Cookies: Storing persistent data on the client

• Method by which server-side programs store simplified information on the client machine

• Cookies allow clients to store:
  – user preferences
  – a user-id or password that can be used later in session
  – keep track of activity/purchases
  – track user activity at the site.
Problems with Cookies

• The Plus: convenience to the user and added value to the site owner.

• The “Minus”: Security??:
  – Cookies are never interpreted nor executed; can’t insert a virus
  – Browsers generally accept only 20 cookies per site and 300 in total and each is limited to 4k; can’t fill memory or launch denial of service attacks

• Privacy:
  – Associate email with images (can send an email with images, attach cookies to those images, then identify your (email and all) if you visit that site.
  – Outside access to your cookie files can let someone use your stored credit info.

• Shouldn’t depend on Cookies - Example
Process

Tutorial

- Server asks client to store cookie by supplying a **Set-Cookie** header
  - should contain cookie name and associated value {(name,value) pair}.
- Multiple cookies (up to 20) can be specified by supplying more than one **set-cookie** line
- Browser sends previously created cookie back to the server by means of a **cookie** header
  - multiple cookies can be supplied by separating them with a ; on a single line
  - `Set-Cookie:cookieName=cookieValue; cNa=cVa`
Using JavaScript to Store and Examine Cookies - client side

- Cookies can be manipulated on client side using `document.cookie` property
  
  - if you lookup the value of `document.cookie`, you will get a single big string of all cookie values, as sent by the browser via the `Cookie` HTTP request header.
    
    - If the current page has cookies the value of “name 1=val1; name2=val2; name3=val3”

- You specify a single cookie at a time
  
  - `document.cookie = “name1 = val1”`;
  - `document.cookie = “name2 = val2 ; expires= +someDate”`;
  - `document.cookie = “name3 = val3 ; path=/; domain=test.com”`
• each time cookie is set it is stored by the browser
• cookie persists as long as the browser session (unless `expire=someDate`)
• local files cannot set cookies
Other Capabilities

• **expires**: Cookie is valid only during current session unless an expiration date is supplied in the form:
  
  ```
  Set-Cookie: cookieName=cookieValue; cNa=cVa; expires=Tuesday, 31-May-2008 13:59:59 GMT  
  ```

• **path**: causes all URLs in the specified path to receive the cookie from the browser
  – otherwise it is sent only for URLs in the same directory or subdirectories

  ```
  Set-Cookie: cookieName=cookieValue; cNa=cVa; path=/  
  ```

  applies to all URLs at site
Other Capabilities

• **domain**: Allows cookies to be shared across sites:
  
  ```
  Set-Cookie: cookieName=cookieValue; cNa=cVa;
  Domain = .dvdservice.com
  ```

• **secure**: causes this attribute to only be sent over secure links (this has no associated value)
  
  – otherwise it is sent only for URLs in the same directory or subdirectories (path)

  ```
  Set-Cookie: uid = alaink; secure
  Set-Cookie: password = abcdefg; secure
  ```

  secure is the only cookie attribute that has no associated value

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