AIRSPAN NETWORKS BROCHURE

# The Future of Inbuilding Connectivity

## One Provider, Complete Indoor Solutions

Airspan

# From Small Offices to Stadiums: Scalable In-Building Solutions

Seamless indoor connectivity is no longer a luxury—it's a fundamental requirement for our daily lives. As mobile data consumption grows, the demand for scalable, high-performance indoor networks has never been greater.

With a comprehensive portfolio of in-building wireless solutions—ranging from highly scalable small cells platform for neutral hosts and operators, to advanced DAS systems—we enable uninterrupted, high-quality coverage across a wide range of industries, from enterprise offices and campuses to stadiums, airports, and public venues. By offering flexible deployment models, we empower property owners, enterprises, and service providers to take control of their indoor networks.

**A U.S. BASED COMPANY**
300 employees in 8 locations

**END-TO-END SOLUTIONS**
RAN solutions with trusted partner integration

**INNOVATION, OUR DNA**
Disruptive Technologies Backed by Patents

**20+ YEARS OF EXPERIENCE**
Multiple Genrations of Award-Winning Products

# Awards and Recognitions


WIRELESS:
FIXED WIRELESS
(WITH PROSPECTA)


JUDGE'S CHOICE:
AWARDED TO INFINIG
(WITH AIRSPAN & COX)


ONGO NEUTRAL HOST ARCHITECTURE/ SOLUTION:
AWARDED TO KAJEET
(WITH AIRSPAN & DRUID)


OUTSTANDING CONTRIBUTION TO EMERGING TECHNOLOGY, ARCHITECTURE & OPEN NETWORKS


ONGO NEUTRAL HOST ARCHITECTURE/ SOLUTION:
AWARDED TO CTS
(WITH AIRSPAN & DRUID)


JUDGE'S CHOICE:
AWARDED
TO BEARCOM
(WITH ATHONET,
AIRSPAN, & BEC)


EXCELLENCE IN COMMERCIAL DEPLOYMENT BY A PRIVATE NETWORK


EXCELLENCE IN COMMERCIAL DEPLOYMENT BY A MOBILE NETWORK OPERATOR


OUTSTANDING CONTRIBUTION TO NEW SMALL CELL BUSINESS CASES


2X INNOVATION AWARDS WIINNER:
DIGITAL DIVIDE (FWA) &
PRIVATE NETWORKS


BEST MOBILE TECHNOLOGY BREAKTHROUGH


EXCELLENCE IN COMMERCIAL DEPLOYMENT
Open RAN


EXCELLENCE IN RESIDENTIAL DEPLOYMENT
Urban


EXCELLENCE IN RESIDENTIAL DEPLOYMENT
Urban

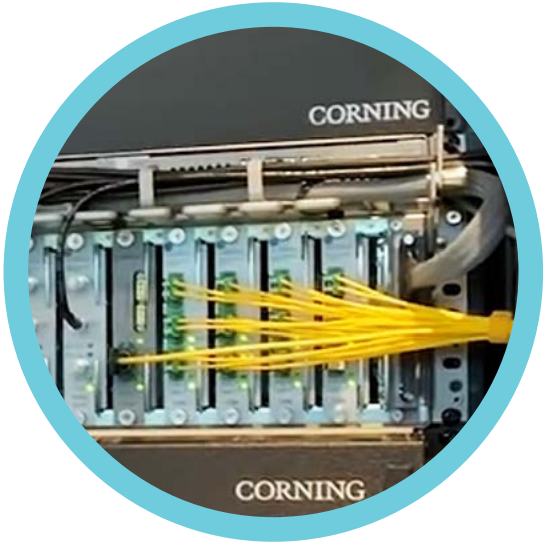

EXCELLENCE IN RESIDENTIAL DEPLOYMENT
Residential

# Expanding Our Reach in In-Building Wireless

Airspan + CORNING

With 5G macro deployments largely complete, the demand for in-building 5G coverage and capacity will grow significantly over the next five years. Airspan is assembling the strongest portfolio of technologies to meet this demand, ensuring scalable, high-performance solutions that address the evolving needs of the in-building market.

A key part of this strategy is the acquisition of Corning's Wireless Business, a move that strengthens our leadership in indoor connectivity and expands our ability to serve enterprises and mobile operators. This acquisition allows us to deliver the most comprehensive in-building wireless solution in the market, including highly scalable small cell platforms for neutral hosts and operators, as well as advanced DAS systems for leading carriers, enterprises, and large public venues.

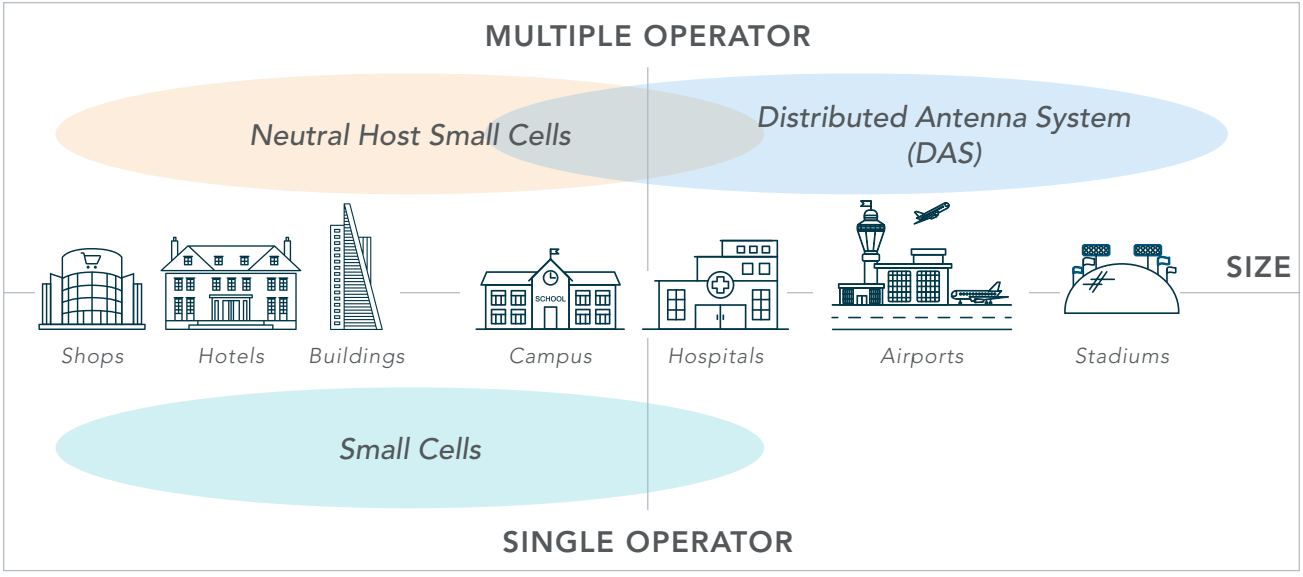



*Distributed Antenna System (DAS)*

It also provides us with access to a world-class customer base, developed over 15 years, including Tier-1 operators that rely on proven, high-performance indoor connectivity solutions. With this expanded portfolio, Airspan is uniquely positioned to meet the evolving demands of in-building connectivity and drive the next wave of indoor wireless innovation.

# Tailoring Connectivity for Every Building Type

Every building has unique connectivity challenges, from small offices and enterprises to massive stadiums and airports. A one-size-fits-all approach doesn't work—indoor networks must be scalable, flexible, and optimized for the specific environment.



# Addressing Indoor Coverage Challenges

As our world becomes increasingly connected, the demand for reliable cellular coverage has never been greater. Yet, despite the rapid expansion of 4G and 5G networks globally, a significant challenge remains: providing consistent and robust indoor coverage. Here is why:

Signal Blockers: Thick walls, metal, modern glass, and building materials block cellular signals, making it especially difficult for 5G's highfrequency waves to penetrate, leading to inconsistent indoor performance.

Macro Focus: Mobile Network Operators (MNOs) prioritize outdoor macro coverage, often leaving indoor environments underserved.

Urban Overload: Dense city environments cause network congestion, making indoor signals weaker and less reliable.

# Why In-Building Coverage Matters

As mobile connectivity becomes increasingly integral to our daily lives, the importance of strong in-building cellular coverage cannot be overstated. While WiFi is widely available, cellular coverage remains crucial in several key areas:

1. Seamless User Experience. With over 80% of mobile data used indoors, reliable cellular coverage ensures uninterrupted calls and fast data speeds, without the inconsistencies of WiFi.

2. Critical Public Safety. Around 80% of 911 calls are made from mobile phones indoors. Cellular networks prioritize these calls, providing fast, reliable connections that WiFi can't guarantee.

3. Secure Connectivity. Unlike public WiFi, cellular networks offer secure, encrypted connections that don't require constant logins. This ensures consistent, safe connectivity across different indoor environments.

# Neutral Host Networks

# Own Your Network: The Power of Neutral Host Solutions

In today's fast-paced, connected world, providing strong, reliable cellular coverage inside your building is no longer a luxury—it's a necessity. As a building owner, you have the power to take control of your connectivity by implementing a Neutral Host Network (NHN) solution. This allows you to ensure top-tier coverage for all mobile users within your property, regardless of their carrier.

# Reliable Indoor Connectivity: No Longer Optional

### Increased Tenant Satisfaction

Poor connectivity frustrates tenants and customers. An NHN ensures reliable coverage, improving user experience and boosting tenant retention.

### Future-Proof Infrastructure

Outdated networks can quickly become a liability. NHNs are scalable and adaptable, keeping your building's connectivity cutting-edge without constant upgrades.

### Simplified MNO Engagement

Getting MNOs to improve building coverage is tough. With an NHN, MNOs connect directly, ensuring reliable service without ongoing negotiations.

### Improved Emergency Services Access

Weak signals can delay emergency responses. An NHN provireliable connectivity for emergency services, enhancing safe all building occupants without ongoing negotiations.

# Navigating NHN: Understanding MORAN and MOCN

When implementing a Neutral Host Network (NHN solution for your building, the choice between MORAN and MOCN depends largely on regulatory guidelines in your country. These regulations determine whether carriers can share a single frequency band for network transmission, influencing which solution is feasible.

### Multi-Operator Radio Access Network (MORAN)

MORAN enables multiple operators to share physical infrastructure like antennas while using their own spectrum. This is ideal in regions where shared frequencies aren't allowed.

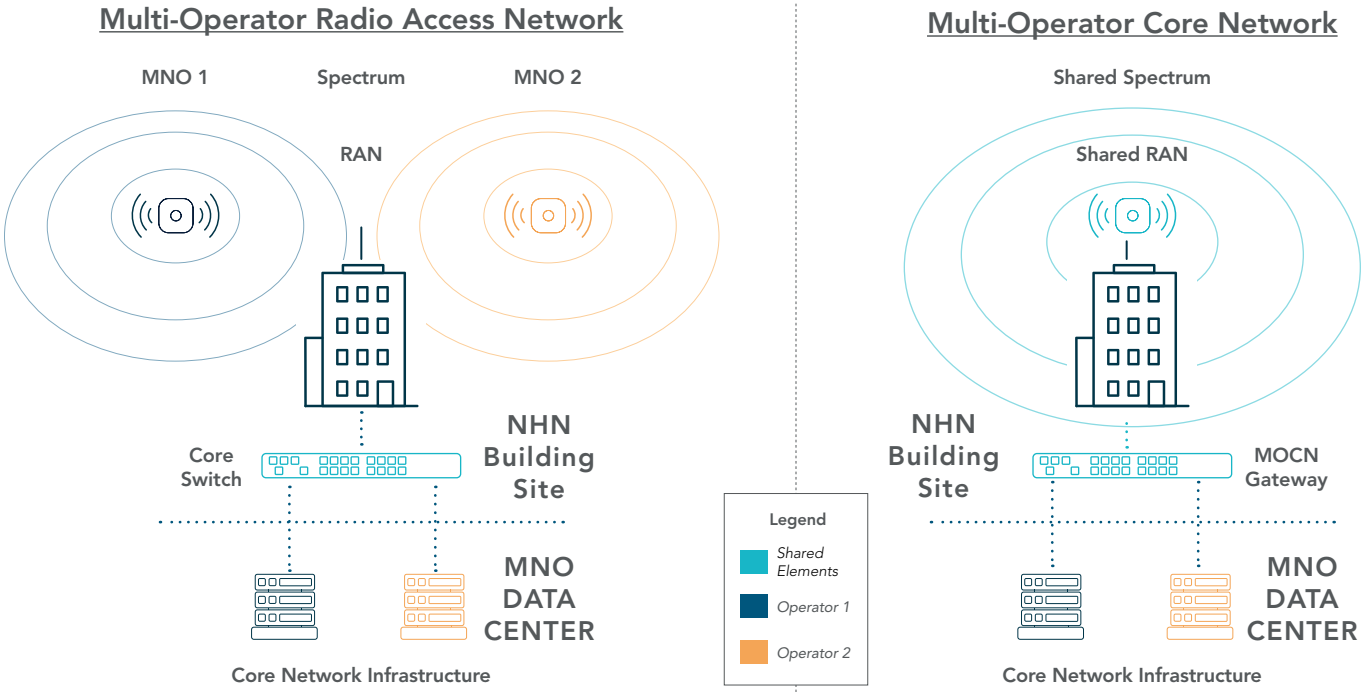
- **Pros:** operator independence, using their own spectrum
- **Cons:** Complex frequency management, may require multiple radios, which increases cost and form factor

### Multi-Operator Core Network (MOCN)

MOCN allows operators to share both infrastructure and a single frequency band, streamlining network management. This option is viable where spectrum sharing is permitted.

- **Pros:** Simplifies deployment, enhances coverage, reduces costs, small form factor solutions
- **Cons:** Limited to regions allowing spectrum sharing.

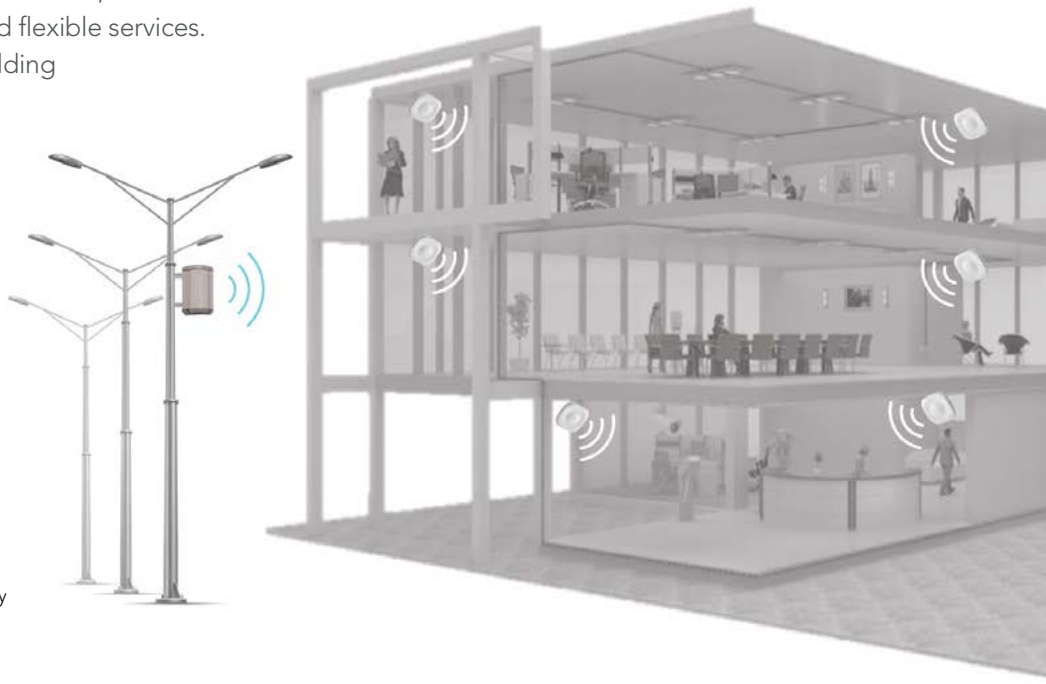
# MORAN & MOCN Diagrams



# CBRS as driver for Neutral Host Networks (NHN)

With the growing demand for reliable indoor coverage, neutral host networks (NHN) based on CBRS spectrum are becoming an increasingly popular solution, providing a cost-effective, efficient and flexible services. Airspan NHN can use the existing building transport infrastructure to connect the indoor small cells.

Together with MOCN GW (Multi-Operator Core Network Gateway) technology, Private and Public networks from different operators can co-exist with the same RAN infrastructure.



# What is CBRS?

CBRS is short for Citizens Broadband Radio Service. In the United States, it defines the usage rules for using the 3.55–3.70 GHz band.

The CBRS band does not require spectrum licenses and reduces the cost of data transmissions.

FCC Rules Part 96 defines commercial use of the CBRS band.

Utilizing shared spectrum, it expands coverage both in-building and outdoors, and increases overall capacity.

# Why CBRS?

1. CBRS significantly lowers the barrier to entry for non-traditional wireless carriers.

2. CBRS provides an opportunity for operators to expand access to spectrum for enhanced Mobile Broadband Services (eMBB).

3. CBRS provides an opportunity for operators to set up private networks that are separated from licensed and expensive spectrum, with performance significantly better than WiFi.

4. With the option to use either Priority Access License (PAL) or General Authorized Access (GAA) spectrum, or both, network operators can have access to up to 150 MHz of spectrum

# Components to build a NHN based on MOCN

### Providers (System Integrators)

These partners design, deploy, and manage your NHN. They ensure seamless integration and compliance with Mobile Network Operators (MNOs), securing necessary agreements for network connectivity.

### MOCN Gateway

Supplied by partners like Highway 9 Networks or Druid, the MOCN Gateway allows multiple operators to share the same infrastructure. This gateway can be installed locally or in the cloud for efficient network management.

### RAN (Airspan)

The Radio Access Network (RAN) provides strong indoor and outdoor coverage. Airspan's solutions, such as AirVelocity for indoor and AirSpeed for outdoor, are tailored to your site to deliver optimal connectivity.

### MNO Verification

To ensure reliable operation, your NHN must be verified and approved by MNOs. This verification guarantees that your network is fully compatible and compliant with industry standards without ongoing negotiations.

# Your Path to Seamless Indoor Connectivity: A Step-by-Step NHN Guide

1

### Contact Airspan

Reach out to Airspan to assess your building's connectivity needs and learn how an NHN can improve indoor coverage for all tenants.

2

### Review & Design

We'll review your building's plans and, if needed, conduct an on-site evaluation to create a tailored NHN design that ensures optimal coverage.

3

### Choose Partners

We'll connect you with trusted partners who handle the installation of RAN and MOCN gateway, ensuring a seamless deployment.

4

### Coordinate with MNOs

We manage integration with major MNOs, ensuring they connect to your NHN, providing tenants with seamless access to their networks.

5

### Installation

Our team installs the NHN infrastructure, including RAN and the MOCN gateway, with minimal disruption to your operations.

6

### Testing

We thoroughly test the network to ensure it meets MNO standards and delivers reliable, seamless coverage to all tenants.

7

### Ongoing Support

Airspan provides continuous monitoring, support, and maintenance to keep your NHN performing at its best.

# Collaborating with Industry Leaders for Seamless Connectivity

An example of the key partners enabling our MOCN architecture in the USA.

Ballast Networks · InfiniG · Highway 9 Networks · federatec wireless · dense air · kajeet.

## Airspan RAN

Installed on-site based on RF Design

**AirVelocity 1500, 4x 200 mW**
2x 2T2R, Dual Carrier, 35 dBm
Full EIRP CAT-A CBRS
INDOOR

**AirSpeed 1030, 4x 1.6W**
2x 2T2R Dual Carrier, 52 dBm
Full EIRP CAT-B CBRS
Outdoor

## Gateway

Choice of Suppliers – installed locally or centrally in the cloud

Druid · Highway 9 Networks

*Will interoperate with any MOCN-GW Supplier

## MNO

Provided by Airspan and operated by the Managed Service Provider

AT&T · T-Mobile · verizon

MNO Core PLMN #MNO1

MNO Core PLMN #MNO2

MNO Core PLMN #MNO3

# Having a Private Network on top of your NHN with one click

## Airspan NHN sets a platform for Private Network Services

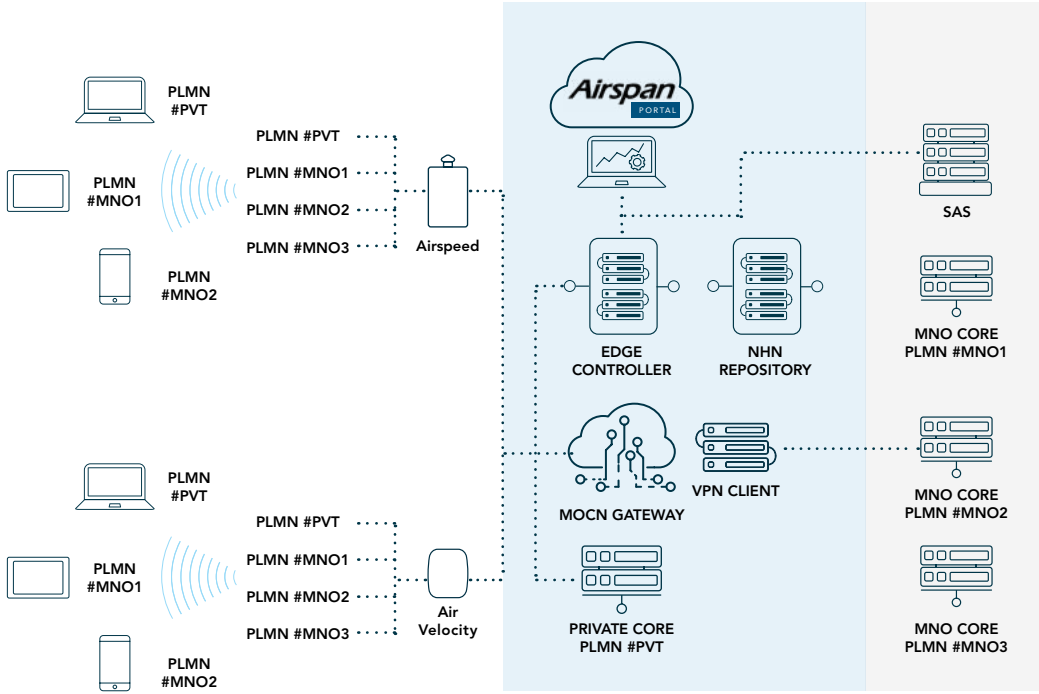
The Airspan Neutral Host can be leveraged for Private Network Services with the same inbuilding infrastructure.

- Separation from Wifi Traffic
- Deterministic Latency
- Extended Range and Mobility

Only additional technology needed is a Core Network and Airspan RAN interworks with almost any Core: Druid, HPE/Athonet, Microsoft, Cisco Highway 9 and more.

# Airspan Neutral Host End-to-End Architecture

- Neutral Host Operator Manages and Runs infrastructure on the cloud or on customer premise
- Support up to 6 network IDs (PLMN IDs) on a single Radio
- Interface to Operator Core Networks through the MOCN Gateway
- Interface to Operator OSS Networks through the ACP/ NHN Repository
- Management through Airspan Cloud Portal
- Connect to SAS directly through Edge Controller
- Private Network Services can be added through the Optional Private Core




# Products

# Complete Portfolio

## Simple & Cost Effective

- Indoor & Outdoor comprehensive solutions
- 2x 2T2R up to 40MHz – dual-carrier with2CA noncontiguous carriers supported
- Multiple backhaul options: SFP/ Copper, Ethernet
- Integrated enhanced antennas and backhaul
- PoE Support
- Enhanced Security Features

## Easy-to-Install

- All-in-one fully integrated eNB
- Fast auto-commissioning and enhanced Centralized Management Solution

**COMING SOON.**
***Carrier-grade DAS.***

**Indoor**


**4G AirVelocity 1500**
**4x 200 mW**
2x 2T2R, Dual Carrier, 35 dBm
Full EIRP CAT-A CBRS

**5G AirVelocity 1901**
**2x 320 mW**
2T2R, 34 dBm
Full EIRP CAT-A CBRS

**Outdoor**

**4G AirSpeed 1030**
**4x 1.6W**
2x 2T2R Dual Carrier, 52 dBm
Full EIRP CAT-B CBRS

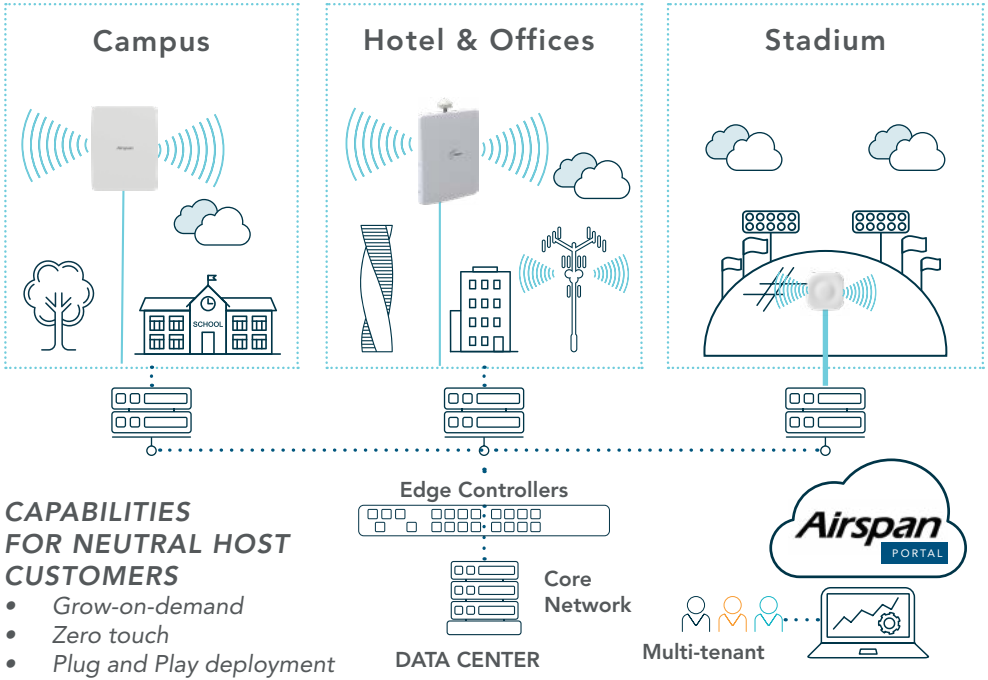
**5G AirSpeed 2900**
**4x 2W**
2x 2T2R Dual Carrier, 54 dBm
Full EIRP CAT-B CBRS

# Airspan Portal Overview

## AIRSPAN PORTAL GENERAL FEATURES

The Airspan Portal is a cloud-based platform for centralized network management while Edge Controllers integrates RAN, Core and SIM management on-site. Together, they enable seamless network deployment and control.

- Multi-Tenant
- Hosted on the Cloud
- WiFi-like Simple Management
- Automated Bring-Up
- Network-Oriented
- Views and Analytics
- Full CBRS Support

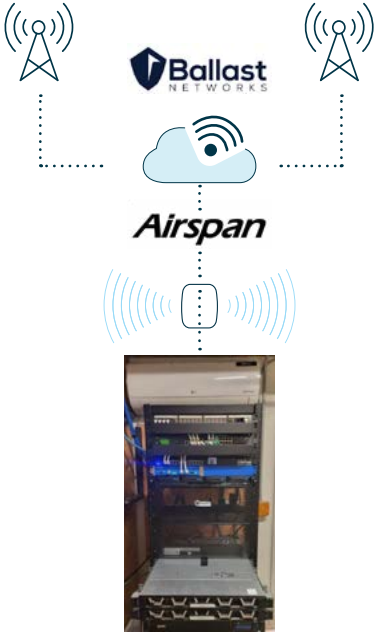



***CAPABILITIES FOR NEUTRAL HOST CUSTOMERS***

- *Grow-on-demand*
- *Zero touch*
- *Plug and Play deployment*

# Reference Use Cases

# Enhancing Hotel Connectivity with CBRS and MOCN Solutions




## Overview

The Sound Hotel Seattle Belltown, an upscale 140-room hotel in downtown Seattle, sought to improve indoor connectivity for guests and staff. Partnering with Ballast Networks, the hotel deployed a private wireless network utilizing the unlicensed 3.5GHz CBRS spectrum band. This network not only provides indoor cellular connectivity for guests but also supports staff communications and additional applications like environmental monitoring and video surveillance.

## Challenges

The hotel's dense construction materials created significant issues for outdoor cellular signals to penetrate indoors, especially on the lower floors. Furthermore, ensuring 911 services remained functional when guests were connected to the hotel's private wireless network was a critical challenge that needed to be addressed.

## Solution & Benefits

Ballast Networks implemented an end-to-end private wireless network using Airspan radios and a core from Druid Software. The network covers 10,000 square feet of the hotel's first two floors with just four transmission sites. Using MOCN (Multiple Operator Core Network) technology, the network seamlessly integrates with AT&T's public network, allowing guests to switch to the hotel's private network when necessary. The integration also ensured that 911 services continued to function properly. The private network is easy to install and cost-effective, making it ideal for venues where DAS isn't viable. As a result, the Sound Hotel now enjoys reliable indoor connectivity for both guests and staff, with additional support for smart applicati

Click the link to resource.

# InfiniG's NHaaS: Seamless Public & Private Network Integration


## Overview

InfiniG has launched its Neutral Host as a Service (NHaaS) solution, offering indoor cellular coverage using CBRS spectrum and cloud-based technology. NHaaS provides an adaptable, scalable network for a wide variety of spaces like hotels, hospitals, and offices. InfiniG's platform allows businesses to easily deploy neutral host networks while giving them the flexibility to layer private networks on top, offering the best of both worlds. Currently supported by AT&T and T-Mobile, InfiniG aims to connect large commercial spaces to mobile operators seamlessly.

## Challenges

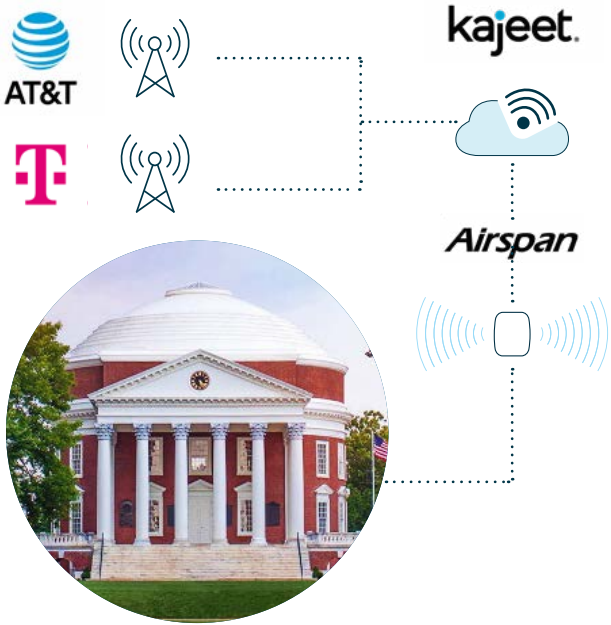
Many enterprises require flexible, adaptable network solutions that cater to their unique needs, from hospitals to hotels, but implementing individual private networks can be costly and complex. Additionally, the private network space has been slower to grow than anticipated, with enterprises unsure of how best to balance public and private network demands. Ensuring compatibility with major carriers while keeping costs manageable has been another hurdle for businesses seeking connectivity solutions.

## Solution and Benefits

InfiniG's NHaaS solution simplifies the process by deploying a neutral host network using CBRS spectrum that connects directly to public mobile operator networks. Businesses can then add their private networks on top of this infrastructure as needed, offering a flexible, scalable solution. Leveraging Airspan radios and cloud technology, InfiniG's NHaaS meets carrier requirements with zero manual intervention, providing seamless public device support while allowing for future private network expansion. The solution is cost-effective, leveraging LTE for its widespread device compatibility, hardened reliability, and lower costs compared to 5G.

Click the link to resource.

# Transforming University Connectivity with Kajeet's Neutral Host Network




## Overview

Kajeet recently launched its Smart Private 5G Neutral Host solution, providing 4G LTE indoor coverage using the unlicensed General Authorized Access (GAA) portion of the CBRS spectrum. Targeting municipalities, universities, and hospitals, the solution is designed to be a cost-effective. Kajeet's first deployment is a pilot at the University of Virginia, with commercial service expected by early 2024, supported by agreements with AT&T and T-Mobile.

## Challenges

Universities and other large properties often face poor indoor mobile coverage, leading to unreliable connectivity for students, staff, and visitors. Additionally, securing agreements with major carriers for network integration is crucial to ensuring seamless mobile service.

## Solution & Benefits

Kajeet's Smart Private 5G Neutral Host solution solves these challenges by using cost-efficient CBRS spectrum and equipment from Airspan, supported by a Multi-Operator Core Network (MOCN) gateway. The solution provides reliable 4G LTE coverage with the flexibility to upgrade to 5G as needed. Moreover, Kajeet's agreements with AT&T and T-Mobile ensure seamless connectivity for mobile subscribers, making it a scalable and efficient option for large venues.

Click the link to resource.

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*Visit airspan.com and let's create a network that empowers your future."*

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