Web databases (COAP 3180)

Code: web-db

Author and version

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- Version: 0.9 (modified 28/2/10 by DKS)

Prerequisites

- Using web browsers
- Some HTML

Availability

url: **http://edutechwiki.unige.ch/en/Help:COAP-3180** **COAP 3180 Course Homepage**

Objectives

- Review of how Internet and the web works
- Advance view on the role of databases

Disclaimer

- There may be typos (sorry) and mistakes (sorry again)

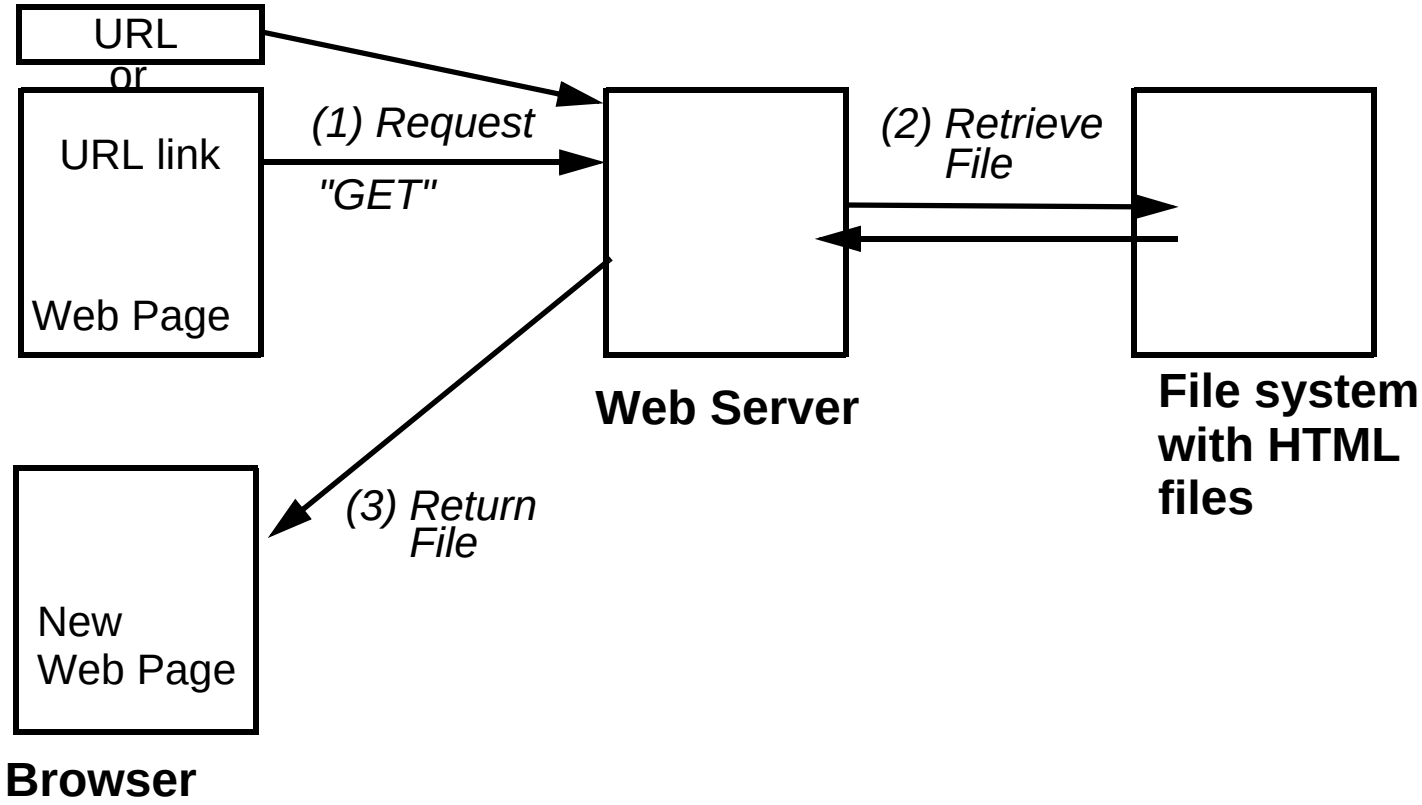
Contents

1. How Internet and the web works

1.1 A little bit of History

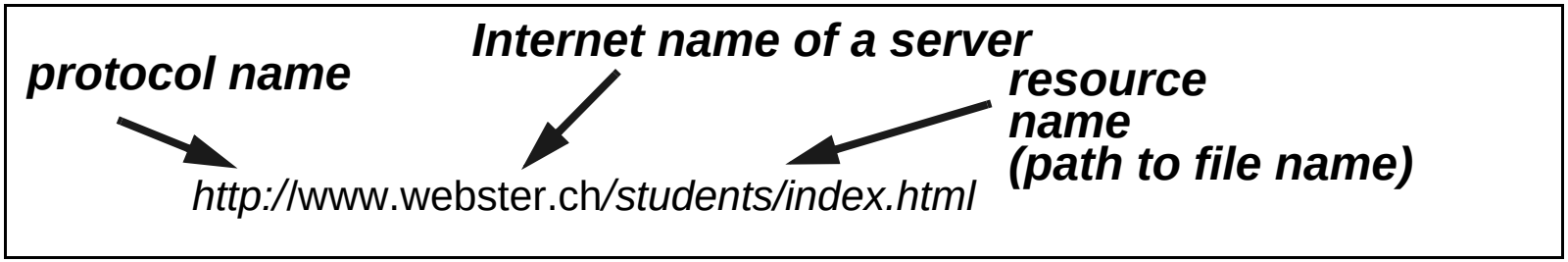
- 1962: Invention of modern networking architecture (packets)
- 1969: first trial of Arpanet (future Internet)
- 1973: TCP, Transmission Control Protocol
- 1978: TCP/IP Protocol - Addition of IP, the Internet Protocol
- Seventies: Mail, forums, file transfer, remote connection services ....
- 1992: WWW, the World-Wide Web - an Internet service that relies on HTTP and HTML
- 1995: The World discovers the WWW
- 2007: 500 million connected computers, hundreds of protocols and services

1.2 Simple web pages

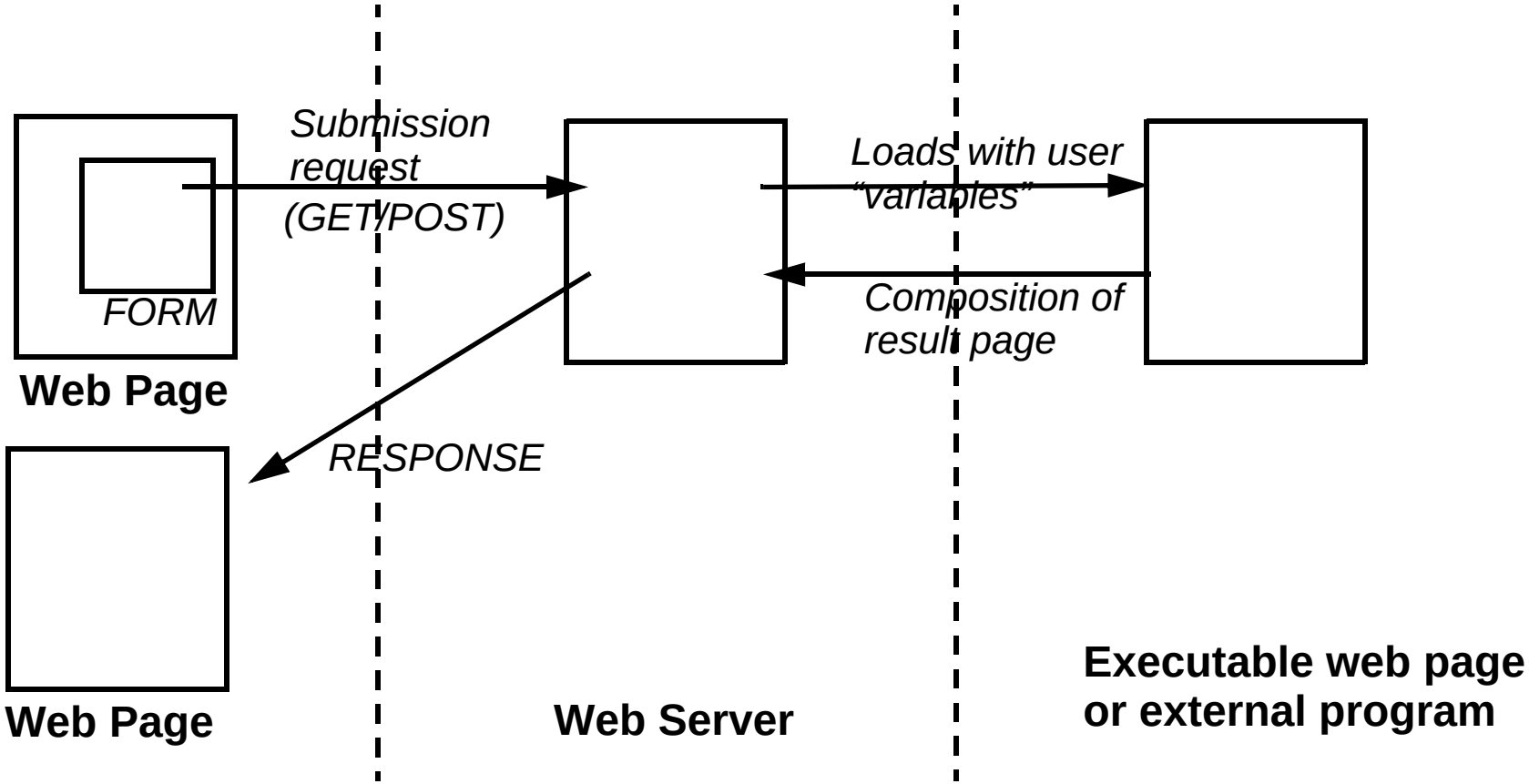


- URL = Universal Resource Locator = unique addresses for resources.

  `Syntax: URL = protocol://address/resource name`



1.3 HTML Forms and server-side scripts



Form example (see next slide for HTML code):

Form example (truncated HTML code example)

```
<form method="post" name="searchForm"
      action="http://connections.webster.edu/cp/..../fileshare/Search.jsp">
<input name="groupID" value="24039" type="hidden">
<table align="center" border="0" cellpadding="0" cellspacing="5">
<tbody><tr>
   <td align="right"><span class="text10">Search for:  </span></td>
   <td align="right"><input name="searchName" value="Y" class="textform"
alt="Select to search file names" checked="checked" type="checkbox"></td>
   <td><span class="text10">File Names</span></td>
   <td align="right"><input name="searchFolder" value="Y" class="textform"
alt="Select to search folder names" checked="checked" type="checkbox"></td>
   <td><span class="text10">Folder Names  </span></td>
   <td align="right">><input name="searchContent" value="Y" class="textform"
alt="Select to search file content" checked="checked" type="checkbox">></td>
   <td><span class="text10">File Content</span></td>
</tr>
<tr>
   <td align="right"><span class="text10">that contain:</span></td>
   <td colspan="6"><span class="text10"><input class="textform" name="searchText"
size="60" maxlength="100" value="" type="text"></span></td>
   <td><input src="/cps/images/btns/search.gif" name="Search" alt="Search"
onclick="return searchRequest()" border="0" hspace="5" type="image"
vspace="5">></td>
</tr>
</tbody></table>
</form>
```

1.4 The HTTP Protocol

- Hypertext Transfer Protocol (HTTP) is a communications protocol used to transfer or convey information on the World Wide Web. (Wikipedia)

  url: **http://en.wikipedia.org/wiki/Http**

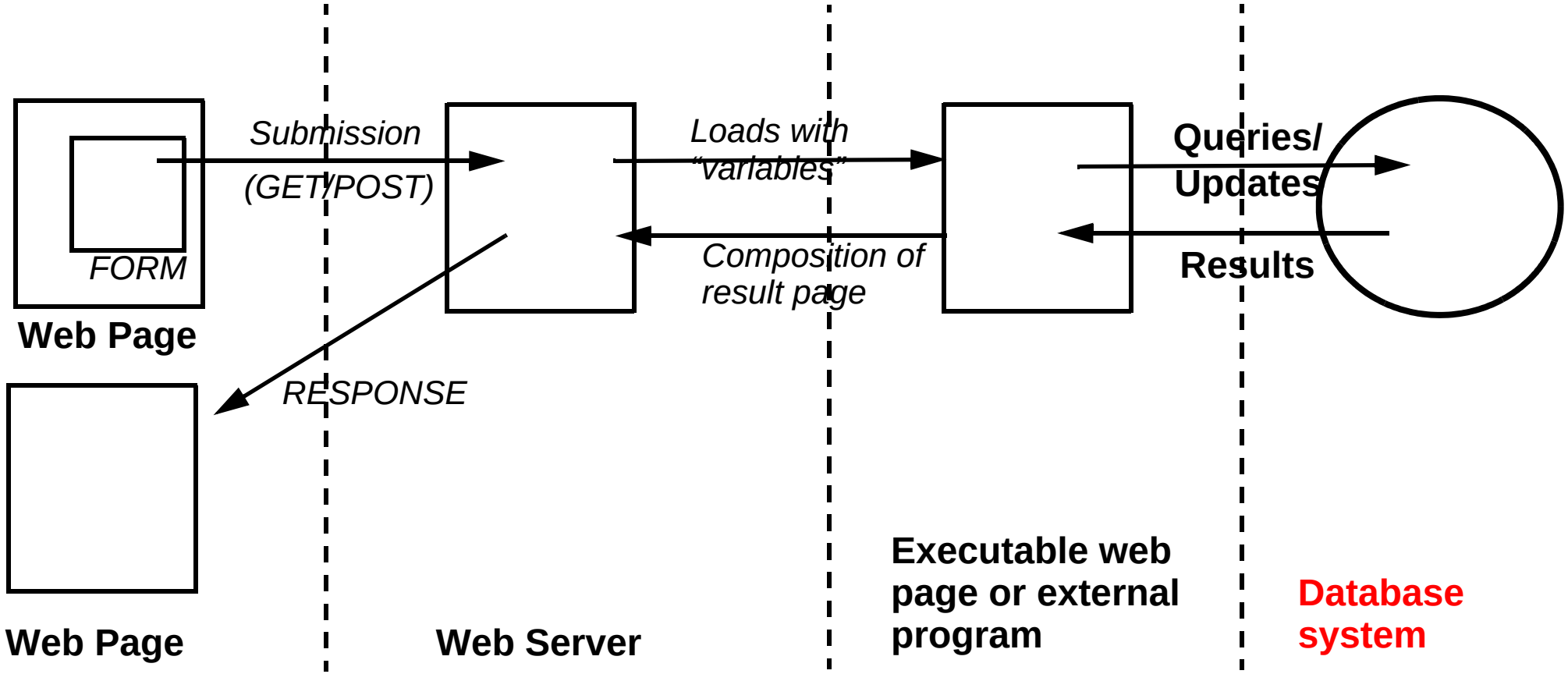
- Sample message sent from browser to server

```
GET /index.html HTTP/1.1
Host: www.example.com
```

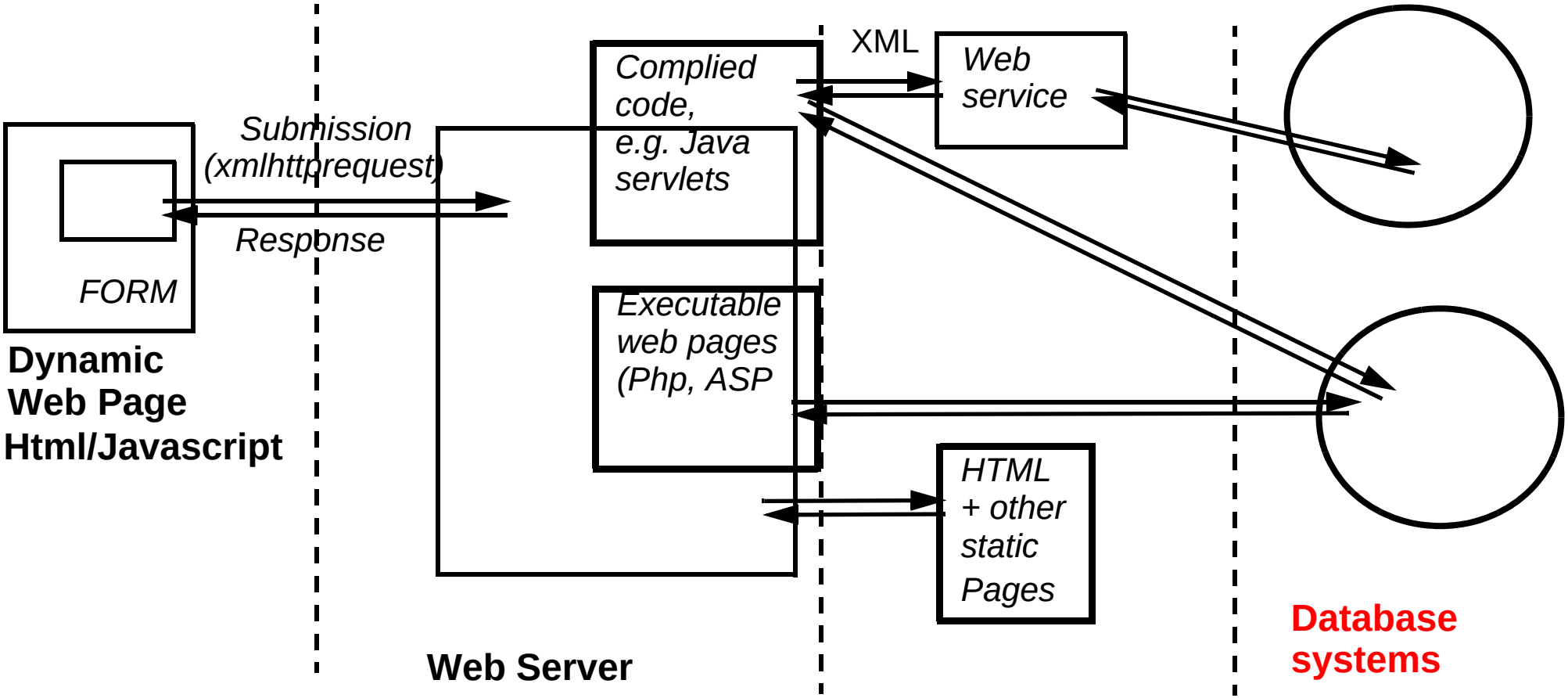
- Sample message sent from server to browser in response

```
HTTP/1.1 200 OK
Date: Mon, 23 May 2005 22:38:34 GMT
Server: Apache/1.3.27 (Unix)  (Red-Hat/Linux)
Last-Modified: Wed, 08 Jan 2003 23:11:55 GMT
Etag: "3f80f-1b6-3e1cb03b"
Accept-Ranges: bytes
Content-Length: 438
Connection: close
Content-Type: text/html; charset=UTF-8
```

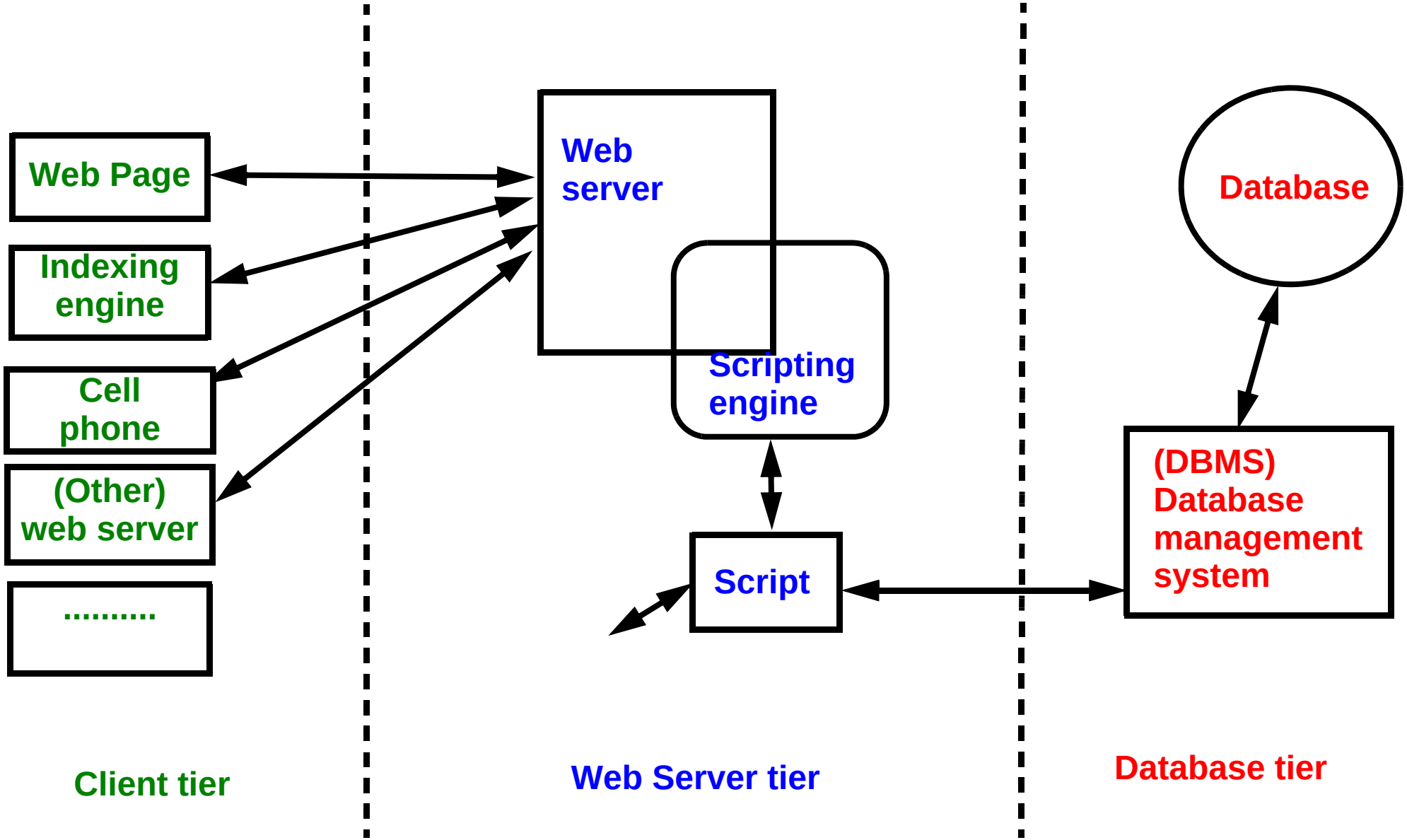
1.5 HTML Forms, server-side scripts and databases



1.6 A modern more complex setup ....



2. The typical three-tier architecture model



3. Types of databases and technologies

A global definition

"In computer science, a database is a **structured collection of records or data** that is stored in a computer system so that a computer program or person **using a query language** can consult it to answer queries. The records retrieved in answer to queries are information that can be used to make decisions. The computer program used to manage and query a database is known as a database management system (DBMS)." (Wikipedia, retrieved 22:30, 12 September 2007 (MEST)).

3.1 Types

1. Simple/flat (e.g. a table with user name, password and name, e.g. excel sheets). Rows are entries and colums define various data types that can be entered.
2. Hierarchical (e.g. LDAP authentication/address serveurs, some XML datastructures, Windows registry): Objects are inserted within other objects. Each object can have both properties and child objects.
3. Relational (mainstream today, in particular SQL databases): Data entries describe properties of an object like in the simple model, but can be linked to identifiers of other data entries.
4. Object and object-relational databases (not covered in this course)
5. Native XML datastores

4. Things a web designer should know

- Create simple database applications
  - Create typed tables with web 2.0 services, enter data and connect these with your own webpages
  - generate very simple PHP/MySQL applications with generator software
- Install and/or use XAMP (Apache/MySQL/PhP) systems:
  - Simple web server configuration
  - Understand how database systems like MySQL work
  - Understand what the PHP scripting engine can do (and its dangers)
- Configure LAMP/WAMP-based applications (various kinds of portals)
  - Create databases and/or learn how to connect to a database with a user name and a password
  - Give the right answers to installation scripts
  - Configure the applications (modules, skins, users, etc.)
- Repair data of web applications
  - E.g. remove SPAM with SQL queries
  - Extend applications with modules (know how to submit SQL code to a db management tool)
- Understand various roles of XML in modern architectures, e.g.
  - Transform database output from XML to HTML
  - Learn XQuery/XQuery update basics
- Understand the role of LDAP and similar authentication/address book applications

... At the end of the course you should have acquired the necessary foundations