

دوره آموزشی جاوا EE

(۱)

مدرس: دکتر اسماعیل صادقی



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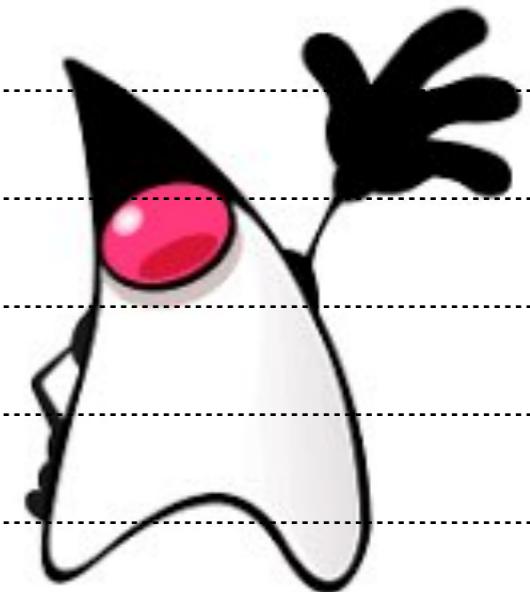
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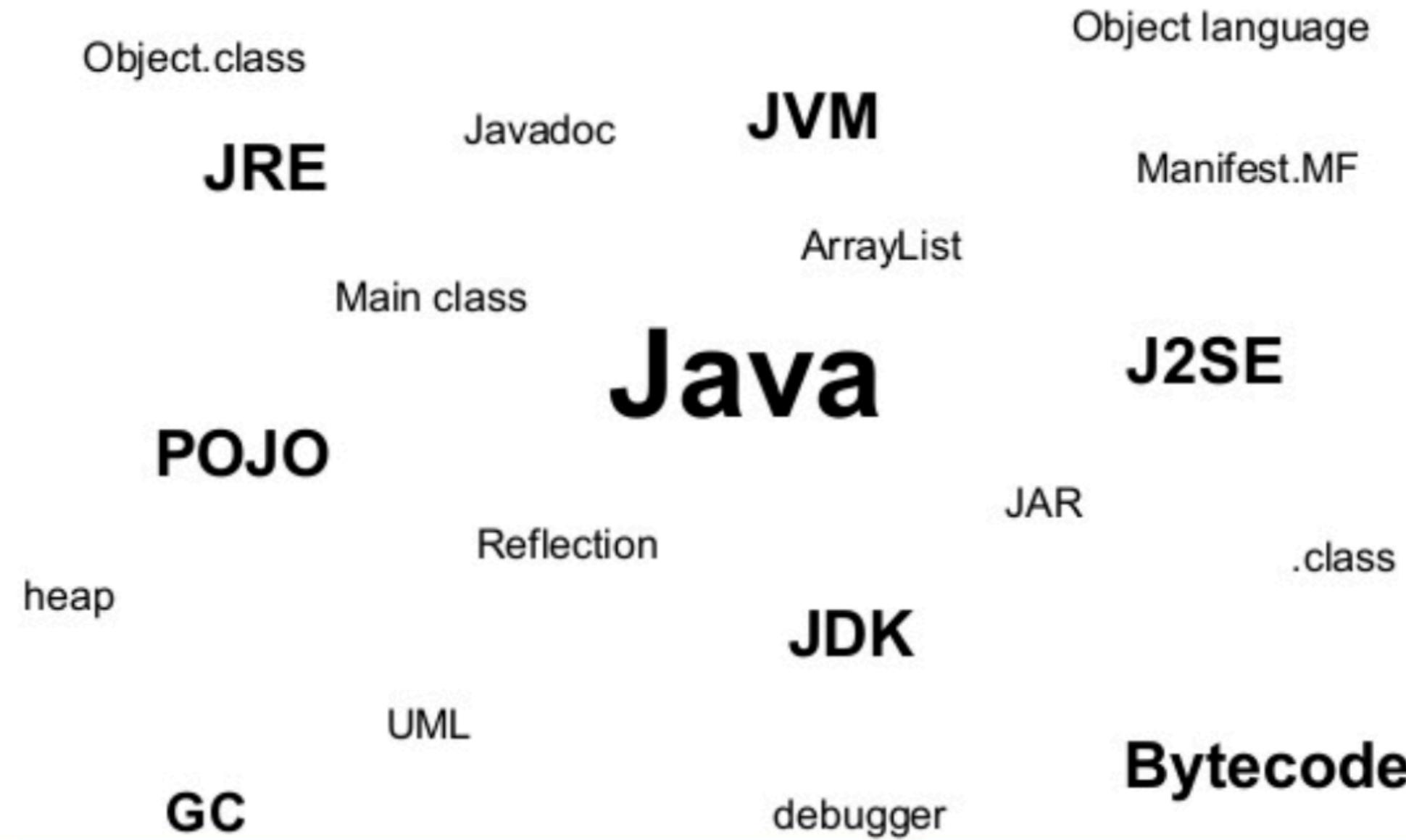
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Keywords



Keywords

JCP

JSR

container

@SessionScope

component

JSF

@ManagedBean

Validation

Renderer

@Stateless

@Converter

@Validator

@Inject

@NotNull

JavaEE

@EJB

@Resource

@MessageDrivenBean

JMS

@TransactionAttribute

Transaction

EntityManager

CriteriaBuilder

JPA

JPQL

NativeQuery



Java EE Architecture

- **Web Specification**

Http request / response

- **Web Service Specification**

Create Endpoint (Rest and Soap protocols)

- **Enterprise Specification**

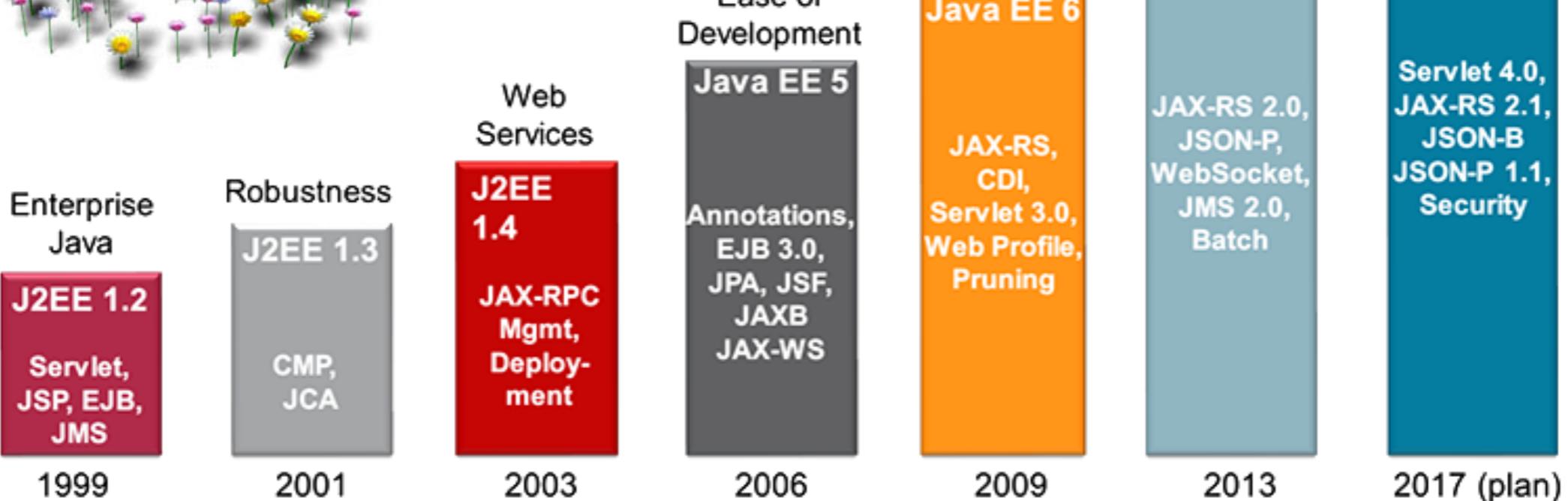
Components (EJB , Messaging Service)

- **Other Specification** (validation, Connector, Batch)



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Java EE Version History



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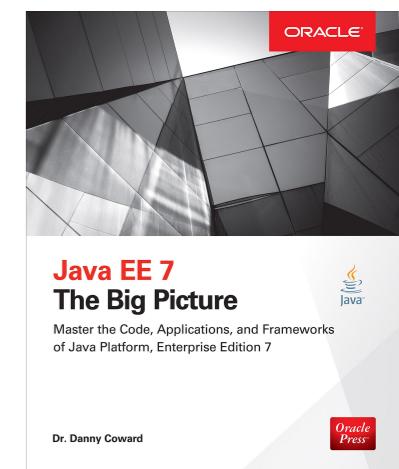
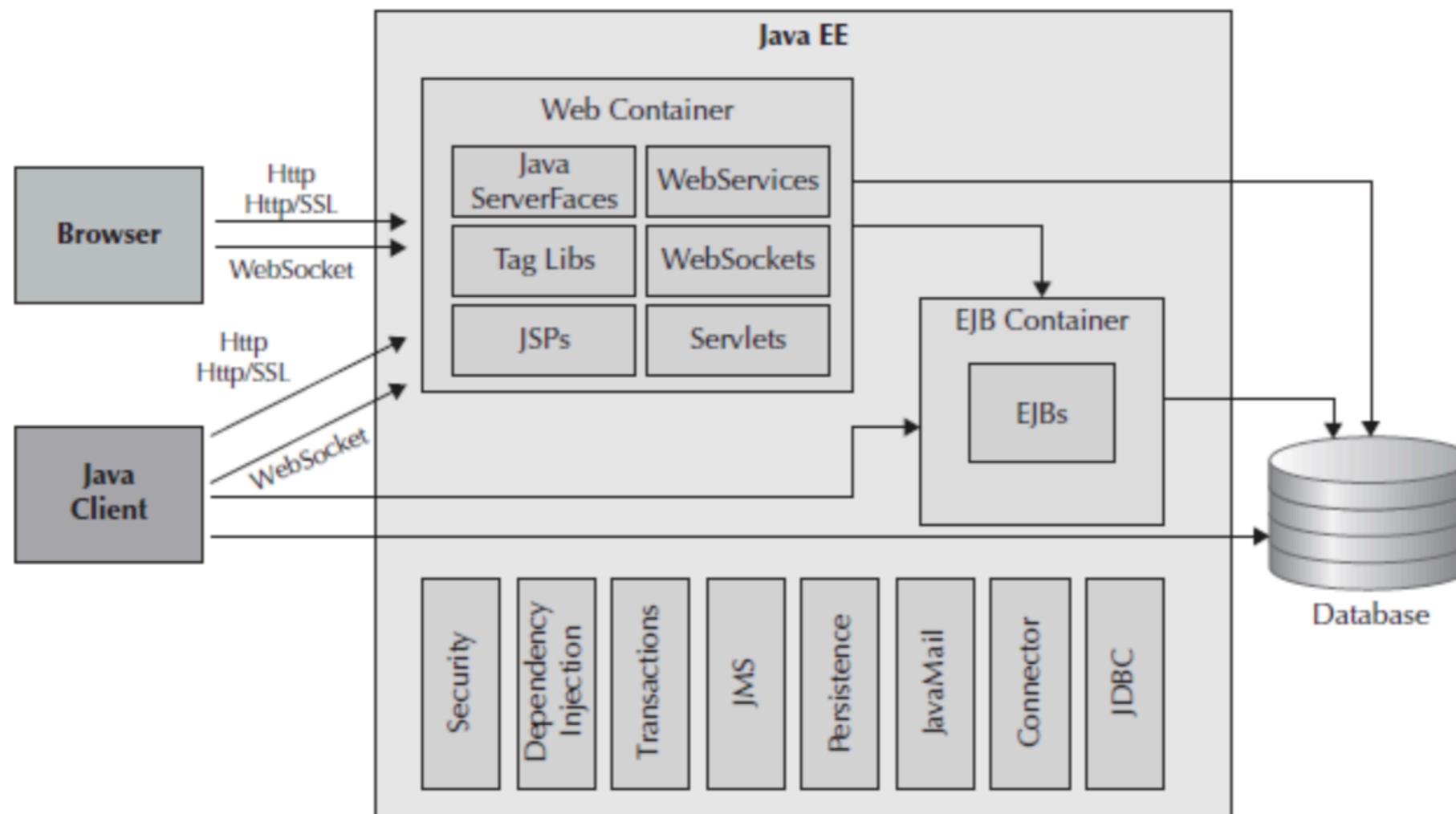
Java EE to Jakarta EE

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

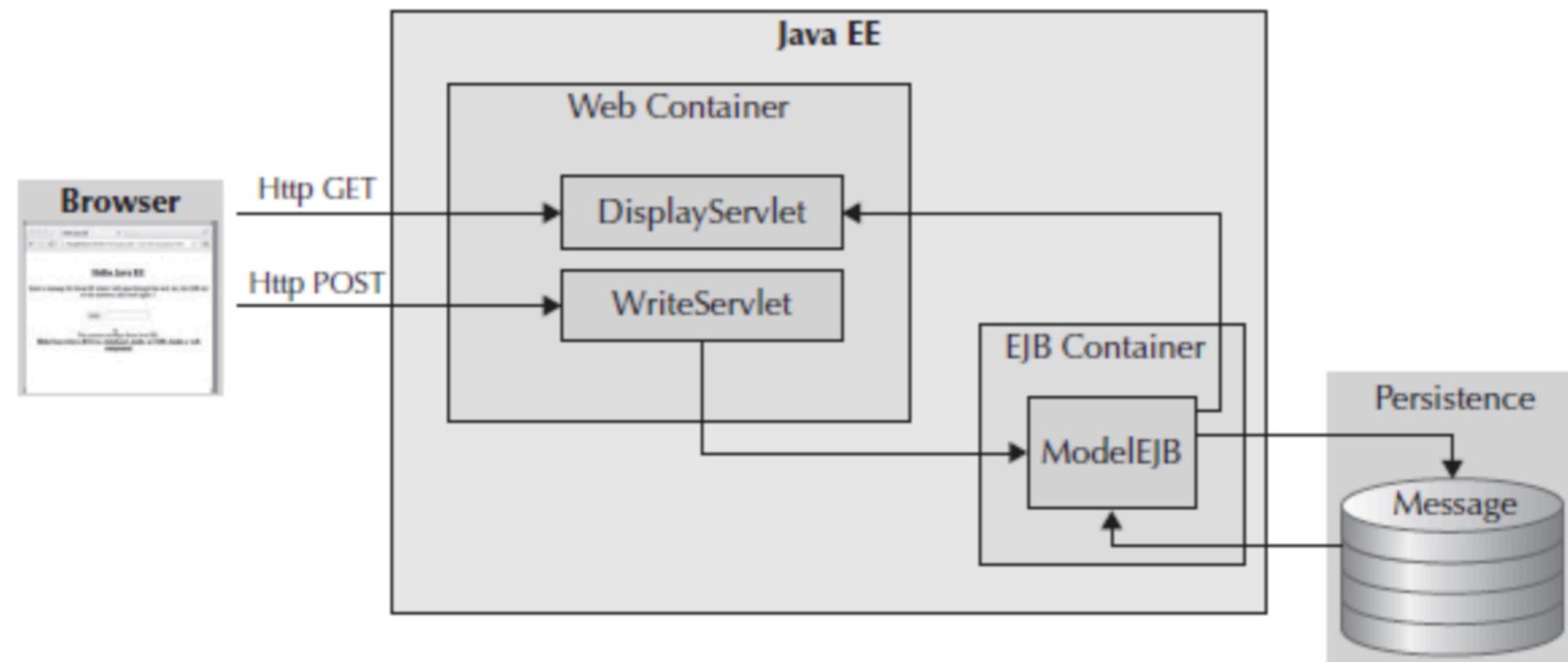


CHAPTER 1: THE BIG PICTURE

JAVA EE ARCHITECTURE



HELLO WORLD APPLICATION

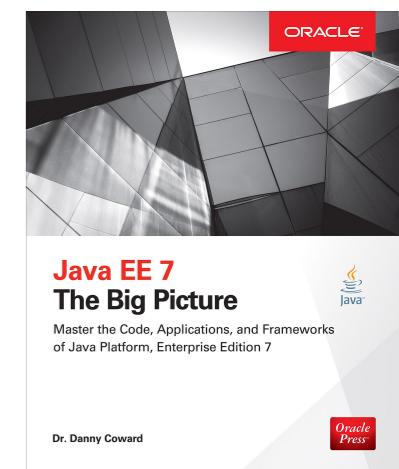


Display HTML page,
send user message

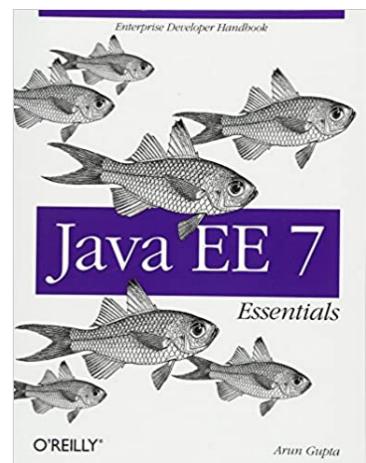
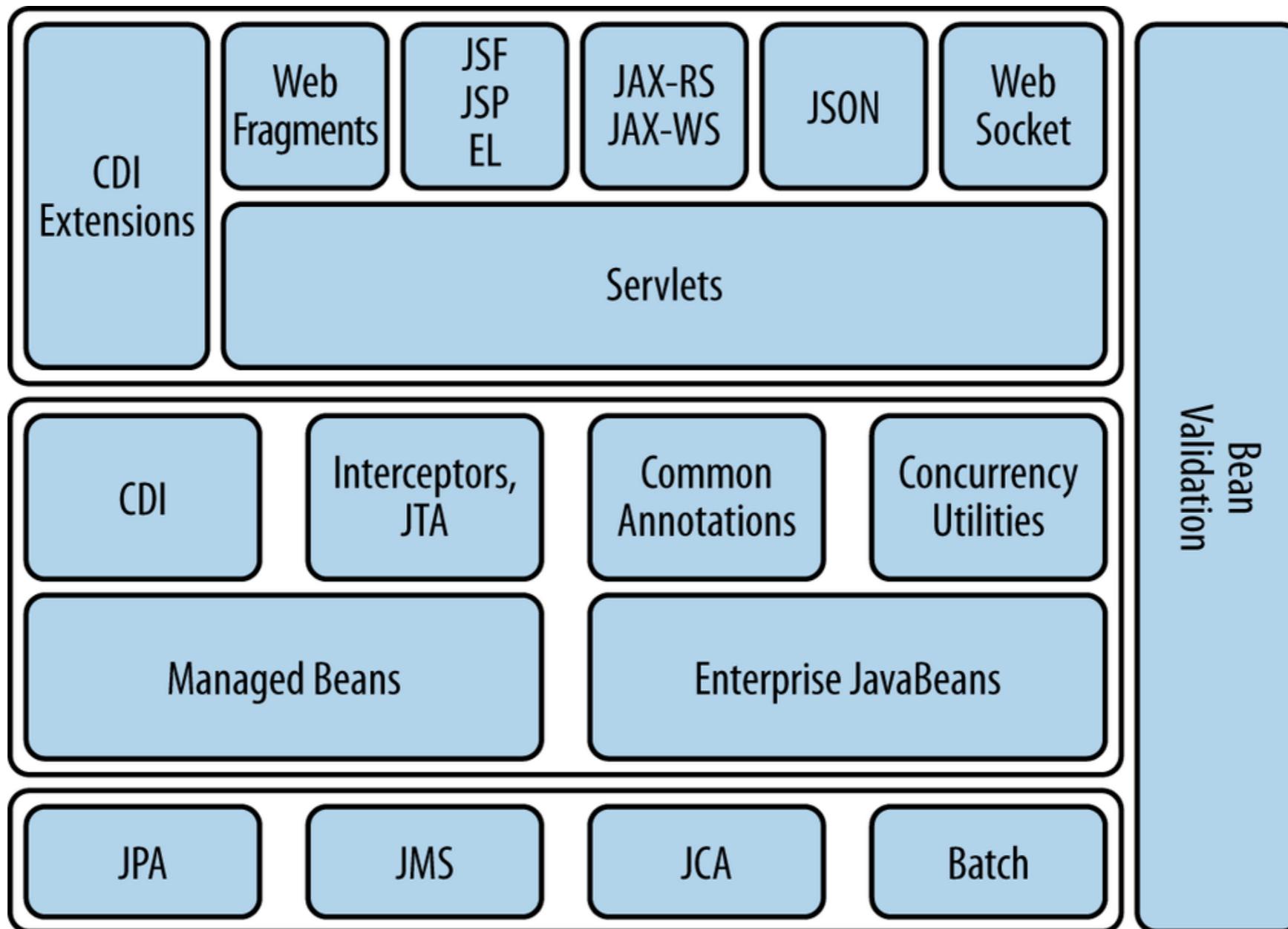
Create HTML page,
process incoming data,
delegate message handling
to EJB tier

Logic for processing
messages

Store messages

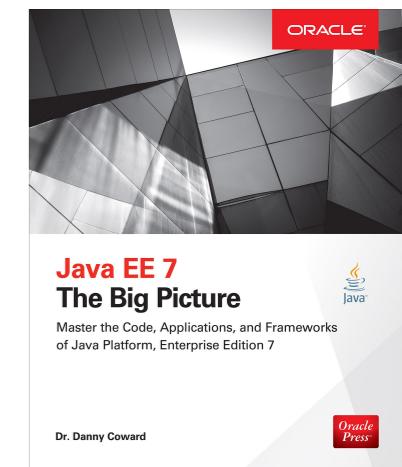


The Java EE stack

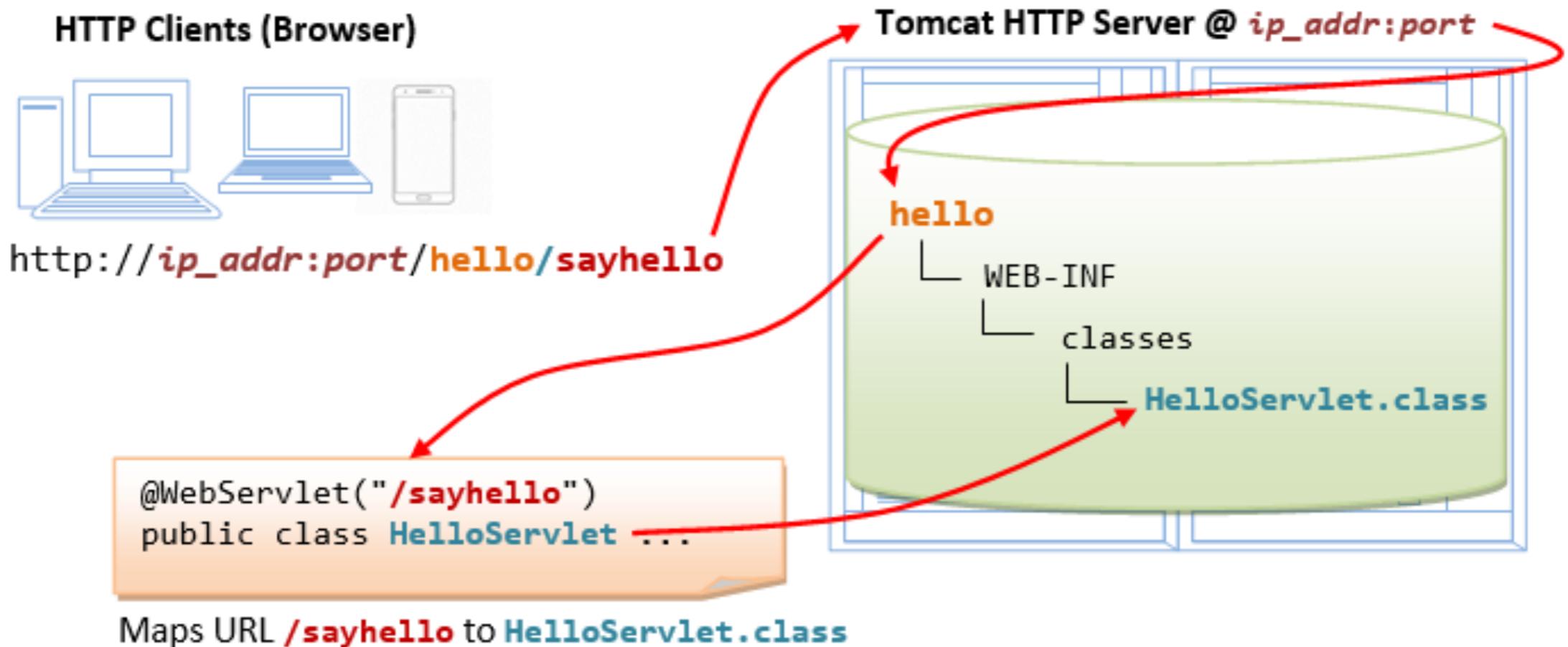
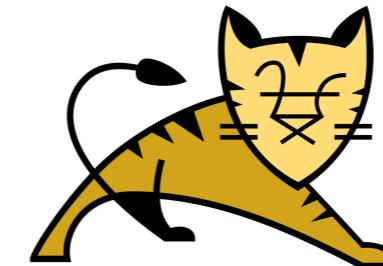


Web ARchive file (WAR)

- 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.



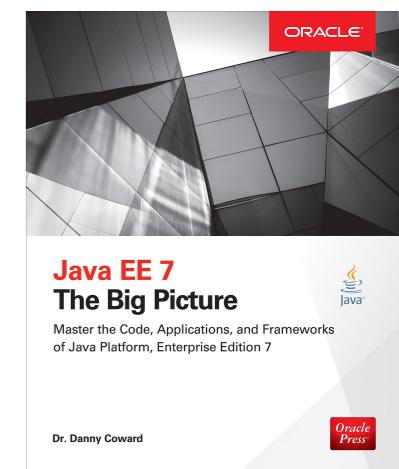
jetty://



Enterprise Bean JAR

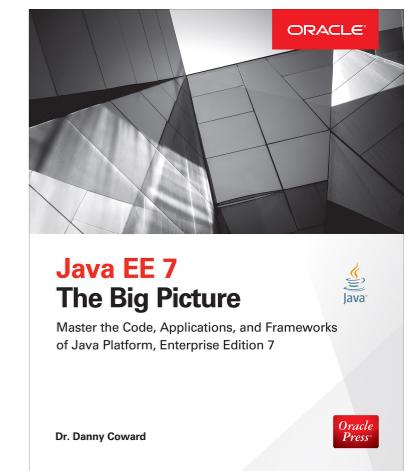
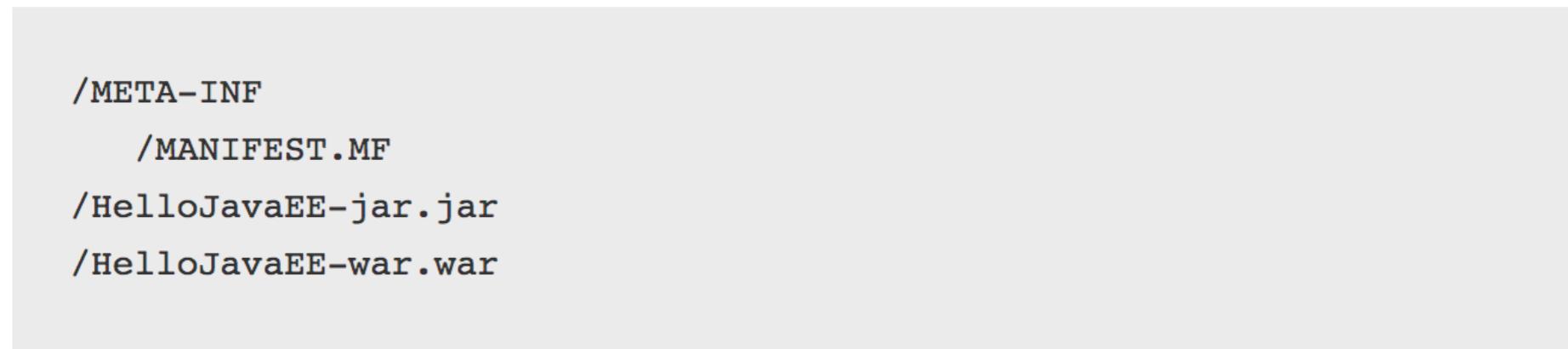
- packages the Enterprise Bean code in a archive
- uses the /META-INF directory to store configuration information about the Enterprise Beans it contains, together with the class files that the beans use at the root level of the archive.
- held the persistence.xml in the META-INF directory to ensure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





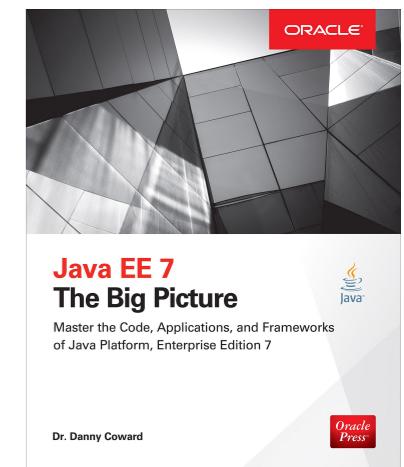
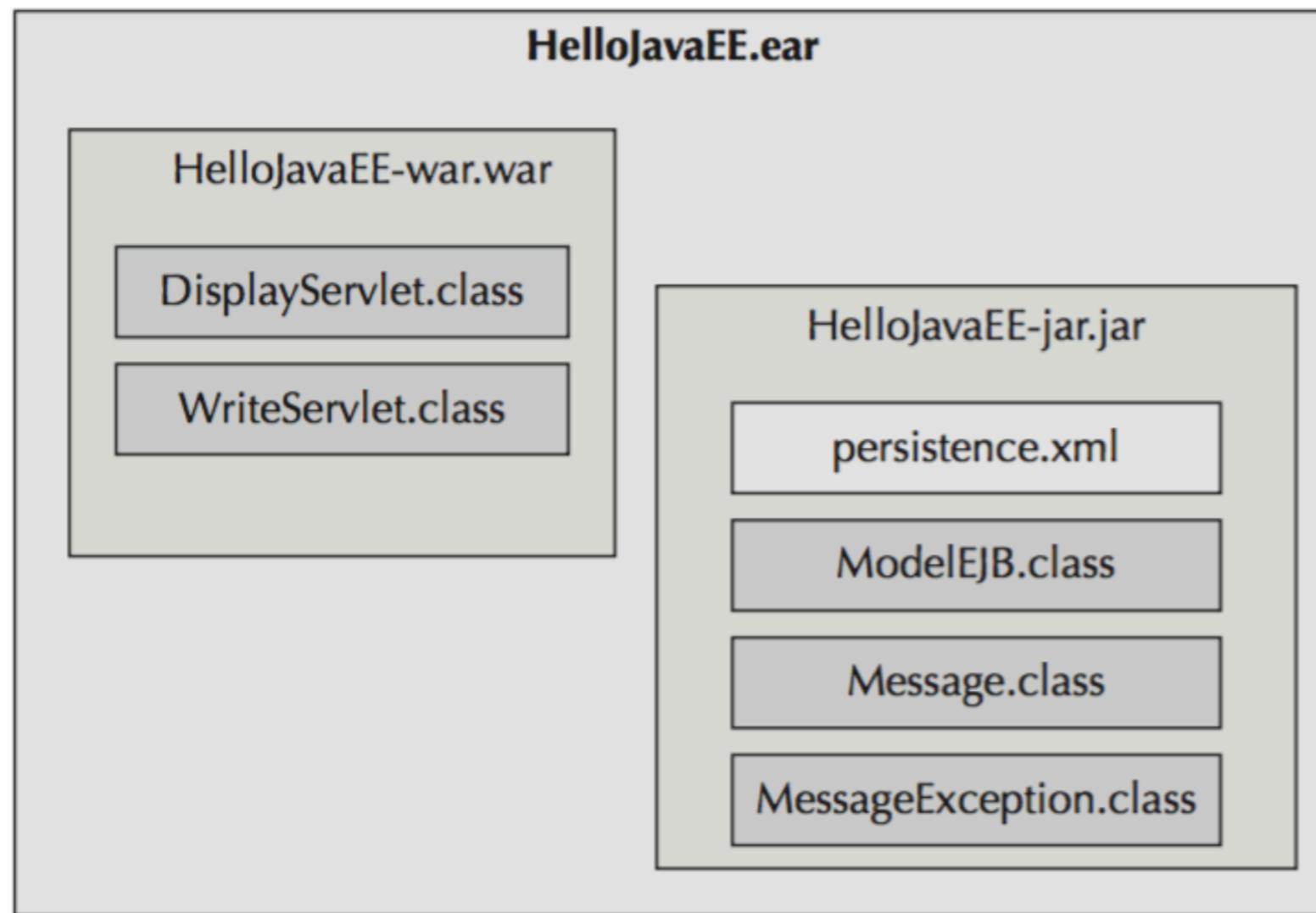
GlassFish



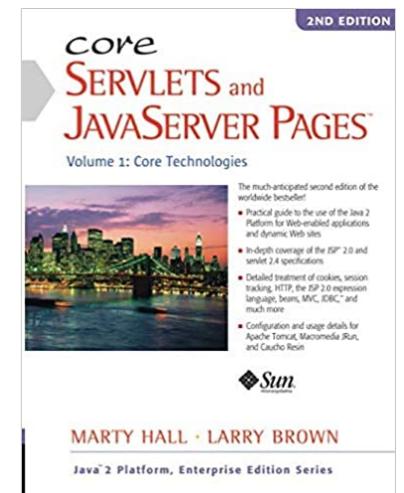
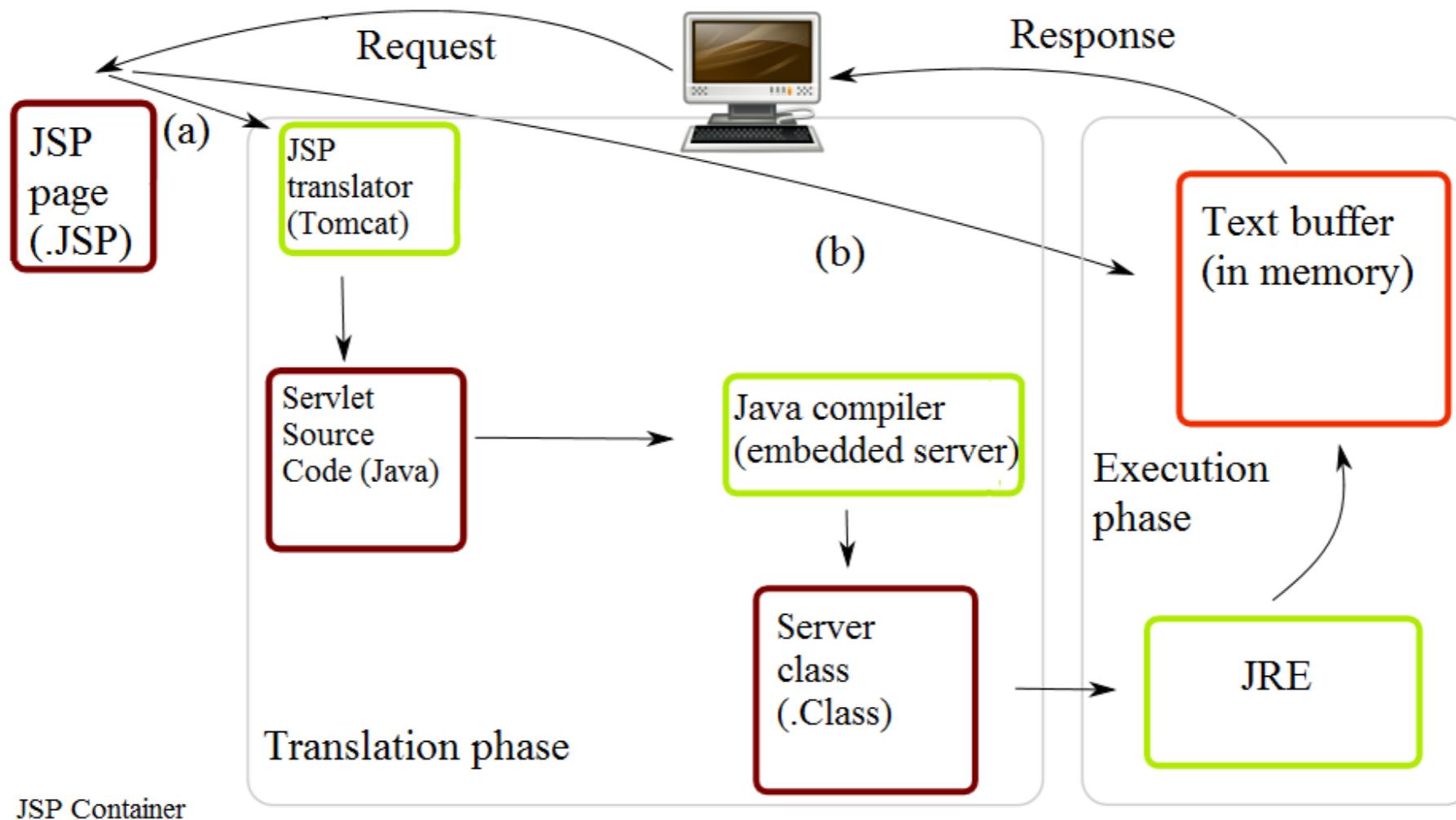
The WildFly logo features the word "WildFly" in a large, dark blue, bold, sans-serif font. A detailed illustration of a dragonfly is positioned above the letter "i". The dragonfly has transparent wings with intricate patterns and a segmented body.



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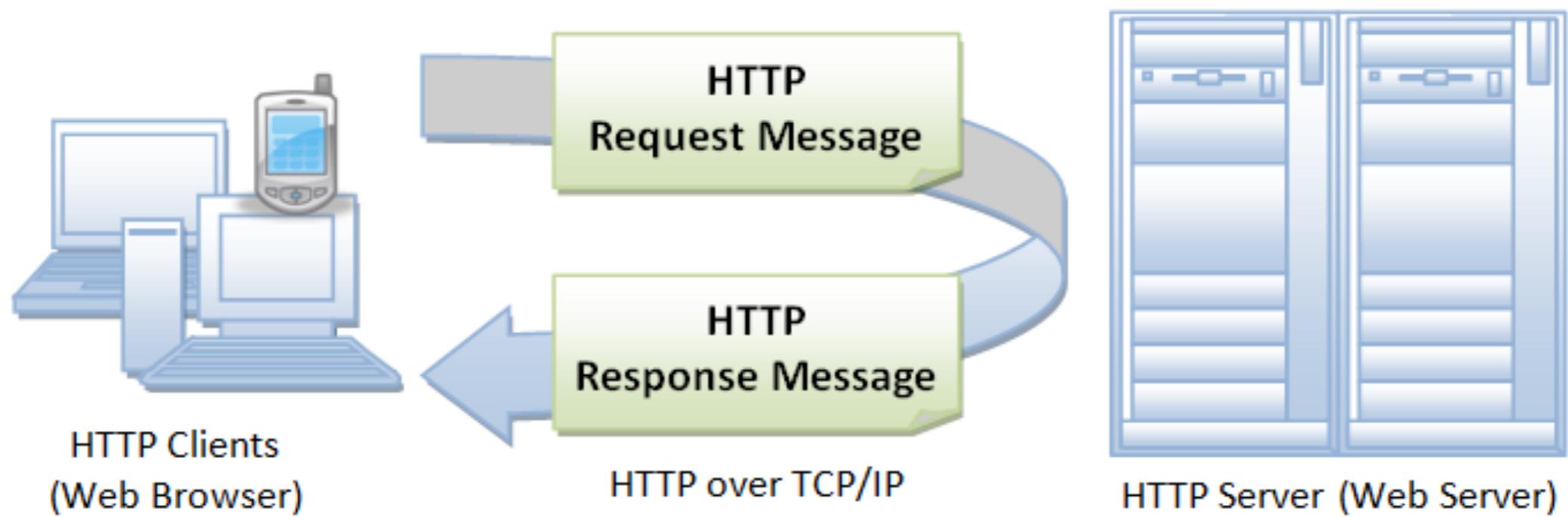


Sevrllet

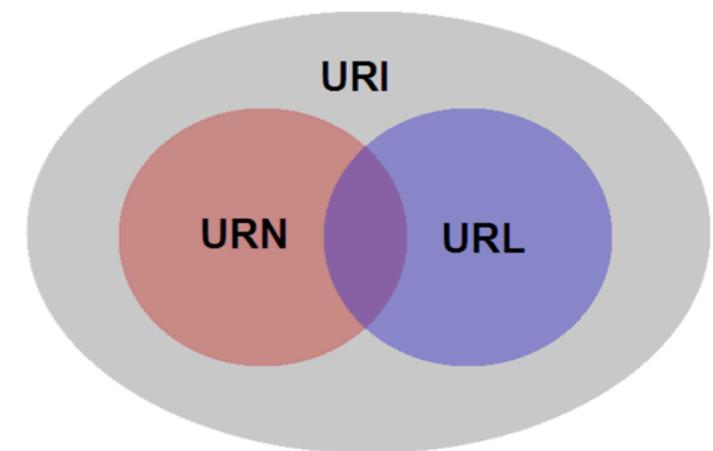
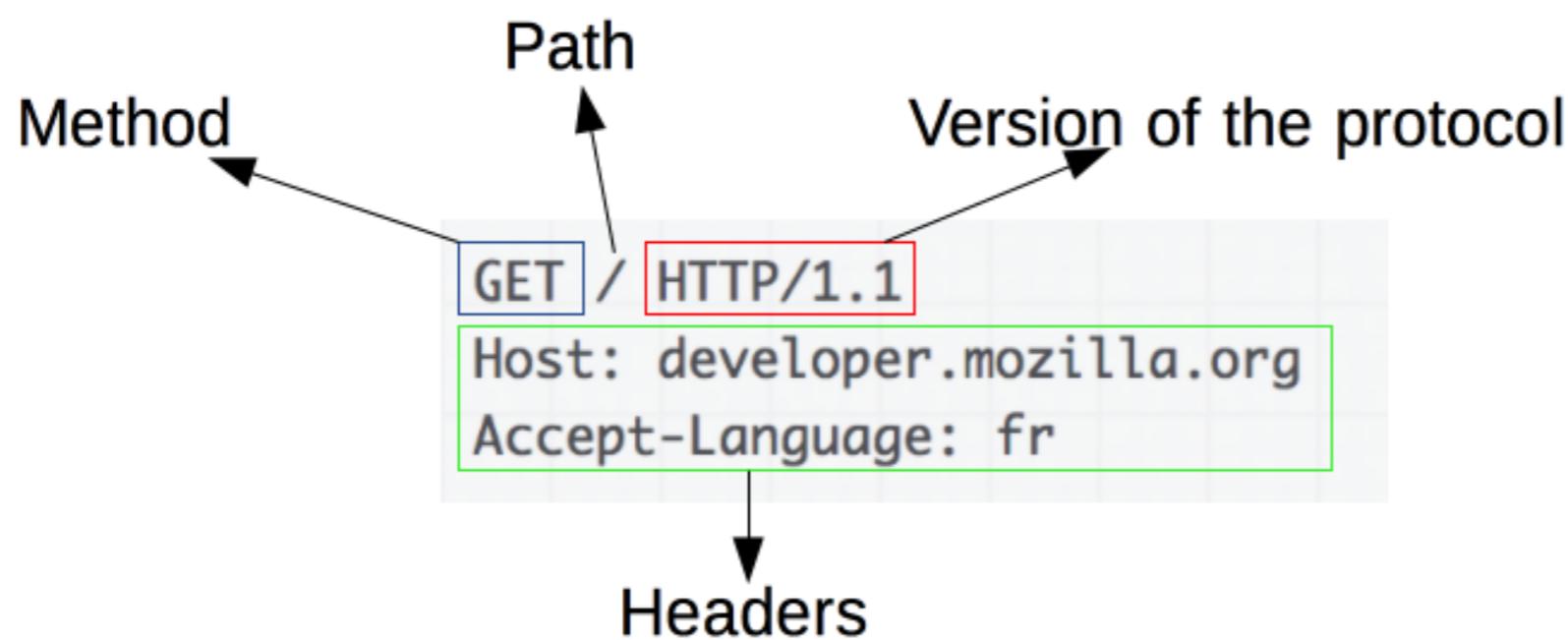
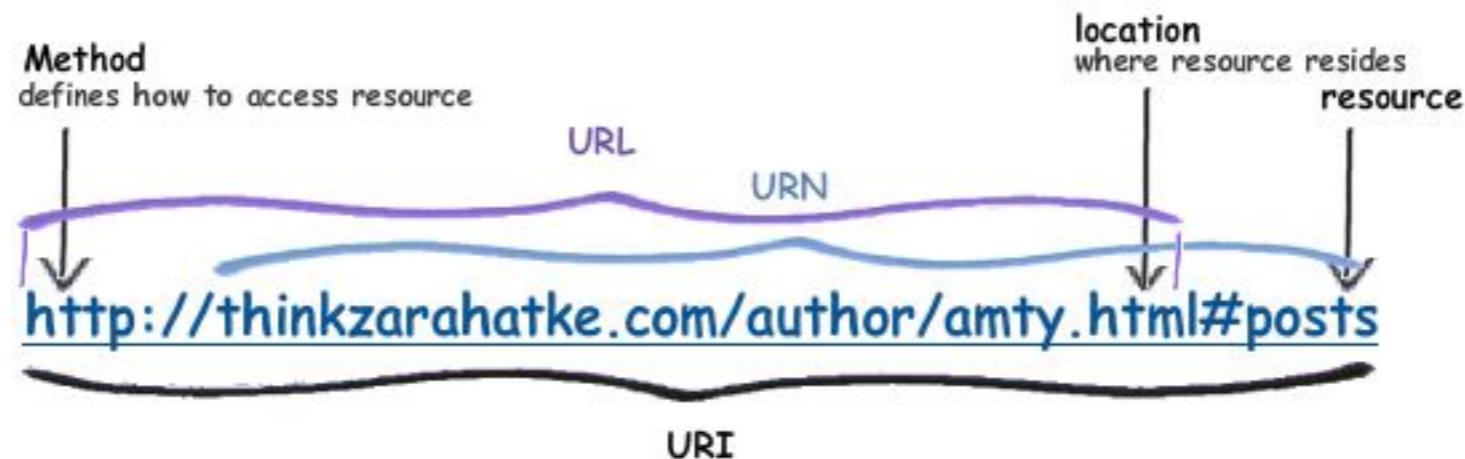


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Http Protocol



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 ...



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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 ...
```

sends request

sends response

Server



Browser interprets representation,
displays presentation



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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());
        }
    }
}
```



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Java Servlet Methods (specific)

protected void	<code>doDelete(HttpServletRequest req, HttpServletResponse resp)</code> Called by the server (via the <code>service</code> method) to allow a servlet to handle a DELETE request.
protected void	<code>doGet(HttpServletRequest req, HttpServletResponse resp)</code> Called by the server (via the <code>service</code> method) to allow a servlet to handle a GET request.
protected void	<code>doHead(HttpServletRequest req, HttpServletResponse resp)</code> Receives an HTTP HEAD request from the protected <code>service</code> method and handles the request.
protected void	<code>doOptions(HttpServletRequest req, HttpServletResponse resp)</code> Called by the server (via the <code>service</code> method) to allow a servlet to handle a OPTIONS request.
protected void	<code>doPost(HttpServletRequest req, HttpServletResponse resp)</code> Called by the server (via the <code>service</code> method) to allow a servlet to handle a POST request.
protected void	<code>doPut(HttpServletRequest req, HttpServletResponse resp)</code> Called by the server (via the <code>service</code> method) to allow a servlet to handle a PUT request.
protected void	<code>doTrace(HttpServletRequest req, HttpServletResponse resp)</code> Called by the server (via the <code>service</code> method) to allow a servlet to handle a TRACE request.
protected long	<code>getLastModified(HttpServletRequest req)</code> Returns the time the <code>HttpServletRequest</code> object was last modified, in milliseconds since midnight January 1, 1970 GMT.
protected void	<code>service(HttpServletRequest req, HttpServletResponse resp)</code> 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	<code>service(ServletRequest req, ServletResponse res)</code> 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 {
        //. . .
    }
}
```



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Java Servlets

. . . ./account?tx=10

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



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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>
```



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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();
    ...
}
```



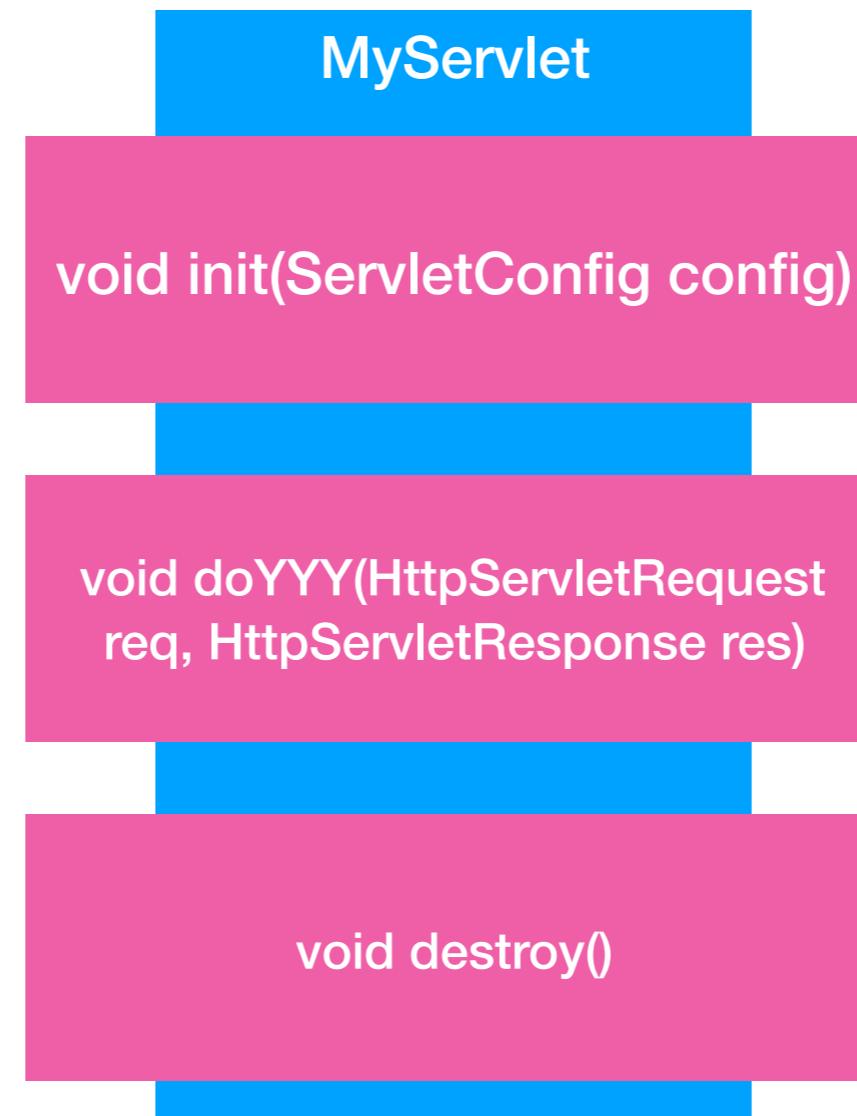
Servlet using web.xml

```
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"
```

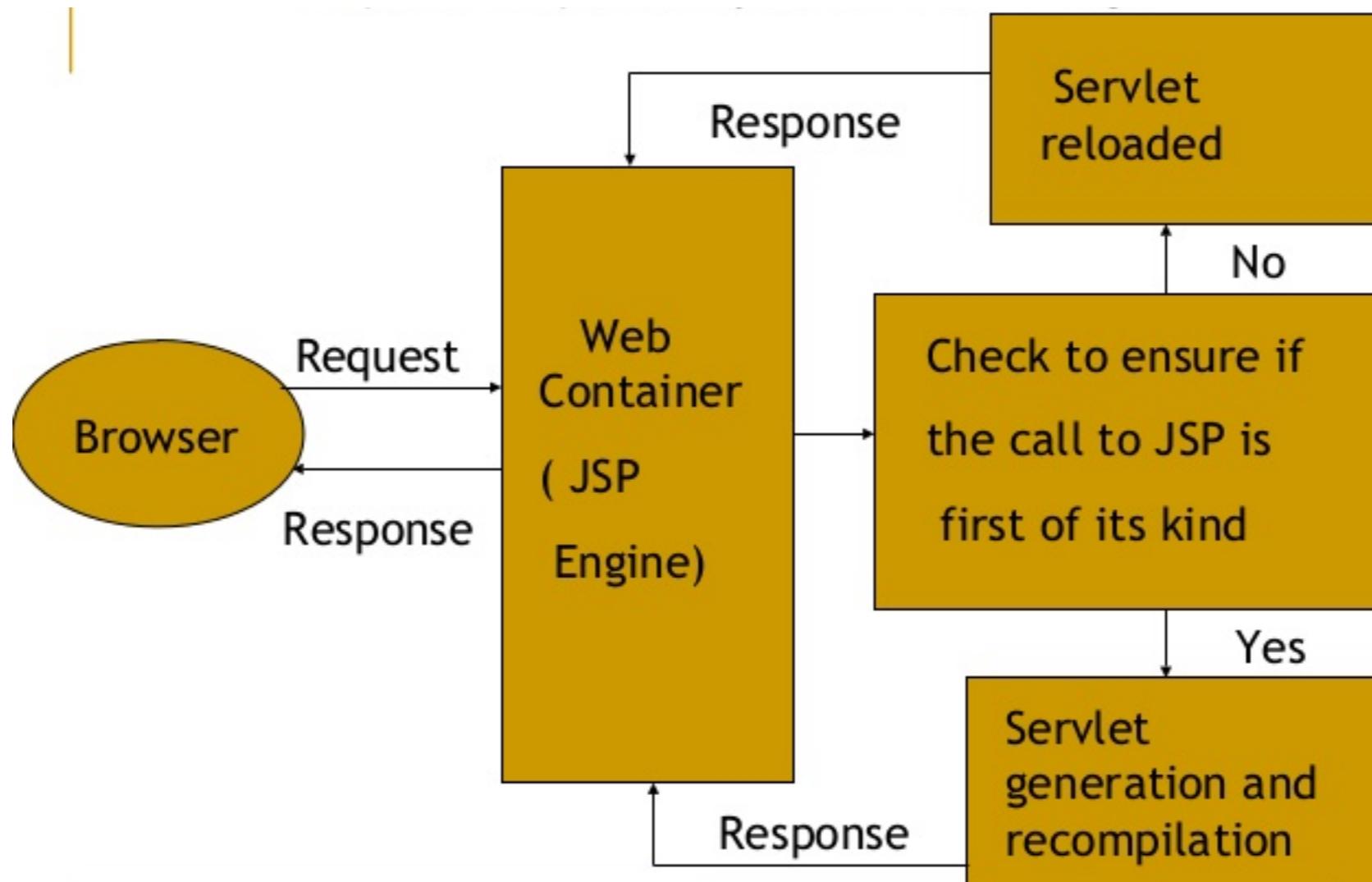
```
TemplateServlet x
/Library/Java/JavaVirtualMachines/jdk1.8.0_201.jdk/Contents/Home/bin/java
https%3A%2F%2Fbacktory.com%2F
https://backtory.com/
```

Process finished with exit code 0

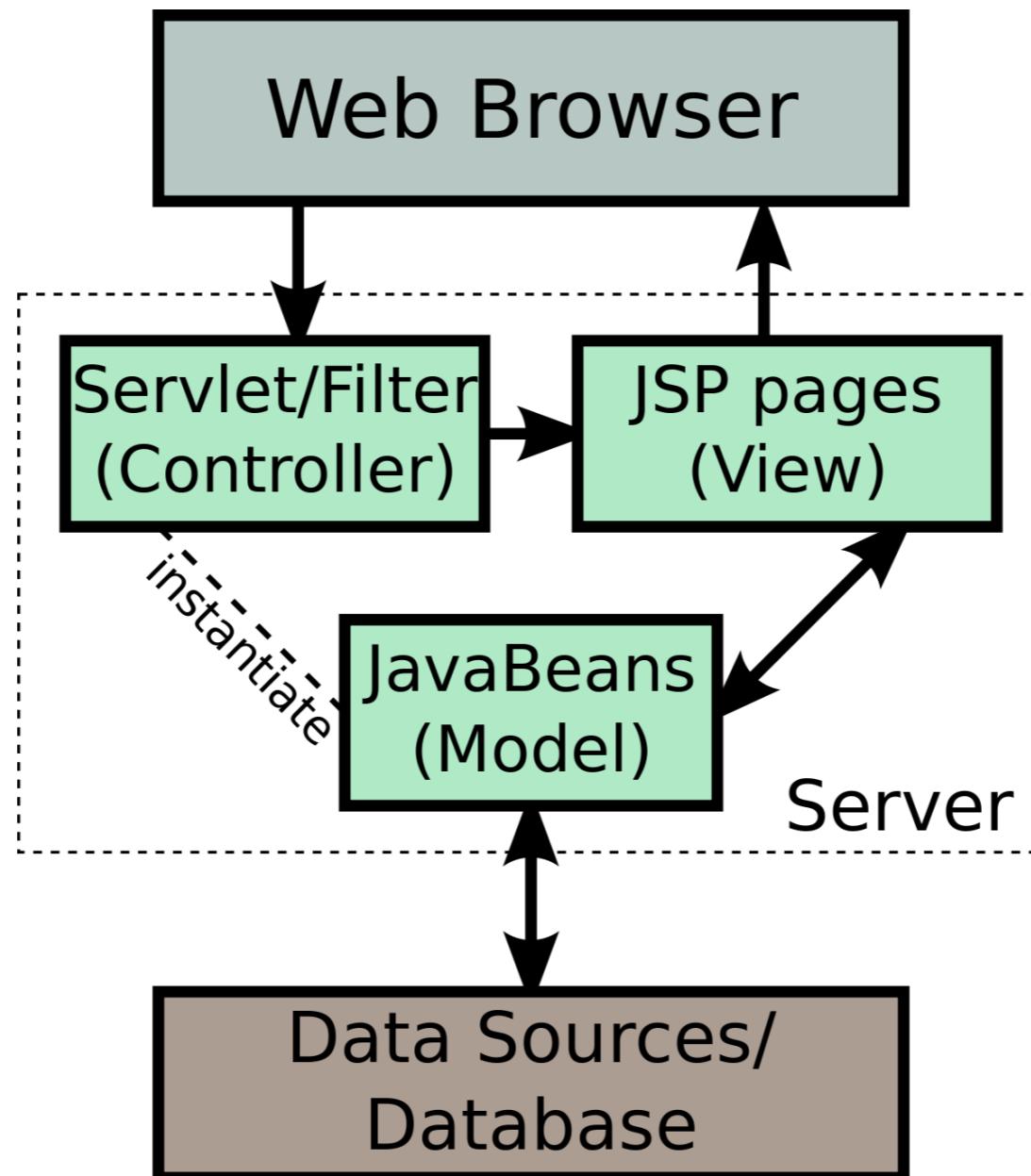




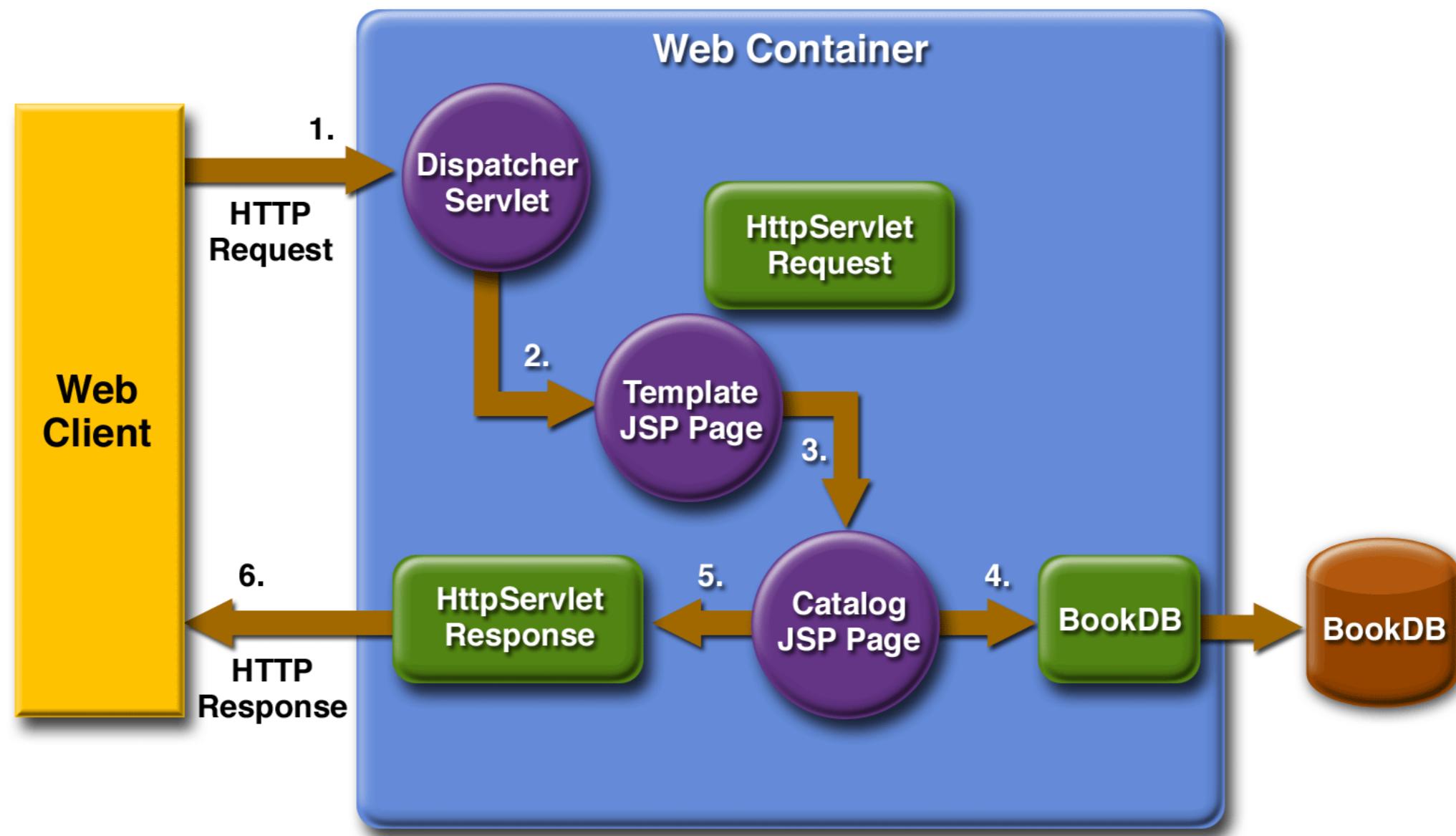
Request-Response Cycle for a JSP Page



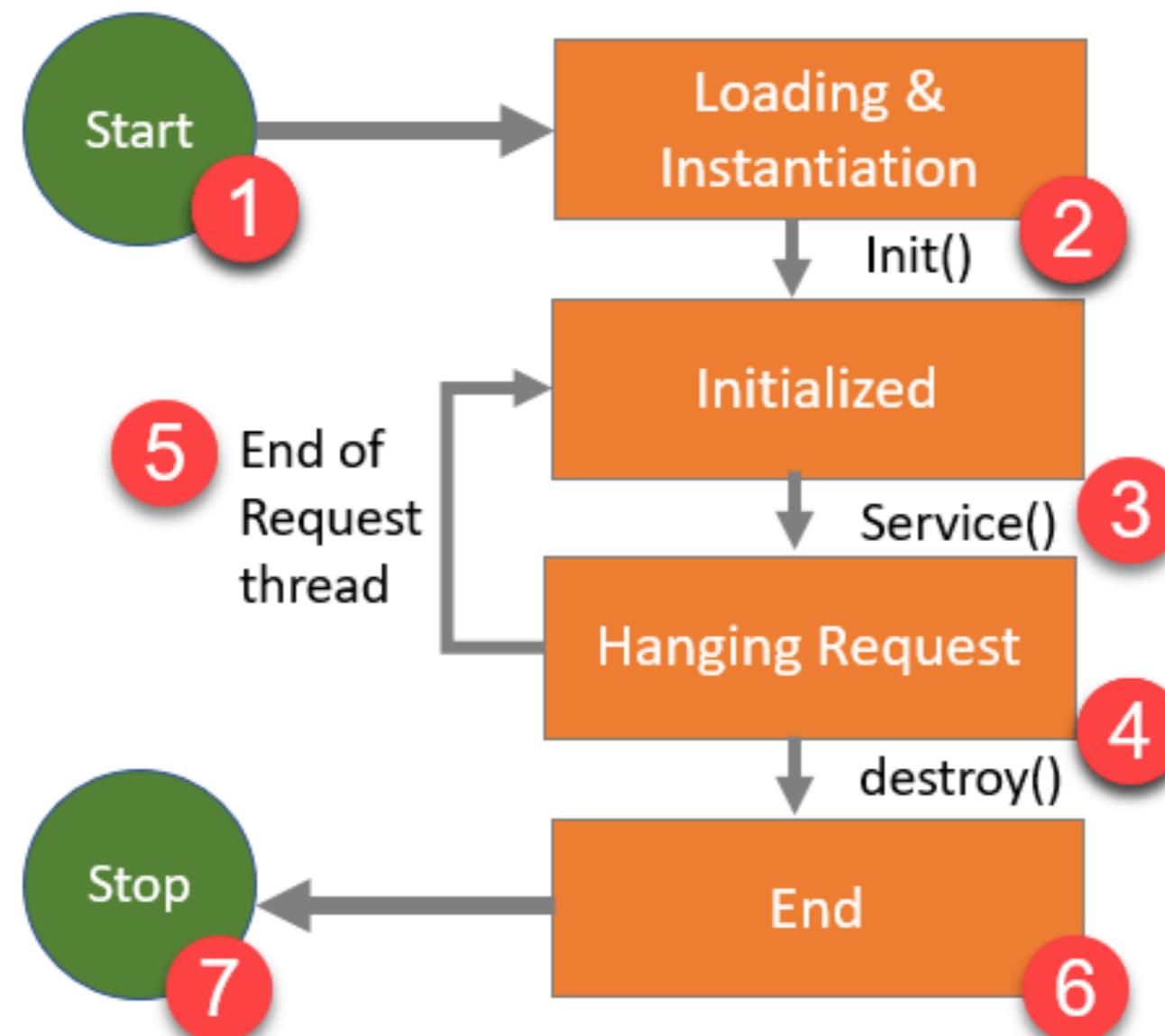
Request-Response Cycle for a JSP Page



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>
```



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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>
```



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