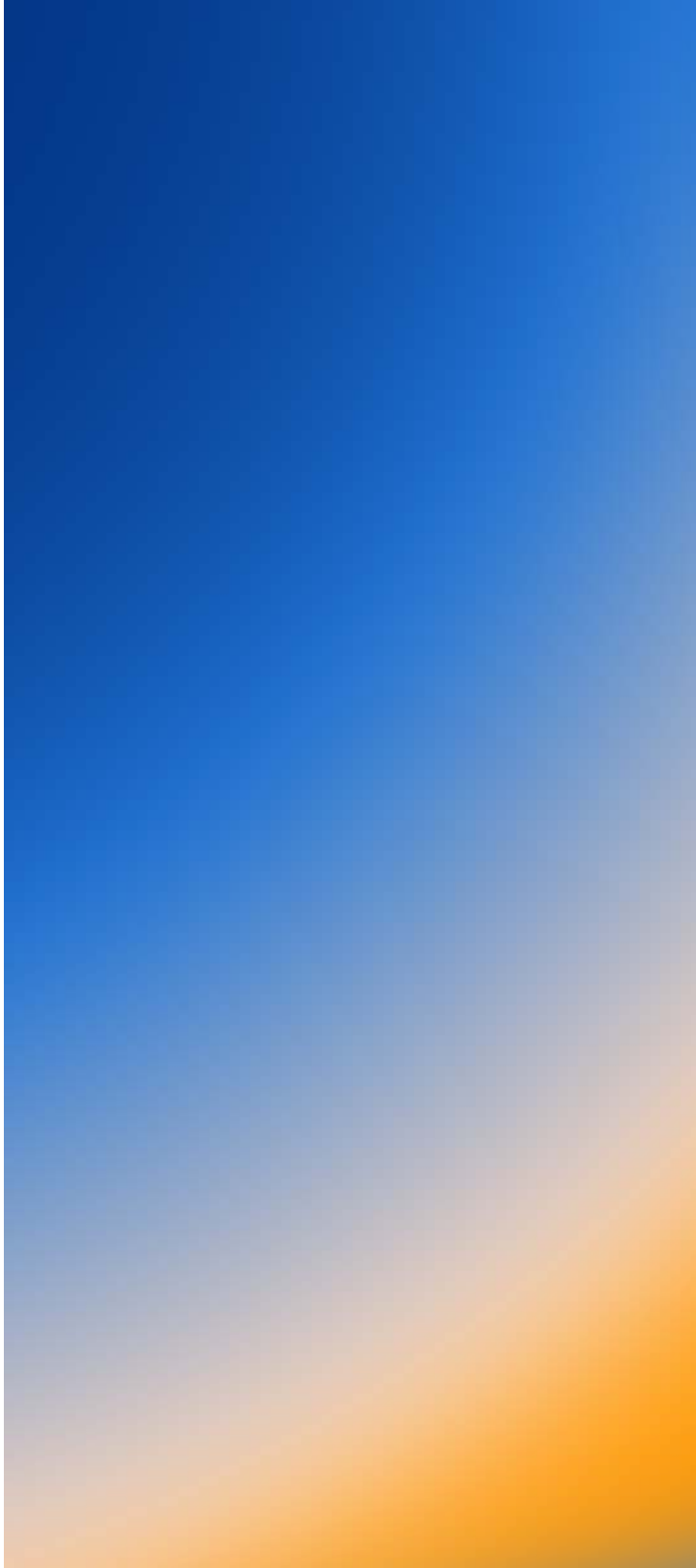
EBOOK

Private Wireless and Cloud

How AWS and Telco Partners can Simplify, Accelerate, and Scale Private Wireless Deployments for Enterprises

Contents



Introduction

PRIVATE WIRELESS

Sizable Opportunity Despite Complexity

Communication service providers (CSPs) worldwide are interested in offering private wireless services to their enterprise clients.

The market for private wireless is expected to hit $8.3B by 2026[1], growing at 35.7% per year. The impact of private wireless goes far beyond this figure, as it can drive significant business transformation for organizations. However, CSPs and the telecom industry have faced challenges delivering scalable, repeatable private wireless solutions to enterprises. Traditional WiFi-based networks offer value within weeks or days, but many private wireless deployments take months and come with substantial costs.

For the past five years, AWS has partnered with CSPs, network equipment providers (NEPs), independent software vendors (ISVs), managed service providers (MSPs), and global system integrators (SIs) to deliver private wireless solutions that leverage cloud technologies. Our efforts have shown that the use of cloud can simplify deployments, shorten time to market, and lower overall costs.

Lowering adoption barriers benefits the entire private wireless ecosystem. We invite you to discover how cloud can help you accelerate your private wireless business.

[1] Worldwide Private LTE/5G Wireless Infrastructure Market Set to Reach $8.3 Billion by 2026, According to IDC.

What Enterprises Want from Private Wireless

Driven by IoT and AI/ML adoption, industries including manufacturing, automotive, logistics, healthcare, agriculture, and education are transforming their operations. Sensors and mobile industrial devices generate vital data that needs to be collected, analyzed, and stored. Private wireless promises reliable and secure connectivity for this data, with the added advantage of consistent network performance.

Our work with our partners has taught us about what enterprise customers want.

WHAT ENTERPRISES WANT

Enterprises want more than connectivity

Enterprises demand fast time-to-value

Enterprises expect simplicity

Enterprises value cost flexibility

Enterprises want more than connectivity

When organizations look for alternatives to WiFi and wired Ethernet, they are driven by a business issue — inability to achieve full benefits of digital transformation due to connectivity challenges. For instance, autonomous robots that can't operate everywhere in a factory because of dead spots, poor connections impacting efficiency in a shipping port, or manufacturers facing issues in building a reliable factory automation network to carry sensor data and control signals to and from industrial devices.

Enterprises demand fast time-to-value

Businesses have widely adopted software-as-a-service, anytime-anywhere mobile computing, and cloud services. They have benefited from increased agility, productivity, and improved ability to focus on their core value-add. Expectations of this on-demand, fast fulfillment carry over into connectivity. Management and leadership have little patience for long-running network infrastructure projects.

Enterprises expect simplicity

IT teams that were happy drilling down into details of computing solutions in the past now demand that complexity be abstracted. IT leaders have evolved into a hybrid blend of technology and business managers, focused on managing what's core and outsourcing non-core services to partners. Few enterprises today view connectivity as core and expect turn-key networking solutions. Enterprises want private wireless to fit into existing architectures, and don't want to build and manage separate overlay networks.

Enterprises value cost flexibility

IT solutions that demand large upfront capital expenditures are less favored. The pay-as-you-go wave that hit with SaaS and cloud computing continues to rise, spreading across all elements of IT applications and infrastructure[1].

[1] XaaS Is the Future for Companies in a Post-Pandemic World (IEEE Computer Society 2022 November), Gaining and sustaining a competitive edge with cloud and as-a-service IT, Deloitte Insights Study

Pitfalls of Early Private Wireless Deployments

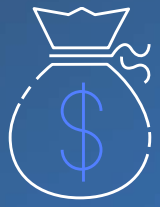
Additional stumbling blocks we've encountered in our joint go-to-market with telecom ecosystem partners:

Mispositioning private wireless as replacement for WiFi

WiFi and private wireless will coexist at most customer facilities. Trying to displace WiFi as part of any deployment makes little sense and hampers enterprise willingness to consider private wireless. At the same time, enterprises want to know how private wireless can seamlessly integrate into their existing networks and IT infrastructure, as enterprise WiFi does today.

Macro network architectures that are a poor fit for private networks

Scaling down a complex macro mobile solution built for a different customer base isn't the right answer for enterprises. Private wireless solutions need to be designed and architected differently for enterprise deployment. Furthermore, how the private wireless software stack is deployed, the infrastructure it is deployed on, and the management of the software are different.



Asking enterprises for large up-front commitments

Traditionally, CSPs offering DAS for private spaces like offices and event venues required upfront capital commitments. But enterprises are reluctant to pay large sums upfront for an unfamiliar technology like private wireless, especially with the need to validate deployment modes and use cases. They need a low-investment, fast-deployment option before committing at scale.

Private wireless success hinges on more than connectivity

Many in the telecom ecosystem think selling private wireless connectivity alone resolves the challenges businesses face. Enterprises have not resonated with this approach. Enterprises need integrated solutions: private wireless connectivity tied closely to computing and storage infrastructure and application and database stacks.

AWS Private Wireless Offerings At A Glance

AWS recognizes the importance of secure, reliable, cost-effective connectivity in unlocking the value of enterprise digital transformation. We believe private wireless holds the key.

To meet the diverse needs of enterprises, AWS and our partners offer a range of private wireless solutions.

From Cloud

AWS Private 5G is a fully-managed AWS service. Enterprises self-install private wireless radios that are connected to mobile cores hosted on and managed from AWS Cloud by AWS.

With Cloud

Integrated Private Wireless on AWS (IPW) are CSP partners' 4G and 5G managed private wireless offerings, **integrated** with AWS services, **pre-validated**, and presented in a portal that allows customers to **easily discover** the offerings and connect with the CSP partners.

On Cloud

Custom Private Wireless solutions are customized deployments that handle unique customer requirements. AWS works with dedicated Solution builders and Integrators to build complex solutions on AWS services.

AWS PRIVATE WIRELESS OFFERINGS AT A GLANCE

	AWS Private 5G	Integrated Private Wireless on AWS (IPW)	Custom Private Wireless
Deployment type	Smaller enterprises or targeted areas in larger organizations	Large campuses, factories, ports, smart cities	Varies but typically larger deployments
Geographies	Currently US-only	Worldwide	AWS Partner-dependent
Spectrum Options	CBRS	Licensed and Unlicensed	AWS Partner-dependent
How to Purchase	AWS Console	IPW portal	AWS Partner-specific
From Whom	AWS	IPW CSP/ISV/MSP/SI Partner	AWS Partner
Who Deploys	Self-deploy (or AWS Partner)	IPW CSP/ISV/MSP/SI Partner	AWS Partner
Who Operates	AWS	IPW CSP/ISV/MSP/SI Partner	AWS Partner
Who Bills	AWS	IPW CSP/ISV/MSP/SI Partner	AWS Partner
Cloud Services Provider	AWS	AWS	AWS
Supported Services	AWS Regions	AWS Regions, Local Zones, Outposts, Snow Family	AWS Partner-specific

Cloud - A Natural Fit for Private Wireless

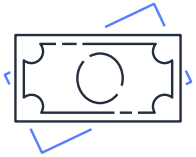
As evidenced by the private wireless offerings from AWS and our partners, the cloud plays a significant role in private wireless. Beyond its role as an infrastructure foundation, the cloud addresses enterprise customer demands for private wireless in the following ways:

Fast time-to-value

Private wireless solutions built on and served from the cloud deploy faster than traditional approaches. Using the cloud avoids searching and contracting for data center space, specification and procurement of hardware servers, installation of operating systems, deployment and configuration of virtualization and orchestration software, and ongoing maintenance.

Simplicity

The cloud encapsulates and abstracts best practices for computing, storage, and networking services while providing advanced capabilities like high resiliency, failover, and auto-scaling. Private wireless solutions such as AWS Private 5G mirror this simplicity and offer a hassle-free approach for enterprise customers.



Cost flexibility

Cloud services embody the pay-as-you-go subscription model, eschewing major up-front capital expenses and offering enterprises a scale-as-you-grow option. This financial flexibility is needed for budding technologies like private wireless that are poised for rapid enterprise-wide uptake.

CLOUD — A NATURAL FIT FOR PRIVATE WIRELESS

Elasticity and Scalability

A solution built on cloud provides the rapid ability to scale up and down as workload demand changes. As enterprise customers gain confidence with private wireless and want to quickly expand the deployment footprint, the underlying cloud can scale up as quickly as the network is built out.

Security

Cloud services adhere to secure practices and make significant investments in security innovation. The same innovation, diligence, and expertise benefit private wireless solutions hosted on cloud. This provides solution providers with peace of mind and allows them to focus on adding unique value.

Developer and IT Productivity

Running private wireless on cloud accelerates the integration of connectivity with enterprise applications. Enterprise application developers already using cloud can leverage the same toolchains and continuous integration/continuous deployment (CI/CD) pipelines. These developers are already comfortable and productive with cloud services and can deploy industry applications with private wireless faster. Likewise, IT teams are familiar with clouds like AWS and know how to integrate services quickly into their infrastructure.

Why CSPs Choose AWS for Private Wireless

The AWS telecom business unit works closely with our ISV and NEP partners to bring the value of their solutions on AWS Cloud to telecom operators. Blending cloud and deep telecom DNA, our team understands the unique needs of CSPs and continually innovates to better serve telecom needs.

Additionally, AWS is the leading worldwide cloud provider with the breadth and depth needed to serve private wireless and CSP needs:

- AWS continues to add AWS Regions worldwide, with 30 launched (96 Availability Zones) and more committed. We also provide 29 Local Zones globally, serving low-latency workloads and providing architectural flexibility for telco workloads, including private wireless solutions.
- For disconnected operations and when extreme environmental conditions might be encountered, the AWS Snow Family can support edge deployments, with proven success in hosting private wireless solutions.
- AWS provides a familiar and effective development pipeline, consistent services, and unified orchestration across all deployment locations. This dramatically reduces the complexity of application and network services running on AWS Cloud while providing agility.

> By providing a fully managed cloud service that CSPs do not need to procure, deploy, manage, or maintain, AWS offloads the pain of running computing and storage infrastructure, allowing CSPs to focus on adding their unique value to enterprise customers.

Spotlight on Integrated Private Wireless on AWS

What is Integrated Private Wireless on AWS (IPW)?

IPW is an AWS program that enables our CSPs, MSPs, and SI partners to provide enterprises with fully managed private wireless solutions. AWS provides the building blocks to shorten the time to market, reduce complexity, and accelerate the customer journey in ordering and consuming private wireless solutions. IPW integrates with AWS services across AWS Regions, AWS Local Zones, AWS Outposts, and ruggedized devices in the AWS Snow Family. The solution is available globally in AWS CSP partner markets and supports both licensed and unlicensed spectrum.

How Does IPW Work?

Enterprise customers seeking private wireless solutions start by exploring different partner offerings on the AWS IPW portal. Once the enterprise picks a solution, and submits a request for proposal along with relevant information, the system will engage our partner. The partner works with the enterprise to create a bill of materials (BOM) and associated consumption-based pricing. AWS's partner will also procure AWS infrastructure and services without additional involvement from the enterprise.

The partner will design, deliver, operate, and support the private wireless solution, including performing site surveys and RF planning. The CSP and SI partner may recommend using unlicensed, shared license, or licensed spectrum based on enterprise requirements.

IPW Customer Journey

Customer explores IPW portal and selects CSP offering

▽

Customer provides required information (size, locations, etc.)

▽

CSP generates proposal and BOM for customer review

▽

Customer accepts proposal after discussion with CSP

▽

CSP sets up invoicing, procures needed services from AWS, ships equipment, schedules deployment

▽

CSP deploys and provides ongoing management while AWS manages underlying cloud services

Value of IPW for the Enterprise

Enterprises purchasing IPW from our partners will benefit from:

Faster time-to-value
A pre-validated solution with fast and flexible deployment options to address diverse enterprise needs allows organizations to get up and running quickly, focusing on solving business, not connectivity problems.

Predictable costs with pay-as-you-grow pricing
Enterprise CFOs and IT leaders will appreciate receiving a high-quality private network without expensive upfront capital commitment. On-demand pricing lowers the hurdle to proving the business case for private wireless.

Elasticity and scalability
A private wireless offering built on cloud provides the benefit of faster scaling when the time comes to expand the network to cover more area or handle increased traffic.

Stability and quality of a brand-name service
With the recognized brands of our CSP partners and AWS, enterprises rest assured knowing that industry leaders in cloud and connectivity back their private wireless solution.

Richness and diversity of offerings
The combined resources and presence of AWS and CSP partners globally offer greater geographic coverage, and potential availability of licensed spectrum can address an enterprise's unique performance or coverage needs.

Deep integration with cloud
IPW is built on AWS Cloud, with seamless integration into AWS services. Leveraging on-demand AWS services for data analytics and AI/ML (e.g., AWS Kinesis, Amazon Sagemaker) allows full unlocking of value from enterprise data.

Value of IPW for the CSP

CSPs looking to tap private wireless as a revenue opportunity benefit from:

Pre-validated private wireless stack

AWS has performed the heavy lifting in validating full-stack private wireless solutions with its NEP and ISV partners, saving CSPs time and effort. AWS's investment in research and development to onboard and improve the mobile core and RAN stacks benefits the entire ecosystem.

Reduction in both time-to-deployment and management complexity

Leveraging AWS Cloud infrastructure with AWS development pipeline and orchestration services allows CSPs to turn up and manage private wireless with lower operational costs than alternative methods.

Lower computing and storage capital expenditure

A private wireless solution built on infrastructure that supports a consumption billing model allows CSPs to benefit from the same pay-as-you-grow flexibility as their enterprise customers.

Ease of discovery and engagement

Presence on the IPW portal allows enterprises to conveniently discover CSPs and their joint services with AWS and to engage with a few simple clicks.

Efficient monetization of unique CSP assets

IPW supports CSP-licensed spectrum, allowing CSPs to differentiate their offering by providing additional spectrum capacity to enterprises

Retention and enhancement of customer relationships

CSPs remain in control of their relationship with the enterprise, managing all customer interactions, from planning to billing and support. This facilitates upsell and cross-sell opportunities.

Extensive ISV portfolio

CSPs benefit from the diverse range of AWS partner ISV solutions certified and hosted on AWS Cloud that integrate seamlessly with IPW deployments, bringing full-stack solutions to enterprise customers.

Verified device ecosystem

AWS has validated a number of 4G LTE and 5G devices as part of IPW (and will continue to do so). CSP partners can safely recommend these as part of enterprise customer onboarding, reducing device compatibility confusion and accelerating time to value.

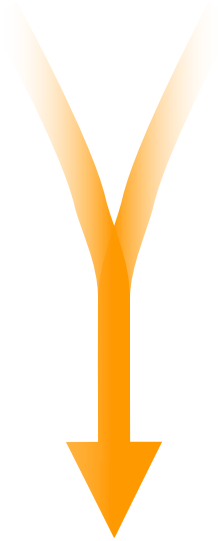
Better Together — IPW

What CSPs Contribute

- Development of business and operating model with AWS
- Site survey, radio planning, network specification
- Generation of the bill of materials (BOM)
- Order fulfillment and management of non-AWS BOM components
- Deployment and integration with enterprise IT
- Ongoing customer billing (CSP commits to pay-as-you-grow pricing for enterprise customers)
- Operations and life cycle management of all elements, from radio units to software stacks on AWS Cloud
- Customer ticket handling and support

What AWS Provides

- Development and certification of multiple private wireless deployment architectures with ISV and NEP partners, including integration with AWS orchestration and automation
- Certified blueprints and list of qualified vendors
- Fulfillment of AWS hardware in the BOM
- Ongoing operation and management of AWS Cloud services
- Consulting support on AWS Cloud services and hardware deployment (AWS Outposts, Snow Family devices)
- Customer portal for enterprises to discover, browse solutions, and submit requests for proposals to partners
- Customer support portal for submission of service tickets



What Enterprises Receive

- CSP-validated private wireless solution integrated with AWS infrastructure and services
- Lower search costs in finding the right solution plus peace of mind that comes with a proven solution
- Fast time-to-value with streamlined onboarding, certified architectures, and rapid deployment
- On-demand offering that scales up rapidly as the value of private wireless is proven, and deployment is expanded
- Flexible deployment options:
  - Local traffic breakout for large data volumes or latency-sensitive workloads
  - Local hosting to address data residency or sovereignty requirements
  - Rugged solution for sites with extreme conditions or that need support for disconnected operation

Getting Started

Telecom Partners:

Learn more about Integrated Private Wireless on AWS

Other Resources:

- AWS Private 5G
- AWS Telecom
- AWS Marketplace