

Web 2.0

Lecture 1: Introduction to JavaScript

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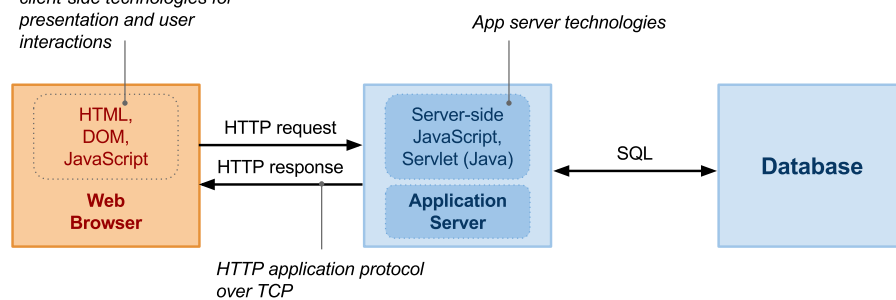
Evropský sociální fond
Praha & EU: Investujeme do vaší budoucnosti

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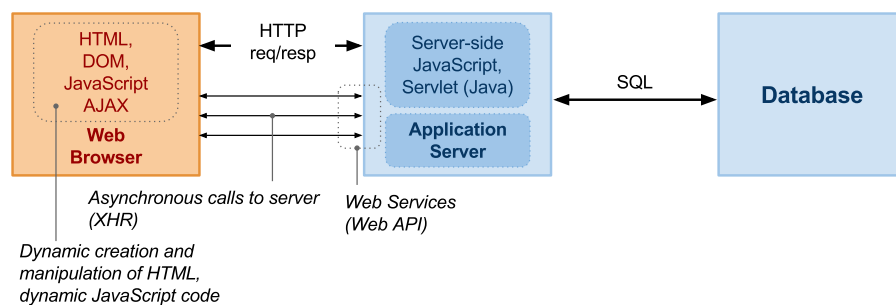
Web 2.0 Application Architecture

Web Application

client-side technologies for presentation and user interactions



Web 2.0 Application



JavaScript

- Lightweight, interpreted, object-oriented language
- Standard
 - *All major browsers support ECMAScript 6 and 7*
- Major characteristics
 - *First-class functions*
 - *functions as first-class citizens*
 - *language supports: passing functions as arguments to other functions, returning functions as values from other functions, assigning functions to variables or storing them in data structures.*
 - *Anonymous functions*
 - *declared without any named identifier to refer to it*
 - *Closures*

Overview

- **JavaScript Basics**
- Server-side JavaScript

Objects and Arrays

- Objects and Arrays
- Functions

Functions

- Function Callbacks
 - *You can use them to handle asynchronous events occurrences*
- Functions as values in object

Closures

- Closures
 - *A function value that references variables from outside its body*

Overview

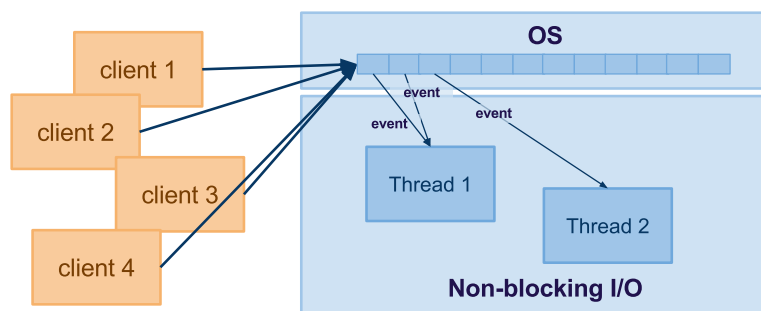
- JavaScript Basics
- **Server-side JavaScript**

Recall: Application Server

- Environment that runs an application logic
 - Client communicates with AS via an application protocol
 - Client – Browser, application protocol – HTTP
- Terminology
 - Application Server × Web Server × HTTP Server
 - AS is a modular environment; provides technology to realize enterprise systems
 - AS contains a Web server/HTTP server
 - We will deal with Web server only
- Two major models to realize communication
 - Blocking I/O (also called synchronous I/O)
 - Non-blocking I/O (also called asynchronous I/O)
- A technology we will look at
 - Node.js – runs server-side Javascript

Non-Blocking I/O Model

- Connections maintained by the OS, not the Web app
 - The Web app registers events, OS triggers events when occur



- Characteristics
 - Event examples: new connection, read, write, closed
 - The app may create working threads, but controls the number!
 - much less number of working threads as opposed to blocking I/O

Node.js

- Node.js [🔗](#)
 - Web server technology, very efficient and fast!
 - Event-driven I/O framework, based on JavaScript V8 engine
 - Any I/O is non-blocking (it is asynchronous)
 - One worker thread to process requests
 - You do not need to deal with concurrency issues
 - More threads to realize I/O
 - Open sourced, @GitHub [🔗](#), many libraries [🔗](#)
 - Future platform for Web 2.0 apps
- Every I/O as an event
 - reading and writing from/to files
 - reading and writing from/to sockets

HTTP Server in Node.js

- HTTP Server implementation
 - server running at **138.232.189.127**, port **8080**.
 - Test it using Telnet

Google Apps Script

- Google Apps Script
 - *JavaScript cloud scripting language*
 - *easy ways to automate tasks across Google products and third party services*
- You can
 - *Automate repetitive processes and workflows*
 - *Link Google products with third party services*
 - *Create custom spreadsheet functions*
 - *Build rich graphical user interfaces and menus*

Rhino

- Rhino
 - *open-source implementation of JavaScript written entirely in Java*
 - *managed by the Mozilla Foundation*
 - *also provides another implementation of JavaScript engine written in C named SpiderMonkey*
 - *typically embedded into Java applications to provide scripting to end users*
 - *core language only and doesn't contain objects or methods for manipulating HTML documents*
 - *enabling development of webapps with JavaScript in containers like Jetty, Tomcat, and Google AppEngine*