Client-side Technologies

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Day 6

Browser Object Model cont.

BOM

JavaScript Cookies

Cookies

- Cookies are small text strings that you can store on the computers of people that visit your Web site.
- Cookies were originally invented by Netscape to give ‘memory‘ to web servers and browsers.
- Normally, cookies are simple variables set by the server in the browser and returned to the server every time the browser accesses a page on the same server.
- A cookie is not a script, it is a mechanism of the HTTP server accessible by both the client and the server.

Need Of Cookies

- HTTP is a state-less protocol; which means that once the server has sent a page to a browser requesting it, it doesn't remember any thing about it.

- The HTTP protocol, is responsible for arranging:
  - Browser requests for pages to servers.
  - The transfer of web pages to your browser.

Need Of Cookies

- *Stateless protocols* have the advantage that they require fewer resources on the server
  -- the resources are pushed into the client.
- But the disadvantage is that the client needs to tell the server enough information on each request to be able to get the proper answer.
- As soon as personalization was invented, this became a major problem.
- **Cookies** were invented to solve this problem.

Cookies

- ***Cookies*** are a method for a server to ask the client to store arbitrary data for use in future connections.
- They are typically used to carry persistent information from page to page through a user session or to remember data between user sessions.
- With JavaScript, you can create and read cookies in the client-side without resorting to any server-side programming.
- A cookie may be written and accessed by a script but the cookies themselves are simply passive text strings.

Types Of Cookies

- Cookies has two types:
  - Session Cookies/ Non-persistent : These cookies reside on the Web browser and have *no expiry date*. They expire as soon as the visitor closes the Web browser.
  - Persistent Cookies: These cookies have an *expiry date*, are stored on a visitor's hard drive and are read by the visitor's browser each time the visitor visits the Web site that sent the cookie

Benefits of Cookies

- **Authentication**
  - no longer need to enter password
  - Greeting people by name.
- **Maintaining state**
  - Adventure games that use cookies to keep track of pertinent character data and the current state of the game.
- **Saving time for returning visitors**
  - The user does not have to re-enter information
- **Shopping carts**
  - By storing data as you move from one page (or frame) to another.
- **Research websites.**

Cookies Limitations

- All Browsers are preprogrammed to allow a total of 300 Cookies, after which automatic deletion based on expiry date and usage.
- Each individual domain name (site) can store 20 cookies.
- Each cookie having a maximum size of 4KB.

Cookies Facts

- A server can set, or deposit, a cookie only if a user visits that particular site.
  - i.e. one domain cannot deposit a cookie for another, and cross-domain posting is not possible.
- A server can retrieve only those cookies it has deposited.
  - i.e. one server cannot retrieve a cookie set by another.
- Cookies can be retrieved only by the Web site that created them. Therefore any cookie you create is safe from view of other Web sites.

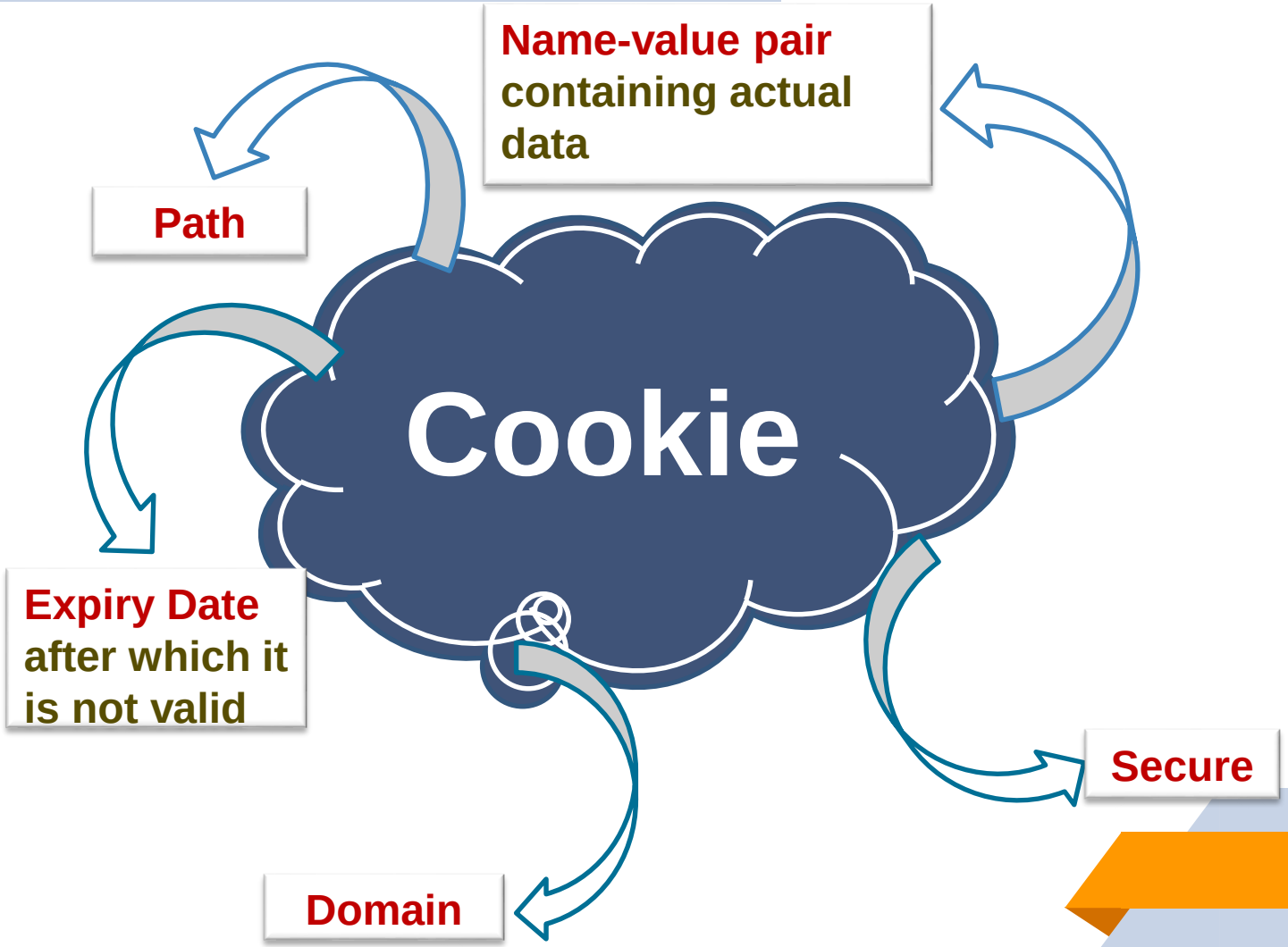
Cookies Securing Facts

- Highly unreliable, from a programming perspective.
  - It's like having your data stored on a hard drive that sometimes will be missing, corrupt, or missing the data you expected.
- Cookie security is such that only the originating domain can ever use the contents of your cookie "*Same-origin policy*".
- Cookies just identify the computer being used, not the individual using the computer.
- Cookie files stored on the client computer are easily read by any word processing program, text editor or web browsing software unless an encryption mechanism is applied.

Cookies False Claims

- Cookies are like worms and viruses in that they can erase data from the user's hard disks
- Cookies generate popups
- Cookies are used for spamming
- Cookies are only used for advertising

Cookies Parameters



Cookies Parameters

Parameter	Description	Example
name=value	This sets both cookies name and its value	username=JavaScript
expires=date	This optional value set the date that the cookie will expire on. The date should be in the format returned by toGMTString() method of the Date object. If the expires value is not given, the cookie will be destroyed the moment the browser is closed.	expires=25/3/2009 00:00:00
path=path	This optional value specifies a path within the site to which the cookies applies. Only documents in this path will be able to retrieve the cookies. Usually this is left blank, meaning that only the path that set the cookies can retrieve it.	path=/tutorials/
domain=domain	This optional value specifies a domain within which the cookie applies. Only websites in this domain will be able to retrieve the cookie. Usually this is left blank, meaning that only the domain that set the cookie can retrieve it.	domain=xyz.com
secure	This optional flag indicates that the browser should use SSL when sending the cookies to the server. This flag is rarely use.	secure

Working with Cookies

- Cookies can be *created*, *read* and *deleted* by JavaScript, under these conditions:

  1. The user's navigator must be cookie-enabled. This can be checked using "*navigator.cookieEnabled*" property .
  2. The cookie(s) that you set or accept are only accessible at pages with a *matching domain name*, *matching path*.
  3. The cookies must not have reached or passed their expiry date.

- When these criteria are met the cookies become available to JavaScript via the *document.cookie* property.

Creating a Cookie

- Assigning a value to the *document.cookie* property

document.cookie="name=value";

document.cookie="name=value;expires=date";

```
<head>
 <script language=”JavaScript”>
  document.cookie =  ”myCookie =“ +
                encodeURIComponent(“This is my Cookie”);
  window.alert(“myCookie=” +
                encodeURIComponent(“This is my Cookie”));
 </script>
</head>
```

Creating a Cookie

- Assigning a value to the *document.cookie* property

document.cookie="name=value;expires=date";

```
<head>
 <script language=”JavaScript”>
  var myDate = new Date();
  document.cookie = “myCookie=” +
                    encodeURIComponent(“This is my Cookie”) +
                        “;expires=” + myDate.toGMTString();
 </script>
</head>
```

Displaying a Cookie

- **Retrieve created Cookie value**
  - Extract the name and value of the cookie to two variables.
  - The document.cookie will keep a list of name=value pairs separated by semicolons, where name is the name of a cookie and value is its string value
  - We use strings' *split()* function to break the string into key and values.

```
<head>
    <script language=”JavaScript”>
        var newCookie = document.cookie;
        var cookieParts = newCookie.split(“=”);
        var cookieName = cookieParts[0];
        var cookieValue = decodeURIComponent(cookieParts[1]);
        window.alert(cookieName);
        window.alert(cookieValue);
    </script>
</head>
```

Clearing a Cookie

- If the user logs out or explicitly asks not to save his or her username in a cookie, hence, you need to delete a cookie to remove a username cookie.
- Simply reassign the cookie, but set the expiration date to a time has already passed.

```
<head>
 <script language=”JavaScript”>
  var newDate = new Date();
  newDate.setTime(newDate.getTime() - 86400000);
  document.cookie = “myCookie=;expires=“+ newDate.toUTCString();
 </script>
</head>
```

Multiple Cookies

- Most Web browsers set limits on the number of cookies or the total number of bytes that can be consumed by the cookies from one site.
- **Creating Multiple cookies**
  - Assign each cookie in turn to the document.cookie object and ensure that each cookie has a different name, and may have a different expiration date and time.
- **Accessing Multiple Cookies**
  - more complicated since accessing document.cookie,there will be a series of cookies separated by semicolons;

CookieName=firstCookieValue;secondCookieName=secondCookieValue;etc.

Creating a Cookie Function Library

- Working with cookies requires a lot of string and date manipulation, especially when accessing existing cookies when multiple cookies have been set.
- To address this, you should create a small cookie function library for yourself that can:
  - create
  - access
  - delete

  } cookies

  without needing to rewrite the code to do this every time.

Creating a Cookie Function Library

- **getCookie (cookieName)**

  Retrieves a cookie value based on a cookie name.
- **setCookie (cookieName,cookieValue[,expiryDate])**

  Sets a cookie based on a cookie name, cookie value, and expiration date.
- **deleteCookie (cookieName):**

  Deletes a cookie based on a cookie name.
- **allCookieList ():**
  returns a list of all stored cookies
- **hasCookie (cookieName)**
  Check whether a cookie exists or not

Events & Event Handlers

Events

- We have the ability to create dynamic web pages by using *events*.
- Events are actions that respond to user's specific actions.
- Events are controlled in JavaScript using event handlers that indicate what actions the browser takes in response to an event.
- Examples for different events:
  - A mouse click
  - A web page loading
  - Taking mouse over an element
  - Submitting an HTML form
  - A keystroke on your keyboard

Events

- Event handlers are created as attributes added to the HTML tags in which the event is triggered. (first way of binding an event handler)

- An Event handler adopts the event name and appends the word "*on*" in front of it.

  < tag onevent = "JavaScript commands;">

- Thus the "click" event becomes the *onclick* event handler.

Mouse Events

Event handler	Description
onmousedown	when pressing any of the mouse buttons.
onmousemove	when the user moves the mouse pointer within an element.
onmouseout	when moving the mouse pointer out of an element.
onmouseup	when the user releases any mouse button pressed
onmouseover	when the user moves the mouse pointer over an element.
onclick	when clicking the left mouse button on an element.
ondblclick	when Double-clicking the left mouse button on an element.
ondragstart	When the user has begun to select an element

Keyboard Events

Event handler	Description
onkeydown	When User presses a key
onkeypress	When User presses a key other than Modifiers (ctrl, shft, ..etc.)
onkeyup	When User releases the pressed a key

Other Events

Event handler	Description
onabort	The User interrupted the transfer of an image
onblur	when loosing focus
onfocus	when setting focus
onchange	when the element has lost the focus and the content of the element has changed
onload	a document or other external element has completed downloading all the data into the browser
onunload	a document is about to be unloaded from the window
onerror	When an error has occurred in a script.
onmove	when moving the browser window

Other Events

Event handler	Description
onreset	When the user clicks the form reset button
onsubmit	When the user clicks the form submit button
onscroll	When the user adjusts an element's scrollbar
onresize	When the user resizes a browser window
onhelp	When the user presses the F1 key
onselect	When selecting text in an input or a textarea element
onstart	When a marquee element loop begins
onfinish	When a marquee object finishes looping
onselectstart	When the user is beginning to select an element

Binding Events

- Binding Event Handlers to Elements can be:
    1. Event handlers as tag attribute
    2. Event handlers as object property

Event handlers as tag attribute

```
<input type=button value="click me" name=b1
   onclick="alert('you have made a click')">
```

OR

```
   <script>
   function showmsg()
   {
       alert("you have made a click")
   }
   </script>
```

```
<input type=button value="click me"
   onclick="showmsg()" />
```

Example!

Event handlers as object property

```
<body>
    <form>
       <input type=button name='b1' value="Click ME" />
    </form>
</body>
```

```
<script>
function showAlert ()
{
alert("you have clicked me")
}
document.forms[0].b1.onclick=showAlert
</script>
```

Note: there are no parentheses

Event handlers as object property

```
<body>
    <form>
       <input type=button name='b1' value="Click ME" />
    </form>
</body>
```

```
<script>
document.forms[0].b1.onclick=function showAlert (){
                                    alert("you have clicked me")
                                }
</script>
```

Event handlers return value

```
<a href="1.htm" onclick="myFunc(); return false">
```

This will make the browser ignore the action of href
valid only inline

- Another way that can also make the browser ignore the action of href is:

```
<a href="javascript:void(0)" onclick="alert('hi')" >
    click me
</a>
```

To avoid refresh action
if href is empty

Example!

Assignment