Servlets

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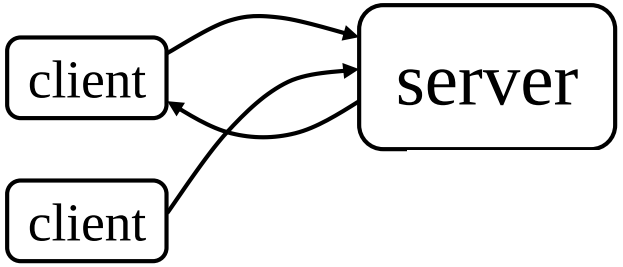
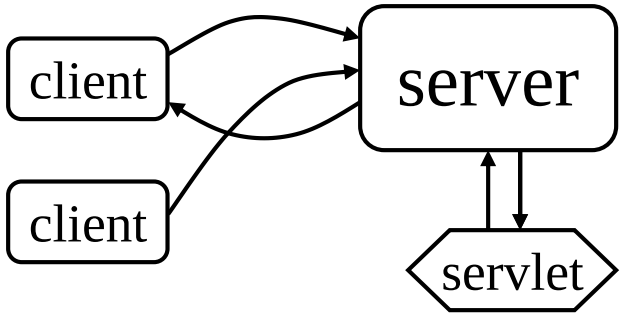
CGI (Common Gateway Interface)

- Is the very first attempt at providing users with dynamic content
- They are written in the native operating system and then stored in a specific directory
- Would need to recompile the programs in the new operating system
- Running independent programs in CGI, they create their own process



Servlets

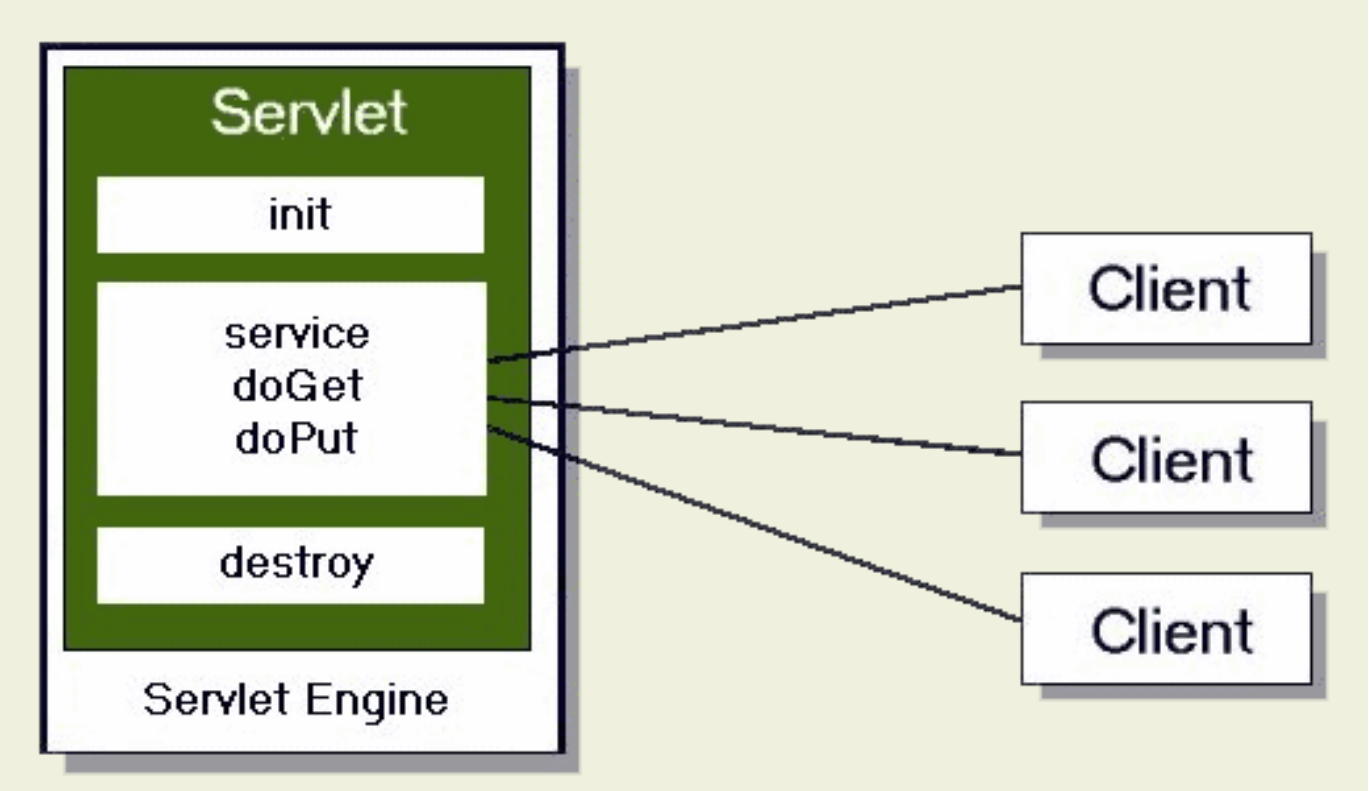
- A servlet is an implementation of Java that aims to provide the same service as CGI does
- But instead of programs compiled in the native operating system, it compiles into the Java bytecode which is then run in the Java virtual machine
- The first advantage of servlets over CGI is in its platform independence
- Servlets can run on any operating system just as long as a JVM is installed
- Servlets share in the common memory space of the JVM



Introduction to Servlets

- The JavaServer™ product family provides servers that can be configured to run one or more *services*: bodies of code that implement an application-level protocol, such as FTP, DHCP, or SMTP
- *Servlets* are modules that run inside request/response-oriented services and extend them in some manner

Servlets


Servlet
init
service
doGet
doPut
destroy
Servlet Engine
Client
Client
Client

Servlets

- For example, an HTTP service responds to its clients by delivering the HTML files they request.
- A servlet can extend the capabilities of the HTTP service by taking the data that a client entered in an HTML order-entry form and applying the business logic used to update a company's order database.
- A servlet can call on other services and servlets to satisfy a request, if appropriate.

Applications of Servlets

- Processing data POSTed over HTTPS using an HTML form, including purchase order or credit card data
- Allowing collaboration between people
- Forwarding requests

Servlet Architecture Overview

- The central abstraction in the JSDK is the `Servlet` interface
- All servlets implement this interface, either directly or, more commonly, by extending a class that implements it such as `HttpServlet`
- The `Servlet` interface provides for methods that manage the servlet and its communications with clients.
- Servlet writers provide some or all of these methods when developing a servlet

Servlet Architecture Overview

- When a servlet accepts a call from a client it receives two objects: one is a `ServletRequest` and the other is a `ServletResponse`
- The `ServletRequest` class encapsulates the communication from the client to the server
- The `ServletResponse` class encapsulates the communication from the servlet back to the client

Servlet Life Cycle

- Services load and run servlets
- which then accept zero or more requests from clients and return data to them
- They can also remove servlets
- Important methods
  - Init
  - Service
  - Destroy

Servlet Life Cycle

- When a service loads a servlet, it runs the servlet's `init` method
- The service cannot reload a servlet until after it has removed the servlet by calling the `destroy` method
- After the service loads and initializes the servlet, the servlet is able to handle client requests

Servlet Life Cycle

- It processes them in its `service` method
- Each client's request has its call to the `service` method run in its own servlet thread: the method receives the client's request, and sends the client its response
- Servlets can run multiple `service` methods at a time
- Servlets run until they are removed from the service

First Servlet

```
import javax.servlet.*;
import javax.servlet.http.*;

public class Hello extends HttpServlet{
     public void doGet(HttpServletRequest
req, HttpServletResponse res) throws
IOException, ServletException{
     // Business Logic
     }
}
```

	Application Server	Web Server
What is it?:	A server that exposes business logic to client applications through various protocols including HTTP.	A server that handles HTTP protocol.
Functions:	To deliver various applications to another device, it allows everyone in the network to run software off of the same machine.	Keeping HTML, PHP, ASP etc files available for the web browsers to view when a user accesses the site on the web, handles HTTP requests from clients.
Clients can include-:	GUI's, Web Servers	HTTP, HTML
Functionality:	Adds functionality	Does not add any
Examples of popular server products:	Sun Java Application server, weblogic server, Apache Geronimo	Apache, Microsoft IIS