



# IT Requirements

Document Version 1.0

Technical Support  
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Published Date August, 2017

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## Internet Connection

Mutualink requires an Internet connection that allows our Secure VPN Router (for example, Cisco 881 ISR) to build outbound IPsec GRE Tunnels across the PUBLIC Internet.

If behind a FIREWALL, the following ports and protocols must be opened or enabled:

- ISAKMP (UDP 500)
- NAT-T (UDP 4500)
- ESP (protocol 50)
- Port 8443
- NTP (UDP/123) to Internet time servers or time sources within the customer network.
- DNS (UDP/53) to Internet DNS servers or DNS servers within the customer network.
- HTTP (TCP/80) to Internet HTTP servers. Use of a transparent HTTP proxy or explicitly defined HTTP proxy is acceptable provided that the proxy honors the HTTP server's cache control directives.

Please inform Mutualink if customer-operated services (NTP/DNS/HTTP proxy) are required so that the VPN routers can be configured appropriately.

Customer must supply a PUBLIC or PRIVATE static IP, subnet mask and default gateway address. DHCP is also supported.

SSH access is strongly recommended during the installation process.

On the LAN side, the Mutualink Secure VPN Router, with its integrated 4 port switch must connect to our associated equipment via home run Ethernet, direct patch cables, dedicated switches, or a Layer 2 NON-ROUTABLE VLAN.

**NOTE: IF YOUR INFRASTRUCTURE DOES NOT SUPPORT THESE REQUIREMENTS, COORDINATE WITH OUR PROJECT IMPLEMENTATION MANAGER, JOHN PARKER, AT (203) 741-5606, JPARKER@MUTUALINK.NET.**



## Installation Policies

As IT installation policies differ from facility to facility, it is important that an IT Staff member or technician be assigned to Mutualink on installation day.

### **This person should be:**

- familiar with your facility data center requirements as to the placement of IT equipment.
- comfortable with the actual placement and mounting of the equipment, especially as it pertains to the mounting of rack unit equipment inside data racks.

### **The Customer/Facility is responsible for the following:**

- installation of all network jacks and cable runs.
- routing of patch cables and AC line voltage cables.
- insuring that the installation of the Mutualink equipment does not interfere with other nearby equipment.
- supplying any accessory equipment such as rack space and mounting hardware (rack shelves are generally not required, and the Mutualink equipment may be installed in a temporary location until the final installation environment is determined).
- The use of an Uninterruptible Power Supply (UPS) is highly recommended. UPS with ratings equal or greater than 350 VA are required for each device.

A Mutualink technician will be available to assist, and will assume responsibility for the configuration of hardware and software, after installation.

## Transmission

**Bandwidth:** Each active transmission uses 125 Kbps of unidirectional bandwidth. This bandwidth is only required while speech is actually present; when no speech is present, only a nominal 4 Kbps on average is required. For most installations, it is recommended that a minimum of 384 Kbps be allocated for the Mutualink system; this will allow several transmissions to be received simultaneously during periods of heavy usage. Please note that if the customer transmits video across the Mutualink Interop Network, added bandwidth will be required to satisfy concurrent voice and video transmissions. If applicable, please contact Mutualink Technical Support at (866) 927-5465 to discuss additional video bandwidth requirements.

**QoS:** To guarantee acceptable transmission of voice, some packet prioritization must be enabled on the network. It is desirable that the network prioritize QoS traffic using the DiffServ protocol. For voice quality to be deemed acceptable, the following parameters will be used:

- Packet loss should be no more than 1 percent.
- One-way latency (mouth to ear) should be no more than 150 ms.
- Average one-way jitter should be targeted at less than 30 ms. A minimum of 100 Kbps of guaranteed priority bandwidth per active incident should be allocated in each direction. A minimum of 384 Kbps is recommended to allow for multiple active incidents and multiple simultaneous transmissions per incident.



## Mutualink External Network Bandwidth Calculator

To calculate required bandwidth, fill in the desired number of streams for each direction in the yellow columns. (All bandwidth rates are in Kbps).

Media Type	Payload Rate	Bandwidth Required	UPSTREAM (TX) DIRECTION		DOWNSTREAM (RX) DIRECTION	
			Max Tx'd @ Same Time	Bandwidth Required	Max Rx'd @ Same Time	Bandwidth Required
VOICE	64	125		0		0
VIDEO	64	74		0		0
	128	147		0		0
	256	294		0		0
	384	442		0		0
	512	589		0		0
	768	883		0		0
	1024	1178		0		0
				0		
				Upstream Bandwidth Required	Downstream Bandwidth Required	