Connection Requirements

We will setup a **virtual private network (VPN)** that extends a **private network** across a public network, and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network. Applications running across the VPN may therefore benefit from the functionality, security, and management of the private network.

A VPN is created by establishing a **virtual point-to-point** connection through the use of dedicated connections, **virtual tunneling protocols**, or **traffic encryption**. A VPN available from the public Internet can provide some of the benefits of a **wide area network (WAN)**. From a user perspective, the resources available within the private network can be accessed remotely.

Purpose:

- **Download patient flow data to analyze and consult on Lean Patient Flow Solutions**
  - **Scorecards**
    - **Patient flow bottlenecks**
    - **KPI Analysis**
    - **Continual Improvement to increase patient flow efficiency and improve the Patient Experience**
- **Upload software changes & updates**
- **Perform remote diagnostics**

Connection Requirements

Panels

Expeditor light systems consist of custom-built panels of lighted push-button switches and a Light System Controller (LS Controller). The panels are customizable, both in number of switches and in functionality of the switches. Panels are typically installed outside of exam rooms, inside exam rooms, procedure rooms, and any other pertinent locations.

Usually a monitor panel, that shows status of all rooms, is located at a Nurse Station and/or other staff work areas.

LS Controller

The lights are controlled by the LS Controller, which is manufactured and programmed by Expeditor for appropriate functionality. The LS Controller also stores only time stamped events (Event Log) which are used for the source of raw data used in XTRAC patient flow reporting and therefore, no PHI data is collected, stored, or downloaded.

Virtual Monitor

The Virtual Monitor product displays a facsimile of a Light System monitor panel on a customer workstation configured to display on a large flat screen TV. A second embedded controller (the VM server) is added to the Light System to provide Virtual Monitor functionality. The VM server is hosted on a DigiConnect embedded module made by Digi International. The DigiConnect is a matchbox-size module running Net+OS, an RTOS based on ThreadX, which provides a TCP/IP stack and a simple HTTP server. To this platform, we add our own software service to communicate with user workstations.

To use Virtual Monitor, the user browses to an HTML page on the VM server's web server. The web page loads a signed Java applet, which then loads a few small configuration files and establishes a connection to a server process on port 7070. Thereafter the applet and the server process exchange update messages, as required, to maintain synchronization between the Virtual Monitor display and the Light System.

The Virtual Monitor applet and server were developed and are maintained by Expeditor Systems, and the communication protocol between the applet and server is Expeditor Systems proprietary.

Connection Requirements

The LS controller and VM server communicate over an in-chassis serial data link using an Expeditor Systems proprietary protocol. Some configuration settings are passed from LS controller to VM server during system startup (IP address, for example), but subsequent to that, only real-time information is passed over this data link. There is no provision for updates to the VM server operating system over the serial link, nor is there any means to "touch" the network connected to the VM server over the link with the LS controller. In short, Expeditor, Inc. certifies that the VM server-connected network cannot be accessed via the LS controller modem.

Remote Access

The purpose of the remote access in the Light System Controller (LS Controller) is to update software and/or configuration settings, to provide Expeditor, Inc. support personnel a view of critical system functions, and to download event logs which comprise the raw data from which XTRAC statistics are derived. The connection is accomplished by Port Forwarding or VPN. The connection is initiated by a Linux server located at Expeditor, Inc.'s home office. Once a connection is established, the server and the LS controller communicate using our proprietary protocol. This protocol was designed strictly for machine-to-machine communications and uses two-factor authentication to unlock the session. The "keys" used to unlock the session are different for each system and for each session. All communications with the LS controller use this protocol. Expeditor, Inc. support personnel interact with remote systems using a software client which insulates them from the protocol; i.e. one cannot login to an LS controller with a username/password.