Boundless Security Systems, Inc.

the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Ultra Low Bandwidth, *Boundless Security System™* with Tunneling Option Works on Wired, Wireless and Dialup Networks That Block Uploads by Other Digital Video Surveillance Systems

used successfully on 5 continents where other systems fail

- Benefits of Boundless' Tunneling for Digital Video Surveillance Uploads via the Internet
- Block Diagrams of *Boundless Security System™* with Tunneling Option
- Comparison of Mobile-Originated (Non-routable) and Mobile-Terminated (Routable) Cellular Data Networks
- Comparison of Use of Mobile-Originated (Non-routable), Cellular Data Networks With and Without Boundless' Tunneling
- Comparison of Use of Mobile-Originated (Non-routable), WiFi Networks With and Without Boundless' Tunneling
- Boundless' Tunneling Seamlessly Handles Fleets of Vehicles Using Cellular in the Field and WiFi in Multiple Depots








police car, train, ship, utility repair vehicle, military humvee, covert, school bus, armored truck, atm

Boundless Security Systems, Inc.

the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Benefits of Boundless' Tunneling for Digital Video Surveillance Uploads via the Internet

- Enables digital video surveillance on wired networks without using port and address translation, and mobile-originated (non-routable) wireless networks[1], and wired and wireless, dialup networks, that don't allow remote access to, and remote control of, conventional servers
- Automatic configuration avoids manual network setup -- no need to allocate static IP addresses, and set up port and address forwarding, and static DHCP in routers
- In tandem with a smart, multi-network router, enables live and recorded video from Boundless' ***Multi-Stream Video Servers*** to automatically be routed over the fastest available wireless network, such as cellular and satellite networks in the field for mobile live and recorded video, and faster WiFi mesh and hotspots in the city, depots or stations for rapid archiving of recorded video
- Automatic network configuration and reconnection enable highest quality recorded video acquired by fleets of vehicles to be accessed quickly from many vehicles simultaneously using WiFi mesh networks and hotspots in depots, garages, parking lots, stations and terminals
- Multiple users can view the same live or recorded video simultaneously from Boundless' ***Tunneling Broadcast Server*** with only one load on a wireless uplink from Boundless' ***Multi-Stream Video Server*** to the Internet
- Enables a single public IP address to be shared by many diverse users and applications, and Boundless' video surveillance simultaneously
- Enables each public IP address to support 100's of Boundless' ***Multi-Stream Video Servers*** and video streams simultaneously and automatically
- Inherently supports dynamic IP addresses without use of public dynamic name server, and quickly restores live and recorded video connections when the IP address or choice of wireless network used by Boundless' ***Multi-Stream Video Server*** changes
- Highly scalable, avoids IP-address bookkeeping nightmares for fleets of vehicles in multiple depots
- Provides quick, instant-messenger-like-speed reporting of events detected by Boundless' ***Multi-Stream Video Servers*** without e-mail delays
- Each Boundless' ultra low bandwidth, ***Multi-Stream Video Server*** can support both tunneled (non-routable) and non-tunneled (routable) remote access simultaneously for redundancy, fault-tolerance and network load-balancing
- Enables wireless carriers to be mobile-originated to protect uplinks, but still enable control of mobile digital video surveillance systems via the Internet

Note 1: Most GSM cellular networks block remote access to conventional servers inside them

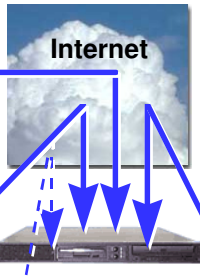
Boundless Security Systems, Inc.

the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Block Diagram of *Boundless Security System™* with Tunneling Option

Boundless uses bandwidth-saving, video-on-demand with many different digital video streams per camera and continuous near-camera recording, instead of bandwidth-wasting, video streaming with central recording of a single digital video stream. Boundless internally records better video than can be sent live.



Boundless' roaming *Multi-Stream Video Server* tunnels through routers that block remote access from the Internet to other servers, shares an IP address, and reconnects across diverse wired and wireless networks

Boundless' ***Tunneling Broadcast Server*** (opt) on Internet is destination of tunnels originated by Boundless' ***Multi-Stream Video Servers*** and conceals their IP-identities

Smart, multi-network (cellular, satellite, WiFi, WiMAX…) third-party router dynamically selects fastest wireless network. Many routers support a 3G PC Card for cellular communications, and WiFi.

Boundless' roaming, Linux-based, ultra low bandwidth, ***Multi-Stream Video Server Compact*** with tunneling option, provides controllable video uploads, and more, on networks that block remote access and control from the Internet to other digital video surveillance systems within them

Four CCTV or (opt) PTZ cameras, or IP-PTZ cameras (opt) with analog video output

VGA, QVGA, QQVGA

Up to eight different IP-video streams per camera simultaneously, with three different resolutions and multiple frame rates, compression parameters and data rates, optimize video for live and recorded viewing, analytics, situation assessment, monitoring and investigations, for stationary and mobile cameras.

Mobile Command and Control Centers with Boundless' ***Control Panel*** live and recorded viewing and searching client software, communicate with Boundless' ***Multi-Stream Video Servers*** via Boundless' ***Tunneling Broadcast Server***

Command and Control Centers with Boundless' ***Control Panel*** live and recorded viewing and searching client software, communicate with Boundless' ***Multi-Stream Video Servers*** via Boundless' ***Tunneling Broadcast Server***

Boundless' roaming video server has been used successfully on 5 continents with fixed cameras.

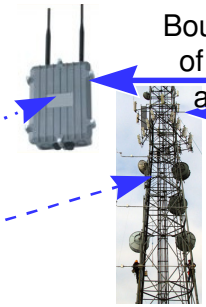
Boundless Security Systems, Inc.

the communications bandwidth experts

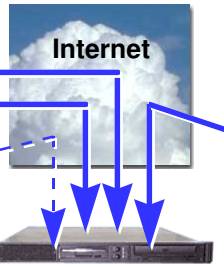
3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Detailed Block Diagram of *Boundless Security System™* with Tunneling Option

Boundless' video-on-demand traffic with bandwidth management, as low as 4 Kbps / camera, avoids flooding wireless networks without sacrificing the quality of recorded video. Boundless' mobile tunneling servers (opt.) avoid the need to configure IP addresses and ports in routers, and provide seamless use of cellular communications in the countryside, and WiFi in cities and depots.



Boundless tunnels through a series of routers, shares an IP address, and reconnects across diverse wireless networks



Mobile Command and Control Centers with Boundless' ***Control Panel*** showing ***Live Alert*** when motion is detected by ***Multi-Stream Video Server***

Boundless' ***Tunneling Broadcast Server*** on Internet is destination of tunnels originated by Boundless' ***Multi-Stream Video Servers***

Distant Command and Control Centers with Boundless' ***Control Panel*** showing ***Live Alert*** when motion is detected by ***Multi-Stream Video Server***

Smart, multi-network (cellular, satellite, WiFi, WiMAX…) router dynamically selects fastest wireless network

Boundless' Linux-based, *advanced* IP-based, ultra low bandwidth, ***Multi-Stream Video Server*** automatically tunnels through routers and firewalls to reach the Internet, and provides communication with remote users only via Boundless' ***Tunneling Broadcast Server***. It provides a bank of up to eight, IP-video encoders for each of four cameras, live and recorded video, searching of recorded video for motion, event detection and ***Live Alert*** notification. It provides an internal Network Video Recorder for continuous recording of its, and others', many IP-video streams.

Four CCTV or (opt) PTZ cameras, or IP-PTZ cameras (opt) with analog video output

VGA, QVGA, QQVGA

Up to eight different IP-video streams per camera simultaneously, with different resolutions, frame rates and data rates, optimize internal video analytics and situation assessment, monitoring and investigations for stationary and mobile cameras.

Many wireless networks protect uplink bandwidth by being mobile-originated (non-routable), which does not allow access from the Internet to mobile servers. Boundless solves this problem by optionally providing auto-network-configuring, upward tunneling from its ***Multi-Stream Video Servers***. Continuous remote access to, and control of, Boundless' servers is provided even as they roam among diverse networks. Unlike a VPN tunnel, which allows a mobile, or roaming, client to access a stationary server, Boundless' mobile, or roaming, ***Multi-Stream Video Server*** tunnels through routers, shares an IP address, and enables mobile clients to access and control it.

Each ***Multi-Stream Video Server*** has a meaningful name, and live and recorded video being viewed are automatically reconnected when an IP address changes. It continuously monitors four cameras for user-selectable zoned motion (opt). For cyber security and to enable multiple users to simultaneously view live and recorded video, perform motion searches, and receive immediate notification of events from ***Multi-Stream Video Servers*** with little load on the network and without e-mail delays, users communicate with ***Multi-Stream Video Servers*** only via Boundless' ***Tunneling Broadcast Server***. Each user has Boundless' ***Control Panel*** client viewing and searching software to receive ***Live Alerts***, view live and recorded video, and search recorded video using new, post-recording, motion parameters.

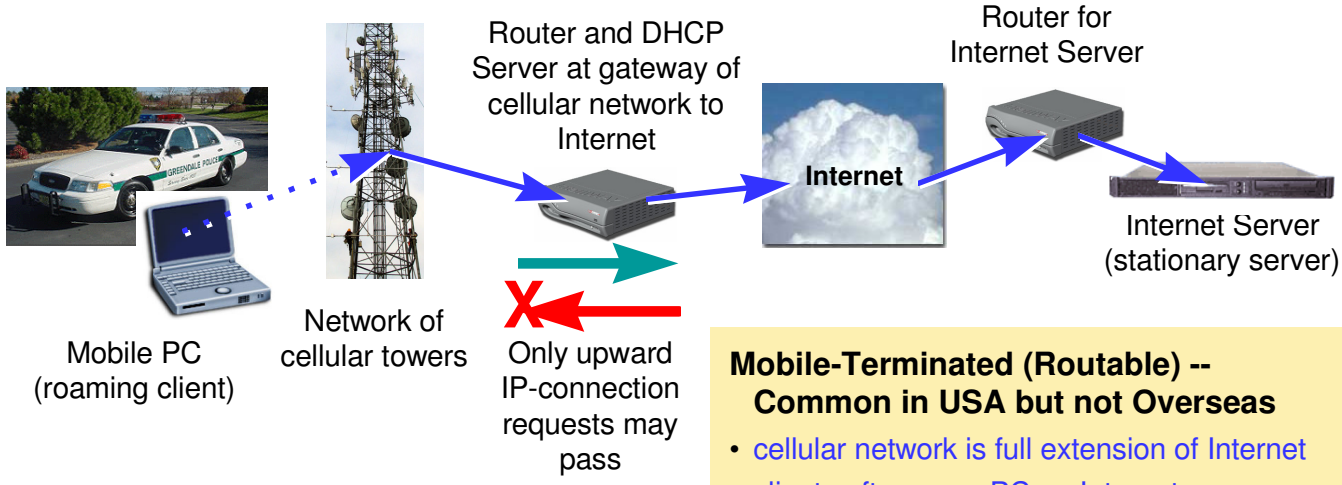
Boundless Security Systems, Inc.
the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Comparison of Mobile-Originated (Non-routable) and Mobile-Terminated (Routable) Cellular Data Networks

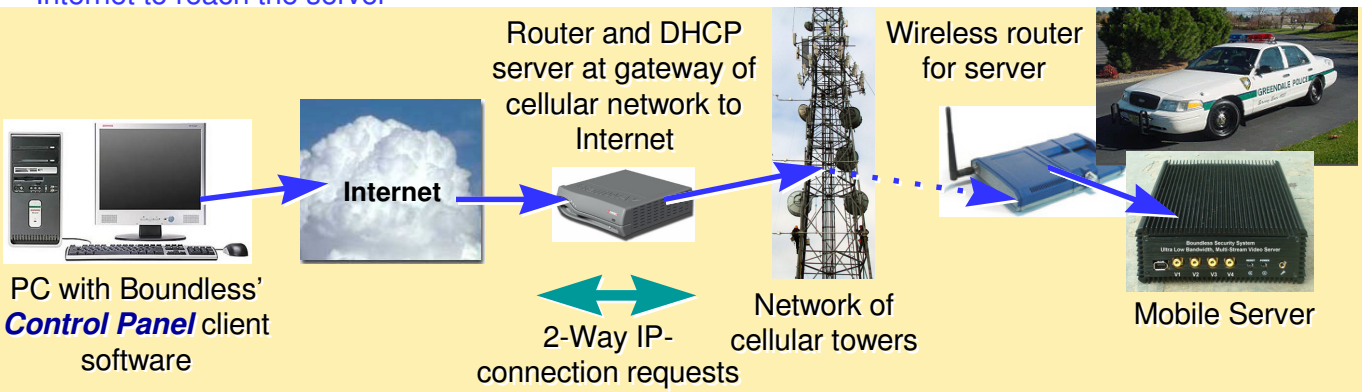
Mobile-Originated (Non-routable) -- Common Overseas but not in USA

- cellular network, like pay phone that makes but not receive calls, not full extension of Internet
- user of mobile PC on cellular network can access an Internet Server because routers on cellular network allow (route) IP-connection requests from user's client software (roaming client) in mobile PC to pass to Internet
- users on Internet cannot access mobile servers inside the cellular network because Internet gateway router for cellular network blocks IP-connection requests from the Internet from being routed to the mobile (roaming) servers
- router for Internet Server enables remote users to access it using a public port number and public IP address on the Internet, and is manually configured using Network Address Translation (NAT) and Port Address Translation (PAT) to allow IP-connection requests from the Internet to reach the server



Mobile-Terminated (Routable) -- Common in USA but not Overseas

- cellular network is full extension of Internet
- client software on PC on Internet accesses a mobile server on the cellular network
- router at gateway of cellular network to Internet allows IP-connection requests from client software in PC on Internet to be passed into the cellular network and on to server
- wireless router on cellular network for mobile server allows a public port number and public IP address from Internet to reach the server -- mobile server has its own public IP address
- wireless router for mobile server uses manually configured Network Address Translation (NAT) and Port Address Translation (PAT) to map a request from the Internet to route a public port on a public IP address, to private port and private IP address of mobile server



Boundless Security Systems, Inc.

the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Comparison of Use of Mobile-Originated (Non-routable), Cellular Data Networks With and Without Boundless' Tunneling

Mobile-Originated (Non-routable)

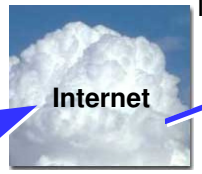
- cellular network, like pay phone that makes but not receive calls, not full extension of Internet
- user of mobile PC on cellular network can access an Internet Server because routers on cellular network allow (route) IP-connection requests from user's client software in mobile PC (roaming client) to pass to Internet
- users on Internet cannot access mobile servers inside the cellular network because Internet gateway router for cellular network blocks IP-connection requests from the Internet from being routed to the mobile (roaming) servers
- router for Internet Server enables remote users to access it using a public port number and public IP address on the Internet, and is manually configured using Network Address Translation (NAT) and Port Address Translation (PAT) to allow IP-connection requests from the Internet to reach the server

Mobile PC (roaming client)

Network of cellular towers

Router and DHCP Server at gateway of cellular network to Internet

Only upward IP-connection requests may pass



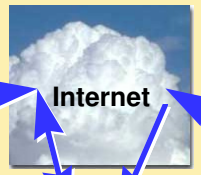
Router for Internet Server

Internet Server (stationary server)

Boundless' Unique Tunneling Solution

- Boundless circumvents routing limitations of mobile-originated / non-routable, cellular, satellite, WiFi, dialup and other networks
- Routability affects whether a client can access a server, not dynamic / static address
- Boundless' mobile ***Multi-Stream Video Server*** on wireless network tunnels through the routers between it and Boundless' ***Tunneling Broadcast Server*** on Internet
- Boundless' mobile ***Multi-Stream Video Server*** on wired or wireless network has dynamic port number and can share a network's public IP address with many others
- Boundless' ***Control Panel*** client software on PC on the Internet accesses Boundless' ***Tunneling Broadcast Server***, which forwards tunneled communications between Boundless' ***Control Panel*** and Boundless' roaming mobile ***Multi-Stream Video Server*** on non-routable, wired or wireless network
- No manual configuration of router between Internet and wireless network is required
- Not same as VPN, which allows roaming clients but not roaming servers
- Not an HTTP tunnel that conceals the client

PC with Boundless' ***Control Panel*** client software accesses ***Multi-Stream Video Server*** despite blocking by router



Boundless' ***Tunneling Broadcast Server***

Router and DHCP server at gateway of cellular network to Internet

Only upward IP-connection requests

Network of cellular towers

Wireless router for server

Boundless' mobile ***Multi-Stream Video Server*** with tunneling option (roaming server)

Boundless Security Systems, Inc.

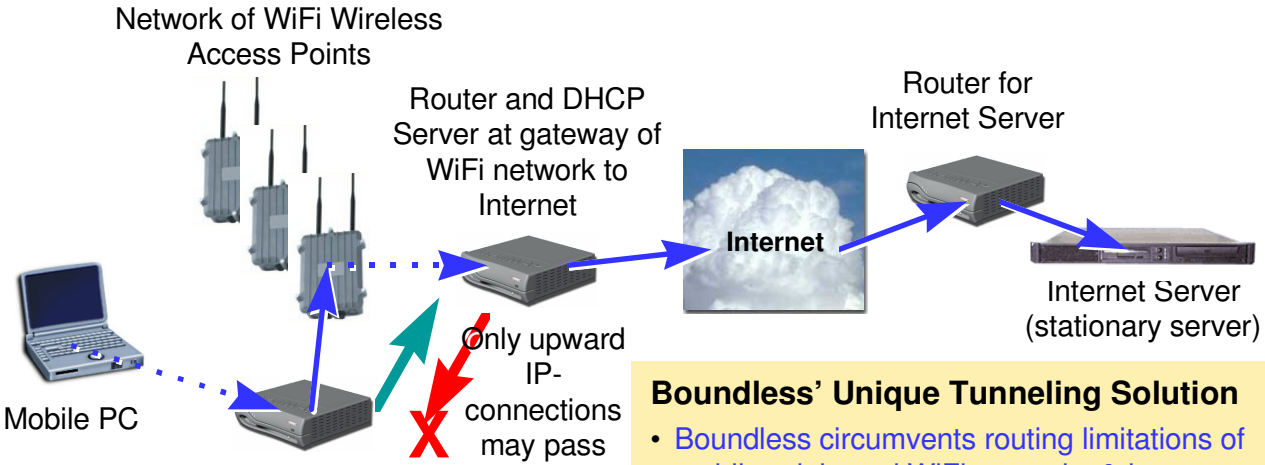
the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Comparison of Use of Mobile-Originated (Non-routable), WiFi Networks With and Without Boundless' Tunneling

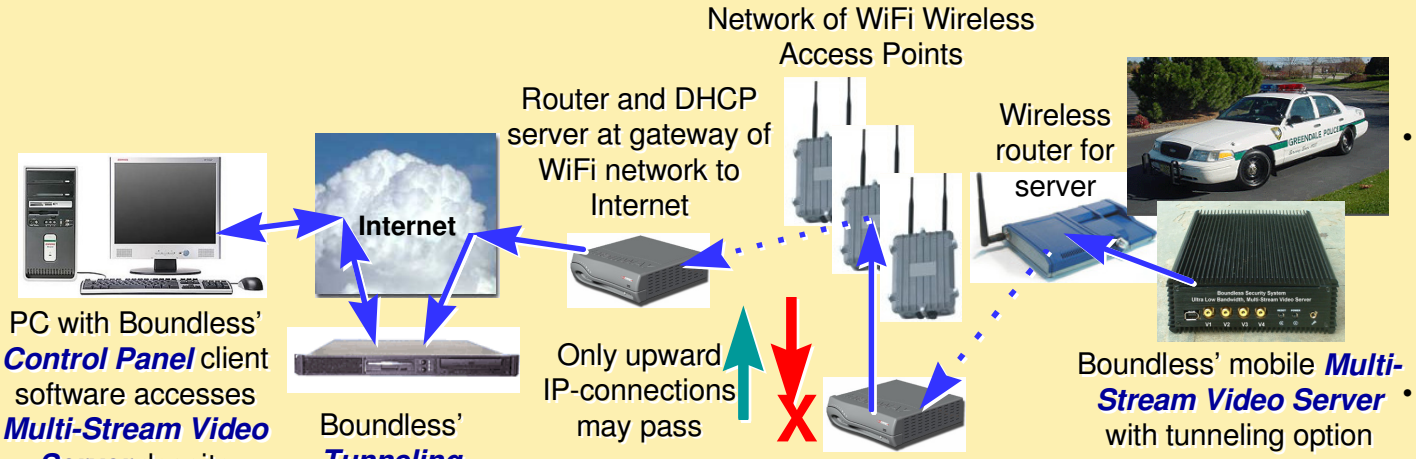
Mobile-Originated (Non-routable)

- WiFi hotspot, like pay phone that can make but not receive calls, not full extension of Internet
- user of mobile PC on WiFi network can access an Internet Server because routers on WiFi network allow (route) IP-connection requests from user's client software in mobile PC to pass to Internet
- users on Internet cannot access mobile servers inside the WiFi network because WiFi routers do not allow IP-connection requests from the Internet to be routed to mobile servers at WiFi hotspots
- router for Internet Server enables remote users to access it using a public port number and public IP address on Internet, and is manually configured using Network Address Translation (NAT) and Port Address Translation (PAT) to allow IP-connection requests from Internet to reach server



Boundless' Unique Tunneling Solution

- Boundless circumvents routing limitations of mobile-originated WiFi networks & hotspots
- Boundless' mobile ***Multi-Stream Video Server*** on wireless network tunnels through the routers between it and Boundless' ***Tunneling Broadcast Server*** on Internet
- Boundless' mobile ***Multi-Stream Video Server*** on wired or wireless network has dynamic port number and can share a network's public IP address with many others
- Boundless' ***Control Panel*** client software on PC on the Internet accesses Boundless' ***Tunneling Broadcast Server***, which forwards tunneled communications between Boundless' ***Control Panel*** and Boundless' mobile ***Multi-Stream Video Server*** on non-routable, wired or wireless network
- No manual port or address configuration of any routers between the Internet and mobile ***Multi-Stream Video Server*** is required
- Wireless accounts still required



Boundless Security Systems, Inc.
the communications bandwidth experts

3 Simm Lane, Unit #1F • Newtown, CT 06470 USA
tel. 203-445-0562 • fax 203-445-0564
www.BoundlessSecurity.com

Boundless' Tunneling Seamlessly Handles Fleets of Vehicles Using a Cellular Network in the Field and WiFi in Multiple Depots

Router and DHCP Server at gateway of cellular network to Internet, dynamically assigns many public IP addresses to many clients, may or may not allow incoming connections

Two-way connections

Internet

Only upward IP-connections may pass

Router and DHCP Server at gateway of each depot's WiFi mesh network to Internet, dynamically assigns private IP addresses to local clients, does not allow incoming connections to be made to conventional internal servers. Boundless avoids need for public IP addresses for all vehicles and complex bookkeeping to assign static private IP addresses to all vehicles in all depots.

Network of cellular towers

Many public IP addresses

Boundless' ***Tunneling Broadcast Server***

Many private IP addresses

Wireless Mesh Network of WiFi Access Points in each of many depots

Scalable, handles fleets with 100's to 1,000's of vehicles in each of many depots, without IP-address bookkeeping nightmares

Public IP address

Boundless' roaming, mobile ***Multi-Stream Video Server*** with tunneling option, in each vehicle

Smart wireless 3G / WiFi router in each vehicle, chooses 3G in the field and WiFi in depots

Smart wireless 3G / WiFi router in each vehicle, chooses 3G in the field and WiFi in depots

Boundless' roaming, mobile ***Multi-Stream Video Server*** with tunneling option, in each vehicle

Four CCTV or (opt) PTZ cameras, or IP-PTZ cameras (opt) with analog video output

PC's in the field and multiple depots with Boundless' ***Control Panel*** can seamlessly access Boundless' ***Multi-Stream Video Servers*** that use 3G cellular in the field and WiFi in depots, via Boundless' ***Tunneling Broadcast Server,*** regardless of location, networks' routability, IP addresses and changes in IP addresses