ICON OF JAVA

ADV. JAVA
Servlets

10.Filters

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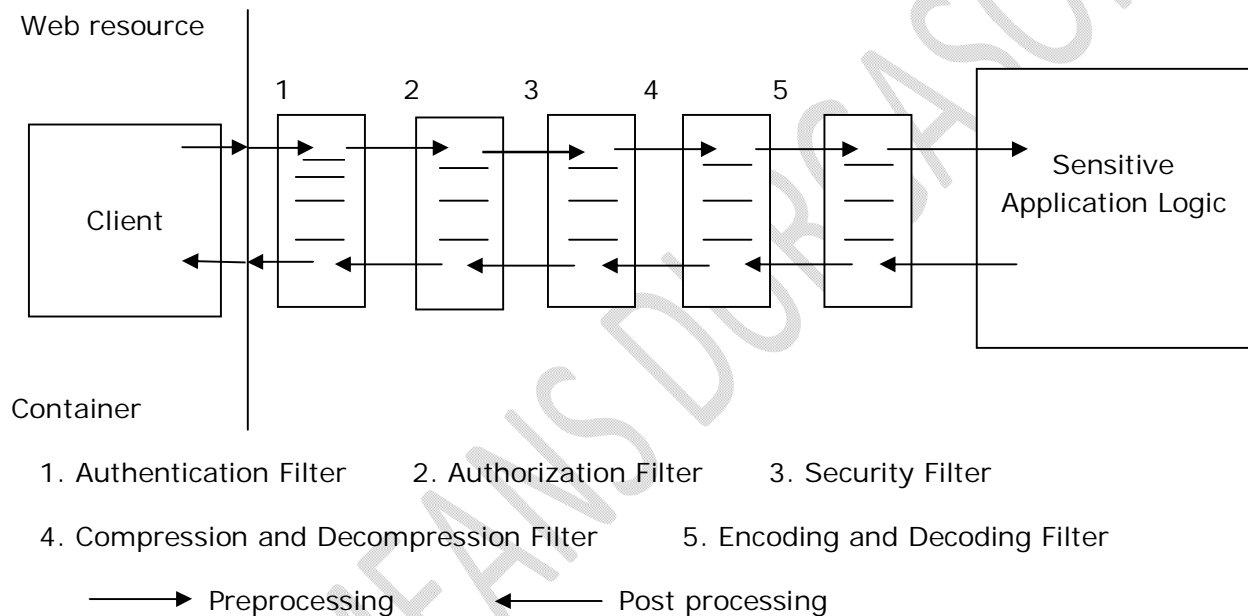**India's No.1 Software Training Institute**

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Filters

In general in web application development, we will provide the complete application logic in the form of the web resources like servlets, jsps and so on.

As part of the web application development some web resources may require the services like Authentication, Authorization, Security, Data compression and decompression and so on as preprocessing and post processing.

In the above context, to implement all the above preprocessing and post processing services Servlet API has provided a separate component called **Filter.**

1. Authentication Filter   2. Authorization Filter   3. Security Filter

4. Compression and Decompression Filter   5. Encoding and Decoding Filter

⟶ Preprocessing   ⟵ Post processing

From the above representation when we send a request from client to server for a particular web resource then container will pick up that request, container will check whether any Filter is associated with the respective web resource, if container identify any Filter or Filters then container will execute that Filters first.

While executing a Filter if the present request is satisfied all the Filter constraints then only container will bypass that request to next Filter or next web resource.

If the present request is not satisfied the Filter constraints then container will generate the respective response to client.

Filter is a server side component, it will be executed by the container automatically when it receives request from client for a particular web resource.

If we want to use Filters in our web applications, we have to use the following steps.

Step 1: Prepare Filter class.

Step 2: Configure Filter class in web.xml file.

Step 1: Prepare Filter class:

Filter is an object available at server machine, it must implement Filter interface either directly or indirectly.

public interface Filter {

public void init(FilterConfig config)throws ServletException;

public void doFilter(ServletRequest req, ServletResponse res, FilterChain fc)throws SE, IOE

   public void destroy(); }

 public class MyFilter implements Filter { -----}

   Where init(_) method can be used to perform Filter Initialization.
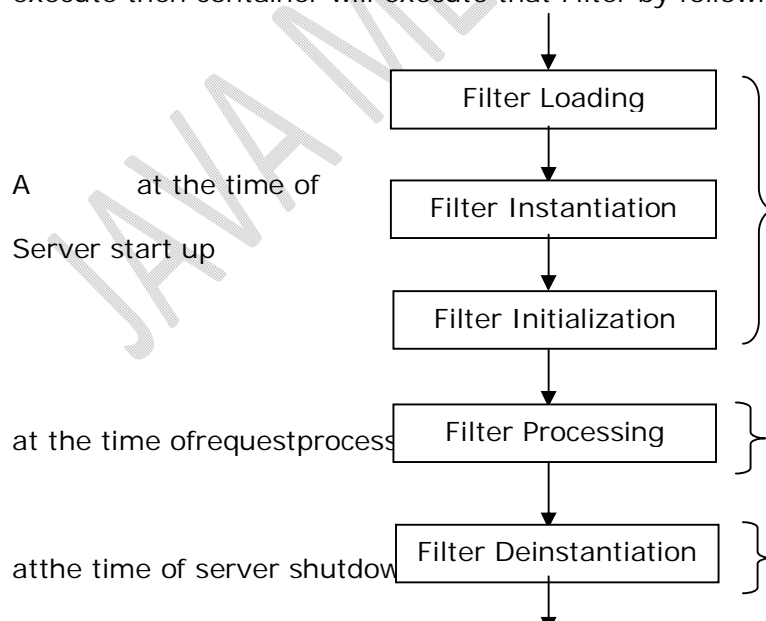
   Where doFilter(_,_,_) method is same as service(_,_) method in servlets it is able to accommodate actual Filter logic.

   Where destroy() method can be used to perform Filter Deinstantiation.

   While executing a particular Filter in web applications, if we satisfy all the Filter constraints then we need to bypass the request from present Filter to the next Filter web resource, for this we need to use the following method from FilterChain.

public void doFilter(ServletRequest req, ServletResponse res)throws SE, IOE

   While executing a particular web application, when container identify a particular Filter to execute then container will execute that Filter by following the following Filter life cycle.

A   at the time of

Server start up

```
          ┌─────────────────────┐  ⎫
          │   Filter Loading    │  ⎪
          └─────────────────────┘  ⎪
                    │              ⎬
          ┌─────────────────────┐  ⎪
          │ Filter Instantiation│  ⎪
          └─────────────────────┘  ⎭
                    │
          ┌─────────────────────┐
          │ Filter Initialization│
          └─────────────────────┘
```

at the time ofrequestprocess

```
          ┌─────────────────────┐  ⎫
          │  Filter Processing  │  ⎬
          └─────────────────────┘  ⎭
```

atthe time of server shutdow

```
          ┌──────────────────────┐  ⎫
          │Filter Deinstantiation│  ⎬
          └──────────────────────┘  ⎭
```

(X)

In web applications, by default all the Filters are auto-loaded, auto-instantiated, auto-initialized at the time of server start up. So that Filters should not require load-on-startup configuration in web.xml file.

Step 2: Filter class Configuration:

To configure a Filter in web.xml file we have to use the following xml tags.

<web-app>

<filter>

<filter-name>logical_name</filter-name>

<filter-class>Fully Qualified name of Filter</filter-class>

</filter>

<filter-mapping>

<filter-name>logical_name</filter-name>

<url-pattern>pattern_name</url-pattern>

                or

<servlet-name>logical name of servlet</servlet-name>

</filter-mapping>

</web-app>

If we want to provide mapping between a Filter and Servlet then we have to provide the same url-pattern for both Filter and Servlet or provide the respective servlet logical name along with <servlet-name> tag in place of <url-pattern> tag under <filter-mapping>.

In web applications, it is possible to use a single Filter for multiple number of web resources.

To achieve this we have to use " **/*** " (Directory match) as url-pattern to the respective Filter.

In web applications, it is possible to provide multiple number of Filters for a single web resource, in this case container will execute all the Filters as per the order in which we provided <filter-mapping> tags in web.xml file.

filterapp:-

studentform.html:-

```html
<html><body bgcolor="lightgreen">
<center><br><br>
        <form method="get" action="./filter">
        <table bgcolor="pink" border="2">
        <tr>
                <td>Student Name</td>
                <td><input type="text" name="sname"/></td>
        </tr>
        <tr>
                <td>Student Age</td>
                <td><input type="text" name="sage"/></td>
        </tr>
        <tr>
                <td>Student Address</td>
                <td><input type="text" name="saddr"/></td>
        </tr>
        <tr>
                <td><input type="submit" value=""/></td>
                <td><input type="submit" value="SUBMIT"/></td>
        </tr>
        </table></form></center>
</body></html>
```

web.xml:-

```xml
<web-app>
<display-name>filterapp</display-name>
<welcome-file-list>
<welcome-file>studentform.html</welcome-file>
</welcome-file-list>
<servlet>
<servlet-name>MyServlet</servlet-name>
<servlet-class>MyServlet</servlet-class>
</servlet>
<servlet-mapping>
<servlet-name>MyServlet</servlet-name>
<url-pattern>/filter</url-pattern>
</servlet-mapping>
<filter>
<filter-name>MyFilter</filter-name>
<filter-class>MyFilter</filter-class>
</filter>
<filter-mapping>
<filter-name>MyFilter</filter-name>
<url-pattern>/filter</url-pattern>
```

```
</filter-mapping>
</web-app>


MyFilter.java:-

import java.io.IOException;
import java.io.PrintWriter;

import javax.servlet.Filter;
import javax.servlet.FilterChain;
import javax.servlet.FilterConfig;
import javax.servlet.ServletException;
import javax.servlet.ServletRequest;
import javax.servlet.ServletResponse;

public class MyFilter implements Filter {

    public MyFilter() {

    }

        public void destroy() {

        }

        public void doFilter(ServletRequest request, ServletResponse response, FilterChain
chain) throws IOException, ServletException {
                PrintWriter out=response.getWriter();
                out.println("<body bgcolor='yellow'>");
                out.println("<center><b><br><br>");
                int age=Integer.parseInt(request.getParameter("sage"));
                if(age<18)
                {
                        out.println("U R not allowed for this Fashion Show");
                        out.println("<br><br>");
                        out.println("Bcoz, U R minor");
                        out.println("<br><br>");
                        out.println("Try after few years");
                        out.println("<br><br>");
                        out.println("<a href='/filterapp/studentform.html'>New Student
Form</a>");

                }
                else{
                        chain.doFilter(request, response);
                }
        }

        public void init(FilterConfig fConfig) throws ServletException {

        }
```

```
}




MyServlet.java:-

import java.io.IOException;
import java.io.PrintWriter;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

        protected void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {

                PrintWriter out=response.getWriter();
                String sname=request.getParameter("sname");
                int sage=Integer.parseInt(request.getParameter("sage"));
                String saddr=request.getParameter("saddr");
                out.println("<br><br>");
                out.println("Hello Student….. Ur details are….");
                out.println("<br><br>");
                out.println("Name….."+sname);
                out.println("<br><br>");
                out.println("Name….."+sage);
                out.println("<br><br>");
                out.println("Name….."+saddr);
                out.println("<br><br>");
                out.println("Enjoy the Fashion show");
        }

}
```

ValidationsApp

Registrationform.html

```html
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Strict//EN"
"http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<font color="red">
<h2>Durga Software Solutions</h2>
<h3>Employee Registration Form</h3>
```

```
</font>
<form method="post" action="./reg">
<table>
<tr>
       <td>Employee Id</td>
       <td><input type="text" name="eid"/></td>
</tr>
<tr>
       <td>Employee Name</td>
       <td><input type="text" name="ename"/></td>
</tr>
<tr>
       <td>Employee Age</td>
       <td><input type="text" name="eage"/></td>
</tr>
<tr>
       <td>Employee Email</td>
       <td><input type="text" name="eemail"/></td>
</tr>
<tr>
       <td>Employee Mobile</td>
       <td><input type="text" name="emobile"/></td>
</tr>
<tr>
       <td><input type="submit" value="Registration"/></td>
</tr>
</table>
</form>
</body>
</html>
```

Web.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd" id="WebApp_ID" version="2.5">
<display-name>filtersapp</display-name>
<welcome-file-list>
<welcome-file>registrationform.html</welcome-file>
</welcome-file-list>
<servlet>
<description></description>
<display-name>RegistrationServlet</display-name>
<servlet-name>RegistrationServlet</servlet-name>
<servlet-class>com.durgasoft.RegistrationServlet</servlet-class>
</servlet>
<servlet-mapping>
<servlet-name>RegistrationServlet</servlet-name>
<url-pattern>/reg</url-pattern>
</servlet-mapping>
<filter>
```

```
<display-name>RegistrationFilter</display-name>
<filter-name>RegistrationFilter</filter-name>
<filter-class>com.durgasoft.RegistrationFilter</filter-class>
</filter>
<filter-mapping>
<filter-name>RegistrationFilter</filter-name>
<url-pattern>/reg</url-pattern>
</filter-mapping>
</web-app>
```

RegistrationFilter.java

```java
package com.durgasoft;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.Filter;
import javax.servlet.FilterChain;
import javax.servlet.FilterConfig;
import javax.servlet.ServletException;
import javax.servlet.ServletRequest;
import javax.servlet.ServletResponse;
public class RegistrationFilter implements Filter {
String eid_err_msg="",
ename_err_msg="",
eage_err_msg="",
eemail_err_msg="",
emobile_err_msg="";
        boolean b=true;
        public void destroy() {
        }

        public void doFilter(ServletRequest request, ServletResponse response, FilterChain
chain) throws IOException, ServletException {
                try {
                        response.setContentType("text/html");
                        PrintWriter out=response.getWriter();
                        String eid=request.getParameter("eid");
                        String ename=request.getParameter("ename");
                        String eage=request.getParameter("eage");
                        String eemail=request.getParameter("eemail");
                        String emobile=request.getParameter("emobile");
                        if(eid == null || eid.equals("")){
                                eid_err_msg="Employee Id is Required";
                                b=false;
                        }else{
                                if(!eid.startsWith("DSS-")){
                                eid_err_msg="Employee Id Must be in DSS-ddd Format";
                                        b=false;
                                }else{
                                        b=true;
                                }
                        }
                        if(ename == null || ename.equals("")){
```

```
                    ename_err_msg="Employee Name is Required";
                    b=false;
            }else{
                    b=true;
            }
            if(eage == null || eage.equals("")){
                    eage_err_msg="Employee Age is Required.";
                    b=false;
            }else{
                    int age=Integer.parseInt(eage);
                    if(age<20 || age>30){
            eage_err_msg="Employee Age Must be in between 20 to 30 Years.";
                            b=false;
                    }else{
                            b=true;
                    }
            }
            if(eemail == null || eemail.equals("")){
                    eemail_err_msg="Employee Email is Required";
                    b=false;
            }else{
                    if(!eemail.endsWith("@durgasoft.com")){
                            eemail_err_msg="Employee Email is Invalid";
                            b=false;
                    }else{
                            b=true;
                    }
            }

            if(emobile == null || emobile.equals("")){
                    emobile_err_msg="Employee Mobile is Required";
                    b=false;
            }else{
                    if(!emobile.startsWith("91-")){
                            emobile_err_msg="Employee Mobile Num. is Invalid";
                            b=false;
                    }else{
                            b=true;
                    }
            }
            if(b==false){
            out.println("<html>");
            out.println("<body>");
            out.println("<font color='red'>");
            out.println("<h2>Durga Software Solutions</h2>");
            out.println("<h3>Employee Registration Form</h3>");
            out.println("</font>");
            out.println("<font color='blue' size='5'>");
            out.println(eid_err_msg+"<br>");
            out.println(ename_err_msg+"<br>");
            out.println(eage_err_msg+"<br>");
            out.println(eemail_err_msg+"<br>");
```

```
                    out.println(emobile_err_msg+"<br>");
                    out.println("</font>");
                    out.println("<form method='post' action='./reg'>");
                    out.println("<table>");
                    out.println("<tr><td>Employee Id</td><td><input type='text'
name='eid' value='"+eid+"'/></td><td>"+eid_err_msg+"</td></tr>");
                    out.println("<tr><td>Employee Name</td><td><input type='text'
name='ename' value='"+ename+"'/></td><td>"+ename_err_msg+"</td></tr>");
                    out.println("<tr><td>Employee Age</td><td><input type='text'
name='eage' value='"+eage+"'/></td><td>"+eage_err_msg+"</td></tr>");
                    out.println("<tr><td>Employee Email</td><td><input type='text'
name='eemail' value='"+eemail+"'/></td><td>"+eemail_err_msg+"</td></tr>");
                    out.println("<tr><td>Employee Mobile</td><td><input type='text'
name='emobile' value='"+emobile+"'/></td><td>"+emobile_err_msg+"</td></tr>");
                    out.println("<tr><td><input type='submit'
value='Registration'/></td></tr>");
                    out.println("</table></form></body></html>");
                    eid_err_msg="";
                    ename_err_msg="";
                    eage_err_msg="";
                    eemail_err_msg="";
                    emobile_err_msg="";
                    b=true;
                    }else{
                            chain.doFilter(request, response);
                    }
              } catch (Exception e) {
                    e.printStackTrace();
              }

       }
       public void init(FilterConfig fConfig) throws ServletException {
       }

}

RegistrationServlet.java

package com.durgasoft;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class RegistrationServlet extends HttpServlet {
       private static final long serialVersionUID = 1L;
       protected void doPost(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
              response.setContentType("text/html");
              PrintWriter out=response.getWriter();
              try {
                    String eid=request.getParameter("eid");
```

```
                    String ename=request.getParameter("ename");
                    int eage=Integer.parseInt(request.getParameter("eage"));
                    String eemail=request.getParameter("eemail");
                    String emobile=request.getParameter("emobile");
                    out.println("<html>");
                    out.println("<body>");
                    out.println("<font color='red'>");
                    out.println("<h2>Durga Software Solutions</h2>");
                    out.println("<h3>Employee Registration Details</h3>");
                    out.println("</font>");
                    out.println("<table border='1'>");
                    out.println("<tr><td>Employee Id</td><td>"+eid+"</td></tr>");
                    out.println("<tr><td>Employee
Name</td><td>"+ename+"</td></tr>");
                    out.println("<tr><td>Employee
Age</td><td>"+eage+"</td></tr>");
                    out.println("<tr><td>Employee
Email</td><td>"+eemail+"</td></tr>");
                    out.println("<tr><td>Employee
Mobile</td><td>"+emobile+"</td></tr>");
                    out.println("</table></body></html>");
              } catch (Exception e) {
                    e.printStackTrace();
              }
        }

}
```