

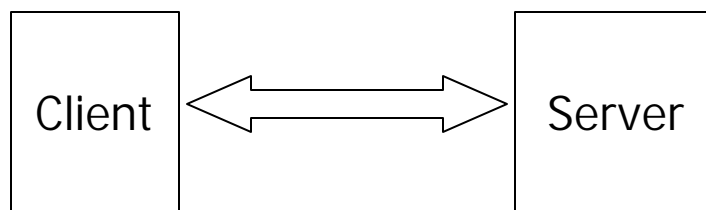
Software Elements of Electronic Business Sites

Daniel A. Menascé, Ph. D.

www.cs.gmu.edu/faculty/menasce.html

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Implementation Options



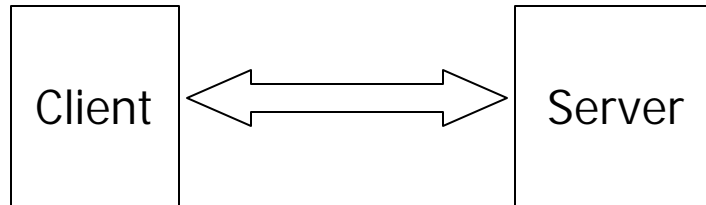
Client-side:

- client-side scripts
- Java applets

Server-side:

- CGI
- servlets
- server-side scripts
- Fast CGI
- Web browser API₂

Client-Side: Applets



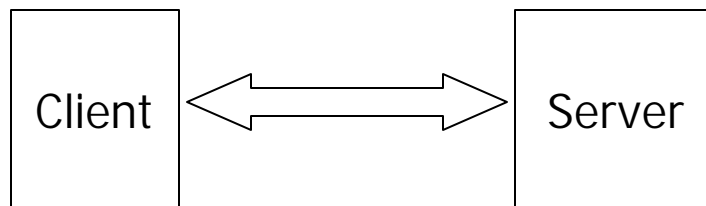
```
<HTML><HEAD></HEAD>  
<BODY>  
  <H1>My Applet</H1><BR>  
  <APPLET CODE=MyApplet.class WIDTH=250 HEIGHT=25>  
</APPLET>  
</BODY>  
</HTML>
```

Code class for applet assumed to be in the same directory as HTML page.

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Client-Side: Applets

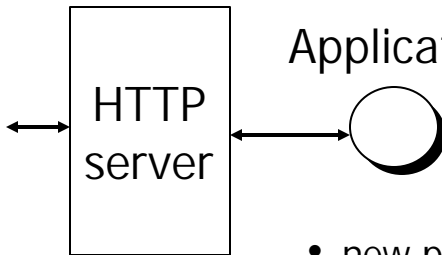


1. The browser requests the applet code from the server.
2. The applet is executed by the browser in its JVM.

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Running Applications at the Server: CGI Scripts



- new process created and killed after execution. If the app is written in Java a new JVM has to be started each time.
- good isolation and security
- stateless application

HTML Forms

```
<FORM ACTION='http://SomeServer/cgi-bin/MyApplication'>  
  <INPUT TYPE='text' NAME='keyword' VALUE='books'>  
  <INPUT TYPE='submit' NAME='submit' VALUE='Go'>  
</FORM>
```

*Application at server
(e.g., C executable,
Perl script)*

*variable passed to
application at server*

*default value of
variable passed to
Application at server*

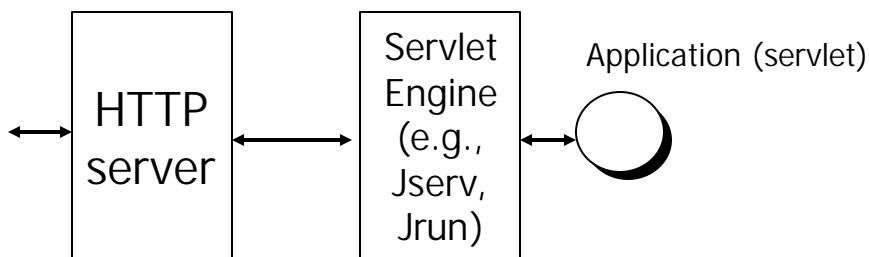
CGI: Common Gateway Interface

CGI Directories

- ❑ How does the server know that a request is for the execution of an application as opposed to a request to retrieve a static file?
 - One can tell the Web server where the CGI applications are and one can even alias the directory. In Apache:

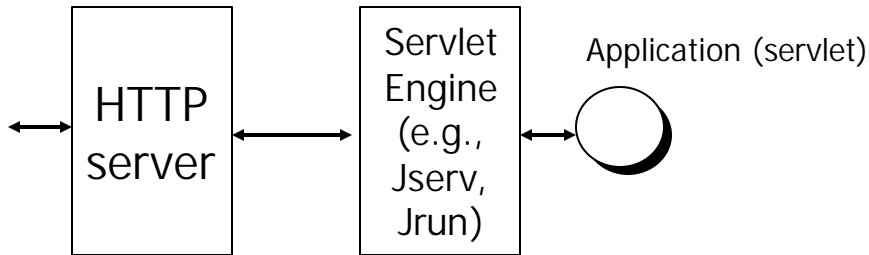
```
ScriptAlias /cgi-bin/ /home/~menasce/cgibin
```

Running Applications at the Server: Servlets



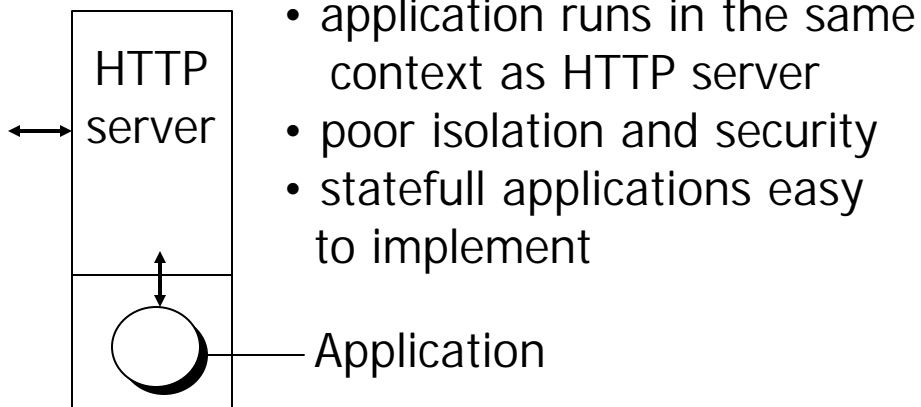
- The Servlet engine loads a class in the JVM process and creates an instance of the Servlet class (at engine startup or at first request to Servlet).
- The same Servlet handles all requests (need to provide synchronization for access to global variables).

Running Applications at the Server: Servlets

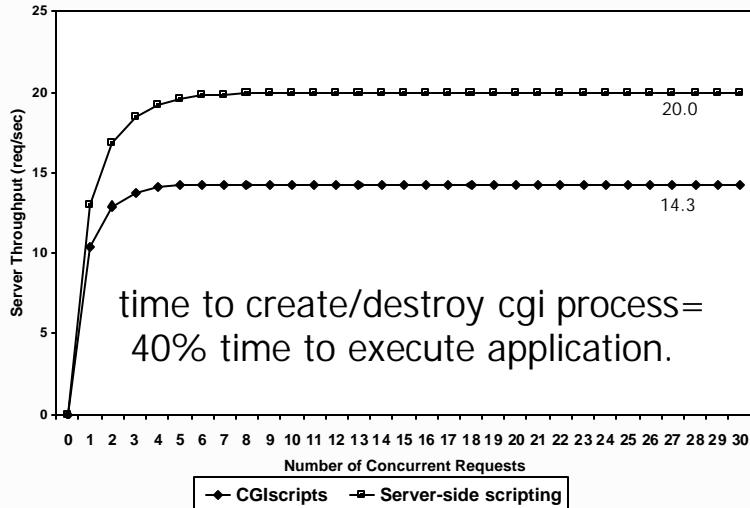


- Jserv: download from <http://java.apache.org/>
- Needs Java Servlet Development Kit: <http://java.sun.com>

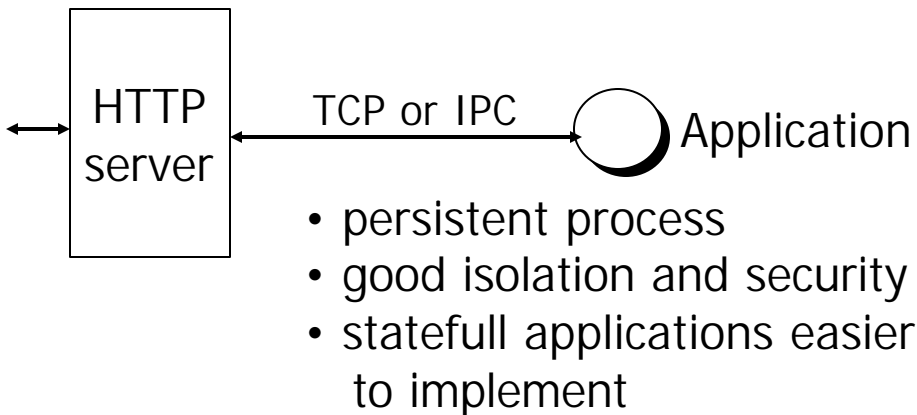
Running Applications at the Server: Server APIs



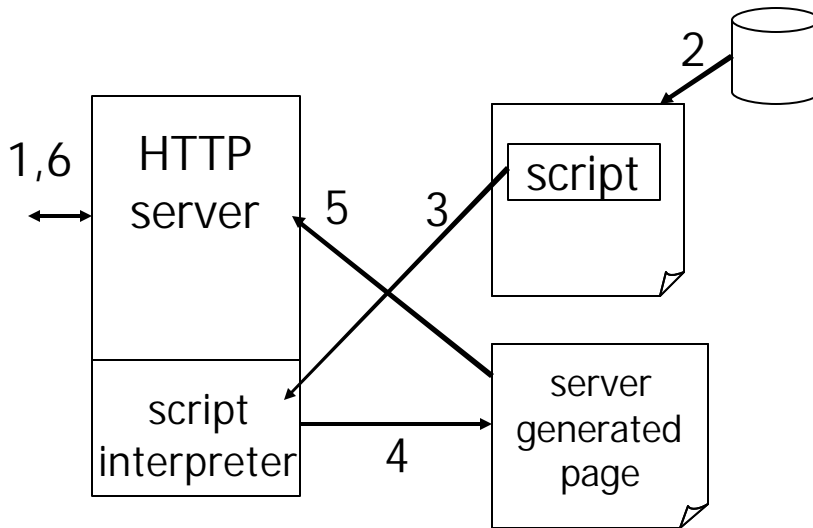
CGI scripts vs. server API: performance impact



Running Applications at the Server: Fast CGI



Running Applications at the Server: Server Side Scripting



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Application Server Implementation Options

- CGI scripts (e.g., to process HTML forms)
 - A new process is started for each request.
 - Stateless application.
- Server APIs (e.g., NSAPI, ISAPI)
 - Application code is loaded and executed in the same context as the server.
 - Poor security and no isolation.
- FastCGI
 - Web server and application communicate via light weight TCP or local IPC.
 - Application can be persistent and statefull

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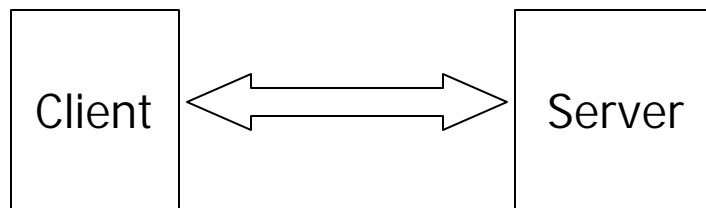
Application Server Implementation Options (cont'd)

❑ Server-side scripting

➤ Server interprets scripts or programs embedded in pages before returning them to the client:

- ✓ MS Active Server Pages (ASP) permits the use of JavaScript and VBScript combined with ActiveX controls written in any programming language.
- ✓ Netscape's LiveWire permits the use of server-side JavaScript.

Implementation Options



What are the relative advantages and disadvantages of client-side vs. server-side computing in electronic commerce?