COMP 4021

Internet Computing

PHP Sessions

What is a ‘Session’?

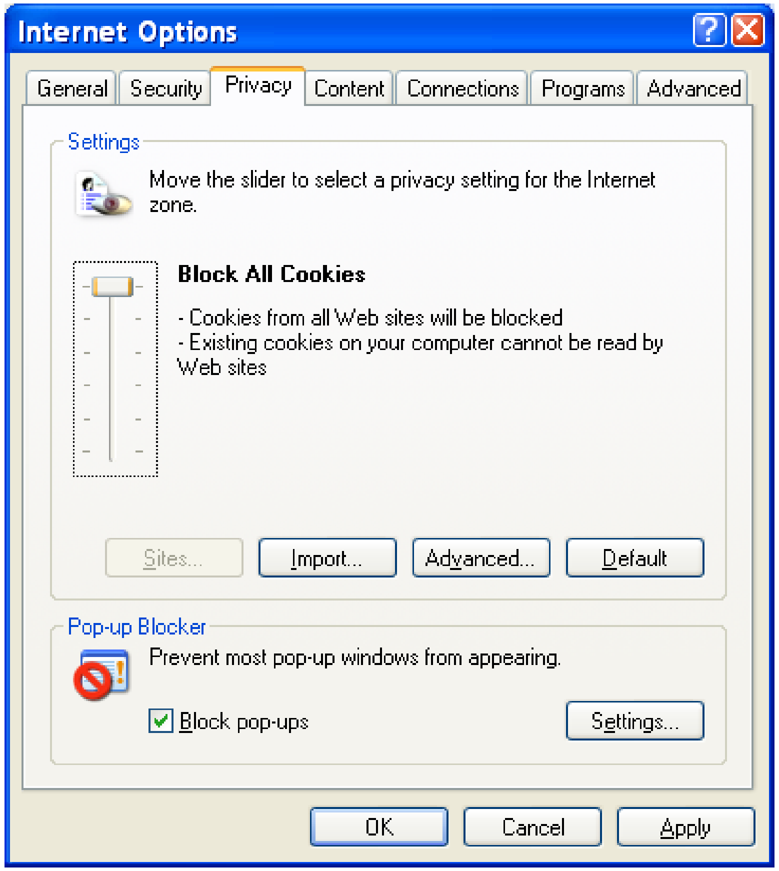
- HTTP is a *stateless* protocol - requests/responses are independent; there is no ‘memory’ from one access to another
- If there is no state then the browser has to send authentication information (i.e. name and password) every time the user accesses a page on that web site
- “States” are crucial for many Web applications

-- We mention this when we study cookies --

Using Cookies

- Traditionally, one way to create a kind of state is to use cookies
- However, a user may block cookies on their computer
- Alternatively, perhaps a browser is being used which does not support cookies (i.e. a browser with high security settings, some mobile phone browsers)

Example Security Settings (IE)


Internet Options

General | Security | Privacy | Content | Connections | Programs | Advanced

Settings

Move the slider to select a privacy setting for the Internet zone.

Block All Cookies

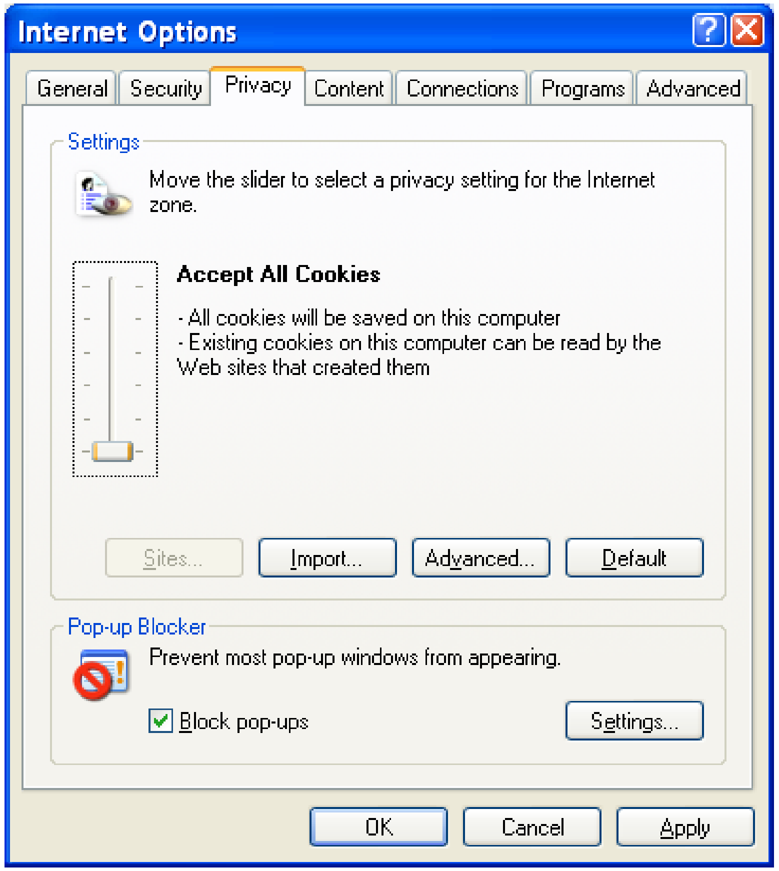
- Cookies from all Web sites will be blocked
- Existing cookies on your computer cannot be read by Web sites

Pop-up Blocker

Prevent most pop-up windows from appearing.

✓ Block pop-ups

. . .


Internet Options

General | Security | Privacy | Content | Connections | Programs | Advanced

Settings

Move the slider to select a privacy setting for the Internet zone.

Accept All Cookies

- All cookies will be saved on this computer
- Existing cookies on this computer can be read by the Web sites that created them

Pop-up Blocker

Prevent most pop-up windows from appearing.

✓ Block pop-ups

High 'privacy' – all cookies blocked

Low 'privacy' - all cookies accepted

Session IDs

- PHP (and other server side languages) can use sessions to identify a sequence of user interactions
- Session can be used to:
  - track anonymous users (no user login needed) for analytics
  - Identify authenticated users so they can access protected pages until logout or session expired
  - Create variables that can be shared between web pages within the same session (e.g., “visit count” in the next slide)
- Create a session using *session_start();* at the beginning of your PHP script, before PHP has done any printing
  - After a session is created successfully, you have:
    - A unique session ID, which can be obtained by session_id(), stored on server
    - A super global array $_session[] storing session related data, e.g., $_session["visit_count"], $_session["last_visit_time"], etc.

Registering a Session Variable

- This code transfers session ID using cookies
- If cookies don’t work, then this code doesn’t work

```
<?php
   session_start(); // create session ID and $_session global variable

   if ( !isset( $_SESSION['count'] ) ) {   // If does not exist, create it
      $_SESSION['count'] = 0;
   } else {
      $_SESSION['count']++;               //  Increment count by one
   }
   echo "You have visited here ".
      $_SESSION['count']." time(s).";  // "." is string concatenate

?>
```

Unregistering a Session Variable

```
<?php
    session_start();

    // Dump the session variable
    unset($_SESSION['count']) ;
?>
```

session_unset(): Erase all session variables and data
session_destroy(): Destroy session data without destroying session variables

Passing Session ID: Cookies vs URL parameters

- There are two methods to propagate a session ID
  1. Cookies: Cookies are simple to use, but …
     - Cookies are not always available
     - Cookies are stored on browser and open to attack
  2. Session ID is passed as a URL parameter using GET method
- PHP session module supports both methods
  - Use cookies first, if unsuccessful, use GET parameter

session_start() and Session IDs

- A session ID must be at least 128 bits long (why so long?)
- What does session_start() do?
  - **If** session has been created (session ID in browser cookie or in URL parameter)
  - **then** load session data and continue
  - **else** generate session ID and set browser cookie, create $_SESSION

    PHP super global array
    - **If** session cookie does not exist (i.e., cookie disabled; use URL redirect)
    - **then** PHP constant SID set to session ID (PHPSESSID=cffce217b4…),
    - **else** SID set to empty (no need because cookie can do the job)

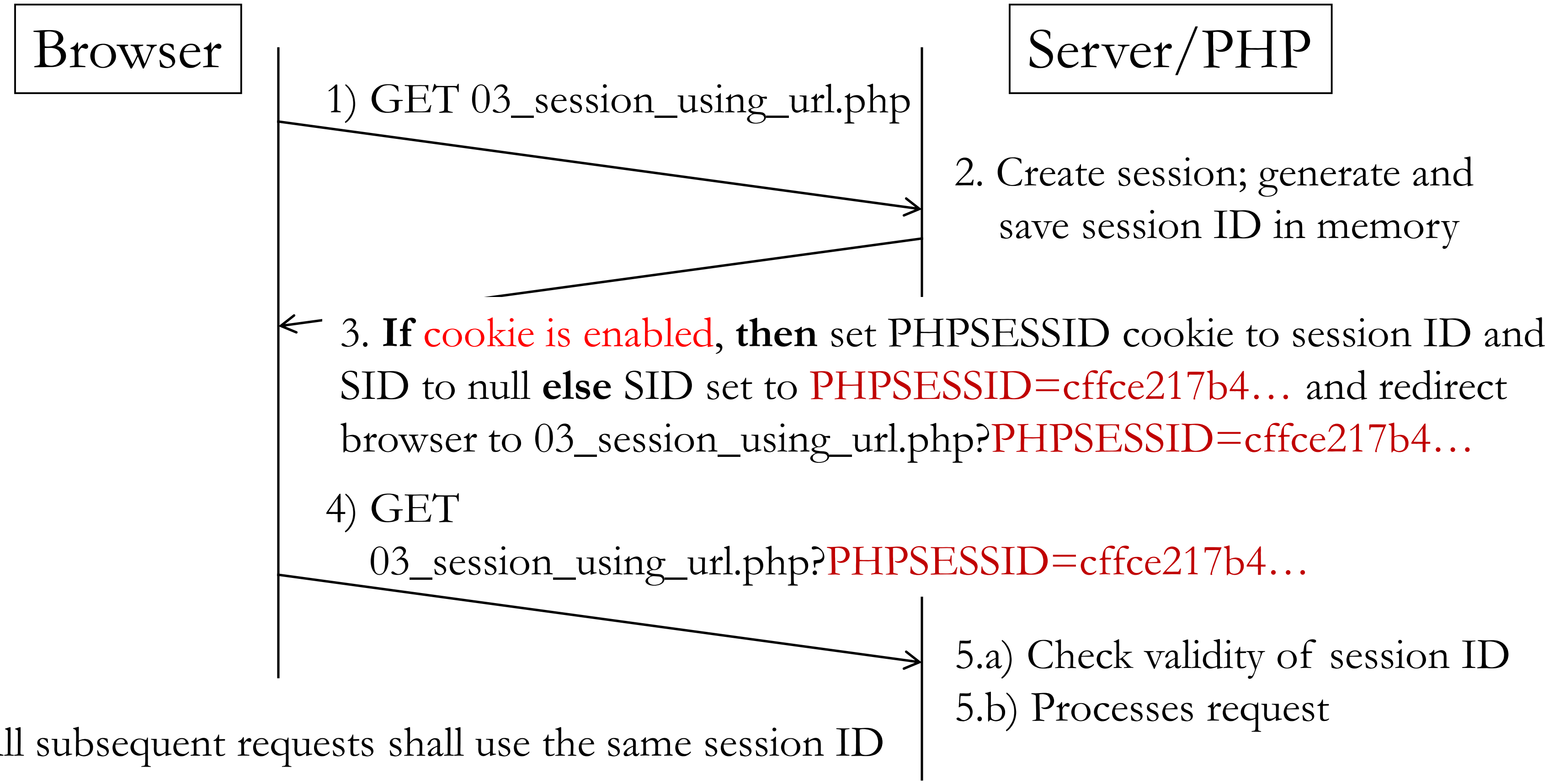
- The first GET is: GET 03_session_using_url.php
- Depending on whether cookies or redirect is used, subsequent GETs are either

  GET 03_session_using_url.php?

  or

  GET 03_session_using_url.php?PHPSESSID=cffce217b4…

A Possible Interaction Scenario



1) GET 03_session_using_url.php

2. Create session; generate and save session ID in memory

3. **If** cookie is enabled, **then** set PHPSESSID cookie to session ID and SID to null **else** SID set to PHPSESSID=cffce217b4… and redirect browser to 03_session_using_url.php?PHPSESSID=cffce217b4…

4) GET 03_session_using_url.php?PHPSESSID=cffce217b4…

5.a) Check validity of session ID
5.b) Processes request

All subsequent requests shall use the same session ID

Example Using URL

- This code transfers session ID using the GET method parameter in the URL

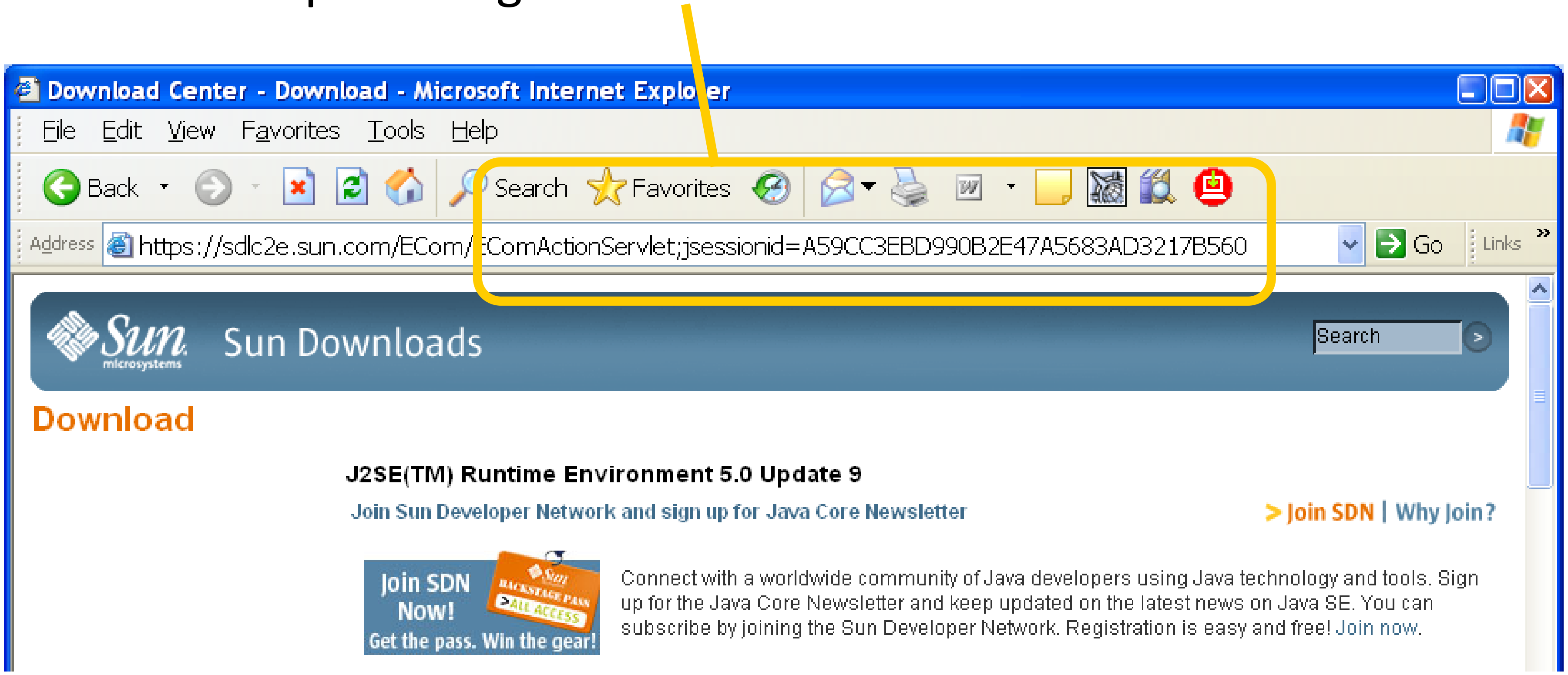
```
<?php
 // This will check for both cookie and URL methods
 session_start();  // Step 2

 if (!isset($_SESSION['count'])) {
   header("Location: 03_session_using_url.php?".SID);  // Step 3
   $_SESSION['count'] = 0;
 } else {
   echo "You have visited here ".$_SESSION['count']." time(s)";
   $_SESSION['count']++;   }
?>
```

03_session_using_url.php

Using URL to pass Session ID

- An example of using URL to pass session ID in a website developed using Java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https://sdlc2e.sun.com/ECom/EComActionServlet;jsessionid=A59CC3EBD990B2E47A5683AD3217B560

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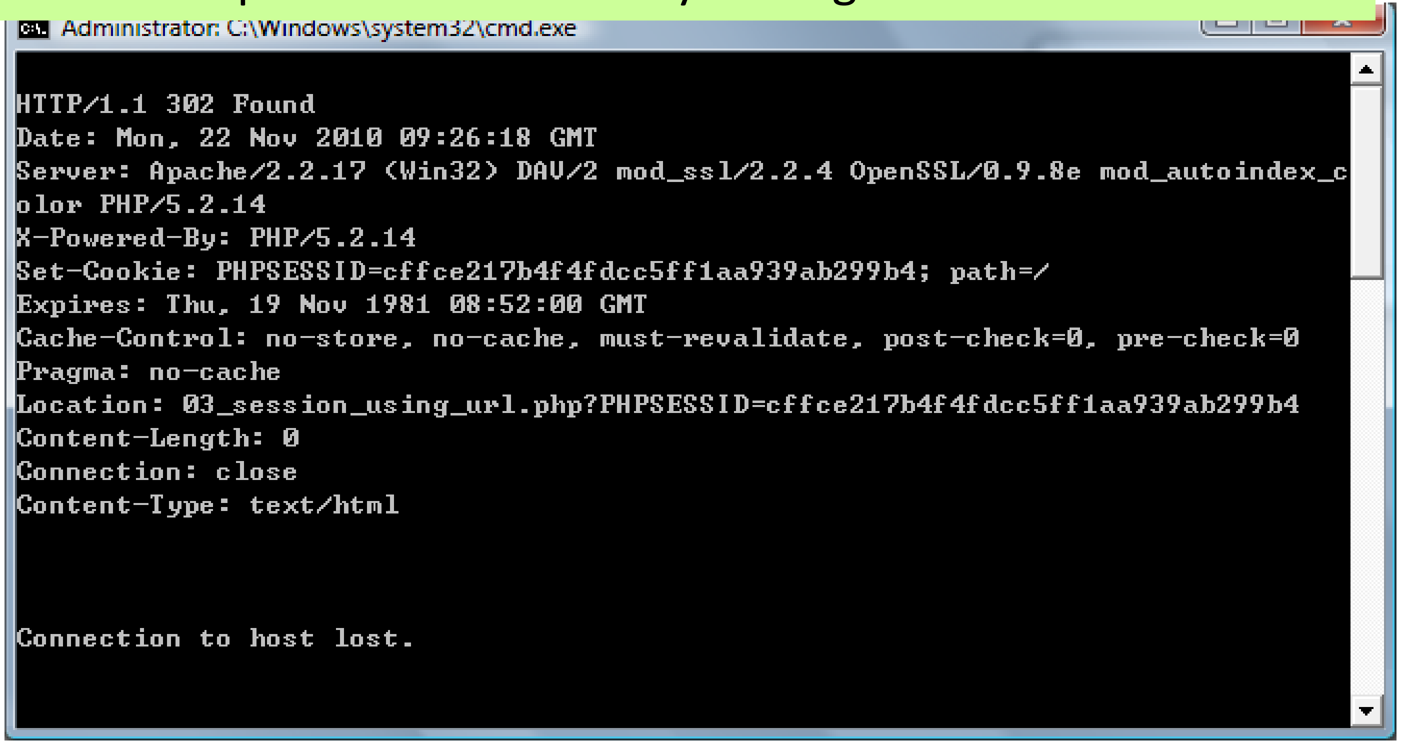
Example Output using PHP

Session ID is passed to browser by setting the PHPSESSID cookie



Administrator: C:\Windows\system32\cmd.exe

```
HTTP/1.1 302 Found
Date: Mon, 22 Nov 2010 09:26:18 GMT
Server: Apache/2.2.17 (Win32) DAV/2 mod_ssl/2.2.4 OpenSSL/0.9.8e mod_autoindex_c
olor PHP/5.2.14
X-Powered-By: PHP/5.2.14
Set-Cookie: PHPSESSID=cffce217b4f4fdcc5ff1aa939ab299b4; path=/
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
Pragma: no-cache
Location: 03_session_using_url.php?PHPSESSID=cffce217b4f4fdcc5ff1aa939ab299b4
Content-Length: 0
Connection: close
Content-Type: text/html



Connection to host lost.
```

Tell the browser to re-load the same program again, this time passing the Session ID to the program so that it can access and manipulate it

Take Home Message

- Session is important for security reason (time out a login)
- It is also important for web analytics, e.g., a session can be treated as a ‘visit’
- PHP provides some handy functions for handling sessions