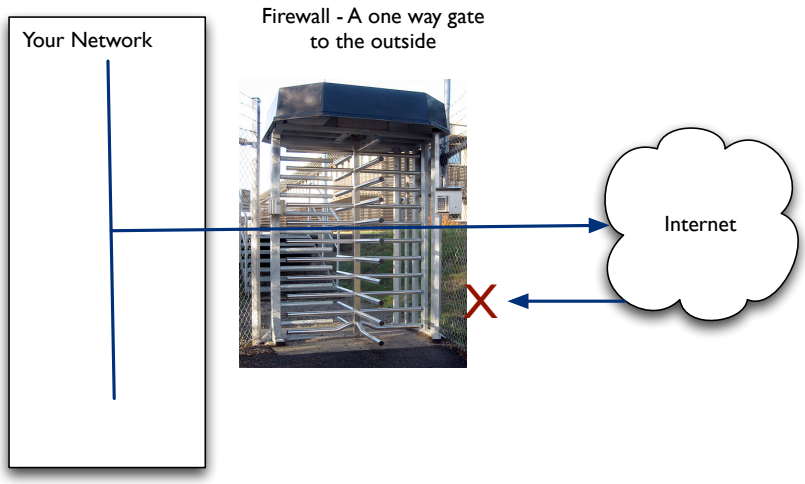
MTConnect EMO Proxy

The MTConnect Proxy being developed for the EMO trade show provides a secure way to access a machine tool behind a firewall. The server will never make a direct connection to the machine, the proxy client will always initiate the connection – here's how it works.

In most corporate networks there is a firewall that keeps your network safe from the outside world by acting like a one way gate. You can connect to remote server from your network, but they can't connect to you. This also means that for MTConnect to function properly, it will need to be able to ask a process on your network to initiate the connection for it.



The MTConnect proxy server is running on the same machine as the EMO demo. What is required is a proxy client running on your network to connect to the proxy server, a lightweight server that waits for remote connections to port 8080. Our only requirement is connectivity from the machine the proxy client is running on to emo.mtconnect.org port 8080. For a full description of the protocol, see *Example and Protocol Details* below.

To use the supplied software, unpack the proxy.zip (http://emo.mtconnect.org/media/proxy.zip) file on your hard drive. Change directory into proxy and execute the proxy.bat according to the instructions. This will automatically connect to the proxy server and initialize your communications. The arguments are as follows:

```
> proxy.bat <server_port> <local_address> <local_port>
```

For Example:

```
> proxy.bat 5010 192.168.0.10 5000
```

This will create tell the server that we will use port 5010 on the server machine which will be a proxy for port 5000 on machine 192.168.0.10. In the EMO application you specify your device url in the to reference the *server_port* as follows:

```
http://localhost:5000/Machine
```

Where Machine is the name of the machine on the agent (device name). From the EMO applications perspective this is the same as `http://192.168.0.10:5000/Machine`. Since the EMO application can't contact your machine directly it must tunnel through the proxy.

To avoid conflicts we will be allocating port numbers to all whom want to use the proxy. Please contact Will Sobel, will@systeminsights.com, to receive a port assignment.

Possible Issues

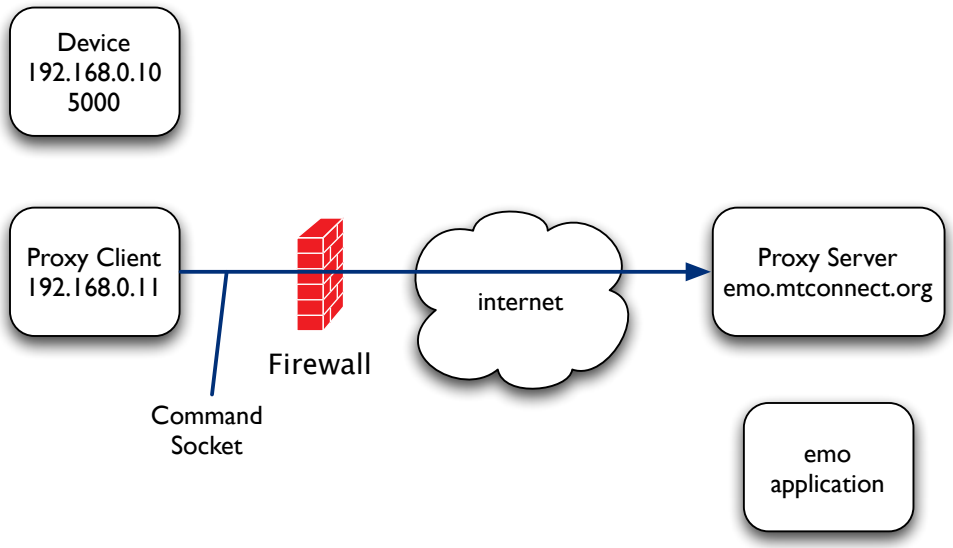
If you company only allows access through an HTTP proxy and does not use BGP or some form routing protocol that allows for direct connections to the internet, contact Will Sobel and we'll discuss some alternatives.

Example and Protocol Detail

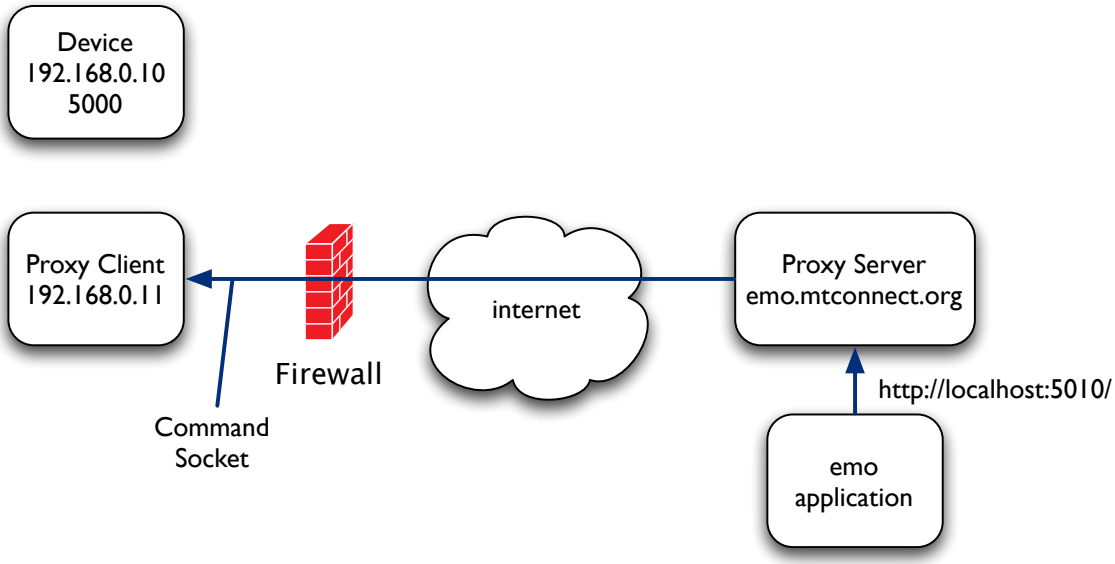
The proxy can be invoked from the command line with the following command:

```
> proxy.bat 5010 192.168.0.10 5000
```

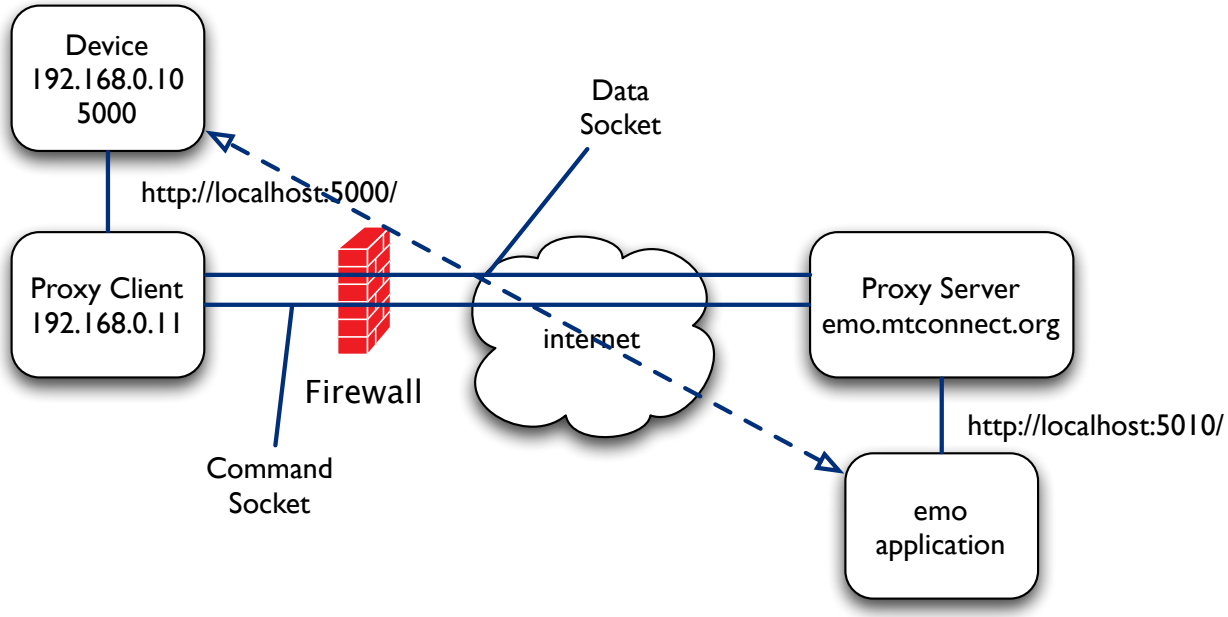
Step 1: A socket is created between the client and the EMO server. This socket servers as the command socket and will allow connect instructions to be initiated from the server. The server receives the port the client wishes the EMO application to connect to, in this example 5010.



Step 2: When the EMO application connects to the local port for this application the proxy server sends a message to the proxy client over the established command socket.



Step 4: The proxy client receives the request and creates a second socket to communicate with the proxy server for the purposes of sending data. Again, the connection must be originated from the proxy client so we don't get blocked. Once the proxy socket is created, the proxy client connects to the device and the communication is then forwarded over the data socket. This creates a virtual connection between the EMO application and the device.



Step 5: When the communication is completed, all but the command socket remain for the next request.