

LoRa Receivers

WEDNESDAY, 1/23/2019

LoRa Gateway Autostart

It's useful to make LoRa Gateways start immediately on power-up, here is one approach to make this happen:

1) Edit `/etc/rc.local` to include:

```
#SH allows autostart of LoRa Gateway
printf "Starting LoRa Gateway in background screen\n"
printf "sudo screen -dr to attach\n"
screen -dmS gateway /home/pi/lora-gateway/myRunGateway
```

Before the final pre-existing:

```
exit 0
```

2) In `~/lora-gateway` create **myRunGateway** to include:

```
#!/bin/bash
trap 2;
cd /home/pi/lora-gateway;

while true;
do
    ./gateway;
done;
```

3) Make the **myRunGateway** script executable by typing in a terminal window:

```
sudo chmod +x myRunGateway
```

4) In `~/lora-gateway` create **myLoRaScreen** to include:

```
#!/bin/bash
trap 2;

while true;
do
    sudo screen -dr;
done;
```

5) Make the **myLoRaScreen** script executable by typing in a terminal window:

```
sudo chmod +x myLoRaScreen
```

6) In ~/ make a directory called: icons

```
cd
sudo mkdir icons
```

7) In ~/icons add a file called lora.png that contains a suitable logo in png format

eg <http://www.ineo-sense.com/wp-content/uploads/2015/02/Lora.jpg> (<http://www.ineo-sense.com/wp-content/uploads/2015/02/Lora.jpg>)_converted to a png

8) In ~/Desktop create **LoRaScreen.desktop** to include:

```
[Desktop Entry]
Name=LoRa Gateway
Icon=/home/pi/icons/lora.png
Exec=lxterminal -e '/home/pi/lora-gateway/myLoRaScreen'
Type=Application
```

What Do These Things Do?

On Pi restart, the rc.local script is executed by the Pi system software, this then automatically starts the myRunGateway script inside an (initially) background/invisible screen instance. myRunGateWay runs the LoRa Gateway in a loop such that if it is quit (with a q or a force-quit CTRL-C) it automatically restarts. Thus at power-on, the LoRa Gateway automatically starts without user intervention and it is quite difficult to stop accidentally - useful, for example, if providing a LoRa gateway to an inexperienced chase car team.

If a user establishes a terminal window connection to the Pi either via the graphical interface or if connecting remotely eg via ssh, it is possible to connect to the otherwise background/invisible screen instance that is running the gateway by executing:

```
sudo screen -dr
```

This will display the standard LoRa Gateway user interface in the terminal window.

If the user (accidentally or deliberately) quits the LoRa Gateway by typing q or CTRL-c, then the myRunGateWay script automatically restarts the LoRa Gateway.

At any point, the terminal window can be detached from the screen instance by typing: CTRL-a then CTRL-d. Detaching does not stop the LoRa Gateway. Terminal windows may be attached / detached / re-attached / at any time using this approach - though only one terminal window can be connected at any one time.

If the user establishes a graphical interface connection to the Pi then they can also choose to connect to the LoRa Gateway background/invisibel screen instance by double-click on the LoRa Gateway icon (the lora.png image) which is visible on the Pi desktop. This will execute the myLoRaScreen script in a terminal window which connects to the LoRa Gateway screen instance created by myRunGateway. This screen instance can be dismissed by clicking on the close window X in the top right hand corner of the terminal window - the LoRa Gateway continues to run in the background/invisble screen instance. The LoRa Gateway icon may be double-clicked again at any time to rejoin the LoRa Gateway screen instance.

One limitation of this approach is that only one connection - either via a terminal window or via the graphical user interface can exist at any given time. Thus:

- (i) If the screen instance is running in a terminal window and a second terminal window invokes the sudo screen -dr command then the second terminal window takes over.
- (ii) If the screen instance is running in a terminal window and a graphical user connection is established then the graphical user take over.
- (iii) If the screen instance is running in a graphical user connection and a terminal connection is established then the terminal connection fails to take over. A workaround to allow a terminal connection to take over a graphical user connection it is to kill the graphical user terminal connection; at the terminal prompt use ps -ef to list current processes, scan the list for a terminal process running the LoRa Gateway, note the PID of that process then try sudo kill that_pid_number. It should now be possible to connect terminal using sudo screen -dr.
- (iv) If the screen instance is running in a graphical user connection and a second graphical user interface connection is established then the gateway "bounces between" the graphical user interface windows. This bouncing stops if one of the windows is closed by clicking on the close window X or by using the kill process option outline above.

If for a period of time you don't want the LoRa Gateway to execute automatically on a restart, edit /etc/rc.local to comment out the line:

```
#screen -dmS gateway /home/pi/lora-gateway/myRunGateway
```

Then reboot.

Simplifying Control Of Gateway Autostart

The following scripts and files can be created and used to simplify turning Gateway autostart on and off

In ~/lora-gateway create myAutoStartGateway to include:

```
#!/bin/bash

cd /home/pi/lora-gateway;
sudo rm myRunGateway;
sudo cp myRunGateway-autostart myRunGateway;
sudo reboot;
```

Make this script executable by typing in a terminal window:

```
sudo chmod +x myAutoStartGateway
```

In In ~/lora-gateway create myRunGateway-autostart by typing in a terminal window:

```
sudo cp myRunGateway myRunGateway-autostart
```

Make this script executable by typing in a terminal window:

```
sudo chmod +x myRunGateway-autostart
```

In ~/lora-gateway create myNoAutoStartGateway to include:

```
#!/bin/bash

cd /home/pi/lora-gateway;
sudo rm myRunGateway;
sudo cp myRunGateway-noautostart myRunGateway;
sudo reboot;
```

Make this script executable by typing in a terminal window:

```
sudo chmod +x myNoAutoStartGateway
```

In ~/lora-gateway create myRunGateway-noautostart to include:

```
#!/bin/bash
```

Make this script executable by typing in a terminal window:

```
sudo chmod +x myRunGateway-noautostart
```

To make the Gateway autostart, type in a terminal window:

```
./myAutoStartGateway
```

The pi will restart and the Gateway will automatically start

To stop the Gateway from autostarting, type in a terminal window:

```
./myNoAutoStartGateway
```

The pi will restart and the Gateway will not automatically start.

The gateway can still be manually started by executing in a terminal window:

```
cd
cd lora-gateway
./gateway
```

Note: if the gateway is running in the screen instance , trying to start it manually returns an error; The gateway program is already running!

Gateway File Management

To simplify Gateway file management the following script can delete all SSDV, telemetry and packet data.

In ~/lora-gateway create **myDeleteGatewayFiles** to include:

```
#!/bin/bash

cd /home/pi/lora-gateway;
sudo rm telemetry.txt;
sudo rm packets.txt;
sudo rm /home/pi/lora-gateway/ssdv/*.*
```

Make this script executable by typing in a terminal window:

```
sudo chmod +x myDeleteGatewayFiles
```

This script is useful to run prior to following a new flight:

```
./myDeleteGatewayFiles
```

Gateway Edits

To add a helpful hint regarding exiting the screen process to the gateway help screen, edit the gateway file **gui.c**
Insert AFTER:

```
printf( buffer, "M = Toggle Modes (This is not implemented yet!!!) ");
mvdstr( 12, ( 80 - strlen( buffer ) ) / 2, buffer );
```

These extra lines:

```
printf( buffer, "If running in a background screen CTRL-a CTRL-d to exit");
mvdstr( 13, ( 80 - strlen( buffer ) ) / 2, buffer );
```

This edit will have to be performed each time the gateway is updated...
(unless I can persuade Dave Akerman to incorporate it...)