

Platform-Based Development: Hybrid Application Development

BS UNI studies, Spring 2018/2019

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Google blocks Huawei access to Android updates after blacklisting

Reported move could hit Huawei Technologies' ability to run phone operating system



Course Admin

- Sprint #4:
 - <http://bitbucket.org/veljkop/runsup/>
 - Don't forget to describe key contributions of you Sprint #4 app
 - Graded on a curve
 - Deadline May 31st 23:59
(firm deadline!)



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Course Admin

- EU Joint Research Center Collaborative Doctoral Programme
 - (Well) funded PhD positions in mobile cybersecurity
 - Presentation **on Wednesday, May 22nd, noon at P21**
 - Internship option for those who have a BS degree
 - Five month paid position in Ispra, Italy

Advantage:

- Programming experience, preferably in mobile environments.
- Experience in debugging.
- Knowledge of Android Studio.



Course Admin

- Today's lecture finishes around 6 pm
 - Lab prep afterwards in P02
- At 7 pm at P22 a roundtable on the dark side of mobile device usage
 - Electronic communication device addiction
 - In Slovenian



Cross-Platform Software

- Idea: write programme once, run it everywhere
- Motivation:
 - We increasingly expect the same functionality from different platforms (e.g. desktop and mobile)
 - The same platform (e.g. mobile) is pushed in different directions by different vendors (e.g. Android vs iOS)



Cross-Platform Software

- Solution: lightweight technologies that can run on different platforms (e.g. Web apps written in HTML, JavaScript, CSS)
- Drawbacks:
 - Features not supported by high-level methods cannot be used
 - We only get the lowest common denominator subset of features which are available on all platforms
 - Translating cross-platform programmes to individual native languages can lead to inefficient programmes
 - Different platforms often have different user interface

conventions



Making Cross-Platform Software More Functional

- Idea: enable access to lower level features of individual platforms
- Solution – Hybrid development:
 - Lightweight technologies that can run on different platforms (e.g. HTML, JavaScript, CSS)
 - Libraries implementing access to internal functionalities of individual platforms
 - Pack into applications for individual platforms



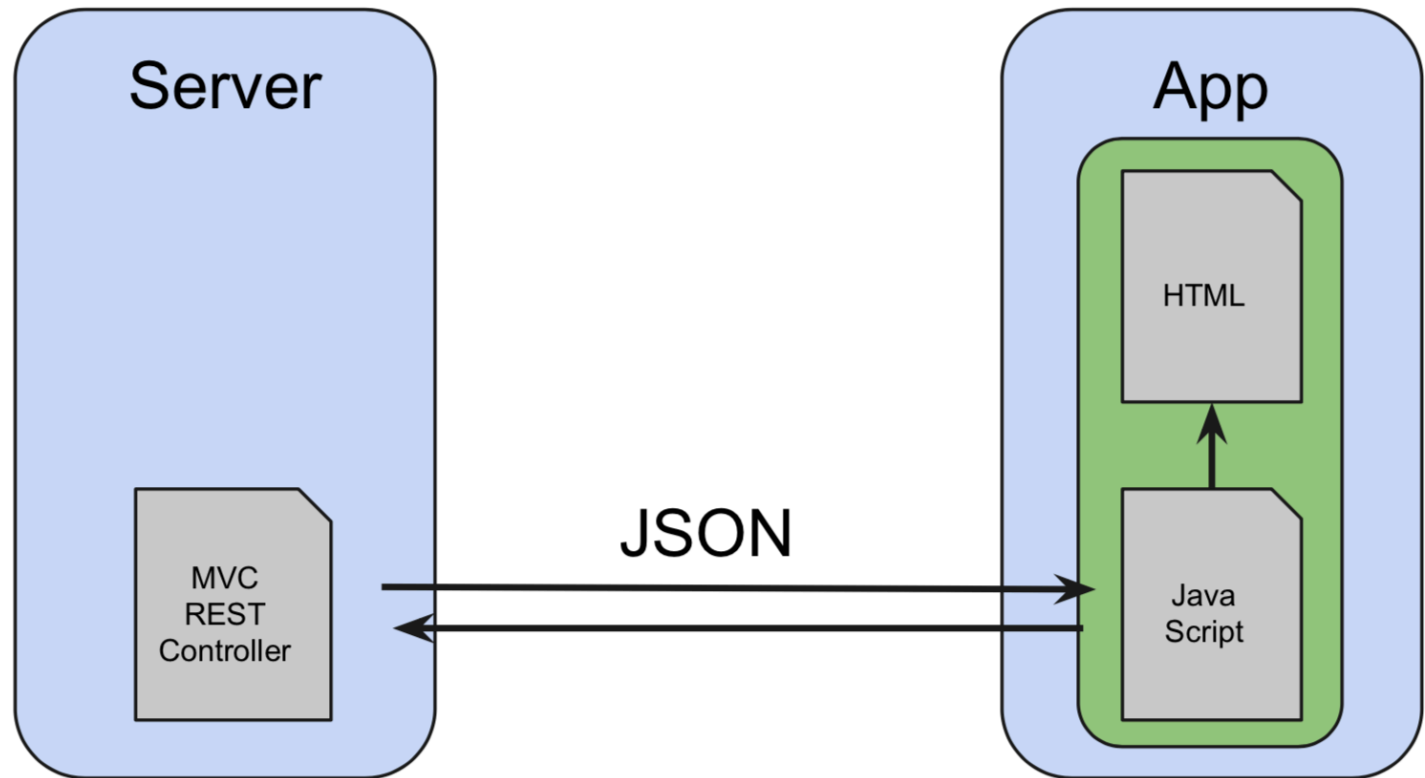
Apache Cordova

- Mobile hybrid app development framework
- Apps written using CSS, HTML5, and JavaScript
- HTML5 enables limited access to native functionalities
- External plugins connect native functionalities with HTML5, e.g. to access accelerometer, camera, compass, file system, microphone, etc.



Apache Cordova

- Apps are Web views running Web apps



Apache Cordova

- You do not need to take care of the platform (e.g. Android) lifecycle, if your app behaves as a classic Web site
 - Application automatically loaded, paused, resumed, and closed by the system
- You can **capture and react to lifecycle events** if needed (e.g. initialise a component at the application launch, save data on pause, etc.)
 - Events exposed through wrappers



Apache Cordova

- Common events exposed by the application:
 - Device Ready – app fully loaded
 - Application Pause – app paused
 - Application Resume – app resumed
 - Back button press
 - Menu button press
 - Start call button press
 - ...
- Example use:
 - `document.addEventListener("pause", callbackFion, false);`



Apache Cordova

- Plugins
 - For sensor access, platform-specific UI methods, database access, disk storage, etc.
 - Installed via
 - `cordova plugin add`
 - Explore plugins at
 - <https://cordova.apache.org/plugins/>



Apache Cordova

- Minimising drawbacks
 - Performance (compared to native apps):
use minified versions of JavaScript and CSS files
 - Non-native look and feel
use CSS-based frameworks such as Ionic to create apps with a native-like look and feel



Apache Cordova

- Prerequisites for running Cordova
 - Node.js
 - The SDK of the platform (Android, iOS, Blackberry, Windows Phone, WebOS)
 - For Android: Java8, Gradle
- Please install Cordova before this week's lab!



Cordova Example

