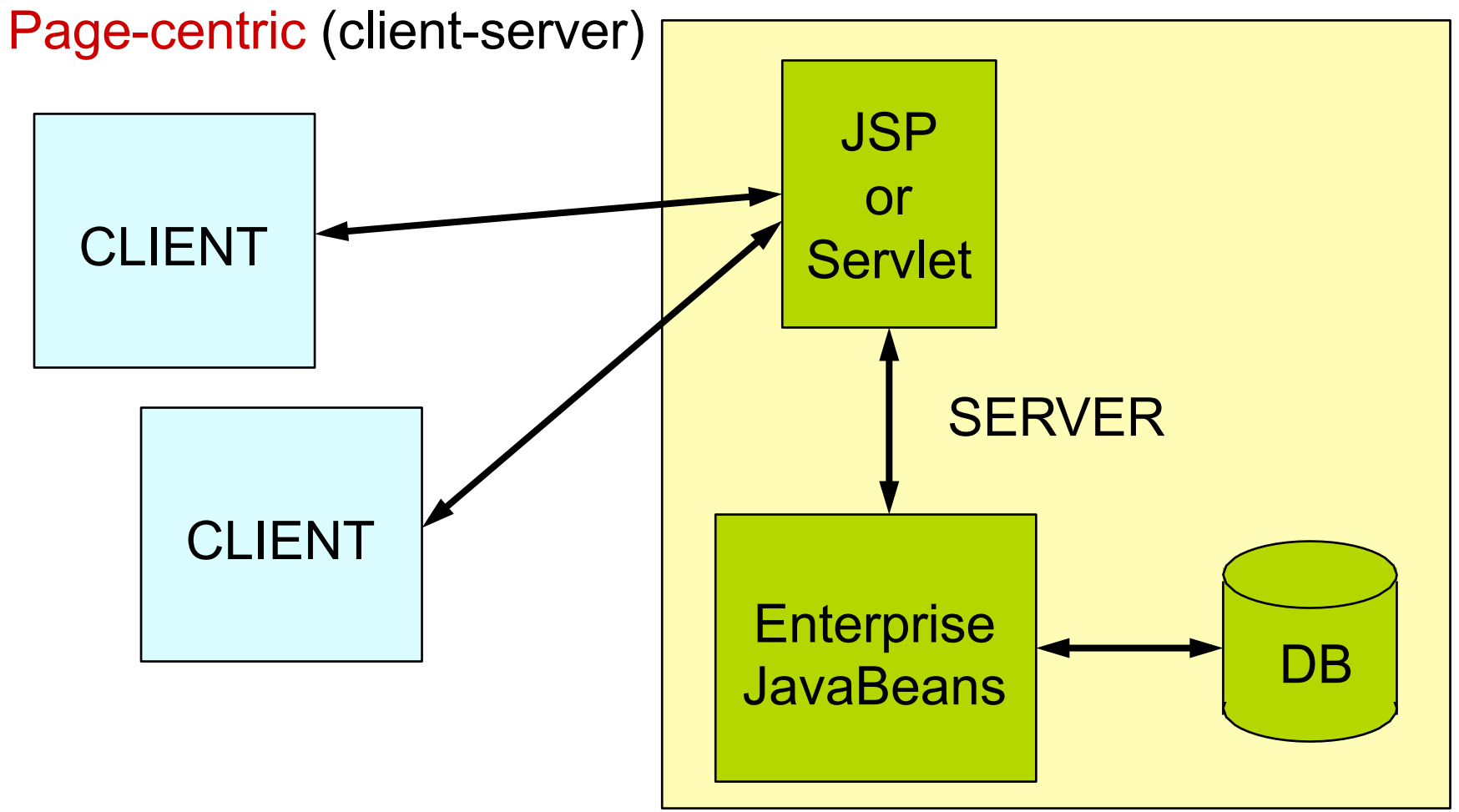
JSP

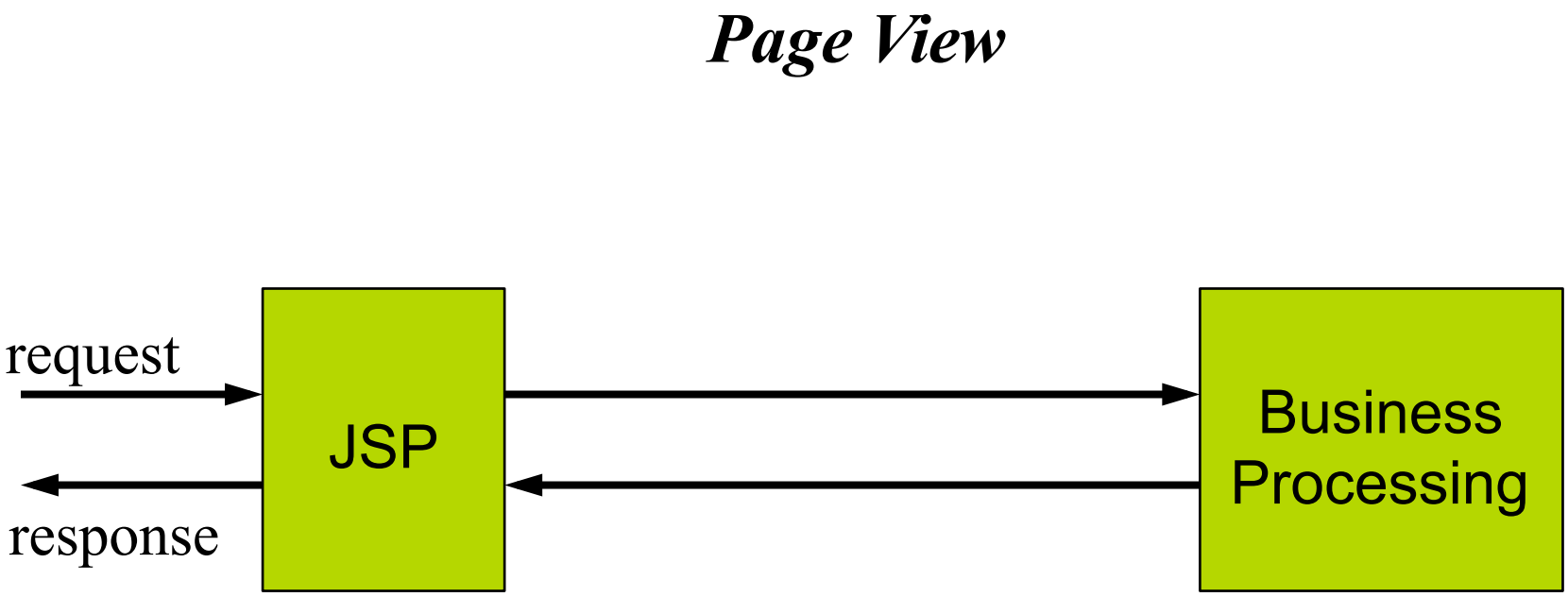
Common patterns

Common JSP patterns



Common JSP patterns

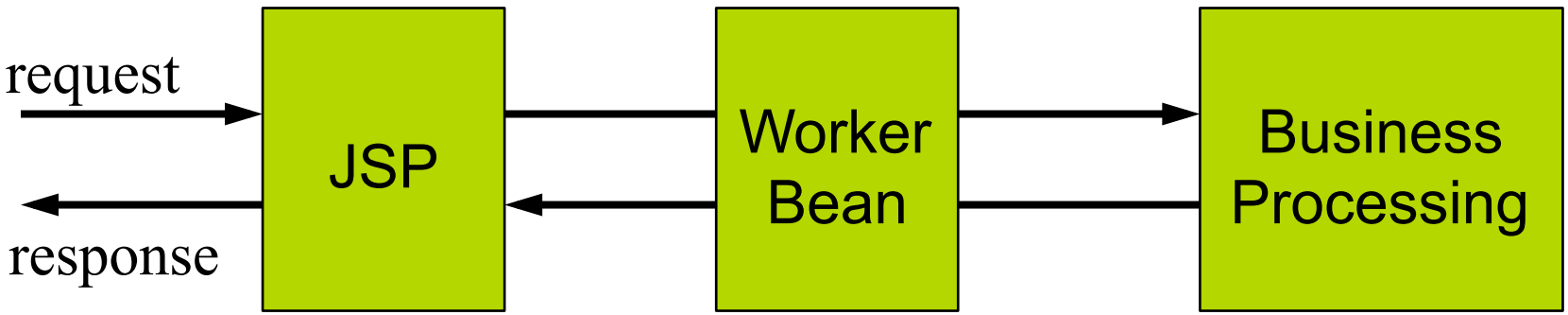
Page-centric 1 (client-server)



Common JSP patterns

Page-centric 2 (client-server)

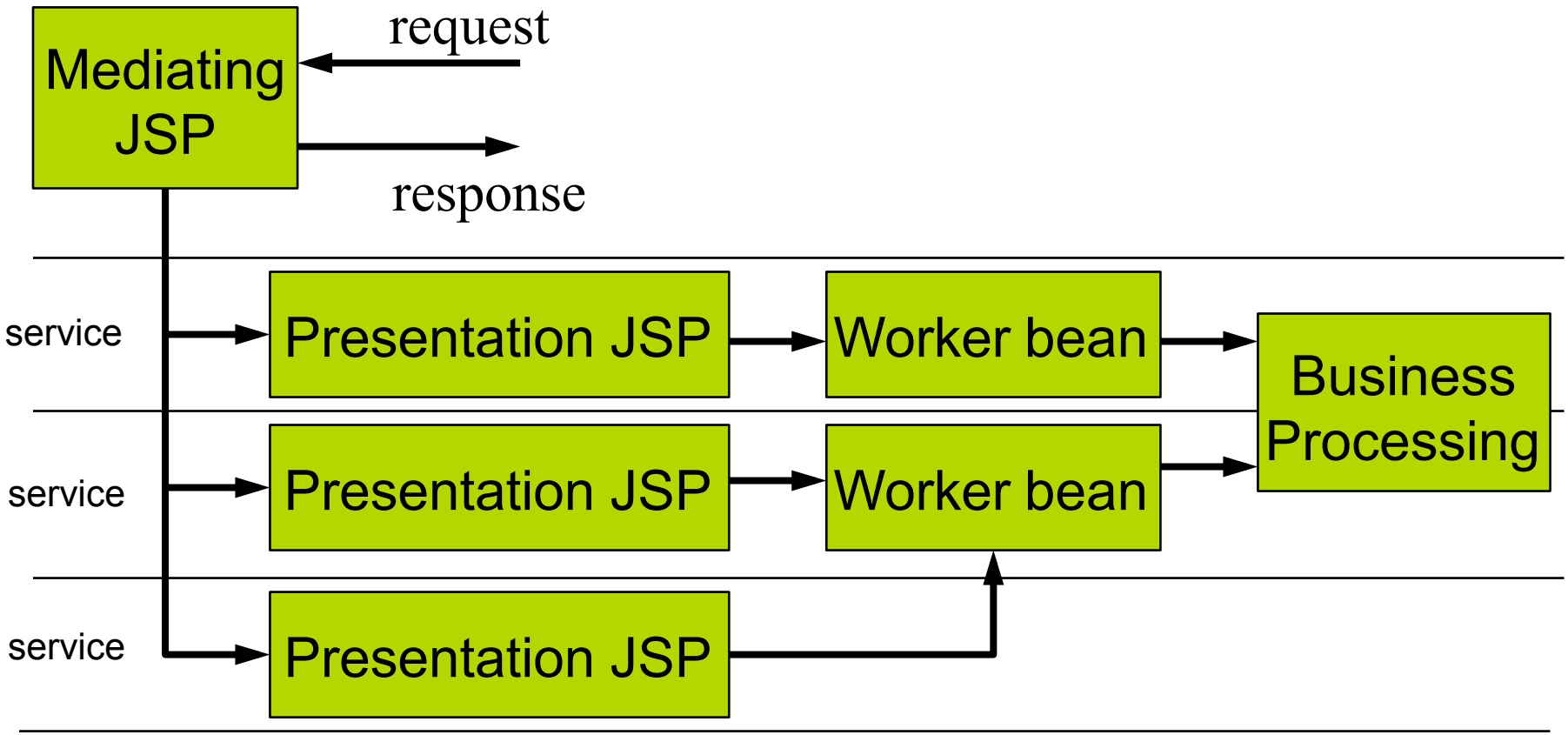
Page View with Bean



Common JSP patterns

Dispatcher (n-tier)

Mediator - View



SERVLETS:
Dispatching, monitoring, filtering

Dispatching

```
RequestDispatcher dispatch =
        cntx.getRequestDispatcher("/SecondServlet");
dispatch.forward(req,res);
```

```
RequestDispatcher dispatch =
        cntx.getRequestDispatcher("/SecondServlet");
dispatch.include(req,res);
```

Dispatching example

```
package servlets;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpServlet;
import javax.servlet.ServletConfig;
import javax.servlet.ServletContext;
import java.io.IOException;
import javax.servlet.ServletException;
import javax.servlet.ServletContext;
import javax.servlet.RequestDispatcher;

public class SecondServlet extends HttpServlet {
   public void doGet(HttpServletRequest req,HttpServletResponse res)
   throws IOException,ServletException
      {  Printer out=res.getWriter();
      System.out.println("Second Servlet Called");
   }
}
```

Dispatching example

```
package servlets;
    import javax.servlet.http.HttpServletRequest;
    import javax.servlet.http.HttpServletResponse;
    import javax.servlet.http.HttpServlet;
    import javax.servlet.ServletConfig;
    import javax.servlet.ServletContext;
    import java.io.IOException;
    import javax.servlet.ServletException;
    import javax.servlet.ServletContext;
    import javax.servlet.RequestDispatcher;

 public class FirstServlet extends HttpServlet  {
   public void doGet(HttpServletRequest req,HttpServletResponse res)
   throws IOException,ServletException {
     Printer out=res.getWriter();
     out.println("First Servlet Called");
     ServletConfig config = getServletConfig();
     ServletContext cntx = config.getServletContext();
     RequestDispatcher dispatch =
          cntx.getRequestDispatcher("/SecondServlet");
     dispatch.forward(req,res);
   }
}
```

Dispatching example

```
<servlet>
<servlet-name>FirstServlet</servlet-name>
<servlet-class>servlets.FirstServlet</servlet-class>
</servlet>

<servlet>
<servlet-name>SecondServlet</servlet-name>
<servlet-class>servlets.SecondServlet</servlet-class>
</servlet>

<servlet-mapping>
<servlet-name>FirstServlet</servlet-name>
<url-pattern>/firstservlet/*</url-pattern>
</servlet-mapping>

<servlet-mapping>
<servlet-name>SecondServlet</servlet-name>
<url-pattern>/SecondServlet/*</url-pattern>
</servlet-mapping>
```

Monitoring Servlets Lifecycle

Web context	Initialization and Destruction	ServletContextListener	ServletContextEvent
	Attribute added, removed, or replaced	ServletContextAttributeListener	ServletContextAttributeEvent
Session	Creation, invalidation, activation, passivation, and timeout	HttpSessionListenerHttpSessionActivationListener	HttpSessionEvent
	Attribute added, removed, or replaced	HttpSessionAttributeListener	HttpSessionBindingEvent
Request	A servlet request has started being processed by Web components	ServletRequestListener	ServletRequestEvent
	Attribute added, removed, or replaced	ServletRequestAttributeListener	ServletRequestAttributeEvent

Monitoring Servlets Lifecycle - Example

```
/* File : ApplicationWatch.java */
import javax.servlet.ServletContextListener;
import javax.servlet.ServletContextEvent;
public class ApplicationWatch implements ServletContextListener
{  public static long applicationInitialized = 0L;
/* Application Startup Event */
public void contextInitialized(ServletContextEvent ce)
    { applicationInitialized = System.currentTimeMillis(); }
/* Application Shutdown Event */
public void contextDestroyed(ServletContextEvent ce) {}
}
```

Monitoring Servlets Lifecycle - Example

```
 /* File : SessionCounter.java */
import javax.servlet.http.HttpSessionListener;
import javax.servlet.http.HttpSessionEvent;
public class SessionCounter implements HttpSessionListener
{  private static int activeSessions = 0;
/* Session Creation Event */
public void sessionCreated(HttpSessionEvent se) { activeSessions
    ++; }
/* Session Invalidation Event */
public void sessionDestroyed(HttpSessionEvent se)
    { if(activeSessions > 0) activeSessions--; }
public static int getActiveSessions() { return activeSessions; }
}
```

Monitoring Servlets Lifecycle - Example

```
<!-- Web.xml -->
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE web-app PUBLIC "-//Sun Microsystems, Inc.//DTD Web
    Application 2.3//EN" "http://java.sun.com/j2ee/dtds/web-
    app_2.3.dtd">
<web-app>
<!-- Listeners -->
<listener>
    <listener-class> com.stardeveloper.web.listener.SessionCounter </
    listener-class>
</listener>
<listener>
    <listener-class> com.stardeveloper.web.listener.ApplicationWatch </
    listener-class>
</listener>
</web-app>
```

Scope Objects

Web context	ServletContext	Web components within web context servlet.getServletConfig().getServletContext
Session	HttpSession	Web components handling requests that belong to a session
Request	ServletRequest	Web component handling the request
Page	PageContext	Web component in the JSP page

Main Methods:
Object getAttribute(String name)
void setAttribute(String name, Object o)
Enumeration getAttributeNames()

AOP

The programming paradigms of aspect-oriented programming (AOP), and aspect-oriented software development (AOSD) attempt to aid programmers in the separation of concerns, specifically cross-cutting concerns, as an advance in modularization.

Logging and authorization offer two examples of crosscutting concerns:
a logging strategy necessarily affects every single logged part of the system. Logging thereby crosscuts all logged classes and methods.

Same is true for authorization.

Filters (javax.servlet.filter)

Other classes that preprocess/postprocess request/response

A filter is an object that performs filtering tasks on either the request to a resource (a servlet or static content), or on the response from a resource, or both.

Filters perform filtering in the doFilter method. Every Filter has access to a FilterConfig object from which it can obtain its initialization parameters, a reference to the ServletContext which it can use, for example, to load resources needed for filtering tasks.

Filters are configured in the deployment descriptor of a web application

Examples that have been identified for this design are

1) **Authentication Filters**
2) **Logging and Auditing Filters**
3) **Image conversion Filters**
4) **Data compression Filters**
5) **Encryption Filters**
6) **Tokenizing Filters**
7) **Filters that trigger resource access events**
8) **XSL/T filters**
9) **Mime-type chain Filter**

http://java.sun.com/products/servlet/Filters.html

Filters

Filters are important for a number of reasons. First, they provide the ability to encapsulate recurring tasks in reusable units.

Second, filters can be used to transform the response from a servlet or a JSP page. A common task for the web application is to format data sent back to the client.

Filters

Filters can perform many different types of functions.

* Authentication-Blocking requests based on user identity.
    * Logging and auditing-Tracking users of a web application.
    * Image conversion-Scaling maps, and so on.
    * Data compression-Making downloads smaller.
* Localization-Targeting the request and response to a particular locale.
* XSL/T transformations of XML content-Targeting web application responses to more that one type of client.

These are just a few of the applications of filters. There are many more, such as encryption, tokenizing, triggering resource access events, mime-type chaining, and caching.

Filters

The filtering API is defined by the Filter, FilterChain, and FilterConfig interfaces in the javax.servlet package. You define a filter by implementing the Filter interface.

The most important method in this interface is doFilter, which is passed request, response, and filter chain objects. This method can perform the following actions:

1. Examine the request headers.
2. Customize the request object and response objects if needed
3. Invoke the next entity in the filter chain (configured in the WAR). The filter invokes the next entity by calling the doFilter method on the chain object (passing in the request and response it was called with, or the wrapped versions it may have created).

Filter example

```
import javax.servlet.*; import javax.servlet.http.*; import java.io.*;
public class LoginFilter implements Filter {
protected FilterConfig filterConfig;
public void init(FilterConfig filterConfig) throws ServletException
        {this.filterConfig = filterConfig; }
public void destroy() { this.filterConfig = null; }
public void doFilter(ServletRequest req, ServletResponse res,
  FilterChain chain) throws java.io.IOException, ServletException {
        String username = req.getParameter("j_username");
        if (isUserOk(username)) chain.doFilter(request, response);
        res.sendError(  javax.servlet.http.HttpServletResponse.SC_UNA
        UTHORIZED);
    }
    // implement here isUserOk()…
}
```

Example

```
<filter id="Filter_1">
<filter-name>LoginFilter</filter-name>
<filter-class>LoginFilter</filter-class>
<description>Performs pre-login and post-login operation</description>
<</filter-id>

<filter-mapping>
<filter-name>LoginFilter</filter-name>
<url-pattern>/*</url-pattern>
</filter-mapping>
```

Filters and sessions

```
public void doFilter(ServletRequest req, ServletResponse res,
  FilterChain chain) throws java.io.IOException, ServletException {
        HttpSession session = req.getSession(false);
        if (null == session || !(Boolean)session.getAttribute("auth"))
            {  if (isUserOk(req.getParameter("user")))
               session=req(.getSession(true);
               session.setAttribute("auth",new Boolean(true));
            } else
           res.sendError(  javax.servlet.http.HttpServletResponse.SC_UNA
           UTHORIZED);
        } chain.doFilter(request, response);
    }
```

Filters and parameters

```
java.util.ArrayList userList=null;
public void init(FilterConfig fc) throws ServletException
    {  BufferedReader in;
    this.filterConfig = fc;
    userList = new java.util.ArrayList();
    if ( fc != null )
        {  try {
             String filename = fc.getInitParameter("Users");
             in = new BufferedReader( new FileReader(filename));
         } catch ( FileNotFoundException fnfe)
              {  writeErrorMessage();return;
         }
         String userName;
         try {
            while ( (userName = in.readLine()) != null )
                userList.add(userName);
         } catch (IOException ioe) {writeErrorMessage();return;}
    }
}
public void destroy() { this.filterConfig = null; userList = null; }
```

Filters and parameters

```
<filter id="Filter_1">
<filter-name>LoginFilter</filter-name>
<filter-class>LoginFilter</filter-class>
<description>Performs pre-login and post-login operation</description>
<init-param>
<param-name>Users</param-name>
<param-value>c:\mydir\Users.lst</param-value>
</init-param>
</filter-id>
```

Filter sequencing

```
<filter>
  <filter-name>Uncompress</filter-name>
  <filter-class>compressFilters.createUncompress</filter-class>
</filter>
<filter>
  <filter-name>Authenticate</filter-name>
  <filter-class>authentication.createAuthenticate</filter-class>
</filter>
<filter-mapping>
  <filter-name>Uncompress</filter-name>
  <url-pattern>/status/compressed/*</url-pattern>
</filter-mapping>
<filter-mapping>
  <filter-name>Authenticate</filter-name>
  <url-pattern>/status/compressed/*</url-pattern>
</filter-mapping>
```

Both Uncompress and Authenticate appear on the filter chain for servlets located at /status/compressed/*. The Uncompress filter precedes the Authenticate filter in the chain because the Uncompress filter appears before the Authenticate filter in the web.xml file.

Further examples

http://www.oracle.com/technetwork/java/filters-137243.html