Java on Mobile

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Java on the client

- Java started on the client

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Java on the client

- Targeting Set-Top Boxes, Video On Demand
  - Premature busines models
  - Cable providers wanted all control
- Mobile phones no big business in 1995

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Then came the server

- Java programming language turned out to be very suited for enterprise/backend development
  - J2EE API's
  - Third party frameworks (Hibernate/Spring/…)
  - IDE's, devops
- Mature business model
- Controlled environments
- Known customers

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What happened to the client?

- Desktop: Swing

- Mobile/PDA:
  - KVM/CVM
  - CDC/CLDC
  - MIDP/PDA/Foundation
  - Personal/RMI

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What happened to the mobile client?

- Java:
  - Fragmentation. Swing on your phone?
  - Required Java on the device
  - No way to easily deploy to end consumers
- Android and iOS
  - Proprietary UI framework
  - Java 7 and Objective-C
  - But it works, looks great and is easy to deploy!

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What if we had Java on Mobile

- Android and iOS
  - ~~Proprietary UI API~~
  - ~~Java 7 and Objective-C~~
  - ~~But it works, looks great and is easy to deploy!~~
- Java
  - Standard UI API (desktop/mobile/embedded)
  - Java 9
  - It still works, looks great and is easy to deploy!

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Standard UI API: JavaFX

- Part of the Java SDK 8
- Open-source (OpenJFX project in OpenJDK)
- Modern API, modern architecture, hardware acceleration
- Leverages Java 8 (functional interfaces)
- FXML markup language (optional)
- Binding framework (model – view), allows MVC
- CSS styling and skinning

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JavaFXPorts: JavaFX on Mobile

- Uses the code in OpenJFX repository

- Apply some Android/iOS specific changes

- Open-source

- Community-effort, maintained by Gluon

- JavaFX SDK for mobile:

  - Public releases

  - Commercial support

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JavaFX needs Java on mobile

- Android: Dalvik/ART (Java 7)
- iOS: RoboVM AOT (leveraging Java 7 runtime)

- Mobile port of OpenJDK:
  - Java 9 on modern mobile devices
  - Project proposed by Oracle
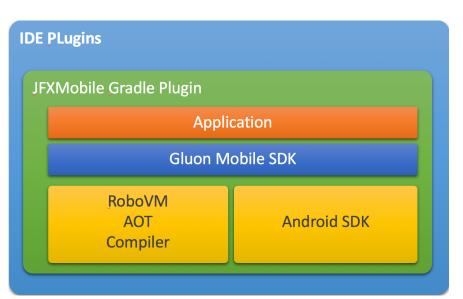 - On Android, iOS and Windows tablets

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Creating an app

- There are some steps between javac and uploading an app
- Bundle your application code and resources with Java and JavaFX runtime
- Gradle script
- IDE plugins

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Creating an app

- IDE plugins create IPA, APK
- allows to run/test on desktop and devices
- 100% code reuse
- Platform-specific code is possible

IDE PLugins

JFXMobile Gradle Plugin

Application

Gluon Mobile SDK

RoboVM AOT Compiler

Android SDK

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Demo

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- It's not just spare time
- Provide commercial support for Java on Mobile
- Provide services and products on top of JavaFX
- eco-system:
  - Open source component need commercial support
  - Commercial company relies on open source component
- Gluon co-funds JavaFXPorts, other companies invited as well.

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- Free tools:
  - Scene Builder
  - JavaFX SDK's
  - IDE Plugin's

- Commercial tools
  - Charm (client library, Material Design controls)
  - Gluon Cloud (data persistence/synchronization and access to legacy/cloud systems)

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Look and feel

- Java
  - Standard UI API (desktop/mobile/embedded)
  - Java 9
  - It still works, looks great and is easy to deploy!
- Consistent and compelling look and feel across devices
- JavaFX Controls can be styled (css), skinned and customized

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Gluon Charm

- Gluon Charm:
    - Client library
    - Add (iOS/Android) specific styling to existing JavaFX Control
    - Add mobile Controls (with specific styling)
    - Allows MVC approach
    - Provides Flow API's
- demo

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Charm Down

- Open Source
- Access native functionality in a cross-platform way
- Examples:
  - Get location info
  - Caching API
- No Android/iOS/Desktop specific code needed
- Runtime: bundle with charm-down-{ios/android/desktop}

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Charm Down

- Code snippet for local file storage

```
import com.gluonhq.charm.down.common.Platform;
import com.gluonhq.charm.down.common.PlatformFactory;

Platform platform = PlatformFactory.getPlatform();
File privateStorage = platform.getPrivateStorage();
```

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Native API's

- Not everything is standardized in Charm-Down
- Examples
  - Activity integration
  - Android watch notifications
- We use the platform-specific source directories for this
- Demo

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Future plans

- Java 9
- Performance
- More mobile widgets, great Look and Feel
- More cloud/back-end integration

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Thanks For Attending

Any Questions?