Static Overlay Public IP Addressing Using WireGuard VPNs

Delivered via Enterprises, MSPs, ISPs, and WISPs

1. Introduction

Many broadband and wireless connections today—especially Starlink, LTE/4G/5G, and WISP broadband—operate behind CGNAT (Carrier Grade NAT). While CGNAT helps providers conserve IPv4 space, it prevents customers from receiving a usable public IP address. Without a reachable IP, customers cannot:

- Remotely view or manage CCTV/NVR systems
- Access industrial devices or automation equipment
- Reach IoT systems, gateways, or data loggers
- Provide secure access to remote stores, telecom towers, solar farms, or oil rigs

Cambium Networks' Static Overlay IP solution assigns public IP addresses to any site—even when the WAN connection has no public IP—by routing the traffic through a secure WireGuard tunnel to a central hub location. This central location may be in a Data Center, ISP/WISP POP, or MSP office.

Who Can Offer This?

PROVIDER TYPE	HOW THEY USE IT
Enterprises	Assign overlay public IPs to branch offices
Managed Service Providers (MSP)	Offer static IP services to customers for secure remote access
Internet Service Providers (ISPs/WISPs)	Sell overlay public IPs to subscribers without needing ASN/BGP per site
System Integrators	Enable remote access for cameras, SCADA, IoT deployments

Instead of the ISP providing a public IP at each customer site, the **provider owns a public IP block** and **hosts the overlay system centrally**. Customers then receive static IPs via encrypted tunnels.

This model works with any WAN and any device behind CGNAT.

2. Benefits

For End Customers

- **Reachable Static IP** even on LTE/4G/5G, Starlink, or CGNAT broadband
- **Secure Access** to cameras, industrial controllers, sensors, or remote gateways
- **Reliable Failover** even if primary WAN fails, LTE backup maintains the same static IP
- **No Exposure to the Internet**—inbound access is encrypted over WireGuard, not open ports

For ISPs/WISPs/MSPs

- **Offer a New Revenue Service:** Static Public IP over CGNAT
- **No Need to Reconfigure ISP Networks: Works** without changing CGNAT setup
- **Low IPv4 Address Consumption:** Can allocate even /30 or single IPs per customer
- **Works over Any Last-Mile Link:** Starlink, LTE, DSL, fixed wireless access, fiber, satellite
- **Build Enterprise Services:** Premium managed remote access for surveillance, retail, industry

For Enterprises

- **Uniform WAN Architecture Across All Branches**
- **Secure Remote Monitoring for Distributed Locations**
- **Centralized Firewall Policies, Logging, and Threat Protection**
- **Perfect Fit for Hybrid WAN with Starlink Backup**

3. How It Works

A provider (Enterprise, ISP, MSP, or WISP) owns or leases a public IP block and hosts the **overlay hub** using Cambium's Network Service Edge (NSE) in their data center or office. Customer sites receive their public IP range over a secure WireGuard VPN tunnel.

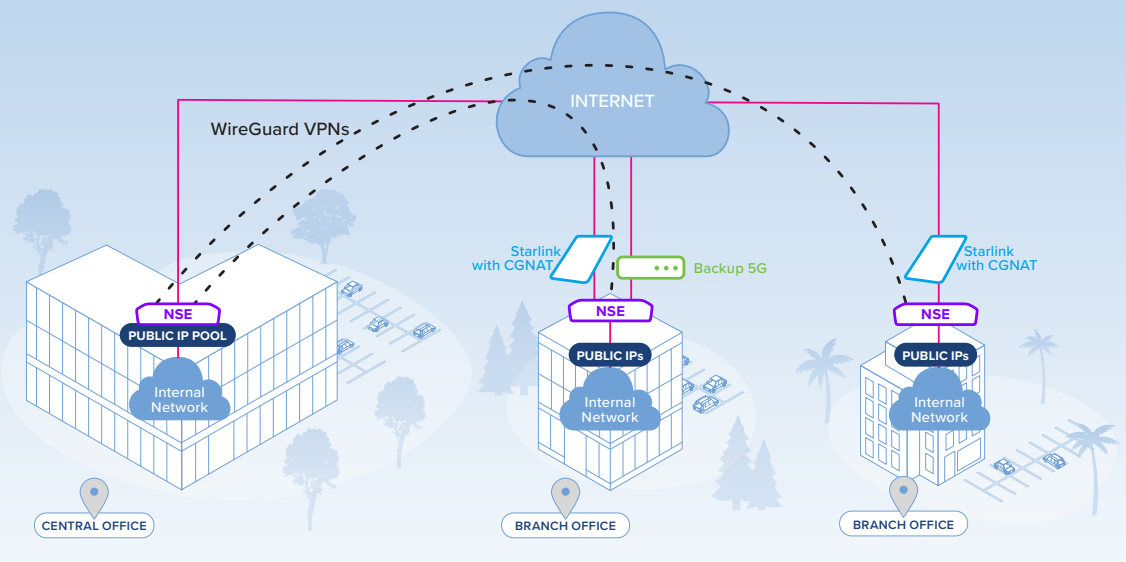
IP Allocation Example

HUB OWNER	PUBLIC IP BLOCK	SITE EXAMPLE
MSP/ISP	162.123.123.0/27	/30 assigned to a remote farm CCTV
Enterprise HQ	10.10.10.0/24 (routed upstream)	/30 assigned to branch offices

Step-by-Step Breakdown

1. Provider (ISP/MSP/Enterprise) hosts a central NSE appliance and owns static public IPs.
2. Provider creates WireGuard tunnels to each customer site.
3. Provider assigns small overlay public IPs to each site (e.g., /30).
4. Routes for those IPs are advertised over WireGuard to customer sites.
5. Customer firewall (Cambium NSE) uses this overlay IP for NAT, port forwarding, VPN, security.
6. Remote access to devices flows through Hub → WireGuard → Customer network securely.

Traffic Flow



4. Typical Customer Deployments

USE CASE	EXAMPLES
Retail/Branch Offices	PoS gateways, NVR access, secure WAN
Industrial/IoT/Automation	SCADA, PLC, Modbus, telemetry
Farms & Solar	Irrigation control, solar inverters, drones
Surveillance Providers	CCTV/NVR access without exposing ports
Construction/Temporary Sites	Portable offices with Wi-Fi and cameras
Marine/Oil & Gas/Remote Mining	Starlink + LTE backup with secure access

5. Why Cambium NSE?

- Built-in WireGuard overlay routing
- Secure firewall + IPS + content filtering
- Multi-WAN support (Starlink, GSM/LTE, fiber, broadband)
- cnMaestro™ single-pane-of-glass management as part of Cambium's ONE Network
- One appliance works as:
  - Customer endpoint at remote site
  - Hub at ISP/MSP/Enterprise network

Providers can create a scalable overlay static IP service without redesigning their network.

6. Conclusion

Static Overlay IP via WireGuard transforms how organizations and connectivity providers deliver reachability. It unlocks static IP availability on networks where it was previously impossible, creating a new secure service opportunity without changing ISP infrastructure.

- **For Customers:** True secure remote access on any WAN
- **For MSPs & WISPs:** New recurring revenue service
- **For Enterprises:** Unified secure WAN with consistent IP addressing

Business-grade connectivity anywhere, even over Starlink or 5G. Always protected.

ABOUT CAMBIUM NETWORKS

Cambium Networks empowers millions of people with wireless connectivity worldwide. Its wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.

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