Technical Whitepaper

Google Cloud for Ecommerce: Secure, Reliable, Scalable, Global Infrastructure

With Google Kubernetes Engine and More

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May 2021

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Contents

ESG Technical Validations

The goal of ESG Technical Validations is to educate IT professionals about information technology solutions for companies of all types and sizes. ESG Technical Validations are not meant to replace the evaluation process that should be conducted before making purchasing decisions, but rather to provide insight into these emerging technologies. Our objectives are to explore some of the more valuable features and functions of IT solutions, show how they can be used to solve real customer problems, and identify any areas needing improvement. The ESG Validation Team's expert third-party perspective is based on our own hands-on testing as well as on interviews with customers who use these products in production environments.

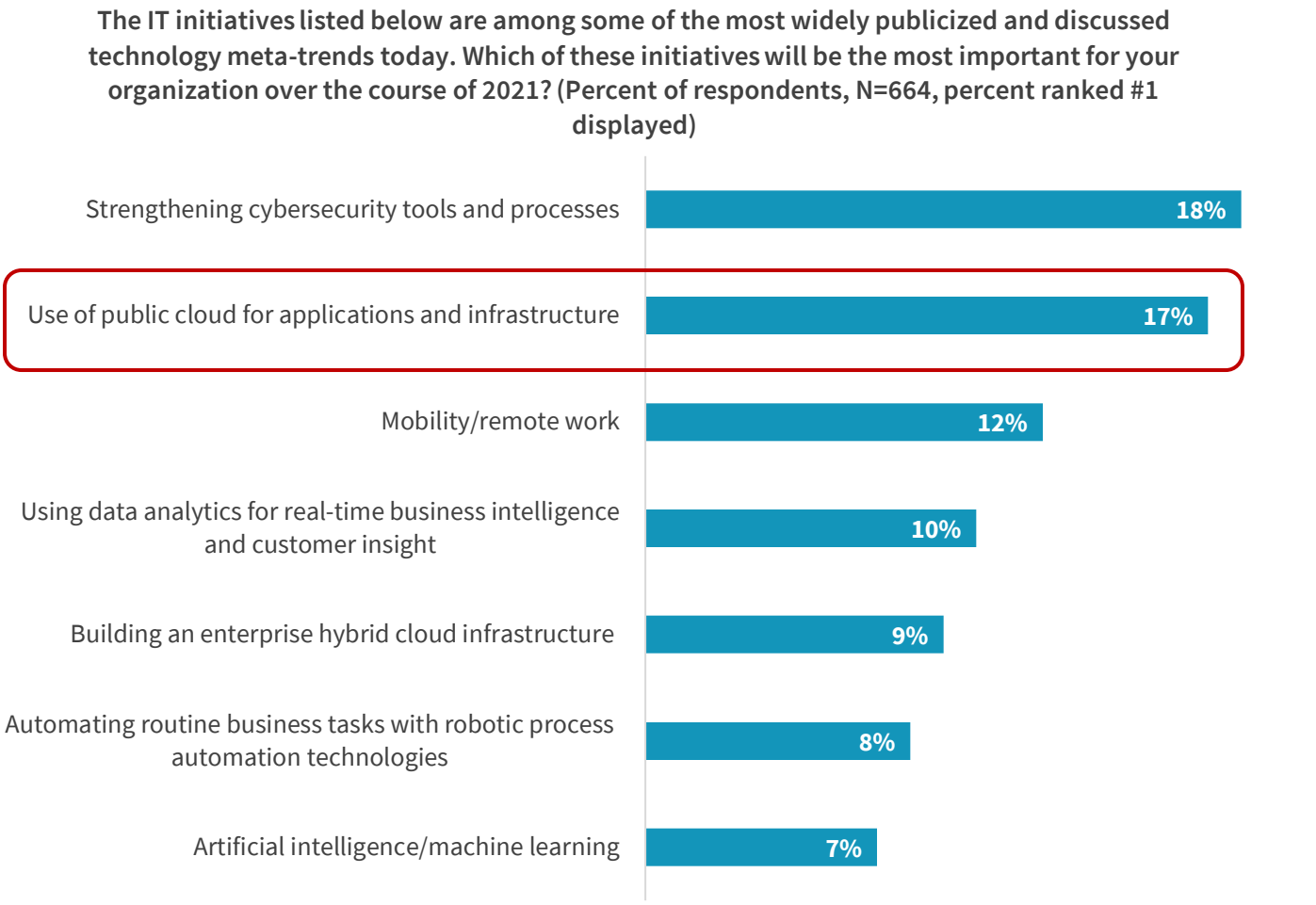
Introduction

This ESG Technical Validation documents ESG's review of Google Cloud solutions for Ecommerce. Google Cloud offers scalable, secure, reliable global infrastructure, including Google Kubernetes Engine (GKE) to containerize applications. The report focuses on two key capabilities that drive revenue growth: Ecommerce Modernization and Migration, and the Black Friday/Cyber Monday (BFCM) White Glove Service.

Background

Most organizations today are data-driven, from prospecting to product development to marketing and data analytics. The IT infrastructure needed to deliver on today's business imperatives is complex to build, manage, and scale, particularly as needs change. As a result, many organizations are looking for different answers than simply buying more gear and hiring more IT staff; they are looking to public cloud providers to help them meet their business objectives. In recent research, ESG asked respondents about the IT initiatives that would be most important in 2021. The use of public cloud for applications and infrastructure was the second most-cited response, second only to strengthening cybersecurity.[1]

Figure 1. Top 7 IT Initiatives in 2021



Source: Enterprise Strategy Group

Source: ESG Research Report, *2021 Technology Spending Intentions Survey*, Jan 2021.

Ecommerce: Increasing Demands Require Innovation

Retail organizations are always under financial pressure as they strive to increase sales volumes while maintaining profit margins. But Ecommerce dramatically changes both the sales opportunity and the competitive landscape. With an online presence, retailers can reach customers around the world, increasing their prospects. But they also have more competition—not only with the store around the corner, but also with online retailers that may be much larger and have much deeper pockets. As a result, to gain market share, a retailer's online presence must be as advanced as its competition's. Customer expectations are high and growing.

Creating and managing the IT infrastructure for Ecommerce is a daunting task. Ecommerce is part of a complete retail value chain that includes product search, purchasing, financial transactions, inventory management, shipping, etc. All these parts must work together; it makes no difference whether a customer enjoys the speed of their product search and check-out experience if the product won't be available for weeks. Also, customers have little tolerance for slow-loading web pages, transaction glitches, shopping cart failures, etc. IT organizations must ensure that their Ecommerce infrastructures can scale to support growth; are reliable and highly available; and are fully secure, protected, and compliant with regional and regulatory requirements. To attract and retain customers, retailers must:

- *Maintain performance* for all Ecommerce processes across all devices. Anything that slows performance or adversely impacts the customer experience (such as inability to handle increases in traffic, slowdowns for maintenance or updates, etc.) can result in lost customers and lost revenue. Investments in marketing can be wasted when websites cannot keep up.

- *Offer reliable, highly available Ecommerce*. This is true at all times, but particularly during Black Friday/Cyber Monday and the ensuing holiday shopping season, which is critical for retailers. Website crashes, downtime, slow site performance, and product availability issues at this time of year can do serious damage to both revenue and reputation. Customers that leave often never return, so keeping the Ecommerce engine running smoothly is essential.

- *Have the agility to shift as needed*. Organizations must be able to not just scale up and down for efficiency, but also add services and capabilities quickly to respond to customer trends. Fixed costs can drag down profitability in the face of a changing landscape.

- *Understand customers*. Organizations need to collect and analyze customer demographic, search, transaction, review, and other data to understand and better serve their needs.

- *Manage inventory in a real-time world*. Retailers must have advanced demand forecasting and inventory management processes to promptly fulfill customer requests. With today's real-time expectations, companies that cannot deliver products immediately are at risk of losing to competitors.

Customer Experience Demands are Changing

While initially the Ecommerce experience was entirely transactional, today it is much more experiential. Shoppers used to simply search online for a specific product and purchase it—and certainly some still do that. But many customers today expect to be presented with new products and are searching for enjoyable, online shopping experiences. To meet these expectations, retailers are offering new customer experiences such as video, interactivity, and virtual reality, along with product suggestions based on data analysis. According to ESG research, when retail/wholesale organizations were asked to

name their most important objectives for digital transformation, 50% said it was to provide a better and more differentiated customer experience, making it the most cited response.[2]

In addition, customers want to use multiple devices—for example, they may start a product search on a laptop, but then want to move to a mobile device without losing their progress. If they have already reviewed several sets of skis and have begun to look at parkas, they want to retain that progress when they switch to a mobile app. Ecommerce solutions must support the ability for customers to complete the purchase process in multiple sessions on multiple devices.

Fulfillment options are required now, especially since the onset of the COVID-19 pandemic. Customers demand options, including delivery, pickup in a store near them, and curbside pickup. Retailers need to offer as many of these options as they can, while keeping costs down.

Retailers must modernize their applications to incorporate continuous integration/continuous delivery (CI/CD) to keep their applications updated without disrupting production. And, in everything they do, retailers strive to deliver the best customer experience with the lowest cost of sales.

IT Challenges

Providing this range of experiences is an enormous IT challenge. On-premises infrastructure to handle these tasks can be difficult to deploy, manage, and scale, and both performance and data protection often depend on having infrastructure in multiple geographies. Building and staffing sufficient data centers for a growing or global presence is costly, time-consuming, and complex. In addition, many organizations need to modernize their applications and infrastructure; some companies still depend on mainframes and applications designed decades ago, which are unable to take advantage of today's technology advancements.

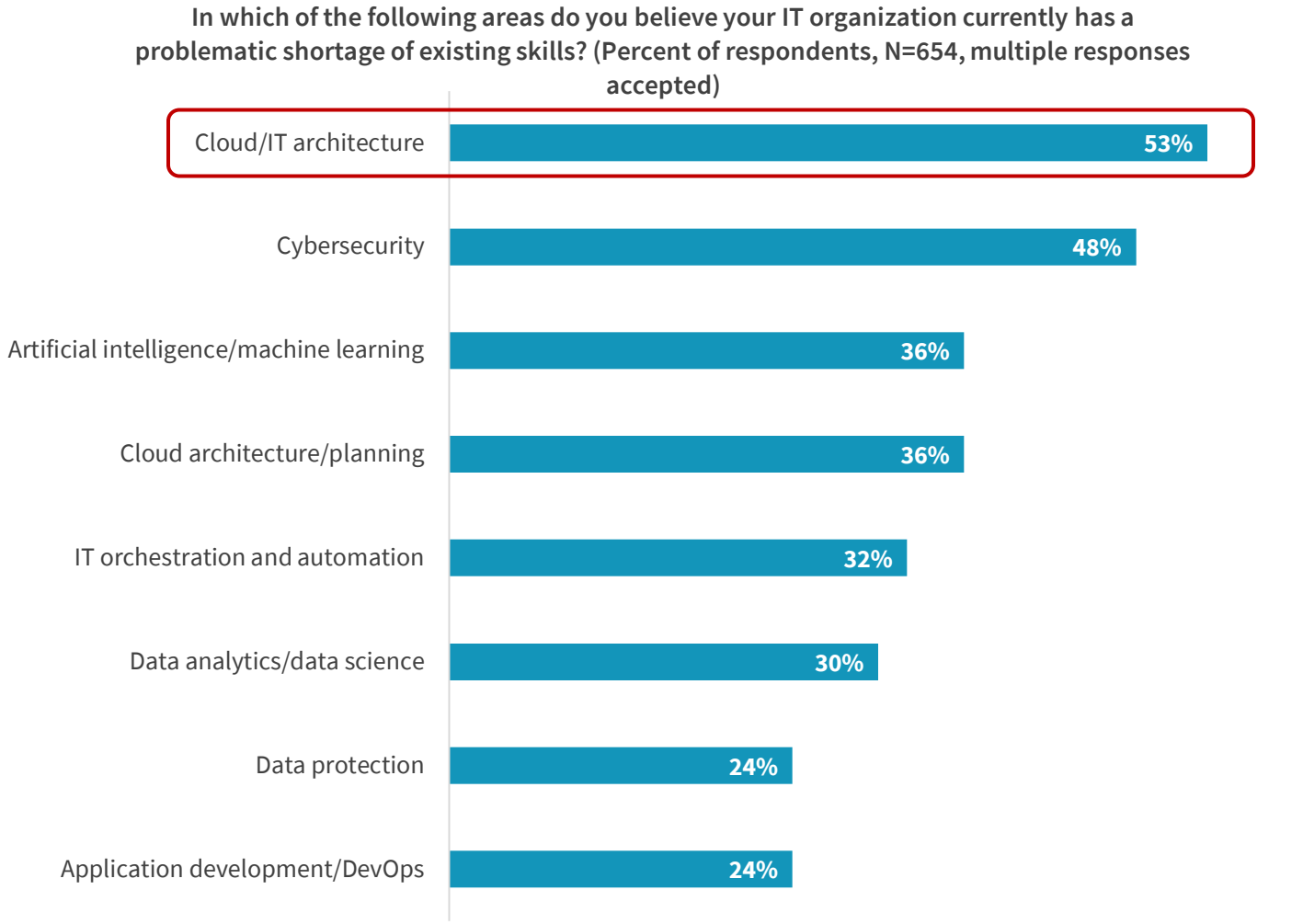
For this reason, many are turning to public cloud solutions and services. These solutions can deliver an Ecommerce infrastructure that is more agile, reliable, and easier to scale; that can offload IT infrastructure management; and that can turn upfront capital investments into monthly operational expenses.

But since moving Ecommerce applications and data to the cloud can be overwhelming, it is critical to select the right solution. For example:

- The typical journey to the cloud requires 12-18 months to transform a monolithic Ecommerce application into a set of microservices that can then be moved to the cloud.
- Many organizations lack the skills they need to move to the cloud. According to ESG research, when respondents were asked in what areas they believed their IT organizations had a problematic shortage of existing skills, the most cited answer was cloud/IT architecture (see Figure 2).[3]

[2] Ibid.
[3] Ibid.

Figure 2. Top 8 Most Common Areas of Problematic Skills Shortage



Source: Enterprise Strategy Group

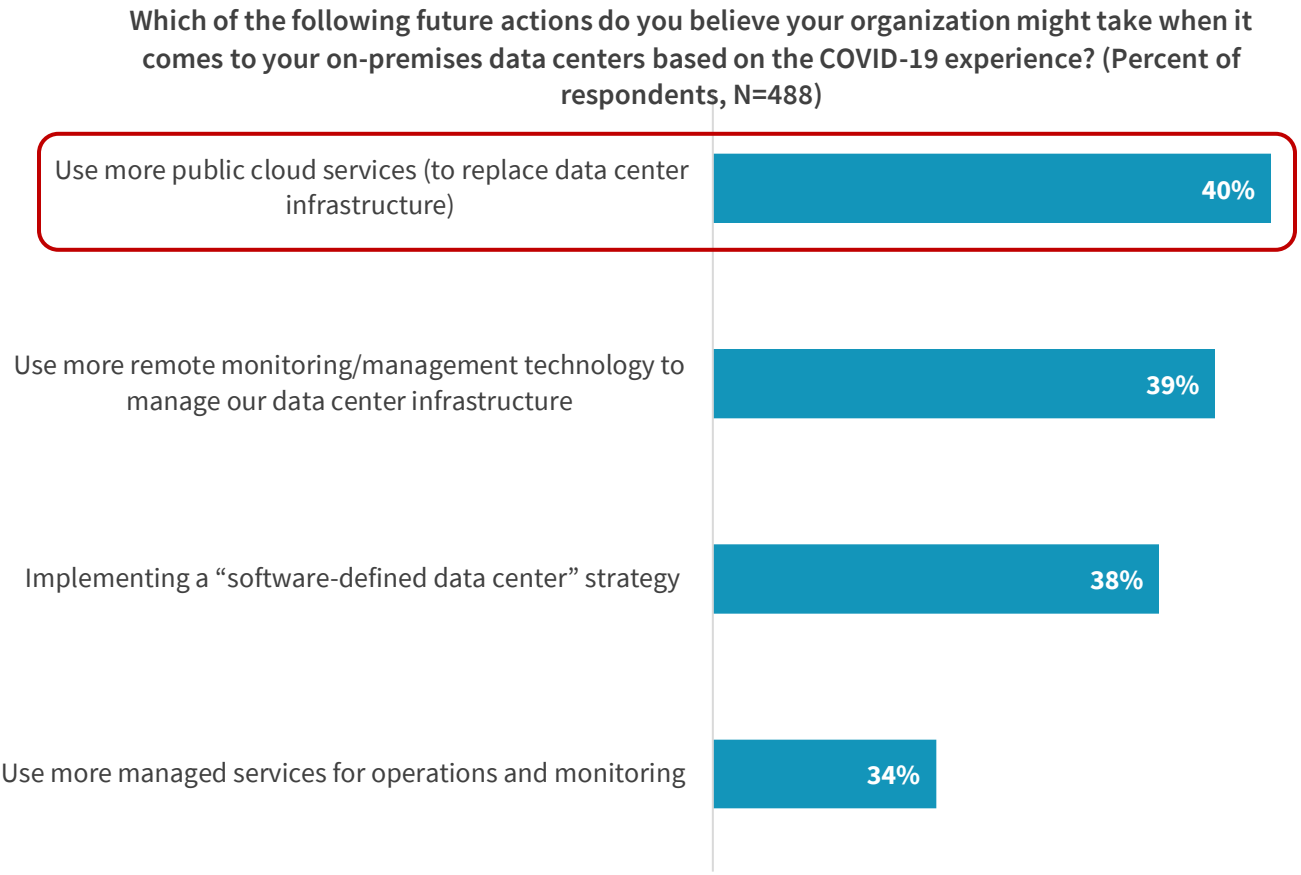
- Organizations must decide whether to move all processes to the cloud or to leave some on-premises. Some companies move only the web front-end to the cloud, leaving the back-end—credit card processing, inventory, shipping, and logistics—on-premises. This is certainly an option but restricts the operational expense benefits of a managed cloud service.
- Retailers must have robust data collection and analysis capabilities that are highly scalable. Only by analyzing data on customer demographics, online transactions, product reviews, industry trends, etc., can retailers understand and deliver what customers want. This demands significant infrastructure resources.

While these challenges were already difficult, the COVID-19 pandemic has exacerbated them. In fact, according to ESG research, when asked which actions their organizations might take regarding on-premises data centers based on the COVID-19 experience, the most-cited answer was to use more public cloud services to replace data center infrastructure (see Figure 3).[4] During the pandemic, online shopping became a lifeline, not just a convenient option. As a result, retailers have had to increase infrastructure resources to handle more traffic while trying to maintain performance, and to rapidly add capabilities to remain competitive. While the innovations are exciting, many retailers have faced these obstacles with

[4] Source: ESG Research Report, *The Impact of the COVID-19 Pandemic on Remote Work, 2020 IT Spending, and Future Tech Strategies*, June 2020.

little preparation. Many were not equipped to handle the increase in Ecommerce traffic or the new capabilities they needed to keep up.

Figure 3. Top 4 Actions Related to On-premises Data Centers Organizations Might Take as a Result of COVID-19



Source: Enterprise Strategy Group

Google Cloud: Scalable, Reliable, Secure Infrastructure for Ecommerce

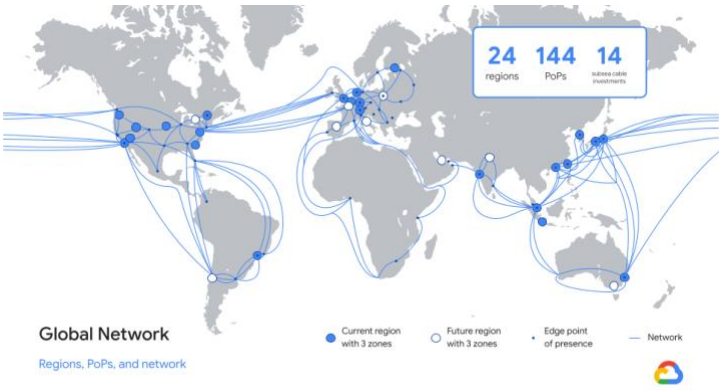
Google Cloud offers a range of solutions to assist throughout the Ecommerce cloud journey. Our focus in this report is on foundational products and solutions for Ecommerce migration and modernization. By moving infrastructure to the cloud, organizations gain the benefits of Google's products and expertise related to performance, scale, security, reliability, and modernization. We will also discuss some of the ways that Google Cloud can help retailers improve experiences for their customers, going beyond the technical foundation with services such as the Black Friday/Cyber Monday White Glove Service.

First and foremost, Google Cloud offers technologies to support customers with a scalable, reliable, secure infrastructure. Google Cloud can provide high-performance, high-quality infrastructure as a managed service, relieving retailers of building, managing, operating, and supporting their own data centers. Hybrid cloud options are also easy to implement, so customers can move some processes to the cloud while leaving others on-premises. Either way, Google Cloud can reduce the cost of infrastructure, leaving retailers to focus on what they do best—creating great products and customer experiences.

Google Cloud offers a range of products. The journey is different for every customer; some want to simply "lift and shift" their current Ecommerce applications into Google Cloud. Some want to move to the cloud and then modernize their

applications; others prefer to modernize first and then move. Some want to move all processes to the cloud for maximum OpEx benefit, while others prefer to keep some processes on-premises in a hybrid deployment. Google Cloud has solutions for all of these needs, for customers of any size.

Solutions include:



- *Google Cloud*. The Google Cloud ecosystem includes globally distributed regions connected by Google's dedicated, high-speed, fiber-optic network. There are currently 24 regions and 144 points of presence (PoPs) that deliver low latency, with additional PoPs in process. Having localized infrastructure ensures that wherever customers are, their Ecommerce experience is fast and responsive.
- *Google Kubernetes Engine*. This secure, managed container platform lets companies place their Ecommerce infrastructures wherever they need for a low-latency customer experience. GKE provides containerized solutions with prebuilt deployment templates and supports massive scaling, including thousands of containers, nodes, and pods on a single cluster. The GKE platform fully manages the control plane, handling numerous server tasks such as cluster management across time zones and CI/CD pipeline code creation. Organizations can take advantage of GKE capabilities in on-premises data centers or wherever they are needed using Anthos, a managed application platform. Anthos extends Google Cloud services and engineering practices so organizations can modernize apps faster and maintain operational consistency. Features of GKE include:
    - High availability options including regional and zonal clusters, non-disruptive upgrades, and configurable maintenance and exclusion windows. This keeps Ecommerce stacks operational for maximum productivity.
    - Horizontal and vertical autoscaling of pods and clusters based on CPU and memory needs. This ensures the ability to scale according to business needs for optimal performance and cost efficiency.
    - Node pools, groups of similarly configured nodes which are managed and scaled as independent groups. This simplifies management while providing flexible scale.
    - Two operational mode options:
        - Autopilot mode for management simplicity. Google provisions and manages the underlying cluster infrastructure, including nodes and node pools. Clusters are pre-configured with GKE best practices using customer workload-defined resource requirements. Autopilot lets customers use Kubernetes without having to manage infrastructure, control plane, or nodes; it can reduce the operational load while ensuring high performance, security, and resilience.
        - Standard mode for cluster configuration flexibility. Customers manage their cluster's underlying infrastructure, providing node configuration flexibility. This option is for customers that want to customize cluster configurations or manually provision/manage node infrastructure.
    - Ability to configure port and node affinity to maintain peak performance.

- Automatic repairs and upgrades to simplify management.
- Choice of release channels to match the preferred update cadence, optimizing features and stability.
- Security features including encryption and vulnerability scanning, support for Kubernetes Network Policy traffic restrictions, and private cluster support.
- Integrated cloud monitoring.
  - For both Autopilot and Standard modes, GKE nodes are pre-configured with agents that automatically collect system logs and metrics. Organizations can monitor the health of Ecommerce resources by defining SLIs and SLOs and explore logs to troubleshoot, define proactive alerts, and provide actionable data for operational tasks.
- Best practices for implementing compliance requirements such as those protecting financial transactions or ensuring geographic data isolation.
- Support from Google Site Reliability Engineers.

- *Product Discovery Capabilities:* Google is investing in product discovery capabilities that help retailers offer their consumers the ability to find highly relevant and personalized products and services—the right products, at the right time, to right consumers across web, mobile, and other digital touch points. Google leverages its advanced machine learning technologies, infrastructure stack, and expertise in serving personalized experiences to consumers – more than a billion Google users—to help retailers offer highly relevant and accurate product search and recommendations to their shoppers. The solutions—Retail Search, Recommendations AI, and Vision Product Search—are available as APIs for retailers to easily integrate with every digital touch point. These product discovery capabilities are customizable to meet retailers' business goals, including clickthrough rate, conversion rate, average order value (AOV) and revenue per visitor (RPV).

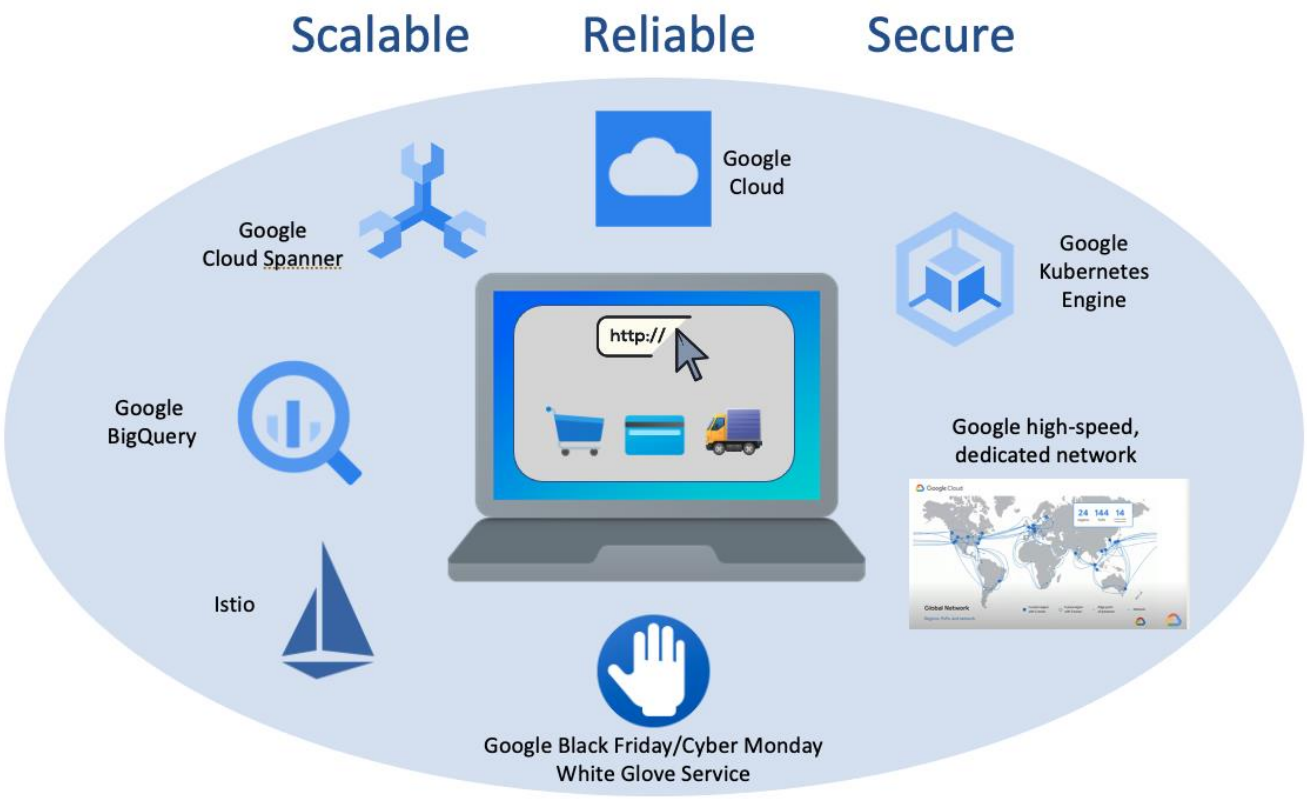
- *Headless Commerce*: To meet the rapid shift to online commerce spurred by the COVID-19 pandemic, retailers, consumer product manufacturers, and other businesses are looking for ways to quickly modernize their Ecommerce with minimal development and IT administrative overhead. Headless commerce solutions on Google Cloud can help them with a ready-to-use, headless digital commerce backend available that can be easily integrated with their own web front ends deployed on Google Kubernetes Engine (GKE). This approach allows customers to own and control consumer shopping experiences on their own front end while leveraging microservices and an API-based backend available on Google Cloud from its ISV partners.

- *Black Friday/Cyber Monday White Glove Services*. This service is focused on Google's Ecommerce customers, addressing their needs during the critical holiday shopping season. It includes personalized architecture reviews, capacity planning, operational drills, reliability testing, and war rooms staffed with Google engineers. Capacity can be reserved in advance to accommodate peak traffic. Google also implements code freezes prior to BFCM to ensure no interruption during this critical window for retailers.

- *Retail Customer Data Platform (CDP)*. This helps retailers bring their customer and marketing data into a single, modern data repository powered by BigQuery, Google's scalable, serverless cloud data warehouse that speeds large-scale data analytics. BigQuery and its built-in machine learning help retailers gain insights to increase revenue by analyzing customer data and activities in real time. The rapid growth of Ecommerce driven by the COVID-19 pandemic

has heightened the need for retailers to deliver data-driven, highly personalized shopping experiences to achieve higher customer loyalty and retention.

Figure 4. Selected Google Cloud Solutions for Ecommerce



Source: Enterprise Strategy Group

- *Istio*. This open-source service mesh provides a networking layer that helps microservices communicate and share data with each other. By managing traffic flows, enforcing access policies, and aggregating telemetry data, Istio helps to automate application functions and improve microservices management. It facilitates securing, connecting, and monitoring microservices for fast and secure app modernization.

- *Migration for Anthos*. This tool helps customers accelerate their move to the cloud by converting Ecommerce applications into a container-ready form that can be easily deployed on GKE or Anthos clusters. It simplifies the modernization process, minimizing the need to re-architect applications and reducing time and labor costs.

- *Google Cloud Spanner*, a fully managed, horizontally scalable, highly available relational database. Ecommerce deployments benefit from Spanner's ease of management, high performance across regions, single-instance deployment, and automatic scalability. Spanner never needs to be paused for patches, backups, failover, or even schema updates. Using Google's dedicated infrastructure, Spanner guarantees consistency and zero planned downtime, even at the most extreme scale, which results in a better customer experience. Spanner is a globally distributed, ACID-compliant database that automatically handles replicas, sharding, and transaction processing, so customers can quickly scale to meet any surge in demand.

Customer Successes

ESG spoke with two Google Ecommerce customers about their experiences with Google Cloud and GKE.

Loblaw Digital

ESG spoke with Jaspal Sawhney, Senior Director of Site Reliability Engineering at Loblaw Digital, the Ecommerce arm of Canada's biggest grocery and pharmacy chain. He is responsible for all public cloud infrastructure and container platforms. Loblaw is a $40 billion company with about 200,000 employees, and an online presence that includes grocery, prescriptions, medical marijuana, cosmetics, a loyalty program, and a bank.

When the company initially built an online presence in 2016, it was still running bare metal servers in an on-premises data center and generating only 1% of the company's revenue—but that 1% was still a significant amount of money ($400,000,000). The IT staff tried running a private cloud with VMware on site but realized that it was impossible to scale the Ecommerce business as fast as they wanted.

"First, We Moved Our Crown Jewel"

That's when they moved the crown jewel—the grocery business—to Google Cloud. The strategy was to lift and shift, and then modernize once it was in the cloud. The success of that migration proved the benefit of using Google Cloud, eliminating pushback from other parts of the business. From then on, the company stuck with key principles: infrastructure-as-code and decentralized control so all teams could function independently. Within nine months, all the other businesses were successfully migrated to Google Cloud with an online presence. *"We immediately saw the benefit of being on Google Cloud, its consistent performance,"* said Sawhney. *"We could start treating our infrastructure as cattle, not as pets."*

However, it was clear that the company had not yet taken full advantage of Google Cloud. The next phase was to move functionality out of the monolithic architecture and into microservices on GKE. Once this began, the teams realized they no longer had to line up to schedule changes because they would impact other teams—they could work independently as long as they respected each other's boundaries and inter-team contracts. *"That's how we literally scaled overnight,"* Sawhney commented. *"And the biggest testament was how we were able to meet the demands during the pandemic. In fact, we were reflecting on how we did our entire Q2 roadmap in just three weeks."*

Continuous Development and Reliability

Loblaw Digital is completely comfortable with GKE, so much so that the entire Ecommerce deployment is on a single cluster instead of separating out development and production clusters. Because they know Google handles updates and maintenance with best practices, Loblaw Digital has complete trust in the infrastructure. This has enabled an increase in agility, since there is no longer a need for guidelines designed to protect production assets (such as only making changes to the production cluster on Mondays).

The ability to scale and to deploy into production grew tremendously with GKE. Sawhney recalls that Ecommerce updates were deployed into production 48 times in 2017, when the Google Cloud/GKE journey was just beginning, while in 2020, they deployed 650 times. "*You can't do that by having IT teams do the deployment—humans just don't scale that fast!"* he commented. In addition, he remarked that IT teams no longer have to worry about when to deploy into production—they are deploying five or six times a day with live systems now, instead of in the past when they could only deploy on certain days and times to prevent business interruption. *"Now, we can deploy on Friday at 4 pm and go home at ease, because there are no issues,"* he said. *"We could not have done that without moving to Google Cloud."*

> *The whole [vaccine rollout] was developed in nine weeks—an effort of this size in the past, before Google, would have taken a year and a half. In fact, it's rolling out today—but I'm so certain of it, I'm able to do this chat with you today."*
>
> - Jaspal Sawhney, Loblaw Digital

When ESG asked for specific examples, Sawhney remarked that during the pandemic the company wanted to create a feature to allow healthcare workers and seniors to get priority vaccine appointment slots online, including a collaboration with some hospital chains. Developers delivered that feature in 2 weeks.

In addition, Loblaw's online vaccine rollout was completed quickly and without concern. *"We just rolled out the vaccine enablement system running across every province in Canada, with all the bells and whistles, running completely on GKE. The whole thing was developed in nine weeks—an effort of this size in the past, before Google, would have taken a year and a half. In fact, it's rolling out today—but I'm so certain of it, I'm able to do this chat with you today."*

Increased Availability

Sawhney says that when they were running on-premises data centers, there were daily incident calls, with 30-40 people on them. Now, that has completely changed. He commented, *"It's not like we don't have incidents now—we do—but they are not traffic-stopping events. Three people get on a call, find what's wrong, roll it back, and that's it. It's not an event anymore—it's just a part of your life."* He mentioned that they can now get back online in 15 minutes.

Black Friday/Cyber Monday White Glove Service

Loblaw Digital takes advantage of Google's Black Friday/Cyber Monday White Glove Service, which has made a huge difference. Loblaw Digital works closely with the Google team to analyze, prepare, and review architecture, but they count on the system to scale by itself. Sawhney commented, *"From 2013 to 2016, every Black Friday we had a guaranteed outage. But from 2017 onward [with Google Cloud], every Black Friday we're talking about our competitors crashing, but we're just sitting and watching."*

Revenue Growth and Success

The pandemic created special circumstances for growth, which Loblaw Digital could easily take advantage of because it was already fully functional on Google Cloud and GKE. The Ecommerce business increased to about 8% of company revenue, representing about $3 billion in 2020. The success of the Ecommerce experience with Google Cloud and GKE has led Loblaw to a plan to move all of IT—not just the Ecommerce arm—into Google Cloud by 2023. In addition, Google has been a true partner to Loblaw Digital. Sawhney appreciates that the Google team understands what Loblaw Digital is trying to do, and he is grateful for their counsel and that they allow Loblaw Digital to push the limits to support their engineering values.

In summary, Sawhney said, *"I'm usually the one who's the most unhappy when stuff goes down, that's the nature of my role. I used to have a lot of explaining to do, but I haven't had to explain anything for the last four years."*

LPP

ESG also spoke with Marek Maciejewski, Head of IT Service Operations for LPP, a major fashion retailer headquartered in Poland. LPP manages five clothing brands—Reserved, Cropp, House, Mohito, and Sinsay—that serve 38 countries in Europe, Africa, and Asia. The company has more than 1,800 brick and mortar stores and more than 24,000 employees.

Black Friday Scalability Challenges with On-premises Data Center

When Maciejewski joined LPP in the summer of 2018, his first task was to get the infrastructure ready for the upcoming Black Friday in November. Since 2011, LPP's Ecommerce operations had been running on 10-15 bare metal machines in a centralized, hosted data center; preparing for the huge spikes in expected Ecommerce sales for Black Friday was an all-consuming, months-long effort. To ensure adequate performance took tremendous time from developers and the infrastructure team and required a huge investment in additional machines. When the company completed a successful Black Friday that year, however, a decision was made to find a cloud solution. Said Maciejewski, *"After that we decided it would be the last time doing it this way. We took a lot of time from our most experienced engineers, preparing infrastructure and applications to handle traffic for just one day."* He continued, *"With Google Cloud we can get better ROI for our engineers than spending time on maintaining infrastructure."*

Migrating to Google Cloud

This led to a proof of concept (PoC) with Google Cloud in 2019, focused on three criteria: performance, disaster recovery, and cost. In Europe, the biggest retail sales occur on Black Friday, at Christmas, and in the summer, and LPP wanted to be better prepared for these spikes. After a successful PoC, LPP began its Google Cloud implementation.

Maciejewski wanted his team to do the migration so that they could gain additional skills working in the cloud. The initial migration was a combination of "lift and shift" with some application architecture improvement, moving the customer view category and product pages of the Ecommerce experience to Google Cloud.

Since 2011, all five brands had been combined for Ecommerce, but with Google they were separated into five different instances and migrated at different times. In Autumn 2019, LPP launched its first brand, Mohito, in Google Cloud. This was an important test, since Mohito generated the second most revenue of all LPP brands. *"We migrated it in six weeks with a team of eight people and developer support—it was a huge achievement,"* said Maciejewski. *"It successfully passed all the tests—performance, Black Friday traffic, and the summer sale, so that was hard proof that this is the way we should go."*

Better Prepared for Pandemic Growth

Additional migration plans were already in place for 2020 when COVID-19 happened. LPP was in good shape since the company had already begun migrating to Google Cloud, but the lockdown required LPP to speed up its migration plans. Cropp was migrated in early Spring 2020, followed by Sinsay, the company's most dynamic, growing brand, in the fall. *"If we had not been on Google Cloud when COVID-19 happened, I think we would have had a lot of issues,"* commented Maciejewski. *"During the first lockdown we had growth of 300%, 400% every day. Like our customer center manager says, right now we've got Black Friday every day!"* In addition, he mentioned that delivering a new service on-premises was taking 8-12 weeks, which would not have been fast enough during the pandemic. But LPP's Ecommerce in Google Cloud is handling the increased traffic just fine, and preparations are underway to migrate the highest revenue brand, Reserved, in 2021. LPP is getting the performance it needs from Google Cloud, and when Reserved is launched, the company expects no problems handling 100,000 concurrent users and 35,000 requests per minute.

> *"We are saving maintenance time, saving time required to prepare for sales, and are getting more for our money. We don't need to buy 40 machines to handle one day of traffic. . . [and] developers . . . can now add value back to the company that they wouldn't have otherwise."*
>
> - Marek Maciejewski, LPP

Fast Feature Upgrades with GKE

Container development is new for LPP. In mid-2020, LPP developers began splitting some processes into microservices using GKE. Building skills around Kubernetes was another important benefit, increasing LPP engineering expertise. So far, engineers have created GKE microservices for core processes including promotion and payment handling, with other major Ecommerce processes in development. *"We can launch portions of the code much faster than before,"* said Maciejewksi. *"Engineers are developing on the container itself, so it's quite easy to take it and move it to production. This is a significant change for us, and we are already seeing the value—they can publish features for the brands in the cloud so much faster."* He expects to migrate the final two brands before the 2021 summer sales.

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Automation Reduces Effort

Another important improvement with Google Cloud is new CI/CD pipelines that automate development. Maciejewski said that the company has made big changes in the deployment process. *"Now, to make changes we build a template, inject code and configuration details, and with just a click it's running—this is a major change,"* he said. "*We take an artifact from the repository and put it into production—on prem it takes an hour and a half, while in Google Cloud it takes seven to eight minutes."* In addition, he appreciates the automated repair and scaling. If something goes wrong on a machine, the load balancer takes it down and replaces it; also, when additional application servers are needed, Google Cloud scales automatically to serve the traffic. Said Maciejewski, *"We don't need to handle configurations or count how many machines will serve each brand. We are launching a brand that is going live with three application servers, and when needed it will scale to 30, 40, 60, whatever it needs."*

Disaster Recovery

Leveraging the cloud for disaster recovery is another huge benefit for LPP, making Maciejewski feel much more secure. The brands in the cloud have data that is stored in one region, but LPP can deploy easily in any region by just switching a single variable. In addition, the on-premises data is backed up to geographically replicated storage across two regions.

In summary, Maciejewski told us that it is much easier to achieve LPP's desired performance in Google Cloud than on-premises. He commented, "*The most crucial thing is that we have gained flexibility. We are saving maintenance time, saving time required to prepare for sales, and are getting more for our money. We don't need to buy 40 machines just to handle one day of traffic. When traffic is lower Google Cloud scales down the number of machines; that doesn't happen on premises. Finally, our developers can use cycles in more beneficial ways; they can now add value back to the company that they wouldn't have otherwise."*

The Bigger Truth

Ecommerce offers a huge opportunity to expand retail sales, providing easy access to customers anywhere in the world rather than only those near brick and mortar stores. However, it also dramatically expands the competitive landscape. Successful retailers must have an online presence that offers the products, features, and amenities customers demand. Fast, intuitive website search and transaction security are "table stakes" today. Customers are also looking for a personalized experience, enhanced Ecommerce that may include video, interactivity, and virtual reality, multi-device support, and more. In order to compete with deep-pocketed competitors, organizations must also be able to understand customers better, improve inventory management, and quickly add new features to their Ecommerce deployments.

Creating and managing the IT infrastructure to deliver the Ecommerce performance, scalability, reliability, security, and feature set customers demand is a difficult task. And yet it is critically important, since search, shopping cart, or transaction glitches can cause customers to leave and not return. Ecommerce deployments must be able to efficiently handle everyday traffic and be able to scale for expected spikes (e.g., Black Friday/Cyber Monday, holiday, and summer sales) and unexpected spikes (e.g., COVID-19 pandemic lockdowns).

Many retailers have turned to Google Cloud solutions for secure, reliable, geographically dispersed infrastructure with automatic scaling, and to Google Kubernetes Engine for microservices-based application development and CI/CD. These solutions enable retailers to:

- Easily move to the cloud.
- Increase efficiency by scaling up and down to meet traffic needs.
- Improve performance and optimize the customer experience.
- Relieve IT staff of mundane tasks.
- Speed customer analytics.
- Launch new features faster.
- Enable developers to focus on innovation instead of infrastructure management.

ESG spoke with two customers about their Ecommerce experiences with Google Cloud and GKE. Both have committed their entire Ecommerce business to Google Cloud, and for one, that success resulted in moving the entire business infrastructure to Google Cloud. These companies count on Google Cloud and GKE for high-performance, secure, scalable, efficient infrastructure that ensures the optimal customer experience, delivers the agility to shift quickly with market trends and add features continuously, and frees up developers to add greater business value. As an example, one customer had this to say regarding Google Cloud:

"If we had not been on Google Cloud when COVID-19 happened, I think we would have had a lot of issues. During the first lockdown we had growth of 300%, 400% every day. Like our customer center manager says, right now we've got Black Friday every day!"

Online shopping is here to stay; while Ecommerce was already growing, the COVID-19 pandemic accelerated that growth and changed customer behavior in ways that are likely to remain. ESG believes that Google Cloud can provide a significant boost to any Ecommerce migration and/or modernization. So, if your organization is looking for ways to increase flexibility, improve the customer experience, or be more cost-efficient, ESG recommends that you give Google Cloud a serious look.

Enterprise Strategy Group is an IT analyst, research, validation, and strategy firm that provides market intelligence and actionable insight to the global IT community.

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