LiteNet OTAP – User Manual

## Introduction

LiteNet firmware running on the ‘nodes’ – or IoT devices deployed in the field networks – can be upgraded ‘Over-The-Air’. This is accomplished using the functionality built in to the Wirepas stack (Wirepas Massive IoT stack). In addition, certain tools are used to in the process. This document describes the procedure.

## Tools Used

### WNT Server

Over-The-Air Programming (OTAP) is orchestrated by Wirepas Networking Tool (WNT) server running on the cloud. LiteNet runs this service on a machine reachable at wpwnt1.ddns.net.

Each network of nodes has to connect to this server so that it is discovered by WNT.

#### Installation Information

WNT4 was installed on Ubuntu 20.04 LTS VM. Ansible was used to install the docker-based images. “No-certs” option was chosen. (That is, TLS is not enabled for communication between WNT server and the gateways/WNT client.

Please check wnt/customer\_report.rst for ports and credentials to be used while configuring WNT client and/or gateway transport services.

Please check the link for details:

<https://developer.wirepas.com/support/solutions/articles/77000499208-wirepas-services-installer-for-wnt4-user-guide>

### WNT Client

This is a GUI client running on a local desktop that connects to WNT Server. The GUI provides support for initiating OTAP.

Note: Current version of WNT Client DOESN’T work well with smaller displays. Windows don’t get resized properly, so some functionality may not be visible. Please use a larger screen, and verify that you are able to scroll up/down and right/left as you traverse the menus.

Please check this link for installation details:

<https://developer.wirepas.com/support/solutions/articles/77000513590-wirepas-network-tool-v4-1-client-setup-4-1-1->

After installation, ‘customer\_report.rst’ from WNT server can be used to connect to the server.

### Wirepas Gateway Transport Service

Typically, Litenet installs a customized cloud service on the gateway node. This service, over MQTT, communicates with the customers’ application server (IoT Server), allowing the IoT Server to control and monitor devices.

However for OTAP, the cloud service has to communicate with a WNT server. This interface uses protobuf to encode the data, and predefined MQTT topics are used. You need to install Wirepas transport service 1.4.1 on the gateway and configure it.

Gateway transport service may be installed on the gateway following this link:

<https://github.com/wirepas/gateway>

Follow “Native Installation” procedure to download Python package and build. Version 1.4.1 was downloaded and built (Sept 2022).

### Wirepas Gateway SinkService

Similar to transport service, you may be running a customized sink service, which handles communication with the sink nodes (devices) connected to the gateway. OTAP would require you to stop this service, and start Wirepas sink service.

Though above link provided pre-built sinkService, the file wouldn’t execute on Raspberry Pi (32-bit Arm). The source code had to be downloaded (gateway sink service) and built. This in turn required c-mesh-api (<https://github.com/wirepas/c-mesh-api>) to be downloaded. Makefile was modified to build the c-mesh-api library first and then sinkService was built.

## Setting up and Performing OTAP

Now that the environment is set up, we are ready to perform OTAP. It is assumed that we have already built the new images for downloading, and corresponding ‘.otap’ file is available.

1. Make sure that the WNT server is running.
2. Login to the gateway node(s). SocketXP or any other mechanism may be used, if physical access is not available.
   1. Stop LiteNet gateway components – $sudo /etc/init.d/litenet\_gw.sh stop
   2. Start Wirepas Sink Service. (Note: port, sink\_node Id etc may differ): sudo /opt/litenet/gateway/bin/wp-sinkService-v1.4.1 -b 125000 -p /dev/ttyACM0 -i 1 &
   3. Start Wirepas transport service (Built under ~/.local/bin): ./wm-gw --settings=../../wp-gateway/wpgw-1.yml 2>&1 > /tmp/gw.log &

Here is the input file used:

litenet@raspberrypi:~ $ cat wp-gateway/wpgw-1.yml

# MQTT brocker Settings

#

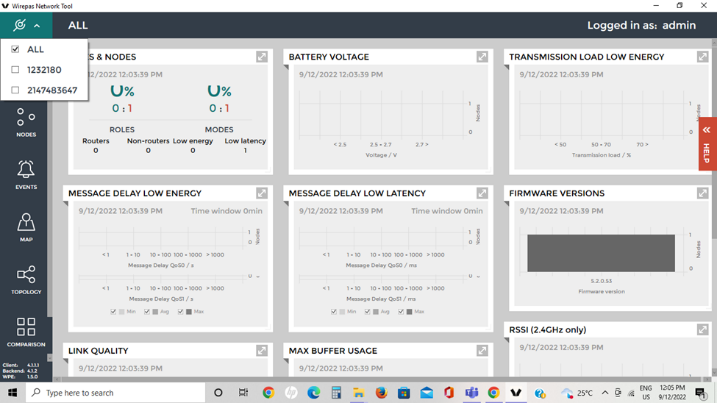
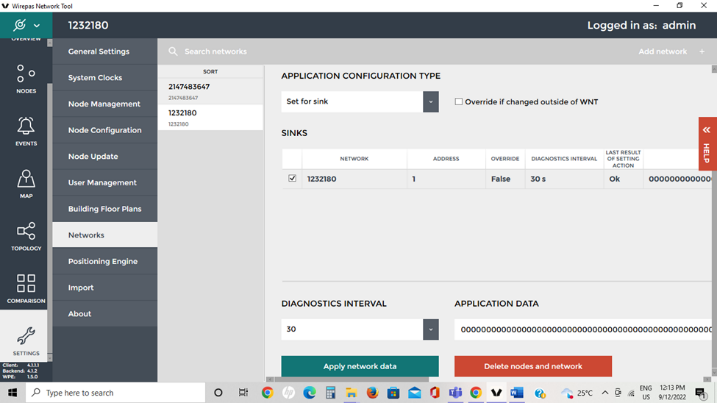
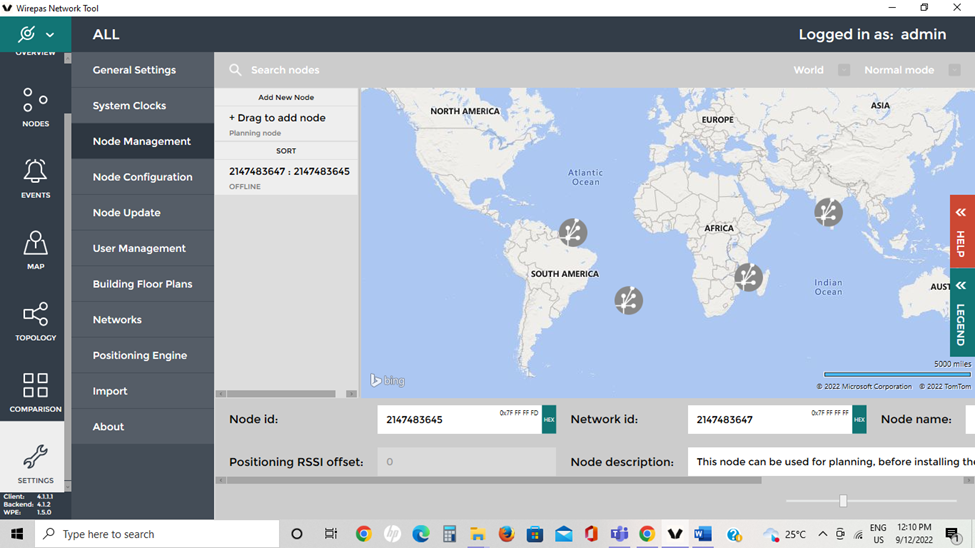
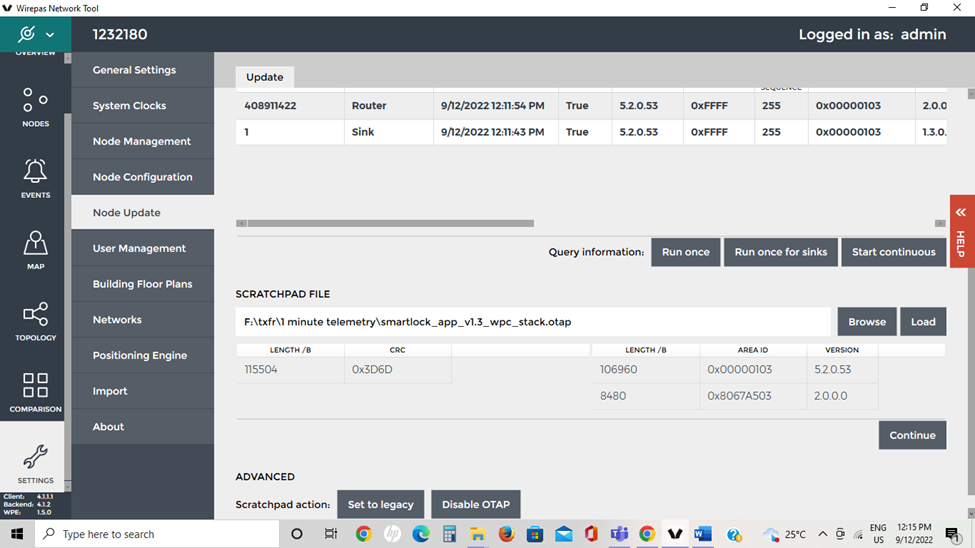
mqtt\_hostname: wpwnt1.ddns.net

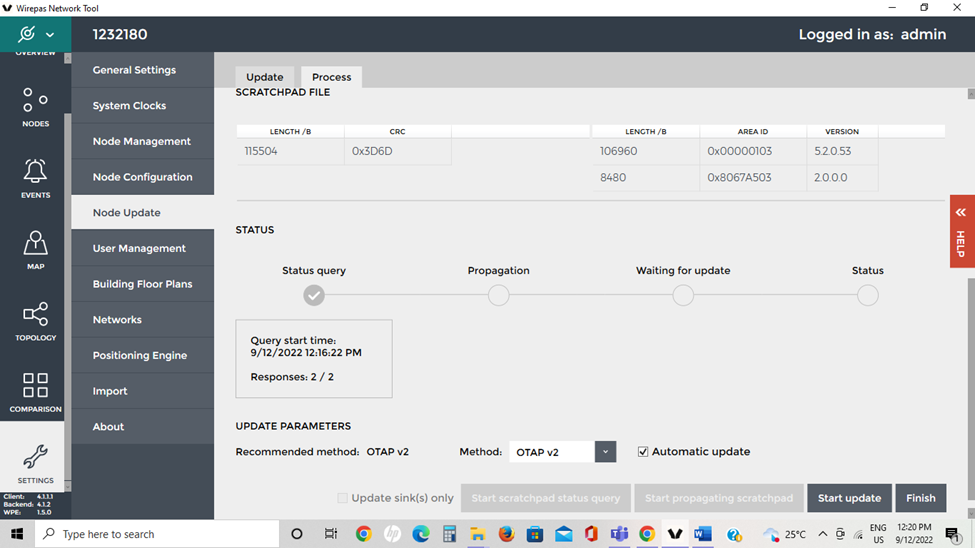
mqtt\_port: 1883

mqtt\_username: mosquittouser

mqtt\_password: 0GxrDL54TpuquGlZqNRKCei3knW7y2

mqtt\_force\_unsecure: true

1. The gateway starts communicating to WNT server now. If we login to the WNT client, we should see the network.
2. Go to “Settings/Networks” and enable Diagnostics for the newly discovered network.
3. “Approve” the nodes from Node Management screen.
4. Go to “Node Update”. Query the nodes for information (“Run Once”), and browse and load the scratchpad with the OTAP file.
5. Select “Continue”, “OTAP v2” and then “Start Update”



This will start OTAP. Will take a few minutes and when done, the nodes will have new firmware.