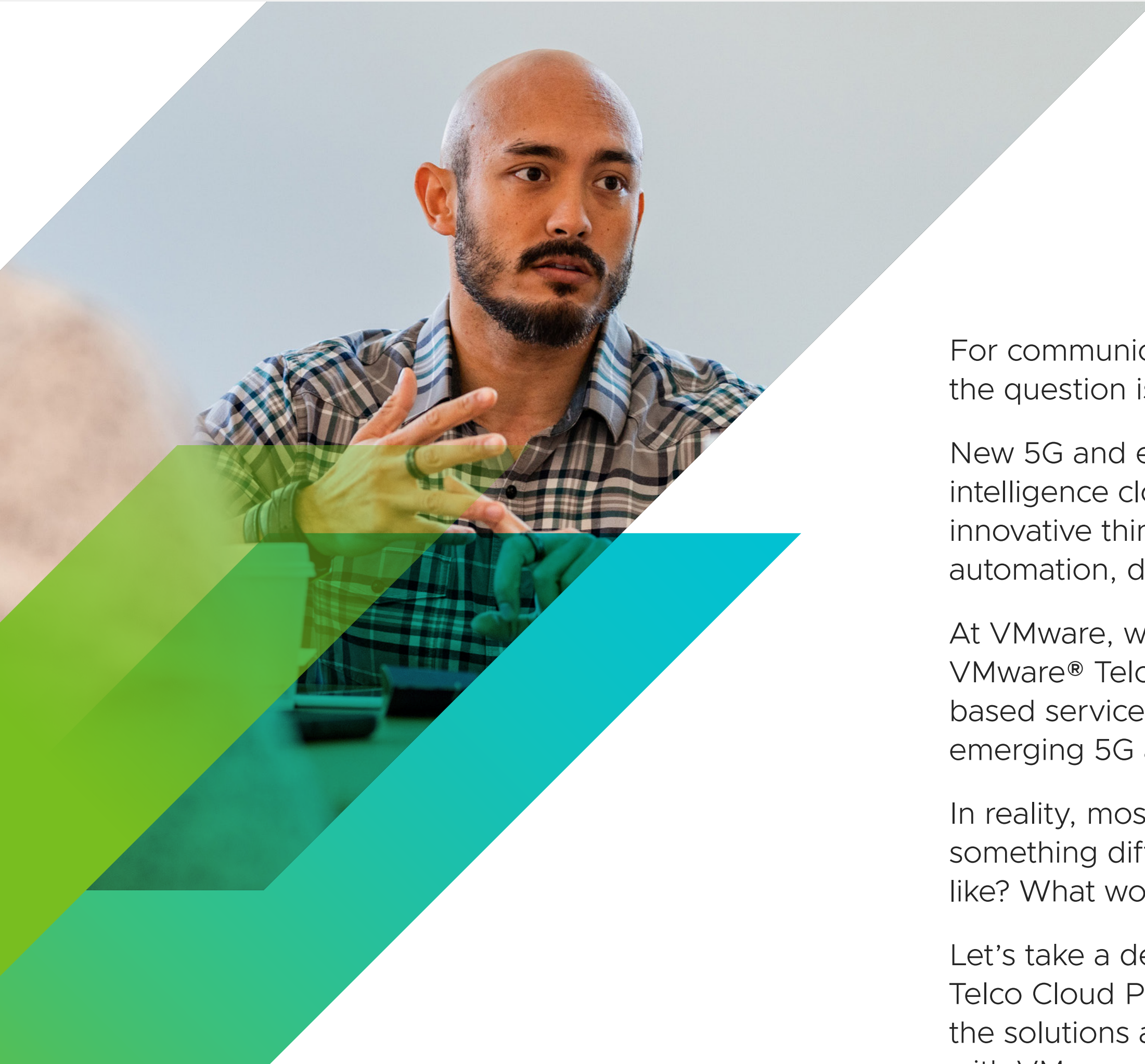


Becoming a Digital Service Provider Unicorn

VMware Telco Cloud is turning myth into reality





For communication service providers (CSPs) contemplating network transformation over the next few years, the question isn't so much "What should we do?" but "Where should we start?"

New 5G and edge innovations offer no shortage of options. With the ability to bring advanced edge intelligence close to users and tune network slices for the applications running on them, CSPs can do amazing innovative things. A world of new consumer and enterprise services—ultra-low-latency applications, industrial automation, dynamic AR/VR experiences and many others—becomes possible.

At VMware, we know that no two transformation journeys will look the same. It's why we designed the VMware® Telco Cloud portfolio from the ground up for versatility. We bring cloud-native flexibility, cloud-based service delivery and end-to-end automation together in a single platform to support the full range of emerging 5G and edge use cases.

In reality, most CSPs will pick one or two areas to focus on, at least initially. But reality is boring. Let's try something different: What if a service provider did everything? What would their network and services look like? What would they be able to do?

Let's take a deep dive into this hypothetical "unicorn" service provider and see how they can use VMware Telco Cloud Platform to reimagine their business. Note that while the CSP described here is purely imaginary, the solutions and outcomes detailed are anything but. All come from real-world experiences of CSPs working with VMware right now.

The challenge

Unicorn Services is a regional telco providing mobile, fixed-line, and broadband Internet services for consumer and enterprise customers. The CSP leads its market, but company leaders are ready to take the next step in transforming their business and can feel new competitors nipping at their heels. As they plan out their investments for the next five years, they have some ambitious goals:

- **Converge siloed operations:** Unicorn Services offers a full range of voice and data services, but they rely on multiple siloed networks to do it. As they prepare to update the voice network for 5G, they find themselves at a crossroads. Should they double down on legacy IMS or adopt a more forward-looking approach?
- **Enable consistent cloud-based service delivery:** Unicorn has been using third-party cloud services for years, both internally and as part of various enterprise offerings. Within the last year, though, the company's cloud portfolio had grown highly complex, with a dozen different public, private and hybrid clouds in use. They want to start the journey to consolidate everything—core, edge, RAN, public clouds and even IT workloads—onto a converged multi-cloud platform so a centralized team can control all resources and clouds with a single operational model.
- **Capitalize on new edge opportunities:** Unicorn leaders want to use new 5G and edge capabilities to offer targeted Internet of Things (IoT) solutions for the public sector. To do it, they need a solution that's powerful at the edge but easy to control centrally. At the same time, they don't want to get locked into one use case; any investments should support multiple edge offerings to meet diverse customer needs.
- **Modernize the RAN:** Unicorn plans to reimagine the RAN to increase scale and density. Critically though, the company wants to adopt an open RAN (O-RAN) framework, where they'll have the freedom to use best-of-breed RAN technologies from any standards-aligned vendor.
- **Deliver superior customer experiences:** Today, Unicorn operations teams can get buried by the avalanche of network alarms pouring in every day. To support complex 5G and edge services, they need to cut through the noise and surface the real problems more quickly.



Let's see how Unicorn Services can work with VMware to accomplish all of these goals.



Unifying the network

As the first step in their journey, Unicorn needed to lay the foundation for converging voice and data services. Unicorn's network vendors offered to help them define an IMS evolution strategy, but it looked a lot like the old one: a siloed platform with integrated software. If Unicorn went that route, they'd still need dedicated tools and processes for voice services. They'd also be at the mercy of their vendors for new features and pricing. If Unicorn intends to stand out in the coming years, they'll need the freedom to continually bring new converged capabilities to customers—in their own way, on their own schedule.

VMware Telco Cloud Platform

Working with VMware, Unicorn designed a horizontal platform for converging all services and management across multiple layers and clouds in their distributed network. The first step: virtualizing and consolidating network functions (NF) from multiple vendors. VMware made it easy with its VMware Telco Cloud Platform.

VMware Telco Cloud Platform helps CSPs deploy virtualized and containerized network functions (VNF/CNF) across their networks from core, edge, RAN and public cloud, enabling simpler, more consistent operations. With a single, flexible cloud-based platform, Unicorn Services gained:

- **Performance:** Telco Cloud solutions help Unicorn optimize application throughput and response times across the multi-vendor architecture.
- **Scalability:** The network can now dynamically allocate capacity in both on-premises telco cloud and public cloud to respond spikes in demand. Soon after launch, for example, a popular sporting event aired that suddenly increased demand by 30%. They were able to spin up new resources in seconds.
- **Resiliency:** With consistent operations for all services, Unicorn customers can now benefit from advanced resource guarantees, unified monitoring and closed-loop remediation.
- **Agility:** The converged platform provides a versatile foundation for Unicorn to develop new products and quickly bring them to market. The CSP has already cut rollout times in half for new services.

Today, Unicorn has a head start on wherever their transformation journey takes them. With a consistent and horizontal services platform, they can use the same operations for any application, running in any cloud, over any access, to any customer.

The goal: a single, horizontal platform to run different services (voice/data) on a single unified platform that extends from core to public cloud to far edge, with a single, consistent operational model.

Enabling consistent multi-cloud management with centralized control

Unicorn leaders knew that cloud would play a central role in their transformation, but few vendors could deliver the multi-cloud platform they had in mind. Some offered solutions that would lock them into siloed proprietary systems and roadmaps. Others offered clunky solutions based on open source software that would be difficult to integrate and expensive to maintain. Only VMware offered a mature telco cloud platform that could unify all networks and operations across multiple vendors and clouds.

Telco cloud solution

VMware Telco Cloud solutions provide a versatile digital foundation to help Unicorn build, run, manage, connect and protect multi-cloud services. Additionally, VMware's pioneering leadership in virtualization made them the perfect partner to disaggregate the previously monolithic, hardware-based network.

Today, Unicorn can treat all infrastructure and services as cloud-based software—delivering any application, to any device, across any cloud. They've implemented a single, vendor-agnostic platform for new and existing applications, with a consistent operating model across engineering and operations. They've also standardized on a common catalog of network services that can be provisioned in the same way across all markets, regardless of where workloads are deployed.

VMware Telco Cloud solutions provide a versatile digital foundation to help Unicorn build, run, manage, connect and protect multi-cloud services.

WITH THIS UNIFIED MULTI-CLOUD PLATFORM, UNICORN CAN:

- **Improve scalability**, scaling network resources up and down, in and out, as needed to meet changing demand
- **Drive down costs and complexity** by centralizing network operations, automating manual processes and breaking free from vendor lock-in
- **Increase agility** with a consistent, cloud-connected platform to create new services on the fly and rapidly bring them to customers



Capitalizing on the intelligent edge

Unicorn leaders believe that smart cities are the future of public safety, and they plan to use new edge capabilities to bring innovative IoT solutions to public sector customers. They envision an expanding portfolio of applications that use next-generation sensors, ultra-high-definition cameras and private 5G networks to protect citizens and optimize emergency response. These applications—especially video analytics—will require advanced edge processing unlike anything customers have needed before.

Unicorn wants to be an early market entrant in delivering these new capabilities. At the same time, their edge ambitions go well beyond smart cities. To support other opportunities in the future—industrial automation, healthcare, autonomous vehicles and others—they want an open, flexible edge.

Telco cloud distributed edge

Working with VMware, Unicorn designed a new edge architecture to enable remote distribution, management and operation of IT resources from devices and networks to the cloud. Now, they're using VMware Telco Cloud Platform to host local hyperconverged infrastructure, IoT gateways and predictive analytics for smart city applications. Unicorn will deploy innovative micro data centers close to sensors around a city. These sites will perform predictive and diagnostic analytics at the edge, sending data back to the core data center only when needed to minimize transport volumes and round-trip times.

With these capabilities, Unicorn can orchestrate complex connectivity and compute for diverse smart city applications. And they can do it under strict service-level agreements (SLAs)—such as delivering advanced video surveillance and analytics with guaranteed quality, coverage and delay. Most important: they can use the same capabilities to support an ever-expanding portfolio of edge use cases in the future, delivering a wide range of applications under diverse SLAs.



Modernizing the RAN

Unicorn's ambitious vision for the future will require new levels of capacity, density and performance from the network. To get there, they need to modernize and open up the RAN. As they evaluated the options, though, they found few vendors that could deliver on what they had in mind.

Traditional telco suppliers pitched tightly coupled hardware/software solutions that would leave Unicorn locked into its vendors' roadmaps and pricing. Hyperscale cloud providers offered their own solutions, but these would similarly lock Unicorn's customers into one public cloud ecosystem. Only VMware offered a universal platform that could accommodate any vendor's RAN technology and any public, private or hybrid cloud.

Telco cloud solution

Unicorn implemented a powerful telco cloud platform for a cloud-native, software-defined 5G network. And, by bringing together multi-vendor innovations across the distributed cloud, edge and RAN, they retained the freedom to use the best-of-breed solutions they choose, without ceding control to a vendor or cloud provider. Through the VMware Ready for Telco Cloud program, Unicorn can choose from dozens of cloud-native 5G NFs from leading RAN vendors that have been pretested and validated for the VMware Telco Cloud Platform.

Unicorn has already updated the RAN at thousands of sites, taking advantage of the cloud-native architecture to deploy the network much more quickly and inexpensively. In all, Unicorn expects to save more than \$50 million in deployment costs over the next four years compared to legacy solutions and several hundred million in capital infrastructure savings. The open platform also facilitates extensive telemetry- and AI-driven automation to drive down implementation and operating costs. And, thanks to this software-led approach, Unicorn can support all types of customers in every market—enterprise, small business and consumer—along with a diverse ecosystem of application partners.

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Realizing multi-cloud vision

Unicorn leaders understand that expanding its footprint and entering new markets are the fastest way to increase their topline growth and combat against competitors. However, they also understand that there are upfront costs and risks required to achieve this goal, especially if Unicorn maintains its current network design using existing siloed proprietary systems.

Unicorn wants a new flexible network design that enables them to minimize the upfront costs and risks while maximizing the business growth. Hyperscale cloud providers offered their solutions, but Unicorn understands the high cost and long lead time of refactoring their workloads to run on a public cloud. Unicorn is also concerned about losing the control of their own workloads and the inability to bring them back to their on-premises cloud while creating siloed operations between different cloud properties.

Telco cloud solution

VMware Telco Cloud Platform enables Unicorn to realize their multi-cloud visions and strategies by providing a choice and flexibility to run their workloads in multi-cloud environments with ease, accelerating their business growth and providing consistent operations across their networks.

With VMware's solution, Unicorn can now migrate both telco and IT workloads to public cloud quickly, easily and cost efficiently while having the flexibility to bring them back to their on-premises telco clouds if and when necessary, providing them full control of the workload placement to maximize their business growth of today and the future.

Unlike siloed cloud solutions that require costly and time-consuming workload refactoring between each cloud, the coherent underpinning platform provides Unicorn with a choice to migrate workloads bi-directionally between on-premises telco cloud and public cloud to quickly deploy Unicorn's unified services.



Delivering superior customer experiences

Unicorn's network operations team had solid customer satisfaction scores, but the task was getting harder every day. As the network and services grew more complex, they were bombarded with hundreds of thousands of network events and alerts from thousands of customer sites daily. Just separating the real problems from the noise—much less responding to them—was a constant challenge. Worse, there was no easy way to map issues in the underlying network to specific customers and SLAs affected.

Adding to the challenge, Unicorn was constantly updating its network software and topology to meet changing customer needs. Every time there was a change, operations personnel had to manually update the network management system (NMS), wasting valuable time and resources.

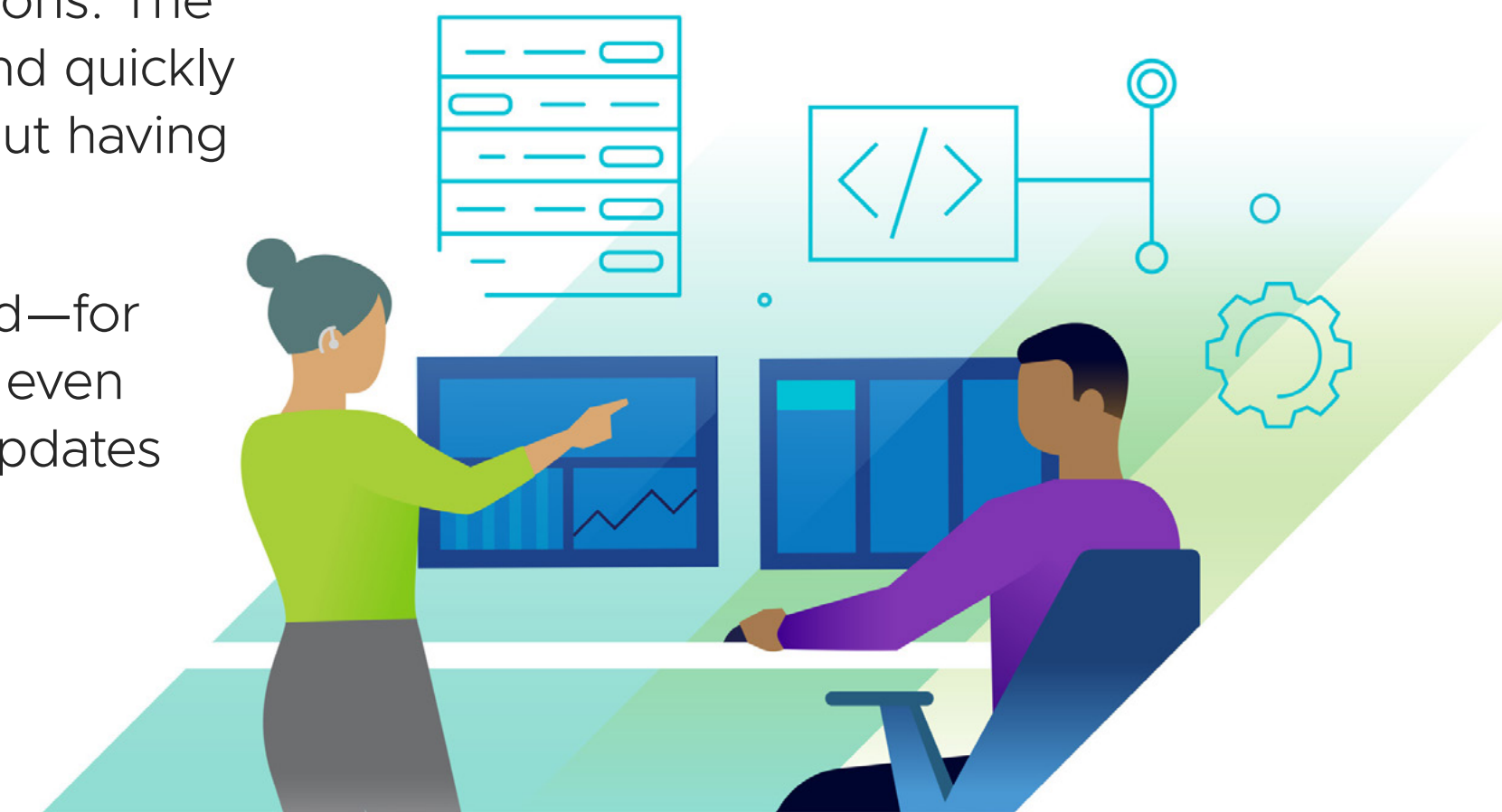
Telco cloud solution

To set the operations team up for success with the new network, Unicorn deployed VMware Telco Cloud Operations. The solution combines holistic visibility with built-in intelligence to correlate network events, determine root causes and quickly surface issues that require intervention. Unicorn's operations team can triage problems much more quickly without having to sift through thousands of extraneous alarms.

When VMware Telco Cloud Operations detects a problem, it immediately identifies the tenant networks impacted—for example, showing the enterprise SD-WAN customers affected by a failure in the underlying infrastructure. It can even prioritize alerts according to business-level factors, such as SLAs. The solution also continuously discovers and updates the topology relationships between devices, protocols and services running on them—so operations personnel don't have to.

WITH THESE PROACTIVE CAPABILITIES, UNICORN'S OPERATIONS TEAM CAN NOW:

- Identify **over 99%** of alarms in real-time
- Isolate incidents **11 minutes faster**, on average, per event
- **Save thousands of hours** annually that they used to spend manually updating the NMS



Take the next step on your transformation journey

Clearly, for a CSP embarking on transformation, VMware Telco Cloud Platform can bring huge benefits to practically every part of the network and operations. As you reviewed the real-world performance of our hypothetical service provider transformation, you might have noticed a common theme: versatility.

The days of designing an entire infrastructure and operational model to do one thing are over. Now, you can use one network, one operations and one consistent multi-cloud/multi-vendor platform to support everything you do. As far as what you build on that platform? The sky's the limit.

- **For consumers:** Use pervasive connectivity and ultra-low latency to deliver customized media like choose-your-view experiences in stadiums. Bring expanded AR/VR capabilities and holographic protection to gaming, learning, and events. Support home wireless broadband, in-car entertainment and autonomous vehicles.
- **For enterprises:** Use advanced edge and slicing capabilities to deliver new applications under more rigorous (and lucrative) SLAs. Support private 5G networks, smart manufacturing, connected mining, remote medicine, inventory management, connected agriculture, smart cities and much more over the same network.



That's a lot of exciting possibilities for your telco cloud. And the best part? You don't have to be a unicorn to do any of them.

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