

Modernizing Telecommunications Infrastructure to Unlock Future Growth





OVER THE PAST TWO YEARS, communications service providers (CSPs) have faced a perfect storm of dwindling margins, competitive pressure from technology companies, and pressure from customers to offer faster and better services. The pandemic put even more pressure on already-beleaguered CSPs in the form of increased customer demand for new services and bandwidth-intensive applications for remote learning and work. All while startups sought to gain ground with digital-first business models.

For that reason, CSPs have to be laser-focused on understanding what their customers want and need, and they have to turn to a sharper view of customer data to do it. “We’re seeing a huge trend around the customer across the CSP space,” says Jen Hawes-Hewitt, head of Telco Partnerships, Industry Solutions, Google Cloud. “We’re helping communications service providers to really dig into that and explore how they can triangulate different data sources — including third-party data and data sources from across all their disparate systems — to build a 360 view of the customer.” That comprehensive customer view is what CSPs need in a fiercely competitive market to better anticipate and meet the fast-changing needs and expectations of their consumers and achieve higher customer lifetime value. That kind of data isn’t just a nice-to-have. It’s table stakes if CSPs are to be able to grow revenues.

Compounding their challenges, CSPs typically carry a significant technical debt in the form of older equipment in data centers that’s difficult and expensive to maintain and update. That hinders their modernization efforts — the results of which could help them collect and analyze the data they need in order to meet customer demand for new services and identify new markets.

In addition to maintenance costs, those legacy setups come with another liability stemming from their inflexibility: They can’t be modified quickly or be easily moved once deployed.

“To provide the agility, the speed that they need to serve customers, CSPs have to be close to their subscribers,” explains Ajay Anthony, Senior Product Line Manager at VMware’s Telecommunication Business Unit. “And what close actually means is that you have to have infrastructure there — otherwise, you have large latency.” That requires careful planning, given the expense of conventional infrastructure. “You’ve got to forecast your infrastructure needs to create a network that is agile and flexible,” Anthony says. “And to be able to grow requires both CapEx and OpEx.”

Despite everything, CSPs have risen to the occasion, finding ways to manage increased demand due to new customer behaviors. However, solutions have proven labor-intensive and costly. That’s why CSPs increasingly seek cloud-based approaches to increase flexibility, leverage automation, and reduce costs. They’re working hard to deliver what customers need in order to handle challenges of their own as they adapt to flexible work and turn to online services to meet essential needs in a world impacted by a global pandemic. And many have not just coped but also found revitalized strategic and economic opportunities. They’ve found them thanks to the advantages of flexibility, agility, and near-ubiquity available beyond the data center, in the cloud.

Table of Contents

Introduction	2
CSPs Respond to Pressure	3
Solutions in the Cloud	4
Benefits of the Cloud	4
Becoming a Data-Driven Provider	5
Finding the Right Mix	5
Modernization via Google Cloud VMware Engine	6
Google Cloud VMware Engine in Action	7
The Bottom Line	8

“You’ve got to forecast your infrastructure needs to create a network that is **agile and flexible.**”

— *Ajay Anthony,
Senior Product Line Manager,
VMware Telecommunications
Business Unit*



CSPs Respond to Pressure

Even as they face rising competition and shrinking profit margins, CSPs are also confronting increasingly demanding customers, themselves under pressure from bandwidth demands based on the digitization of almost everything from mortgage lending and online shopping to new work-from-home demands and more. One example is an increase in online service provisioning required by consumers making their residences their home base. They also need increased bandwidth and more reliable connections. “Latency is critical,” Anthony says of people working or playing at home. Retailers, too, demand more of CSPs. “From an e-commerce perspective, the shopping season — between October and the beginning of January — is going to be extremely heavy. That’s when you’re going to see your utilization spike like crazy.”

CSPs have responded to these pressures with a concerted effort to reduce costs. For example, they have sought to close legacy data centers. “Legacy systems are a huge challenge that we see CSPs facing,” Hawes-Hewitt says. She points to self-assessments from CSPs indicating that technical debt consumes as much as 40% of their IT budgets. That represents a lot of financial and people resources not available for upgrades, data analysis, and all the other work that needs to go into meeting the demands of today’s shifting marketplace. “There’s a lot of legacy IT they just need to service, so a lot of conversations we have with the CSP CIOs are around what they can do to break down that problem.”

Hawes-Hewitt says those conversations revolve around what workloads they can shift into the cloud and which ones might make more sense to keep on-premises with some upgrades to the existing architecture. At the center of such conversations is what the cloud can offer. “There’s a real appetite to gain the benefits of elasticity, scalability, and access to the AL/ML data tools available in the cloud.”

Hybrid and multicloud environments, as typically used, offer some relief but don’t address all of the issues, since they often leave behind legacy systems that don’t work well in such environments. In such a case, IT managers try to tease out what systems can have the biggest impact on operations and the bottom line if they’re moved to the cloud and with the least disruption. “They’re working through what to move, in what order, with what risk, and so forth,” Hawes-Hewitt says.

These decisions aren’t always based on what’s best for the business case; they can be just as dependent on what can easily be moved and with the least time and expense. To be sure, CSPs have had success migrating newer billing, operations, and customer services software to the cloud. However, to gain the full benefits of the cloud, they also need a way to shift older systems to the cloud and even move to a cloud-native approach for old infrastructure.

Virtualization and containerization offer that opportunity.

Virtualization and containerization enable CSPs to **migrate applications to the cloud** without making any changes to them.



Solutions in the Cloud

Virtualization and containerization enable CSPs to migrate applications to the cloud without making any changes to them. They do this by abstracting an application either at the machine level (in the case of virtualization) or at the operating system (OS) level.

With virtualization, a virtual machine contains all the operating system and other software resources an application needs to run, enabling IT managers to lift and shift it from legacy infrastructure to the cloud. This can prove especially useful for applications running on legacy operating systems. With virtualization, managers can simply pack up the application — OS and all — and move it to the cloud.

Containers also provide a layer of abstraction, in this case at the OS level. Instead of bundling up an entire OS with each application, containers contain only the application and its dependencies, each separated from the other applications on a physical machine just as if it were running by itself in a given environment. This makes containers less resource-intensive than virtual machines, since they share the resources of an operating system already running natively on a given physical machine. It also makes them a good choice for instances in which many applications can share a modern OS that administrators can easily install on a cloud server.

Benefits of the Cloud

Virtualization and containerization enable CSPs to leverage the IT investment they've already made when modernizing via the cloud. That's in contrast to tearing everything down and starting from scratch to take advantage of the latest technological advances.

"Those tools that you've built up, the talent that you've built up, the skill set that you've built up are applicable in these scenarios," explains Anthony. "So it's not a situation where I've invested a lot of capital in building everything up and then on day 2 of modernization, I lose all of that investment and I have to start investing again in something else."

Hawes-Hewitt agrees that the ability to migrate applications without modification — porting their capabilities and data to new platforms — provided by virtualization is critical to controlling modernization costs. "Lift-and-shift is a low-risk way to get some of the benefits in the cloud without a broader investment," she says.

Putting infrastructure in the cloud makes CSPs nimbler, Anthony points out. "Being able to do public cloud gives you faster time to market," he says. For example, if operations managers need to build out more capacity to meet demand, they can scale up existing systems much more easily than if they had to install new systems on-premises. "You can start building the same workloads in the cloud that you have on-premises," Anthony says. "And you can maintain full control while no longer requiring the infrastructure on the other end."

What's more, once applications are in the cloud, CSPs can modernize even legacy applications with AI, ML, cloud storage and backup, virtual desktop infrastructure (VDI), and more.

CSPs can also **reimagine the customer journey with data**, thanks to operations in the cloud.



According to Hawes-Hewitt, the benefits of moving workloads to the cloud include:

- ▶ Improved scalability from quick access to more resources when needed
- ▶ Access to modern data analysis tools, including those that leverage AI and ML
- ▶ Reduced licensing costs due to having to run fewer instances of a given application
- ▶ Enhanced resilience, thanks to distributed architecture and cloud-based backup
- ▶ Enhanced performance with modern IT architecture
- ▶ More robust security from world-class global security frameworks and dedicated security professionals

In many cases, upgrades providing such benefits would require prohibitively costly and time-consuming on-premises investments. However, with operations and business support systems in the cloud — no matter where these systems originated — CSPs can bring operational efficiency to core IT functions without breaking the bank or tapping in-house IT support. And organizations can deploy cloud-only tools such as Google’s BigQuery data visualization tool, which is unavailable at any price on-premises.

Becoming a Data-Driven Provider

More than simply upgrading existing systems, CSPs can also reimagine the customer journey with data, thanks to operations in the cloud. That means confidently addressing one of the biggest challenges facing CSPs today in their quest to provide more and better services to support ever-growing numbers of bandwidth-intensive use cases.

Equally importantly, CSPs can reclaim control of their workload management. Getting control of workload management enables them to:

- ▶ Increase responsiveness to customer needs
- ▶ Gain agility by engaging analytics to predict trends and demand
- ▶ Boost revenue, thanks to increased visibility into customer usage

All of which enables a CSP to become far more than a traditional CSP. It means that it can become a data-driven communications service provider.

Finding the Right Mix

Anthony cautions that CSPs shouldn’t view the cloud as a universal cure for all that ails them, despite all the benefits. Instead, they should see it as just another tool in their arsenal to get what they and their customers need. To that end, some systems will likely stay on-premises, and that’s OK. “It is going to be a seesaw,” Anthony says. “It’s going to be a smaller subset of CSP workloads running in the cloud and the rest running on-premises.”

Over time the mix will likely change, according to Anthony. “That will evolve into where you either have everything in the cloud or it is a mix of both cloud and on-premises,” he says. “I feel that the future is going to be a mix of both, because the costs associated with running everything in the cloud over the long term can become extremely expensive.”

IT managers can move their existing applications into the cloud **in just a few minutes** without having to rebuild them.



The point is that the cloud provides the flexibility needed to make adjustments and scale up or down and mix and match on-premises and cloud infrastructure as needed. And that can make all the difference in a rapidly evolving market.

Also, with the cloud in play for all workloads — not just those that can be easily migrated without the leverage of virtualization and containerization — CSP IT managers have a lot more to work with as they strive to reach their goals. That means more systems to consider when seeking to lower costs. Efforts to streamline operations and bring new capabilities to bear on solving business challenges can also benefit from moving more workloads to the cloud.

Working with the right cloud provider can help CSPs address these challenges.

Modernization via Google Cloud VMware Engine

Dedicated cloud and virtualization services can help CSPs, and their at-times-overwhelmed IT staffs, accomplish more of their modernization goals in less time at less expense, getting them that much closer to realizing critical business goals. For example, Google Cloud VMware Engine enables CSPs to easily lift and shift their VMware-based applications to Google Cloud without changing their apps, tools, or processes. Dedicated migration tools smooth the process through automation that recognizes patterns in applications and dependencies.

However, Anthony cautions, they must do it judiciously. “The services that a telecommunications provider comes out with, which give it top-line growth, are very infrastructure-specific,” he says. “Secondly, this is a highly regulated industry, so with any drop in SLA [service-level agreements], there’s a huge penalty associated with it. Which means that the care and maintenance of existing infrastructure are absolutely critical.” For those reasons, Anthony says a phased approach to modernization makes the most sense.

Which is exactly the path that a platform such as Google Cloud VMware Engine enables CSPs to take, with a minimum of hassle. That’s because the service provides all the hardware and VMware licenses that IT departments need in order to run in a dedicated VMware-powered software-defined data center in Google Cloud, meaning that they can get the infrastructure they need up and running quickly. They can even run small-scale experiments to get a feel for a new service or market before rolling it out more broadly.

Anthony gives as an example a CSP he helped recover from a failed expansion that relied on conventional IT infrastructure. “They decided to come out with a new service in a new market,” he says. “They took on CapEx costs and set out infrastructure in the hope of selling it.” It didn’t work. The initiative took too long to roll out, and it was too expensive to make a return on investment.

So the company regrouped and made plans to expand with the help of Google Cloud VMware Engine. Crucially, it decided to conduct a small-scale test without investing too much prematurely to see if it would work before committing more fully.

Anthony says Google Cloud VMware Engine made all the difference, because of its ability to let the company scale affordably and without unnecessary capital expenses that it would have had to carry no matter what. As a result, it succeeded in the new offering. “They could start small and then expand based on whether there was demand or not,” Anthony says.

The Google tool set can provide **insights in real time** from data about what customers are doing.



That example illustrates how a CSP can become more agile, responsive, and profitable thanks to cloud infrastructure. Google Cloud VMware Engine can make a crucial difference in helping CSPs succeed in today's challenging telecommunications landscape. That's because it gives them such competitive advantages as:

- ▶ Enhanced customer experiences
- ▶ Business insights gained through Google Cloud BigQuery and other tools
- ▶ Optimized IT operations with old workloads, including HP-UX and AIX, running on emulators in the cloud
- ▶ Greater agility
- ▶ Lower operational costs with fewer data centers to run
- ▶ Greater resilience, thanks to cloud-based backup and disaster recovery

According to Hawes-Hewitt, just the benefits of applying data analytics to customer and usage data that come from using cloud-based tools make the shift from conventional IT worth the effort. "It's not just data," she says. "It's really about insight — a contextual, real-time understanding of what's happening on their networks and with their customers. With it, they can dynamically respond to such problems as potential quality-of-service or churn issues and progressively get better at anticipating them."

Google Cloud VMware Engine in Action

Insights derived from data are valuable only if they are timely and available to the right people. The Google tool set can provide insights in real time from data about what customers are doing, how operations infrastructure is running, and even about the effectiveness of business processes in meeting the objectives of executives and managers.

That power comes from the accessibility of advanced tools such as Google BigQuery in the cloud. "It's about democratizing insights," Hawes-Hewitt says. "Previously, there'd be a smaller group of people that would know how to manage information."

Hawes-Hewitt says that with readily accessible cloud-based data tools, CSP leaders can empower their business units to do their own reporting on data and create their own visualizations to aid decision-making. With Google Cloud VMware Engine, there's no need to wait for specialists to crunch numbers and translate data into forms that business leaders can understand. Instead, available tools do it for them in an instant. The implications can be profound for every aspect of a communications service provider.

CSPs are under more pressure than ever to deliver **seamless, reliable service** to meet rapidly evolving customer needs.



Google Cloud VMware Engine Delivers Benefits

E-commerce migration and modernization

- ▶ CSPs can use Google Cloud VMware Engine to migrate their e-commerce platforms to the cloud and take advantage of the reliability and scalability of a global leader in cloud services. The shift can improve both site performance and the customer experience, helping CSPs both attract and keep business at a time when competitors battle for every customer.
- ▶ At-home provisioning of service — a critical aspect of today's communications service landscape — becomes much simpler and easier to manage with Google Cloud VMware Engine and further enhances the customer experience.

Lifting and shifting business operations to Google Cloud

- ▶ Migrating business systems to the cloud provides a host of benefits, including enhanced disaster recovery and backup capabilities and storage in the cloud accessible by team members from any location. These capabilities are especially critical now in the era of hybrid and remote work environments.

- ▶ Business systems in the cloud help simplify operations and lower the total cost of ownership to increase agility and reduce expenses through lower licensing fees and reduced IT maintenance.
- ▶ And the benefits of data analysis and visualization as applied in the cloud to business systems can help leaders streamline operations for even further cost reductions.

Virtual desktop infrastructure (VDI)

- ▶ Virtual desktop infrastructure (VDI) can provide remote employees with the same consistent access to vital systems as their on-premises counterparts get, helping them provide seamless service to customers and colleagues.
- ▶ Telus is one CSP that turned to VDI to support a newly homebound workforce in 2020. The company got up and running quickly, thanks to VDI that enabled employees to access vital desktop resources without straining virtual private networks. Telus deployed a system in only 24 hours to serve tens of thousands of employees.
- ▶ VDI in the cloud helps CSPs improve support, reduce costs, and lower complexity through performance gains, the ability to scale capacity quickly and easily, and more efficient use of resources.

The Bottom Line

CSPs are under more pressure than ever to deliver seamless, reliable service to meet rapidly evolving customer needs. Aging infrastructure, upstart competitors, and the challenges of a remote workforce hinder CSPs' progress in achieving their and their customers' goals. But a cloud migration strategy that leverages the power of virtualization can get them where they need to go with few of the capital expenses required of conventional IT infrastructure, giving them the room they need in order to innovate.

"CSPs are striving to become more agile and reduce their time to market with new services," Hawes-Hewitt says. "But doing that with a large legacy environment is a challenge." Google Cloud VMware Engine can deliver the services and solutions CSPs need if they are to meet that challenge.

Learn more about how moving operations to the cloud can help CSPs lower costs and boost revenue at cloud.google.com/vmware-engine.