



Distributed Applications ***Server Applications***

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Types of server

File Servers

Database Servers

Groupware Servers

Web Servers

Mail Servers

Object Servers

Printer Servers

Application Servers

Tiered architectures

The presentation and logic layer

The data layer or data base layer

Middleware

There are two kinds of middleware: general middleware and Service middleware.

General middleware is often associated with the operating systems,

Service middleware is focused more on the provision of services

Database Servers

Relational data bases

The main functions of a database are:

To interpret SQL statements sent to it by a client

To optimise queries

To prevent concurrent access errors

To detect and act upon deadlock

To administer security

To administer back-up and a recovery

Relational Middleware

The two main components are

the SQL API

the database driver

Distributed databases

Problems with distributed data

- If data is replicated.
- Ensuring that concurrent access is safe
- Security
- Reliability
- Clocks need to be synchronised.

Date's rules

These are a selection from the twelve rules of a good distributed database proposed by Date [Date, 1987].

Continuous operation

Transparency

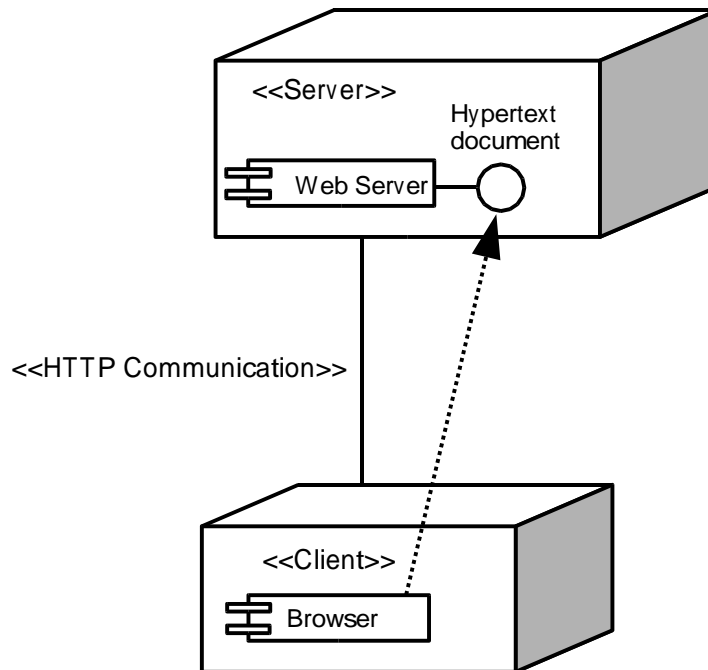
Replication independence

Mixing Servers

Operating system Independent

Optimisation of queries

Client-server



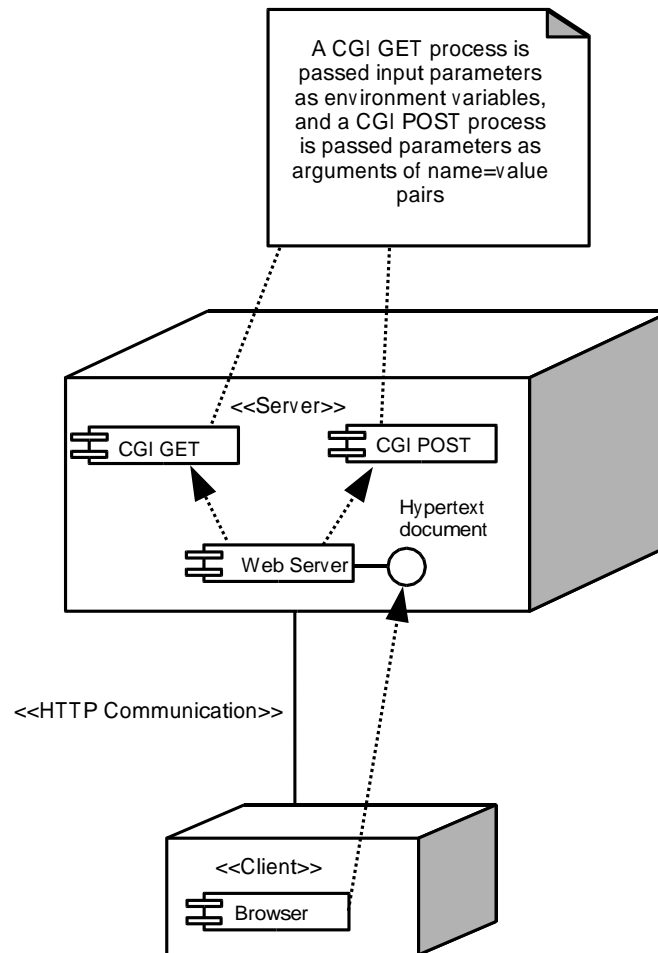
Server-side functionality

- client side computing.
- client is able to POST messages to the server.
- *Common Gateway Interface* protocol
- any computing language (C, ADA, ...),
- languages with easy interfacing to networks favoured,
- for example PERL and JAVA.
- *Scripting languages*

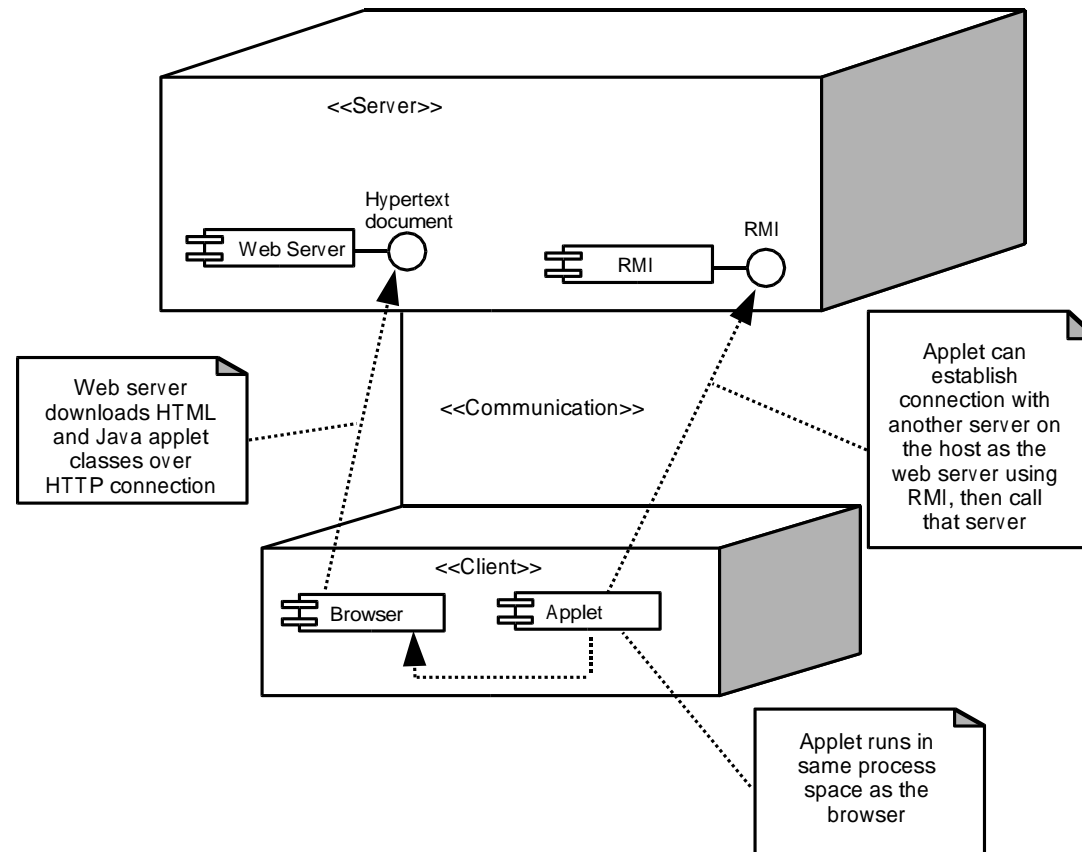
Summary

- CGI protocol
- The client-side web browser takes information (gathered for example with a FORM), and sends it to the server.
- The information sent must be in a CGI format.
- The server then processes that information and sends back information to the client.
- HTML format ready for display by the client browser,
- images, streaming audio, Macromedia flash files or XML.

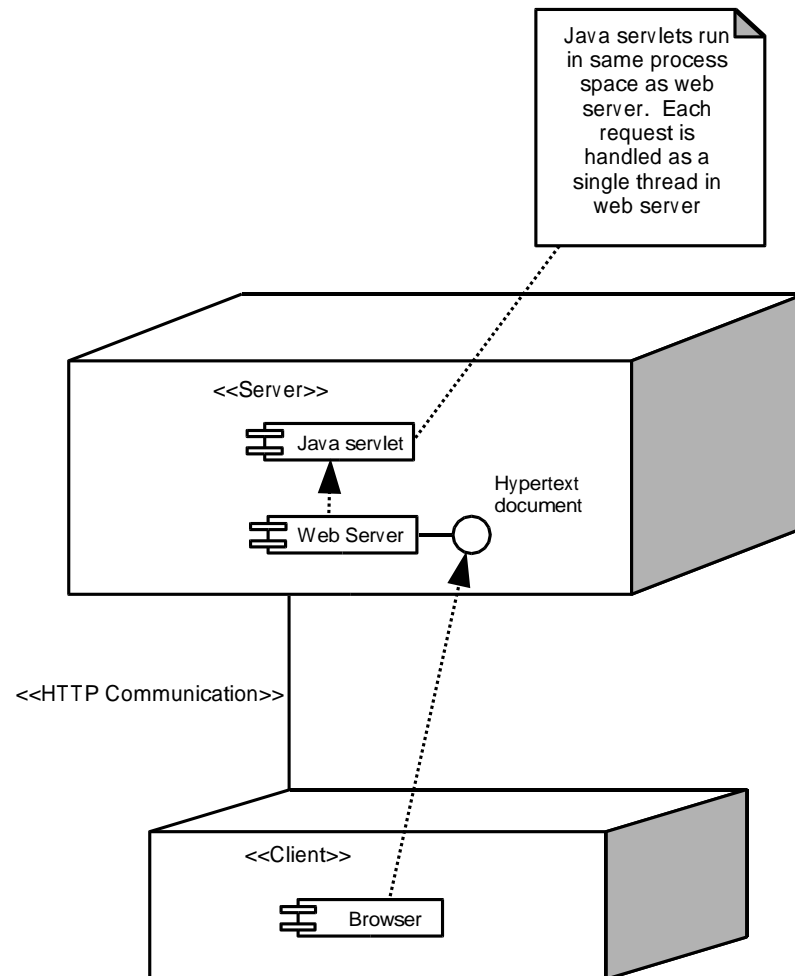
Common Gateway Interface (CGI)



Client-side functionality enhanced with applets



Server-side Includes



HTML

- *tags* embedded
- *browser*
- platform dependent *plug-ins* required,
- The appearance of a HTML document
- PDF format

DHTML - Cascading Style Sheets

Cascading Style Sheets [Deitel et al., 2000].

- Styles can be declared *inline*, for example

```
<P STYLE = "font-size:14pt"> Some text that will  
appear in 14 pt</P>
```

- Incorporated into a header:

```
<STYLE TYPE = "text/css">  
EM background-color: #800F0F;  
color:red  
H1 font-family: Arial, sans-serif  
P font-size: 18pt  
</STYLE>
```


CSS

Style sheets can be imported,

- `<LINK REL = "stylesheet" TYPE = "text/css" HREF = "styles.css">`
- User styles vs author styles
- DHTML - Object Model and Collections

Web page Scripting

- static page
- 'FORMS'
- DHTML provides some control and flexibility
- scripts associated with the HTML page.

Scripting languages

- *javascript* and the similar *JScript*.
- *VBscript*,
- standardise web page scripting under ECMAScript [ecma,].
- WWW Consortium is seeking to standardise a Document Object Model for browsers [w3DOM,].

Cookies

- created by the server, stored on client,
- The cookie is a (normally text) file.
- Normally the cookie is set with an expiry date

XML

- HTML is a subset of SGML
- XML is also a subset of SGML, but is less reduced than HTML,
- HTML is for displaying information, XML is for describing data of virtually any type.

References

[Date, 1987] Date, C. (1987). *An Introduction to Database Systems*. Addison-Wesley.

[Deitel et al., 2000] Deitel, H., Deitel, P., and Nieto, T. (2000). *Internet and World Wide Web: How to Program*. Prentice Hall.

[ecma,] ecma. <http://www.ecma.ch/stand/ecma-262.htm>.

[w3DOM,] w3DOM. <http://www.w3.org/DOM/>.