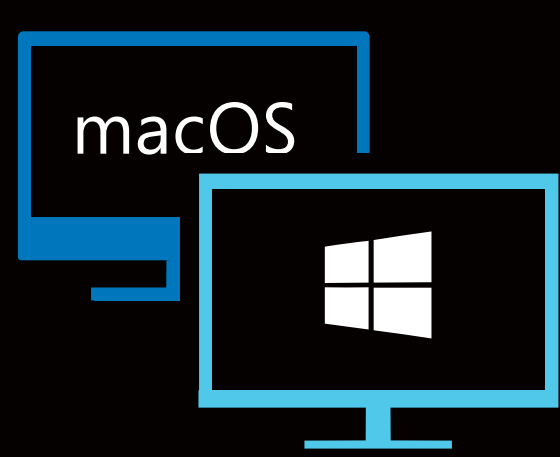
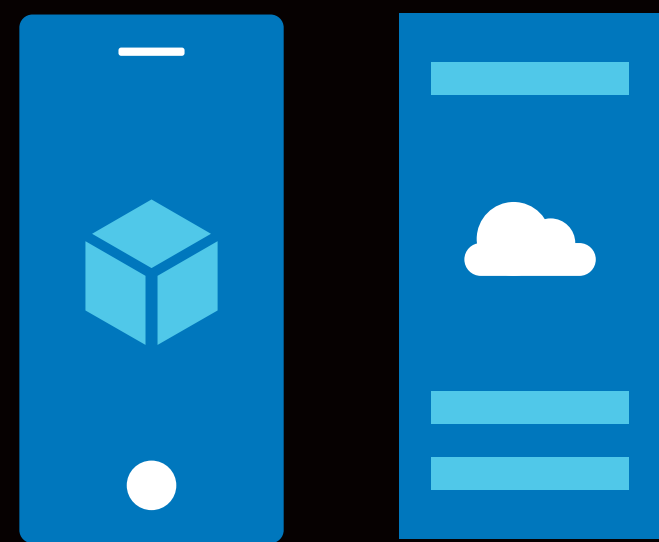


# Android and iOS apps using Xamarin + Azure



## Visual Studio

Quickly build, test, deploy, and manage mobile apps with Visual Studio 2019, Visual Studio for Mac, and cloud-powered services.

[aka.ms/vs/xamarin](https://aka.ms/vs/xamarin)

## Visual Studio App Center

Automate the lifecycle of your apps built with Xamarin. Ship apps more frequently, at higher-quality, and with greater confidence. Connect your repo to build in the cloud, test on thousands of real devices, distribute to beta testers, and monitor real-world usage with crash and analytics data.

[aka.ms/vs/app-center](https://aka.ms/vs/app-center)

**Deliver quality mobile apps**  
With advanced debugging, profiling tools, unit tests, and UI test generation features, it's faster and easier than ever for you to design, build, and tune native mobile apps for Android, iOS, and Windows.  
[aka.ms/vs/xamarin/xamarin-tools](https://aka.ms/vs/xamarin/xamarin-tools)

**Collaborate efficiently**  
Manage your code in Git repos, hosted by any provider, including GitHub and Visual Studio Team Services.  
Share projects seamlessly with developers using Visual Studio across Windows and Mac.  
[aka.ms/vs/Xamarin/source-control](https://aka.ms/vs/Xamarin/source-control)

**Build in the cloud**  
Build Swift, Objective-C, Java, React Native, Xamarin, and UWP apps with every commit or on demand, without the headache of managing build agents.  
[aka.ms/vs/Xamarin/app-center-build](https://aka.ms/vs/Xamarin/app-center-build)

**Test on real devices**  
Test your app on thousands of real devices and hundreds of configurations in the cloud. Automate UI tests for your apps with popular testing frameworks.  
[aka.ms/vs/Xamarin/app-center-test](https://aka.ms/vs/Xamarin/app-center-test)

**Distribute apps instantly**  
Put apps in the hands of your beta testers and users on multiple device platforms—send different builds to different groups of testers and notify them via in-app updates.  
[aka.ms/vs/xamarin/app-center-distribute](https://aka.ms/vs/xamarin/app-center-distribute)

**Create intelligent services**  
Visual Studio and Visual Studio for Mac enable the creation of .NET Core solutions, to power your mobile apps. Code, debug, and test these cloud services simultaneously with your apps for increased productivity.  
[aka.ms/vs/xamarin/cognitive](https://aka.ms/vs/xamarin/cognitive)

**Monitor your app health**  
Get real-time crash reports, notifications, detailed stack traces, and easy-to-read logs to quickly diagnose and fix problems in beta or production apps.  
[aka.ms/vs/Xamarin/app-center-diagnostics](https://aka.ms/vs/Xamarin/app-center-diagnostics)

**Analyze and learn faster**  
Understand your customers' app usage with analytics about your core audience—devices, locations, session info, language, and more.  
[aka.ms/vs/xamarin/app-center-analytics](https://aka.ms/vs/xamarin/app-center-analytics)

**Push notifications**  
Integrate push notifications into your apps in a few easy steps. Segment your audience and engage them with targeted messaging at the right time.  
[aka.ms/vs/xamarin/app-center-push](https://aka.ms/vs/xamarin/app-center-push)

**Data storage**  
Convenient access to CosmosDB with the Data Client SDK for cloud data storage with built-in offline data support.  
[aka.ms/vs/Xamarin/app-center-data](https://aka.ms/vs/Xamarin/app-center-data)

**User Authentication**  
Leverage the cloud-based identity management service to easily authenticate user and manage user identities.  
[aka.ms/vs/xamarin/app-center-auth](https://aka.ms/vs/xamarin/app-center-auth)



## Mobile Back-end as a Service (MBaaS)

Quickly build powerful back-end services with high reliability, security and scalability

**Visual Studio App Center**  
**Auth** – authenticate your users and leverage user identities to view user data and send push notifications to users instead of devices (building on Active Directory B2C)  
**Data** – Persist, manage and sync data in the cloud across multiple platforms online and offline (with CosmosDB)  
**Push** – Engage your users by sending them targeted messages at the time you want. Create segments of users based on device and custom props (via Notification Hubs)  
[aka.ms/vs/xamarin/app-center](https://aka.ms/vs/xamarin/app-center)

**Azure Functions**  
Run code in response to a variety of events, without having to provision or manage infrastructure, in your development language of choice. Build rich serverless scenarios by integrating multiple Azure services  
[aka.ms/vs/xamarin/azure-functions](https://aka.ms/vs/xamarin/azure-functions)



## Data

Store structured and unstructured data in cloud services that are highly available, secure, durable and scalable

**Azure Cosmos DB**  
Build extremely low latency and massively scalable databases that can be transparently replicated worldwide, to always be near your users  
[aka.ms/vs/xamarin/cosmos-db](https://aka.ms/vs/xamarin/cosmos-db)

**Azure SQL Database**  
Build high-performance, reliable, and secure relational databases for data-driven app, without needing to manage infrastructure  
[aka.ms/vs/xamarin/azure-sql-db](https://aka.ms/vs/xamarin/azure-sql-db)

**Azure Storage**  
Securely store blobs, unstructured data, and files that can be accessed from anywhere around the world, publicly and privately  
[aka.ms/vs/xamarin/azure-storage](https://aka.ms/vs/xamarin/azure-storage)

**Visual Studio App Center**  
Configure CosmosDB easily for your mobile applications.  
[aka.ms/vs/Xamarin/app-center-data](https://aka.ms/vs/Xamarin/app-center-data)

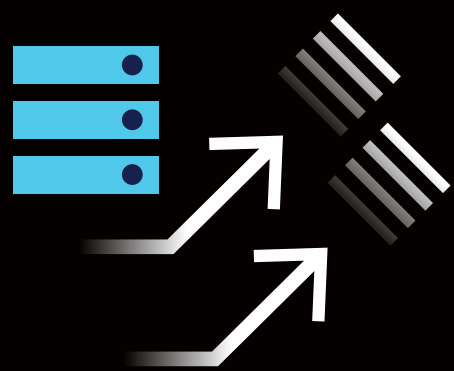


## Identity

Secure and powerful customer identity and access management

**Azure Active Directory B2C**  
Enable your apps to authenticate with social accounts, emails and custom identity providers, using a fully customizable identity experience while meeting your and your users' security, scalability and compliance needs  
[aka.ms/vs/xamarin/azure-ad](https://aka.ms/vs/xamarin/azure-ad)

**Visual Studio App Center**  
Streamlined integration of identity features into mobile applications.  
[aka.ms/vs/xamarin/app-center-auth](https://aka.ms/vs/xamarin/app-center-auth)



## Communication

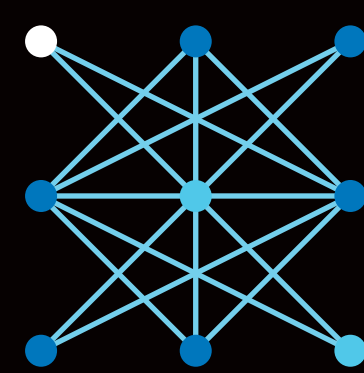
Absorb unexpected traffic bursts and scale your communication channels on demand with options that grow with your app's success.

**Azure SignalR**  
Add real-time communications to your apps without the need to provision or maintain servers and integrate easily with many Azure services.  
[aka.ms/vs/xamarin/signalr](https://aka.ms/vs/xamarin/signalr)

**Azure Storage Queue**  
Integrate application components using simple, affordable, durable messaging.  
[aka.ms/vs/xamarin/azure-queue](https://aka.ms/vs/xamarin/azure-queue)

**Azure Service Bus**  
Integrate application components that span multiple communication protocols, data contracts, trust domains and network environments using a reliable and scalable infrastructure.  
[aka.ms/vs/xamarin/service-bus](https://aka.ms/vs/xamarin/service-bus)

**Azure Event Grid**  
Azure Event Grid Develop richer apps by connecting multiple sources and destinations of events. Eliminate polling and benefit from fully managed event delivery and intelligent filters with massive, dynamic scale all built-in  
[aka.ms/vs/xamarin/event-grid](https://aka.ms/vs/xamarin/event-grid)



## Artificial Intelligence

Use Artificial Intelligence to infuse your apps with algorithms to see, hear, speak, understand and interpret your users' needs through natural communication

**Azure Cognitive Services**  
Use computer vision to identify, caption and moderate photos and video. Convert spoken audio into text, add speech recognition to your app, enable your apps to process natural language  
[aka.ms/vs/xamarin/cognitive](https://aka.ms/vs/xamarin/cognitive)

**Azure Bot Service**  
Create bots that can naturally interact with your users by easily integrating Cognitive Services. Build any kind of bot from a Q&A bot to your own branded virtual assistant, using comprehensive and open source SDK and tools  
[aka.ms/vs/xamarin/bot-service](https://aka.ms/vs/xamarin/bot-service)

**Azure Machine Learning**  
Use existing data to forecast future behaviors, outcomes and trends such as estimating product demand, predicting sales figures and analyzing marketing returns  
[aka.ms/vs/xamarin/machine-learning](https://aka.ms/vs/xamarin/machine-learning)



## Search

Enterprise-grade search solution for all types of internal data, with fast querying and advanced search options

**Azure Search**  
Add powerful and sophisticated search capabilities to your apps  
<https://aka.ms/vs/xamarin/azure-search>



## AR/VR/MR

Make the world your app canvas and offer your users a more immersive and engaging experience

**Azure Spatial Anchors**  
Create mixed reality apps that map, designate and recall precise points of interest accessible across HoloLens, iOS and Android  
[aka.ms/vs/xamarin/spatial-anchors](https://aka.ms/vs/xamarin/spatial-anchors)