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# Design Patterns

## Web Level Design Patterns

### 4. Front Controller



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## Front Controller

**Problem:** When the user access the view directly without going through any centralized mechanism each view is required to provide its own system services, often resulting in duplication of code and view navigations is left to the views, this may result in commingled view content and view navigation. In other words keeping the common and global pre-request processing logic (like authentication & authorization logics) in every main web resource program kills the reusability. Hence a centralized point of contact for handling a request may be useful, for example, to control and log a user's progress through the site.

If we take **Plain Java** classes are taken as web resource program of a web application then they cannot take **http request** given by client directly.

**Note** The process of checking the identity of a user is called as **Authentication** and the process of checking the access privileges of a user on a particular resource is called as **Authorization**

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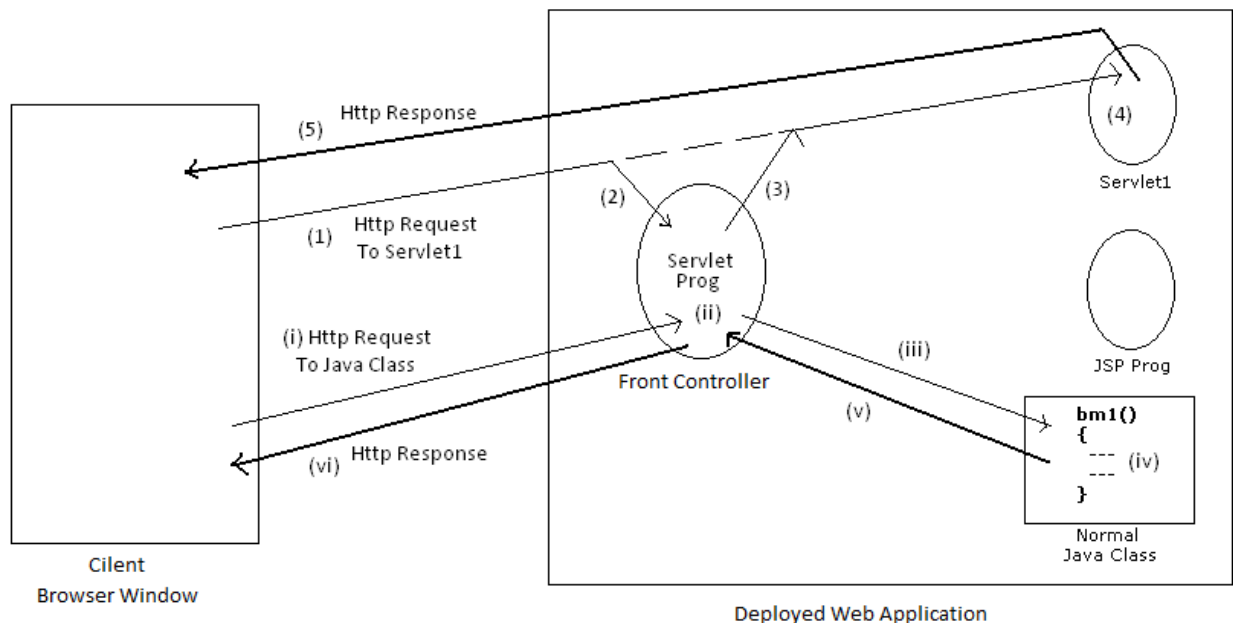
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**Solution:** Introducing a controller (Front Controller) as the initial point of contact for handling a request. The controller manages the handling of the request, including invoking security services such as authentication and authorization, delegating business processing, managing the choice of an appropriate view, handling errors, and managing the selection of content creation strategies.

The controller provides a centralized entry point that controls and manages Web request handling. By centralizing decision points and controls, the controller also helps reduce the amount of Java code, called scriptlets, embedded in the JavaServer Pages (JSP) page.



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**Def: Front Controller** is a special web resource program of a web application that is capable of trapping and taking the requests coming to other web resources of web application by having

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common and global pre-request processing logic. **Ex:** ActionServlet in Struts 1.x is the implementations of Front controller design pattern only.

The front controller design pattern means that all requests that come for a resource in an application will be handled by a single handler and then dispatched to the appropriate handler for that type of request. The front controller may use other helpers to achieve the dispatching mechanism. (**Note:** Front Controller is not responsible to trap the response of other web resource programs)

The Front Controller design pattern is applicable and useful for all kind of applications be it web or desktop applications and is not limited to any single programming language or framework.

- ❖ We generally use either Servlets or JSP programs as Front Controller by defining URL pattern for it either by using Extension match method or Directory match method.
- ❖ In Struts 1.X, struts Action classes are normal Java classes. Since they cannot take HTTP request directly from clients the ActionServlet is given as Front Controller so it takes HTTP request from clients and passes them to appropriate Action classes.

**Advantages:**

- ✓ Design request handling component.
- ✓ Channel all requests through a single controller.
- ✓ Centralize request processing and view selection.
- ✓ Reduce business logic in a view
- ✓ Improve manageability of security
- ✓ Promote code reuse across requests
- ✓ Avoid code duplication



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