Proxim wireless

Performance Matters. Proxim Delivers.

WORP sync

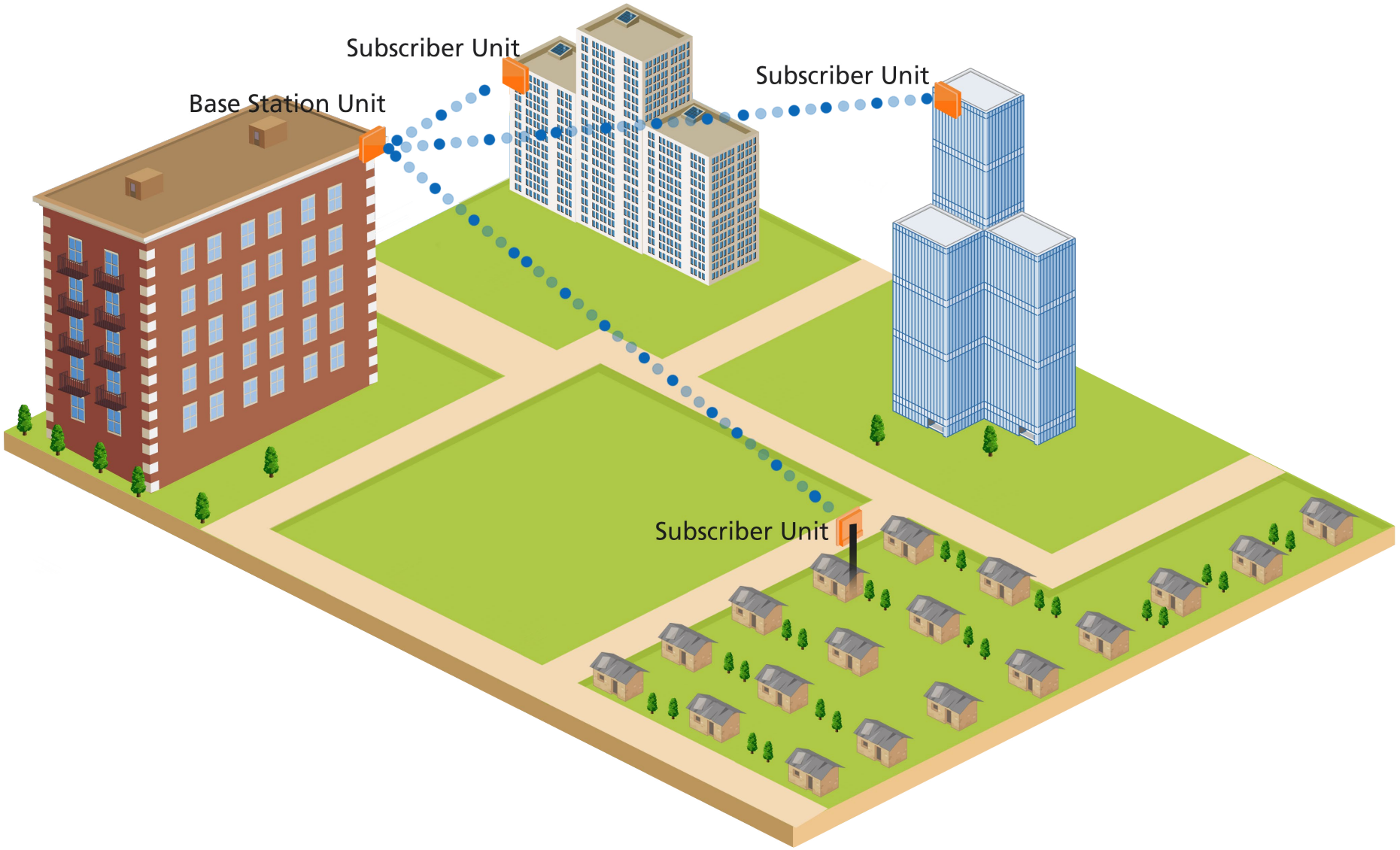
Technology Overview

Today wireless ISPs are at a critical juncture, on one hand the demand for internet and wireless applications is undergoing exponential growth, while on the other hand the spectrum "crunch" is turning out to be a real major concern; forcing wireless ISPs to make the most of the limited spectrum. To make matters more challenging for the WISP, the persistent consumer demand for more cost-efficient "subscription plans" is driving wireless ISPs to optimize and cut down costs wherever possible.

Proxim with its new WORP sync feature helps overcome these challenges by allowing efficient collocation of more and more radios at a cell site. WORP sync enables networks to operate on the same or adjacent channels by mitigating the effects of self interference. To understand how this is accomplished let us first take a quick look into the basics of a typical point to multipoint network topology.

Point to Multipoint Topologies

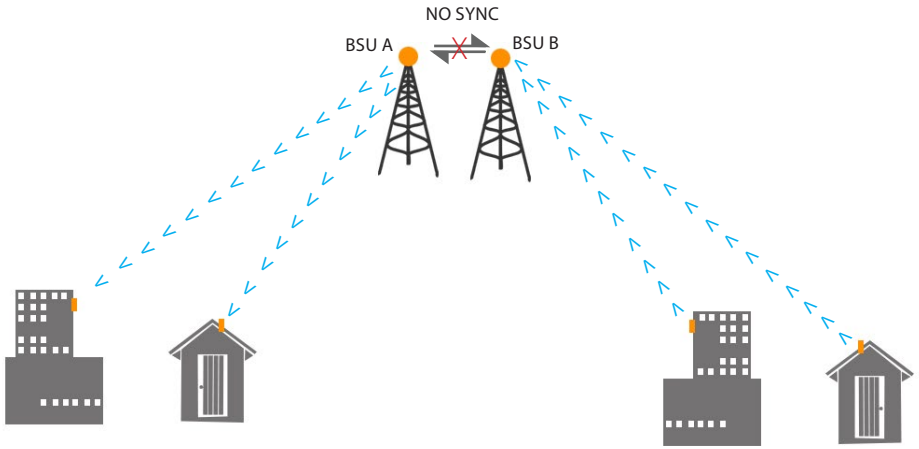
A typical point to multipoint network, regardless of network type (with or without synchronization), consists of a central point called a base station unit (BSU). A base station's primary function is to control the access to the communication medium and coordinate with multiple subscriber units to avoid a "collision" and ensure error free communication.

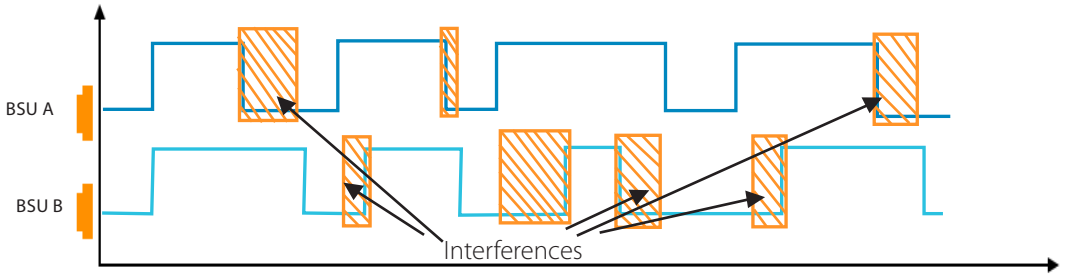


Asynchronous Networks and Self Interference

An asynchronous network is one where the networks are not synchronized to a clock or other time keeping device. Rather these networks transmit and receive signals without a timing source according to their own network demands, which allows them to adapt rapidly to changing conditions. These types of networks can be very efficient.

The downside to asynchronous networks is that this kind of architecture, particularly in dense and limited spectrum environments, often suffers from what is called "self interference." In this instance self interference refers to the condition where RF signals of transmitting collocated base station units "spill" into the coverage area of receiving collocated base station units that belongs to the same network and operate on the same or an adjacent channel. Self interference can result in packet loss, network errors and reduced network throughput.

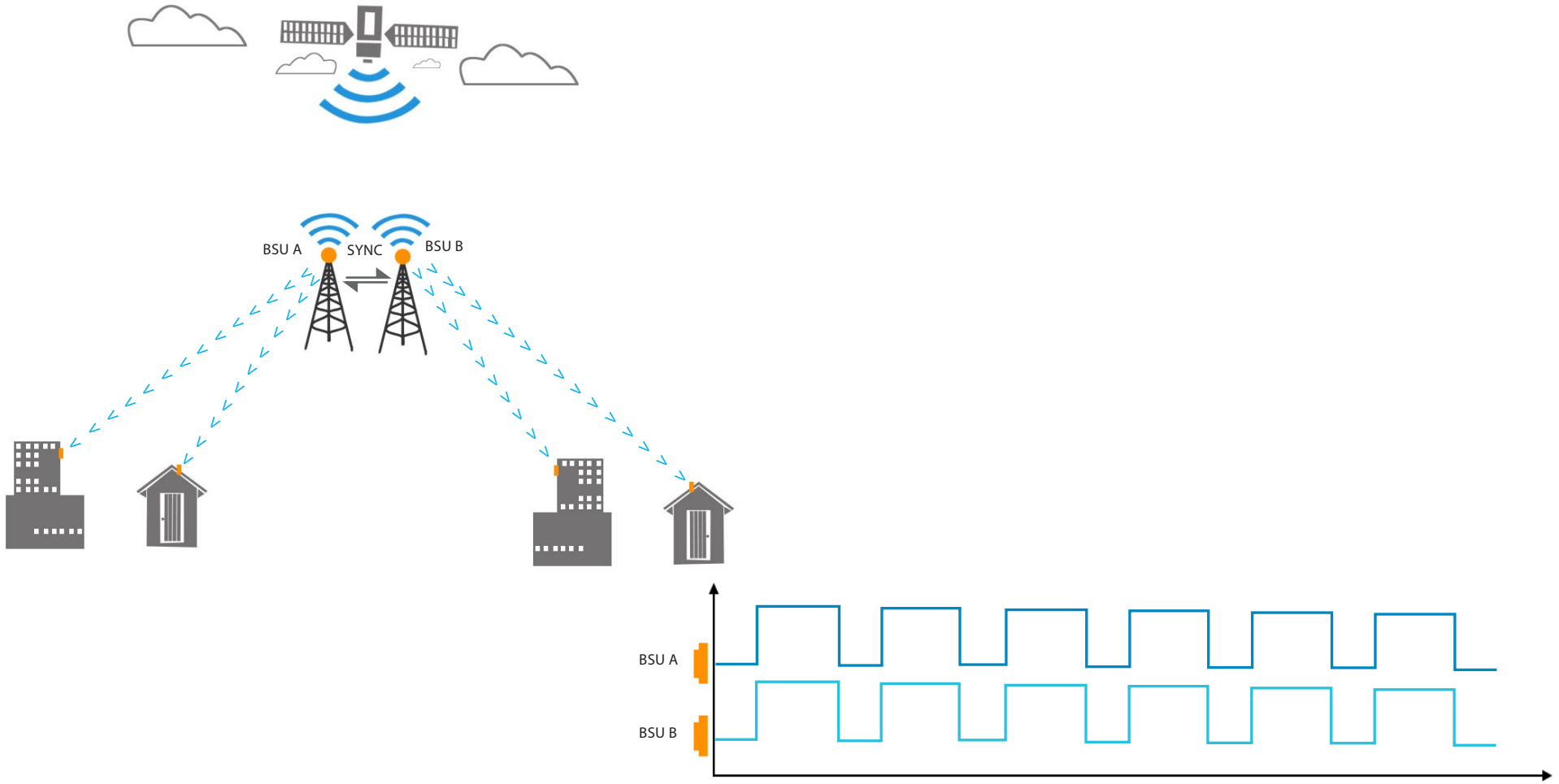




When multiple base station are collocated, each follows its own transmit/receive pattern resulting in possible self interference condition

Synchronous Networks with WORP sync

Conversely, WORP sync (as shown in the below diagram) coordinates the transmit timing between all the base station units within a network. The timing mechanism used as a clock for these synchronous networks is either a satellite signal or other clock sources such as CTM-2, CMM or CMM Micro. This ensures all base station units within a geography where they may interfere with each other transmit and receive at the exact same time. This applies not only to BSUs on the same tower, but all BSUs within a given area that can potentially "hear" each other and hence improper timing can corrupt Tx and Rx data streams.



All BSUs transmit or receive simultaneously with no self interference

The WORP sync Advantage

Comprehensive anti interference solution

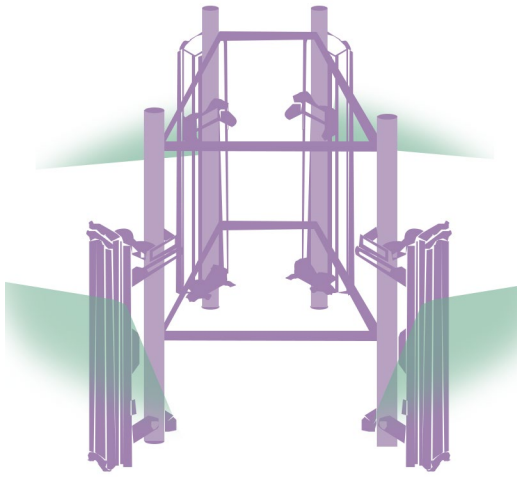
Proxim's WORP® technology virtually eliminates any sort of self interference at both the base stations and subscriber units with its centrally controlled architecture. Now further augmented with the WORP sync feature, WORP® ensures all unintended communication i.e. interference between multiple closely located base station units are also mitigated.

Scalability with frequency reuse

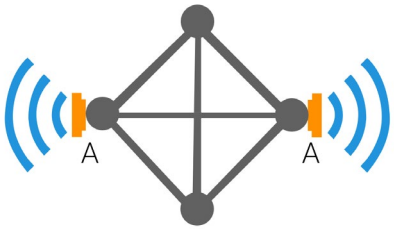
WORP sync, with its self interference mitigation capability, allows wireless ISPs to operate more and more base station and subscriber units on the same or adjacent channels with no or minimal performance degradation. This capability provides superior cost-effectiveness by allowing service providers to use the limited number of channels to serve a higher number of subscribers when compared to asynchronous networks.

Reduced costs with better co-location

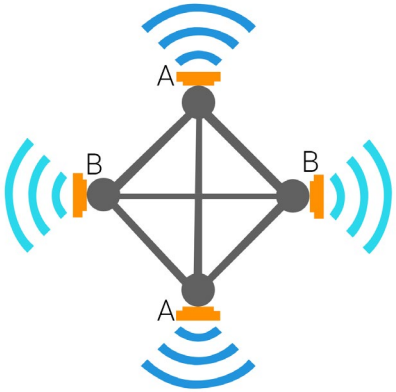
Leveraging the advantage of frequency reuse and reduced self interference, WORP sync enabled Tsunami® base stations units can be collocated more efficiently on the same tower with fewer channels and without affecting the performance of the network. This from a business standpoint is of great advantage as it allows network engineers to "pack" many more radios on a single tower thereby avoiding the spiraling tower and rental costs.



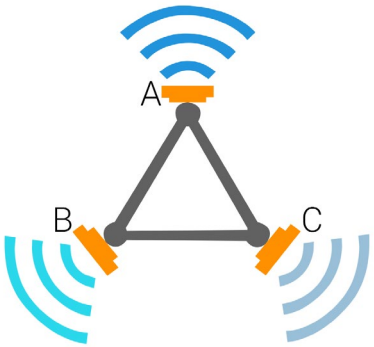
Proxim recommended collocation installation



Two diagonally opposite base station units (BSU) with the same frequency can be placed on a single tower



Four BSUs co-located with two different frequencies can be used, with the same frequency set on each of the diagonally opposite BSUs



Three BSUs with adjacent channels can be placed on a single tower

Cambium GPS sync - Interoperability

WORP sync when used in deployment of Proxim networks has numerous advantages as detailed above. However WORP sync also has the ability to mimic the timing of third party wireless BSUs, allowing Proxim BSUs to be co-located with other vendor BSUs. The first products supported with this feature are Cambium's GPS sync enabled solutions – the Cambium 100, 430, 450 and recently released ePMP. This allows an operator more flexibility in deploying new networks, but particularly in expanding existing Cambium networks where Proxim gear can now be deployed.

One size does not fit all

Despite the myriad performance benefits that WORP sync brings to the table, one should thoroughly examine the network requirements to select the best-fit solution i.e. synchronous vs. asynchronous. In the case of a start up network in a relatively "free" environment, one may choose the asynchronous Tsunami® product lines while for more developed and hence dense networks one should upgrade WORP® to WORP sync enabled Tsunami® 8200-G and 820 product lines that are perfectly suited for dense environments where a large number of users demand high speed connectivity.

Conclusion

For wireless ISP, maximizing throughput of the limited spectrum and cell sites can have a huge impact on their business profitability. With optimal RF management, WORP sync enabled networks offer enhanced frequency reuse and co-location capabilities. This allows wireless ISPs to make the most of the available spectrum, maximize Bits/square mile of cell sites and ultimately achieve higher business returns.

Additionally, WORP sync enabled Tsunami® radios feature MIMO 3x3 nLOS functionality, advanced channel management capability and cutting edge QoS class of service that ensures optimal delivery of voice, video and data applications. To know more about our other features that enhance the performance of our Tsunami point to point and multipoint product range, please download our white paper on our proprietary technology –WORP®.

About Us

Proxim Wireless Corporation (OTC Markets: PRXM) provides Wi-Fi®, Point-to-Point and Point-to-Multipoint 4G wireless network technologies for wireless internet, video surveillance and backhaul applications. Our ORiNOCO® and Tsunami® product lines are sold to service providers, governments and enterprises with over 2 million devices shipped to over 250,000 customers in over 65 countries worldwide. Proxim is ISO 9001-2008 certified. For more information, visit www.proxim.com. For investor relations information, e-mail ir@proxim.com or call +1 413-584-1425.