Build more robust native mobile applications with IBM MobileFirst Platform

Enable mobile application development, delivery and management in a security-rich manner

Mobile applications are rapidly becoming the primary channel through which people in the world do business. At the same time, user experience expectations for mobile applications far exceed expectations for applications delivered through virtually any other channel. In a world of millions of mobile apps, an estimated 80 - 90 percent of apps are deleted after first use.[1] Users expect value, ease of use and a delightful experience, but too often their expectations are not met.

Developers at companies building mobile apps are responding in a number of ways to the increase in demand and high expectations for mobile apps. One response is the decision to build native mobile apps. Of course building native apps can be more costly because you have to develop a distinctive code for each supported platform and often each platform requires differentiated development teams. The benefit, however, is that developers can use the full capability of the device operating system. Native apps offer benefits including an extremely powerful user experience, innovative functionality and top-line performance.

Native SDK vendors seize the power of this idea and offer their respective development toolsets as the way to realize these benefits. However, developers at organizations require more than toolsets to build native mobile apps that meet the expectations of their users.

Experience on-screen is only the beginning

Toolsets are essential because of what they focus on, but the fact is these toolsets typically focus only on client-side development. Client-side development effort is essential, after all developers want to deliver an exceptional user experience, but there is more to a mobile app than what is on-screen. In fact, studies show that the time spent building the user interface typically accounts for only a small percentage of the overall time spent developing and delivering a mobile app. At this point you might ask, 'How is the rest of the time spent?' In simple terms,

the rest of the time is spent making sure the application is more than just superficially attractive. The remaining time is spent ensuring the app is secure, integrated and engaging. For this reason, developers at an organization require more than just a toolset for native mobile apps. In addition, this is the reason why developers require a mobile app platform that enhances the entire mobile app lifecycle management process.

With the IBM MobileFirst Mobile Platform, you can help address the full lifecycle of mobile app development, delivery and management. This IBM platform supports various development approaches including mobile web, hybrid and native. Further, developers can use the tools they want to use—whether that is XCode, Android Studio, Xamarin, IBM MobileFirst Platform Studio, or any other development tool of choice.

The IBM MobileFirst Platform is a more comprehensive platform that enables developers at organizations to build, test, integrate and help secure mobile applications of various types.

The security imperative

The MobileFirst Platform Foundation security features for native apps include:

- Extensible user authentication framework
- Application authentication
- Device provisioning integration
- Encrypted on-device storage
- Application management controls
- SSO for enterprise applications

Security is a chief priority for business leaders embarking on the mobile journey. However, many leaders at organizations are challenged to effectively implement appropriate security measures. Up to 53 percent of enterprises report that they struggle to implement effective end-to-end mobile security measures.[2]

With MobileFirst Platform, you can better confront the security challenge for native mobile apps in a number of ways. To begin with, MobileFirst Platform provides a user authentication framework that enables you to integrate their mobile applications with existing enterprise or third-party security systems. With MobileFirst Platform user authentication framework, you can use extensible points of control in both the mobile app and on the server. Further, this IBM framework provides you with a means to standardize authentication requirements over a number of different platforms and devices. You can enable basic authentication approaches such as username, password authentication. In addition, this platform supports more complex schemes such as certificate-based authentication and multifactor authentication protocols with one-time pass codes, step-up authentication procedures and more. With MobileFirst Platform, you can help extend authentication enforcement to situations when devices do not have connectivity thus enabling security-rich, offline access for users.

User authentication is an important part of securing mobile apps, but that protection alone is not enough. MobileFirst Platform specialists go further by providing security capabilities distinctive to mobile apps. For instance, you can better secure the data stored on a mobile device with AES-256 encryption and make the data FIPS 140-2 compliant. With MobileFirst Platform, you can protect your apps against repackaging attacks by ensuring that mobile apps that connect to the MobileFirst Platform environment are known and trusted applications.

This IBM platform provides single sign on capabilities such that multiple mobile apps can participate in a globally authenticated session. In addition to all of these capabilities, this platform offers management controls that enable administrators to almost immediately disable mobile apps for all users or disable mobile apps for specific users on specific devices. As a result, administrators can help mitigate risk in the face of unknown app vulnerabilities, recently lost devices, quickly changing access rules and more.

In addition to these capabilities, business leaders realize that delivering secure mobile apps requires more than securing the run time. The development and application lifecycle management process must be secure. With IBM MobileFirst Platform Application Scanning, you can conduct a static code analysis of a mobile app for both native and web content to detect potential vulnerabilities such as data leakage, sensitive information exposure, high-risk API usage and more. This analysis can be run on demand and be an automated part of an organization's continuous integration and build strategy. Static code analysis for mobile apps is an important part of raising an organization's overall security posture. With MobileFirst Application Scanning, you can more easily institutionalize as part of the mobile app lifecycle.

Security is an imperative for developers at companies delivering mobile apps and it is more complex than security measures employed for traditional web applications. You can better address both development and run time concerns with a more comprehensive set of security capabilities with Platform. You can use these capabilities to enhance your mobile security posture without spending considerable upfront and ongoing resources to arrive at the same result MobileFirst Platform is designed to provide right off the shelf.

Interactivity through integration

The MobileFirst Platform Foundation integration features for native apps include:

- Standards-based enterprise integration
- Automatic data transformation for mobile optimization
- Zero code integration for SAP services and web services
- Fine-grained security controls
- Response time and data usage analytics

In the early days of mobile, the mere notion of having an app was novel. Developers delivering apps were not expected to offer much in the way of user interaction. Mere existence of apps was sufficient.

Today, however, users have loftier expectations for mobile apps. Users value apps that help them complete tasks such as ordering takeout, hailing a taxi, or making a restaurant reservation. You can deliver this type of interaction only if mobile apps can integrate with services and data; toolsets alone cannot deliver on a full spectrum of integration needs.

The MobileFirst Platform delivers a robust set of integration capabilities starting with the ability to connect native mobile apps with various back-end systems. This IBM platform is designed to broker connectivity for mobile apps over HTTP, JMS and SQL and further help you optimize connectivity when using IBM Integration Bus or IBM® Cast Iron®. MobileFirst Platform's integration architecture promotes a decoupling of integration logic from mobile app logic. That means integration logic is encapsulated on the server thereby isolating a mobile app from changes that occur in the data and service layer. Another important effect of delegating this logic to the server is that a single set of integration services can be used by native mobile apps running across a number of different platforms.

Basic service connectivity is important, but the fact is that mobile apps must often connect to services that were built long before mobile was in existence. Such connectivity poses challenges in both data delivery and service security for the mobile channel. With MobileFirst Platform's ready-to-use data transformation capabilities, you can more easily optimize the data delivered to mobile apps. These capabilities are especially valuable when dealing with legacy services that return relatively large payloads targeted at the traditional web channel. With the integration capabilities, which also include a service mashup feature, developers can retrieve data from multiple services in a single network call thereby helping to reduce the impact of the inherently unreliable mobile network. In terms of integration security, MobileFirst Platform provides mobile-specific and fine-grained security controls that IT professionals at organizations can include with their legacy services. Together, with these capabilities, you can help ensure optimized and security-rich integration for native mobile apps.

Integration is key to fostering the level of interaction many users expect from their mobile apps and the MobileFirst Platform provides a robust set of integration capabilities to enhance mobile interaction. With these features, you can use existing enterprise investment, optimize data delivery to sustain user interactions over unstable mobile networks and help reduce development cost by providing zero-code integration paths. In addition, you can help improve organizational insight into user experience through integration analytics.

Engagement is key

The MobileFirst Platform Foundation engagement features for native apps include:

- Unified server-side API for SMS and push notifications
- Complete location services framework
- Robust operational analytics
- Remote device log collection

There are many distinctive characteristics of mobile apps but perhaps none more so than the notion of instant and intelligent engagement. Mobile app users expect to be engaged in the right context, at the right time and in the right place. To fulfill this expectation, you have to design services that support both proactive engagement and the use of context in that engagement.

When speaking of engagement in mobile apps, you often think of push notifications. The ability to proactively send data to the user sets apart mobile apps from traditional web apps, which is a powerful concept. With MobileFirst Platform, you can make enabling push notifications easier by providing users a single, unified API for sending push notifications from the server to mobile apps. This approach means that developers can develop a single set of logic to send push notifications to their native mobile apps running on a number of different devices and platforms. Without the unified push framework from Platform, developers would be left to develop push logic for each differentiated platform the organization needed to support.

If push notifications deliver the means for engagement, then location services deliver the ability to intelligently engage. By understanding where users are, you can engage them in a timely manner thereby increasing the likelihood of action—such as a purchase. With MobileFirst Platform, you can more easily engage users based on location context by providing a more continuous and complete API to detect, transmit and consume location-based events. These events, which are triggered based on geolocation or WiFi data, are transmitted by the mobile app using MobileFirst Platform client-side API. The MobileFirst Platform provides a unified server-side API that enables developers to consume location events on the server and take action. As a result, the integration of enterprise systems into patterns of intelligent user engagement is made easier.

The benefits of the MobileFirst Platform location services are two-fold to the organization. First, developers do not have to worry about efficient location data collection and transmission on the client side because they can use the platform's API.

Second, developers can build one set of location-enriched engagement logic on the server and apply that logic to their native apps throughout various platforms. With this IBM platform's location services, you can understand where app users are and more importantly, implement business logic based on this contextual understanding.

Finally, you cannot discuss intelligent mobile engagement without discussing the role of mobile app analytics and operations. To start, IT professionals must understand the quantitative and qualitative aspects about the usage of their mobile apps. The MobileFirst Platform includes a rich analytics system that automatically captures information such as app usage by device type, service invocation patterns, service response times, data usage, push notification patterns and more. You can also capture custom events within the mobile app with an API. In addition, a rich set of reports in a browser-based interface and a browser-based search interface for events can be created and organizations benefit from greater insight into their mobile app environment.

You also must be able to easily administer and operate the environment to ensure optimal user engagement. Most importantly, when things go wrong you must respond quickly. The MobileFirst Platform helps you in the area of rapid response by providing remote log collection and automatic crash log capture capabilities. With remote log collection, administrators can define log policies and device filters on the server, push that configuration down to devices and then collect device logs for transmission to the server. As a result, administrators can more easily retrieve logs in the case of problems reported by users. With MobileFirst Platform, you can enhance this log retrieval feature by automatically collecting any crash logs from a mobile app. These crash logs are also transmitted to the server where they can be analyzed by administrators. Building such a robust analytics and operations system would be a difficult task.

Rich and personalized engagement is clearly the allure of the mobile channel for many organizations. With MobileFirst Platform, you can help reduce development cost through unified push APIs and enhance developer productivity and user interaction with a rich location services framework. In addition, this IBM platform helps improve insight into the user experience through in-depth analytics and simplified device log collection.

The details of development

The MobileFirst Platform Foundation development features for native apps include:

- CLI to enable a Bring Your Own Toolset approach
- Advanced screen view composition capability
- Transparent state management for mixed mode applications
- Action coordination system for mixed mode applications

Most developers building native mobile apps prefer to use toolsets built specifically for the native language in use. These toolsets are reasonable preferences given that the toolsets offer several optimizations that make the development process faster and more efficient. Rather than try to replace these native toolsets, with MobileFirst Platform, you can accept them while enhancing the overall development process.

A core part of the MobileFirst Platform is the IBM MobileFirst Platform Studio. The MobileFirst Platform Studio is an integrated development environment (IDE) that developers can use to build apps on the platform. The difference however between MobileFirst Platform and many of its competitors is that developers are not required to use the MobileFirst Platform Studio. The MobileFirst Platform includes a command line interface (CLI) that helps developers create, build and deploy applications for the platform from any environment in a more simplified manner. With this CLI,

developers can more easily add MobileFirst Platform capabilities to both existing and new native mobile apps, while providing flexibility to use the toolsets and development environments of choice.

Advanced view composition is becoming an increasingly common technique in the development of mobile apps. This technique gives developers the power to mix native and web controls within the same mobile app and even on the same screen. This technique provides a great balance of native optimization and cost savings through code reuse. With Platform, you can enhance this approach by providing APIs to switch more easily between native and web views and construct mixed view screens in a mobile app. In addition, with the platform, you can manage data sharing, activity coordination and state among the different view components of a mobile app. You can focus on delivering an exceptional experience without having to build the client-side infrastructure that supports it with the robust set of capabilities from the MobileFirst Platform.

Mobile apps must provide users a delightful experience with useful functionality. The MobileFirst Platform is designed to enhance the development process by enabling developers to use existing development tool skills and expertise. With MobileFirst Platform, you can support mobile app construction approaches that optimize code reuse without limiting developers and empower developers to focus on business logic instead of infrastructure that manages mobile app state and communication.

Testing is not optional

The MobileFirst Platform Foundation testing features for native apps include:

- Automated functional testing
- More comprehensive quality assurance testing
- Application sentiment analysis
- Crash log collection and analysis

Mobile app development, run time and management capabilities are important for developers at organizations building mobile apps, but there is even more to the story. Industry leaders in mobile technology understand that they have to deliver quality mobile apps that must continue to improve over time. To do that, business leaders have to build a robust testing approach.

Testing might not always come to mind when talking about mobile app development, but it is a crucial facet of application lifecycle management. Testing also happens to be a huge challenge for many business leaders embarking on a mobile journey. The ability to efficiently and consistently test mobile apps is critical to fulfill and exceed user expectations, but that fact does not make testing any less difficult. With MobileFirst Platform, you can address the need for testing in a number of ways, including by providing automated functional testing tools. Using the IBM Mobile Test Workbench included in the platform, users can record functional tests of their native mobile apps and export those recordings as English-language, editable scripts. Consequently, users can then execute those scripts in the form of automated tests on simulators, emulators and real devices. With this capability, you can both create and execute an inventory of functional regression tests in an easier way. Using automated functional testing, you can more consistently deliver stable mobile apps.

The ability to automate functional testing is clearly beneficial, but there is more to an effective testing strategy than functional testing. Particularly in mobile, you require the ability to make manual testing of mobile apps efficient and easy. IBM MobileFirst Platform Quality Assurance is designed to facilitate crowdsourced quality testing within an organization. Using MobileFirst Quality Assurance, you can use over-the-air distribution to target pilot users within the organization. Once the mobile apps are distributed, users use the app and can also

use an in-app screen capture feature to take a snapshot of what they see. This screenshot can be further annotated with comments or interactive markup and then the annotated capture can be sent back to the quality assurance portal with the click of a button. With the quality assurance testing capability of the platform, you no longer have to create process and technology for mobile app distribution and feedback collection.

Testing continues to be one of the biggest challenges for anyone embarking on a mobile journey. The MobileFirst Platform helps you confront this challenge and more consistently deliver higher-quality apps. With this IBM platform, you can help reduce functional testing cost with an easier-to-use automated solution and improve the efficiency of quality assurance testing by enabling a crowdsourced model. In addition, you can support iterative mobile app improvement by providing ongoing app insight and user sentiment analysis.

Conclusion

The MobileFirst Platform is a more comprehensive mobile application platform that is designed to offer considerable value to developers building mobile apps regardless of the development approach. With respect to native mobile apps, the MobileFirst Platform complements as opposed to replacing toolsets from native vendors and can deliver critical capabilities that these toolsets do not address.

Building mobile apps must not be an exercise completely left to the user; you require mobile application platforms that advance your mobile app journey in a way that lets you control your destiny. With MobileFirst Platform, you can take advantage of a robust set of capabilities in a manner that supports developer choice.

For more information

To learn more about the IBM MobileFirst Platform, please contact your IBM representative or IBM Business Partner, or visit the following website: **ibm.com**/mobilefirst

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[1] *How Upcoming Changes to Google Adwords Affects Mobile App Advertising, Ironpaper,* May 1, 2014

[2] *The Upwardly Mobile Enterprise, IBM Institute for Business Value,* October 2013

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