### ORACLE MOBILE APPLICATION FRAMEWORK DATA SHEET

Oracle Mobile Application Framework (Oracle MAF) is a hybrid-mobile framework that enables developers to rapidly develop single-source applications and deploy to both the Apple iOS and Google Android platforms. Oracle MAF provides a complete MVC development framework - that leverage Java, HTML5 and JavaScript - with declarative user interface definition, device services integration and built-in security. Oracle MAF maximizes code reuse and results in faster development of compelling mobile applications.

**Cross Platform Mobile Development Framework**

Based on a hybrid architecture, Oracle MAF lets you build application that are portable across devices and operating systems while still leveraging the device specific capabilities and delivering a rich user experience. Applications developed with Oracle MAF can be designed for phone and/or tablet form factors and packaged for either Apple iOS or Google Android – from a single code base. Oracle MAF leverages the power of Java, HTML5, and JavaScript and provides a visual and declarative development approach to provide a faster way to build on-device mobile applications. Oracle MAF applications install on-device, can work in both connected and disconnected mode, and can access device services as well a local SQLite database.

**KEY FEATURES**

* Visual and declarative development
* Mobile optimized user experience
* Simplified access to device services
* Code in Java and run on multiple mobile OSs
* Offline support using encrypted SQLite
* Built-in security for authentication, authorization and encryption support

**KEY BENEFITS**

* Develop once, deploy to both iOS and Android
* Accelerate mobile development
* Protect from technology shifts
* Use industry standards
* Leverage device services and offline capabilities
* Extend existing enterprise applications to mobile
* Leverage existing skillsets in Java and HTML5

![Figure 1: Same application running on Android and iOS](image)
Visual and Declarative Development

Oracle MAF focuses on increasing developers’ productivity by offering extensive out-of-the-box capabilities along with a visual and declarative development approach provided through IDE integration.

Oracle MAF is integrated into both Oracle JDeveloper and Oracle Enterprise Pack for Eclipse providing a complete development environment for the framework. Both IDEs integrate with the iOS and Android SDKs to provide direct deployment and test/debug capabilities from inside the IDE to devices and emulators.

Oracle JDeveloper and Oracle Enterprise for Eclipse offer visual and declarative development capabilities for the framework. Beyond the support for smart code editing with code insight and helpful coding features, the IDEs provide an accelerated development experience through features such as:

- Visual page and flow editors
- Component palettes with simple drag and drop into the page and flow editors
- Data control palette for simplified access to services and backend logic as well as device features
- Interactive structure panel for manipulating the structure of pages
- Property inspectors for easy manipulation of attributes and features

These features along with many others reduce the amount of coding involved in developing the application.

Figure 2. Visual and declarative mobile application development

Leverage Java Skills

Oracle MAF supports coding business logic in your mobile application with the Java language, in addition to supporting coding in JavaScript and HTML5. Packaged Oracle MAF application contains a lightweight Java virtual machine (JVM) delivered as a native library for each platform. The JVM executes the business logic, data access and controller
layer logic. The JVM passes data to the HTML5 view, which renders the user interface.

By leveraging Java, Oracle MAF offers a smooth transition of skills to millions of Java developers, and enables them to become mobile developers. Developers can leverage existing skills and techniques they are already familiar with when building mobile applications. For example, access to the SQLite database is coded through JDBC and support for web service requests are available through SOAP or REST interfaces.

**Mobile Optimized User Experience**

Oracle MAF includes a library of more than 80 professionally developed components that can be used to create rich mobile application interfaces in a declarative way. Components include layout components, data display components, input and selection components, and operation components. Beyond the basic components - such as checkbox, selection lists and buttons - Oracle MAF offers rich data visualization components including charts, maps, gauges, timelines and more. The components generate mobile optimized HTML5 and JavaScript based user interfaces, and shield the developers from the need to code in those low level technologies.

Underlining the user interface layer is an advanced controller layer, part of a complete model-view-controller (MVC) architecture, that supports the visual modeling of complete process flows that navigate between pages, functions, and decision points and enable easy creation of complex flows. Application page and process navigations are defined using a task flow diagram that enables developers to visually design the flow of control in the application.

Oracle MAF also supports the creation of custom declarative UI components by developers. This capability lets developer extend the set of components provided for them as well as encouraging the reusability of UI components across multiple pages.

Oracle MAF components were designed for mobile devices which means they include support for touch and swipe gestures and are “skinned” to look great on mobile form factors. Where appropriate, native component integration is enabled – for example when entering date/time. Components can be further customization through CSS3 – an industry standard.

An Oracle MAF application can be developed such that it can work well on either a tablet or a phone. When the application starts the appropriate form factor will automatically load. Tablet views are often fewer in number, but more complex. Whereas phone views are often greater in number but generally simpler due to screen size constraints. Defining both sets of views within the same application promotes reuse for business logic, data access, service integration, security and other artifacts of the application.
In addition to the component based user interfaces, Oracle MAF can incorporate local HTML5 pages into the same application. This enables developers who prefer direct coding of the UI to incorporate their expertise along with third party components and code-libraries to create features in the application while keeping the ability to leverage the Oracle MAF container’s services.

In addition to displaying local HTML content from the device, the Oracle MAF container can also include features that display HTML content that is generated and delivered from the server, allowing mobile applications to integrate with web applications and interfaces.

**Declarative UI to Data Binding**

Oracle MAF provides a declarative binding layer that simplifies the connection of business services and data services to user interfaces. Developers can expose local Java classes and remote SOAP and REST services as “data controls” which can then be visually dragged and dropped into the user interface to create forms, lists, charts and other data display formats.

The binding layer can also be leveraged to simplify binding controller layer methods to business services. This procedure accelerates development speed and provides a loose coupling between the user interface and the business service layer.

The same declarative binding layer is used to simplify integration of device specific features such as the camera, GPS, SMS etc.

**Simplified Device Feature and Services Access**

Oracle Mobile Application Framework gives developers the ability to quickly and declaratively integrate with local device services and features, such as camera, phone, SMS, contacts and GPS, through the declarative binding layer. Instead of writing multiple lines of device-specific code, developers simply drag-and-drop device service integration methods and add them to their pages.

The access to the device features is provided through the open source Apache Cordova platform that is integrated into the Oracle MAF container. Java and JavaScript APIs enable
developers to programmatically interact with device features from Oracle MAF pages as well as local HTML5 and remote content that is incorporated as part of an Oracle MAF application.

Developers can also add integration with device features that are not supported out-of-the-box in Oracle MAF by leveraging the Cordova plug-in architecture.

Oracle MAF supports device native push notification, allowing application to register to receive and react to notifications sent to both iOS and Android applications.

Secure Mobile Applications

Security is a top priority for mobile application development given that mobile devices have higher risks of loss or theft. Oracle Mobile Application Framework comes with built-in security that can limit access to your applications and ensure encryption of sensitive data.

Oracle MAF supports authentication and access control for refined security at the feature level in an application. The developer simply specifies the appropriate login server, for example, a server running Oracle Identity Management and/or Oracle WebLogic with basic authentication, or a server supporting OAuth (open standard for authorization) protocols. At runtime users are presented with login screens and the appropriate tokens are accessible for further web service calls. Developers can build single user interfaces that meet the needs of users with different privileges (e.g. show/hide components based on role or privilege).

Oracle Mobile Application Framework enforces encryption in the following areas:

- Communication Encryption: Encrypted using SSL/TLS (HTTPS)
- On-device Encryption: Credentials can be kept in an encrypted key store and used for validation when supporting offline authentication.
- SQLite Database Encryption: The SQLite Encryption Extension is included with Oracle MAF. This means encrypting a SQLite database for an application built with Oracle MAF is simply a configuration option when the application is developed. No additional license for SQLite Encryption Extension is required for deploying the application into production.

Support for Offline Mode

Oracle MAF supports the development of applications that can work offline as well as online. Applications are self-contained and can run on the mobile device in both connected and disconnected mode. For data access and storage applications can leverage a local encrypted SQLite database.

Furthermore applications can be built in such a way that initial access to data is done from remote servers through web services, the data is then stored in the local SQLite database for offline access. The data can then be replicated and synchronized to the server when connectivity is available again.

Oracle MAF also supports local storage of user authentication credential to enable offline authentication and authorization to secured applications.
Conclusion

Oracle Mobile Application Framework answers the needs of organizations looking to develop cross device mobile applications faster. Leveraging the power of Java, HTML5 and JavaScript standards and providing declarative and visual development experience and integration with development tools, Oracle MAF accelerates the creation of on-device mobile applications for phones and tablets.

Contact Us

For more information about Oracle Mobile Application Framework, visit oracle.com/mobile or call +1.800.ORACLE1 to speak to an Oracle representative.