



New ePMP WISP Promotional Offer
Bruce Collins – Director Product
Management

Limited Time Promotion for WISP's new to ePMP and Cambium Networks

- \$1,995 – ePMP 3000 Starter Bundle
- \$1,595 – ePMP 3000L Starter Bundle

Includes:

- ePMP 3000 with 4x4 MU-MIMO Sector OR ePMP 3000L
- Twelve ePMP Force 300-25 Subscriber Modules
- Force 300 Connectorized Subscriber Module
- cnHeat Trial
- One RF Elements Twist-Port Adaptor and Horn Antenna
- Six months of VISIP.net billing and automation services
- Two hours of one-on-one consulting with an ePMP Network Engineer



- **North America ONLY**
- **All requests must be registered by the end user WISP at:**
www.cambiumnetworks.com/na-epmp-newcustomer-promo

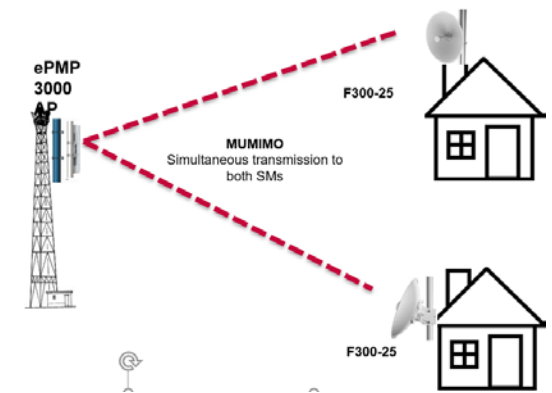
The benefits of the platform

- ✓ Working GPS sync allowing you to re-use frequency.
- ✓ Scalability – You can go up to 50/60/80SMs without dramatic performance impact.
- ✓ Air fairness – Weak SMs no longer taking out sector performance.
- ✓ Performance under interference – industry leading not just because of hardware but years of software tweaking.
- ✓ Easy to use interface. If you are used to UBNT UI, the shift should not be too challenging.
- ✓ Lots of statistics to troubleshoot and understand the behavior.
- ✓ CnMaestro management, provisioning, troubleshooting.



Cambium AC vs “other” AC – the details

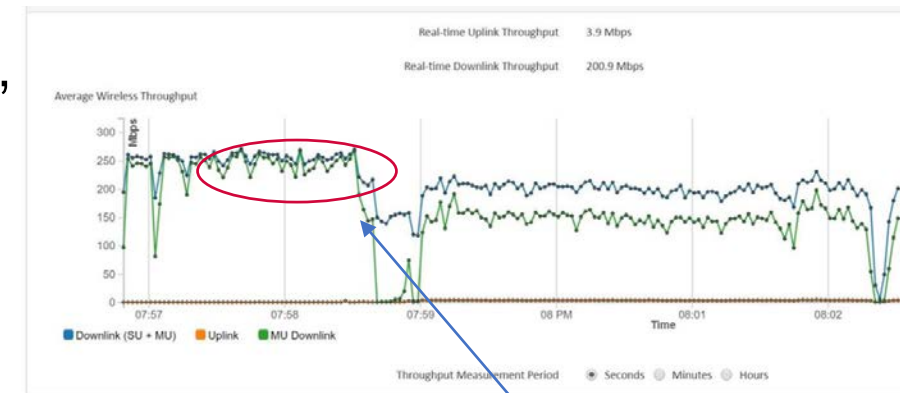
- ✓ Other AC is 11AC Wave 1 – 256qam3/4, 80MHz
- ✓ Cambium e3K supports 256qam5/6 (one additional rate) and MUMIMO.
- ✓ e3K has two overlapping 90 degree antennas. An additional 3dB of beamforming gain when not doing MUMIMO
- ✓ With MUMIMO traffic present, ability to get 40% to 70% gain
- ✓ 4X4 Rx providing an additional 3dB of gain in the UL
- ✓ Dynamic filtering for adjacent channel reject.
- ✓ Optional UL Beamsteering antenna to benefit some subscribers
- ✓ Still compatible with 11n subscribers and Elevated SMs



Longer term Cambium benefits

Investment protection and strategic benefits

- ✓ Every AC SM you deploy today will be compatible with a 8X8 MUMIMO AP. This ensures a path to higher order MIMO systems. End result? More capacity in your network simply by swapping APs.
- ✓ Cambium focus on MUMIMO is following the trends set by IEEE, 3GPP and 5G. Multiple input/output systems and the ability to send/receive data is the only way to higher tput. Systems only supporting higher modulation will always be limited by noise/interference.
- ✓ Cambium support at many levels. An engagement from a senior engineer is a forum post away or a quick escalation away.
- ✓ A partnership at every level with 3 year warranties and a company willing to be by your side.



MU gain



ePMP 3000

- 5 GHz
- 4x4 MU-MIMO
- 802.11ac Wave 2
- 120 SM's
- Dynamic Filtering
- Opt. UL Beam-Steering



ePMP 3000L

- 5 GHz
- 2x2 MIMO
- 802.11ac Wave 2
- 64 SM's



ePMP 2000

- 5 GHz
- 2x2 MIMO
- 802.11n
- Full (120 SM) or Lite (10 SM)
- Dynamic Filtering
- Opt. UL Beam-Steering



ePMP 1000

- 5.x, 2.4, 2.5, 6.4 GHz
- 2x2 MIMO
- 802.11n
- Full or Lite



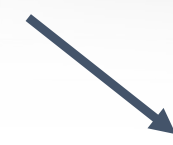
Omni Micro-POP 5 GHz 2x2 MIMO 802.11ac Wave 2

Access Point topologies to fit the Application

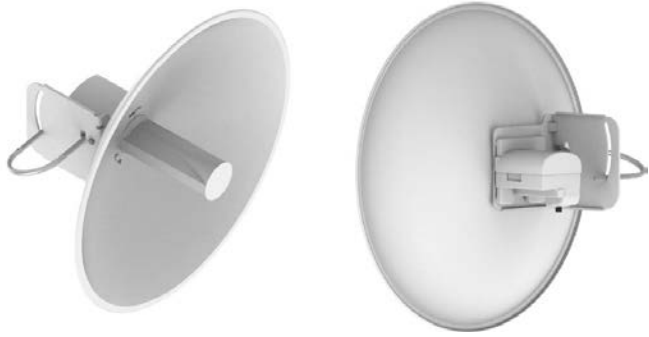
ePMP 3000L



ePMP 3000



ePMP Force 300 (802.11ac Wave 2) Subscriber Module Portfolio



F300-25

- 25dBi gain
- Gigabit Ethernet
- Real time spectrum analyzer



F300-16

- 16dBi gain
- Gigabit Ethernet
- Real time spectrum analyzer
- Small form factor
- 15 degree Azimuth/Vertical orientation



F300 CSM (IP67)

- 2X2 Wave 2 Connectorized SM
- Support for external horns and dishes



F300-19 (IP55)

- 2X2 Wave 2 SM
- 19 dBi gain flat panel antenna

F300-19R (IP67)

- 2X2 Wave 2 SM
- 19 dBi gain flat panel antenna
- Adds 5/10 MHz channels
- Enterprise SW Plan of Intent



F300-13 (IP55)

- 2X2 Wave 2 SM
- 13dBi gain



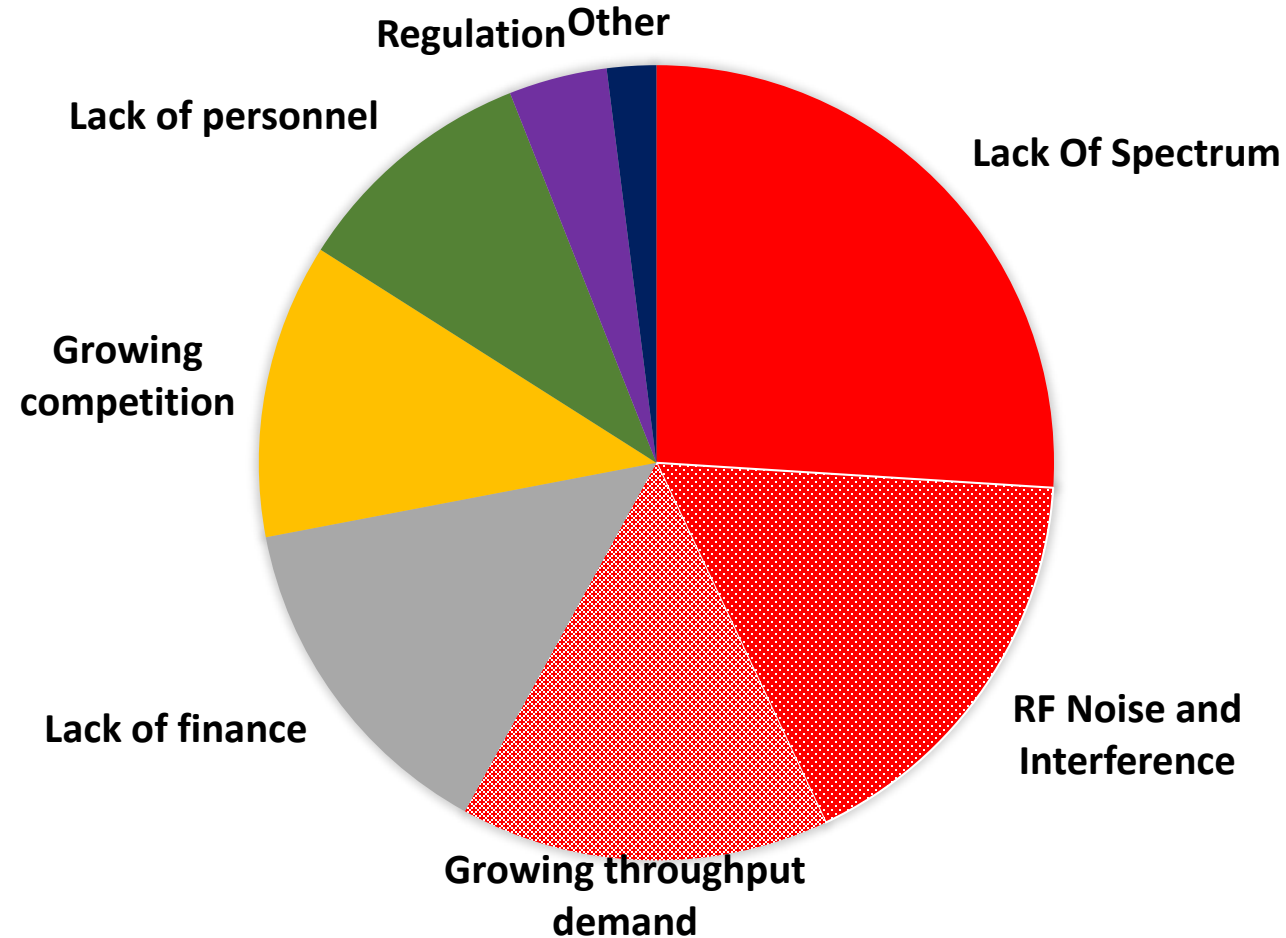
INTRODUCTION

Tasos Alexiou

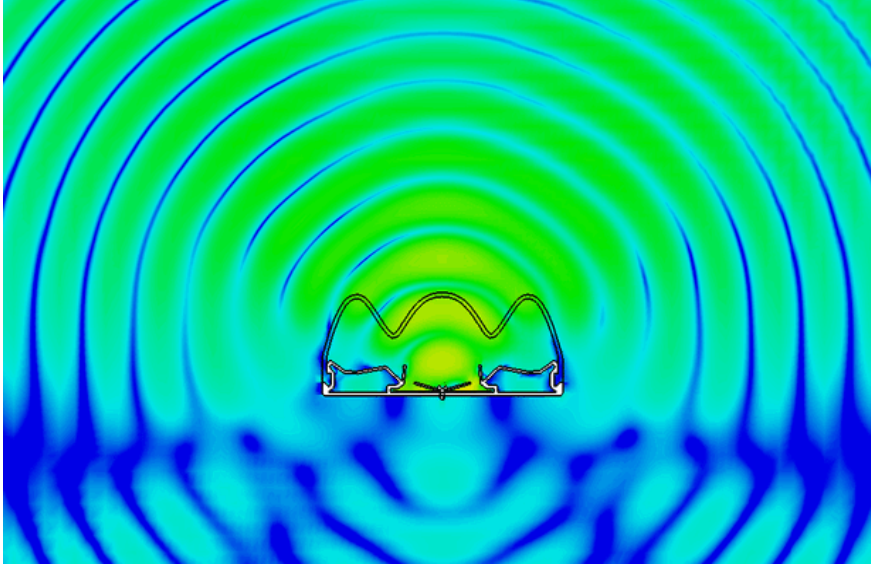
24 March 2020

WE SOLVE THE #1 PROBLEM OF WISP

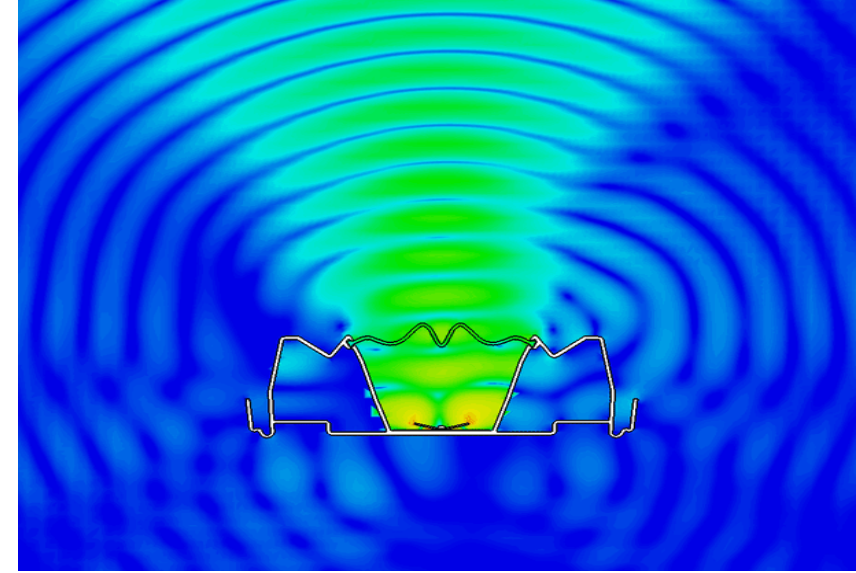
THE BIGGEST CHALLENGES FOR WISP



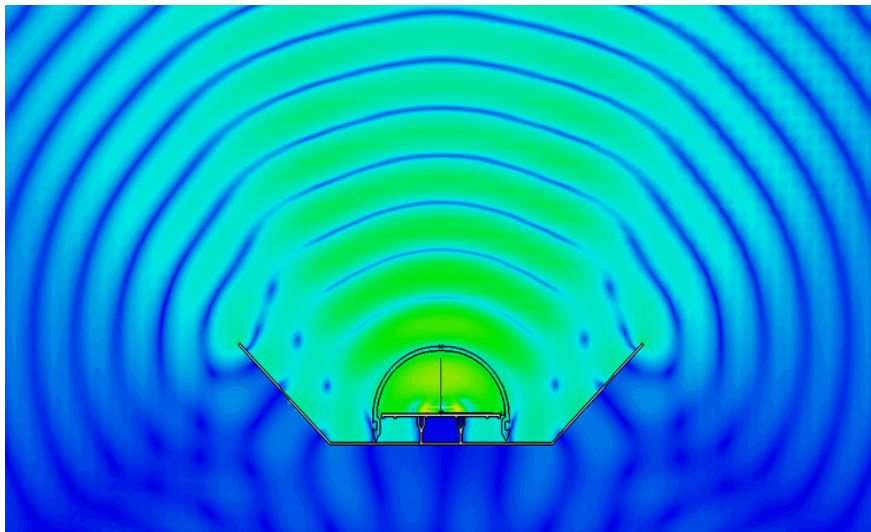
NOISE GENERATION



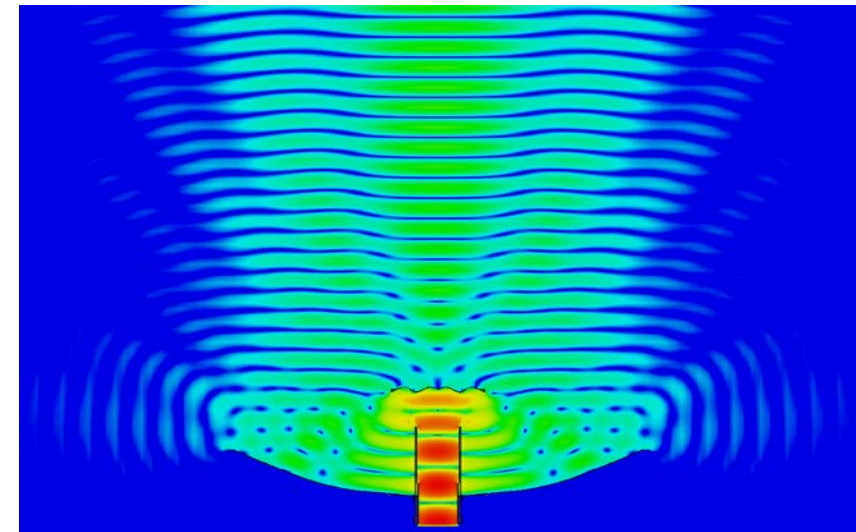
5GHz 19dBi 90° Sector



5GHz 21dBi 45° Sector

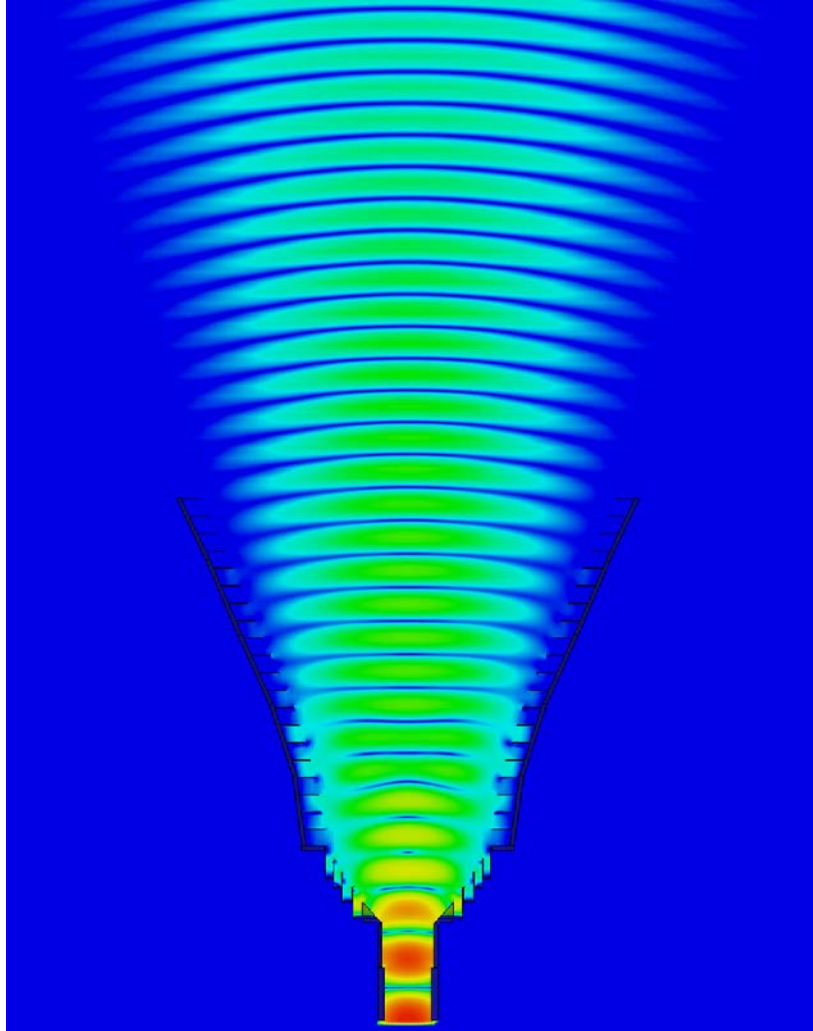


5GHz 19dBi 90° Sector with Armor Shield

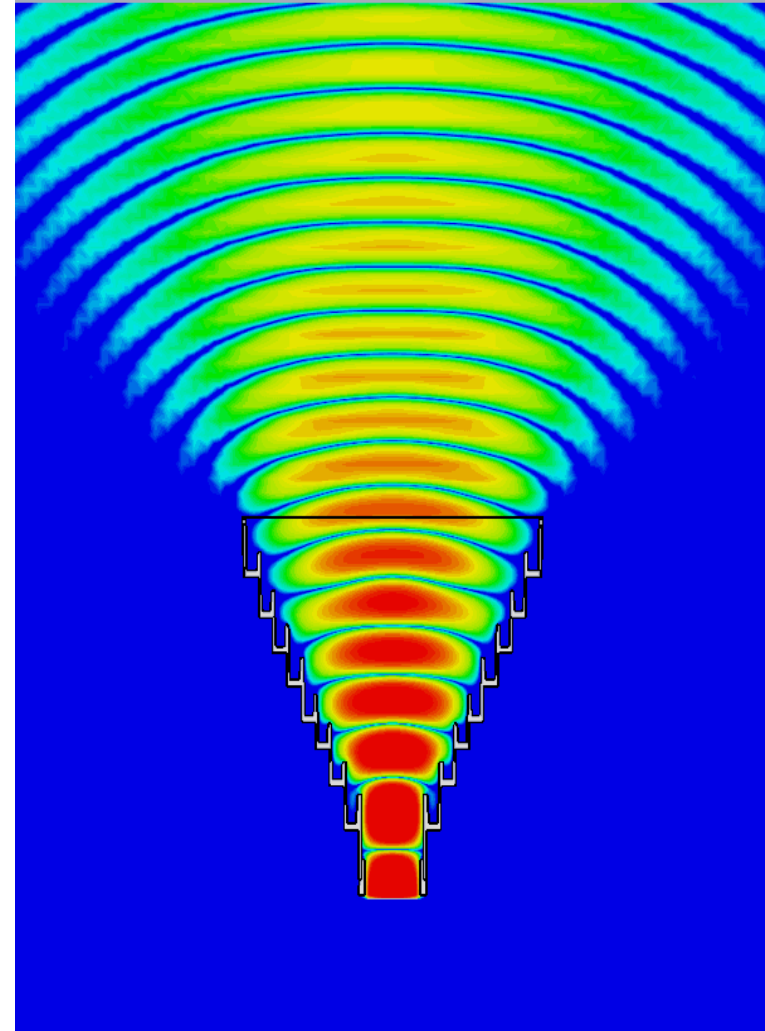


5GHz 29dBi Parabolic Dish

NOISE REJECTION



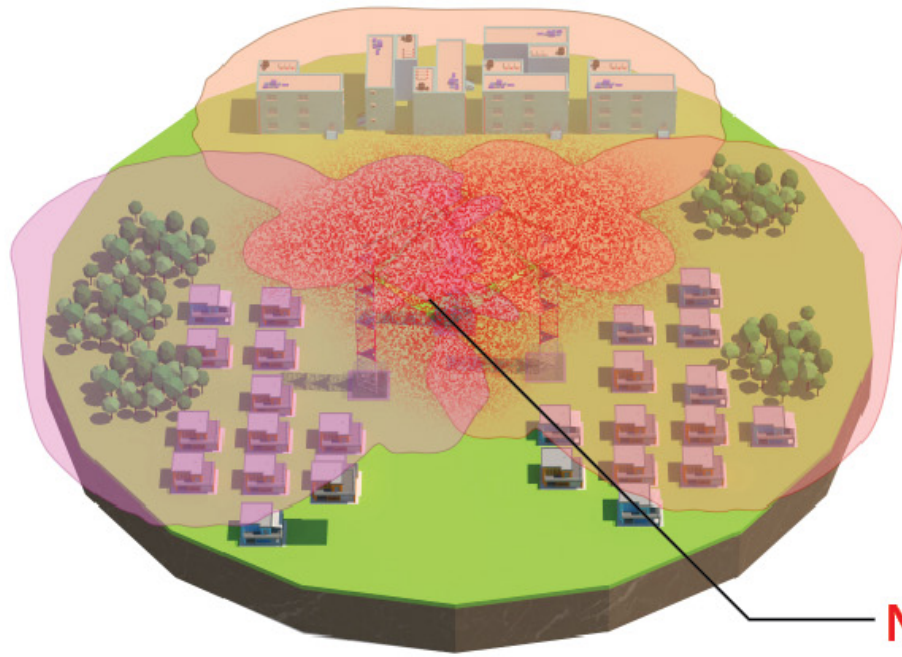
5GHz 21dBi PtP UltraHorn™



5GHz 18dBi 30° Symmetrical Horn

NOISE REJECTION

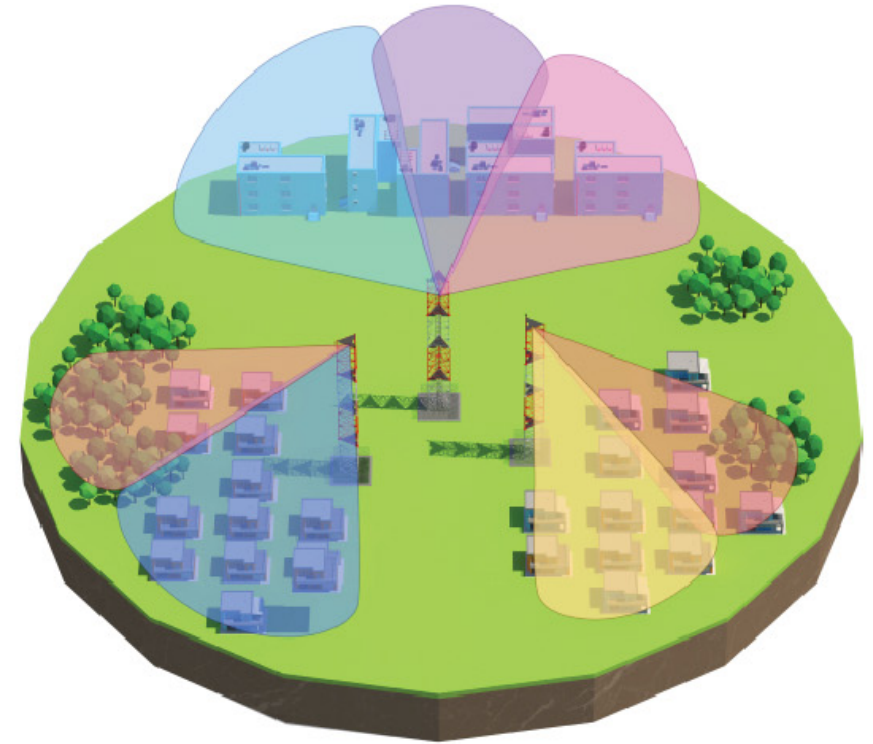
Competitive Sector Antennas



NETWORK THROUGHPUT:



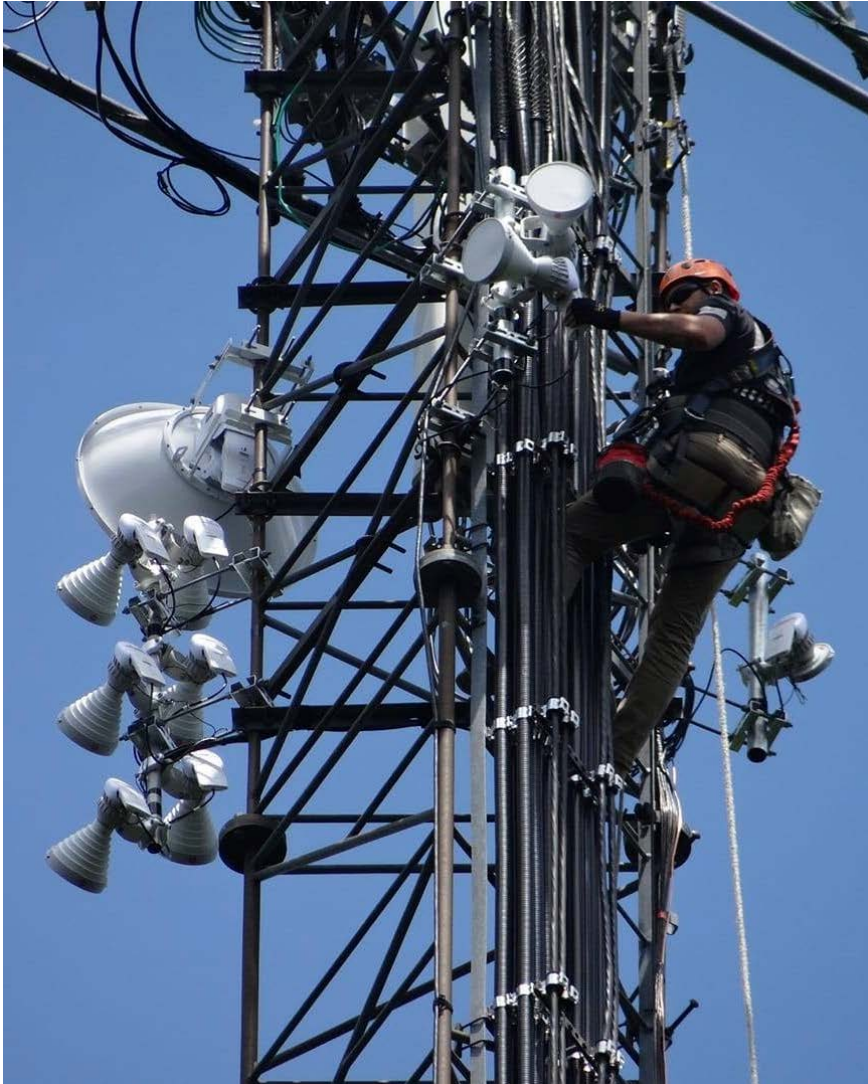
RF elements Symmetrical Horn Antennas



NETWORK THROUGHPUT:



DEPLOYMENT



INSTALLATION EXAMPLE



Symmetrical Beam Antennas

	Symmetrical Horns TP Gen2							UltraHorn™ TP	UltraDish™	
TwistPort™										
Product ID	HG3-TP-S90	HG3-TP-S80	HG3-TP-S70	HG3-TP-S60	HG3-TP-S50	HG3-TP-S40	HG3-TP-S30	UH-TP-5-24	ULD-TP-400	ULD-TP-550
MSRP (USD)	\$125	\$125	\$125	\$125	\$125	\$125	\$130	\$389	\$100	\$130
Gain	9.6 dBi	10.4 dBi	11.5 dBi	13.2 dBi	14.3 dBi	16.2 dBi	18.4 dBi	24.0 dBi	24.5 dBi	27.5 dBi
Beam width	90°	80°	70°	60°	50°	40°	30°	15°	11°	8°

	Symmetrical Horns CC Gen2							UltraHorn™ CC
Carrier Class								
Product ID	HG3-CC-S90	HG3-CC-S80	HG3-CC-S70	HG3-CC-S60	HG3-CC-S50	HG3-CC-S40	HG3-CC-S30	UH-CC-5-24
MSRP (USD)	\$220	\$220	\$220	\$220	\$220	\$220	\$220	\$429
Gain	9.6 dBi	10.4 dBi	11.5 dBi	13.2 dBi	14.3 dBi	16.2 dBi	18.4 dBi	24.0 dBi
Beam width	90°	80°	70°	60°	50°	40°	30°	15°

Asymmetrical Beam Antennas

	Asymmetrical Horns TP			Asymmetrical Horns CC				Carrier Class Sectors	
TwistPort™									
Product ID	HG3-TP-A90	HG3-TP-A60	HG3-TP-A20-30	HG3-TP-A90	HG3-TP-A60	HG3-TP-A30	HG3-TP-A20	SEC-CC-2-14	SEC-CC-5-20
MSRP (USD)	\$280	\$280	\$280	\$350	\$350	\$350	\$350	\$130	\$140
Gain	16.0 dBi	17.0 dBi	20.5 dBi	16.0 dBi	17.0 dBi	20.5 dBi	20.5 dBi	14.0 dBi	20.0 dBi
Beam width	90°/25°	60°/25°	30°/20°	90°/25°	60°/25°	30°/20°	20°/30°	100°/20°	100°/5°

TwistPort™ Adaptors

	TwistPort™ Adaptors										
Product ID	TPA-ADAP-IS	TPA-PAF	TPA-RMS	TPA-RSAC	TPA-RBC	TPA-RBP	TPA-ePMP	TP-ADAP-e2K	TPA-CSx	TPA-CSx	TPA-SMA
MSRP (USD)	\$19.90	\$54.90	\$29.90	\$29.90	\$54.90	\$39.90	\$29.90	\$44.90	\$29.90	\$29.90	\$44.90
	for Ubiquiti*			for MikroTik			for Cambium™		for Mimosa™		with RP-SMA

CAMBIUM CONNECTIVITY MAP

TWISTPORT™ ANTENNAS COMPATIBLE RADIOS



ePMP™ 3000L AP



ePMP™ Force 300 CSM



ePMP™ 2000 AP



ePMP™ 2000



ePMP™ 1000 with GPS Sync



ePMP™ 1000

CC ANTENNAS COMPATIBLE RADIOS / ALSO COMPATIBLE WITH TWISTPORT™ ANTENNAS + TPA-SMA



ePMP™ 3000



PMP 450 AP



PTP 450 SM



PTP 450 AP



PTP 550



PTP 670



PTP 700

LONG-TERM ADVANTAGES

- Free up **MORE SPECTRUM**
- Sell **HIGHER SERVICE PACKAGES** to users
- More APs per tower for **HIGHER AGGREGATE THROUGHPUT**
- **SCALABILITY** = Safe, smart and **SUSTAINABLE GROWTH**
- Low cost of ownership = **LESS TRUCK ROLLS TO FIX ISSUES**
- **QUICK & EASY MAINTENANCE**
- **EASY UPGRADE PATH** (N to AC to AX..)
- **SIMPLE MIGRATION** 1K to 2K to 3K....

GIVEAWAYS: AP ANTENNA + ADAPTOR



Symmetrical Horn series



Asymmetrical Horn series

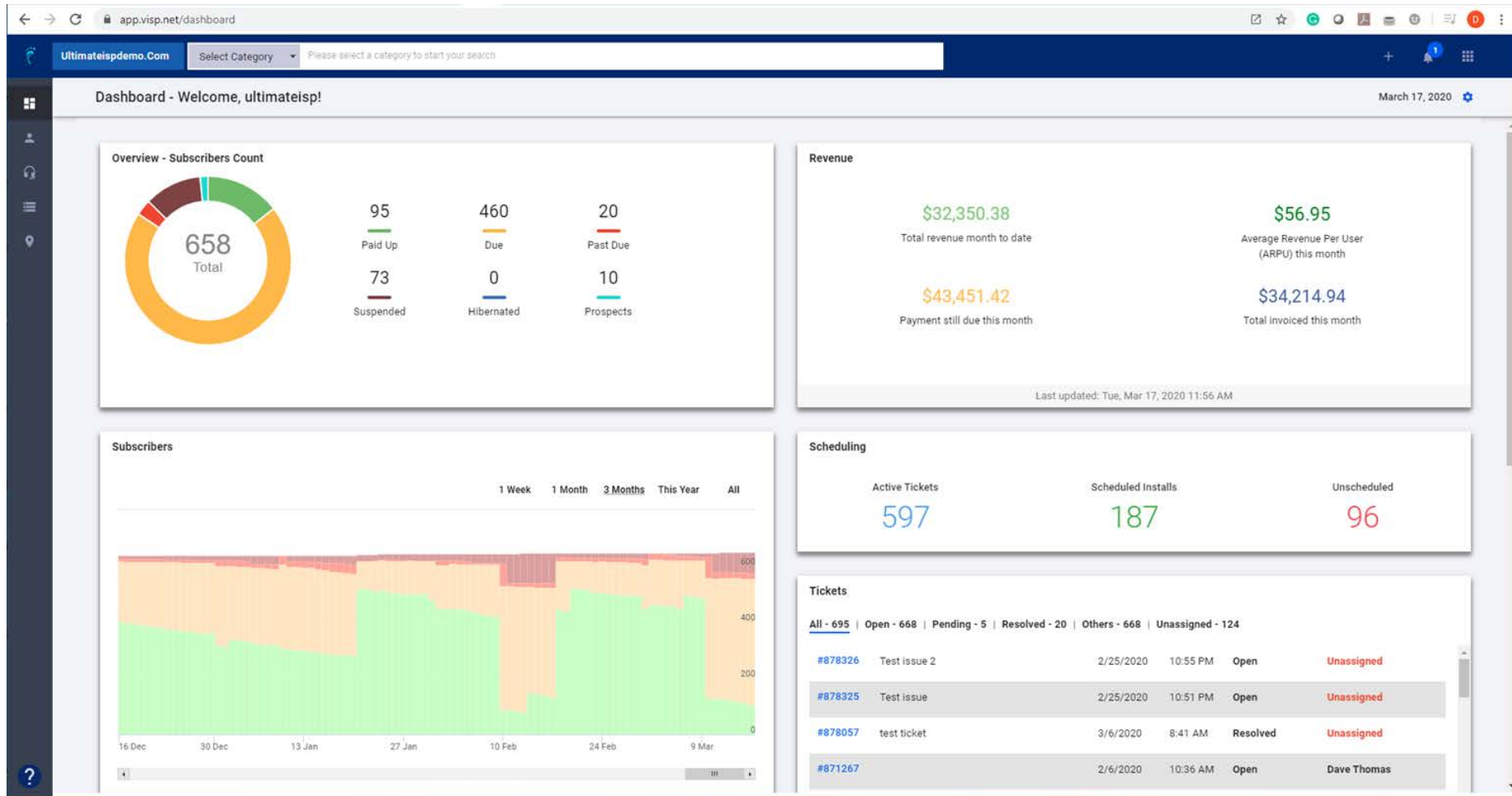


TwistPort Adaptors for ePMP series



visp.net

BILLING and AUTOMATION



The Only Three Ways To Grow

1. Get more subscribers

- Field activation servers speed up onboarding and make it quick and easy to deploy hotspots.
- Captive portals Get You Paid and simplifies the reactivation after payment.

2. Get subscribers to buy more services

- Updating speeds and packages with a simple drag and drop process.
- The billing system auto-updates the invoice, and auto-provisions the subscribers access in real-time. NO Tech or Access to your mission critical hardware are REQUIRED

3. Get subscribers to stay longer

- The Web-based system is so intuitive your support teams can:
 - Find Subscriber info fast, resolve billing issues quickly and reduce support call times.
 - Give subscribers access to their account online.
- Your Customer Service Staff have full control of the subscribers connection.

Happy subscribers stay your subscriber's longer:

So, its important you choose vendors that align their systems & products to support your business goals.

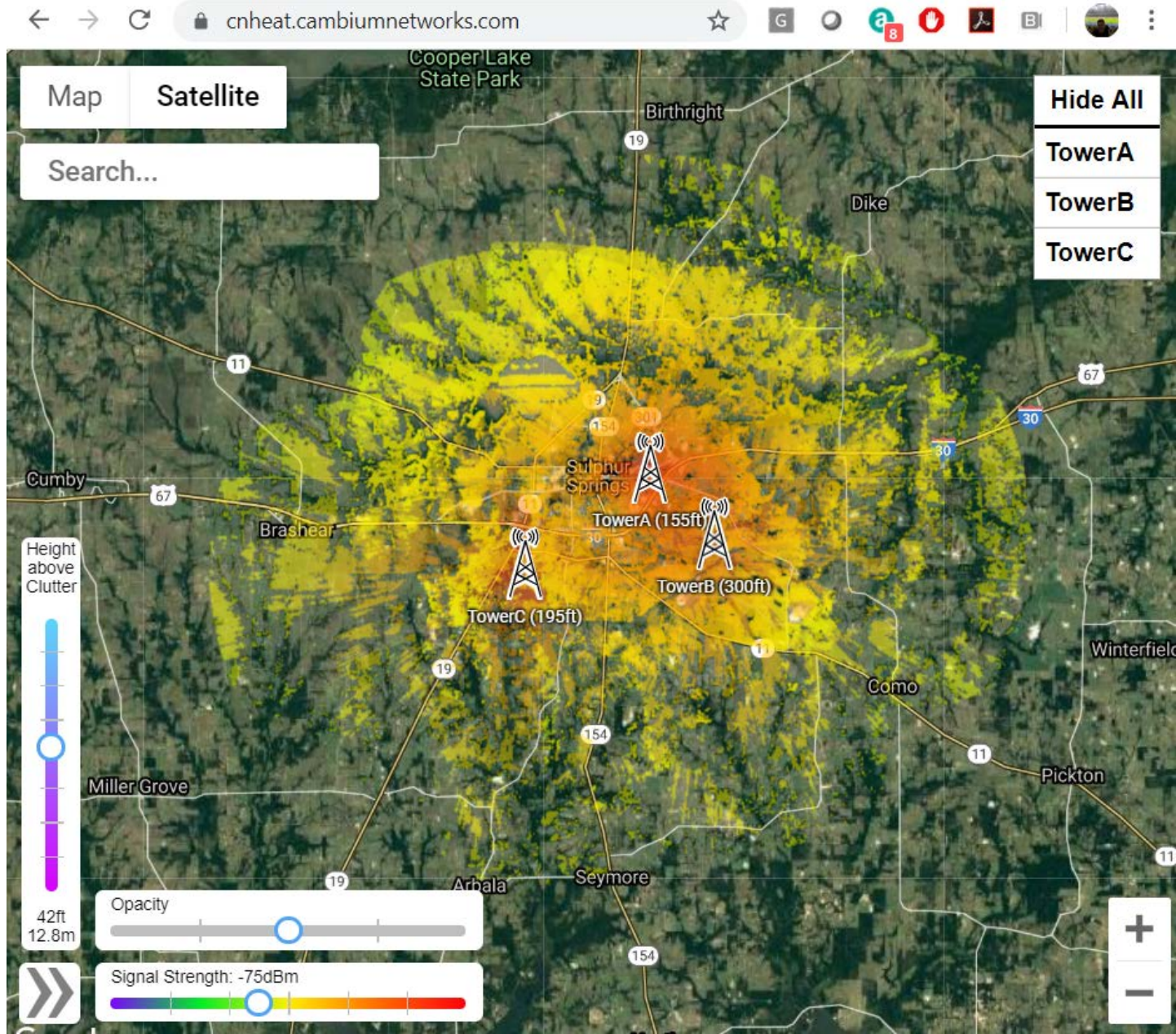


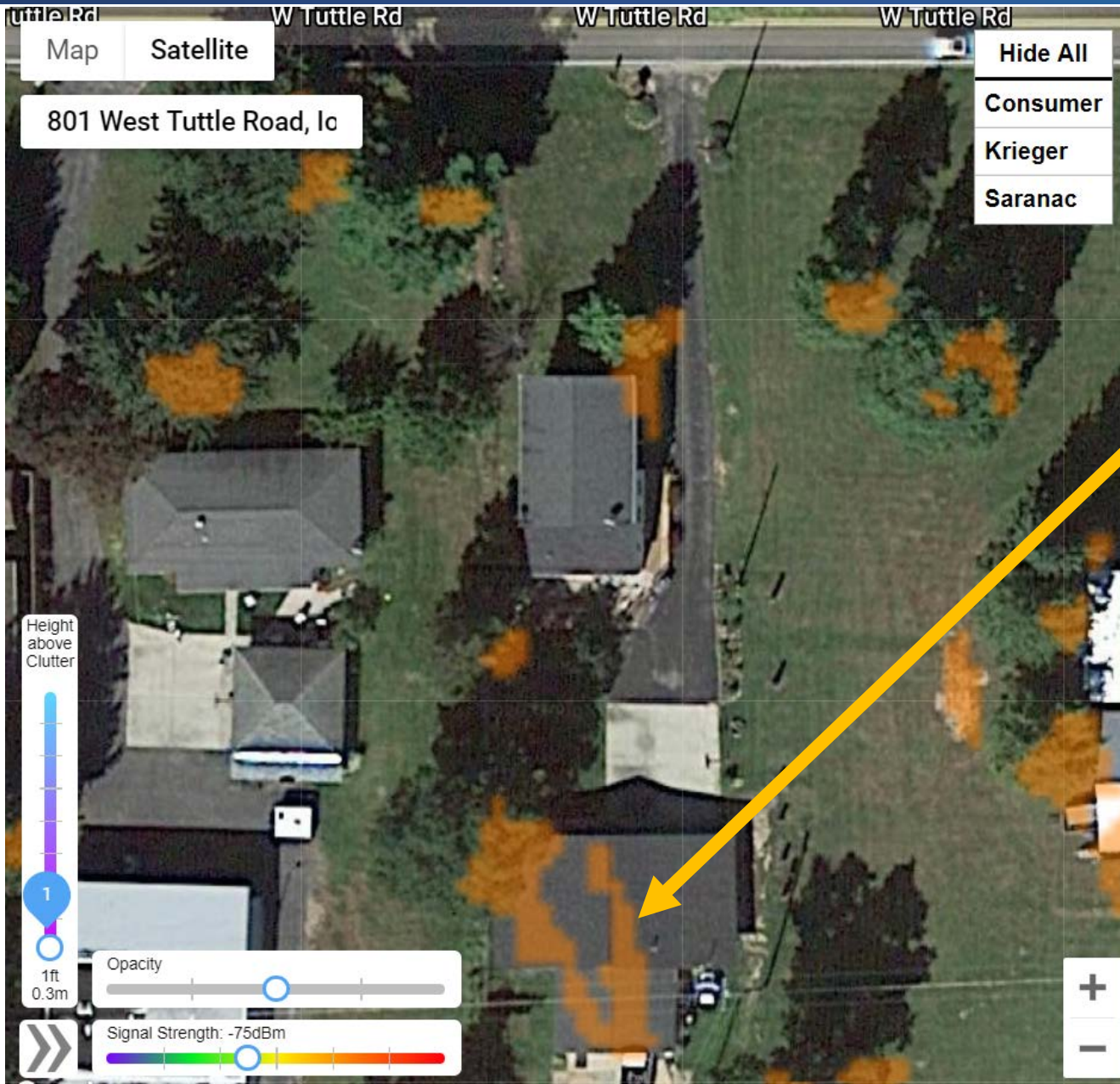
How important is your Success?



• LOCATE your SUBSCRIBERS

- High resolution (1m) heat maps
- Coverage shown as combination of
 - SM Height
 - Signal Strength
- SM from 1' to 80'
- Signal Strength from -40 to -100 dBm
- Dynamically control SM Height and Signal Strength
- View Heat Map using Signal Strength or SM Height
- Demo site:
 - cnheat.cambiumnetworks.com
 - Account Names: "cnheat"
 - Password: "demo"





Install example 1

- Coverage shown at 1'
- Finds best spot on roof to install




Install example 2

- SM Height reduced until 22'
- Finds best spot to install on back corner of property



IDENTIFY your CUSTOMERS

- Identifies buildings with coverage at specified SM Height and minimum RSSI level
- **IDENTIFY**  provides
 - Addresses, distributed either to
 - Self
 - Industry leading marketing company
 - Locations (Latitude and Longitude)
- United States only

WISP Referral Program – Earn Free Equipment



<https://www.cambiumnetworks.com/wisp-bring-a-friend-registration/>

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Cambium Networks™