Publication date:
12 Feb 2025
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On the Radar: Ribbon Communications' solution offers cloud native real-time communications architecture

Summary

Catalyst

Carriers maintaining old communications solutions incur higher operational expenses (OpEx) costs. Legacy solutions are more difficult to upgrade or patch in a timely fashion, which can be an avenue for security breaches, yet carriers have been cautious about adopting public cloud services (Azure, Amazon Web Services [AWS], Google Cloud, etc.) for their critical infrastructure, preferring to maintain operational and security control through private deployments. Although there is a tendency for the term "cloud native" to be coupled to public cloud deployments, the technology is often applicable to private cloud environments.

This article describes Ribbon Communications' cloud native communications architecture, which can be deployed on-premises, in a private cloud, or migrated to any public cloud infrastructure. It removes many barriers and challenges of deploying real-time communications in a Kubernetes environment.

Omdia view

The Omdia report *The Future of Telcos and the Cloud: New Business Models and Paths to Growth for 2030* advises telcos to focus on OpEx control through key cloud investments. This means migrating toward a modern, cloud native infrastructure, regardless of whether it's deployed in public or private clouds. The report noted: "…the inefficiency of running multiple networks and the growing complexity of service

delivery means that most telcos are accelerating rather than reducing OpEx. In particular, rising IT costs—to support automation and personalization—are driving up the cost of delivery... As a result, most telcos have seen OpEx growth since 2009."

Continuing to maintain and operate older solutions causes higher OpEx costs and can also enable security breaches like those recently revealed by the FBI and the Cybersecurity & Infrastructure Security Agency (CISA) because maintenance upgrades for legacy solutions occur less frequently and are harder to install. In this attack, foreign nationals were able to breach commercial telecommunications infrastructure to enable the theft of customer call records, listen to certain private communications, and obtain copies of law enforcement requests to monitor the communications of suspect individuals.

Carriers have been cautious about migrating to public cloud infrastructure. Part of the reason is loss of control: carriers favor private cloud environments where they can maintain operational and security control. Even AT&T, which adopted the Microsoft Azure Operator Nexus platform, ran an Azure instance on-premises in AT&T's own data centers. Cloud native technology is more disaggregated and modular, meaning that staff must be trained to understand how to troubleshoot failures.

Carriers are held to a very high standard. Interruptions in real-time voice communications, especially during emergencies, can have serious consequences. Service outages can result in lawsuits or even congressional scrutiny. Carriers must ensure high availability and reliability. Cloud services like Netflix or Disney+ also manage media, but not in real-time. A Netflix user who experiences latency or congestion can simply retry playback whereas carriers face much stricter standards and expectations.

Why put Ribbon Communications' cloud native architecture on your radar?

Ribbon's cloud native solution will be of interest to Tier 1 and Tier 2 carriers and cable operators. These companies need to determine how they will migrate to newer, more robust solutions with enhanced security and upgrade functionality along with newer agile function addition, all while maintaining operational control.

Market context

Ribbon Communications is a global provider of communications software, solutions, and services, serving the telecommunications, enterprise, and cloud communications sectors. The company's core offerings include the following:

- Service provider voice core, including softswitches, centralized routing, session border controllers (SBCs), and media gateways. This includes professional support and tools to help carriers move from legacy to cloud native communications in either private or public cloud.
- Solutions for modernizing legacy mobile networks to a cloud native integrated management system (IMS) voice core and tools to reduce churn and proactively manage the mobile voice and data network.
- Unified communications and collaboration solutions for enterprises and service providers.
- High-performance data and optical networking equipment, including optical transport and data connectivity for service providers.

- Security and analytics tools to detect and mitigate fraud, robocalls, and other cybersecurity risks in communications networks.

The carrier communications market is ripe for change. The carriers' massive investments in delivering higher bandwidth have enabled over-the-top players like RingCentral, Zoom, 8x8, Microsoft, and others to create compelling new unified communications services that cannibalize the carriers' existing business voice traffic. Likewise, WhatsApp, FaceTime, WeChat, and similar services have cannibalized their consumer traffic.

The carriers' most profitable enterprise customers and long-standing consumer customers are often using legacy telecom solutions that incur high maintenance costs for the carrier, experience infrequent upgrades, and offer little in the way of capability enhancements for carriers or customers. As a result, carriers are witnessing a decline in traditional voice communications services like T1/E1 trunks for private branch exchanges (PBXs) and contact centers, as well as consumer voice services.

Ribbon's cloud native solutions enable communications service providers to transition to more agile deployments with lower OpEx, which can significantly impact net income over time.

Product/service overview

Ribbon provides a variety of communication functionalities, as shown in **Table 1** below. All of these are cloud native with the exception of Ribbon's Softswitch (which runs in a virtualized environment) and the gateways, which require physical network interfaces.

Table 1: Ribbon Communications' telco communications product portfolio

Softswitch	Virtual C20	**Virtualized (not cloud native)**	A carrier-grade softswitch designed to support VoIP and time-division multiplexing (TDM) telephony in a virtualized environment.
Telephony application server	Application server	**Cloud native**	Integrates voice, video, instant messaging, presence, mobility, conferencing, and collaboration over any network and any device, including Web Real-Time Communications (WebRTC)-based web clients, mobile, PCs, Macs, and SIP phones.
SBC	SBC software edition (SWe)/cloud native edition (CNe)	**Cloud native (CNe version)**	A network element that provides secure and reliable connectivity between different voice, video, and multimedia networks. It acts as a critical component for service providers and enterprises to manage, secure, and optimize real-time communications.
Secure Telephone Identity Revisited (STIR)/Signature-based Handling of Asserted Information using toKENs (SHAKEN) and robocall mitigation	Call Trust	**Cloud native**	A solution designed to combat illegal robocalls, call spoofing, and fraud in telecommunications networks. It focuses on ensuring the authenticity and trustworthiness of voice calls by leveraging industry standards, analytics, and advanced security mechanisms. It helps service providers and enterprises to protect their networks and users while maintaining compliance with regulatory requirements.
Media gateways	G5, G6, G9, TelcoBridges trunk media gateway	**Not cloud native**	Media gateways provide seamless interworking between legacy TDM networks and modern IP networks. They are used to modernize communications networks while maintaining compatibility with existing infrastructure.
Management and analytics	Analytics, Ribbon Application Management Platform (RAMP),	**Cloud native**	Analytics leverages big data and analytics to more rapidly, intelligently, and efficiently respond to real-time communications cyberattacks, fraud

	Learning Enabled Automation Platform (LEAP)		attempts, and network quality incidents. RAMP offers centralized, cloud native management that streamlines the network management of Ribbon's products. LEAP eliminates manual testing processes by providing a fast, more-efficient, and easy way to test network software, reducing risk and dramatically simplifying the software upgrade process.

Source: Omdia

The benefits of cloud native environments over virtualized applications

Kubernetes is the most popular and widely adopted cloud native environment. It is an open source container orchestration platform designed to automate the deployment, scaling, and management of containerized applications. Containers are individual software units providing functionality that has been isolated and virtualized. The Ribbon cloud native capabilities outlined above have been containerized to run in a Kubernetes environment.

Kubernetes environments offer several benefits over a virtualized environment like VMware or KVM. These benefits are described in **Table 2** below.

Table 2: Benefits of Kubernetes over virtualized environments

		Kubernetes cloud native environments	VMWare environments
Resource-efficiency		Containers share the host OS kernel, reducing overhead. This enables better utilization of system resources and allows for a higher density of workloads per machine.	Virtual machines (VMs) include their own OS, making them more resource-intensive. Compared with containers, fewer VMs can typically run on the same hardware.
Scalability and agility		Scales applications horizontally by adding or removing containers dynamically based on demand. This is particularly well suited for microservices and stateless applications.	Scaling typically involves creating or cloning entire VMs, which is slower and more resource-heavy.
Automation and self-healing		Includes robust automation features such as: • Auto-scheduling containers across nodes. • Auto-restarting failed containers. • Auto-scaling based on load. • Rolling updates and rollbacks for seamless application deployment.	While VMware offers automation through tools like vSphere and vRealize, it is generally less granular and more focused on infrastructure-level tasks.
Portability		Containers are lightweight and can run consistently across any environment (on-premises, public cloud, or hybrid). Kubernetes abstracts the infrastructure, making it easier to migrate applications.	VM images are less portable because they depend on specific virtualization stacks and can require significant adaptation to move across environments.
Cost-efficiency		By optimizing resource usage and enabling fine-grained scaling, Kubernetes can reduce infrastructure costs. Open source Kubernetes also avoids licensing fees (although managed Kubernetes services from Google, Microsoft or Amazon may add costs).	Licensing costs for VMware products can be substantial. Additionally, the resource overhead of VMs may lead to higher infrastructure costs.
DevOPS and continuous integration and continuous delivery (CI/CD)		Provides seamless integration with CI/CD pipelines, enabling faster development and deployment cycles. It supports infrastructure as code and DevOps practices out of the box.	While VMware supports DevOps workflows, it requires additional tools and effort to achieve the same level of integration and automation.

Cloud native features		Kubernetes: natively supports modern, cloud native patterns such as: • Service discovery and load balancing. • Secrets management. • Declarative configuration with YAML/Helm charts. • Support for microservices architecture.	Primarily designed for traditional, more monolithic applications and infrastructure.
Community and ecosystem		Supported by a vast open source community with a rich ecosystem of tools like Prometheus (monitoring), Grafana (observability), Istio (service mesh), and Helm (package management). APIs to these tools enable the scalability necessary to meet a growing number of devices and subscribers. It also enables granular-level key performance indicators (KPIs) for each microservice.	A mature, enterprise-focused ecosystem but less dynamic compared with Kubernetes' open source innovations.

Source: Omdia

Kubernetes and VMware environments are designed for different purposes, and to be fair, there are some challenges with Kubernetes environments compared with virtual environments. Kubernetes is newer, and the automation services that deliver so many benefits also require expertise and experience to master. In some instances, small Kubernetes deployments may require more resources than VMware, making it easier and more economical to stay in a virtualized environment.

Cloud native advantages

The OpEx advantages of cloud native environments include independent operation of workloads within a service, enabling easier upgrades, and reduced maintenance windows:

- **Independent operation.** In cloud native environments, each workload operates independently, which means that failure in one workload does not affect the others and is far less likely to bring down the entire service. This independence allows for more robust and resilient systems.
- **Easier upgrades.** Cloud native environments allow for easier upgrades and maintenance. Workloads can be upgraded individually and monitored to be sure they are working properly (canary upgrades) before upgrading to the next workload. This reduces the risk of impacting the overall system, allowing for more frequent updates.
- **Reduced maintenance windows.** The flexibility of Kubernetes-based architectures reduces the need for maintenance windows. Upgrades and patches can be applied during regular business hours without disrupting services, which is a significant advantage over traditional environments that require off-hours maintenance. Some countries apply severe overtime pay penalties for night and weekend work, so being able to upgrade individual communications services during regular working hours can result in significant expense reductions.

Operational and security drivers

Adopting cloud native solutions also offers the following benefits for operational efficiency, security improvements, and the ability to automate software delivery and upgrades:

- Operational efficiency. Cloud native solutions improve operational efficiency by automating processes and reducing manual intervention. This automation leads to faster deployment and more reliable operations.
- Security improvements. Cloud native solutions provide modern security features and the ability to apply patches and updates more quickly. This reduces the risk of vulnerabilities and improves the overall security posture.
- Economic benefits. There are economic benefits of cloud native solutions for Tier 2 and Tier 1 carriers as well as for cable companies looking to optimize their operations. Cloud native solutions will often cost less to operate than a plethora of VMWare instances. Further, the recent increases and changes to VMWare pricing models are causing carriers to consider alternative deployment architectures.

How to get started

Many telecom providers have some internal Kubernetes expertise because they run operations or bill applications in a native cloud environment. However, they may not be using Kubernetes for real-time services like voice. If possible, this expertise should be leveraged or extended into the real-time voice domain. If Kubernetes expertise does not exist within the organization, then hiring or retraining is the only option to keep skills and expertise in-house. Fortunately, many vendors and systems integrators also invest in cloud native practices, which can supplement in-house teams as needed.

Service providers moving to a Ribbon cloud native environment will need to establish a test environment. The easy wins here will be migrating Ribbon's non-real-time tools like the Call Trust application for fraud protection, the Analytics app, or the management and automation tools like RAMP and LEAP. These are not as challenging as working with applications that manage real-time media flows and can give service providers experience operating Kubernetes environments.

Ribbon's cloud native SBCs, centralized routing, and similar real-time applications will take more time to implement. Any telecom application that manages real-time media flows must be configured and tested to preserve real-time media should one of the workload pods fail (a pod is the smallest execution unit in Kubernetes). Although Kubernetes can spin up new instances quickly, this won't happen quickly enough for media flow continuity, especially in something like an SBC where media and signaling are all operating at wire speed. Consequently, multiple instances of the pod will need to be operating in an active-active manner so that failover can occur instantaneously. If a pod does fail, it can be halted, and a new one restarted to replace the one that failed to maintain continuity.

Once these capabilities are proven to function satisfactorily in test environments, live traffic can be moved gradually to it as the carrier transitions from legacy to the cloud native solution and infrastructure.

Company information

Background

Ribbon Communications is a global provider of communications software, solutions, and services, serving the telecommunications, enterprise, and cloud communications sectors. The company specializes in enabling secure and reliable voice, video, and data communications across various networks, including IP, cloud, and traditional networks. The Ribbon Communications brand was formed in 2017 through the merger of Sonus Networks and GENBAND. In 2018, it added Edgewater Networks and, in 2020, acquired ECI Telecom.

Current position

Ribbon has spent the last four years creating, testing, and honing a cloud native communications architecture suitable for real-time communications for service providers. This solution runs on a Kubernetes container orchestration platform designed to manage and deploy microservices-based communications applications. It supports real-time media, transparent failover, agility, and scalability, and it makes maintenance upgrades much easier. The solution can be run on private, hybrid, or public cloud infrastructure.

Future plans

Ribbon is rolling out its cloud native architecture and the corresponding applications globally. Although the softswitch (V20) presently does not run in a Kubernetes container, Omdia believes this is the end goal.

Key facts

Table 3: Data sheet: Ribbon Communications

Product/Service name	Cloud native architecture	**Product classification**	N/A
Version number	N/A	**Release date**	2021
Industries covered	Telecommunications/CSPs	**Geographies covered**	Global
Relevant company sizes	Tier 1, Tier 1, and Cable Operators	**Licensing options**	Various
URL	www.ribboncommunications.com	**Routes to market**	Partner Channel
Company headquarters	Frisco, Texas, USA	**Number of employees**	3,100

Source: Omdia

Analyst comment

Ultimately, a carrier's decision to adopt a Kubernetes-based solution, such as Ribbon's cloud native offering, will be based on a thorough risk-versus-reward analysis. To get the cloud native solution up and running will initially entail more resources than just keeping the status quo with legacy equipment and software; however, this is an investment that will likely pay dividends long into the future. On the other hand, doing nothing and keeping current legacy solutions also entails risk: risk of end-of-life solutions, risk of harder and fewer upgrades, risk of functional weakness, and risk of long-term higher operating costs.

Several major carriers are moving to Ribbon's cloud native solution, including a Tier 1 carrier in the US and a Tier 1 carrier in Europe. They have tested it in their private clouds where it proved resilient, and they are now moving live traffic to it.

Cable-based communications service providers and Tier 2 providers should also have the resources, both financial and human, to create the test environment with some help from Ribbon. These providers should at least look at the economics versus the risks to determine if the risks can be mitigated while the economics are improved over current operations.

Smaller communications providers should start preparing by hiring experts and moving less critical applications to a cloud native architecture. Once familiar, they can assess the risks and benefits of transitioning real-time communications applications.

Appendix

On the Radar

On the Radar is a series of research notes about vendors bringing innovative ideas, products, or business models to their markets. On the Radar vendors bear watching for their potential impact on markets as their approach, recent developments, or strategy could prove disruptive and of interest to tech buyers and users.

Further reading

The Future of Telcos and the Cloud: New Business Models and Paths to Growth for 2030 (February 2023)

"Joint Statement from FBI and CISA on the People's Republic of China (PRC) Targeting of Commercial Telecommunications Infrastructure," Cybersecurity & Infrastructure Security Agency (CISA) (retrieved December 19, 2024)

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