

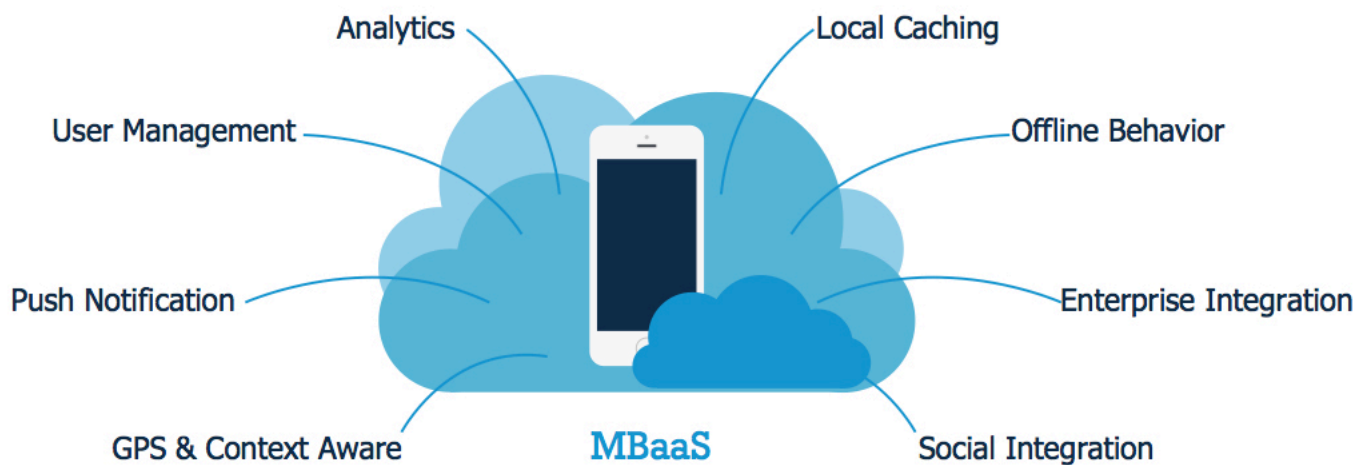
Backend as a Service

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WHAT IS BAAS

BACKEND AS A SERVICE

BaaS (Backend as a service) or MBaaS (mobile backend as a service) is a means for mobile and web developers to connect their applications to a backend cloud storage and processor. Other common features are often provided including user management, push notifications, social networking integration and more. With the power of BaaS developers can utilize backend features for all of their apps in a matter of minutes instead of days or weeks, this allows developers to focus on developing their app instead of creating a backend for it. There are two types of BaaS providers; consumer BaaS and enterprise BaaS. The companies that cater to consumers target smaller apps and games while the enterprise companies focus on mobilizing sensitive, business-critical data for enterprise systems. BaaS offers these services by creating a unified API and SDK to connect your mobile apps to the backend service. Instead of having to use an API for each different feature you want to integrate, such as push notifications and social networks, those features and more are all housed under one API and SDK through your desired BaaS provider.



FIVE BAAS SOLUTIONS

CONSUMER, ENTERPRISE & OPEN SOURCE

Kumulos: Kumulos is one of the popular BaaS providers that works well for both small and large mobile developers alike. Kumulos supports iOS, OSX, PHP and Android and is free while you are developing your project/app. Once your app is launched the cost is \$50 per app per month. One upside to Kumulos is that it is very easy for newcomers to BaaS to get started quickly. Kumulos also allows you to perform basic CRUD operations on your database which can be useful when moving data from an existing server to the Kumulos platform.

FireBase: FireBase is owned by Google and is a go-to for real-time apps. FireBase offers a flexible security model which includes the ability to incorporate your own auth tokens or those from third parties. The SDKs made available through FireBase are for JavaScript (web and node.js), Objective-C (iOS), and Java (Android). They also provide officially supported integration with Angular JS, Backbone.js and EmberJS, all of which are client-side JavaScript frameworks. Multiple third party libraries exist as well, including Python, PHP, Ruby, Clojure and Perl.

BaaSBox: BaaSBox supports all app developers and houses all of its backend features in a standalone server. Instead of an Application Server and a Database Server there is only a JVM and nothing else. Simply install the JVM and connect your app to it. One of the large selling points for BaaSBox is that it is completely open source and free to download.

Kinvey: Kinvey is focused on the enterprise side of mobile applications and thus if you have more than 200 active users per month you are required to have a paid plan. Although Kinvey is best suited for large enterprises, they also offer a useful tool aimed at agencies and freelancers that enables you to estimate the cost of app development projects based on the feature requirements and usage estimates. Integrated backend services that Kinvey has available include: Identity and access management, data store, file store with CDN, push notifications, SMS and email services, location services, beacon support, user and usage analytics and more.

AnyPresence: AnyPresence is another enterprise BaaS used by the likes of MasterCard, Citi and more. They offer a scalable backend and focus on helping big companies get their apps to market quickly. Some features offered by AnyPresence include a custom API builder, a customized OEM app designer allowing you to create your own branded app builder portal, and the ability to use certain components independent of each other such as Smart SDKs, backend servers, etc. based on the needs of your specific app.

THREE REASONS TO USE BAAS

ADVANTAGES OF BAAS

- I. **Management:** One of the main reasons to use a BaaS is the management it provides. Instead of going out and building an entire backend for your app from the ground up you can select from a multitude of BaaS providers that already have those back-ends setup. This lets developers focus on what's most important; building their apps, marketing their apps, finding new users, etc.
- II. **Features:** Every app now is expected to have certain core functionality, such as social media integration and push notifications. An advantage of using a BaaS is that pretty much every BaaS provider allows your app to easily integrate these features and many more. Instead of using a different API for each social media platform and feature, a BaaS houses all of these features under one API and SDK.
- III. **Security:** If you don't choose to use a BaaS for your app you are left with building your own backend, maintaining that backend, and most importantly, making it secure. BaaS providers take the burden of wondering if your app and user's information is secure off of your shoulders.

THREE BAAS SOLUTIONS

PROS AND CONS

Kumulos

Pros:

- Great for both large and small companies/developers.
- Free while you are still developing your app.
- Easy to use for newcomers.
- Allows CRUD operations on your database.

Cons:

- Lacking in documentation, not everything is explained.
- Not open source.

BaaSBox

Pros:

- Open source.
- Runs on one JVM.
- Choose between self hosted or hosted options.

Cons:

- Poor documentation.
- Not as easily deployed as other providers.

Firebase

Pros:

- Ability to incorporate your own auth tokens or third party tokens.
- Deploy and rollback with one command.
- Well documented.
- Offers support for real-time apps with a real-time NoSQL database.

Cons:

- No self hosted option; must be hosted through Google's service.

APP EXAMPLE WITH ONE SOLUTION

THREE REASONS WHY

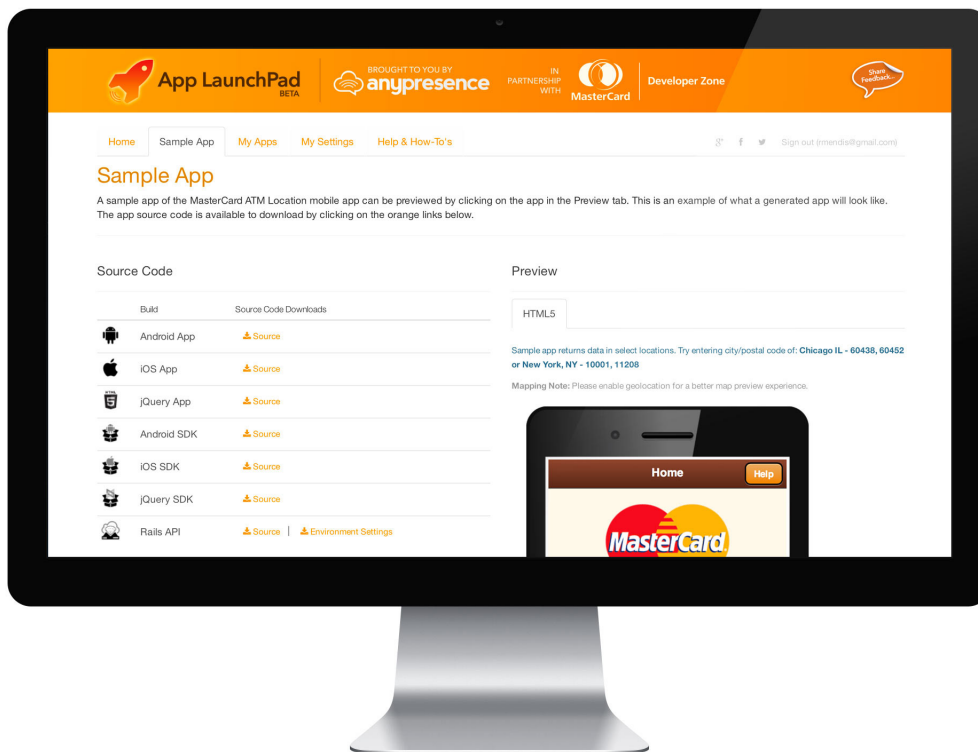
There is a plethora of BaaS providers to choose from, but to choose the right BaaS you need to first determine what platforms you want to support and what features you need. One example that has a particular set of requirements would be a real-time app. Let's say you are building a collaboration app that allows multiple users to create tasks, projects, etc. If one user adds or edits a task, all the other users currently viewing that project will want to see that change/update in real-time. In this case, the best solution to use would be Firebase, and here is why.

- I. **Real-time database:** Firebase is the go-to BaaS for apps that need to support a real-time database. Firebase offers this with their NoSQL cloud database where data is synced across all connected clients in real-time and even remains available when your app goes offline.
- II. **Cloud Messaging:** Firebase offers cloud messaging that lets you deliver cross-platform messaging and can even be sent to one device, a group of users/devices or even topics. Let's say in our collaboration app that a task was added to a certain project, instead of notifying everyone using the app that there was a new task added, you could notify just the users and devices associated with that project.
- III. **Dynamic Links:** The dynamic links offered through Firebase are smart URLs that can dynamically change behavior for different platforms, users, and more. Going back to our collaboration app, what if you have a new team member that wants to get setup on the collaboration app, you can use a Firebase dynamic link to send them to a download page and once they have downloaded the app and open it for the first time they can be automatically added to your project and taken to the tasks screen, all with a single dynamic link.

ONE COMPANY USING BAAS AND WHY

WHY MASTERCARD USES BAAS

MasterCard was faced with the challenge of increasing adoption of their open APIs through instant, customizable, sample mobile app starter kits. To solve this problem, MasterCard looked to AnyPresence to take advantage of their unique ability to generate cross-platform sample apps from within their own developer portal. This feature offered by AnyPresence is called "App LaunchPad" and provided MasterCard with the perfect solution. This means that instead of developers having to read through documentation or code snippets they can interact with live sample apps and generate their own custom apps from templates to integrate with MasterCard's APIs.



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