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Building iOS Apps with Java 8

And Android Too...

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Warning – demo may contain small fonts – sit closer...



Safe Harbor Statement

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The Most Scary Things...

1



2



loading...

3



Mobile Apps – 3 kinds

- Native
 - Develop with the platform’s specific SDK, language, tools
- Web
 - Develop once – run on many – limited “mobile experience”
- Hybrid
 - Develop once run on many



A Java Developer in a Mobile World

- I can do the backend for mobile apps
- I can do mobile web apps
- I can use a variation on Java to build Android only apps
- But is this all?



What If You Could...

- Build on-device apps for iOS and Android (and Windows)
- Use the language you already know – Java
- Leverage techniques/methodologies you know
 - MVC
 - Component based UI definition
 - POJO beans
- Develop in an IDE you already know – Eclipse or JDeveloper
- Integrate with device features and notifications
- Support offline and online apps



Steps For a Solution

- Get a JVM running on iOS
- Get same JVM running on Android and Windows
- Build a development framework
- Build tooling for the framework

You Can with Oracle Mobile Application Framework

Productivity Boosting Mobile Development Framework

Oracle Mobile App
Framework



JVM on iOS

- JDK 8
- Compact Profile 2
- Native library

compact1	compact2
-----	-----
java.io	java.rmi
java.lang	java.rmi.activation
java.lang.annotation	java.rmi.registry
java.lang.invoke	java.rmi.server
java.lang.ref	java.sql
java.lang.reflect	javax.rmi.ssl
java.math	javax.sql
java.net	javax.transaction
java.nio	javax.transaction.xa
java.nio.channels	javax.xml
java.nio.channels.spi	javax.xml.datatype
java.nio.charset	javax.xml.namespace
java.nio.charset.spi	javax.xml.parsers
java.nio.file	javax.xml.stream
java.nio.file.attribute	javax.xml.stream.events
java.nio.file.spi	javax.xml.stream.util
java.security	javax.xml.transform
java.security.cert	javax.xml.transform.dom
java.security.interfaces	javax.xml.transform.sax
java.security.spec	javax.xml.transform.stax
java.text	javax.xml.transform.stream
java.text.spi	javax.xml.validation
java.util	javax.xml.xpath
java.util.concurrent	org.w3c.dom
java.util.concurrent.atomic	org.w3c.dom.bootstrap
java.util.concurrent.locks	org.w3c.dom.events
java.util.jar	org.w3c.dom.ls
java.util.logging	org.xml.sax
java.util.regex	org.xml.sax.ext
java.util.spi	org.xml.sax.helpers
java.util.zip	
javax.crypto	
javax.crypto.interfaces	
javax.crypto.spec	
javax.net	
javax.net.ssl	
javax.security.auth	
javax.security.auth.callback	
javax.security.auth.login	
javax.security.auth.spi	
javax.security.auth.x500	
javax.security.cert	



JVM on Android and Windows

- Android - done
- Windows 10 - coming soon

compact1	compact2
java.io	java.rmi
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java.lang.invoke	java.rmi.server
java.lang.ref	java.sql
java.lang.reflect	javax.rmi.ssl
java.math	javax.sql
java.net	javax.transaction
java.nio	javax.transaction.xa
java.nio.channels	javax.xml
java.nio.channels.spi	javax.xml.datatype
java.nio.charset	javax.xml.namespace
java.nio.charset.spi	javax.xml.parsers
java.nio.file	javax.xml.stream
java.nio.file.attribute	javax.xml.stream.events
java.nio.file.spi	javax.xml.stream.util
java.security	javax.xml.transform
java.security.cert	javax.xml.transform.dom
java.security.interfaces	javax.xml.transform.sax
java.security.spec	javax.xml.transform.stax
java.text	javax.xml.transform.stream
java.text.spi	javax.xml.validation
java.util	javax.xml.xpath
java.util.concurrent	org.w3c.dom
java.util.concurrent.atomic	org.w3c.dom.bootstrap
java.util.concurrent.locks	org.w3c.dom.events
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javax.crypto.interfaces	
javax.crypto.spec	
javax.net	
javax.net.ssl	
javax.security.auth	
javax.security.auth.callback	
javax.security.auth.login	
javax.security.auth.spi	
javax.security.auth.x500	
javax.security.cert	



JVM for Mobile Devices Coming to OpenJDK (Soon)

- JDK 9 based
- Support at minimum the equivalent of compact2 profile
- iOS x64 and arm64
- Android x86 and arm
- Windows 10 x64 Surface Pro
- JavaLauncher helper interface

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Mobile Development Framework

- Component based UI
- MVC architecture
- Declarative binding
- Access to device features
- Security
- Secured offline storage



Oracle Mobile Application Framework – Oracle MAF

Productivity boosting mobile development framework

- Build Once, Run on Multiple-Platforms
- Simpler UI development
- Java, JavaScript, and HTML5-based application development
- Offline-capable: SQLite with Encryption
- Full Access to Native Device Features
- Modular, Reusable Components
- Choice of development tools



Business Logic Development

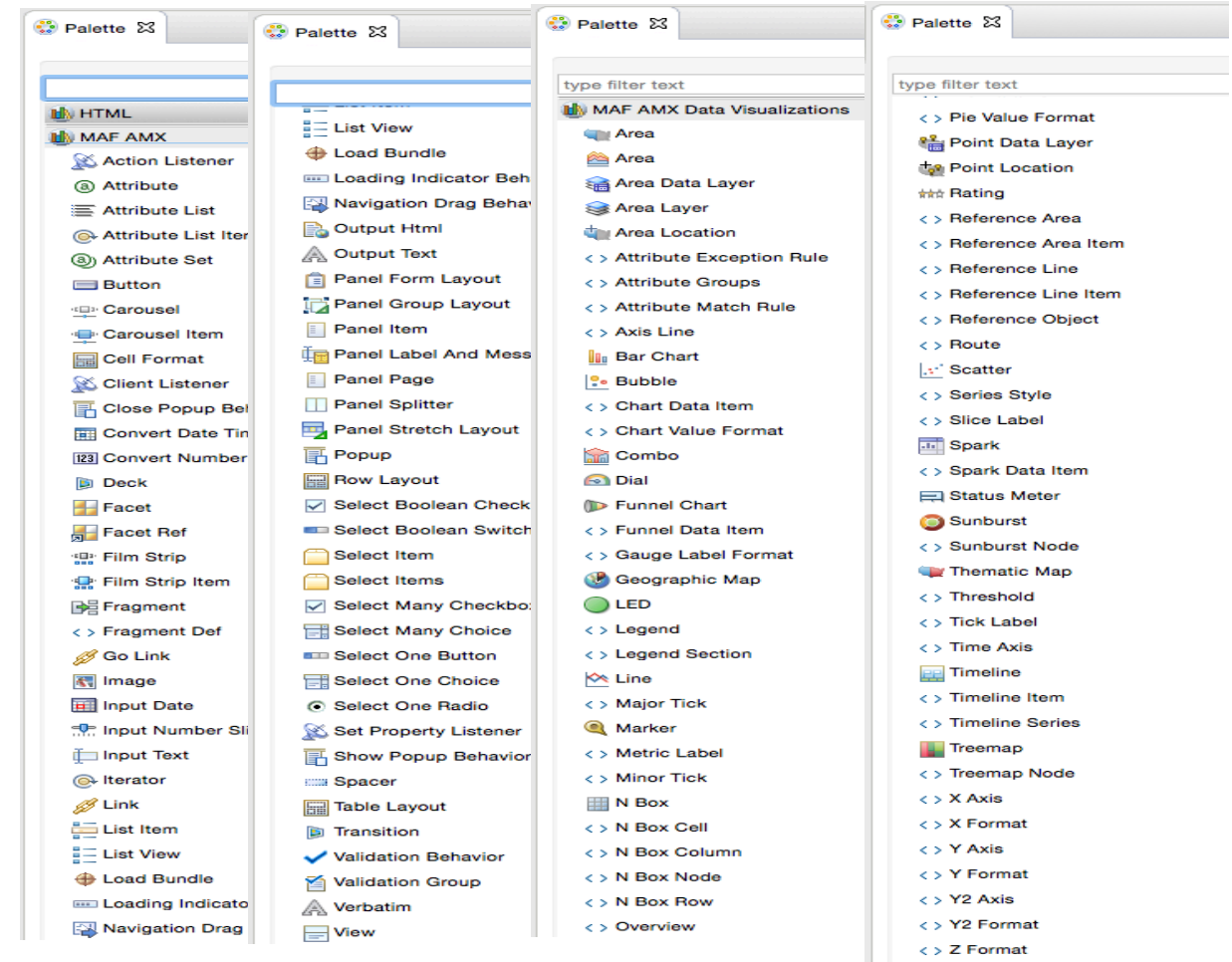
Access and Process Application Data

- Code logic with Java 8
- Lightweight JVM
 - Java 8 Compact profile 2
- Native library on device
- Used for
 - Accessing local and remote data (model)
 - Respond to UI events (controller)



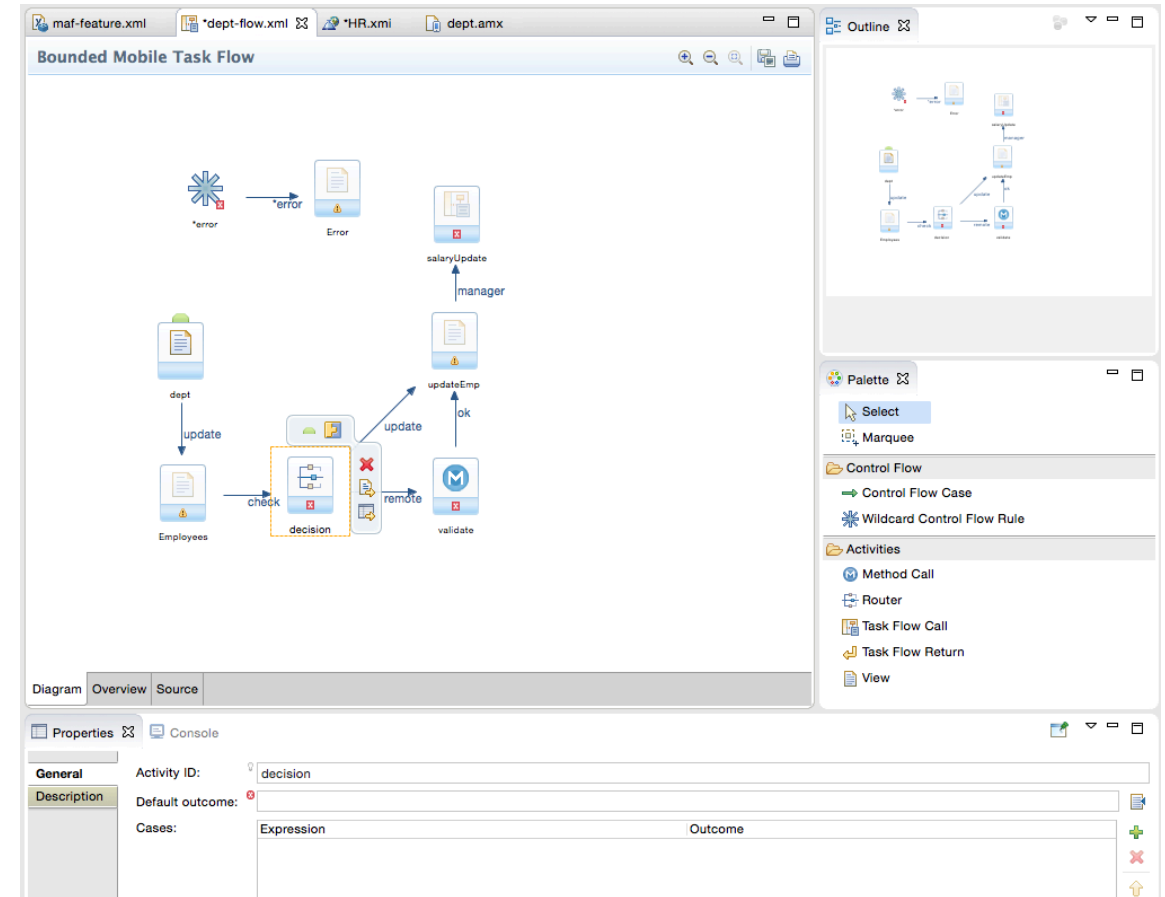
UI Development – UI Components

- 80+ Components
- XML format
- Visual development
- Declarative data binding
- Rendered into mobile optimized HTML5/JavaScript on device at RT
- Customized look and feel with CSS
- Custom component creation



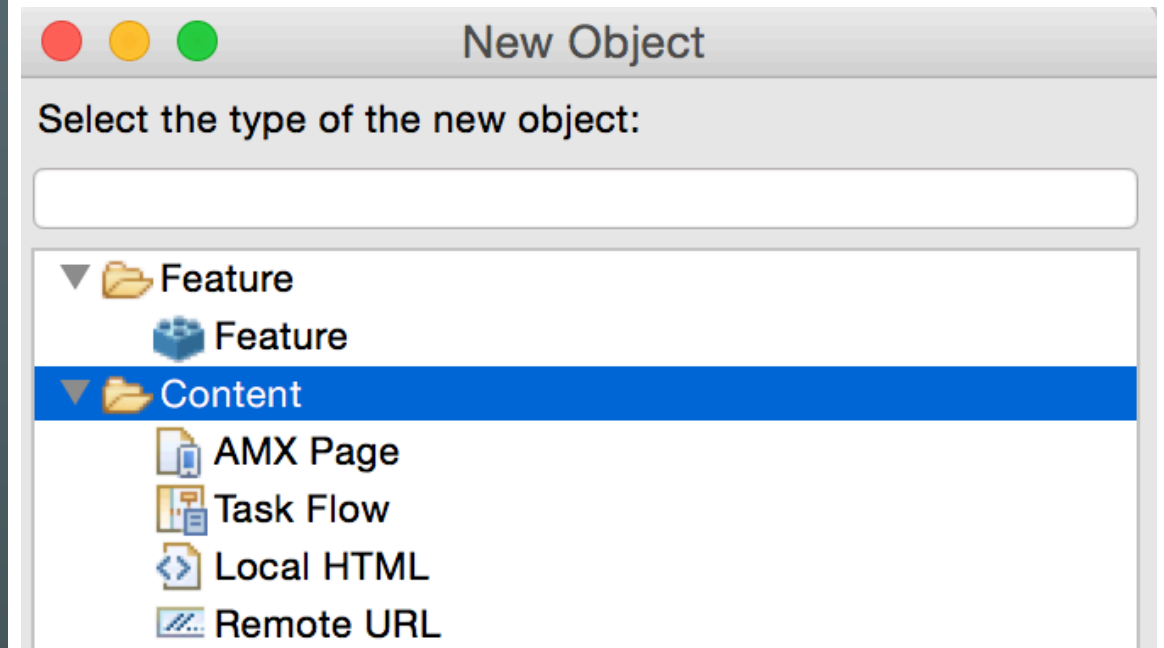
Controller Development

- MVC architecture
- Define the flow of your application
- Navigate between pages, methods and decision points
- Java code for UI events and managed beans



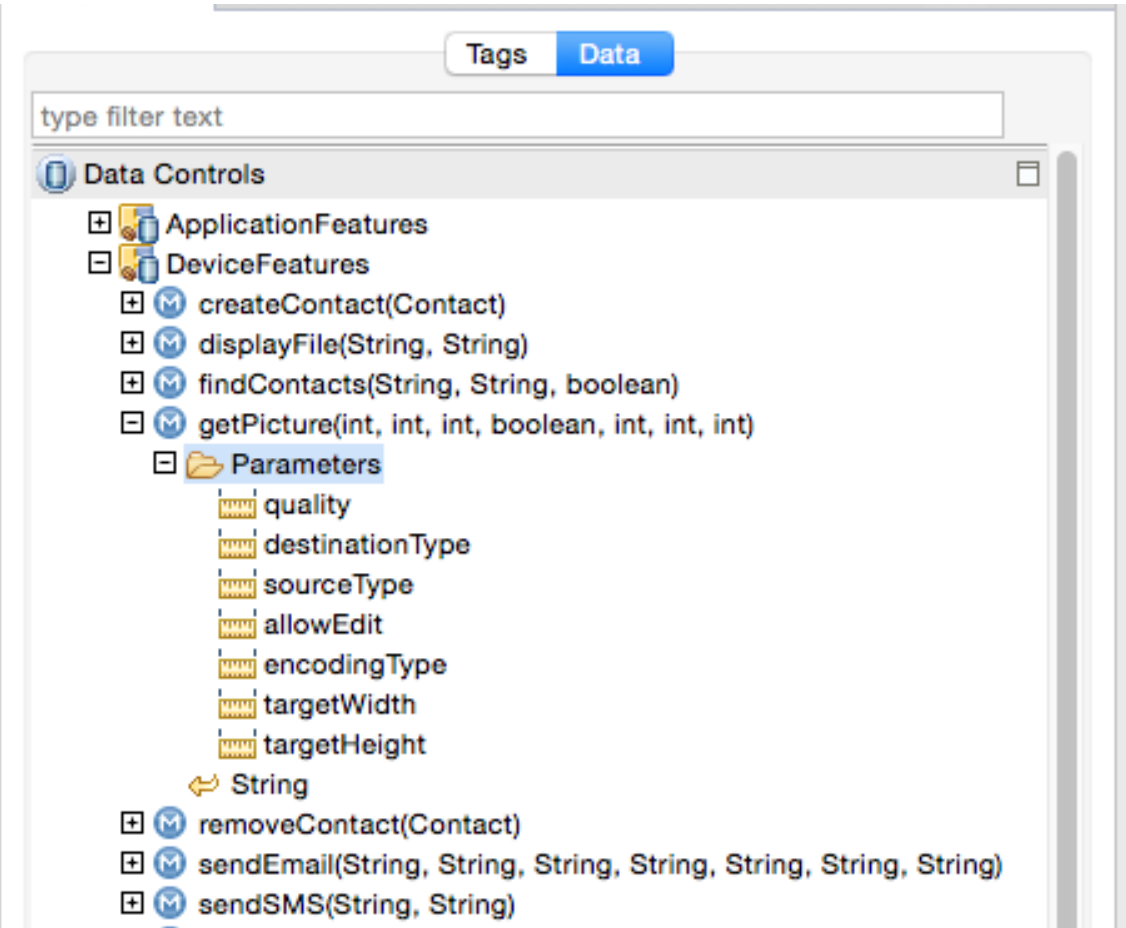
More UI Implementation Options in Oracle MAF

- Component based page definition
 - AMX Components
 - Controller code
- Local HTML5
 - with any third-party HTML5 frameworks
 - Can invoke Java logic
- Remote URL
 - Any server-side HTML
 - Can invoke Java logic



Device Features Interaction

- Leverages Apache Cordova
 - Including plug-ins
- Drag and drop to use
 - Email -SMS
 - Notifications -Contacts
 - GPS -Camera
 - Files
- Or access programmatically
 - Java & JavaScript API



Extend and Expand

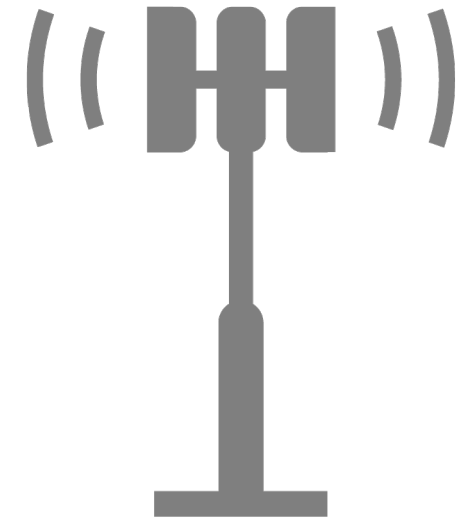
Add capabilities to the framework

- Cordova Plug-in Support
 - Add device integration functionality
 - Cross platform
- Custom UI Component Support
 - Allows developer to add custom UI components to the framework
- Declarative reusable Component Support



Native Push Notification Support

- Push notifications to mobile users from a single code base
- Leverage native push notification
 - iOS: Apple Push Notification
 - Android: Google Cloud Messaging Service
- Tightly integrated
 - With the application lifecycle and business logic
- Local Notifications Support



Built-in Security Features

- Authentication
- Access Control
- Encryption
- Containerization



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Development Tools Integration

Increase developer productivity

- Oracle JDeveloper or Oracle Enterprise Pack for Eclipse
- IDEs integrate with mobile SDK seamless development/testing/deploying experience
- Productivity boosting IDE
 - Declarative and visual editors
 - Component palette
 - Data control palette
 - Property inspectors
 - Smart code editors



Oracle JDeveloper

The screenshot displays the Oracle JDeveloper 12c IDE interface. The top menu bar includes File, Edit, View, Application, Refactor, Search, Navigate, Build, Run, Source, Team, Tools, Window, and Help. The status bar at the top right shows 100% zoom, Monday 1:40 PM, and a search icon.

The main workspace is divided into several panes:

- Applications:** Shows the project structure for 'PhoneHR', including 'META-INF', 'Web Content', 'phone.hr.oracle.EmpList', 'search-flow.xml', 'adfc-mobile-config.xml', and 'untitled1.amx'.
- untitled1.amx:** Displays the source code for an AMX page. The code includes a bar chart component and several facets for layout and data.
- Components:** A palette on the right showing various MAF AMX Data Visualizations, including Chart, Gauge, and Map.
- untitled1.amx - Structure:** A tree view showing the hierarchical structure of the AMX page, including facets for data stamp, header, primary, secondary, and footer.
- search-flow.xml:** A Bounded Task Flow diagram showing the flow of the application. It includes components like Search, List, manager, checkPrivs, and EditEmo, connected by actions like find, select, auth, and edit.
- Bar - Properties:** A panel on the right showing the properties of the selected bar chart component, including its ID, value, and appearance settings.

The bottom status bar shows the file path: /Users/sshmeltz/jdeveloper/mywork/PhoneHR/ViewController/public_html/phone.hr.oracle.EmpList/search-flow.xml.

Oracle Enterprise Pack for Eclipse

The screenshot displays the Oracle Enterprise Pack for Eclipse IDE interface, showing a mobile application project with the following components:

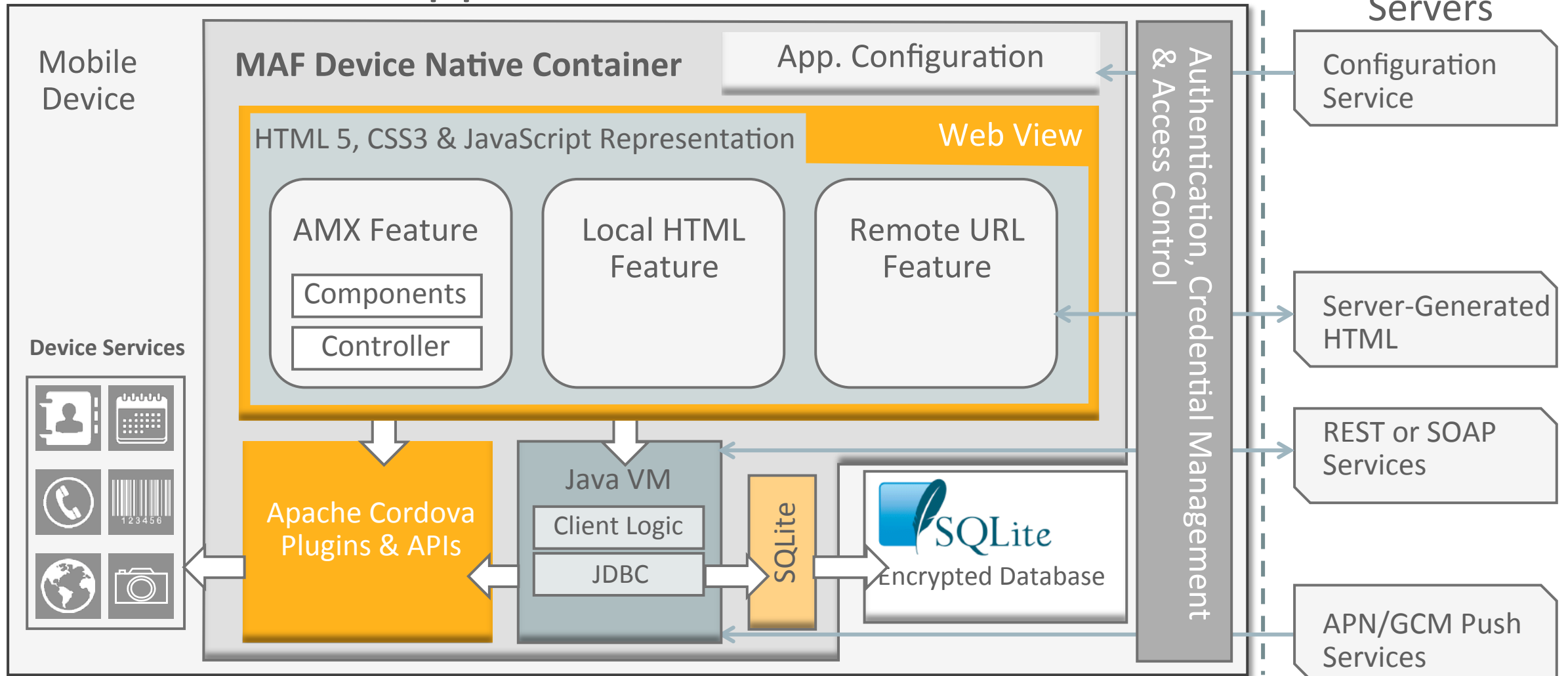
- Project Explorer:** Shows the project structure, including `MAF`, `adfmsrc`, `src` (default package), `app9View` (containing `Emp.java` and `Emps.java`), `META-INF`, and `ViewContent` (containing `adfc-mobile-config.xml`, `Camera.amx`, `Chart.amx`, and `emp-flow-definition.xml`).
- Palette:** Shows a list of components and methods, including `ApplicationFeatures`, `DeviceFeatures`, `Emps`, `Constructors`, `emps` (with `email`, `hireDate`, `name`, and `salary`), `addPropertyChangeListener`, `removePropertyChangeListener`, and `Operations`.
- *List.amx:** Shows the XML code for the `List.amx` component, including a `carousel` element and a `listItem` element. A tooltip for the `carousel` element is visible, stating: "Element : carousel. The carousel component displays a spinning series of items based on rows of a collection model. Content Model : (facet?)".
- emp-flow-definition.xml:** Shows the Bounded Mobile Task Flow diagram, which includes a `Camera` component, a `List` component, and a `Chart` component, connected by a `graph` element.
- AppXaminer:** Shows the data model diagram, which includes a `List.amx` component, a `binding: email` component, a `binding: emps` component, a `binding: hireDate` component, a `binding: name` component, a `binding: salary` component, and an `Iterator: empsiterator` component.

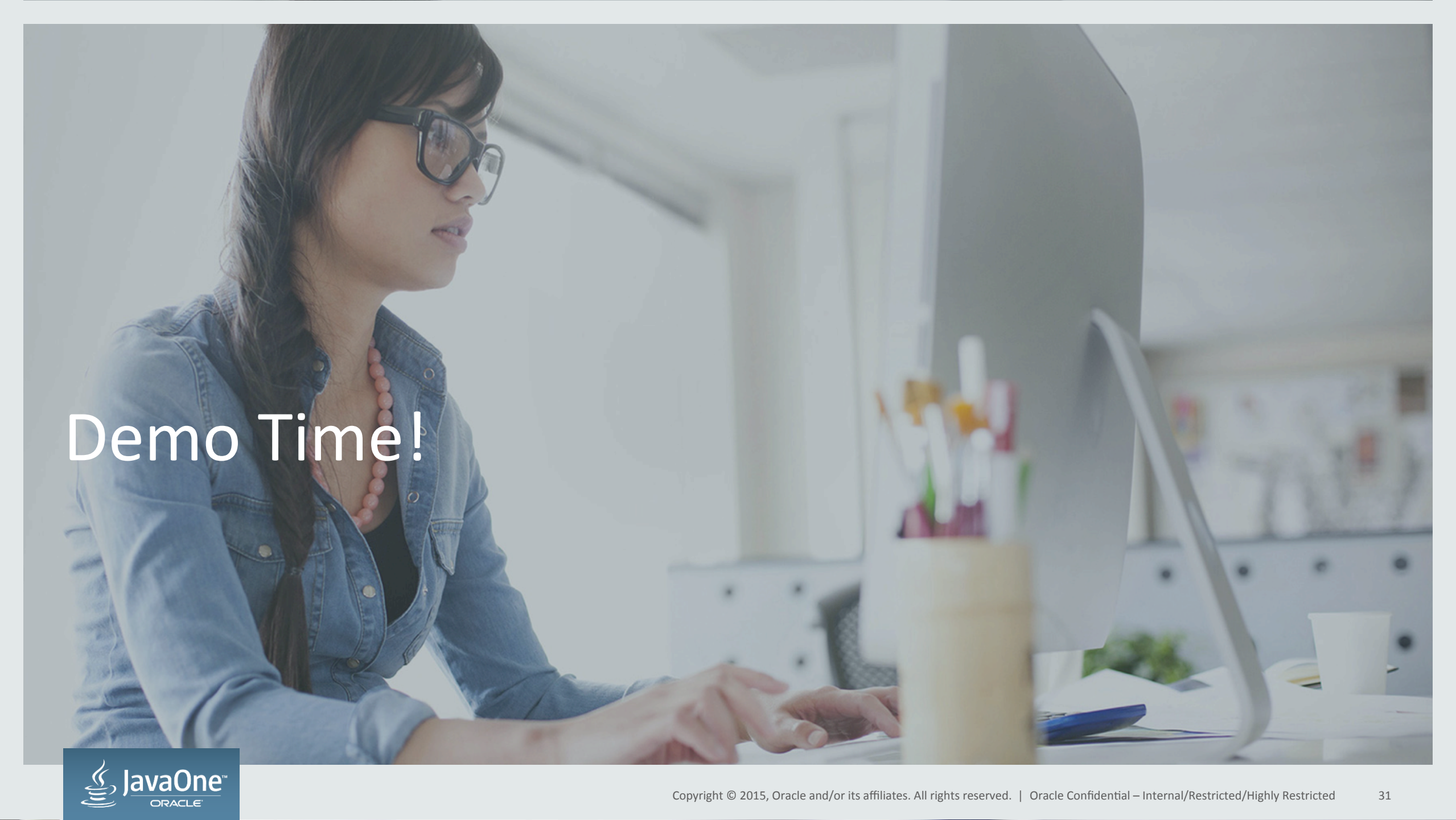
The status bar at the bottom indicates the current component is `amx:view/amx:panelPage/amx:panelSplitter/amx:facet/amx:listView/amx:listItem/amx:c`, and the page number is 16 of 31.

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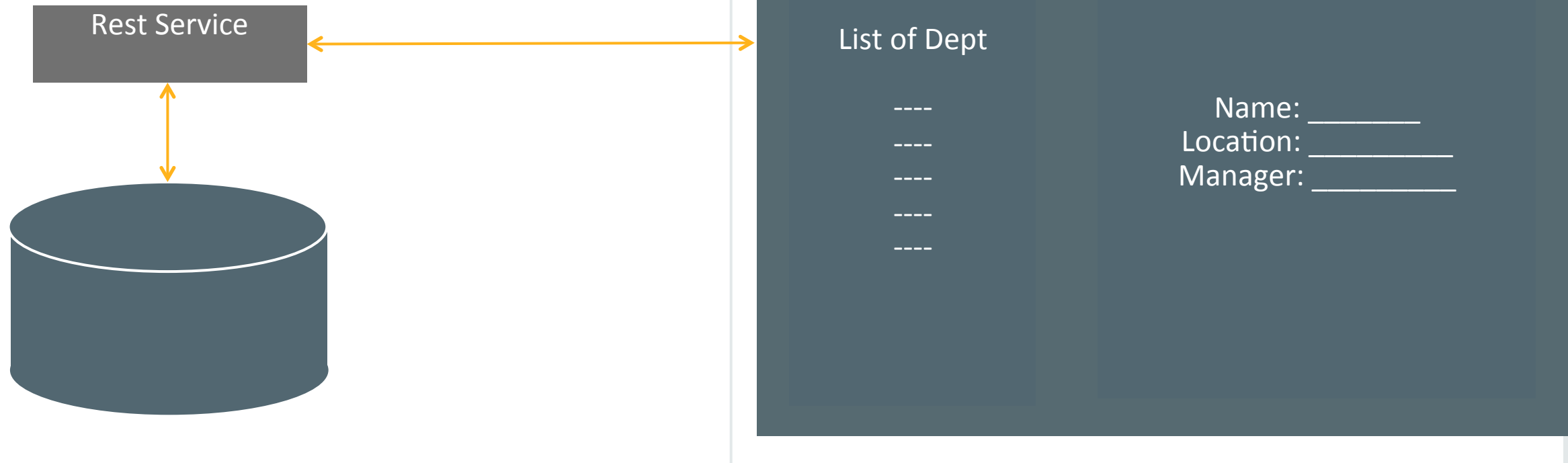
Oracle Mobile Application Framework Architecture



A woman with long dark hair, wearing glasses and a blue denim shirt, is sitting at a desk and looking at a large computer monitor. Her hands are on the keyboard. The background is a blurred office environment with shelves and a desk lamp.

Demo Time!

Demo Application



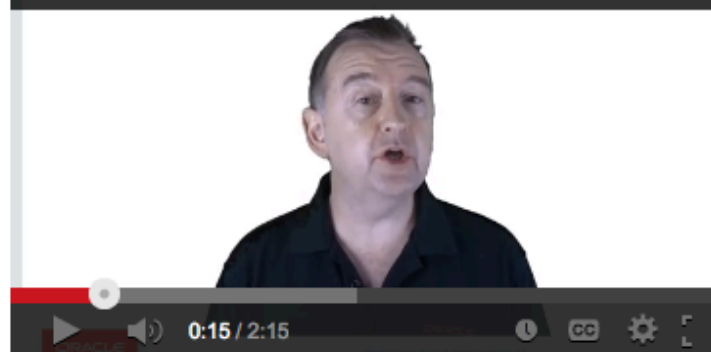
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Luc Bors
Oracle ACE



Introduction and Overview

This Introduction and Overview playlist sets the scene by introducing mobile development and the Oracle Mobile Application Framework (MAF)



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