Server-Side Web Scripting

**Java Servlets**

- Java objects that are intended to play the role of server components in client-server communication.

- handles the client requests by generating responses to such requests.

- Part of the Java EE specification (see java Servlet API for more details).

-hosted in a 'servlet container' that provides the environment in which the servlet runs, as well as controls the 'servlet lifecycle'.

**Servlet Lifecycle:**

Instantiation => constructor call.

- creates an instance of the servlet to service client requests.

- invoked implicitly by the servlet container when the servlet is called upon to service a client request and no instance currently exists.

Initialization => init() method

- invoked only once and is intended for any startup initialization code for the servlet.

request handling => service() method

- invoked for each client request.

servlet performs whatever logic necessary in order to serve the request and generate a response..

- Multiple client requests are typically handled by a single, multi-threaded sevlet instance, thus to ensure that the code is being run by the servlet is 'thread-safe'.

- destruction => destroy() method.

- invoked before the servlet instances’ 'unloaded', and is intended for any 'housekeeping' code that the servlet may need to run ..

**HttpServlet**

- Java servlet used to handle HTTP request and generate HTTP responses..

- hosted in a 'web container’, which is a component in a Java 'application server'(e.g., Apache Tomcat, Red Hat Jboss/WildFly, Oracle GlassFish, IBM WebSphere, etc.)

- the service() method call is routed to a doXXX() call, depending on the HTTP request method, e.g., doGet(), doPost(), doHead(), doPut(), doDelete(), etc...

- the doXXX() methods are passed two arguments:

**HttpServletRequest**

- object representation of the HTTP request sent by the client and received by the servlet.

- used to access information from the request message (e.g., HTTP request method, request URI, query string, message headers, message payload, etc.).

**HttpServletResponse**

- object representation of the HTTP response generated by the servlet and sent back to the requesting client.

- used to set information in the response message (e.g., HTTP response status code, message headers, message payload, etc.).

\* The web container facilitates the conversation to and from the HTTP request/response messages to HttpServletRequest/HttpServletResponse.