

OpenX Case Study | Google Cloud

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OpenX: Powering the future of advertising with Google Cloud



About OpenX

As the world's largest independent advertising exchange, OpenX makes efficient people-based marketing buying experiences available to all marketers across the open web. OpenX works with more than 30,000 advertisers across every screen and device, reaching nearly one billion consumers—including a quarter billion unique consumers in the US—and processing more than one trillion transactions globally each day. To date, OpenX has helped deliver more than \$3 billion in total monetization to publishers.

Industries: Technology

Location: United States

Products: [Google Cloud](#), [AI Platform](#), [App Engine](#), [BigQuery](#), [Cloud AutoML](#), [AutoML Tables](#), [Cloud Bigtable](#), [Cloud CDN](#), [Dataflow](#), [Cloud Dataproc](#), [Cloud Dataprep](#), [Cloud Functions](#), [Cloud Load Balancing](#), [Cloud Memorystore](#), [Cloud Pub/Sub](#), [Cloud SQL](#), [Cloud Storage](#), [Cloud TPU](#), [Compute Engine](#), [Kubernetes Engine](#), [Operations](#), [Virtual Private Cloud](#), [Google Marketing Platform](#), [Looker Studio](#), [Display & Video 360](#)

In order to further the company's mission of powering people-based marketing across the open web, OpenX moved its entire advertising exchange and audience platforms to Google Cloud, improving performance, scalability, speed, and global reach while accelerating new product development.

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Google Cloud results

- Completes cloud migration and refactoring in seven months
- Reduces time to market for new products and features by over 50% with full CI/CD pipelines and automated infrastructure
- Utilizes advanced AI capabilities powered by Google Cloud AI (Cloud TPU, Kubeflow, AutoML) reducing cost to serve and process traffic by over 35%
- Enables OpenX to launch new global regions and markets almost instantaneously

Serving over 100 billion targeted ad requests per day

[OpenX](#) is a leader in programmatic advertising, powering monetization and advertising revenue for publishers (i.e. websites, mobile apps, CTV and OTT apps, etc.) and providing highly targeted audiences for advertisers, brands, and agencies.

As a global leader in programmatic advertising, OpenX creates marketplaces where publishers and app developers can monetize their content by connecting with advertisers that value their audiences. Over the past decade, the company grew quickly as its technology became widely adopted, and by 2015 it was serving the second most ad impressions on the internet. Today, OpenX processes approximately 100 billion ad requests every day.

Although good for business, the explosion of ad traffic brought infrastructure management and scalability challenges. To provide good performance for its customers, OpenX needs to be close to major demand-side platforms (DSPs) in certain geographic regions. Nearly a quarter of OpenX's technology workforce was focused on keeping five physical data centers performant, available, secure, and up to date—and the company still needed more data centers to serve new markets.

OpenX had come to a turning point and had to make a decision: either continue to invest time and money in infrastructure, or migrate to a public cloud. The former strategy would carry a steep opportunity cost in the form of lost innovation, while the latter would free up substantial resources to add value and focus on new growth areas for the company, such as people-based marketing. OpenX decided to make a cultural and technical change that would allow it to focus on its core business by bringing the entire OpenX exchange onto [Google Cloud](#).

“This investment and our work with Google will provide OpenX the flexibility to surge into new markets, adapt our business and billing models, expand our product suite to address the opportunity of people-based marketing, and provide our partners the exceptional quality and support they have come to expect,” explains Tim Cadogan, CEO of OpenX.

More than just a “lift and shift”

Instead of simply porting its existing infrastructure to virtual machines on [Compute Engine](#), OpenX wanted to take advantage of Google Cloud-managed services to build a scalable and automated architecture that would be much more efficient. It engaged [Google Cloud Professional Services](#) to simplify the deployment and modernize the company's infrastructure for cloud, deploying into seven Google Cloud regions for increased global reach.

“We had great support from Google Cloud Professional Services, making it possible for us to undergo a significant transformation in just seven months,” says Joel Meyer, Chief Architect at OpenX. “That's a spectacular achievement, and we couldn't have done it without them. Rather than being a ‘lift and shift’ it was a strategic move toward the future.”

Google helped OpenX choose the right Google Cloud services to support both the high-volume, low-

latency pipeline that serves ad impressions and the subsequent data processing and reporting to customers. To bring consistency, standardization, and speed to its software deployments, OpenX moved all of its workloads to Docker containers running on [Google Kubernetes Engine \(GKE\)](#), a managed, production-ready environment. Approximately 50 PB of data per week is processed on [Dataproc](#), another managed service, before it is handed off to [BigQuery](#) for ad hoc analysis.

“With Google Kubernetes Engine and autoscaling, we’ve achieved a whole new level of automation and cost efficiency that we couldn’t get elsewhere. The marriage of the managed service with the on-demand billing model really hits the sweet spot for us, making us one of the top five GKE consumers by size.”

—Joel Meyer, Chief Architect, OpenX

“A major strength of Google Cloud is its variety of managed services,” says Ivan Gusev, TechOps Architect and Principal Engineer at OpenX. “Google Kubernetes Engine is years ahead of any other managed Kubernetes service, not just by release time, but by ease of use and the quality of the integrations it provides. And there’s nothing else out there like BigQuery for high-powered analytics.”

GKE helped OpenX build a continuous integration/continuous delivery (CI/CD) pipeline to improve its time to market for software releases, bringing the average time to deploy new features down from 30 days to updating multiple times a day.

“Most public clouds give you the ability to scale up and down as needed, but with Google Kubernetes Engine and autoscaling, we’ve achieved a whole new level of automation and cost efficiency that we couldn’t get elsewhere,” says Joel. “The marriage of the managed service with the on-demand billing model really hits the sweet spot for us, making us one of the top five GKE consumers by size.”

Improving performance, scalability, and security

The move to Google Cloud reduced overall latency, especially when sending requests to [Google Marketing Platform](#) products such as [Display & Video 360](#). It increases the speed that bids come into the OpenX Exchange from potential buyers, driving increased revenue potential by allowing publishers to see greater demand for their audiences before an auction closes. Faster performance for serving ads and content also translates to a better user experience, making users more likely to click and thus improving return on ad spend (ROAS) for buyers.

“Google is one of our biggest exchange bidding partners, so keeping that ad traffic within the Google network just makes sense,” says Joel. “The lower the latency, the better the user experience, and the better we can perform for our publishers. It also helps that egress traffic to Google Marketing Platform products is free for Google Cloud customers.”

The OpenX Exchange is now much more easily scalable, allowing the company to support publishers as they experience traffic spikes without sacrificing monetization opportunities or performance. With the ability to deploy new servers on demand in any Google Cloud region and zone, OpenX can enter new markets almost instantaneously instead of waiting six to nine months to build a data center, and scale specific locations based on their unique demands. In May 2019, OpenX launched in Singapore, fully on Google Cloud, becoming the first exchange in Southeast Asia to benefit from operating fully in the cloud without on-premises servers.

Security has also improved, making it easier for OpenX to meet its business partners’ requirements for how confidential data is viewed and managed. Over the past decade, OpenX has built a

reputation in the market around quality, and the security features built into Google Cloud added in an additional layer to OpenX's market leading solution.

"Moving to Google Cloud took us up many levels in security without us investing much time," says Ivan. "Building the same kind of security into an on-premises infrastructure would have been a multi-quarter project for us, if it would even have been possible."

"We crushed a lot of technical debt by moving to Google Cloud and refocused a significant portion of our workforce on smarter work. That allowed us to develop a compelling new product even when we were in the middle of a migration, and do it twice as fast."

—Satya Challa, Senior Engineering Director, OpenX

Innovating in people-based marketing

By utilizing Google Cloud to power its global exchange, OpenX is delivering faster innovations into the market. Shortly after the migration, the company created and delivered the foundational elements of OpenAudience, the first people-based marketing solution for the open web, enabling marketers to plan and buy people-based marketing campaigns across the massive scale of the open web. Using Google Cloud allows OpenX to build on its significant existing data assets while eliminating barriers or caps on the number of data points or unique identities utilized. It also helped OpenX bring the new product to market much faster.

"We crushed a lot of technical debt by moving to Google Cloud and refocused a significant portion of our workforce on smarter work," says Satya Challa, Senior Engineering Director at OpenX. "That allowed us to develop a compelling new product even when we were in the middle of a migration, and do it twice as fast."

"This was no simple lift-and-shift. We fully utilized the cloud-native services of Google Cloud to refactor and optimize the OpenX platform. We completed this unprecedented migration in record time due to a fantastic OpenX engineering team, as well as support from the Google Cloud Professional Services team and Google training and support."

—Paul T. Ryan, CTO, OpenX

Future-proofing the OpenX Exchange

Moving to Google Cloud allowed OpenX to decommission its data centers and resell much of the hardware. As its technology continues to improve, OpenX will always have access to the latest generation of computing power, instead of using on-premises servers that quickly become outdated. As artificial intelligence (AI) and machine learning (ML) play larger roles in programmatic advertising and traffic analysis, OpenX will be able to leverage Google innovations to get a jump on competitors. By utilizing advanced capabilities powered by [Google Cloud AI](#) such as [Cloud TPU](#), [Kubeflow](#), and [AutoML](#), OpenX expects to reduce its cost to serve and process traffic by over 35%.

"This was no simple lift-and-shift," says Paul Ryan, Chief Technology Officer at OpenX. "We fully utilized the cloud-native services of Google Cloud to refactor and optimize the OpenX platform. We completed this unprecedented migration in record time due to a fantastic OpenX engineering team, as well as support from the Google Cloud Professional Services team and Google training and support."



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