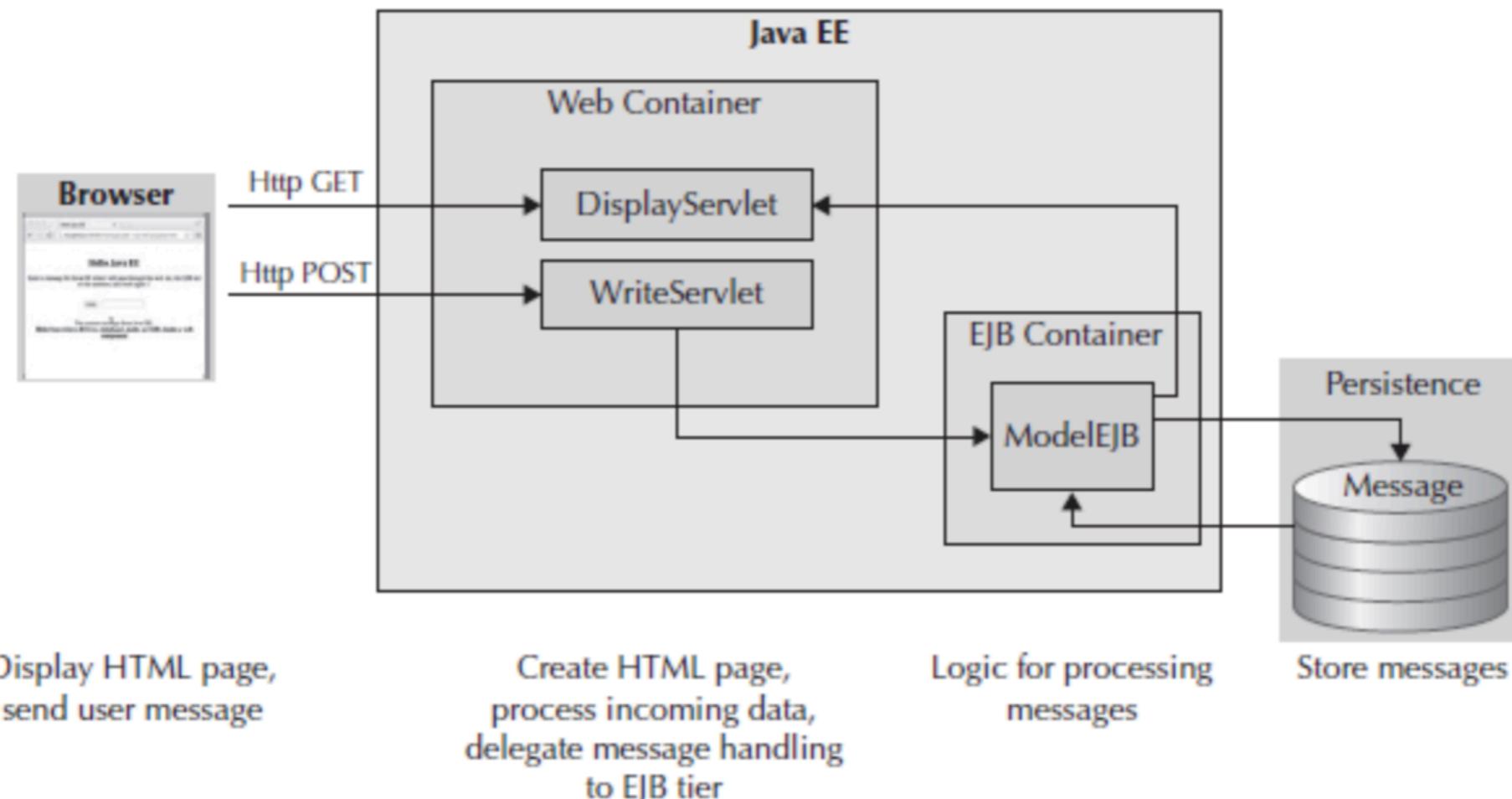
# CHAPTER 1: THE BIG PICTURE

## JAVA EE ARCHITECTURE



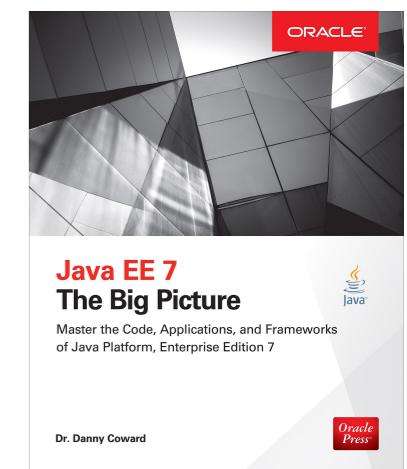
EmaelSadeghiJob@gmail.com

# HELLO WORLD APPLICATION



## Web ARchive file (WAR)

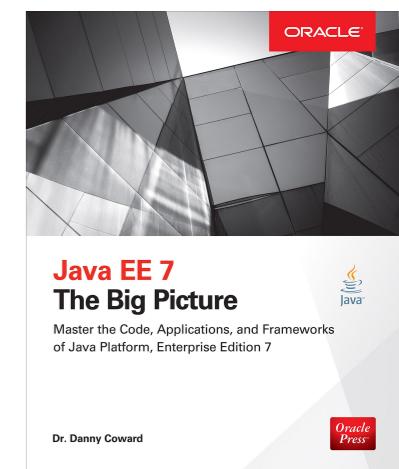
- is the vehicle for deploying the web components in a Java EE application
- is a kind of ZIP file, with a predefined structure consisting of a
  - root directory to hold any textual web pages such as HTML pages, JSP, or JSF files.
  - /WEB-INF directory under which any Java class files they need, such as Java servlets, are held, in addition to other configuration information.



## Enterprise Bean JAR

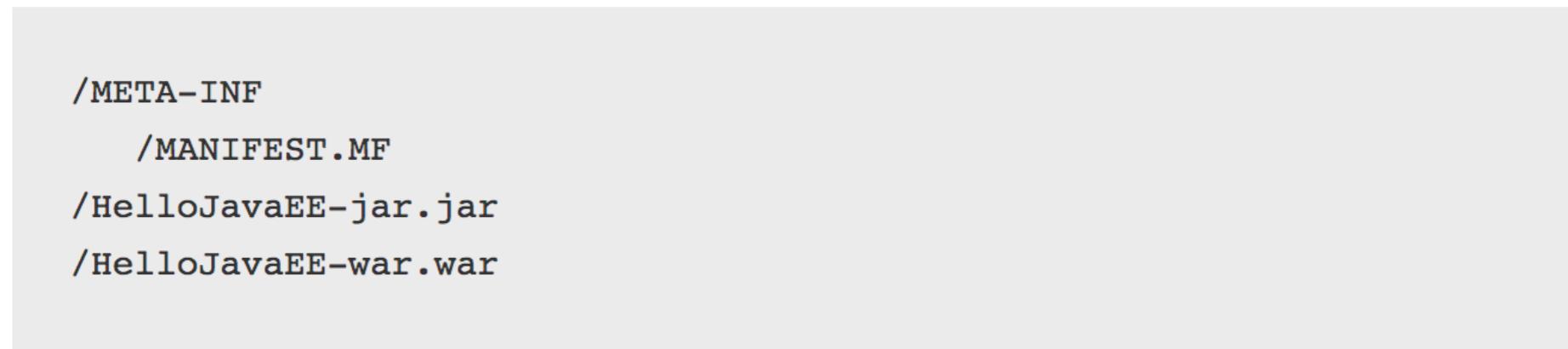
- packages the Enterprise Bean code in a archive
- uses the /META-INF directory to store configuration information about the Enterprise Beans it contains, together with the class files that the beans use at the root level of the archive.
- held the persistence.xml in the META-INF directory to ensure that ModelEJB can access the database through the Java Persistence layer.

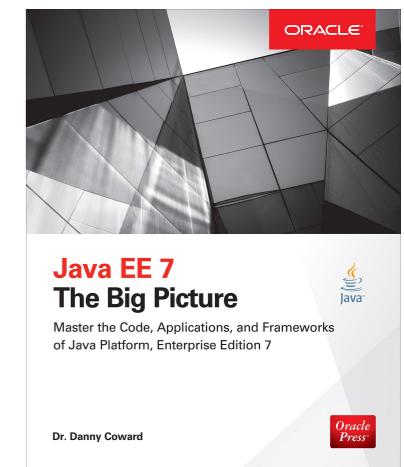
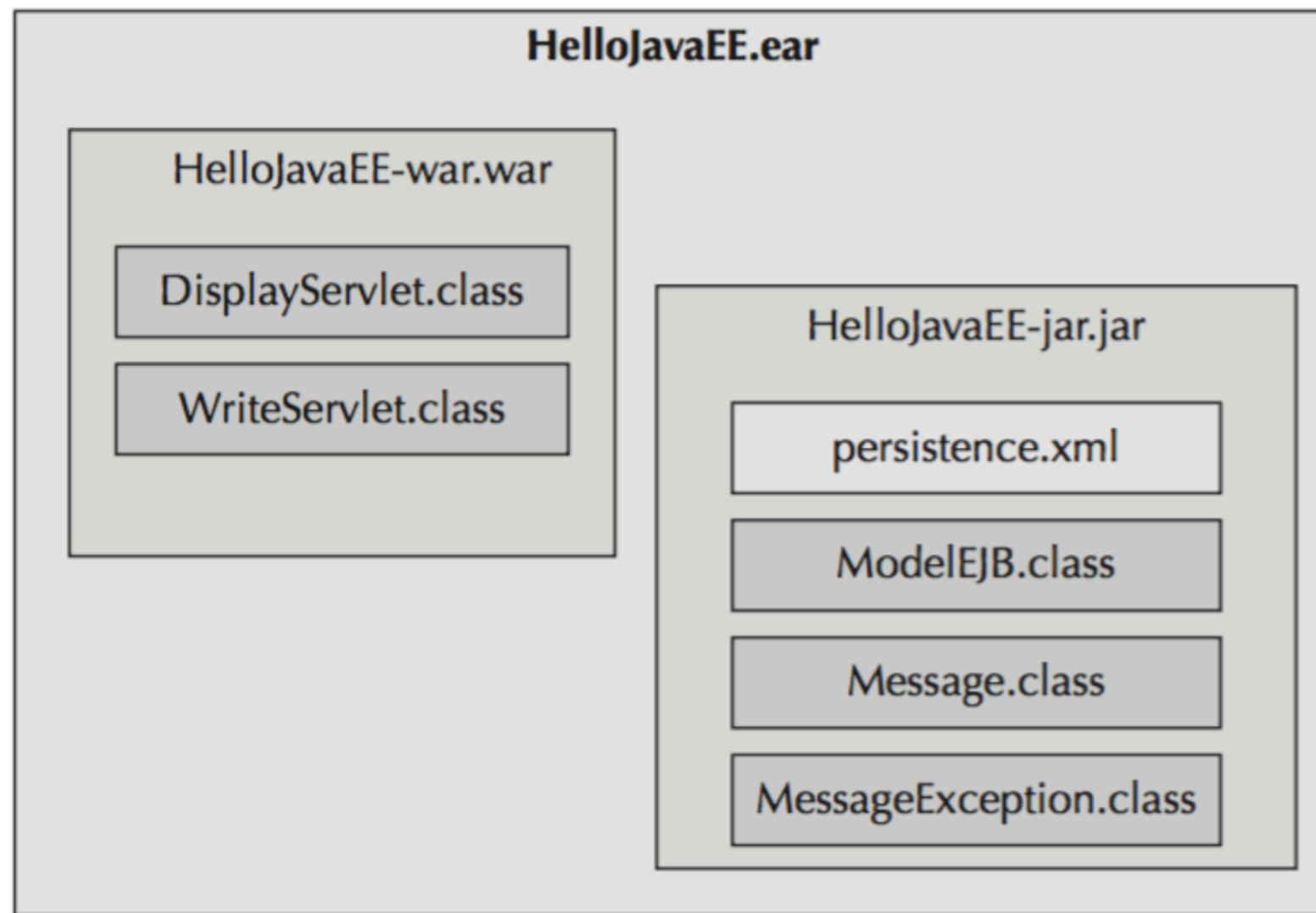
```
/META-INF  
  /MANIFEST.MF  
  /persistence.xml  
/javaeems  
  /model  
    /ModelEJB.class  
    /Message.class  
    /MessageException.class
```



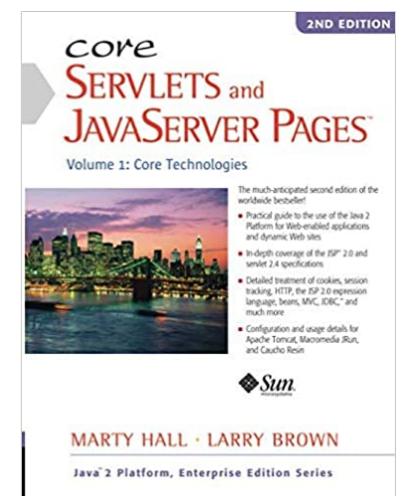
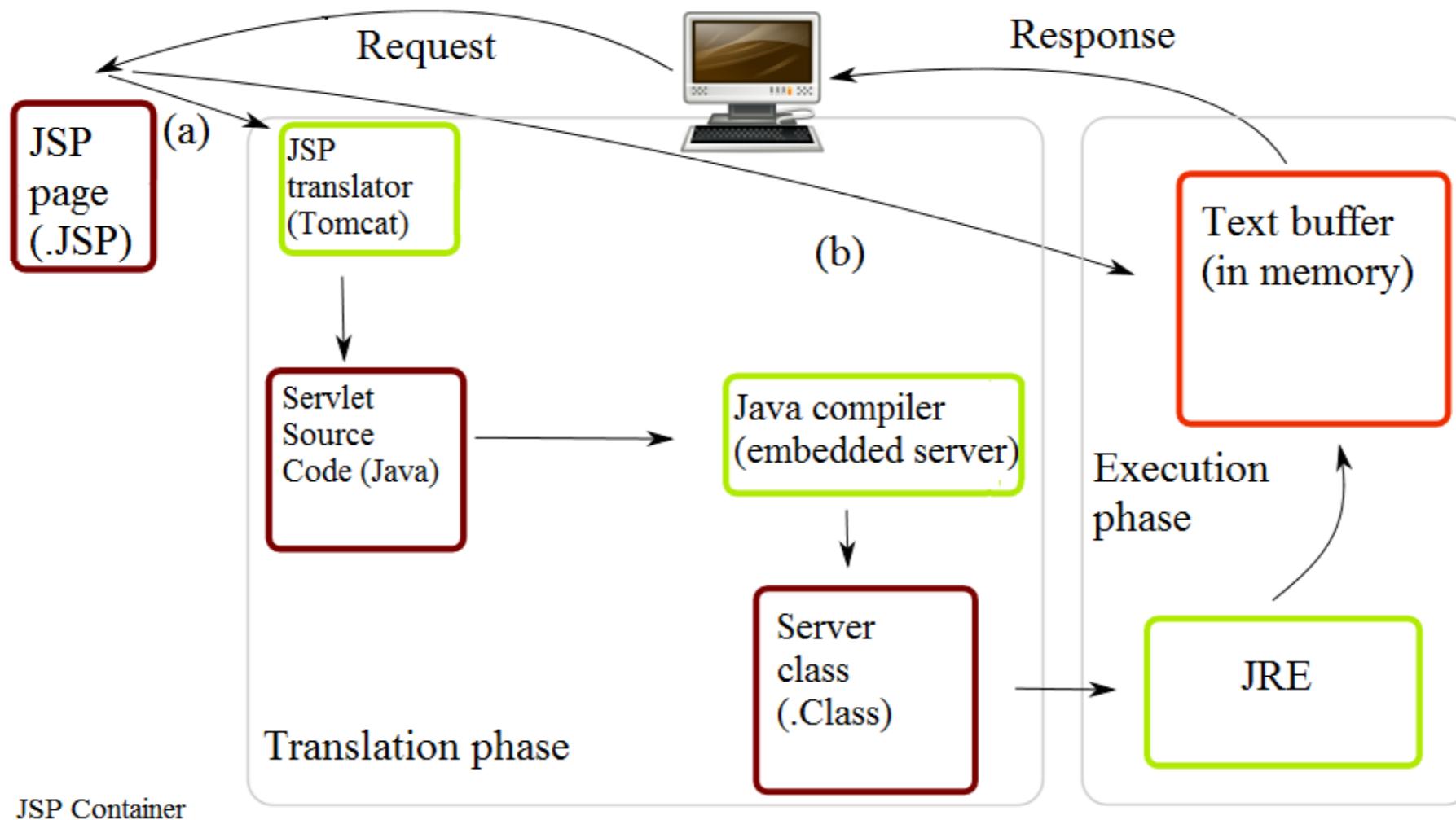
## ENTERPRISE ARCHIVE (EAR)

- allows a Java EE application to be packed into one single, self-contained file.
- /META-INF held the configuration information

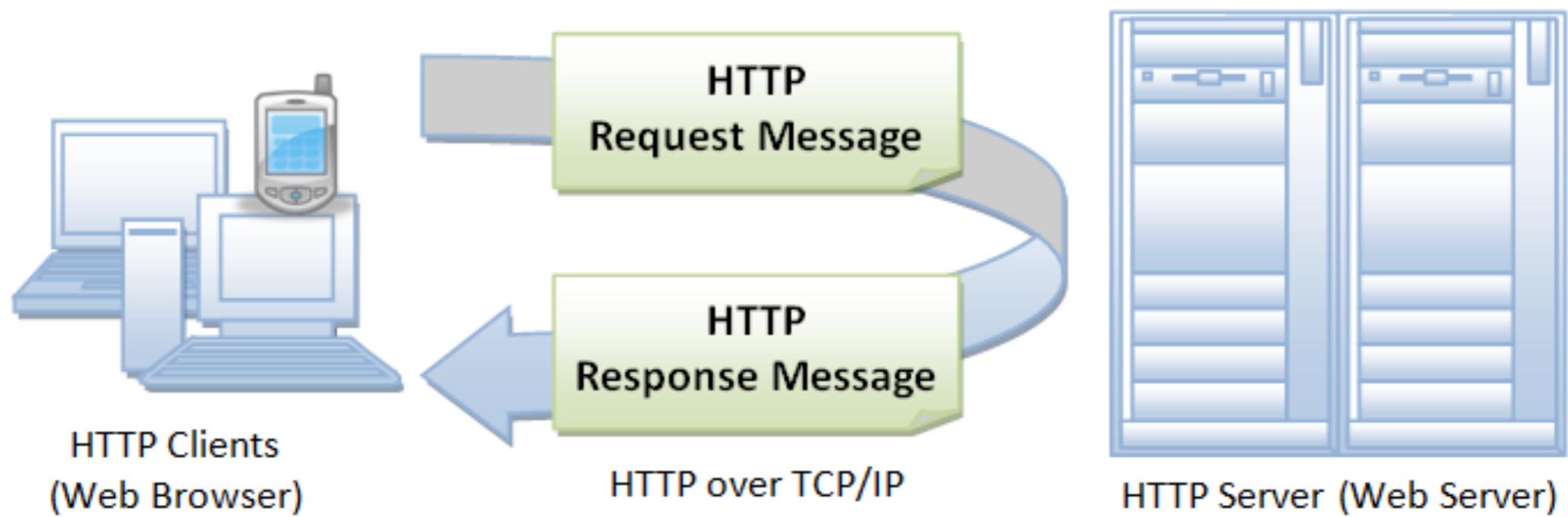




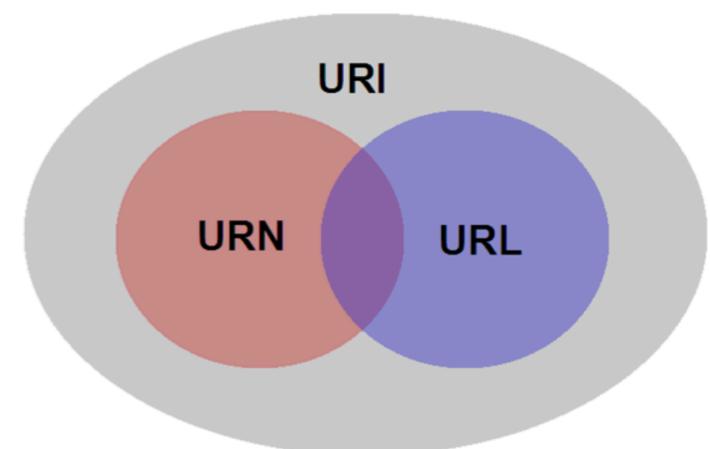
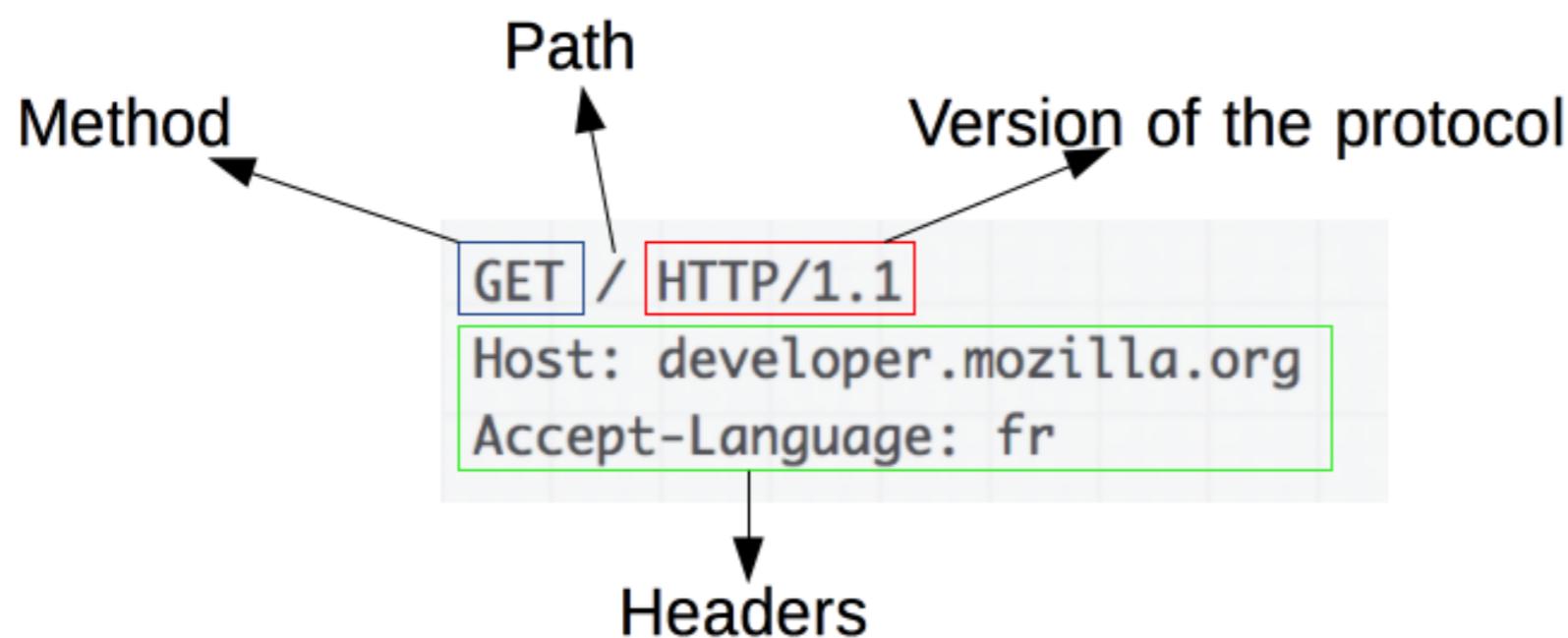
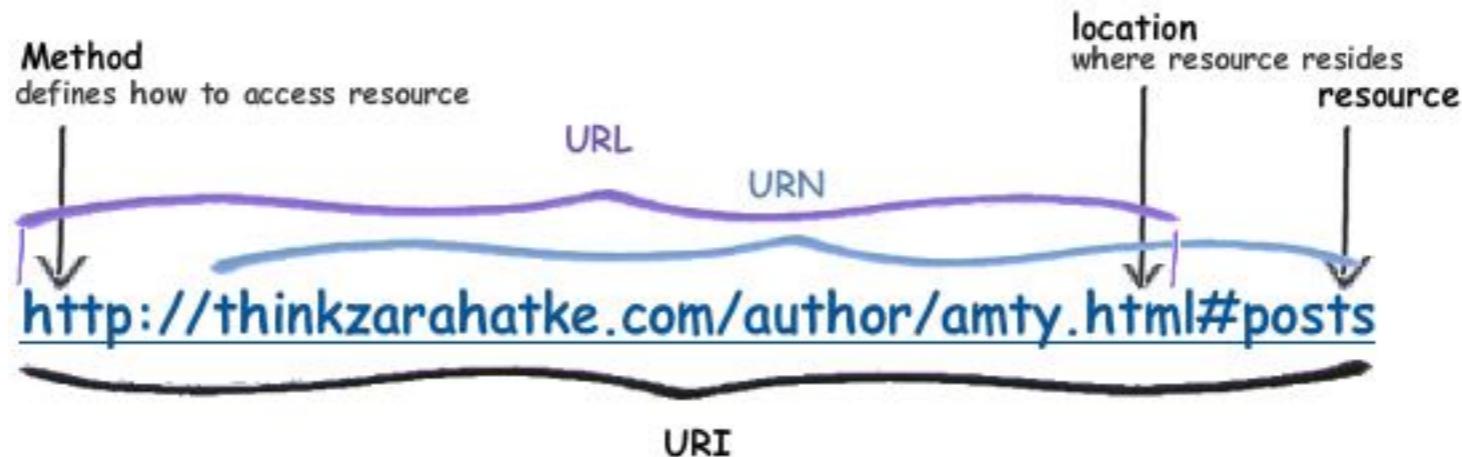
# Sevrllet



# Http Protocol



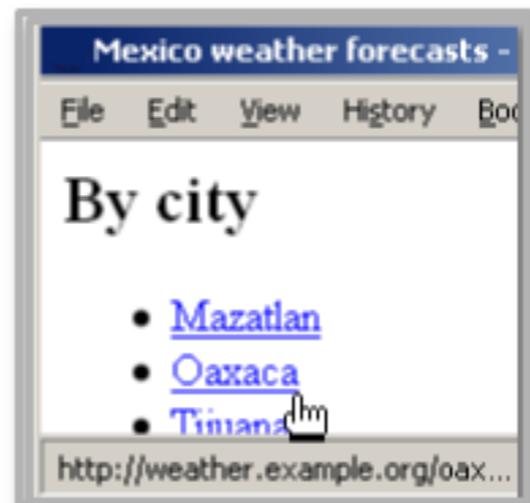
# URI



# Http Request / Response

| Status | Method | Domain             | File                  | Initiator  | Type | Transferred      | Size       |
|--------|--------|--------------------|-----------------------|------------|------|------------------|------------|
| 200    | GET    | backtory.com       | /                     | document   | html | cached           | 50.50 KB   |
| 403    | GET    | storage.backtor... | DeepChartAnalytics.js | script     | json | 609 B            | 0 B        |
| 200    | GET    | backtory.com       | bootstrap.min.css     | stylesheet | css  | cached           | 124.36 ... |
|        | GET    | backtory.com       | new-main.css          | stylesheet | css  | 14.13 KB (raced) | 14.13 KB   |
|        | GET    | backtory.com       | new-style.css         | stylesheet | css  | 4.18 KB (raced)  | 4.18 KB    |
| 200    | GET    | backtory.com       | new-style.css         | stylesheet | css  | cached           | 33.19 KB   |
| 200    | GET    | backtory.com       | new-rtl.css           | stylesheet | css  | cached           | 2.90 KB    |
|        | GET    | backtory.com       | jquery-ui.min.css     | stylesheet | css  | 28.59 KB (raced) | 28.59 KB   |
| 200    | GET    | backtory.com       | jquery.min.js         | script     | js   | cached           | 84.89 KB   |
| 200    | GET    | backtory.com       | bootstrap-min.js      | script     | js   | cached           | 31.06 KB   |
| 200    | GET    | backtory.com       | iauerv-ui.min.js      | script     | js   | cached           | 234.79 ... |



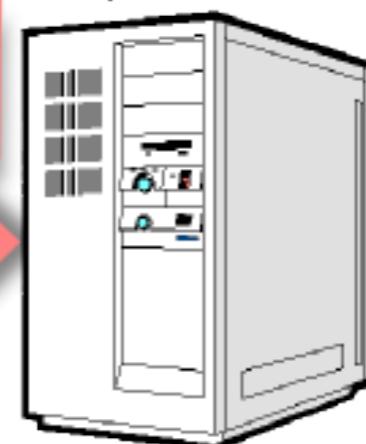


User clicks

Browser

```
GET http://weather.example.org/oaxaca HTTP/1.1  
Host: weather.example.org  
Accept: application/xhtml+xml
```

Server handles request



Web server for  
weather.example.org

```
HTTP/1.1 200 OK  
Content-Length: 45178  
Content-Type: application/xhtml+xml; charset=utf-8  
  
<!DOCTYPE html PUBLIC "..."  
<html xmlns="http://www...  
<head>  
<title>5 day forecast ...
```

Server



Browser interprets representation,  
displays presentation



Headers Cookies Request Response Timings Security

Filter Headers Block Resend

▶ GET https://spring.io/

Status **200 OK**

Version HTTP/2

Transferred 14.64 KB (49.52 KB size)

Response Headers (568 B) Raw

- cf-cache-status: DYNAMIC
- cf-ray: 5b6f38e97f2064a9-FRA
- cf-request-id: 041961e5ec000064a9eea85200000001
- content-encoding: br
- content-language: en-US
- content-type: text/html; charset=UTF-8
- date: Wed, 22 Jul 2020 18:28:35 GMT
- expect-ct: max-age=604800, report-uri="https://report-uri.cloudflare.com/cdn-cgi/beacon/expect-ct"
- server: cloudflare
- strict-transport-security: max-age=15552000; includeSubDomains
- x-application-context: sagan:production,cloudfoundry,cloud:0
- X-Firefox-Spdy: h2
- x-vcap-request-id: c10961e7-eb51-46af-6616-2b7d57fbc3d9

Request Headers (532 B) Raw

- Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,\*/\*;q=0.8
- Accept-Encoding: gzip, deflate, br
- Accept-Language: en-US,en;q=0.5
- Connection: keep-alive
- Cookie: \_\_cfduid=d7846a4ba88167819723ac19229db5c071595442506; notice\_behavior=no ne; \_ga=GA1.2.693338156.1595442510; \_gid=GA1.2.1000605241.1595442510; \_gat\_UA-2728 886-20=1; \_gat\_UA-2728886-19=1
- Host: spring.io
- TE: Trailers
- Upgrade-Insecure-Requests: 1
- User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.13; rv:78.0) Gecko/20100101 Firefox/7 8.0



# Http Methods

| HTTP Verb | Path             | Action  |
|-----------|------------------|---------|
| GET       | /photos          | index   |
| GET       | /photos/new      | new     |
| POST      | /photos          | create  |
| GET       | /photos/:id      | show    |
| GET       | /photos/:id/edit | edit    |
| PATCH/PUT | /photos/:id      | update  |
| DELETE    | /photos/:id      | destroy |

## REST Web services



# Java Servlets

---

- A Java  **servlet** is a class
- runtime initialization by application server or web server (single)
- Processing http requests
  - Read and Write **body**
  - Create date for Client response
  - Read and Write **Header**



# Java Servlets

---

```
@WebServlet("/template")
public class TemplateServlet extends HttpServlet {

    private Template template;

    @Override
    public void init() throws ServletException {
        template = new FreemakerConfig().loadTemplate("movie.ftl");
    }

    @Override
    protected void doGet(HttpServletRequest req, HttpServletResponse resp) throws IOException {

        PrintWriter writer = resp.getWriter();
        Movie movie = Movie.example();
        try {
            template.process(movie, writer);
        } catch (TemplateException ex) {
            throw new IOException("Could not process template: " + ex.getMessage());
        }
    }
}
```



# Java Servlet Methods (specific)

|                |  |
|----------------|--|
| protected void | <a href="#"><code>doDelete(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Called by the server (via the <code>service</code> method) to allow a servlet to handle a DELETE request.   |
| protected void | <a href="#"><code>doGet(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Called by the server (via the <code>service</code> method) to allow a servlet to handle a GET request.   |
| protected void | <a href="#"><code>doHead(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Receives an HTTP HEAD request from the protected <code>service</code> method and handles the request.   |
| protected void | <a href="#"><code>doOptions(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Called by the server (via the <code>service</code> method) to allow a servlet to handle a OPTIONS request.   |
| protected void | <a href="#"><code>doPost(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Called by the server (via the <code>service</code> method) to allow a servlet to handle a POST request.   |
| protected void | <a href="#"><code>doPut(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Called by the server (via the <code>service</code> method) to allow a servlet to handle a PUT request.   |
| protected void | <a href="#"><code>doTrace(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Called by the server (via the <code>service</code> method) to allow a servlet to handle a TRACE request.   |
| protected long | <a href="#"><code>getLastModified(HttpServletRequest req)</code></a><br>Returns the time the <code>HttpServletRequest</code> object was last modified, in milliseconds since midnight January 1, 1970 GMT.   |
| protected void | <a href="#"><code>service(HttpServletRequest req, HttpServletResponse resp)</code></a><br>Receives standard HTTP requests from the public <code>service</code> method and dispatches them to the <code>doXXX</code> methods defined in this class. |
| void           | <a href="#"><code>service(ServletRequest req, ServletResponse res)</code></a><br>Dispatches client requests to the protected <code>service</code> method.  |



# Java Servlets

---

```
@WebServlet(urlPatterns="/account",
    initParams={
        @WebInitParam(name="type", value="checking")
    }
)

@WebServlet("/account")
public class AccountServlet
    extends javax.servlet.http.HttpServlet {
    @Override
    protected void doGet(
        HttpServletRequest request,
        HttpServletResponse response) {
        //...
    }
}
```



# Java Servlets

---

```
protected void doGet(HttpServletRequest request,
                      HttpServletResponse response) {
    try (PrintWriter out = response.getWriter()) {
        out.println("<html><head>");
        out.println("<title>MyServlet</title>");
        out.println("</head><body>");
        out.println("<h1>My First Servlet</h1>");
        //. . .
        out.println("</body></html>");
    } finally {
        //. . .
    }
}
```



# Java Servlets

---

. . . ./account?tx=10

```
protected void doGet(HttpServletRequest request,  
                      HttpServletResponse response) {  
    String txValue = request.getParameter("tx");  
    //. . .  
}
```



# Servlet using web.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app version="3.1"
    xmlns="http://xmlns.jcp.org/xml/ns/javaee"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
    http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd">
    <servlet>
        <servlet-name>AccountServlet</servlet-name>
        <servlet-class>org.sample.AccountServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>AccountServlet</servlet-name>
        <url-pattern>/account</url-pattern>
    </servlet-mapping>
</web-app>
```



# Servlet using web.xml

```
<web-app version="3.1"
  xmlns="http://xmlns.jcp.org/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
  http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd"
  metadata-complete="true">
  ...
</web-app>

protected void doGet(HttpServletRequest request,
                      HttpServletResponse response) {
    ServletContext context = request.getServletContext();
    ...
}
```



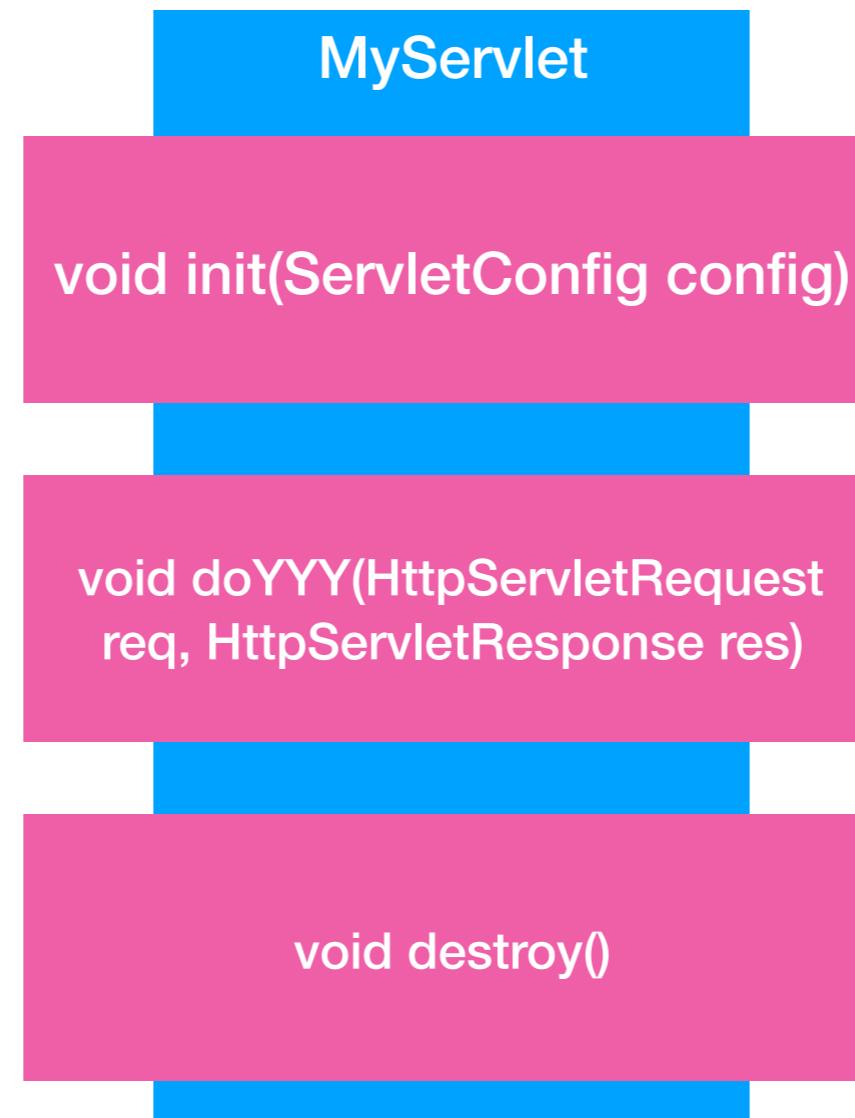
# Servlet using web.xml

```
protected void doGet(HttpServletRequest request,
                      HttpServletResponse response) {
    request.getRequestDispatcher("bank").forward(request, response);
    //. . .
}

protected void doGet(HttpServletRequest request,
                      HttpServletResponse response) {
    //. . .
    response.sendRedirect("http://example.com/SomeOtherServlet");
}
```



# life cycle servlet



Call by application server

Stop application server



# HttpServletRequest

```
import java.net.URLDecoder;
import java.net.URLEncoder;
```

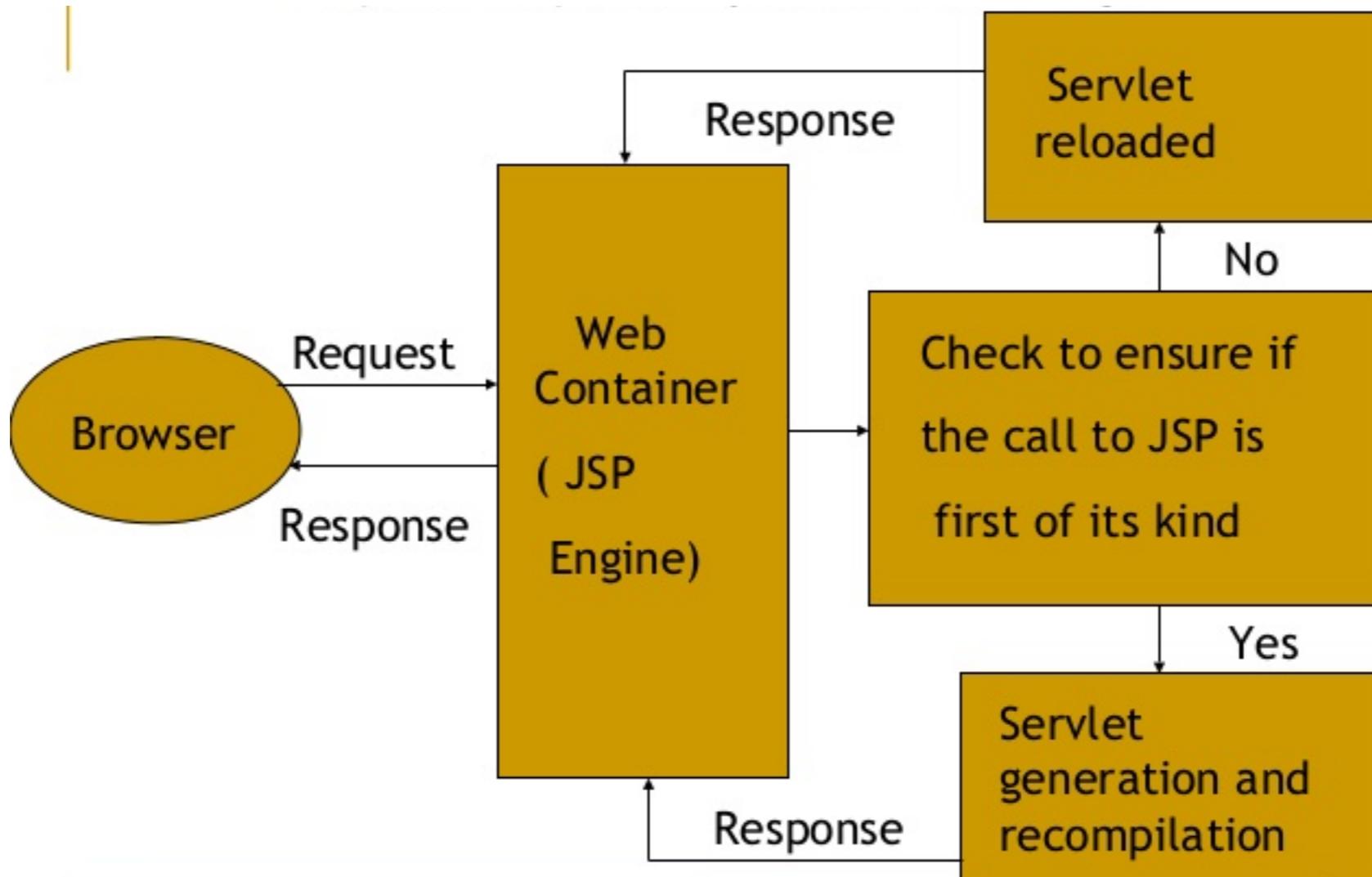
```
URLEncoder.encode( s: "https://backtory.com/", enc: "utf-8");
URLDecoder.decode( s: "https%3A%2F%2Fbacktory.com%2F", enc: "utf-8"
```

```
TemplateServlet x
/Library/Java/JavaVirtualMachines/jdk1.8.0_201.jdk/Contents/Home/bin/java
https%3A%2F%2Fbacktory.com%2F
https://backtory.com/
Process finished with exit code 0
```

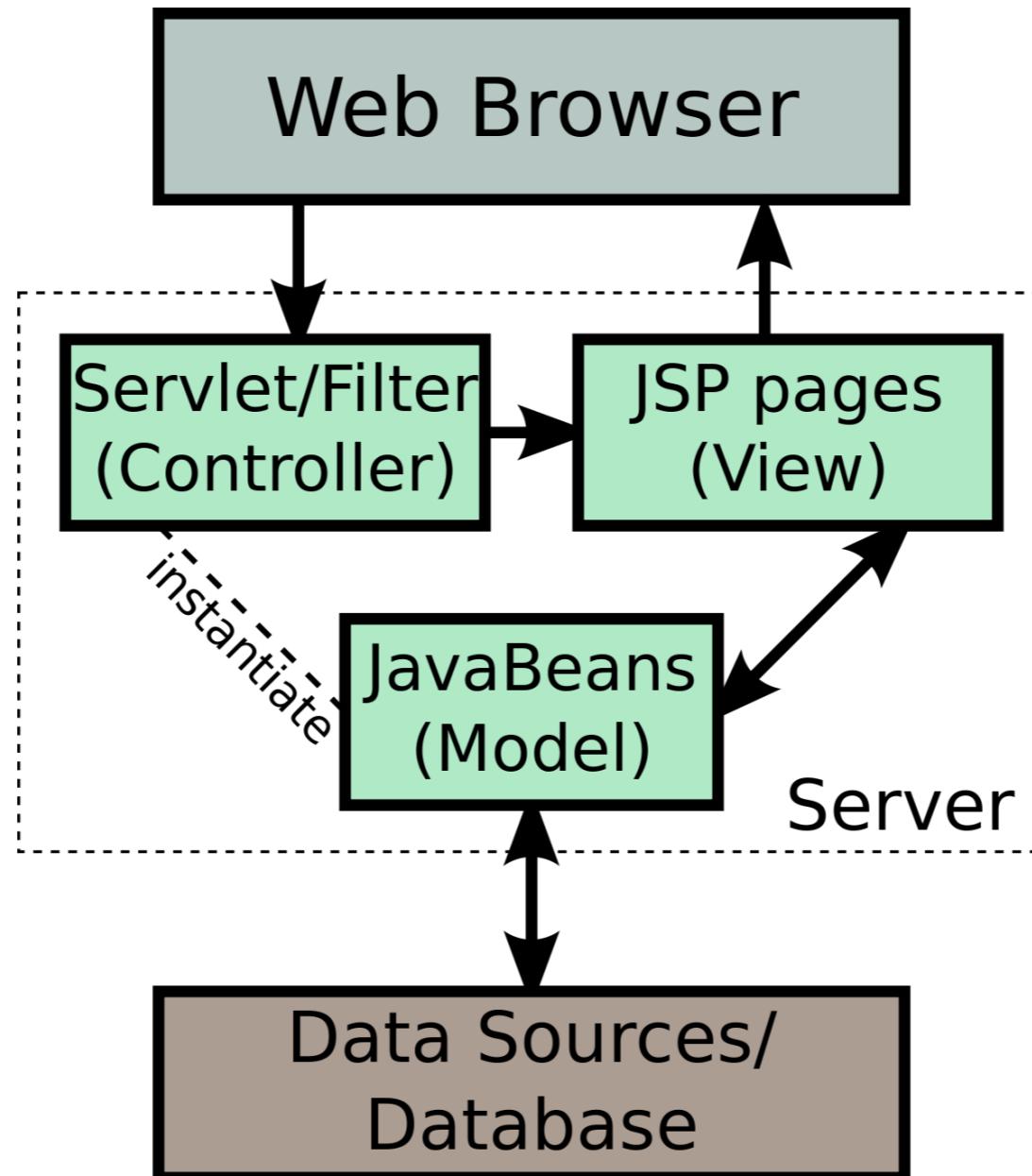




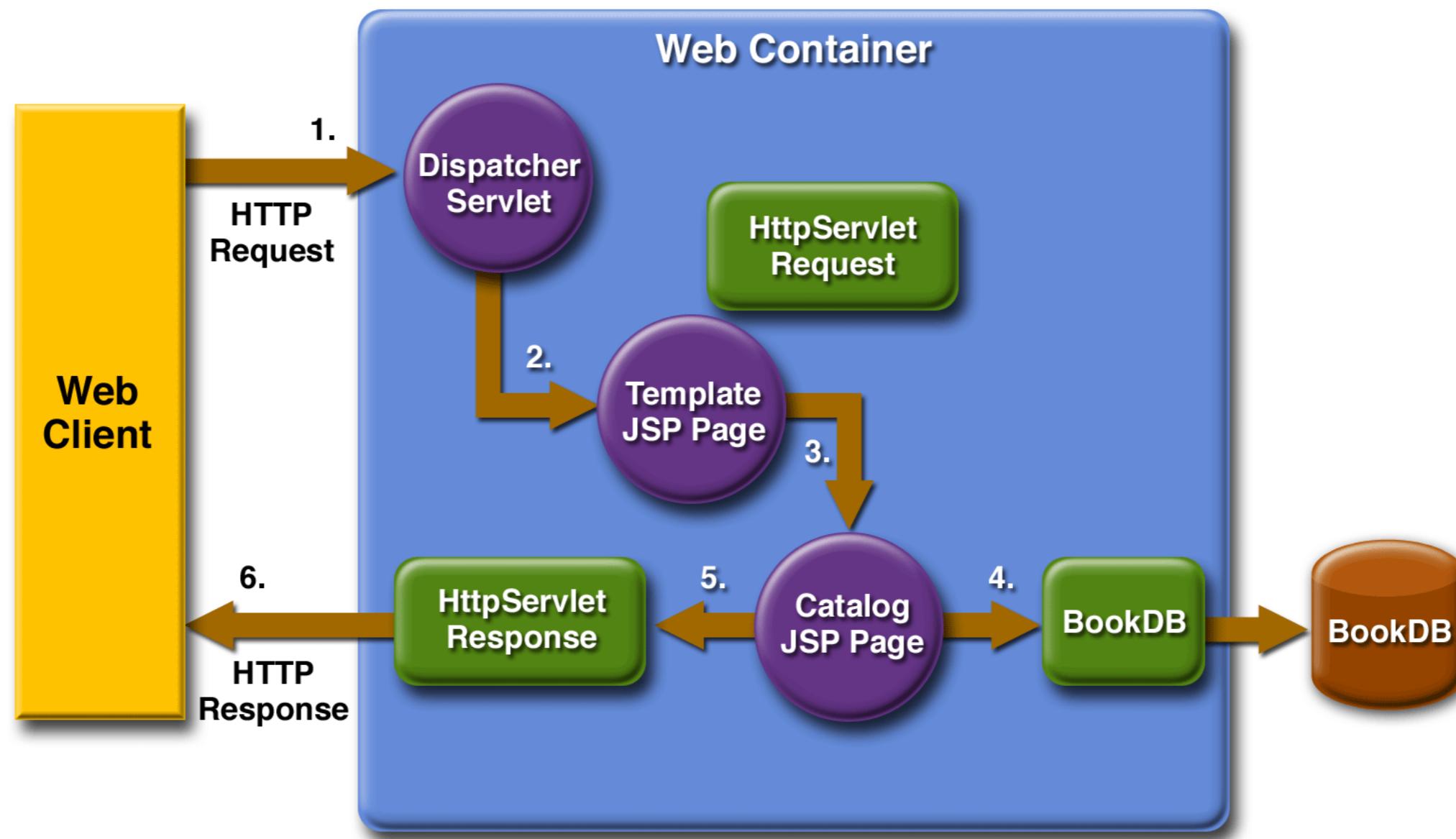
# Request-Response Cycle for a JSP Page



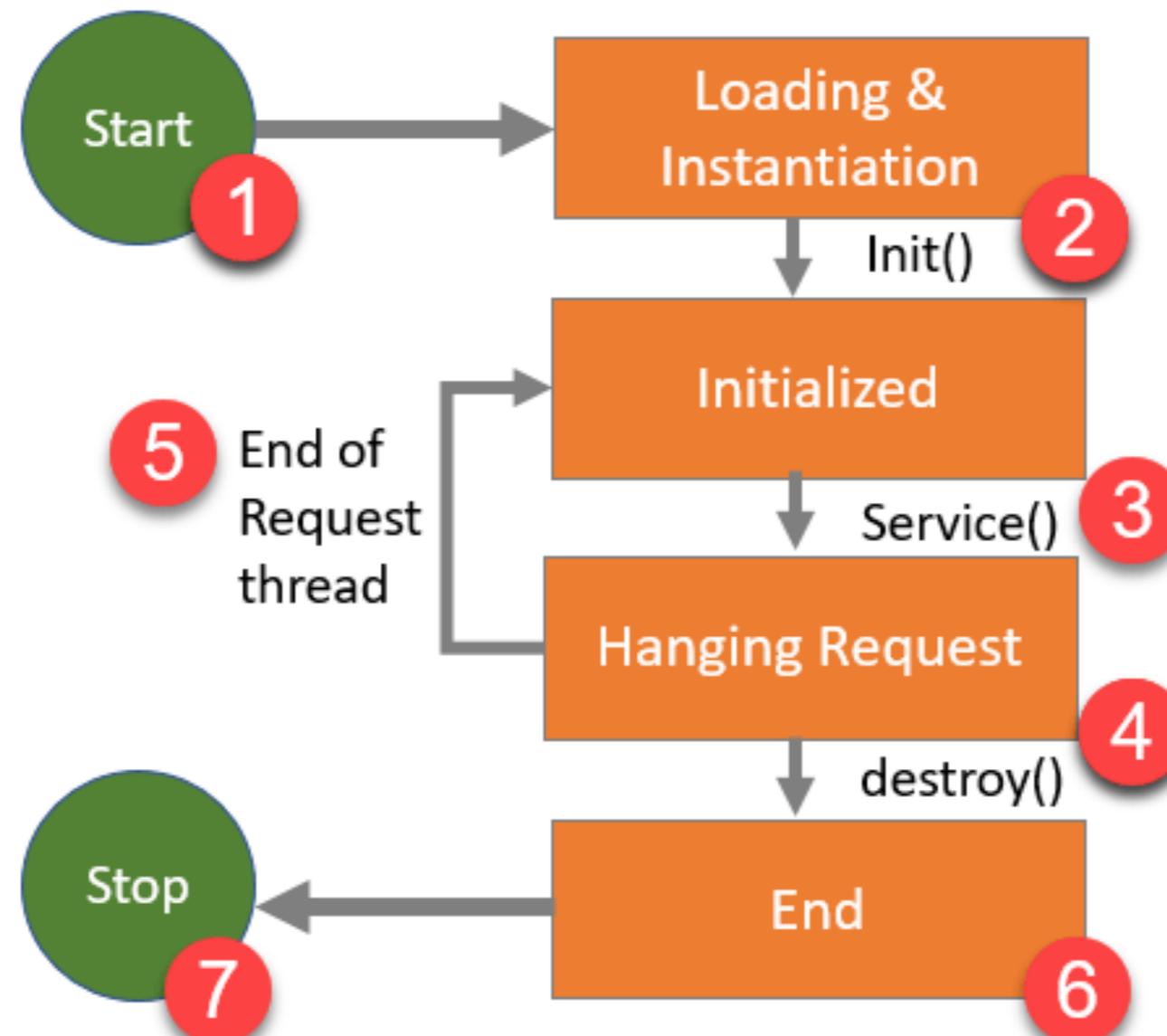
# Request-Response Cycle for a JSP Page



# Request-Response Cycle for a JSP Page



# Request-Response Cycle for a JSP Page



# Assignment

---

DatePage.jsp

```
<html>
```

```
<body>
```

```
<%= new java.util.Date () %>
```

```
</body>
```

```
</html>
```



# Assignment

---

```
<html>
  <body>

    <h4> Today's Date is :
      <jsp:include page="DatePage.jsp" flush="true" /> </h4>

    <%
      out.println("<h4> The output of the file DatePage.jsp is shown
                  above </h3>");

    %>
  </body>
```





JavaTar

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