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Introduction To Servlet JSP

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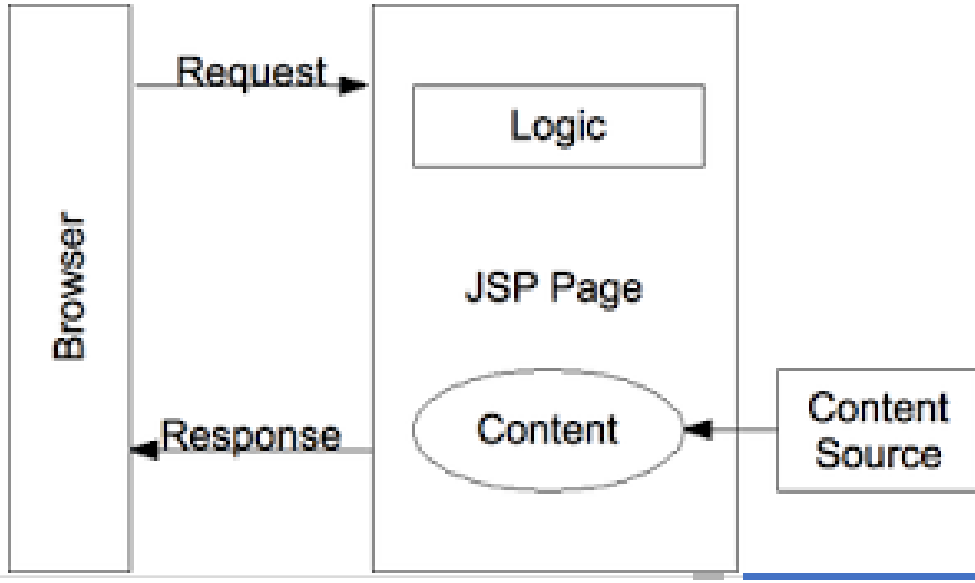
Introduction to Servlet JSP

- The static and dynamic web page design
- The Model-I and Model-II architecture
- Introduction to Servlet
- Servlet API
- Servlet-JSP Life Cycle
- Servlet Context and Servlet Config
- Context and Config Parameters
- Request and Response Objects
- Query String and Form Data Parameters

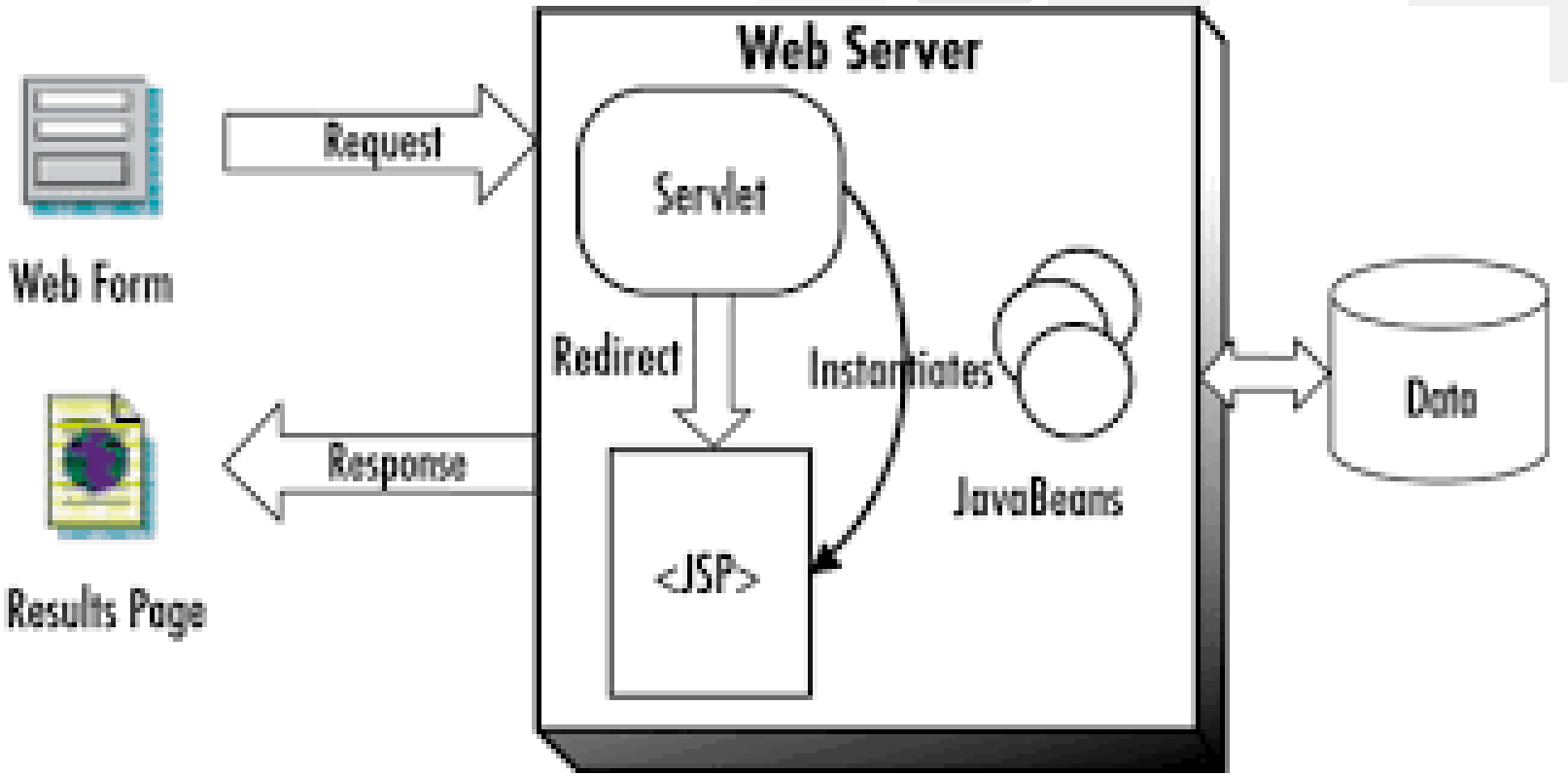
JEE for Dynamic Web Page Design

- Highly Scalable and Platform Independent
- Write Once and Deploy Anywhere (WODA)
- Many choices of intermediators like Servers (Web and Application Servers)
- Java Web Components
  - Java Servlets : Basically for Java Web Developer
  - Java Server Pages (JSPs) : Basically for Web Page Designer. Extensible way to generate web pages dynamically at the server side.
- Model 1 Architecture



Model 2 Architecture

- The servlet works as a bridge between core layer and presentation layer.
- JSP works as a major component in Presentation Layer.



Servlet and its Advantages

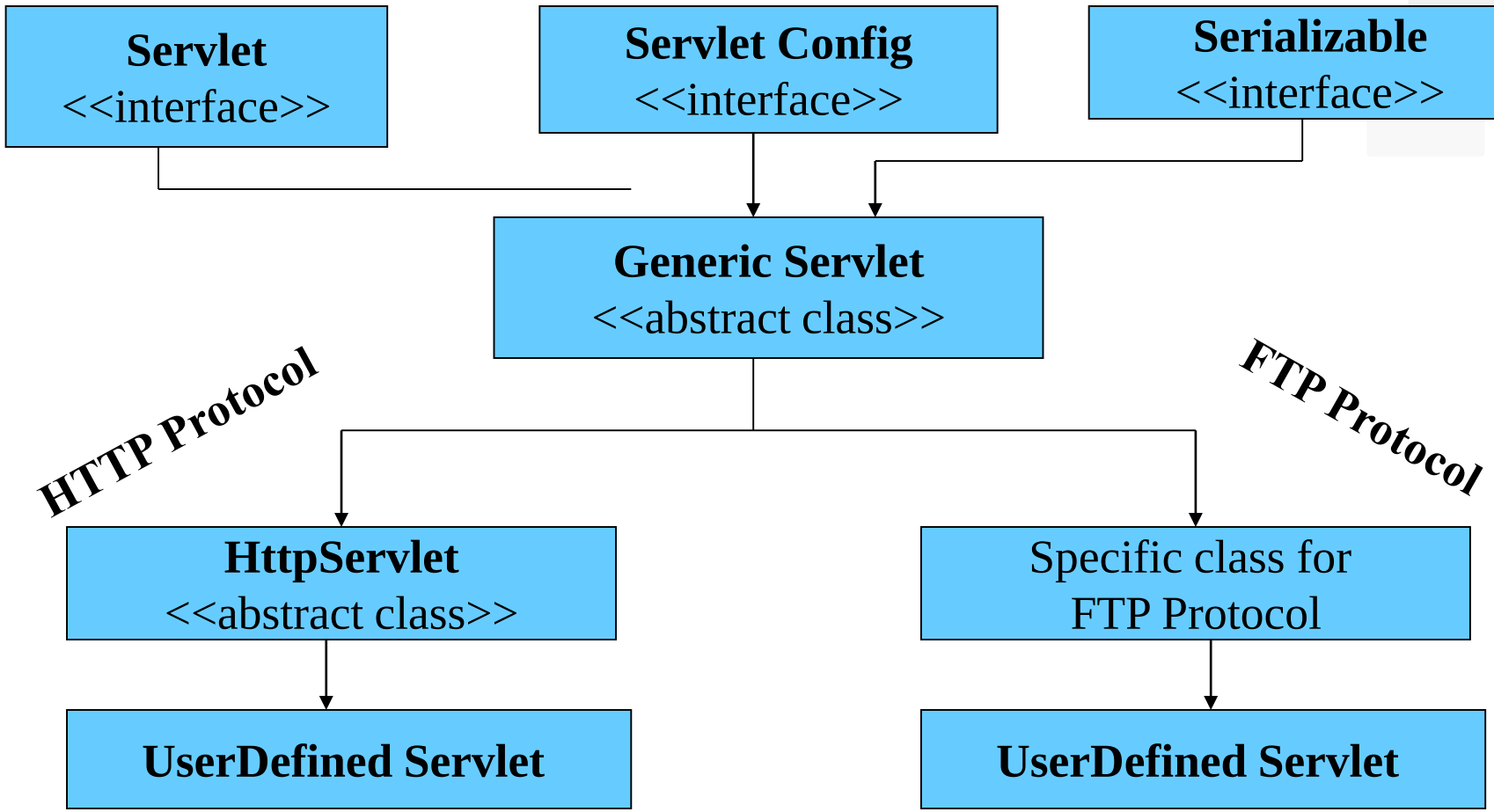
- Its for Java Developers
- The HTML code embedded in Java code.
- Inherits Platform Independency from Java
- Write Once and Deploy Anywhere.
- Extensible and Protocol Independent
- Multi-threaded and thus highly scalable
- Inherits Security features from Java
- Added with JEE Security features

Demo- I

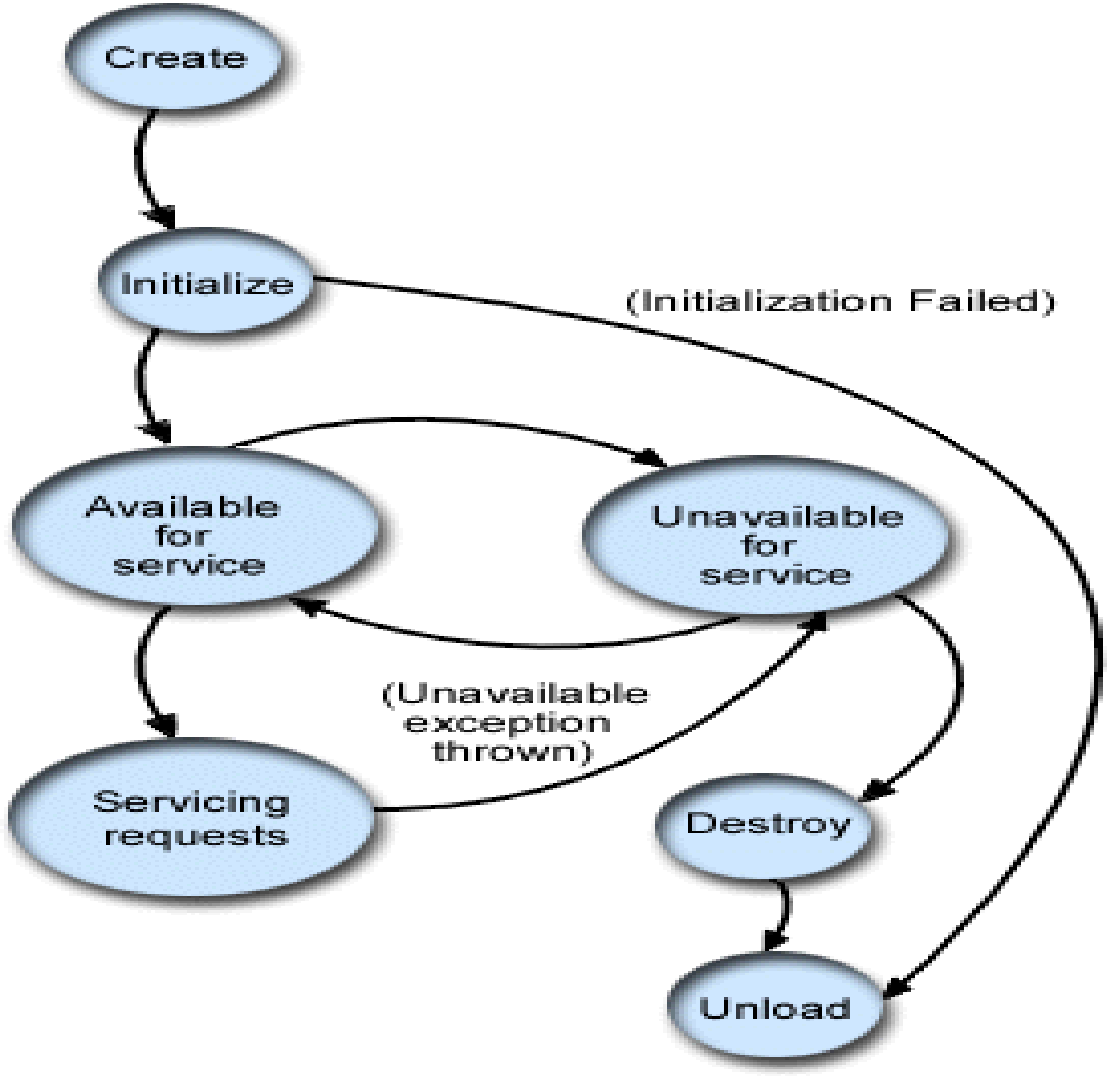
Create development environment and servlet-jsp (Proj: Demo010_Basics010)

1. Configure JDK 1.8 in Eclipse
2. Configure Tomcat 8/9 in Eclipse
3. Start and check running of the Tomcat
4. Create a Dynamic Web Project
5. Configure Web Project for Tomcat
6. Create a Servlet
7. Execute the servlet.
8. Design a servlet for creating a web page.
9. Create a JSP
10. Test its working.
11. Create JSP
12. Write a code to design the page
13. Observe, web.xml is optional in new version.

Servlet Hierarchy



Servlet-JSP Life Cycle



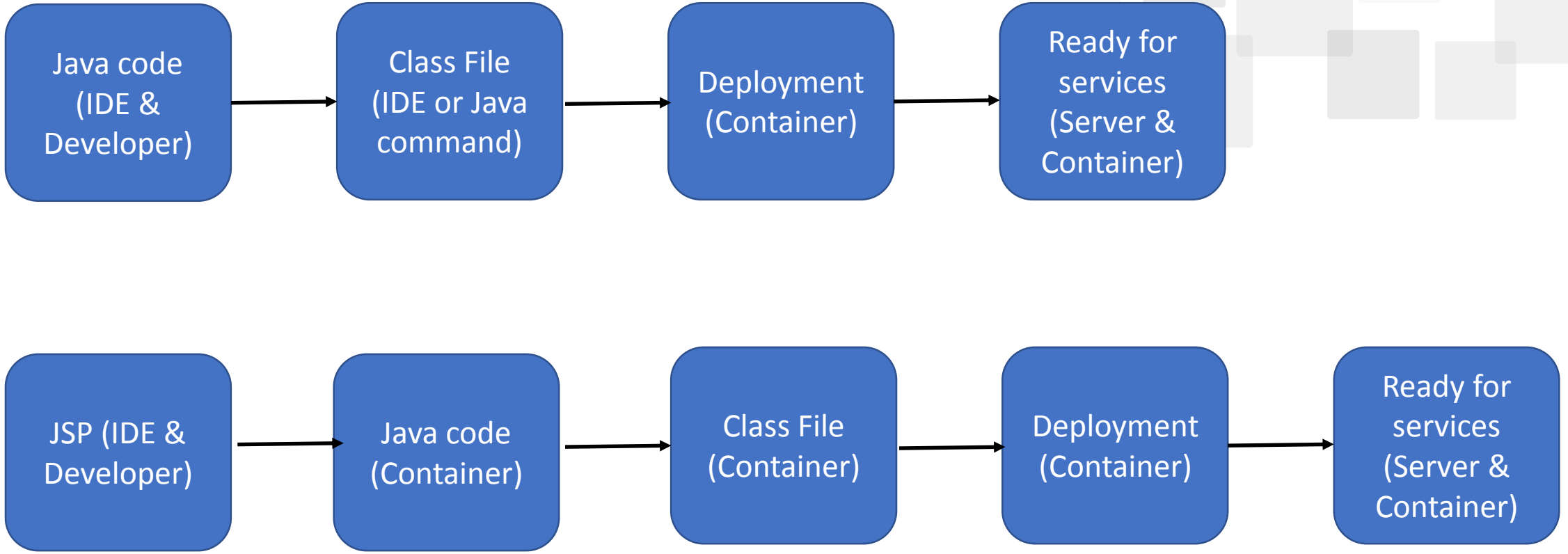
Life cycle methods

init(ServletConfig): Automatically called once at the time of deployment of a servlet after server creates an instance.

service(): Automatically called on receipt of each request from client.

destroy(): Automatically called when servlet instance is being un-deployed or removed from container. Now server instance is free to get removed from Garbage Collector.

Servlet-JSP Deployment Life Cycle



Deployment directory structure

Context Root

jsps(Optional)

WEB-INF

classes *(Goes to classpath. For all .class files)*

lib *(For all jar files including driver)*

web.xml *(Optional in new version)*

others(Optional)

Demo- II

Understanding life cycle methods of Servlet(Proj: Demo020_LifeCycle010)

1. Understanding life cycle methods of Servlet
2. Creating a new servlet
3. Create a constructor and init()
4. Check constructor and init() method gets executed once
5. The doGet()/service() gets executed once for each refresh
6. The destroy() is executed at the time of un-deployment
7. Observe warm deployment
8. Assigning multiple urls to a servlet.
9. Eager and Lazy deployment of the servlet.

The ServletContext

- One per application
- Facilitates communication between server and the servlet
- Provides access to resources and facilities common to all servlets and JSPs in the application
- getServletContext( ) returns a reference to the ServletContext

The ServletConfig

- One per Servlet
- Used to store information specific to a particular servlet
- Carries servlet specific data, which is not accessible to any other servlet
- getServletConfig ( ) returns the reference to the ServletConfig

ServletContext methods

Accessing initial parameters and other server side information.

- getInitParameter( )
- getInitParameterNames( )
- getMajorVersion( )
- getMinorVersion( )
- getServerInfo( )

To access server side file resources.

- getMimeType( )
- getResourceAsStream( )
- getRequestDispatcher(String path)

Handling server side log

- log( )

ServletContext methods contd…

Accessing context workspace

- setAttribute( )
- getAttribute( )
- getAttributeNames( )
- removeAttribute( )

ServletConfig methods

Obtaining Config Parameters

- getInitParameter( )
- getInitParameterNames( )

Obtaining Context reference

- getServletContext( )

Obtaining Servlet Name

- getServletName( )

ServletConfig vs ServletContext

- **Accessibility :**
  - **ServletContext :** One per Application , Context parameters are available across servlets under same application.
  - **ServletConfig :** One per servlet. The config parameters are private to the servlet and cannot be accessed by any other servlet.
- **Getting the parameter values :**
  - **ServletContext sct = this.getServletContext();**

    String driverName = sct.getInitParameter("drv");
  - **ServletConfig sc = this.getServletConfig();**

    String passwd = sc.getInitParameter("pass");
- **Setting attributes :**
  - **ServletConfig has only Parameters.**
    - Cannot set the config parameters via methods hence, only getter methods are available.
  - **ServletContext has both Paramters and Attributes.**
    - Context Parameters can be set via the setter methods provided

Demo- III

Configuration in XML(Proj: Demo030_InitParams010)

1. *Configure a servlet in the XML*
2. *Configure Welcome file*
3. *Configure Load On Startup*
4. *Configure multiple urls for the servlet*
5. *Configure Context Parameters in XML*
6. *Configure Config Parameters in XML*
7. *Observe these parameters are accessible to ThirdServlet*
8. *Observe the config parameter is not accessble to ForthServlet*
9. *Configure config parameters in Forth Servlet*
10. *Observe how it is accessible to Forth Servlet.*

Typical Http Request

For GET method :

GET /requestheadersdemo?**name=abc&surname=xyz** http/1.1

Host : http://localhost:8081/Myservlets/collectparameters

User-Agent: Mozilla/4.0

Accept :*/*

Accept Encoding : gzip,deflate

For POST method :

POST /requestheadersdemo http/1.1

Host : http://localhost:8081/Myservlets/collectparameters

User-Agent: Mozilla/4.0

Accept :*/*

Accept Encoding : gzip,deflate

name=abc&surname=xyz

The Request Object

The ServletRequest methods :

- String Request.getParameter(String)
- String [ ] request.getParameterValues(String)
- Enumeration.request.getParameterNames()
- BufferedReader request.getReader()
- ServletInputStream request.getInputStream()

The HttpServletRequest methods :

- String getHeader (String)
- Emnumeration getHeaderNames( )
- String getMethod( )

Demo- IV

Query String and Form Data Parameters(Proj: Demo040_Params010)

1. Defining a jsp as Welcome Page
2. Using hyper link and form tags on JSP
3. Using form action and other HTML components
4. Accessing Query String and Form Data within a Servlet using getParameter()
5. Accessing Query String and Form Data within a Servlet using getParameterValues()
6. Differentiate GET and POST methods.

The Response Object

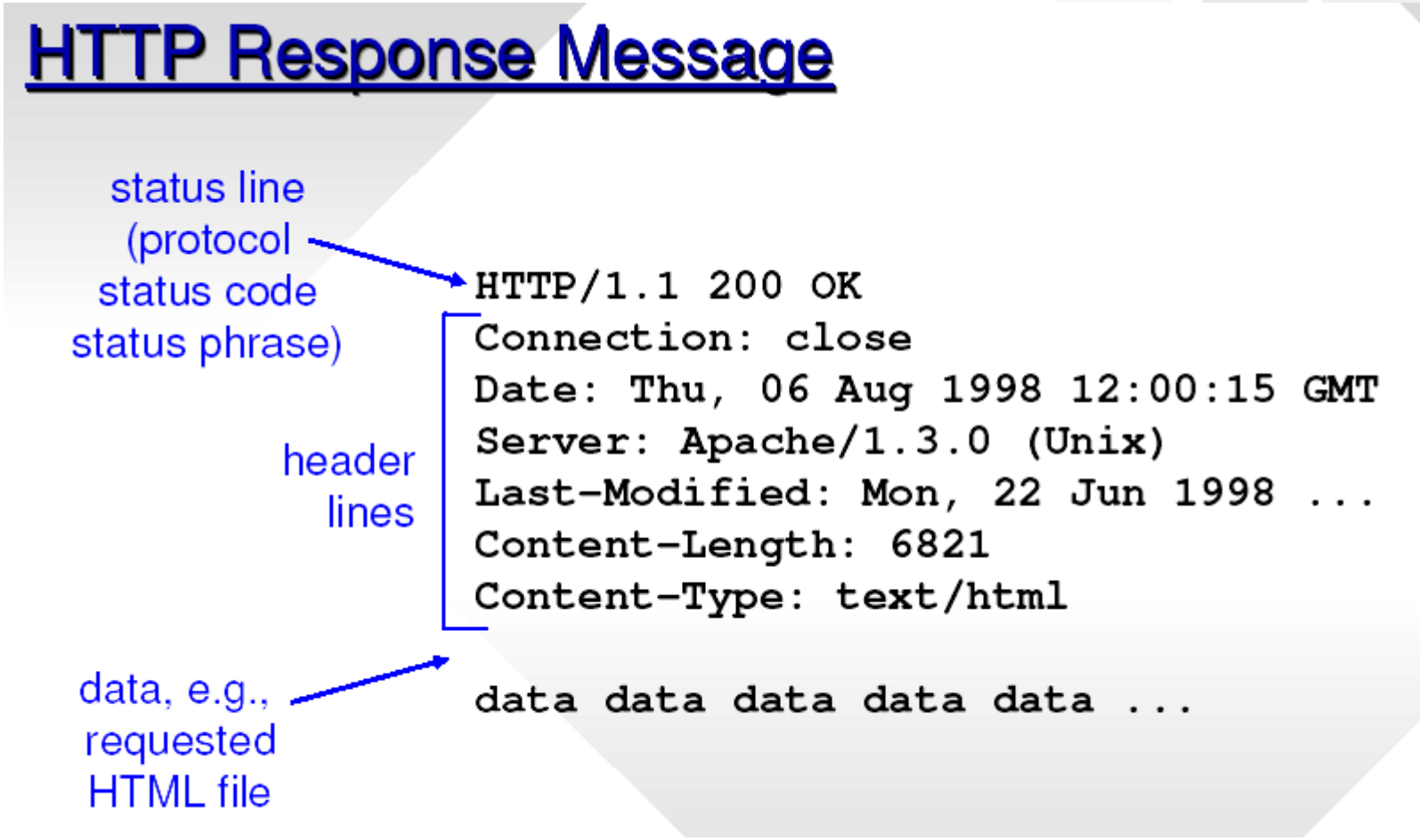
The Servlet Response methods :

- PrintWriter getWriter( )
- void setContentType(String type)
- void setBufferSize(int size)
- ServletOutputStream getOutputStream( )

The HttpServletResponse methods :

- void addHeader(String name, String value)
- void setHeader(String name, String value)
- void setStatus(int code)

Typical HttpResponse



Setting Response Header

Overview :

- HTTP Response Header
- Setting MIME types
- Status Code, Refreshing, Sending Error Page, Logging in
- Setting Encoding Type

Various Response Headers

- Allow
- Cache-Control
- Connection
- Content-Encoding
- Content-Language
- Content-Length
- Content-Type
- Refresh

Setting MIME type

Method to set MIME type :

setContentType(Mime type)

List of all mime types :

- text/plain : Plain text
- text/html : HTML document
- text/xml : XML document
- audio/basic : Sound file in .snd format
- image/gif : GIF image
- image/jpeg : JPEG image
- application/msword : Micrsoft Word Document
- application/pdf : Acrobat (.pdf) file .
- application/x-java-archive : JAR file
- video/mpeg : MPEG video clip

Demo V

- Explore Request and Response Headers

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Q & A

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Thank You