

# Application Note

## Wi-Fi HotZones



### Benefits of the SkyPilot Synchronous Mesh Network Solution:

- Integral single or dual access points (2.4 and/or 4.9 GHz) support both public access and public safety needs
- Mesh-wide traffic coordination via directional antennas provides industry-leading performance and scalability
- Sophisticated traffic management delivers exceptional quality for “triple play” data/voice/video service offerings
- The extended range and non-line-of-sight capabilities combine to lower costs and simplify the deployment
- Built-in security provisions protect the privacy and integrity of all traffic traversing the mesh network

There are over 100,000 Wi-Fi (Wireless Fidelity) HotSpots worldwide, according to *JiWire*. And over 400 municipalities (about half in the U.S.) are now in the process of seeking proposals for or deploying community-wide Wi-Fi HotZones, according to industry analyst firm *visiongain*.

Why Wi-Fi? In today’s global, mobile economy, Internet access has become a necessity—almost like a utility. Which is why Wi-Fi interfaces are now built into most laptop PCs, personal digital assistants (PDAs) and many smartphones. For communities, providing Wi-Fi access encourages economic development and promotes tourism in a variety of venues, including business districts, airports, convention centers, stadiums, shopping malls, marinas, and other public places where residents and visitors gather. And for wireless service providers, Wi-Fi is the best way to compete against cable and digital subscriber line (DSL) access, as well as to supplement 3G cellular networks with broadband Internet access and voice over IP (VoIP) capabilities.

(voice/video/data) communications for first responders. The Wi-Fi mesh can even be used for video surveillance, automatically reading utility or parking meters, monitoring facilities and infrastructure, providing disaster recovery services, and more.

A wireless mesh is a self-forming, self-healing network that installs quickly and easily, and requires minimal ongoing management. The mesh topology automatically creates multiple wireless paths, allowing the network to overcome obstacles, expand readily into new territory and deliver mission-critical reliability.

Prior to the advent of wireless mesh networking, HotSpots had to be hard-wired to the Internet. The expense of digging trenches or paying high monthly fees for leased line services made it difficult or impossible for most service providers or municipal governments to cost-justify the investment. But with no dependency on backhaul wiring, along with dramatic improvements in wireless price/performance, deploying Wi-Fi everywhere is now so affordable, that some communities are able to offer access for free.

### Wi-Fi Everywhere with Mesh HotZones

Wireless mesh was the breakthrough advance needed to make the community-wide Wi-Fi HotZone practical and affordable. With ubiquitous Wi-Fi, the “digital divide” disappears. City workers have constant access, whether in their offices or out serving constituents. Public safety agencies benefit from interoperable multimedia



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### Third-generation Mesh Networking from SkyPilot

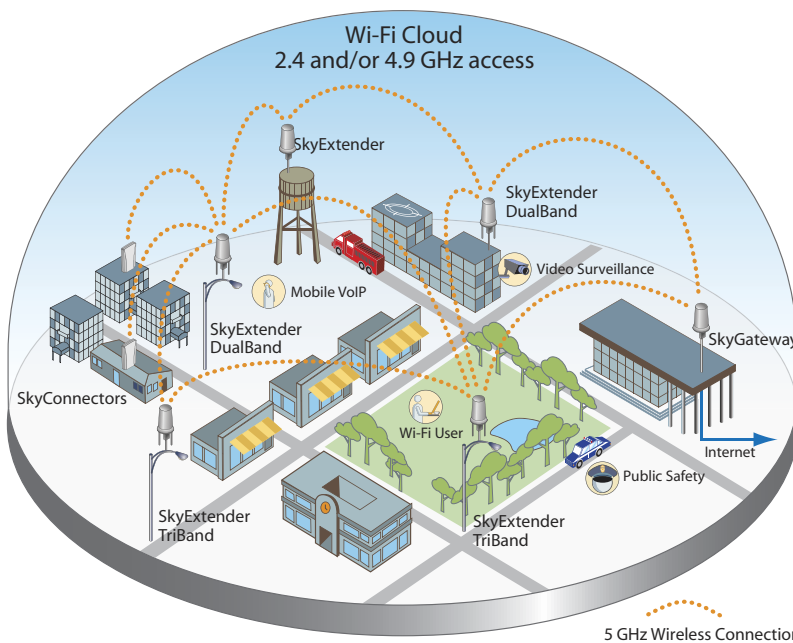
SkyPilot's third-generation Synchronous Mesh Network solution advanced the state-of-the-art in mesh technology on two major fronts with an 8-way directional antenna array and mesh-wide traffic synchronization. This innovative SyncMesh™ architecture has made SkyPilot the industry leader in both performance and scalability. And a

traffic concurrently.

Because directional antennas create point-to-point links with neighboring nodes, transmissions occur at much higher power levels than are permitted with omnidirectional antennas. Higher power levels afford several key advantages, including lower error rates based on an improved signal-to-noise ratio, better penetration through obstructions that attenuate signals, and a much longer range (up to 10 miles or 16 kilometers) between

The SkyPilot solution also has unprecedented versatility in multi-use, multimedia mesh network environments. A full suite of built-in security provisions, including access controls, authentication and traffic encryption, protect both the privacy and integrity of all traffic. For an additional layer of security, Virtual LANs (VLANs) can be defined and devoted exclusively to each separate application. Features like traffic filtering, shaping and prioritization accommodate demanding real-time applications, including VoIP and video surveillance, and allow different levels of service to be offered to different users. For example, Internet access might be offered at a lower speed at no charge—supported by advertising or location-based services—with paid subscribers receiving higher speed access and priority class of services symmetric or asymmetric bandwidth. These and other features make SkyPilot the fast, flexible, secure and affordable choice for Wi-Fi mesh deployments.

**To learn more about third-generation wireless mesh networking with the SkyPilot Synchronous Mesh Network solution, please visit SkyPilot on the Web at [www.skypilot.com](http://www.skypilot.com).**



growing number of industry analysts are now beginning to realize that it is, in fact, impossible to create a scalable, high-performance Wi-Fi mesh topology without the spatial and spectral reuse afforded by these twin capabilities.

By synchronizing directional antennas, nodes throughout the mesh topology are able to transmit or receive traffic simultaneously. This dramatically improves overall throughput and makes the mesh deterministic; that is, the bandwidth, latency and jitter can all be controlled. Such deterministic quality of service (QoS) is essential to providing "triple play" offerings that must transport both data and real-time voice/video

nodes. This allows HotSpots to be deployed more cost-effectively throughout large geographies, including in those locations that are well beyond the reach of most other wireless systems.

SkyPilot nodes integrate access and backhaul in a single, rugged unit to simplify installation and operation. Each node includes one or two access points operating at 2.4 GHz (unlicensed Wi-Fi) and/or 4.9 GHz (licensed in the U.S. for exclusive use in public safety applications). To eliminate radio frequency (RF) interference with the integral access point(s), mesh backhaul is provided in the unlicensed 5 GHz spectrum.



*Leading the Mesh Revolution*

SkyPilot Networks, Inc.  
2055 Laurelwood Road  
Santa Clara, California 95054  
Telephone: +1-408-764-8000  
[sales@skypilot.com](mailto:sales@skypilot.com)  
[www.skypilot.com](http://www.skypilot.com)