IERG 4210

Web Programming and Security

Tutorial 4

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Outline

- Tips for Phase 3
- Lecture review

Tips for Phase 3

- Using AJAX to get the price of the product, then calculate the total price and update the UI
- Store the pid and quantity of each product in Localstorage
- Restore the shopping list info through LocalStorage when page is reloaded.

Tips for Phase 3

- JavaScript: Dynamically update the shopping List
  - When click “Add to Cart” Button
  - When hover on the shopping List, a shopping list will expand
    - you can change the quantities of goods on the expended shopping list
  - When the page is reloaded, restore the shopping list from local storage.

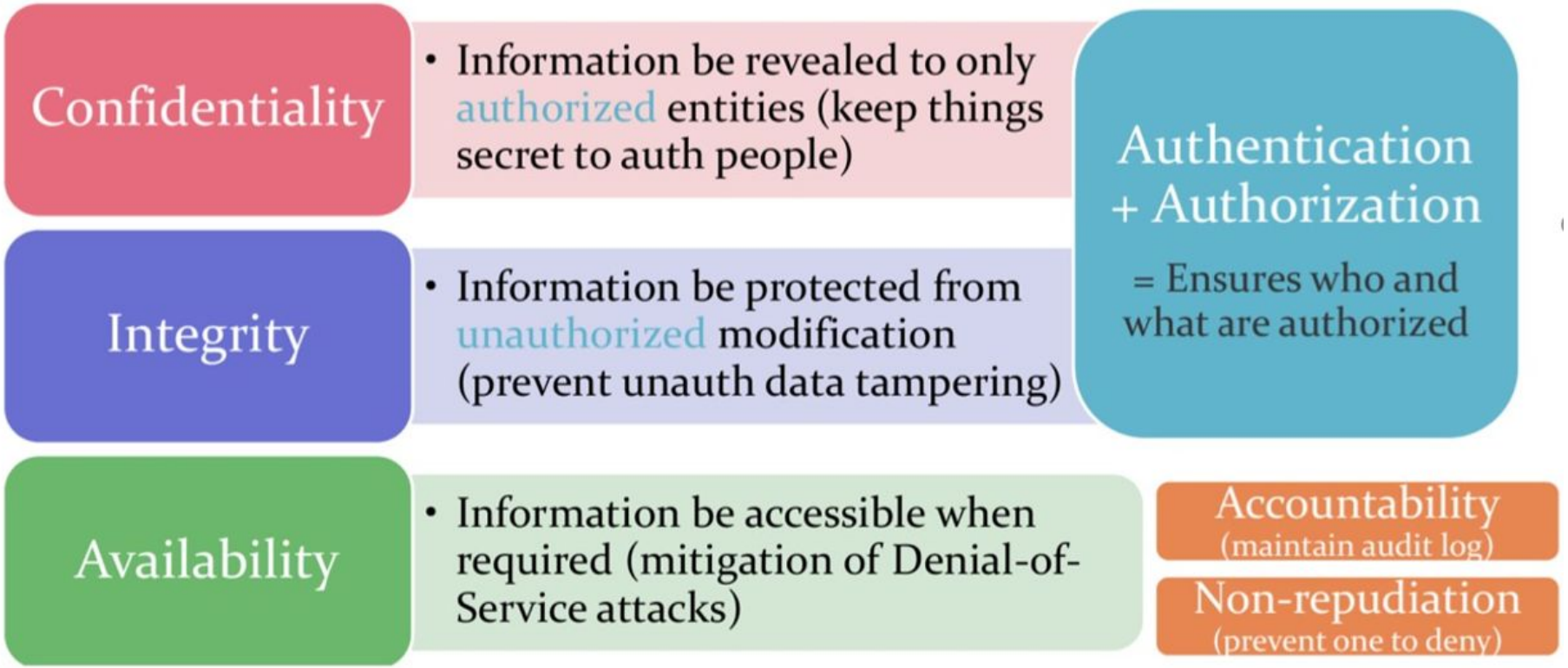
Basic Concepts of Web

- Web Architecture
  - HTTP, URL, etc.
- Web Development Languages
  - HTML, CSS, JavaScript, PHP, etc.
- Web Development Components
  - User Interface Design
    - Both Client and Server Side
  - Forms Handling
    - Both Client and Server Side
  - Web and Database Server Management
  - Session Management & Authentication

Basic Concepts of Internet

- **Internet Components**
  - **URL: URL is a string that references an Internet resource.**
  - **Domain Name: Domain Name System (DNS) server resolves domain name to IP addresses for ease memorizing, or vise versa**
  - **IP Address: Address is a numerical address that references a device connecting to a computer network using the Internet Protocol.**
  - **World Wide Web: is the point-and-click system of navigating through information shared over the Internet by using hypertext**

Information Security Goals



Secure Design Principle

- Securing the Weakest Link
- Secure Failure
- Defense-in-Depth
- Least-privilege
- Compartmentalization / Separation of Privilege
- Simplicity
- Promote Privacy
- Don’t extend trust easily

Client-side UI

- Structure and Content –HTML
- Presentation – Cascading Style Sheet (CSS)
- Behavior – JavaScript (JS)
  - An Object-Oriented Scripting Language
    - Dynamic Typing – Variable Types are generally dynamic
    - Interpreted Language – Just-In-Time (JIT) Compilation at browsers
    - Syntax – Similar to Java
- Data Object Model (DOM)
  - Browsers will parse a Web page file and build a tree-like data structure for it
  - Every <tag> corresponds to a Node Object, including CSS, JavaScript

JavaScript Events

- An element generates events that reflect its current status, which can be registered with event listening callback functions that respond accordingly.
- Asynchronous – Events are fired out of order
- Non-threaded – Events get queued and fired one at a time
- Some common types:
  - Mouse: click, mouseover, mouseout, dragstart*
  - Keyboard: keydown, keypress, keyup
  - TouchScreen: touchstart*, touchmove*, touchend*
  - Form/Input/Select: submit, change, focus
  - Un/Loading: load, beforeunload, error, readystatechange
  - Timer: setTimeout(), setTimeInterval()

Forms – Client-Side

- HTML Forms: Basic and Input Controls
- Client-Side Restrictions
  - The use of different form controls
  - Validations with HTML5
  - Validations with JavaScript
- Form Submission Approaches
  - Traditional Form Submission
  - Programmatic Form Submission
  - AJAX Form Submission

Forms – Server-Side

- Request Methods: Get vs. POST
- PHP, a server-side Scripting language:
  - Basics
  - C-like syntax with a few syntactic differences
  - Block-level Scoping for variables
- Form / Request Handling with PHP:
  - Input – Sanitizations and Validations
    - Code at client-side (for user experience enhancement)
    - Code at server-side (for security enforcement)
    - Security Best Practice (for input validation)

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  - Process – Database Manipulation
    - SQL Languages (e.g., SELECT *)
    - DB Manipulations with PHP Data Objects (PDO)
  - Output – HTML vs. JSON

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  - Output - HTML vs. JSON
    - Advantages of using JSON when compared to HTML
      - Minimize bandwidth needed
      - JSON parsing is stunning fast as the format itself is JS
      - Loose coupling: PHP - data-intensive processing; JS - UI handling