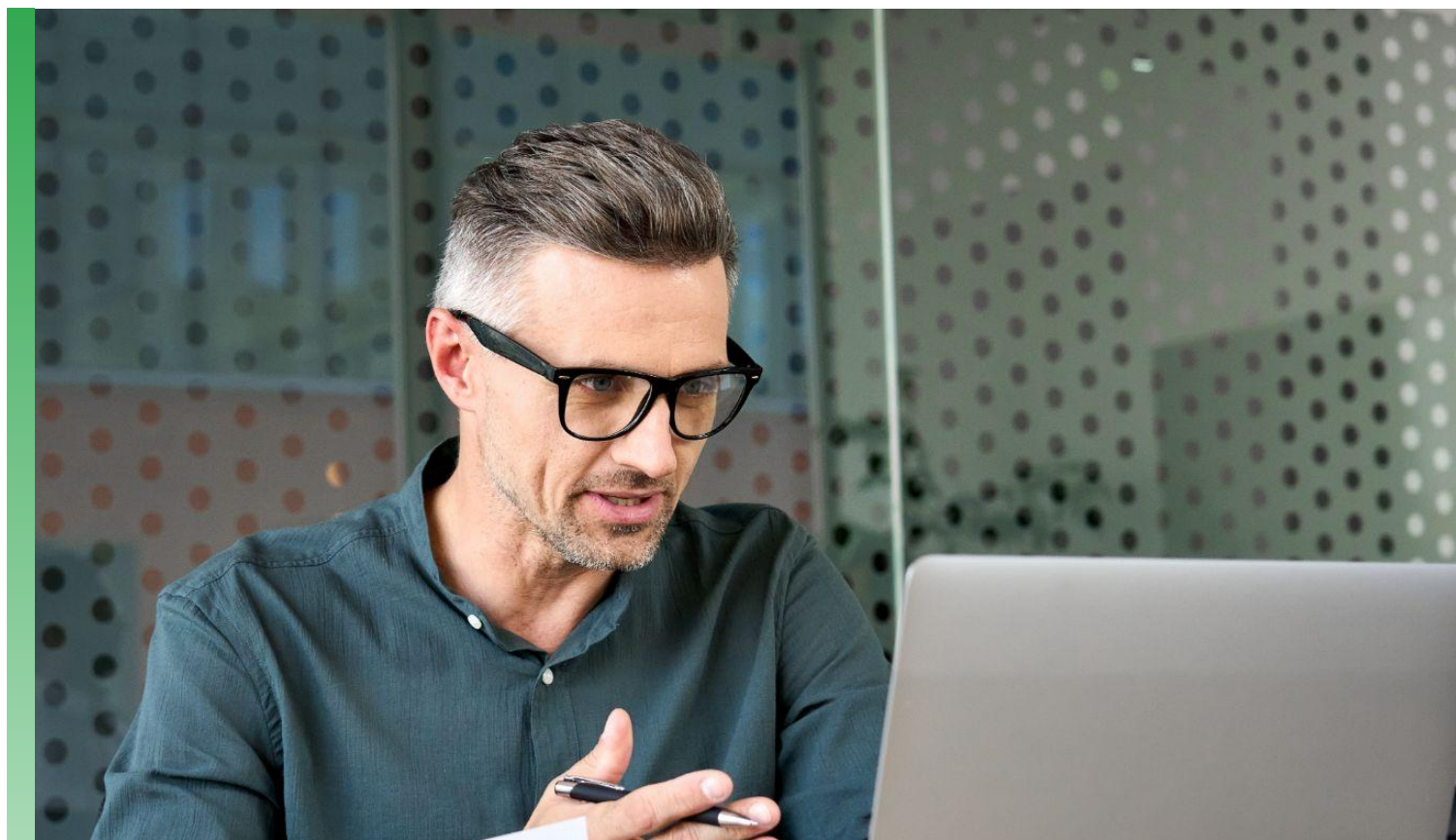




Google Cloud Application Modernization Program

August 2022



What is Google **CAMP**?

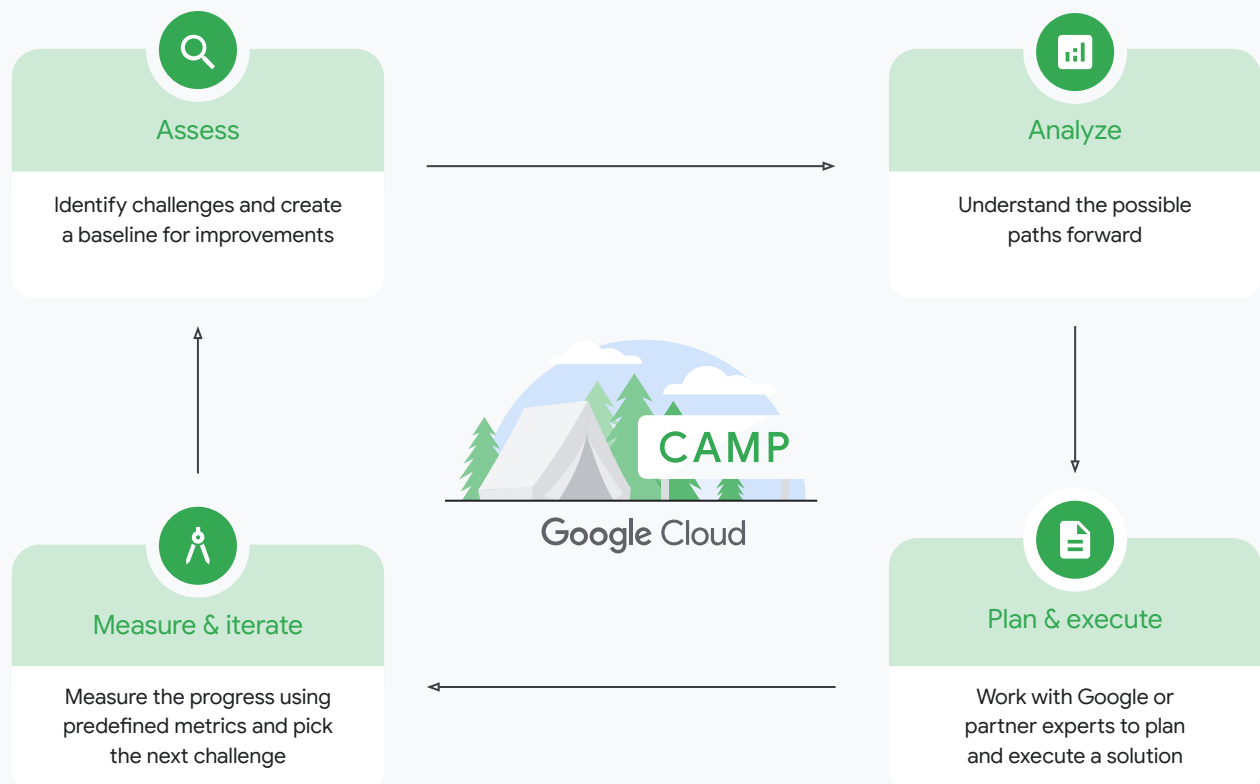
IT leaders are looking to maximize their digital transformation benefits. Modernizing and simplifying their business application portfolios and software life cycles are often at the heart of this. These leaders are looking for advice and a proven set of practices. It shouldn't come as a surprise that Google engineers have strong opinions on modern software development, APIs, containers, and DevOps practices. We believe that developers should have flexible, secure, and easy-to-use tooling that supports a robust software life cycle and allows applications to be deployed on a variety of environments, including on-prem or any public cloud, without compromising these principals.

While our conviction is strong, we know that in order to help our customers experience the magic of our offerings, we have to showcase our platform and make the transition as seamless as possible with tooling and guidance. We also know that when it comes to modernizations, one size does not fit all, which is why we're introducing the [Google Cloud Application Modernization Program \(CAMP\)](#), a framework for designing a tailored end-to-end application modernization journey.

How the program works

CAMP uses a phased approach, providing organizations with step-by-step guidance while allowing each organization the ability to choose their path based on their level of comfort and budgetary constraints. For example, a company that's new to containerization can start by understanding the benefits of containers before tapping into more complex architectural patterns like multicloud or DevOps.

For customers that are unsure of their starting point, CAMP provides a variety of assessments to dissect customer challenges and help build a list of recommended actions. A large part of CAMP focuses on educating customers and showcasing the recommended approach with hands-on workshops and deep-dive sessions whenever possible. These sessions are designed to help organizations get comfortable with Google Cloud and the process of modernization, so they can create their own **iterative** approach and take smaller steps instead of trying to do too much too soon which can be discouraging.





- Discussion
- Whiteboard session
- Jumpstart
- Assessment
- Workshop
- Pilot

To provide different levels of time and budgetary investment, CAMP engagements can start with low-effort options and progress from there. A customer can begin with a **Jumpstart** session that lasts less than two hours to get a better understanding of a topic and get questions answered by experts. They can then dig deeper with an interactive, half-day **Hands-on workshop** that includes instructor-led labs and deep-dive breakout sessions for teams that provide technologists with an under-the-hood view of a topic.

Occasionally, customers may want to go further and see the recommended technology in their own environment. We'll help connect the customer with the right resources and partners that can support running a **Pilot** in their own environment.

CAMP's ultimate goal is to **help make our customers comfortable** with Google Cloud technology and application modernization, getting them started on the right path. A large part of this effort involves creation of a CAMP enabled partner echo-system that can support our customers' every step of the way in their journey.

Paths to modernization

In our experience, modernization efforts fall into three main categories, and we provide customers with a set of solutions for each of them that can be used on their own or combined, to meet the needs of various parts of an organization, to create a holistic strategy for an organization:



Move and improve

In this category, we focus our attention on improving or modernizing the strategies of the past by aligning to organizations looking for guidance around containerizing or exposing their existing traditional apps via an API. Google Cloud provides tooling and approaches that can be used with traditional Java or .NET applications, migrating first-generation containerized apps running on Cloud Foundry and OpenShift to a standardized managed Kubernetes platform, or modernizing apps running on Mainframe.



Build and operate

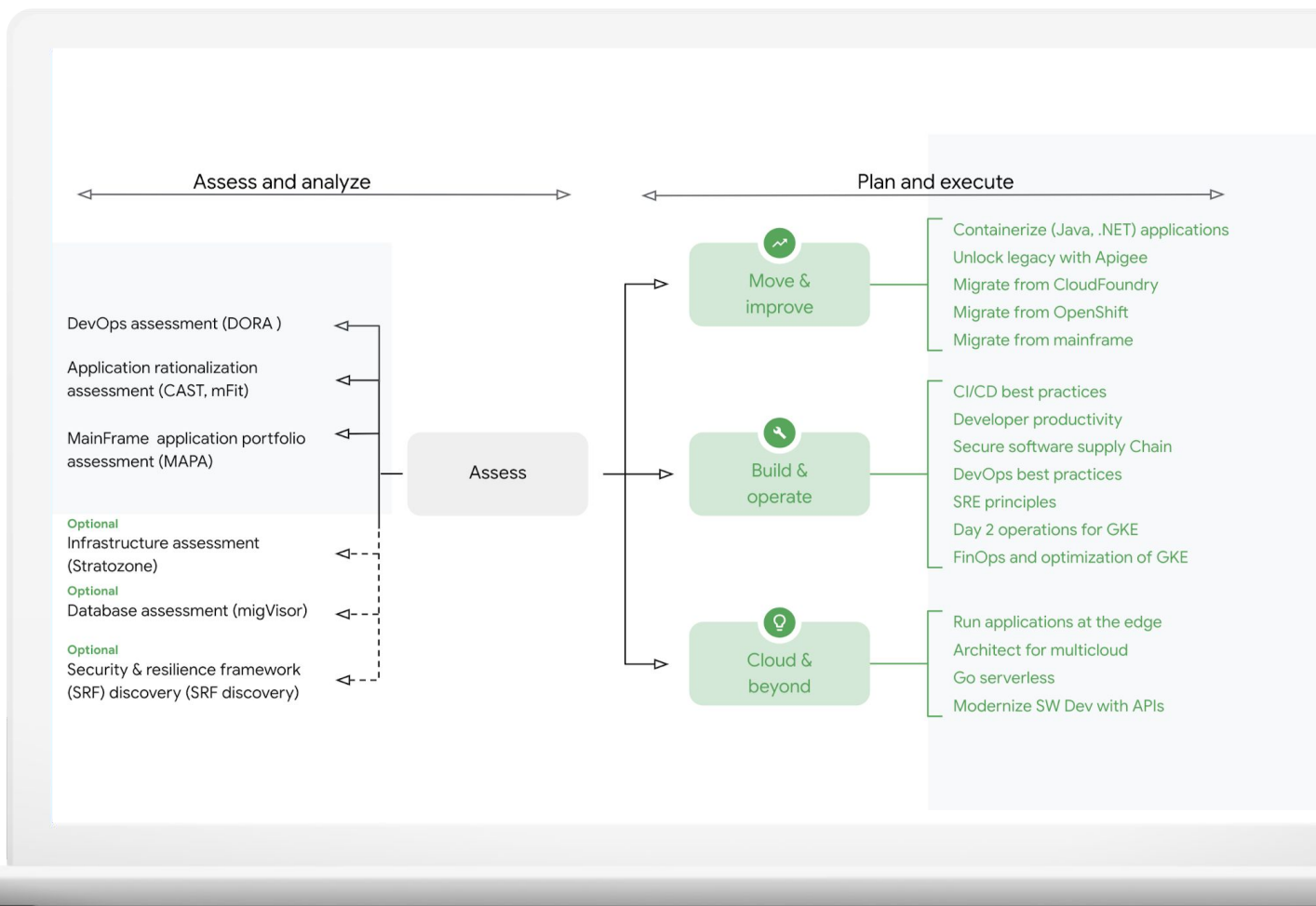
This set of solutions is recommended for organizations looking to improve developers and operations efficiencies. Here we focus on DevOps and Site Reliability Engineering (SRE) best practices, shift left security, development strategies for containerized applications, continuous integration and deployment (CI/CD) pipelines establishment or improvement, day 2 operations, and Google Kubernetes Engine (GKE) optimization for existing environments for reliability and cost-efficiency.



Cloud and beyond

Organizations are also planning for their next-gen environments. This set of solutions focuses more on advanced topics like API management and design, serverless application development, architecting for multicloud environments, and computing at the edge for distributed industries like retail.

A deeper understanding of each path





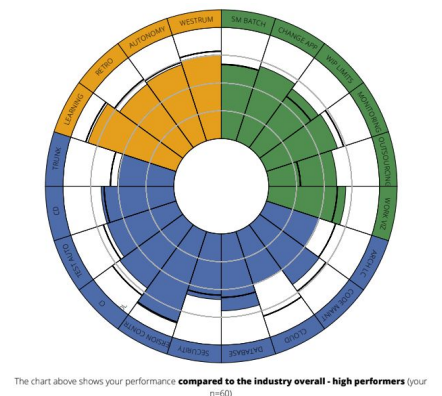
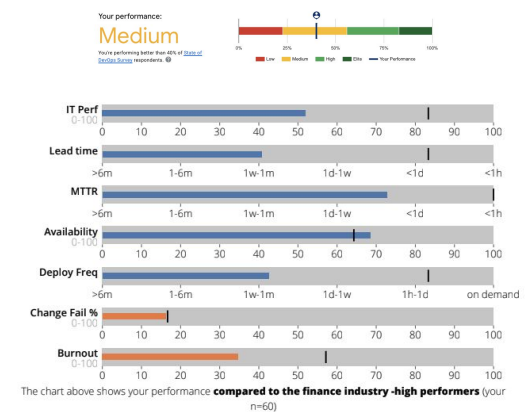
Assess

When customers require guidance on where to start their journey, CAMP provides a variety of assessments to help customers discover challenges and build a plan of action before starting their journey. Some of these assessments are directly related to apps and app development, and other optional assessments help customers understand other related areas of interest such as data, security, and infrastructure. Here are some of the available assessments today:

DevOps assessment

It's often difficult to get an unbiased view into your own software delivery practices. Companies that are looking to improve their software life cycle end up with disjointed efforts that often don't expand beyond a couple of teams and fail to address the larger organizational problems.

CAMP uses the foundation created by [DORA research](#) – one of the longest and most comprehensive ongoing DevOps research programs– to help organizations assess their own practices and identify areas with the most chances for impactful improvement. We offer two types of DORA engagements: DORA workshops take ~4 hours and are designed for smaller, more intimate teams; and the full DORA assessments can take a few weeks and are designed to scale up to thousands of cross-functional team members in multiple regions and lines of business. Each engagement will be followed by a results readout discussion to help with prioritizing the follow-up work and to recommend next steps in the CAMP workflow when appropriate.



Application Rationalization

Many organizations have been developing and deploying business-critical applications for years and are now facing the daunting challenge of moving these applications into a more modern environment. For a true understanding of an existing environment, customers have to look at the underlying platform, applications, and supporting data stores. [Application Rationalization](#) is a multi week engagement where Google experts help organizations decompose their current environments using a variety of assessment tools like:

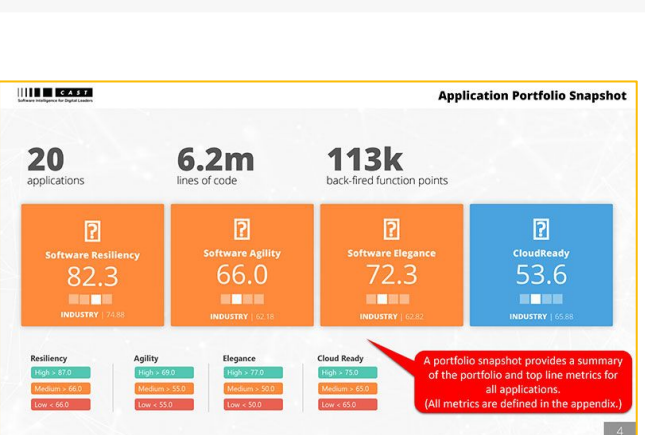
Discover & assess against a VMware inventory (mFit)

A large number of workloads can be assessed at once using Google Cloud's [fit-assessment tool](#), resulting in either best "value for effort" or shortest "time to on-board" according to customer preference. Use [Migrate to Containers](#) to convert VM-based workloads into containers that run on Google Kubernetes Engine (GKE), Anthos clusters, or Cloud Run platform.

Code-level assessment with CAST

Partnering with [CAST](#), a code-level assessment tool, Google helps customers conduct analysis of target applications using [CAST Highlight](#), as well as identify cloud blockers and good migration targets. Combined with business-level discussions, these results help design the appropriate migration path for each application, and customers can prioritize their approach based on cloud readiness, open source risks, and business criticality.

FIT Assessment



- Estimate refactoring effort
- Risk assessment
- Reduce technical debt

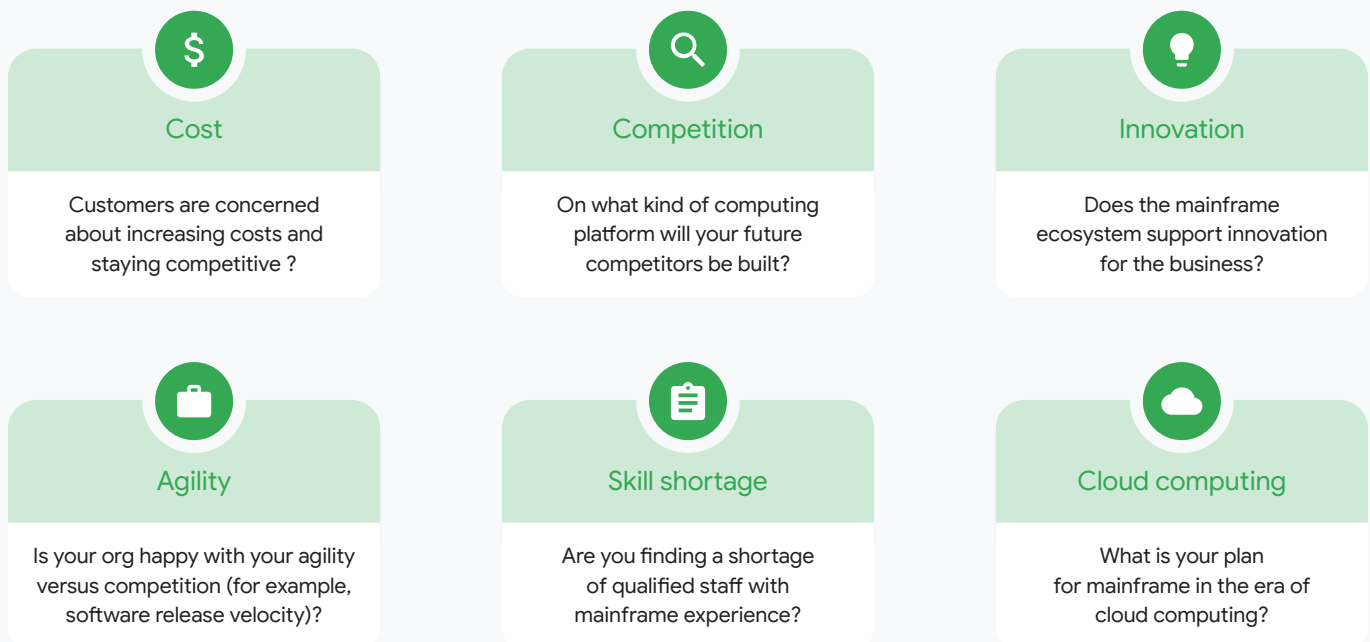
Mainframe Application Portfolio Assessment Program (MAPA)

This assessment program is designed to help customers build a financial and strategic plan for their mainframe estate. It is meant to help customers understand:

- The overall size and complexity of their mainframe estate
- The potential disposition of their mainframe applications
- The potential value in optimizing the mainframe for cost, complexity, risk, etc.
- The right-sizing of the mainframe to run the right workload.

MAPA leverages an application survey and associated analysis to segment mainframe applications based on characteristics such as business value and technical maturity. The segmentation then helps to make application disposition recommendations and analyze the impact of these recommendations on costs, risks, value, and more.

Why do customers modernize their mainframe estate?





Customers are also provided with infrastructure, data, and security assessment tools that can help grow their understanding of their environment and plan, including:

Infrastructure and network assessment with StatoZone

[StratoZone](#), a SaaS platform assessment tool, provides customers with the ability to easily deploy StratoProbe, a data collector, and scale the discovery of an IT environment for private-, public-, or hybrid-cloud planning.

Data assessment with migVisor

[migVisor](#), a partner product, scans existing databases and detects over 100 unique features, including configurations, schemas, triggers, and other characteristics that can impact migration complexity. It performs database discovery and generates metrics and insights that are valuable for planning database migrations to Google Cloud offerings like Cloud SQL and Cloud Spanner.

Security and resilience assessment

[SRF discovery](#) is a quick evaluation of a customer's security posture against our Security & Resilience framework to provide opinionated guidance to improve their security posture.



Plan and execute

Here we examine each available path and its options:

Move and improve

Organizations are realizing that lifting their traditional applications as is into a public cloud does not allow them to realize the cloud's full benefits, and, for that reason, they're investigating better approaches to moving and improving their workloads. Here are several options Google Cloud provides for these customers:

Containerize Java or .NET applications

Java and .NET dominated the application development market for years, and we cannot underestimate the number of companies relying on these technologies for running their mission-critical applications today.

There are a variety of options when it comes to modernizing these applications, and we provide specific guidance and tooling for migrating [Java](#) and [.NET](#) applications to Google Cloud. CAMP also supports organizations with migration strategies through our [Application Rationalization Assessment](#), which provides a variety of assessment tooling options that analyze application [code](#), [data](#), and [infrastructure](#) and helps plan the best approach for each application.

A great example of a customer who did their application inventory and planned their cloud migration journey using this strategy is [1-800-Flowers](#). This migration effort, coupled with their adoption of a new microservices and microsite strategy gave 1-800-flowers a much more flexible application development environment and enabled them to increase their software release frequency to 10- 15 deployments per day. [J.B. Hunt](#) is another organization who exemplifies how through the right strategy using assessments, planning, and testing an organization can move in a quick and near-flawless manner to migrate workloads to Google Cloud in only 35 days.

Unlock legacy apps with Apigee

In cases where legacy applications aren't good targets for transformation and modernization due to technical limitations, [Apigee serves as a gateway](#) abstraction layer, joining these systems with the rest of the ecosystem and allowing for a seamless integration of the legacy with the new, modern designs – without disrupting the flow of business.

Migrate from Cloud Foundry

When it comes to Cloud Foundry, organizations struggle with operational complexity and commercial licensing costs. To its credit, Cloud Foundry is a popular platform for developers, but most organizations are looking at investing in Kubernetes as a way forward for many operational benefits.

With our [Pivotal Cloud Foundry](#) migration solution leveraging [Kf](#), these organizations can have their developers continue using the Cloud Foundry workflow and tools, while operators can benefit from simplified operations, declarative models, and a common policy and configuration framework across on-prem with Anthos and cloud deployments with GKE. As an example, [CoreLogic](#) is replatforming their 10,000+ Cloud Foundry app instances across on-prem and public cloud foundations using Kf. This strategy allows them to assess, automate and accelerate their migration to Kubernetes.

Migrate from OpenShift

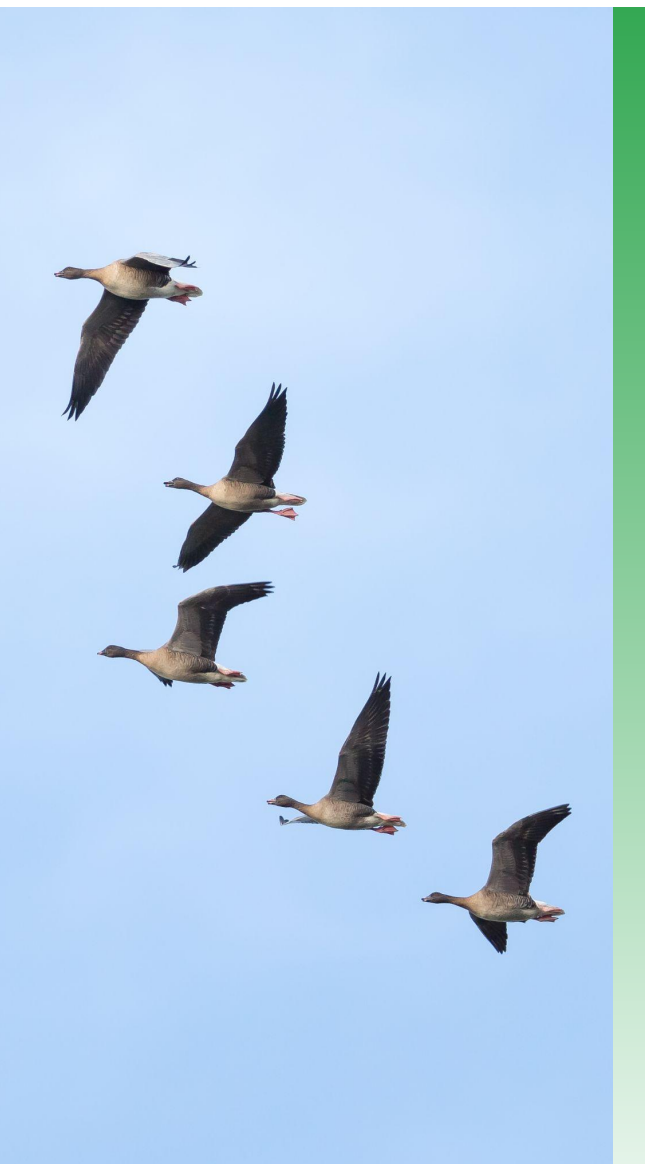
While Red Hat OpenShift provides both managed and self-managed custom Kubernetes options, many organizations choose to move their Kubernetes workloads to Google Cloud because of our innovation and leadership, standardization, better security, multicloud capabilities and portability with Anthos, and better automation.

We provide [migration guidance](#) and [open source migration tooling](#) for customers that wish to move their Kubernetes workloads from OpenShift to GKE or Anthos.

Migrate from mainframe

Organizations realize they can increase agility and reduce operational costs by modernizing their mainframe environments, but the task can seem too complex to tackle at times. Google provides customers with [industry expertise and a rich partner ecosystem](#) that can support them throughout their migration and ensure success

For example - Google and its partners moved [Arek Oy](#) pension calculator comprising 20+millions of mainframe code to Google cloud in less than 9 months and helped them achieve faster calculation results at a lower transactional cost. Moving to Google cloud has also enabled them to embrace open banking much easier. Similarly, [Unitec](#) universities migrated eight servers, 22 zones, including 25 TB of data from their SPARC servers to Google Cloud in 24 days. This move allowed them to fully exit their data center and gain infinite on demand scalability.





Build and operate

As the cloud becomes the standard environment for application delivery, organizations are looking to upskill their development, operations, and platform administration teams to better harvest the power of cloud native technologies. Here are some options Google Cloud provides for these teams:

DevOps best practices

While [DevOps](#) is a well-known practice, many struggle when it comes to applying its principles to their well-established development and operations teams. Relying on the longest-running DevOps research program, [DevOps Research and Assessment](#) (DORA), and Google's own experience, CAMP provides customers with a variety of engagement options to get an unbiased view into their own practices – and then act.

- [Quick check](#) (5 min): An online questionnaire for a quick comparison
- Jumpstart (90 min): A discussion of the main DORA concepts, or the [Four Keys](#)
- DORA workshop (≈4 hrs): An interactive deep dive led by Google or Google partner experts to engage and examine a customer team's practices
- [DevOps assessment](#) (multiple weeks): Recommended for large, geographically distributed organizations looking for a big-picture view of their DevOps posture

[Google's 2021 DevOps Award](#) winners are great examples of companies that have seen improvements by adhering to these best practices and principles. As an example, [Deutsche Bank](#) tripled their software release frequency, while lowering their incident rate by 40%, which proves that speed and reliability can be achieved together.

SRE principles

[SRE](#) is a job function, a mindset, and a set of engineering practices to run reliable production systems. While this is a well-established concept at Google, it's a new concept for many of our customers. We strive to support these SRE learners and enthusiasts via tooling and learning opportunities, and CAMP provides a variety of hands-on, discussion-based options for this.

[Lowe's](#) is a great example of where applying these principles has helped improve business impact by increasing their monthly software release velocity 300X.

Modernize software delivery

Focusing on developers and software lifecycle management, this [set of workshops](#) explore developer productivity, continuous integration and deployment, and secure software supply chain on Google Cloud.

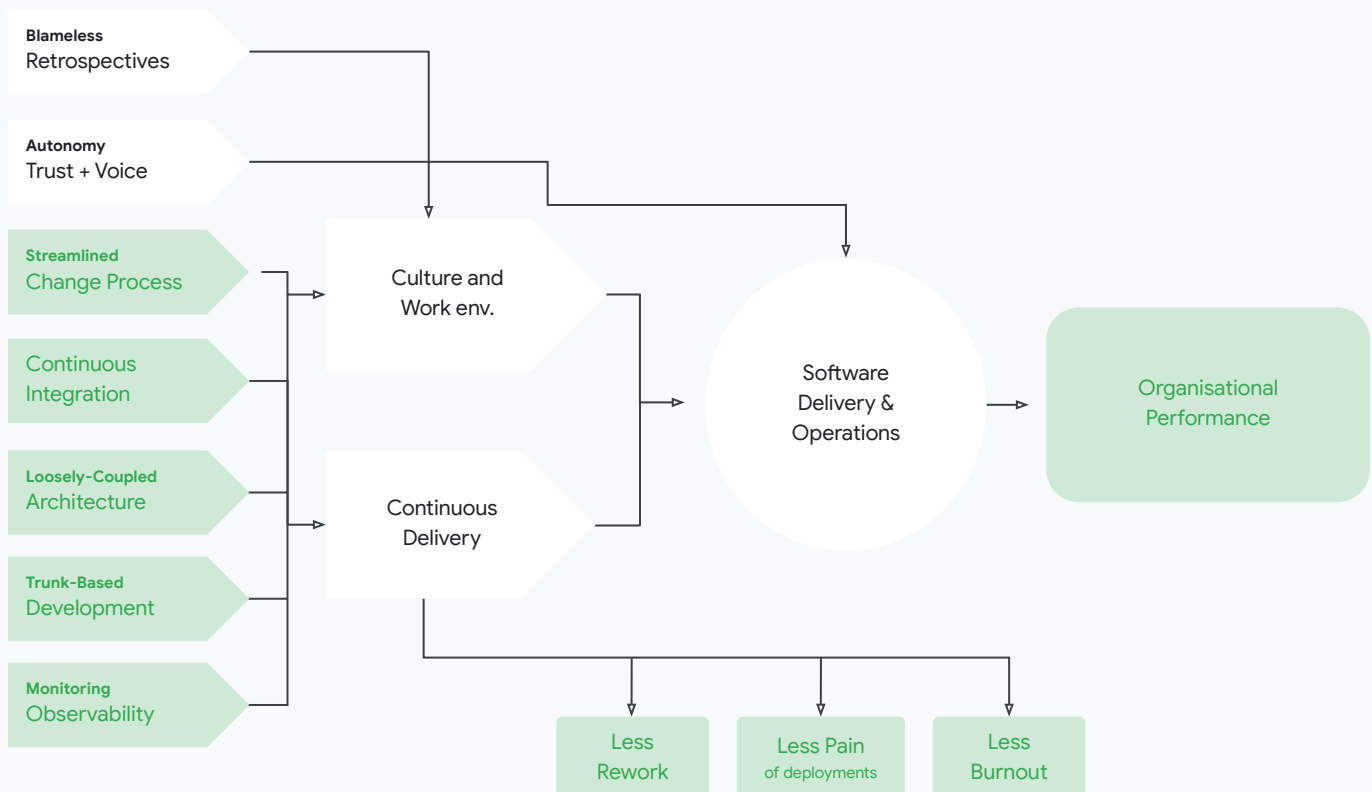
Developer productivity

Many enterprises are new to containers and haven't figured out how to best code, build, and test containers on Kubernetes during the inner-development loop. At Google, we recognize this struggle and have created a solution using both Google products and open source technologies. Using this approach, you can reduce the developer learning curve, increase developer productivity, speed up software delivery, and solve developer onboarding challenges. Google offers a hands-on container developer workshop that shares these best practices.

CI/CD best practices

CI/CD has evolved to move from heavy, hard-to-scale, on-prem implementations to cloud-based, serverless models that get the best advantage from managed infrastructure and scale to an enterprise's needs. Google offers solutions to showcase software delivery best practices based on next-generation tools like Cloud Build, Google Cloud Deploy, Artifact Registry, and more. With our hands-on software delivery workshop, we coach enterprises to take a leap into the future state of software delivery.

One of the most important concepts of software development is the need for a single delivery model that can scale across multiple teams and environments. We also offer a software delivery blueprint which is a reference-opinionated implementation of such a software delivery platform. Enterprises use this blueprint as a starting point and customize it to their needs.



Secure software supply chain

Software supply chain attacks are on the rise, and most enterprises don't know where to start when combating them. We understand and have worked with industry stakeholders to start [SLSA](#), a cross-organizational, vendor-neutral steering group committed to improving the security ecosystem for everyone. As part of CAMP, we also built a solution to coach organizations on the aspects of securing a software supply chain. With our workshop, we teach the concepts of a secure software supply chain by applying security concepts to the five stages of the CI/CD pipeline.



FinOps and optimization of GKE

Another aspect of managed containers that's often overlooked is the importance of resource management and optimization through configuration best practices. The [GKE optimization workshop](#) is a hands-on engagement that applies to both existing and new GKE customers. [OpenX](#) was able to realize up to 45% in cost savings, leveraging GKE and its capabilities. Google experts help customers adopt [GKE optimization best practices](#), focusing on a FinOps culture, either by reviewing a customer's current environment or using preemptive enablement for platform admins as they start their journey. Some of the topics discussed are:

- Kubernetes **scaling dimensions**
- Insights into the **four main overprovisioning challenges with GKE**
- The **golden signals of GKE optimization** for operation and monitoring

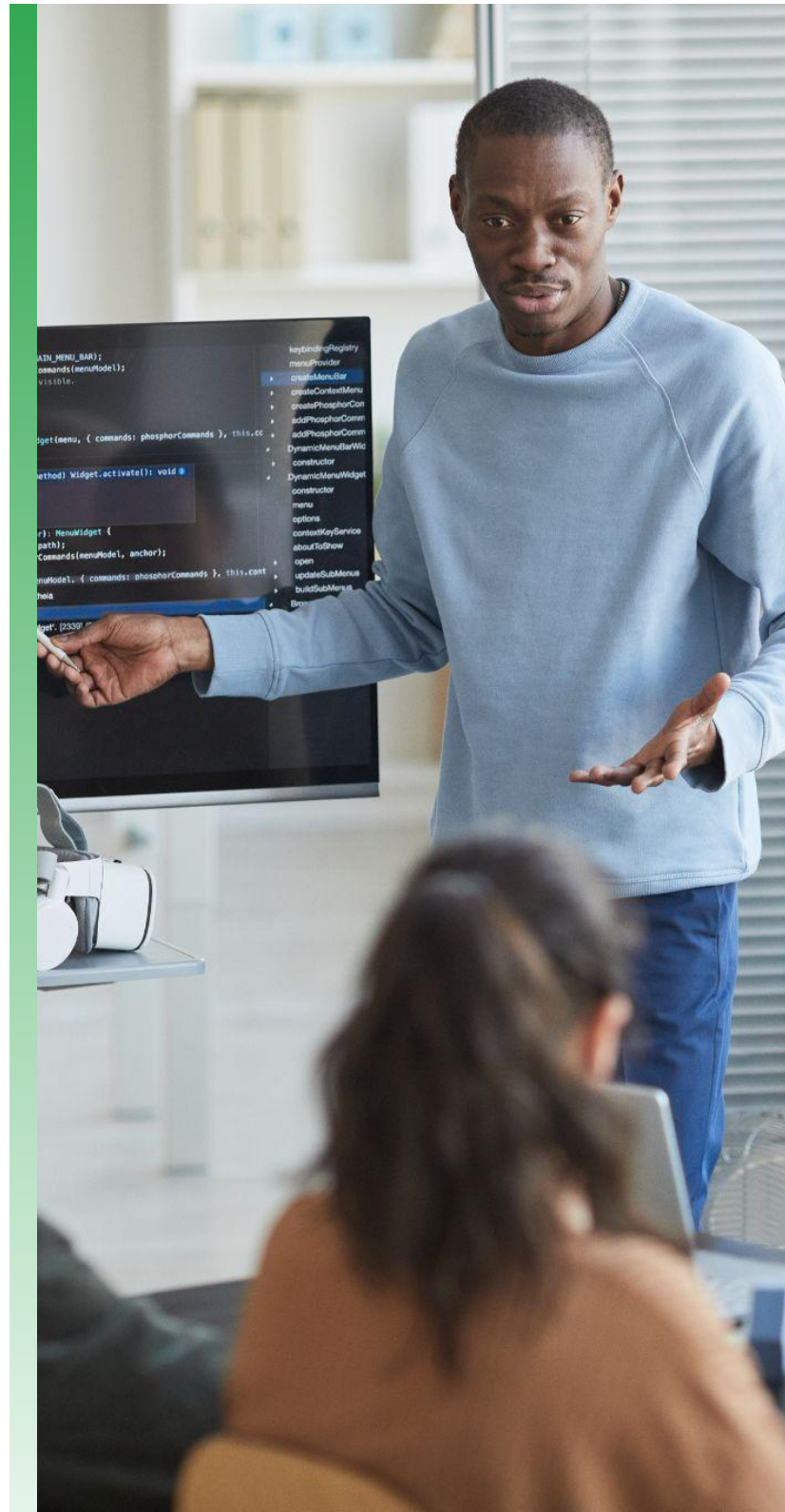
This workshop often results in a list of tailored recommendations for different roles within an organization, including app developers, platform admins, and budget owners, to reduce overprovisioning. This can help an organization continuously deliver **business value** by running **reliable, performant, cost-efficient** applications. Longer-term impact can be realized by enabling technical staff to continue running cost-efficient applications that leverage principles shared within the workshop.

Day 2 operations for GKE

What does it look like for a platform admin when an organization decides to move their workloads and run them on a fully managed cloud platform like GKE? Does it offer an opportunity for early retirement? The answer is, sadly, no. While these managed platforms help with the daily minutiae of managing container clusters and upgrades, there are still tasks that have to be performed by the administrators in several areas to ensure business continuity and platform optimization.

To help increase productivity and reduce toil, we offer a [hands-on workshop](#) that focuses on understanding the life cycle capabilities of GKE for platform administrators – for example, ensuring that an automated cluster upgrade doesn't disrupt workloads' fault tolerance and reliability. Even though GKE is a managed Kubernetes environment, teams are still responsible for observing the environment and taking action as needed to ensure the platform is behaving as intended. Additional workshop topics include:

- Centralized logging and monitoring
- Observability
- Logging and metrics for GKE and multitenancy





Cloud and beyond

We believe in the power of 10x thinking. What could you do if you removed the constraints you're dealing with today because of past decisions? How would you design your next generation of applications to meet future consumer demands? Here are a few ideas:



Architect for multicloud

As enterprises increase their adoption of public clouds, they're faced with how to best expand their operations and take advantage of the best-of-breed services provided by cloud providers – without compromising reliability, safety, and manageability of their software operations.

We offer a [workshop](#) that provides hands-on experience for platform managers who are looking for a consistent experience in managing and observing workloads across cloud providers using **Anthos Multicloud**. This workshop helped a financial services provider realize the value and assess the requirements for workloads that require east-west communication across multiple clusters.

Run applications at the edge

As customers seek to improve their operational efficiency and enhance their customers' experiences, having infrastructure outside the cloud or data center is becoming essential. Edge locations, whether it's a retail store or manufacturing plant, are increasingly processing more data locally and enabling real-time decision-making. Our [edge solution using Anthos](#) allows customers to deploy and manage applications across hundreds of locations regardless of whether it's traditional applications running in VMs or machine learning models.

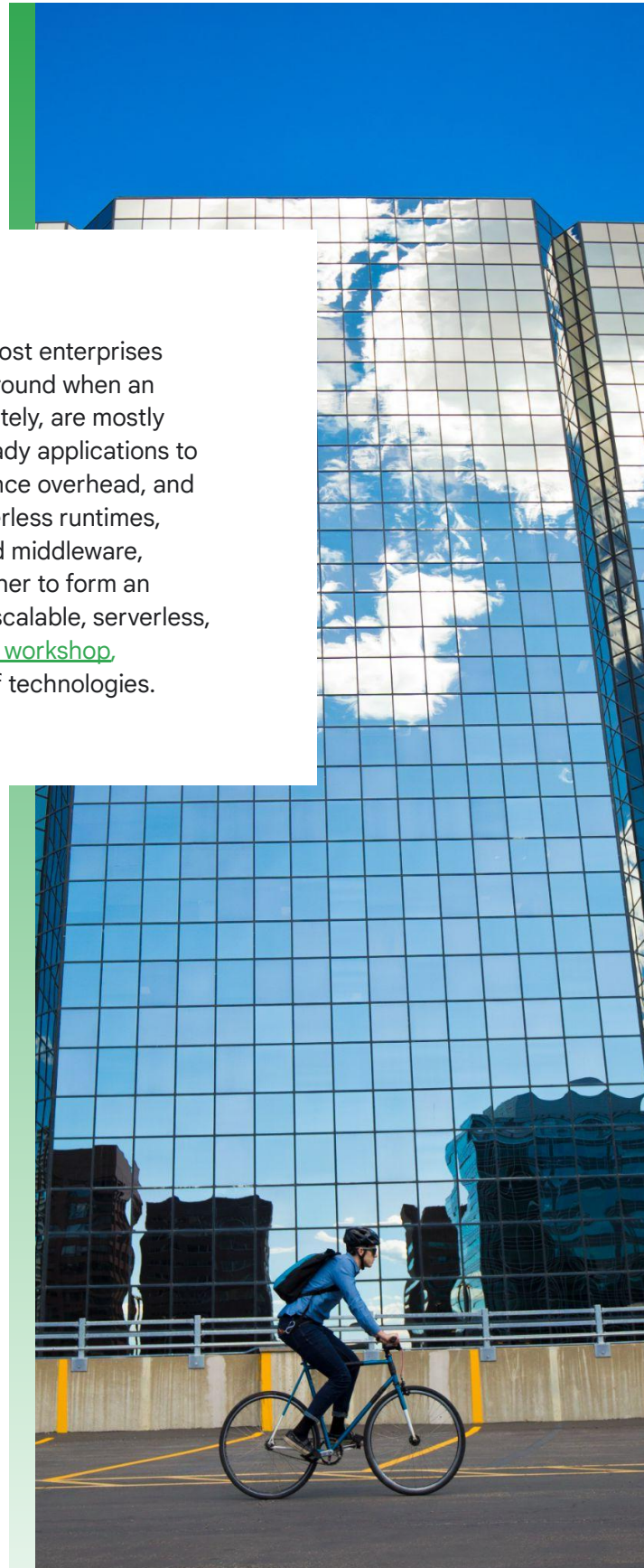
Go serverless

Serverless technologies are ready for enterprise adoption, but most enterprises aren't aware of this. There's also a set of common perceptions around when an organization would use serverless technologies which, unfortunately, are mostly incorrect. Today, you can build and run serverless, enterprise-ready applications to improve speed of software delivery, significantly lower maintenance overhead, and reduce cost. Google Cloud serverless technologies include serverless runtimes, cloud databases, eventing and orchestrations, message-oriented middleware, workflows, schedulers, storage, and many more that come together to form an excellent place to build and run container-based, elastic, highly scalable, serverless, enterprise-ready applications. Through our enterprise [serverless workshop](#), organizations can learn how to build applications using our set of technologies.

Modernize software development with APIs

Today, it's a given that any solid containerized microservice and multicloud strategy include an API management layer that provides a common, flexible communication layer between various components of the service mesh in a secure and optimized manner. [Apigee](#) serves this important function, ensuring organizations are well informed and equipped to deploy their API management layer as securely and efficiently as possible.

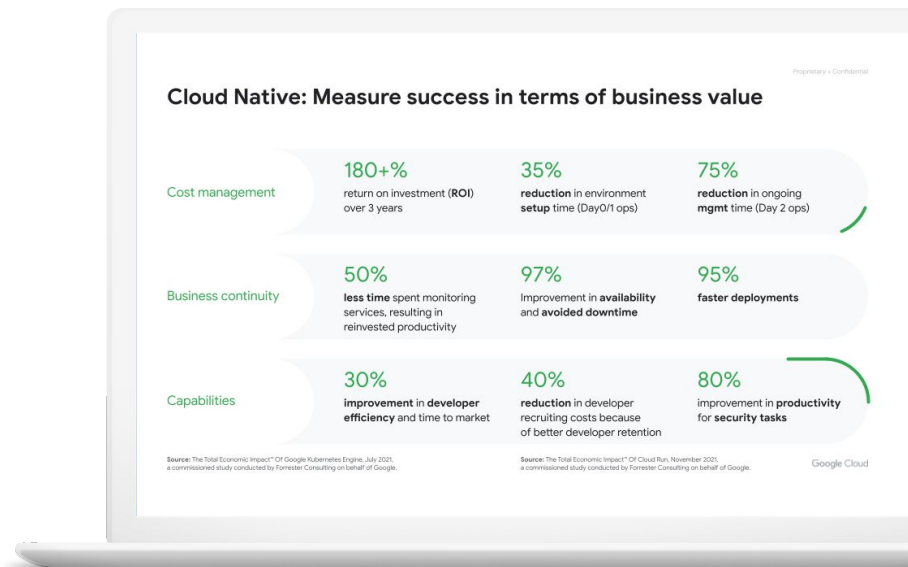
Read about how [Nationwide Insurance modernized their software development with API management](#).



Take the next step

Since its inception, Google engineers have been working hard to organize the world's information and help communities and customers with everyday challenges like finding information online, navigating to destinations, and collaborating with others. We continue that mission through our public cloud technology, refocusing our attention on creating offerings that make it easier for engineers and application developers to build and manage secure and reliable products more efficiently and less costly. Research shows that this effort has paid off for many of Google cloud customers with **180+%** return on their investment. These organizations are creating applications that are **97%** more available while experiencing 95% faster deployments with **75%** reduction of Day 2 management operation.

This is an exciting time to be thinking about transformation for any enterprise. Not only do we have the power of cloud to rely on, but there are also plenty of good options for organizations that are thinking about modernization to choose from. The Google Cloud Application Modernization Program brings these resources and options together, guiding you every step of the way. Think of CAMP as your personal guide – from your existing environment to your modernized destination.



To learn more about CAMP and our available resources, please [visit our site](#).

To find a partner that can support your modernization efforts, please visit our [partner page](#).

If you would like to connect with Google experts and start your CAMP journey, please reach out to your account representatives or [contact us](#).