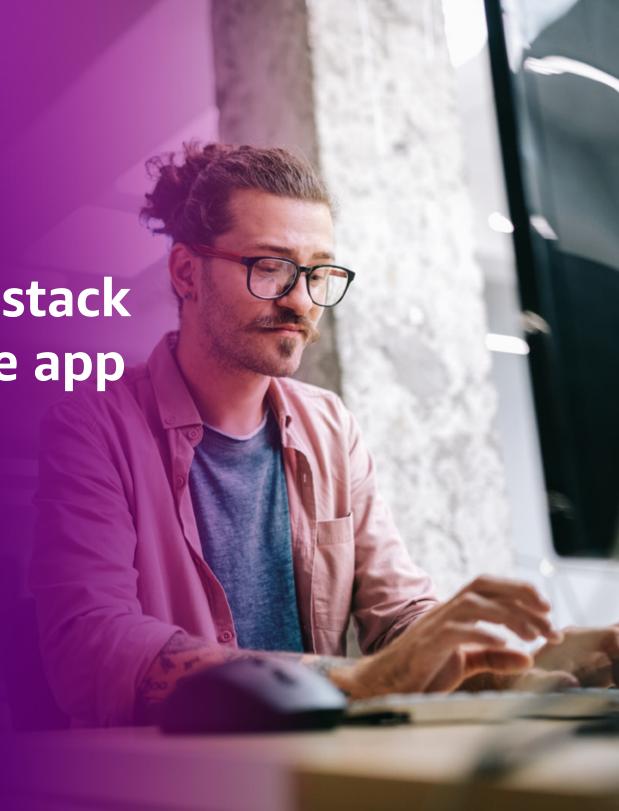aws

Accelerate full-stack web and mobile app development

Three tips proven to help teams build modern apps faster.

Build mobile and web apps faster

Organizations want to innovate faster with modern web and mobile applications that delight customers and support employees. To do so, development teams must meet the ever-rising bar for advancing user experience and complex cloud features—while delivering a scalable, secure, high-performance app at low cost.

When building modern web and mobile applications, ensure that your teams are set up to deliver full-stack scalable apps quickly and successfully. Look for developer tools that close the gap between new and experienced developers—helping your teams launch apps quickly while leveraging extensible options that integrate with internal processes.

To accelerate your development processes, search for solutions that streamline access to dispersed, distributed data across workstreams. This will enable front-end teams to build data-driven features quickly and efficiently. Make architectural choices to support the ability of your app to fit today and flex to meet the needs of tomorrow. Whatever you decide, ensuring app performance and security remains your number one job.

In this guide, we share three tips to speed the development of mobile and web apps:

1 **Modern Tools and Frameworks –** empower your front-end teams with flexible, purpose-built tools and frameworks

2 **Modern APIs –** simplify access to distributed data sources with unified GraphQL and Pub/Sub APIs

3 **Modern Compute –** reduce management issues and complexities with managed and serverless services

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Empower your front-end teams with flexible, purpose-built tools and frameworks

The situation

Front-end developers create a differentiating user-experience for their apps using front-end programming languages like JavaScript, Swift, or Kotlin, popular frameworks like React, React Native, Flutter, or Angular, and tools such as integrated development environments (IDEs). They code the presentation layer of apps, access and integrate data through APIs, and build cloud-powered features such as video or chat with real-time and offline capabilities for their web or mobile application.

While front-end developers may be experts in building user interfaces, they are typically not cloud experts. Building and connecting cloud functionality into a mobile or web application can be complex and time-consuming, reducing the time front-end teams can use to focus on developing the user experience.

The solution

Help your front-end teams be more productive with development tools and frameworks that reduce the amount of code needed to accomplish common use cases. Leverage frameworks with deep capabilities for the most complicated tasks—such as authentication and data access—and look for advanced features to handle caching, reconnection, data synchronization, and conflict resolution. Select tools that simplify development without sacrificing the flexibility to customize or extend code-based app features. Choosing tools that reduce the cloud learning curve results in quicker setups, faster workflows, and automated security—giving front-end teams the freedom to focus on the problems they're solving for your customers.

How AWS can help

AWS Amplify offers tools and services to help front-end developers quickly build web and native mobile apps that share a common AWS powered backend. Amplify libraries simplify the integration of common use cases, like storing images and video in the cloud, into your app and integrate deeply with popular front-end frameworks, languages, and mobile platforms. Additionally, the Amplify CLI and Admin UI can help developers quickly create an extensible AWS backend, as needed. Unlike backend-as-a-service offerings, AWS Amplify allows developers to leverage the breadth of AWS services and tools as their apps evolve.

Amplify Studio lets you easily build and ship complete web and mobile apps in hours, outside of the AWS Console. With Amplify Studio, you can quickly build an app backend, create rich user interface (UI) React components, and visually bind a UI to the backend in clicks. Developers can use the visual interface to define a data model, user authentication, and file storage without backend expertise. Developers can also accelerate their front-end UI application development by selecting from dozens of popular React components, such as newsfeeds, contact forms, e-commerce cards, and primitives (buttons, text fields, alerts) and customize them to fit their style guide. Amplify Studio integrates with Figma, streamlining the designer-developer workflow. Developers can import designer built Figma prototypes into Amplify Studio as clean React code. AWS Amplify automatically generates the underlying business logic and deployment code so that developers can extend apps with custom business logic code in their preferred programming language.

Your developers can also use the AWS Amplify Hosting to deploy and host any React, Vue.js, or Next.js web app—including built-in continuous integration and continuous deployment (CI/CD) workflows, testing, pull-request previews, and custom domains.

By enabling the above benefits, AWS Amplify is helping front-end developers build mobile and web apps faster than ever. By encoding best practices for common scenarios and delivering them in an opinionated way, AWS Amplify reduces the overall steps and lines of code required to build full-stack apps on AWS—while providing dev teams with the flexibility to customize apps as business requirements evolve.

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Neiman Marcus increases application speed to market by 50 percent on AWS

NeimanMarcus

Challenge

A leader in luxury goods, Neiman Marcus has a reputation for delivering a first-class, personalized customer-service experience. To modernize and enhance that experience, the company wanted to develop Connect—an omnichannel, digital selling application that would empower associates to view rich, personalized customer information. The goal: Make each customer interaction unforgettable.

While the COVID-19 pandemic was forcing many retail stores to close, Neiman Marcus was moving its sales exclusively online. The company needed to launch Connect quickly to continue providing the hallmark experience that had always attracted customers. Doing so meant equipping its associates to sell in the digital environment.

"Using a serverless architecture with AWS Amplify and AWS AppSync, we increased our speed to market by at least 50 percent and were able to accelerate the launch of Connect."

Sriram Vaidyanathan
Senior Director, Omni Engineering, Neiman Marcus

Tools and services used

- AWS Amplify
- AWS AppSync
- AWS Lambda

Results

- Speed to market for Connect increased by 50 percent
- Using a serverless architecture costs 90 percent less than traditional methods

Read the full case study ›

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Simplify access to distributed data sources with unified GraphQL and Pub/Sub APIs

The situation

Organizations continue to transition away from monolithic applications to more modular architectures in the cloud. When applications are built with modular or independent components, called microservices, release velocity can increase because developers can easily make changes to any individual component.

Microservices make applications easier to scale and faster to develop, enabling innovation and accelerating time to market. However, the adoption of microservices may require front-end teams to connect to hundreds of distributed microservices and data sources, making it more difficult for them to access the data they need for their user-facing application. By streamlining data access in a way that makes it easier for front-end teams to consume in the application, backend teams play an important role in accelerating web and mobile development.

The solution

Technologies such as GraphQL can increase the speed and efficiency of data access and integration across multiple backend data sources. GraphQL is a query language for APIs and a runtime for fulfilling those queries with your existing data. GraphQL provides a complete and understandable description of the data in your API, giving front-end developers the ability to query exactly the data that's needed on each API call from multiple backend databases and microservices. Backend development teams can use GraphQL to abstract existing data sources into a single endpoint and provide easier data access to front-end teams. For a set of existing APIs, abstracting multiple endpoints into a single GraphQL API delivers GraphQL advantages—without the work of migrating APIs or rewriting the application from scratch.

Creating a unified API layer with GraphQL complements your REST API strategy to help front-end developers simplify their interactions with distributed service architectures. GraphQL users can also publish real-time data updates from any event source to subscribed web, mobile, and IoT clients by extending the API to include subscriptions.

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How AWS can help

AWS AppSync is a serverless GraphQL and Pub/Sub API service that simplifies the development of modern web and mobile applications. AWS AppSync handles the heavy lifting involved in securely connecting to data sources like Amazon DynamoDB and AWS Lambda. AWS AppSync offers fully managed GraphQL API and Pub/Sub API setup, administration, auto-scaling, and high-availability.

AWS AppSync GraphQL APIs simplify application development by providing a single endpoint to securely query or update data from multiple databases, microservices, and APIs. Use GraphQL to power your applications with the right data, from one or more data sources, with a single network request. AWS AppSync securely connects your GraphQL API to data sources like AWS DynamoDB, RDS, OpenSearch, and Lambda. And easily add caches to improve performance, authentication to secure your data, and client-side data stores that keep off-line clients in sync.

AWS AppSync Pub/Sub APIs simplify the creation of engaging real-time experiences by automatically publishing data updates to subscribed API clients via serverless WebSockets connections. Publish real-time data updates from any event source to subscribed web, mobile, and IoT clients by extending your GraphQL API to include subscriptions. Or start with a simple Pub/Sub API without GraphQL. Either way, AWS AppSync handles the creation of serverless WebSockets connections, message broadcast, and fan out to up to millions of connected clients.

AWS AppSync offers integrations with other AWS services, making it easy to secure, monitor, and troubleshoot APIs. These services include:

1. AWS WAF to protect APIs from common web exploits
2. Amazon CloudWatch for managing metrics and logs
3. AWS X-Ray for tracing the behavior of distributed applications
4. AWS CloudTrail for monitoring audit logs in real time

Public Good goes from concept to production in under one month with one engineer

Challenge

Public Good Software is a leading cause-marketing platform with a goal of making news actionable by matching journalistic articles to relevant charitable causes. AWS AppSync allowed the organization to move from concept to production in less than a month with a single engineer working on the API backend. Because fewer calls were required from the client to the backend, the use of AWS AppSync lowered the latency in delivering actionable content. The combination of AWS AppSync and GraphQL meant data could be fetched and aggregated across multiple microservices in a single network request.

Tools and services used

- AWS AppSync
- Amazon SageMaker

Results

- Executed API improvement and moved to production in less than one month
- Updated API has improved customer experience and sped up page load times
- Application scales seamlessly to match variable site traffic

Read the full case study ›

PUBLIC GOOD

"We went from concept to production in less than a month with a single engineer working on the AWS AppSync service"

Michael Manley
Chief Technology Officer, Public Good Software

Operate less with managed and serverless services

The situation

Deloitte reports that 80 percent of IT resources are focused on running the business, while 20 percent are focused on innovation. The fastest way to improve that ratio and bias it toward innovation is to reduce time spent on activities that are not core to your business—such as managing infrastructure. Managing servers, storage, networking, and operating systems is time-consuming, expensive, and operationally complex due to procurement cycles. Managing infrastructure consumes more and more of your teams' time (and represents a critical opportunity to optimize and reinvest in innovation).

The solution

One of the easiest ways to "operate less" is by offloading the operational burden to a cloud provider by adopting managed or serverless services for your infrastructure. Reducing time spent provisioning, managing, and patching servers enables your developers to spend more time innovating—writing and iterating code for the products that delight your customers. With serverless computing, there's no infrastructure to provision or manage. Your infrastructure scales automatically by unit of consumption—rather than server unit. With serverless, your organization pays only for the compute it consumes; availability and fault tolerance are built in. Serverless computing removes the burden of server operations so you can focus on building the application rather than managing and scaling the infrastructure to support the application.

How AWS can help

A great place to start is **AWS Lambda**, a serverless, event-driven compute service. With AWS Lambda, you only need to write code for the business logic. AWS Lambda is event-oriented, which means that it sits idle until an event is triggered and the system is powered into action. In fact, you can automatically trigger AWS Lambda functions from over 200 AWS services and SaaS apps—without writing a single line of integration code. Once the event is triggered, resources are automatically spun up and down to meet the need of the task—at millisecond speed. There is no need to provision or configure infrastructure, and you pay only for what you use. This means faster time to production at the lowest possible TCO. AWS Lambda offers maximum agility with minimal operations, but sometimes you may find that finely tuning infrastructure adds value to your business. Your teams can continually complement AWS Lambda with container services on AWS, namely Amazon ECS and Amazon EKS.

QsrSoft launches employee engagement app in 90 days with a team of 2 developers

Challenge

When the COVID-19 pandemic hit, QsrSoft was presented with an opportunity to innovate. The company realized that its customers, including McDonald's and other restaurant operators, were facing challenges involved in retaining and motivating their workforces. In response, QsrSoft wanted to provide the resources to help fill this gap.

QsrSoft reinvented its restaurant dashboard on the built-in security, latency, and scalability of AWS Lambda and Amazon DynamoDB—solutions that enable its developers to focus on the application (not the infrastructure). The company also selected AWS Amplify for fast, easy application development and secure, reliable webhosting. As a result of these choices, QsrSoft completed the application build in just 90 days, and onboarded more than 1,000 locations in six months.

Tools and services used

- AWS Amplify
- AWS AppSync
- Amazon DynamoDB
- AWS Lambda

Read the full case study ›

Results

- Onboarded 100 locations within 1 week
- Onboarded over 1,000 locations within 6 months
- Decreased time spent configuring QsrSoft TV to 3 minutes

"We can think bigger and more creatively working on AWS. We have a much better product because of our ability to innovate."

Adam Pehas
Director of Development, QsrSoft

Getting started

Now that you've explored our three tips for accelerating the development of modern mobile and web applications, you're probably anxious to get started. We advise teams to begin with one or more of these tips as a way of complementing their current approach to building modern applications.

At last, you can empower your front-end teams with AWS Amplify—reducing the overall steps and lines of code required to build full-stack apps can help developers launch faster. You can also simplify access to distributed data sources with AWS AppSync—abstracting existing data sources into a unified GraphQL API endpoint provides easier data access to front-end teams to build data-driven features. You can even differentiate your application with real-time data experiences using a simple Pub/Sub API. And AWS helps you operate less infrastructure using services like AWS Lambda.

Whichever path you choose, AWS will help you meet the ever-rising bar for user experience and cloud services—allowing your teams to deliver a scalable, high-performance application at low cost. Discover how your organization can quickly and easily build and launch feature-rich **mobile and web applications**. Or jump right in and get started today with one or more of our tools or services.

Start your application modernization journey ›

Connect with an AWS expert ›

Start building mobile and web apps with

AWS Amplify ›

Dive into API modernization with GraphQL ›

Learn the benefits of Pub/Sub API ›

Read the 2021 Deloitte TCO report on serverless ›

Gain practical tips in the AWS AppSync GraphQL Blog ›

Explore articles on the Front-End Web & Mobile Blog ›