

Powering business: Red Hat and Casa Systems launch private 5G networks

Overview

Private 5G networks: the wireless way forward

"Many companies appear willing to work through the challenges to realize the transformational potential of private 5G networks."

As organizations work to capitalize on the capabilities of newer wireless standards and spectrum such as citizens broadband radio service (CBRS), they are beginning to recognize the potential of 5G-powered mobile private networks. Uptake is accelerating, with [43% more enterprise-level private 5G networks](#) implemented between September 2021 and January 2022.

While private 5G network implementations remain limited in number, the potential they offer can open up a number of emerging technologies to their full potential. 5G networks support enterprise applications in providing low latency and real-time access. Wifi technology has already proven to be too limited; its speed and security are insufficient for many applications, managing large-scale wifi networks can be impractically complex, and it fails to meet many organizations' security needs.

Private network deployments in enterprises worldwide:

- ▶ 14% increase since Nov. 2021 in Jan. 2022.
- ▶ Almost 43% increase since Sept. 2021.
- ▶ In January 2022, up roughly 14% since November 2021 and almost 43% since September 2021, according to the Global mobile Suppliers Association (GSA).¹

By contrast, 5G not only can achieve the speed that these applications require, but it also provides excellent security. 5G private networks can deliver a solution that is fast, compact, and highly security-focused from the end point to the infrastructure to the application. Private 5G networks promise to be a major factor in autonomous logistics, fully automated manufacturing, augmented reality, video analytics, and many other nascent applications reaching the market.

Casa Systems and Red Hat have partnered to create a solution that meets these organizations' growing need for private 5G networks. Casa Systems' unique 5G architecture converges fixed and wireless technologies to operate as one seamless, borderless network. With the Casa solution, organizations can deploy a 5G network at any scale, from targeted private networks for enterprise to service providers looking to transform and modernize their chassis-based legacy systems.

The Casa 5G core and open radio access network (O-RAN) run on Red Hat® OpenShift® Container Platform, providing a proven architecture that can support private 5G deployments of any size, with industry-leading security and flexibility.

The unlimited potential of private 5G networks

Service providers and system integrators are working to meet ever-increasing user demands for their clients, while accelerating the delivery of new services. This has pushed them to develop modernized network infrastructures that are open, cloud-native, and programmable. The range, speed, and low latency of 5G-based networks makes them the preferred choice over wired or wifi-based systems.

For many organizations and enterprises, the ability to gather and process data closer to data sources, especially for such emerging applications as artificial intelligence, machine learning, or new immersive

¹ Deloitte Insights. "[Powering digital aspirations with private 5G networks](#)," June 23, 2022.

applications, is an important differentiator. Companies need to react more rapidly, connect everything anywhere, and deliver better experiences and business outcomes. This can mean:

- ▶ Using data derived from sensors, video devices, and other edge devices to make faster, data-driven decisions.
- ▶ Deploying latency-sensitive applications with the experience users expect—no matter where they are.
- ▶ Keeping data within geographical boundaries to meet regulatory requirements for data storage and processing.

As part of these implementations, many organizations also benefit from edge computing, which supports them by:

- ▶ Limiting the data that needs to be sent to a cloud environment for processing, thereby decreasing bandwidth usage and costs.
- ▶ Creating resilient sites that can continue to operate, even if the connection to the core datacenter or cloud provider is lost.
- ▶ Optimizing resource usage and costs, since only necessary services and functionality are deployed to address a use case or problem.

Primary use cases for private 5G networks:

- ▶ **Video analytics:** Detecting, classifying, and counting groups of objects: vehicles, pedestrians, and bicycles.
- ▶ **IoT analytics:** Advanced edge analytics components and southbound protocol integration to acquire device information.
- ▶ **Outdoor location:** Advanced GPS signal-processing at the edge to provide high-precision location services for logistics and asset tracking.
- ▶ **Content delivery (edge CDN):** Video content delivery for live broadcasting of events with superior quality and reduced backhaul bandwidth requirements.

Companies are turning to private 5G networks to meet all of these needs. As industry expectations increase, service providers must find innovative solutions that meet the varied and evolving needs of new applications in a variety of industries.

Red Hat and Casa Systems: a market-leading solution

Casa Systems and Red Hat have partnered to provide private 5G networks that are more scalable, dynamically adjustable, reliable, and security-focused. These networks can be deployed more easily, to meet organizations' current and emerging needs for private 5G networks.

These private 5G networks are composed of Casa Systems' 5G Multi Access core, running on OpenShift Container Platform. This combination reduces the complexity that most organizations associate with network transformation, while giving service providers a more reliable, interoperable, common cloud infrastructure. It is built on technology that has been tested, verified, and certified in public 5G networks worldwide, providing a proven solution based on experience and best practices for customers.

This unique 5G architecture solution can converge fixed and wireless technologies to operate as one seamless, borderless, integrated network. This innovative approach helps the deployment of a 5G network at any scale, from targeted private networks for enterprise to service providers looking to transform and modernize their chassis-based traditional systems.

Built on OpenShift Container Platform with Intel 3rd generation Xeon scalable processor-based servers, the resulting solution is ideal for IoT, high-traffic venues, enterprise, and other applications.

A proven 5G solution

Casa Systems delivers ultra-broadband LTE/5G and wireline broadband infrastructure, including 5G Standalone (5GSA), the newest, all-5G standard. In addition, Casa Systems provides a range of small

cell eFemto and O-RAN solutions specifically designed to address indoor and outdoor capacity and coverage applications. The Casa mobile private networks can also interwork with third-party RAN and ORAN products.

Casa Systems 5G Core was designed from the ground up using a cloud-native, microservices-based software architecture approach. This allows the 5G NFs and NF microservices to scale independently.

A scalable and secure platform

Red Hat provides an open source, hybrid container/virtual machine infrastructure with OpenShift Container Platform—an enterprise-grade certified Kubernetes distribution with real-time capabilities, monitoring, and authentication and authorization solutions. OpenShift Container Platform can be scaled for use in many deployment scenarios ranging from core datacenters to edge and far-edge servers.

Speed, agility, and flexibility

Casa Systems 5G Core is an end-to-end, cloud-native wireless network that offers a web-scale solution based on a distributed microservices framework running on OpenShift Container Platform. It includes certified third-party components and CNFs for mobile, fixed, and converged service providers. It is hosted on OpenShift Container Platform to provide cost-effective core and edge deployments, and modernizes service creation and network management. The solution can quickly adapt to changing conditions and be prepared for the future.

Primary use cases for private 5G networks:

“Organizations have great expectations for 5G security.. Across smart factories, smart hospitals, and other locations, a growing range of organizations is looking to private 5G networks for coverage, control, low latency, and enhanced security as one of the enterprise networks.”²

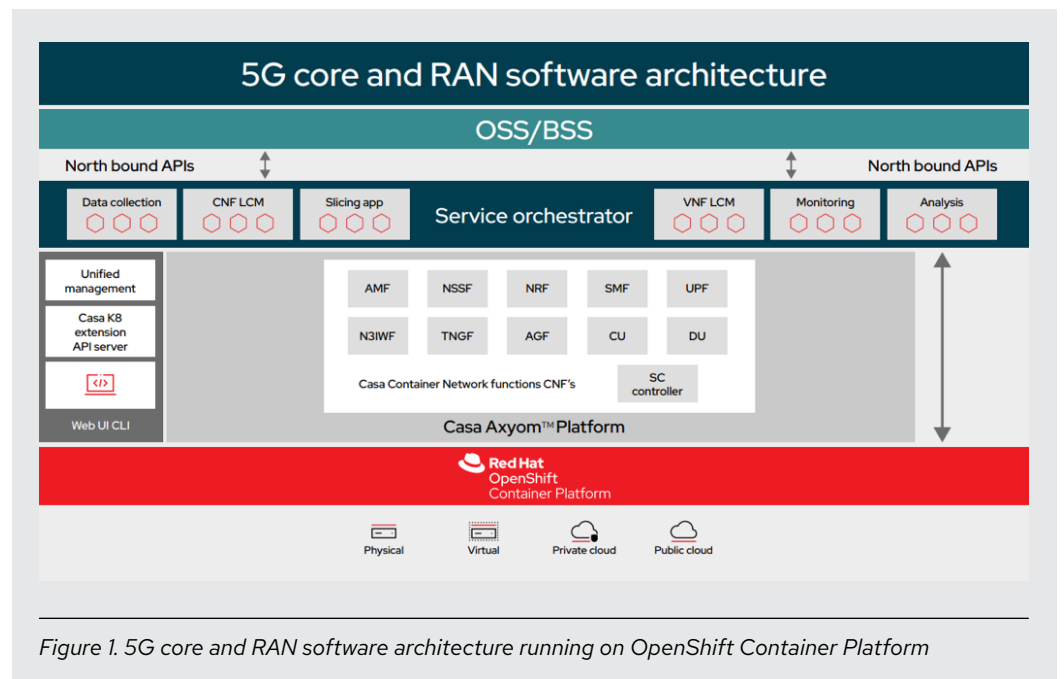


Figure 1. 5G core and RAN software architecture running on OpenShift Container Platform

Casa’s Axyom Software Platform running on OpenShift Container Platform provides the tools to deploy innovative services and scale faster to keep up with service spikes. Axyom Software Platform

² Trend Micro. [“Enhanced Security is Driving Private 5G Network Adoption.”](#) June 16, 2022.

Key components of the Casa Systems and Red Hat solution:

- ▶ 5G, 4G/5G, 4G
- ▶ Cloud-native
- ▶ Small footprint
- ▶ 1K - 50K Users
- ▶ 10 Gbps to 100 Gbps
- ▶ Enterprise-grade Linux® OS
- ▶ Kubernetes orchestration. Container runtime for cloud-native workloads
- ▶ Automated provisioning, management, and scaling
- ▶ Automated life cycle management

and OpenShift Container Platform help speed development of services and experiences and meet service-level agreements (SLAs) with a modern approach to DevOps and continuous integration and continuous delivery (CI/CD).

One solution with many advantages

The Casa-Red Hat partnership provides a solution with many advantages for organizations that adopt it. Key benefits of the solution include:

Reduced capital and operating expenditures

The performance of the Casa Systems-Red Hat solution allows its cloud-native functions (CNFs) to use fewer servers, significantly lowering capital and operational expenditures for network deployments. Casa's industry-leading, minimal virtual CPU CNF footprint dramatically improves resource utilization.

CNFs can be scaled down to as low as one or two vCPUs in a lean configuration, which reduces power consumption and supports multiple tenants on a single server. The solution's outstanding performance, advanced management, automation, and security tools can also streamline IT maintenance, minimizing operations costs.

Flexible architecture to meet industry needs

Casa Systems' end-to-end solution integrated with OpenShift Container Platform provides the network core components that organizations need to be able to deploy quickly from the core all the way out to the edge of the network. Casa's broad 5G wireless and wireline portfolio also provide opportunities to take advantage of such new technologies as RAN slicing, low latency, local breakout, and wireless/wireline convergence solutions to provide high-value feature content.

The flexible Red Hat architecture offers a multitude of deployment options, whether the organization wants to deploy the private 5G network on-premise, in a distributed network, in a central location, or in a cloud environment. It can even be packaged with hardware by Casa to provide 5G in a box. Depending on the needs of the implementation, the private 5G network can be implemented as:

- ▶ **Three-node cluster deployments**, with software tailored across nodes to provide a high-availability solution.
- ▶ **Single-node deployments**, with Red Hat and Casa running on a single node, offering a low-cost solution with a minimal footprint.
- ▶ **Hybrid deployments**, where 80% or more of the core is deployed in three-node clusters, with single nodes at remote network points—a distributed model that minimizes total cost of ownership.

For any implementation size, the Casa Systems and OpenShift Container Platform solution provides an architecture that can meet, and scale with, the needs of operators or enterprises.

Secure, resilient, and flexible private 5G networks

Built on Red Hat OpenShift Container Platform, the Casa-Red Hat technology offers a high level of security for private 5G networks. The hardened Red Hat operating system (OS) is recognized for its security focus, providing a small surface area for attacks. Implementing a solution with multinode architecture provides redundancy, ensuring the resilience and availability of the system.

99.999% availability can be supported using three-node cluster configurations.

Implementing the solution on OpenShift Container Platform containers is flexible enough to move workloads as needed. In addition, Casa Systems' microservices-based design facilitates rapid introduction of new services, and maintenance is flexible, because fixes can be made to an individual microservice, rather than having to modify and test a monolithic code base.

Flexibility, security, and a proven 5G platform

With the increasing interest in private 5G networks for so many different applications, organizations need a solution that provides 5G speed and functionality on a more secure, flexible, and scalable platform.

Casa Systems and Red Hat provide a proven 5G solution that can be deployed in a variety of architectures, from single-node on-premise implementations to widely distributed cloud-based networks.

The multiyear partnership between Red Hat and Casa Systems has resulted in an established, certified 5G networking solution on OpenShift Container Platform. As the de facto standard for public 5G networks, OpenShift Container Platform is the obvious platform for private 5G networks, with the scalability and flexibility to respond to the new and evolving needs of enterprises in any industry.

[Contact Red Hat today](#) to learn more about Casa Systems and Red Hat's private 5G network solution.



About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. [A trusted adviser to the Fortune 500](#), Red Hat provides [award-winning](#) support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

f facebook.com/redhatinc
@RedHat
in linkedin.com/company/red-hat

redhat.com
#F32050_202210

North America

1 888 REDHAT1
www.redhat.com

Europe, Middle East, and Africa

00800 7334 2835
europe@redhat.com

Asia Pacific

+65 6490 4200
apac@redhat.com

Latin America

+54 11 4329 7300
info-latam@redhat.com