MultiTech Conduit Edge Microserver Installation and Setup Guide

Version [1.0]

Introduction

The Edge MicroServer is a powerful component of the ThingWorx architecture. The Edge MicroServer allows for the rapid deployment of connections between the ThingWorx platform and an associated data reporting device, with minimal design requirements on the part of the user.

The Edge MicroServer provides an "always-on" connection to the platform, and it opens a local web server that interacts with the REST API available on the platform.
This document provides installation and usage instructions for setting up the Edge MicroServer with the MultiTech MultiConnect Conduit device.

About the DEVICE

The MultiConnect Conduit is a multi-port programmable gateway device manufactured by MultiTech Corporation. It uses an open Linux environment to enable M2M connectivity using various wireless interfaces.
The Edge MicroServer Linux distribution may be installed on the MultiConnect, and this guide will follow the procedure for doing so.

Initial Setup

Setup of the DEVICE with an EMS will first require inserting an activated and valid SIM card in the MultiConnect Device. **Please note that this guide was written for a computer running Microsoft Windows.**
Refer to the Troubleshooting section of this guide for help with frequently asked questions.

Connect the MultiConnect Conduit to a Local Computer

1. Follow MultiTech's online setup guide to complete the initial setup of your device, including inserting a SIM card. Visit the URL at right: http://www.multitech.net/developer/wp-content/uploads/2015/05/Conduit.pdf
2. Connect the MultiConnect to a computer using a standard Ethernet cable. Connect a power source to the MultiConnect device.

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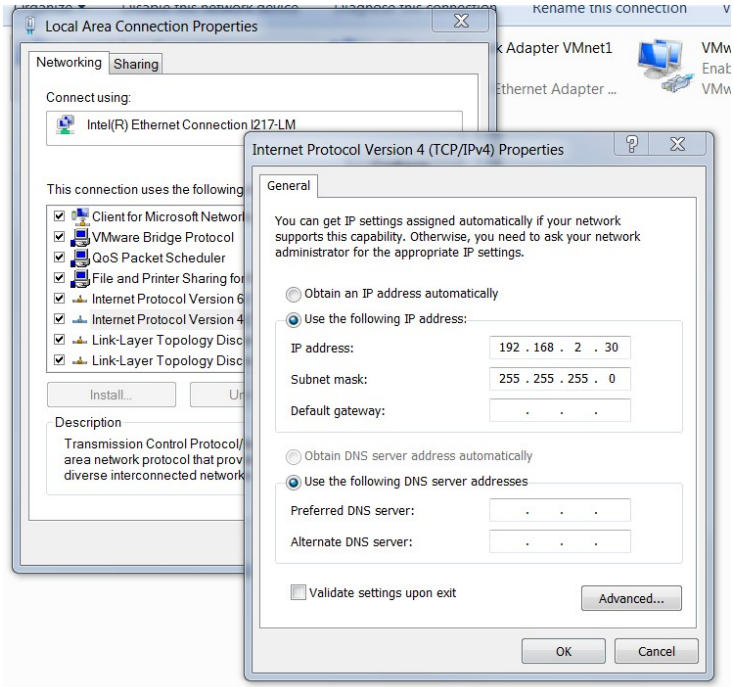
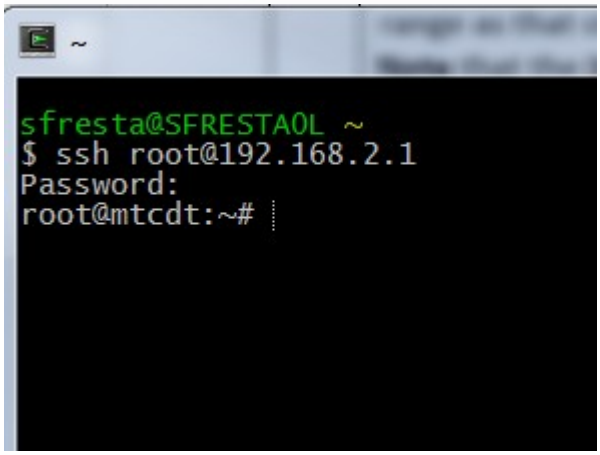
3. Assign your computer's Ethernet Adapter device to an IP address on the same IP range as that of the MultiConnect device. **Note** that the MultiConnect device's default IP address is 192.168.2.1

   A recommended IP address for your computer is 192.168.2.xx in this case, where xx is any valid number in range, such as 30.



4. Connect to the device via SSH using a client such as PuTTY or Cygwin for Windows.
   Connect to the device at 192.168.2.1, (default port 22), using the username "**root**" and password "**root**".

   Note that these are the default credentials for the device.



5. At this point, you should be logged into the device as an administrative user (your connection terminal should look like the window in the previous screenshot).

Install the ThingWorx Edge MicroServer

1. Included in this Starter Kit are two packages you will need to install on the MultiConnect Device to get started using the ThingWorx Edge MicroServer (EMS). Locate the following two files in this package:
   - *thingworx-ems_5.2.0.15-r0.1_arm926ejste.ipk*
   - *thingworx-ems-lua_5.2.0.15-r0.1_arm926ejste.ipk*

2. Using a utility such as WinSCP, or a simple *scp* command, copy the files to the MultiConnect device under a directory such as /opt/thingworx/.

   Note that you may have to create the thingworx directory or another suitable location for the files.

3. Once these files are copied, run the following commands using the Open PacKaGe utility:

```
opkg install thingworx-ems_5.2.0.15-r0.3_arm926ejste.ipk
opkg install thingworx-ems-lua_5.2.0.15-r0.1_arm926ejste.ipk
```

   Note: If your device does not have the Open PacKaGe utility, contact the manufacturer for instructions on installing it.

4. If your installation completes successfully, you should see a result similar to the following for each install:

```
root@mtcdt:/opt/thingworx# opkg install thingworx-ems_5.2.0.15-r0.3_arm926ejste.ipk
Installing thingworx-ems (5.2.0.15-r0.3) to root...
update-rc.d: /etc/init.d/tw_microServerd exists during rc.d purge (continuing)
 Removing any system startup links for tw_microServerd ...
  /etc/rc0.d/K90tw_microServerd
  /etc/rc1.d/K90tw_microServerd
  /etc/rc2.d/S90tw_microServerd
  /etc/rc3.d/S90tw_microServerd
  /etc/rc4.d/S90tw_microServerd
  /etc/rc5.d/S90tw_microServerd
  /etc/rc6.d/K90tw_microServerd
Configuring thingworx-ems.
 Adding system startup for /etc/init.d/tw_microServerd.
root@mtcdt:/opt/thingworx#
```

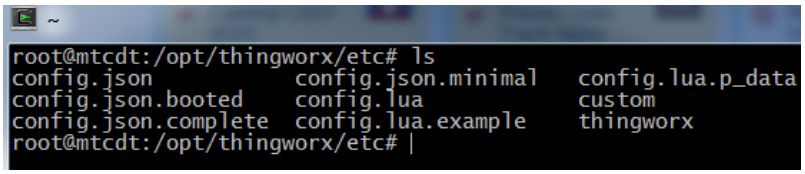
5. Locate the "wsems" executable file. It may be installed under the **/usr/bin** directory. If it is, **copy it** to the same top-level directory as your EMS install. In our case, this was the same directory as the location of our two .ipk files:

```
root@mtcdt:/# cd opt/thingworx/
root@mtcdt:/opt/thingworx# ls
etc
offline_msgs.bin
subscribed_props.bin
thingworx-ems-lua_5.2.0.15-r0.3_arm926ejste.ipk
thingworx-ems_5.2.0.15-r0.3_arm926ejste.ipk
tmp.txt
tw_staging
wsems
root@mtcdt:/opt/thingworx#
```

Configuration and Setup

Configure the MultiConnect Device

1. On the MultiConnect, navigate to the thingworx installation directory, and then navigate to the /etc/ directory. Your working directory should now be something similar to: **/opt/thingworx/etc**



2. Locate the “config.json” file. You will need to modify the connection parameters in this file so that they match the connection parameters of your ThingWorx instance.

Note: For additional guidance and examples on setting a configuration file, please refer to http://support.ptc.com/cs/help/thingworx_hc/thingworx_6.0_hc/ and follow the guide section entitled “ThingWorx WebSocket-based Edge MicroServer (WSEMS)”

3. The **config.json.complete** file is also available in this install directory for reference.

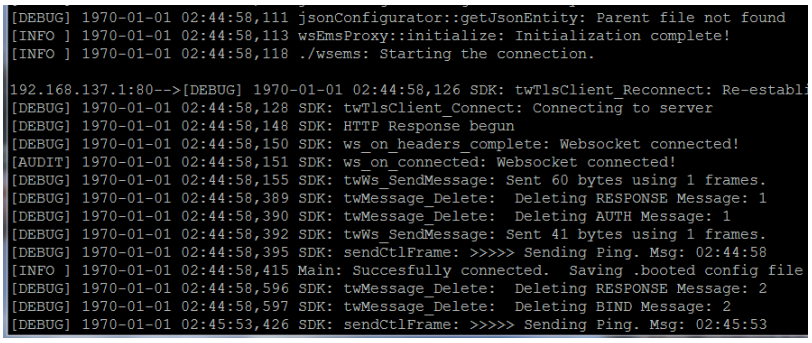
   Edit the **config.json** so that it resembles the file at right (text included for your convenience), but fill in your specific information.

```
{
        "http_server": {
                        "host": "127.0.0.1",
                        "port": 8000
        },

        "ws_servers":  [{
                        "host": "192.168.2.30",
                        "port": 80
                }],
        "appKey":       "YOUR APPKEY HERE",

        "resource":     "/Thingworx/WS",

        "logger":       {
                        "level": "DEBUG"
        },

        "auto_bind": [{
                        "name": "MyGateway",
                        "gateway": true
        }],
        "ws_connection":{
                        "encryption": "none",
                        "verbose": true,
                        "msg_timeout": 1000
        }
}
```

4. Save and close the config.json file. Verify that the “wsems” executable is located in the top level “thingworx” folder. (/opt/thingworx)

5. Verify that the “wsems” file is executable by typing `chmod 777 wsems`.
6. Run the executable by typing the following command:
   `./wsems`
   Verify that the executable is running and in an idle state. You should see a console *similar* to the screenshot at right if it is running correctly.

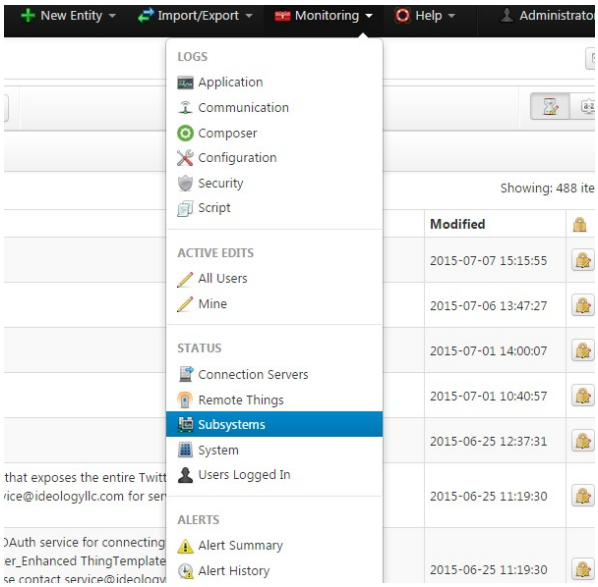
   Most important are the “Successfully connected” and “Sending Ping” responses.

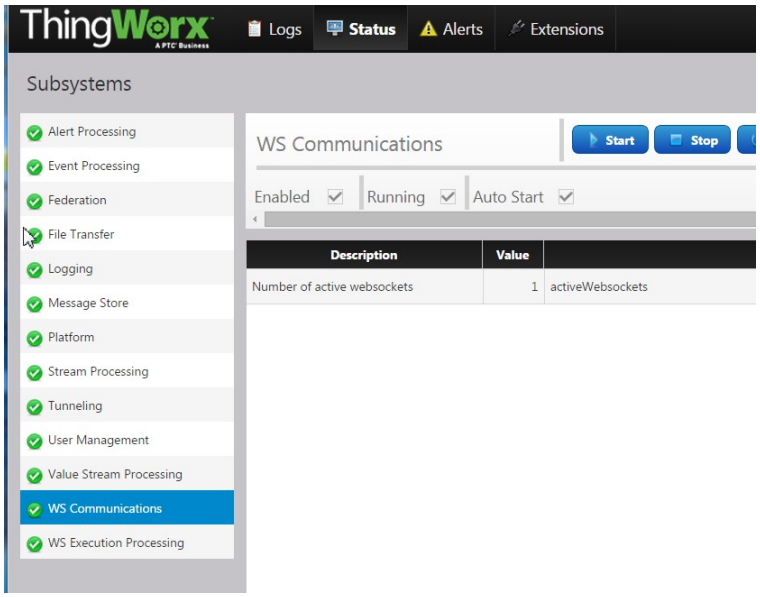


7. Refer to the Troubleshooting section for assistance with problems encountered at this stage.

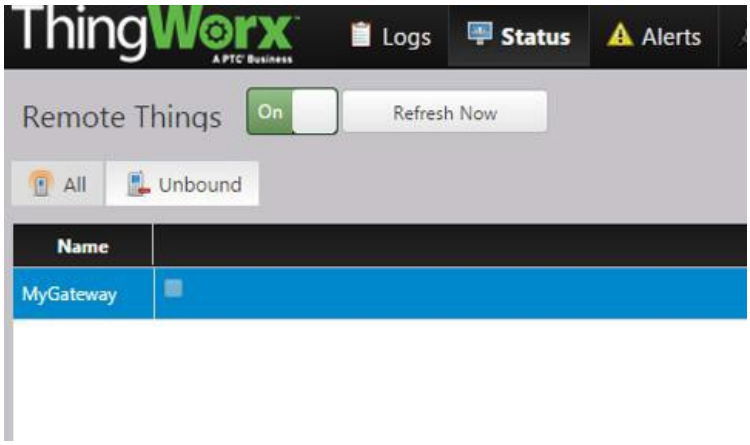
Verify the Connection on the Platform

1. On your ThingWorx platform, navigate to the “Monitoring” drop-down at the top-right of the Composer, choose “subsystems”, and then click “WS Communications” and “Refresh Now”. You should see an active websocket listed.





2. You can verify that the connected websocket is the one configured from the MultiTech device by checking the "Remote Things" and then the "Unbound" tab at the top right. You should see a device listed with the same identifier as that listed in your config.json file.



At this point, your MultiConnect device is connected to the ThingWorx Platform.

Troubleshooting

	Problem	Solution(s)
1.	I cannot connect to the MultiConnect device from my local computer.	1. Ensure that your Ethernet Adapter is active in Windows, and that the IP address is configured manually. Choose an IP address on the same range as that of the MultiConnect Device. 2. Reset the MultiConnect Device by holding the RESET button on the front for 5 seconds, while it is powered on, and then try again. 3. See the *Quick Start Guide* for more assistance.
2.	The included EMS and lua packages will not install with Open PacKaGe utility.	1. Verify that your Open PacKaGe utility is installed on the device. 2. Ensure that you are running the command from the same directory as the location of the two .ipk files. 3. Try installing the files on a different directory on the device.

		4. Check the version number (r0.3 versus r0.1) of the package. Correct your install command to reference the version number of the package that you are installing. Verify that the rest of the command was typed correctly.
3.	The wsems fails to connect to the ThingWorx Platform.	1. Verify that the MultiConnect device has a valid internet connection. Type “ping 8.8.8.8” or similar and look for a response. 2. Verify that the wsems is executable. Read the error messages itreports to figure out if you have a problem with your installation. 3. Double-check the configuration parameters in config.json and verify that they are correct. Look for syntax errors. Start from the example text provided in this guide, under “Configure the MultiConnect Device”. 4. If all else fails, try first to connect to a ThingWorx Platform instance located on the local machine connected to the device, rather than over the internet.
4.	I cannot locate the wsems file.	1. Included in this package is a wsems executable, which you can copy to your device for installation purposes.

Compatibility

This guide has been tested for compatibility with the DEVICE and the following ThingWorx platform and operating system:

ThingWorx Platform Version	ThingWorx 6.0.1
OS	Windows 7, Service Pack 1

Document Revision History

Revision Date	Version	Description of Change
August 12, 2015	1.0	Initial Release