

INFSCI 2470

Interactive System Design

Lecture 3 (Java part 1): Client-Server Programming

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Client-Server Approach

- Client request action
- Server performs action, responds to client
- Useful for database-intensive applications and dynamic content
 - Thin clients - little client-side support needed
 - Server controls database access
 - Logic code written once, on server



Simple Client-Server Context

- Access to distributed information
 - Client request a fragment by its unique ID
 - Server sends the information
 - User examines it on a client
 - Example: FTP, Gopher
- Now use integrated clients and a possibility to use links..
 - WWW - distributed hypertext



Advanced Client-Server Context

- Client may need to send some requests to the server (I.e., for doing search)
- Client may need to access parameterized information
- Client may need to send some information to the server for processing
- Web HTTP GET and POST methods



WWW: Everyone's Client-Server

- Variety of servers and *browsers*, but
- HTML - universal presentation language
- URL - universal addressing scheme
- HTTP - universal communication protocol
 - HTTP 1.0: POST, GET, HEAD
 - HTTP 1.1: DELETE, OPTIONS, PUT, TRACE



HTTP 1.0 Protocol

- Client sends a request:

Request:

GET /hello.html HTTP/1.0

Optional header info:

User-Agent: Mozilla/4.0 (compatible; MSIE 4.0; Windows 95)

Accept: image/gif, image/jpeg, text/*, */*

Blank line

If post method - the data to be posted



HTTP 1.0 Protocol

■ Server sends a response

Status line:

HTTP/1.0 200 OK

Response headers:

Date: Wednesday, 20-March-00 23:00:01 GMT

Server: Tomcat Web Server/3.2

MIME-version: 1.0

Content-type: text/html

...

Content

<html><head>.....</html>



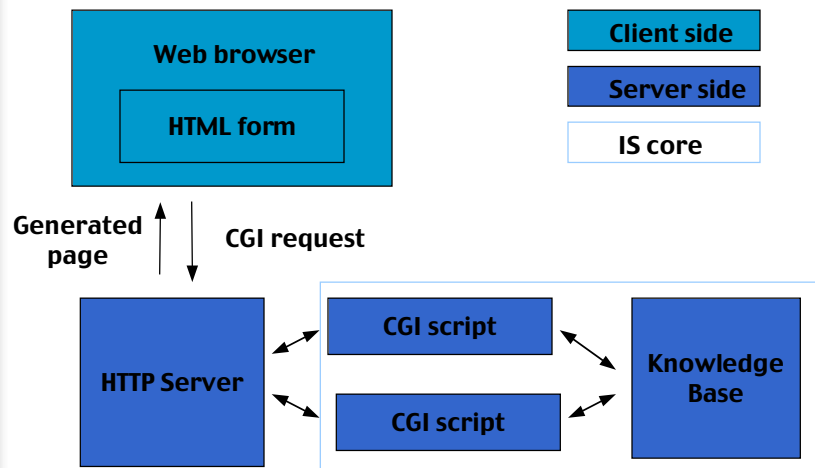
Interaction technologies

■ GCI-style GET/PUT exchange

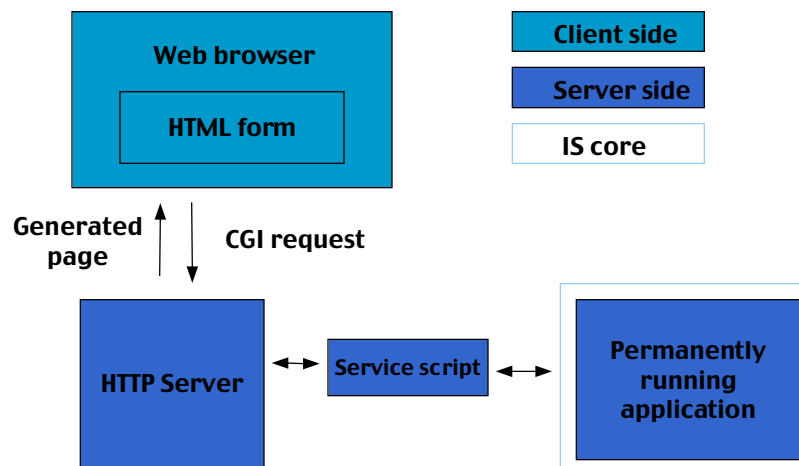
- Client to server
 - URLs with parameters
 - HTML forms
- Server to client
 - HTML pages generated “on the fly”

■ Client-Side Java

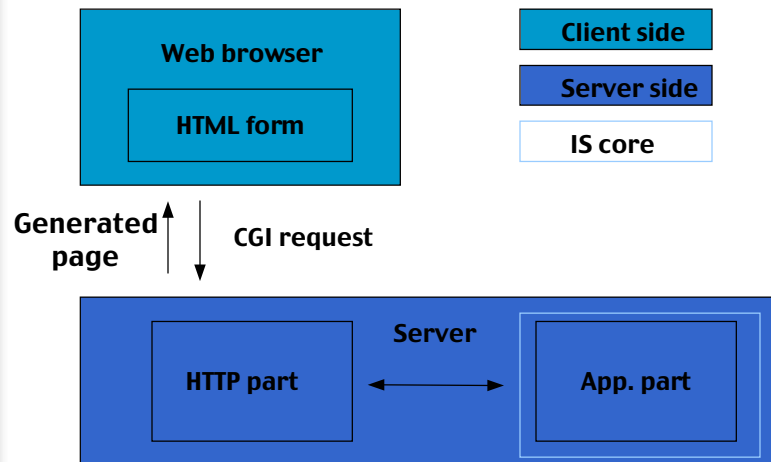
Classic CGI scripting



Separate application



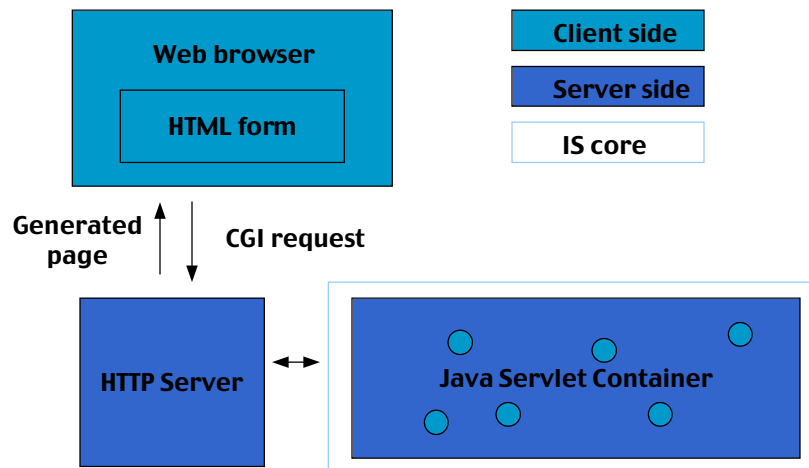
Server Extensions



Server Extensions

- URL responses are a part of the server
 - Perl server
 - SUN Java Server
 - Common Lisp CL-HTTP server
- URL responses are inside the server plugin
- Server include script interpreter for scripting language
 - Apache's mod_perl
 - Microsoft ASP

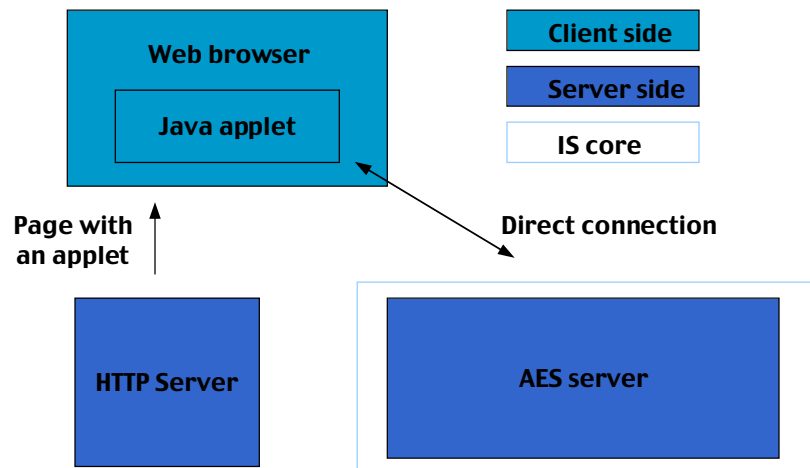
Java Servlets



Servlets

- Single process (but many threads)
- No startup costs
- Standard
- Java-based (can use many APIs)
- Works with many servers (containers)
 - Directly: Tomcat, JIGSAW...
 - Using server add-ons: JRun, JServ...

Java-based Client-Server



Things to Do

- Start with servlets
- Install/find a server
- Try simple servlets (like used in class)
- Read Servlet intro from ANY suggested book
- Start with pair HW3 (List of pairs is published)