



Boundless Security Systems, Inc.

sharper images with better access and easier installation

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Ultra Low Bandwidth, **Boundless Security System™** Automatically Tunnels Through Routers and Provides Wireless, Mobile, Roaming Video Servers with Cross-Network Connectivity (1 of 5)

Benefits of Boundless' Tunneling

- Enables comprehensive, bandwidth-saving, video-on-demand, digital video surveillance on networks that can't otherwise support roaming video servers, including mobile-originated (non-routable) wireless networks, and wired networks where routers can't be modified
- 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 multi-network wireless 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 stream simultaneously from a Boundless **Broadcast Server** with only a single load on a wireless uplink from Boundless' **Multi-Stream Video Server** to the Internet
- Highly scalable, enables a single public IP address to be shared by many diverse users and applications, and Boundless' video surveillance simultaneously
- Enables a single public IP address to support 250 Boundless **Multi-Stream Video Servers** and more than 10,000 Boundless video streams at once
- Inherently supports dynamic IP addresses without use of external 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
- Provides immediate, instant-messenger-like 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 provide mobile video uploads
- Provides another layer of cyber security, and server and user authentication



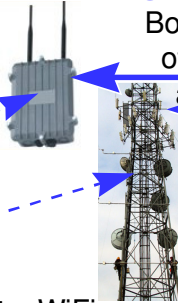
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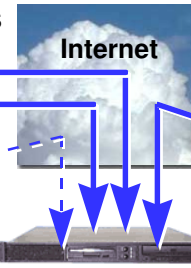
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Ultra Low Bandwidth, *Boundless Security System™* Automatically Tunnels Through Routers and Provides Wireless, Mobile, Roaming Video Servers with Cross-Network Connectivity (2 of 5)

Boundless' video-on-demand traffic with bandwidth management, typ. only 32 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**

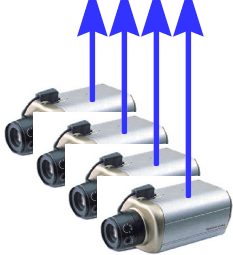
Boundless **Broadcast Server** on Internet is destination of tunnels mobile-originated by Boundless' **Multi-Stream Video Servers**

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



Multi-network (cellular, satellite, WiFi, WiMAX...) wireless router dynamically selects fastest wireless network

Boundless' versatile, x86 Linux-based, advanced IP-based, ultra low bandwidth, **Multi-Stream Video Server** automatically tunnels through routers and firewalls to reach the Internet, and provides secure communication with remote users only via a Boundless **Broadcast Server**. It provides a bank of up to ten 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.



One to four CCTV cameras (opt. mega-pixel)



VGA, QVGA, QQVGA (opt. 6VGA)

Up to 10 different IP-video streams per camera simultaneously, with different resolutions, frame rates and data rates, optimize internal video analytics and remote 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 upward traffic so a mobile client can access an Internet server, Boundless tunnels through routers, shares an IP address, and enables downward traffic so clients on the Internet can access mobile **Multi-Stream Video Servers**.

Each **Multi-Stream Video Server** is easily identified, and live and recorded video being viewed are automatically reconnected when its IP address changes. It continuously monitors one to four cameras for user-selectable zoned motion. 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 a Boundless **Broadcast Server** on the Internet. 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.



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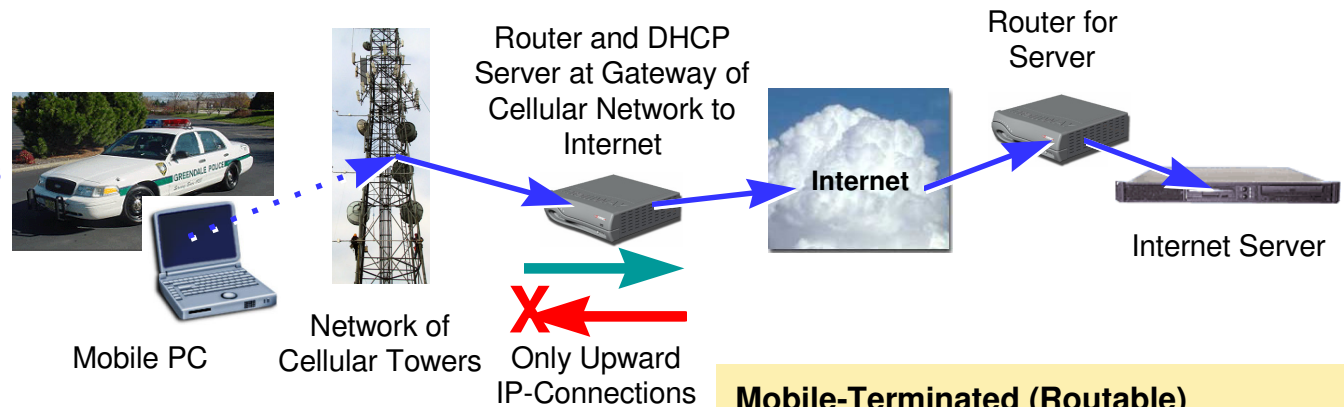
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Ultra Low Bandwidth, *Boundless Security System™* Automatically Tunnels Through Routers and Provides Wireless, Mobile, Roaming Video Servers with Cross-Network Connectivity (3 of 5)

Comparison of Mobile-Originated and Mobile-Terminated Cellular Data Networks

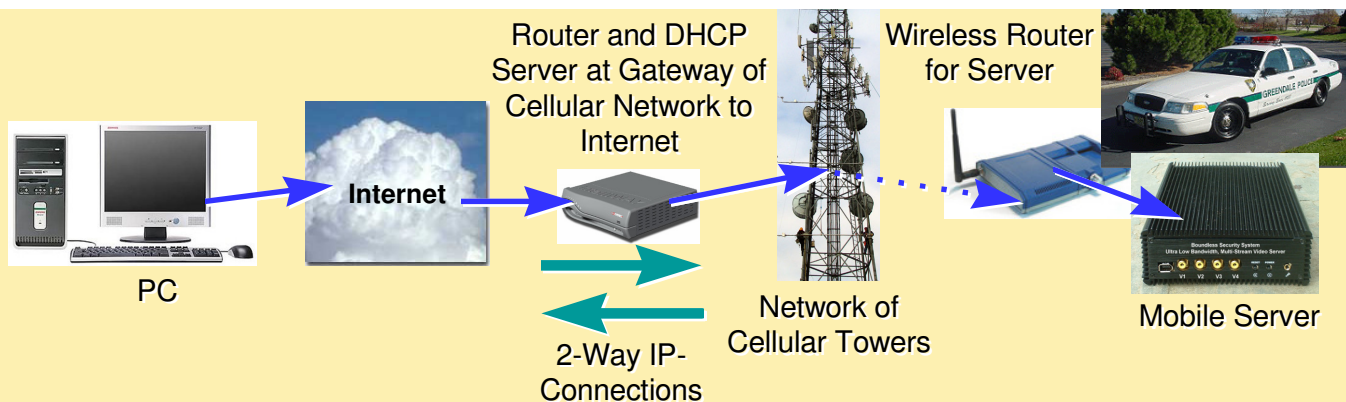
Mobile-Originated (Non-routable)

- 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 IP-connection requests from user's client software in mobile PC to pass to Internet
- users on Internet cannot access mobile servers inside the cellular network because routers on cellular network do not allow IP-connection requests from the Internet to be routed to the mobile 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)

- 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





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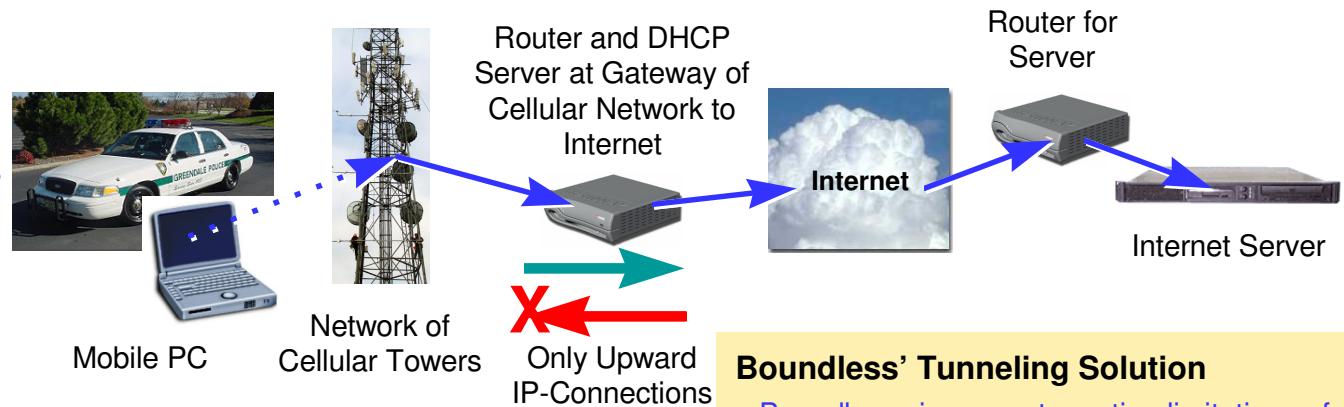
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Ultra Low Bandwidth, *Boundless Security System™* Automatically Tunnels Through Routers and Provides Wireless, Mobile, Roaming Video Servers with Cross-Network Connectivity (4 of 5)

Comparison of Mobile-Originated and Boundless' Tunneled Cellular Data Networks

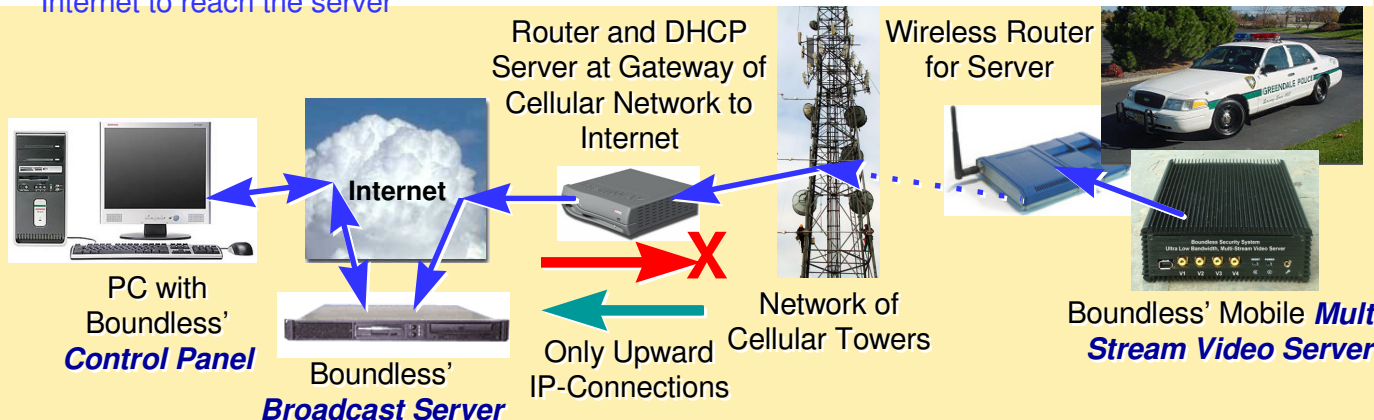
Mobile-Originated (Non-routable)

- 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 IP-connection requests from user's client software in mobile PC to pass to Internet
- users on Internet cannot access mobile servers inside the cellular network because routers on cellular network do not allow IP-connection requests from the Internet to be routed to the mobile 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



Boundless' Tunneling Solution

- Boundless circumvents routing limitations of mobile-originated cellular networks
- Boundless' mobile **Multi-Stream Video Server** on wireless network automatically tunnels through the routers between it and Boundless' **Broadcast Server** on Internet
- Boundless' mobile **Multi-Stream Video Server** on wireless network has dynamic port number and dynamic IP address, and can share that IP address with many other users
- Boundless' **Control Panel** client software on PC on the Internet accesses Boundless' **Broadcast Server**, which forwards tunneled communications between Boundless' **Control Panel** and Boundless' mobile **Multi-Stream Video Server** on wireless network
- No manual configuration of router between Internet and wireless network is required





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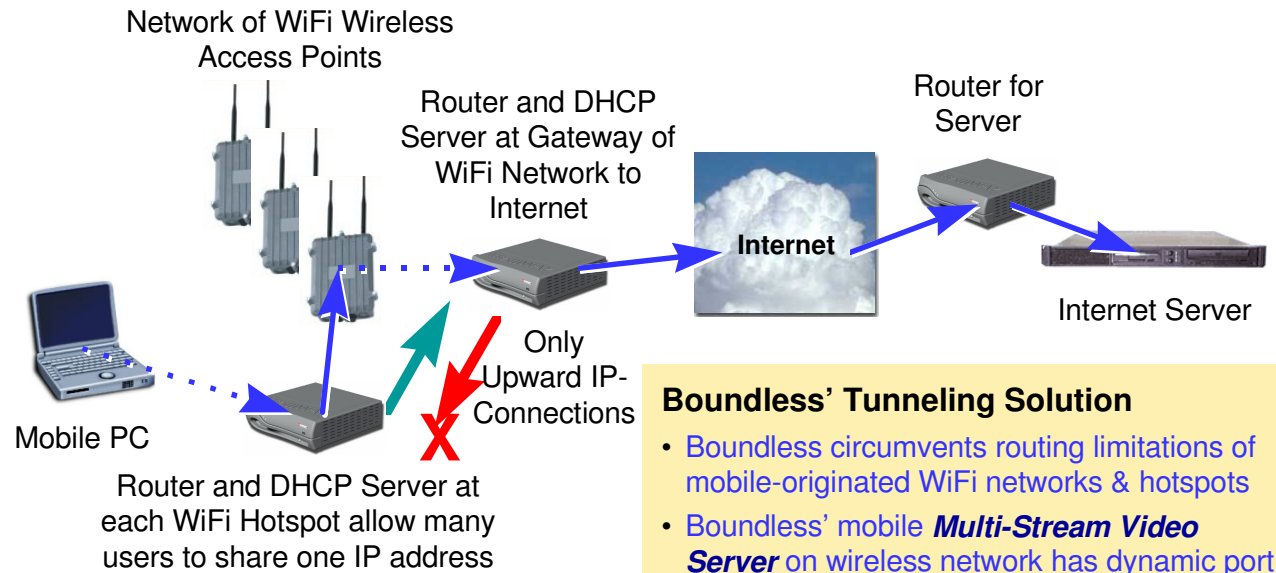
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Ultra Low Bandwidth, *Boundless Security System™* Automatically Tunnels Through Routers and Provides Wireless, Mobile, Roaming Video Servers with Cross-Network Connectivity (5 of 5)

Comparison of Mobile-Originated and Boundless' Tunneled WiFi Networks

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 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' Tunneling Solution

- Boundless circumvents routing limitations of mobile-originated WiFi networks & hotspots
- Boundless' mobile **Multi-Stream Video Server** on wireless network has dynamic port number and dynamic IP address, shares that IP address with many other users, and automatically tunnels through all the routers between it and the Internet, to Boundless' **Broadcast Server** on the Internet
- Boundless' **Control Panel** client software on PC on the Internet accesses Boundless' **Broadcast Server**, which forwards tunneled communications between Boundless' **Control Panel** and Boundless' mobile **Multi-Stream Video Server** on wireless network
- No manual configuration of any routers between the Internet and mobile **Multi-Stream Video Server** is required
- Wireless accounts still required

