THE AUSTRALIAN NATIONAL UNIVERSITY

The Dynamic Web

COMP1710 – New Media

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Limitations Of Static Web Pages

- There are a number of limitations of static web pages. These include:
  - It can be difficult to maintain consistent information across the different web pages on your site.
  - It can be more difficult to update information on a web site.
  - Some information you wish to publish may be dynamic(eg stock prices).
  - You may wish to give different users a different view on the same web pages.
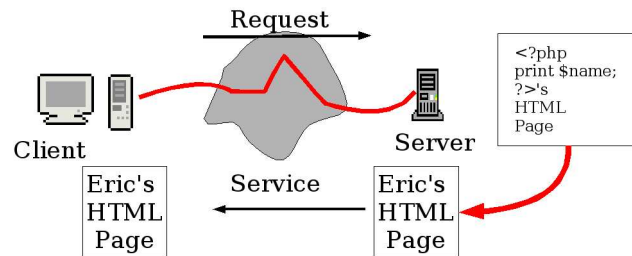
ASP, JSP and PHP

- The commonly used approaches that provide dynamic pages are:
  - Microsoft's Active Server Pages (ASP),
  - Java Server Pages(JSP), or
  - PHP.

- The server does most of the work in executing code to generate the content which is sent via HTTP like static content.
- Remember the web is a 'pull' technology.

Request

```
<?php
print $name;
?>'s
HTML
Page
```

Client

Server

Eric's HTML Page

Service

Eric's HTML Page

- The PHP file on the server contains the following:

  `<p> The current time is <?php print date("h:i:s A"); ?> </p>`

- When the HTTP request comes the web server 'executes' the php file to generate the HTML.

  `<p> The current time is 9:30:31 PM </p>`

- This HTML is they sent back to the web browser.

- PHP provides a powerful and flexible way of keeping information consistent on web pages.

```
<?php $hod = "Tom"; ?>
  :
<p> The current head is <?php print $hod ?>. </p>
<p> <?php print $hod; ?> works hard to keep
everyone happy! </p>
```
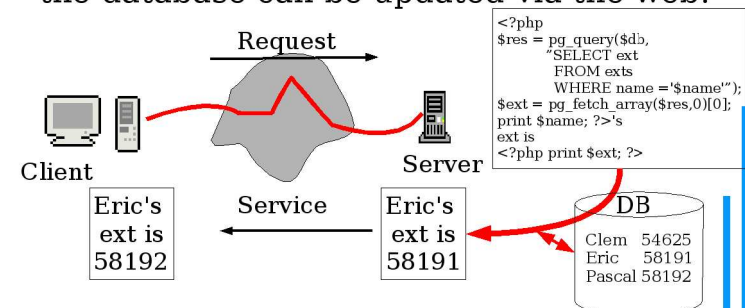
The current head is Tom.

Tom works hard to keep everyone happy!

- PHP(and JSP, ASP) provide simple interfaces to connect to database systems. This enable web pages to be created using information taken out of the database. Also the database can be updated via the web.

Request

```
<?php
$res = pg_query($db,
    "SELECT ext
    FROM exts
    WHERE name ='$name'");
$ext = pg_fetch_array($res,0)[0];
print $name; ?>'s
ext is
<?php print $ext; ?>
```

Client

Server

Eric's ext is 58192

Service

Eric's ext is 58191

DB

Clem   54625
Eric   58191
Pascal 58192

- A DataBase is a program that stores a set of tables. DataBase's have standard ways of get information out of the database and put information back into it.
- DataBase's are designed to be efficient and robust.
- MySQL and Postgres are databases that are commonly used to connect to web servers.
- SQL is a commonly used languages to talk to a database with. (commands like select, delete and update,)

- This php page generates a phone list from a database.

PHP Examples : Phone List

Name	Number
Eric	58191
Pascal	58192

```php
<?php
$db = pg_connect ("dbname=numbers");
?>
<html><head><title>  Phone List  </title></head>
  <body>
    <h1> PHP Examples : Phone List </h1>
    <table>
      <tr> <th>Name</th> <th>Number</th> </tr>

<?php
$res = pg_query($db, "SELECT * FROM numbers;");
$rows = pg_num_rows($res);
for ($i = 0;$i < $rows; $i++) {
 $arow = pg_fetch_array($res,$i);
 print "<tr><td>".$arow[0]."</td>" . "<td>".$arow[1]."</td></tr>" ;
}
?>
    </table>
  </body>
</html>
```
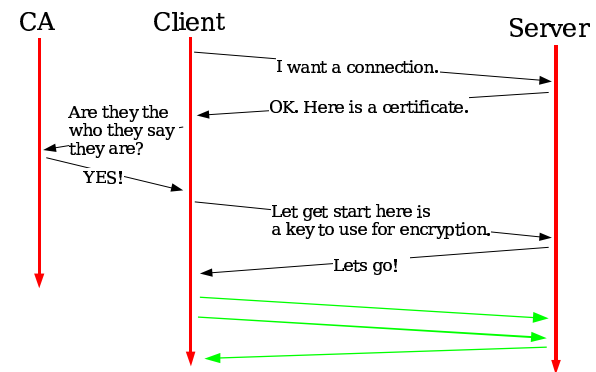
- Secure Sockets Layer(SSL) a secure way of authentication of the server(and client). It also encrypts the data between the client and the server. This stops a third party viewing this information.
- The protocol part of the URL is 'https' when SSL is used.
- SSL uses a trusted third part to certify the identity of the server. (CAs certification authorities)

- SSL uses public key encryption to set up the connection.

CA   Client   Server

I want a connection.

OK. Here is a certificate.

Are they the
who they say
they are?

YES!

Let get start here is
a key to use for encryption.

Lets go!

SSL

- There can be problems if a name server has been compromised.
- Often people will accept any old certification authorities.
- Also SSL will not tell you if the business at the other end of the interaction is any good. Moreover, it does not help in terms of the business knowing if you should be using the credit card or not!

Passwords and Encryption

- Passwords provide the simplest and most common way of authenticating a user.
- Encryption provides a way of keeping information secret even when a third part views the information along the way.
- RSA(public key encryption) and DES are two commonly used encryption standards.

Scaling Up or Scaling Out

- The more complexity placed on a server the slower it will work. Moreover, the server will have difficulty handling a large number of requests.
- Note that, the demand peeks on servers on the internet can be large.

Load
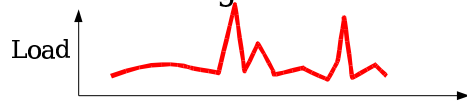
- One approach to this problem is using solutions that scale up(make servers faster and more efficient). Another approach is to scale out(duplicate the inefficient approach)

References

- Kurose and Ross, Computer Networding : A Top-Down Approach Featuring the Internet, Pearson, 2nd Ed, 2003.
- http://www.php.net/manual/en/introduction.php