



AZBSN

AIRVINE's WaveTunnel™

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Who is AIRVINE & What Problems Are We Solving?



AIRVINE Story: The Evolution of Networking



We are the first and only indoor wireless backhaul system, we **simplify and enable deployment of backhauls in days** to drastically reduce labor costs and dependencies, provide multi Gbps speeds & increase asset values for MDUs, Hotels, Factories and more.



AIRVINE VALUE PROPOSITIONS

IN BUILDING BACKHAUL UPGRADES

Much lower costs (50%) and faster deployments (80%)

IoT NETWORKS

Enable separate IoT networks without impacting existing IT networks

SURVEILLANCE AND SECURITY

Cameras any place and anywhere double the coverage within days

TEMPORARY EVENTS

Reduce setup time by 200%, enable quick moves, adds and changes

FOUNDED
2017

HEADQUARTERS
Santa Clara, CA

AIRVINE'S WAVETUNNEL™ IS THE ONLY WIRELESS BACKHAUL SYSTEM YOU WILL EVER NEED

AIRVINE Use Cases and Value Prop



Multifamily



In today's digital world, having access to high-speed internet and state-of-the-art technology has become a necessity for both property owners and residents.

Eighty percent (80%) of US Multi-family units are not ready to provide the speed and low latency network required.

- Minimal disruption to residents
- Installation in days
- Integrity of Property
- Security

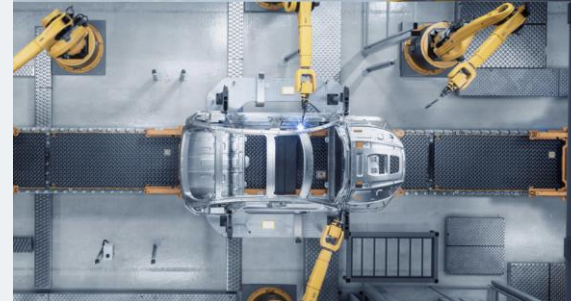
Hospitality



The Hospitality industry must provide high performance connectivity for a multitude of applications well beyond simple cellular or Wi-Fi.

- Additional Guest services
- Safety of Guests and staff
- No heavy construction
- No loss of revenue due to floor closures
- Isolation and security of OT and IT networks.
- Expand existing network beyond original footprint

Industrial



Industrial IOT (IIOT) Market needs Advanced Network Infrastructure

10k square foot warehouse can be completely covered with WaveTunnel backbones in days at a fraction of the cost of running new Cat6A ethernet.

- Quick and adaptable installation
- Lowering cost by improving speed and efficiency
- Speed of Invention is outpacing infrastructure available (Robots, Big DATA, AR/VR)
- Lack of downtime to update network

Large Public Venues



Large Private Venues represent the ultimate challenge to the supporting networks. The Digital Experience is now a key part of...the Live Experience

Implementing new services quickly and without disruption, in conjunction with existing infrastructure

- On-the-fly adaptable networks for every changing real time events.
- Additional Guest Access and Services, POS, Security.
- IOT applications and operational efficiencies.

When Airvine is the **Optimal Solution**

Ethernet cabling is not an option for network connectivity. APs, Cameras, IoT devices and more

Modification of building structure is not permitted

Budgets do not allow for cabling and labor costs

No physical room or budget for MDF switches

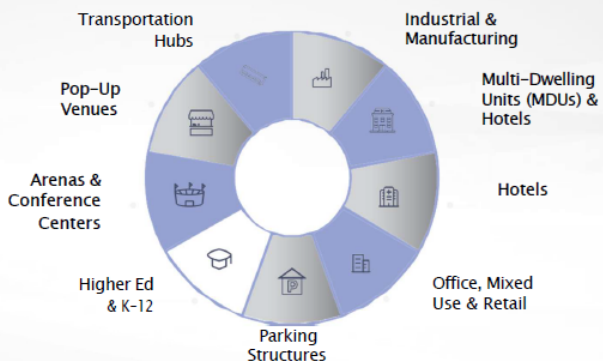
Project timeframes call for simple and fast installations

Technology changes require flexibility to deliver new Services with higher capacity backbones

APs or Small Cells must be relocated or added to the network and cables are not nearby

Active electronics require anywhere connectivity (e.g., sensors, diagnostic devices, cellular calls, etc.)

TARGET MARKETS



APPLICATIONS

CROSS MARKET APPLICATIONS

- ▶ Enhanced WIFI
- ▶ Video Surveillance
- ▶ Digital Locks/Access Controls
- ▶ Sensors – Sinks, Leak Detection, Lighting
- ▶ Temperature Controls
- ▶ Anywhere Cellular Calling
- ▶ Digital Signage
- ▶ Secondary networks – traffic isolation

MARKET SPECIFIC APPLICATIONS

- INDUSTRIAL & MFG**
 - ▶ Robotics, IoT, 3D Printing, & Video Surveillance
- MEDICAL & HOSPITALS**
 - ▶ Wireless Diagnostic Devices
- PARKING STRUCTURES**
 - ▶ Payment Kiosks, EV Charging & Video Surveillance





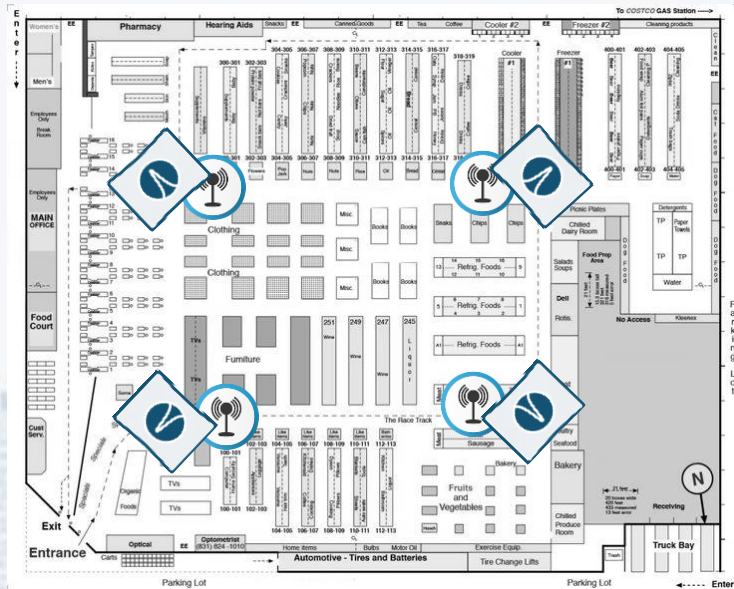
Use Cases

 AIRVINE

AIRVINE SAVES A LOT MORE THAN JUST \$\$



Connecting a Warehouse/Store-Cable versus WaveTunnel™



CABLE

- Cost - \$25K-\$30K (Labor plus cable)
- Cables must be strung along ceiling
- Requires scissor lift rental, professional cablers
- Each cable run a single point of failure
- Estimated 4 days per store

WAVETUNNEL™

- Cost - \$15K-\$17K (Labor plus WaveTunnels)
- No cables, mount AP and WaveTunnel in the same location at the same time
- No professional skills needed
- Deployed in a ring for resiliency
- Estimated 1 day per store

THE PROJECT

- 250 Stores – each measuring 300ft by 100ft
- Connecting 4 Wi-Fi APs across the building into head end
- Work to be done only in off hours

3/5/2024 Airvine Proprietary & Confidential

\$7.5M AND 1000-MAN DAYS USING CABLES

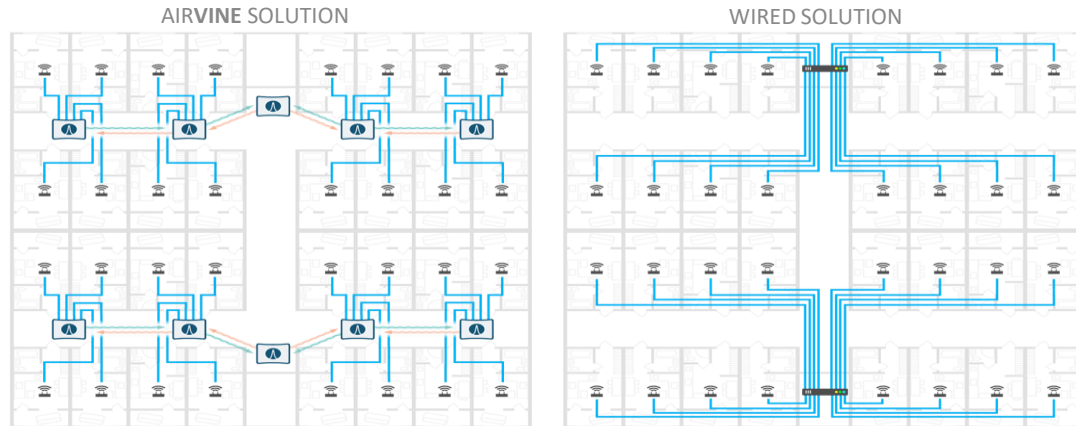
Vs

\$3.75M AND 250-MAN DAYS USING WAVETUNNELS

AIRVINE SAVES A LOT MORE THAN JUST \$\$



Connecting Hotel or MDU -Cable versus WaveTunnel™



CABLE

- Labor Cost – 4-man weeks
- Massive amount of cable used ~4800'
- Requires cable to be run in conduit or above ceilings
- Optical components for MDF to IDF fiber

WAVETUNNEL™

- Labor Cost – 1 man week
- No IDF, no HVAC for wiring closet
- No professional skills needed
- 128 manhours of labor saved
- Install APs and WaveTunnel™ at the same time

THE PROJECT

- Hotel Upgrade
- Connecting 32WiFi APS across the floor into head end
- 5 Floors
- Work to be done only in off hours

\$720K LABOR COST LAYING CABLE OVER 5 WEEKS

Vs

\$180K LABOR COST USING WAVETUNNELS OVER 1 WEEK

AIRVINE SAVES A LOT MORE THAN JUST \$\$



Connecting Wi-Fi and Security - Cable versus WaveTunnel™



CABLE

- Labor Cost – 1-man weeks
- Massive amount of cable used ~1400'
- Requires cable to be run in conduit or above ceilings

WAVETUNNEL™

- Labor Cost – 1 man day
- No IDF, no HVAC for wiring closet
- No professional skills needed
- 36 manhours of labor saved
- Install APs, WaveTunnel™ and security cameras at the same time

THE PROJECT

- Contract Manufacture
- Connecting 2 WiFi APs across the floor into head end and 2 IP cameras
- Work to be done only in off hours
- Factory floor must shut down

PRODUCTION COST LAYING CABLE OVER 1 WEEK

Vs

PRODUCT COST USING WAVETUNNEL™ OVER ½ Day



WaveTunnel™ Technical Overview

 AIRVINE

System Overview



Hardware Overview



Software Overview



Mobile or PC
Configuration

Powered by VineSuite

VineIQ

Vine
Manager

Airvine
Mobile

VineOS



Up to 6 Selectable
Channels available*

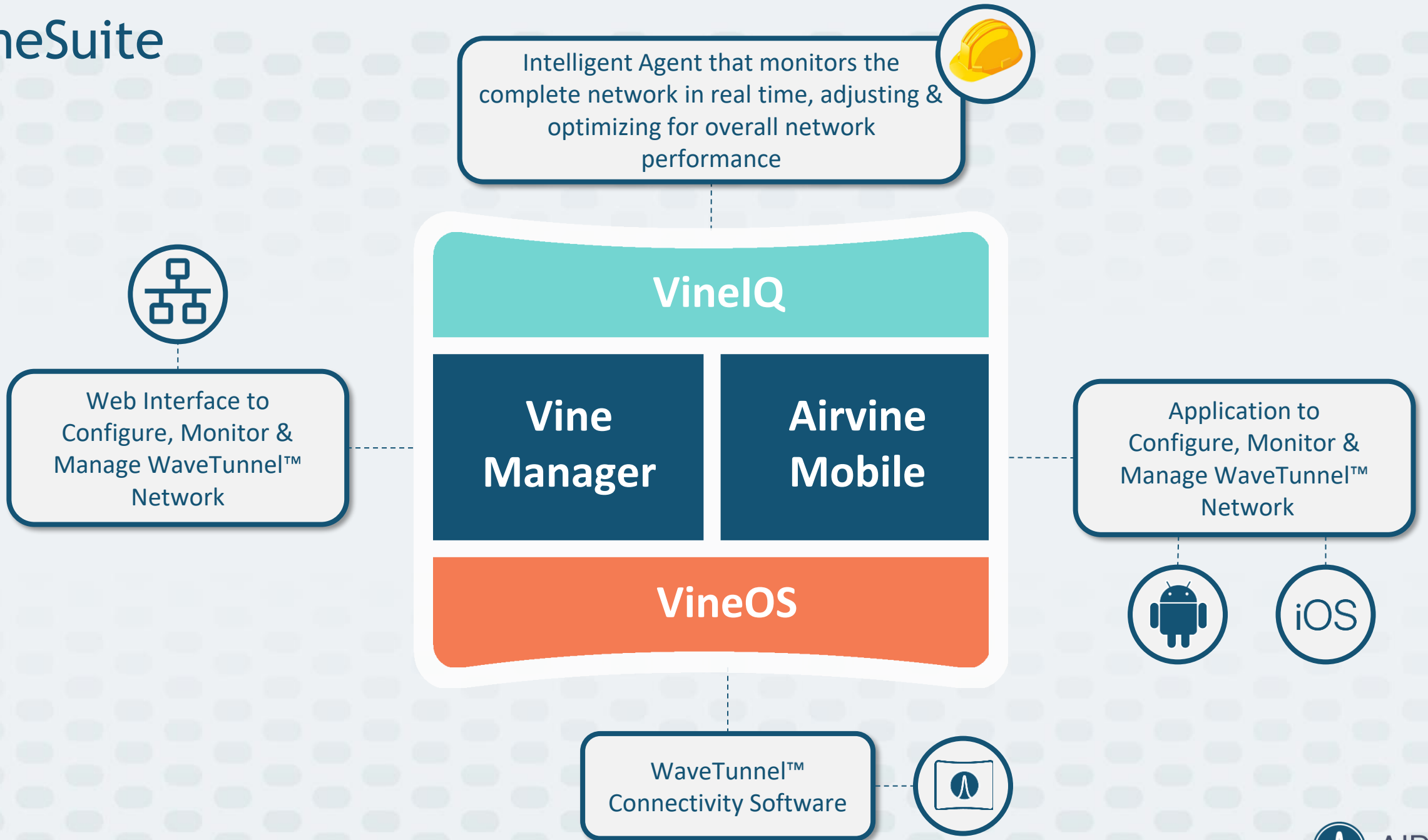
** Channels vary by
country*

802.1Q VLAN Support

OTA Security
AES Dynamic
Encryption



VineSuite



Intelligent Agent that monitors the complete network in real time, adjusting & optimizing for overall network performance



Web Interface to Configure, Monitor & Manage WaveTunnel™ Network

Vine Manager

Airvine Mobile

Application to Configure, Monitor & Manage WaveTunnel™ Network



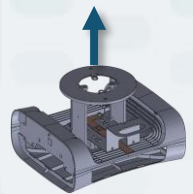
WaveTunnel™ Connectivity Software



Installation Summary

1

Mount Bracket to Ceiling



2

Snap WaveTunnel™ to bracket

3

Plug WT into AC Power



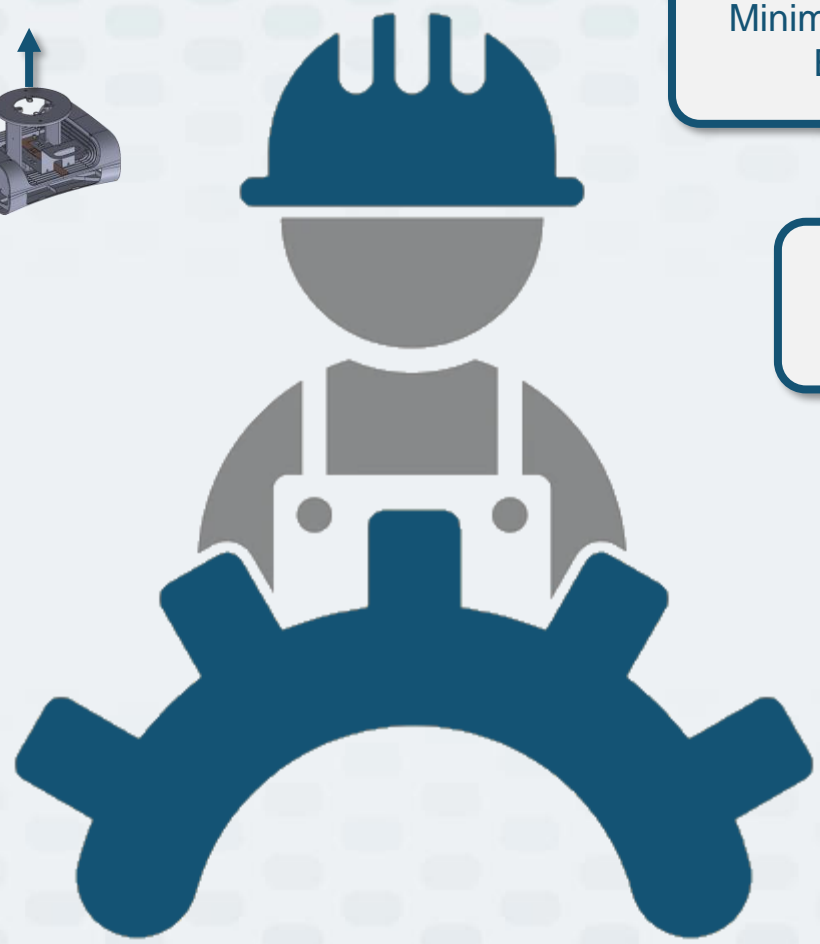
4

Configure Nodes Using AirvineMobile



5

Connect Ethernet Cable from Source



Minimal Construction = Minimal Business Disruptions

Distributed IDF = No Additional Closet Space

Distributed Demarcation = Services delivered where needed

Source Agnostic = Endless Possibilities



WaveTunnel™ Topologies

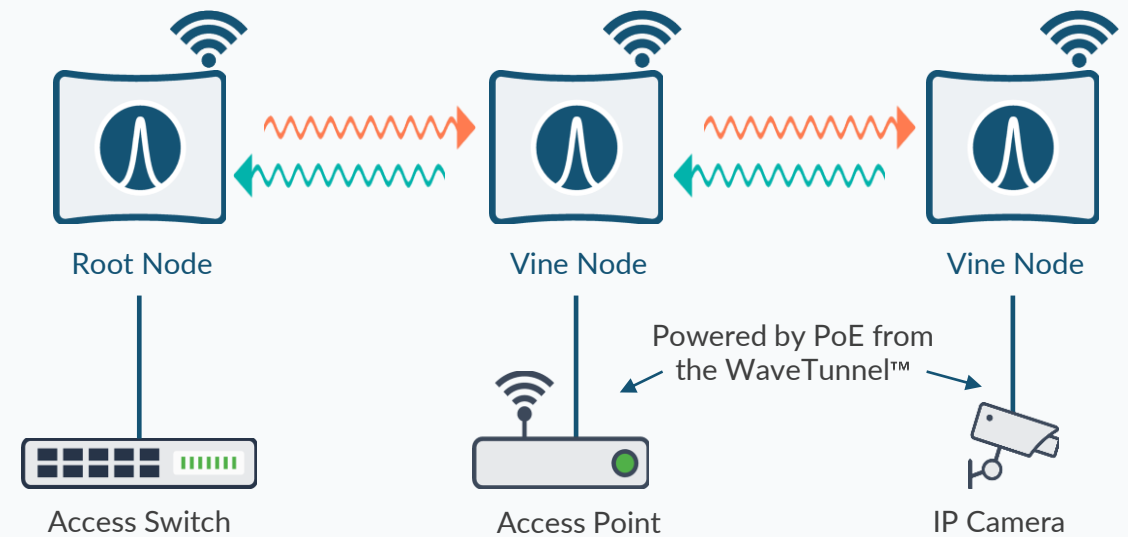
How WaveTunnel™ Nodes Can Be Deployed



Bus/Chain Topology

Chain topology is the basic AIRVINE configuration

- Root node connects to the network
 - Single Ethernet Link
 - LAG: Static or LACP
- 5+ node hops (latency, connected end-nodes, performance considerations)
- Vine nodes (non-root) may also connect to the network for additional redundancy



*WaveTunnel Wi-Fi interface is for management only and does not support client connections

Ring Topology

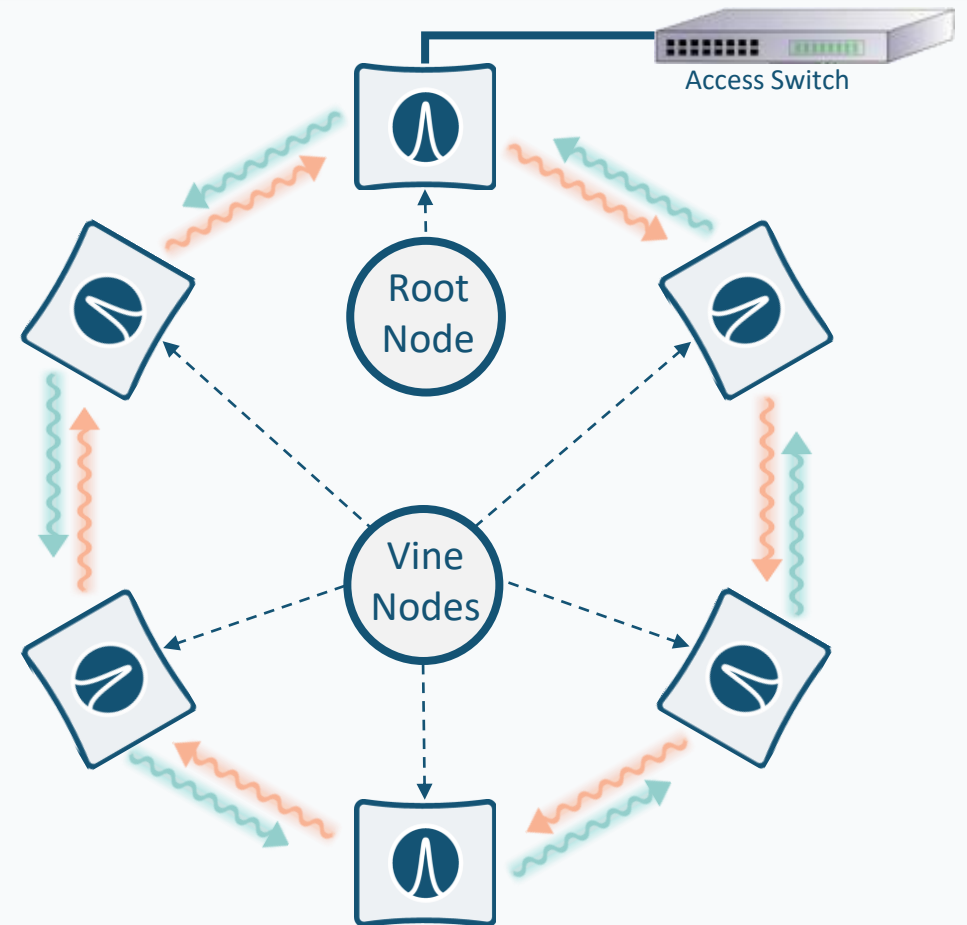
Ring topology allows for:

- Data Moves in both directions for a dual-ring topology
- Redundant, self-healing loop
- If a node fails, the ring loops back on itself
- Best (fastest) forwarding path
- Network Loop Prevention
- Installs in minutes

Built-in Vine Resilience Protocol

If an Airvine Bridge becomes disabled, Airvine's Vine Healing Resilience Protocol, *Self-Heals in a matter of seconds* creating a redundant data path for all connected devices

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The Wrap



The AIRVINE Solution - WaveTunnel™

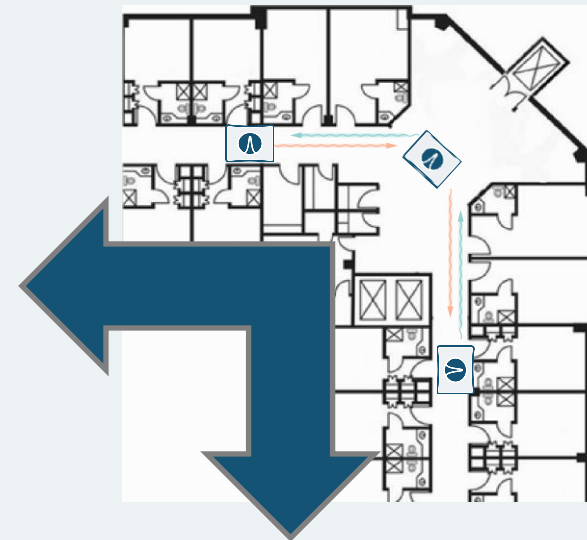
Powered by VineSuite



- Multigigabit wireless backbone with low latency operating in the 60GHz band able to support high-capacity devices - Wi-Fi 6/7 APs, 5G NR femtocells, 4K Video security cameras
- Ability to penetrate indoor walls and beam around corners - never been done before with 60GHz
- Single node installation and configuration executed in less than an hour with just a screwdriver and a Smart Phone
- Provides virtual and physical network segmentation for securing sensitive assets from IoT devices or guest users
- Little to zero construction means no disruptions to business
- Powered by a complete set of software - VineSuite™



60GHz

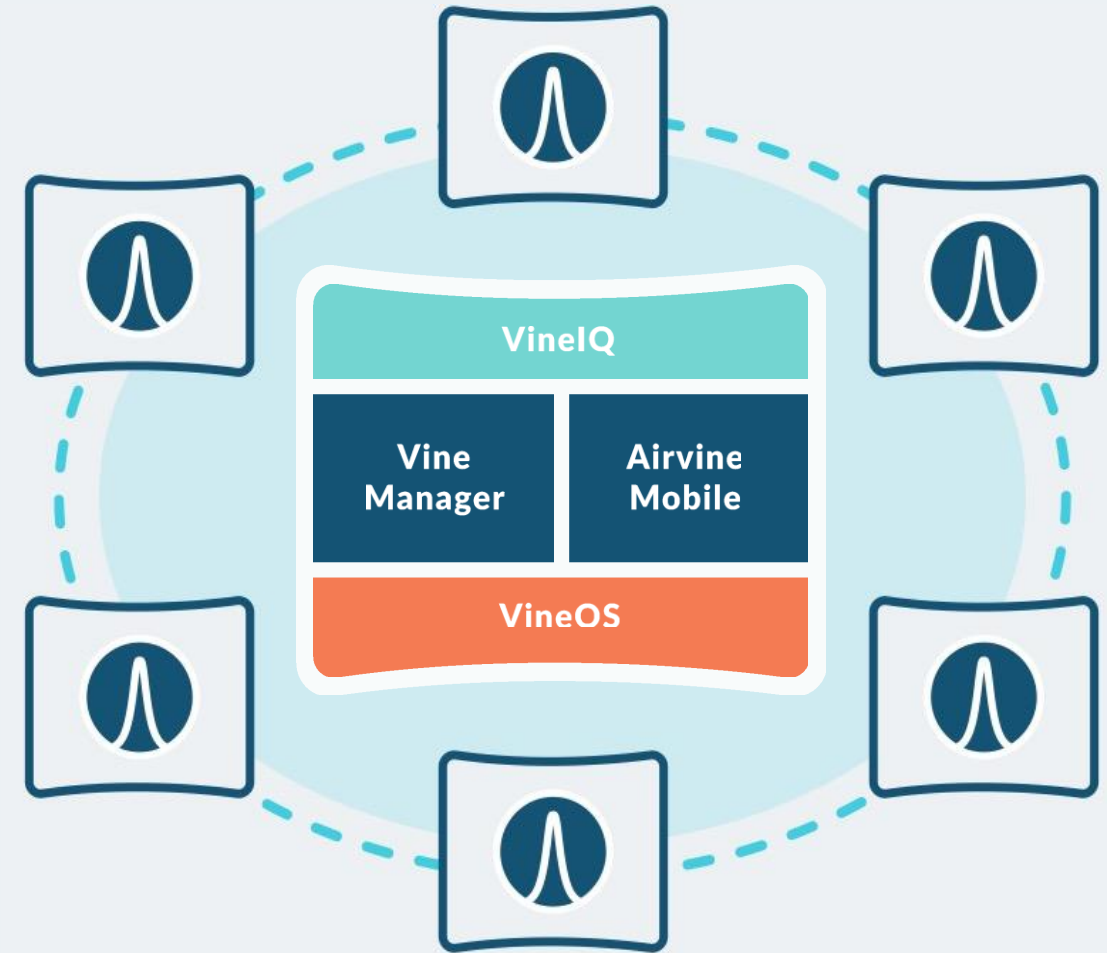


The AIRVINE Solution - WaveTunnel™

Powered by VineSuite



- Local Area Networks have traditionally only been backhauled with cable
- New APs and emerging applications demand performance, security and ease of use from the connectivity solution
- WaveTunnel powered by VineSuite offers the performance of wire, wirelessly with physical and virtual security
- Solution is simple to configure, fast to deploy and easy to manage
- Future VineIQ implementations will monitor and control a WaveTunnel network in real time using adaptive AI algorithms
- WT with groundbreaking 60GHz NLOS technology goes through walls and around corners while delivering multi-gigabit performance providing connectivity wherever it is needed, not where the cable lies



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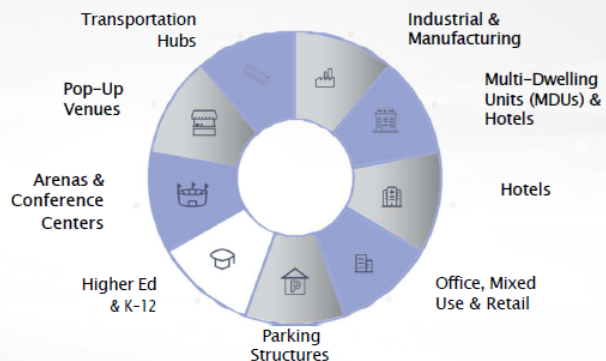
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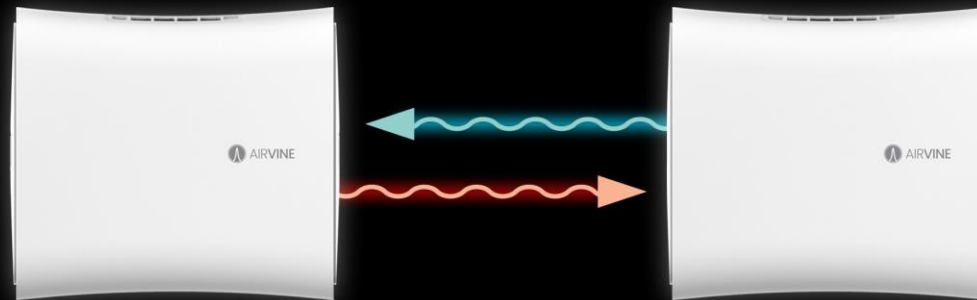
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Thank You!

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