



Accelerating the Development of Enterprise Mobile and IoT Apps

ESSENTIAL APIS AND TOOLS DEVELOPERS NEED TO BUILD FIVE-STAR APPS



From App Revolution to App Economy

The Apple[™] iPhone[™] revolutionized computing in 2007, but it was the opening of the App Store[™] in 2008 that marked the dawn of a new mobile business era. The App Store[™]—and Google Play[™]—allow businesses to deliver information and services through a new, extraordinarily intimate consumer channel. The mobile "Gold Rush" that followed turned the mobile device into what Matt Strain of AVG called an "information appliance." App development was primarily done in native languages, using whatever toolkits were available.

As app features became more sophisticated, users could perform formerly webbased tasks with integrated mobile capabilities such as geolocation and SMS. Evolved standards like HTML5 and multi-platform languages andframeworks aided app development, as did the parallel rise of cloud computing that increased availability of data and backend services. Meanwhile, the popularity of bring your own device (BYOD) policies drove many companies to examine how mobile technologies were supported and integrated in their businesses.

Today, the app economy is in full swing—but it's not the same economy of the early days of the App Store. With the Internet of Things (IoT), mobile now serves as a hub for connecting devices and services that fuel billion-dollar business opportunities. The early user-experience and integration challenges created by the "app revolution" are now more mission-critical than ever.

FOR ENTERPRISE MOBILE APP DEVELOPERS, THE LANDSCAPE HAS BECOME INCREASINGLY COMPLEX AS THEY DEAL WITH:



Multiple data sources and data formats from a variety of on-premises, mobile and IoT devices



Legacy business rules and systems that must be integrated with new mobile investments



Increasingly fragmented maze of devices and operating systems



Increased importance of security and user experience



Top Omnichannel Roadblocks

The following diagram shows typical components of an enterprise mobile app architecture. Data and logic are fragmented across the device, cloud and onpremises infrastructure in order to deliver a full user experience that doesn't compromise security, performance or maintainability. APIs (Application Programming Interfaces) are the connection points between the on-device app and the various backend—cloud and on-premises—services.





Mobile Enterprise Apps: The User's View

The addictiveness of smartphones is enabled, in part, by the intimacy of the user experience (UX)—the principle upon which mobile apps were founded. "There's an app for that"[™] thinking resulted in single-task-based applications crafted for a frictionless and engaging UX. For instance, simply unbundling the basic features of photo sharing sites and social networks and adding artistic filters precipitated the meteoric rise of Instagram. This early emphasis on user experience forever raised the bar for all mobile apps.

But there is a constant tension between meeting the enterprise's integration and security needs and the experiential expectations of end users. The enterprise demands high security, scalability, maintainability and functional reusability from legacy assets. This can result in compromises around look and feel, intuitiveness and responsiveness. Early consumer-facing apps that mimicked Web portals rather than mobile context died on the vine. And IoT apps demand even faster and more secure experiences.

So how can companies best deal with this tension?

Start by remembering that the app developer precedes the ultimate app consumer. Developers must deal with the substantial complexity behind the app that the end user never sees. Place the same emphasis on Developer Experience (DX) as you would for UX, and you liberate the developer from much of that complexity, freeing them to design and build great apps with the expected UX. A great DX comes from the tools, building blocks and instructions you provide to developers.





Layer7 API Gateways

To help enterprises provide the increasingly critical developer experience, Broadcom and Layer7 have created a new category of mobile development technologies. Layer7 API Gateways accelerates development of mobile and IoT apps with a developer toolkit containing SDKs and APIs. The toolkit provides the benefits listed below which reduce repetitive coding and complexity for the enterprise developer.

Repeatable yet critical functions of mobile development such as user management, storage and backend/device integration are wrapped up as developer-friendly, callable functions of an SDK. Developers can invoke these SDK calls to accomplish key tasks.

Now, developers can focus more on creating a rich UX without worrying about backend functions.

Layer7 API Gateways Benefits:

• Open interfaces free developers and enterprises from vendor lock-in

- Underlying security infrastructure and integration with advanced authentication reduces risk in enterprise mobile apps
- Ad-hoc groups enhance sharing in collaboration apps
- Pub/Sub and MQTT enables the development of reactive apps to utilize near real-time propagation of events and data
- IoT-friendly interfaces and MQTT support allow for seamless integration across a large volume of devices





Key Features to Boost Developer Productivity

User/Group Management

Developers must include easy sign-up and quick on-boarding for apps. Layer7 Mobile API Gateway includes a SCIM 2.0 (System for Cross-domain Identity Management) connector that enables easy provisioning for individuals or custom groups. Standardsbased security flows based on OpenID Connect, single sign-on (SSO) and FIDO integration provide advanced authentication and access management. Out-of-the-box integration with identity providers that support LDAP is also available. With simple SDK calls, developers can manage app-level access control and realtime access revocation.

Secure Local/Cloud Storage

Enterprise apps require on-device or cloud storage capabilities. Layer7 Mobile API Gateway offers "unified storage" capabilities, including on-device encryption of data and cloud storage APIs. The storage service offers a convenient device API that handles data encryption and sync-to-cloud as needed. The local app will use the data offline but whenever connectivity is established—and the policy mandates it—synching will be initiated.

SAMPLE USE CASES



SAMPLE USE CASES (Applications)





Key Features to Boost Developer Productivity

Publish/Subscribe Model for Reactive Apps

The RESTful API design pattern is well established as the way to externalize data. However, IoT apps need more real-time access to devices, their data and events propagated from the various system components. Polling mechanisms don't scale well. But in a publish-subscribe messaging pattern, a message broker tracks subscribers to a particular class of messages and forwards messages appropriately. The subscribers opt-in for specific classes of messages with no knowledge of potential publishers. This complements the RESTful pattern and provides an alternative transport mechanism. It also decouples system components and adds scalability for massively distributed systems. Layer7 Mobile

SAMPLE USE CASES (Consumption of IoT data in)



API Gateway support MQTT and a broker proxy model that enables full control of inbound and outbound messages.

User-to-User Messaging

Developers are often asked to make applications more collaborative by including social and messaging features. Layer7 Mobile API Gateway includes a component for building direct user-to-user or user-to-group messaging into apps with just a few lines of code. Few messaging platforms provide the simplicity of Layer7 Mobile API Gateway. Even fewer layer on advanced security with autoencryption of payload so that only the recipient will be able to decrypt the messages.



SAMPLE USE CASES



Preparing For the Enterprise of Things

As the digital economy drives complex enterprise architectures, IT has embraced the complexity with simplified standards. APIs allowed new cloud and mobile architectures to co-exist with enterprise systems. And newer and evolving standards will enable integration of smart devices into these IT landscapes. The digital enterprise facilitates transactions spanning from customer devices to private cloud to enterprise systems behind the firewall. These transactions can originate from smart homes, smart cars or consumer wearable devices, and access data from an enterprise system on-premises. The enterprise's boundaries are now more extensible and permeable than ever—making security, governance and management critical topics in the "Enterprise of Things" conversation.

Leveraging Layer7 Mobile API Gateway not only enables a great DX. It also empowers developers to craft a great UX. Most security and management tasks are easily addressed with the SDK. The underlying mobile security technology also allows for SDK calls to enforce security policies specified by the developer. The same SDK allows for publish/subscribe messaging using protocols like MQTT—allowing seamless integration with a wide range of smart devices inside and outside the enterprise.

Just as the Web paved the way for the Mobile App era, mobile technologies will lay the foundation for the IoT era.



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Accelerate Mobile and IoT App Development with Layer7 API Management

DISCOVER HOW: LAYER7

Layer7 API Management provides a central point for securing and authorizing access to mobile backend services and enterprise assets exposed via APIs and open source SDKs, enabling developers to rapidly create five-star mobile and IoT apps.





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