True Web Application Management: Fixing the Gaps in EMM Solutions

Executive Summary

The modern workforce expects to use a combination of laptops, tablets, and smartphones to complete its work. Organizations have met this demand by adopting Enterprise Mobility Management (EMM) solutions for mobile device and application management. In addition, many of these organizations also have developed custom applications to take advantage of mobile computing.

But, EMM solutions have a number of deficiencies including:

- Poor support on the desktop

- Inefficient management

- Reducing the portability of web applications

EMM solutions tend to provide the greatest benefit for application management when:

- The organization uses primarily native application development technology

- Applications need to run only on mobile devices and not on the desktop

- Applications are deployed only to employees, not to the Extended Enterprise, comprised of trusted partners, contractors, consultants, and other business collaborators.

Sencha Web Application Manager can help to overcome EMM deficiencies in web application management. For hybrid web applications—applications built with web technology that look and feel like native applications—EMM solutions can seamlessly integrate with Web Application Manager to streamline the deployment, security, and management of web applications over their entire lifetime.

This whitepaper provides a reference architecture for integrating Web Application Manager with EMM platforms to create a single, integrated system for application management across smartphones, tablets, and desktops.

Integrating Web Application Manager with EMM solutions preserves all the benefits of both EMM and web-based applications, saving organizations considerable time and expense. As a result, organizations are more flexible, efficient, and competitive.

Adoption and Benefits of EMM

For many technology-driven organizations, it is now mainstream for both employees and trusted non-employee collaborators, the Extended Enterprise, to access business-critical applications and data on tablets, smartphones, and laptops.

Many of these mobile-friendly organizations have adopted EMM solutions to manage mobile devices and business-critical mobile applications. EMM solutions ensure compliance with corporate IT policies and improve mobile security policies.

When building custom applications, organizations typically pick one of the following approaches: native applications or hybrid web applications. Native applications use the native language and tools of the platform on which they are running. Supporting a single app natively on multiple platforms requires multiple native codebases for the same application, an expensive and unscalable process for many organizations.

On the other hand, hybrid web applications use web technology such as HTML, JavaScript, and CSS to implement the front-end application logic combined with APIs to integrate native device capabilities, such as camera, GPS, accelerometer, and other common device sensors. These applications are called "hybrid" because they combine the best of web and native application technologies and enable a high degree of code portability and reuse across platforms.

However when organizations deploy hybrid applications, the EMM solution provides only part of the solution and imposes constraints on web application management that result in wasted resources. For example, EMM solutions do not support web application management on the desktop, which continues to be a primary deployment target for web applications. On mobile platforms, EMM vendors require web applications to be packaged natively, so they can be managed and deployed like every other native app—through a public or enterprise app store. In these cases, Web Application Manager, Sencha's solution for deploying and managing web applications, can fix critical gaps and integrate with the EMM environment to provide a powerful and complete application management solution that maximizes efficiency across platforms.

Scenarios Where EMM Solutions Are Suitable

EMM solutions work well for organizations under the following circumstances.

1. **Using native application technology on each platform, as opposed to cross-platform web technology.**

If an organization has chosen to develop an application using the native language and idioms of each target platform—Objective-C for iOS and Java for Android, for example—then the App Wrapping and Native SDKs described below provide a way to add security and management features without having to create a new solution for these complex problems. For hybrid applications, these solutions introduce inefficiencies into the development process that detract from the value proposition of cross-platform web technology.

2. **Application management capabilities are required only on smart mobile devices, not the desktop.**

Many organizations develop applications only for mobile and do not require a complementary component to support users on laptops and desktops. In these cases, EMM solutions provide a relatively complete solution. However, many organizations now architect applications to be used on smartphones, tablets, and desktops with device-appropriate user experiences and use cross-platform web technology. In these cases, EMM solutions address only part of the equation, providing no management and security capabilities for the desktop version of the application.

3.   Deploying applications only to employees.

EMM solutions are designed for managing mobile devices and applications within a single organization's boundaries. For the growing number of organizations with application use cases for the Extended Enterprise, in which critical applications need to be deployed to non-employee business collaborators, EMM solutions do not provide a workable solution. A business partner, part-time contractor, or consultant is unlikely to hand over control and oversight of a personal or company device to a third party.

How Sencha Web Application Management Fills the Gaps in EMM

For hybrid web applications, EMM solutions fall short in the following ways.

1.   EMM solutions have limited application management for apps that support both mobile and desktop.

EMM vendors provide two ways to manage applications: app-wrapping and native SDKs. With app wrapping, the EMM solution provides a tool to "wrap" an existing native binary with a thin management and security layer. Native SDKs require the app developer to explicitly insert management and security hooks into the application code on every platform. But EMM vendors typically provide this technology only on mobile devices, so in order to support a cross-platform app on the desktop, a second set of management, deployment, and security technologies is required. This defeats the whole purpose of standardizing around web technology that is supported widely on both mobile and desktop devices.

Web Application Manager provides a secure, containerized web application environment on smartphones, tablets, and desktops. EMM solutions can easily deploy this containerized application to devices under management. Integrating these two solutions enables the use of management and security capabilities that are optimized and focused on web-based applications on every platform, including desktop, for which EMM solutions tend to have weak support.

2.   EMM Mobile Application Management capabilities are optimized for native mobile binaries, not web.

In order to take advantage of the EMM app-wrapping and native SDKs described above, developers must create native application binaries for each target mobile platform. Next, they leverage the EMM solution's native SDK or app wrapping technology to inject management and security features into the app to create a modified binary. Then, the binary must be signed and published to either a public app store or an Enterprise App Store. For native mobile applications, these are the required steps to deploy an application in an EMM environment. For hybrid web-based applications, this process introduces inefficiencies and needlessly delays delivery time.

Integrating Web Application Manager with the EMM environment eliminates this inefficient and redundant work by providing a stable, native, secure, containerized application on each target platform that can be wrapped and published once in an app store and then used to deploy and access all subsequent web-based applications. This model enables the delivery of hybrid applications instantly over-the-air and eliminates the need to convert individual web applications into native binaries or publish them in any app stores. Improving application delivery time bolsters an organization's competitive position.

3.   EMM solutions degrade the natural advantages of web application technology.

Organizations choose web technology because it enables them to create cross-platform applications that can be easily supported across a wide variety of OSes and devices. By narrowly focusing on native mobile applications, EMM solutions actually eliminate key advantages of web applications. These advantages include:

- **Easy app upgrades**—Ordinarily, it's simple and nearly instantaneous to deploy updates to a web application. Under standalone EMM, any simple change to a hybrid app requires repackaging and re-wrapping the app and publishing to at least one app store, and then updating the app across a fleet of end user devices.

- **No native dependencies**—Open web standards have made it possible to create applications that are portable across platforms. Native packaging and EMM SDKs often impose the need for platform-specific code to support required device platforms.

- **No mobile/desktop divide**—With web technology, it's possible to create a single application codebase that can support smartphones, tablets, and desktops. EMM's mobile-first or mobile-only focus creates an artificial divide between mobile and desktop devices.

- **Supports browsing, but not hybrid apps**—Most EMM vendors provide a "Secure Browser" that allows managed browsing of approved websites on managed mobile devices. A browsing experience is different from a hybrid application user experience because it does not provide necessary access to the device's native capabilities.

By integrating Web Application Manager with EMM, organizations can get all the benefits of both EMM and hybrid application technology. They can manage mobile devices and native mobile applications with EMM solutions, and Web Application Manager enables them to easily deploy, secure, and manage web-based applications on smartphones, tablets, and desktops.

Drawbacks of First-Generation Hybrid App Technology

First-generation hybrid applications created by native packagers like PhoneGap and Cordova provide a webview and a way to create the application binary, but they negatively impact developer productivity. These drawbacks include:

- **Webview fragmentation**—Native packagers use whatever webview the underlying platform provides. Each minor version of an OS may provide a slightly different webview, with minor incompatibilities, complicating cross-platform testing and support.

- **"Batteries not included"**—Cordova and PhoneGap rely on a patchwork of mostly third-party plugins for even basic capabilities; these plugins are frequently not supported across platforms, burdening developers with additional non-core development work.

- **No integrated management or security**—Native packaging platforms do not provide integrated management or security features. As a result, once the native packaged app is installed on a user's device, the application owner cannot revoke access to the app or any potentially sensitive data that might then be on a user's device. In addition, that data is stored unencrypted by default and with no user access control, again burdening the developer to solve these problems with plugins.

- **No deployment support** —Application owners must publish their native packaged hybrid apps through an app store in order to deploy them on a user's device.
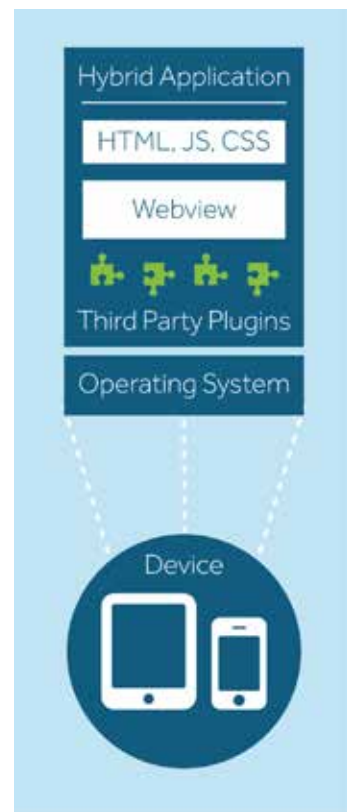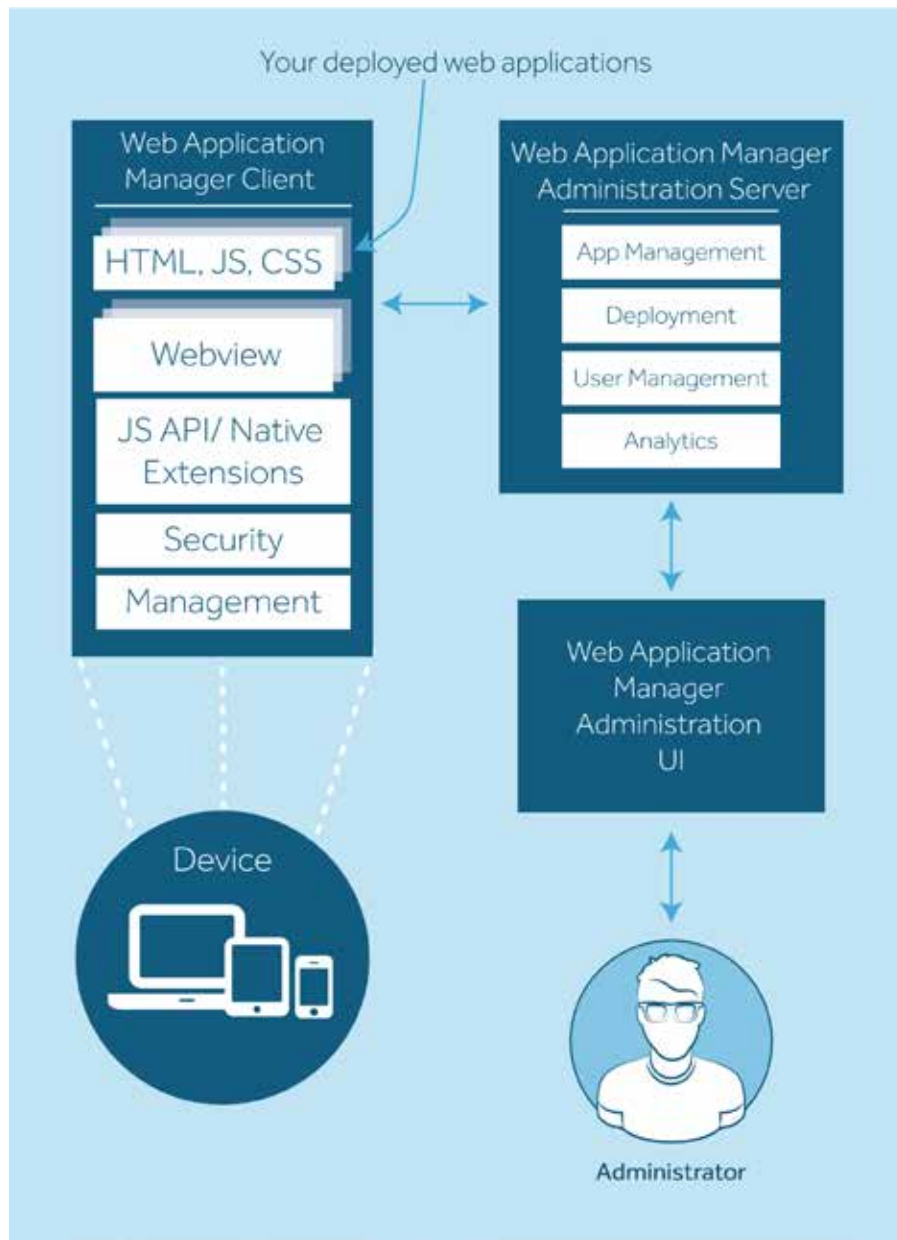

High-level architecture of a Hybrid Application created with PhoneGap/Cordova.

Third-party dependencies and the lack of integrated security and management complicate app development, deployment, and management with native packagers. Webview fragmentation across device platforms compounds these challenges by making app testing much more difficult.

How Web Application Manager Fixes Native Packaging Drawbacks

Web Application Manager addresses these obvious shortcomings by providing a powerful management system, as well as a stable, high quality native containerized application that supports smartphones, tablets, and desktops.

High-level architecture of a hybrid application deployed with Web Application Manager

Web Application Manager provides these benefits:

- **Solves webview fragmentation**—the Web Application Manager Client application includes a single, consistent, high-performance webview on each platform, reducing the risk and uncertainty arising from fragmented device platforms.

- **Consistent cross-platform API**—Web Application Manager delivers a set of integrated APIs to provide access to common native device features across platforms. Developers do not have to search for additional plugins or worry about shoddy cross-platform support.

- **Integrated data security**—Web Application Manager provides automated, transparent local data encryption by default and is integrated with widely-adopted identity and access management systems including ActiveDirectory, LDAP, and Single Sign-On providers.

- **Management, deployment, and analytics**—The management system provides a complete inventory of applications, users, and devices which enables instant over-the-air deployment and revocation of applications, as well as application analytics and audit support. It also provides an open RESTful API for easy integration into existing administration workflows or other IT management systems.

Reference Architecture of EMM Solution Integrated with Web Application Manager

Integration of EMM and Web Application Manager should leverage the strengths of each solution to create a single, seamless application management system. Here is a summary of the integration steps:

1. **Use EMM app-wrapping to wrap the Web Application Manager client application**. This will enable the EMM platform to manage, secure, and distribute the client application through the enterprise app store. The EMM solution can treat the client application just like any other native app on the platform.

2. **Leverage EMM authentication and secure network tunneling.** App-wrapping the Web Application Manager client extends benefits, including authentication and secure network tunneling capabilities, to the web applications running inside the container.

3. **Integrate management systems via API**. Web Application Manager provides administration APIs to easily integrate with EMM to streamline application delivery. Ideally, the management systems can be integrated to provide "single pane of glass" management and simplify administrative overhead for IT and DevOps professionals.
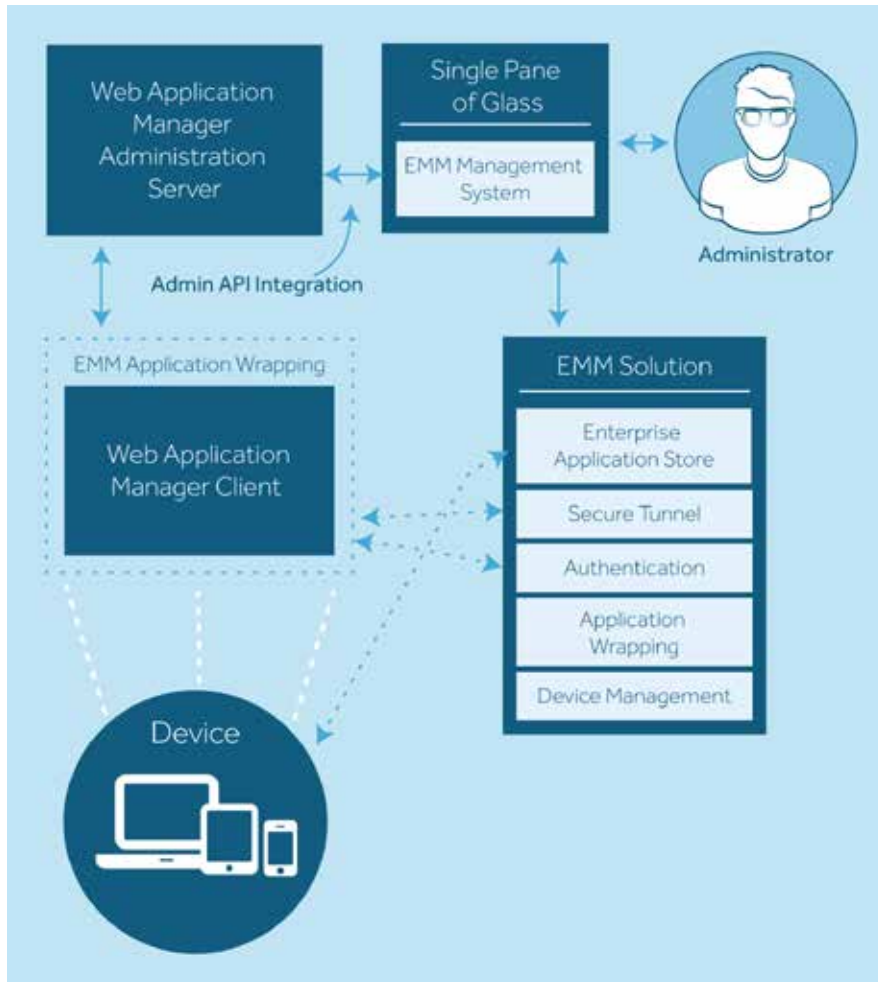
High-level architecture of Web Application Manager integrated with an EMM solution

Conclusion

EMM solutions are a great tool for managing smartphones, tablets, and native mobile applications for organizations and their employees. For hybrid web applications, Web Application Manager streamlines management, deployment, security, and analytics. By integrating the two solutions, organizations can minimize unproductive work such as native packaging and app store publication; and they can deploy their web-based applications on any supported smartphone, tablet, or desktop. Web Application Manager enables organizations to provision and revoke critical applications, even to trusted non-employees in the Extended Enterprise, when needed. By deploying this combined solution, organizations save considerable time and expense, making them more flexible, efficient, secure, and competitive.