Packet Forwarder Does Not Start on IXM When Radio is Off

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Introduction

This document describes how to resolve the issue where the packet forwarder on the IXM does not start when LoRa radio is off on the IXM.

Problem

When you deploy a fresh IXM and install the Actility LRR package, you can see this message in the LRR trace.log:

```
Gateway#show packet-forwarder log name trace 250
...
03:40:45.990  (00834) [../main.c:954] no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/dyncalib.ini'
03:40:45.990  (00834) [../main.c:979] search
'/tmp/mdm/pktfwd/firmware/lrr/config/channels_eu868_2015.ini'
03:40:45.990  (00834) [../main.c:2127] load default
'/tmp/mdm/pktfwd/firmware/lrr/config/channels_eu868_2015.ini'
03:40:45.990  (00834) [../main.c:951] search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/channels.ini'
03:40:45.990  (00834) [../main.c:954] no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/channels.ini'
03:40:45.991  (00834) [../main.c:2354] lgw thread is started
03:40:45.991  (02398) [../lgw_gen.c:1820] start lrr.x/lgw th=b63a7380 pid=834 count=1 capture=0
03:40:45.993  (02398) [../lgw_x8.c:1053] BOARD1 RADIO cannot be started ret=-1 'Invalid version
number for the top FPGA'
03:40:45.993  (02398) [../lgw_gen.c:1530] enter Idle loop ... waiting for cancelation
03:41:45.980  (00834) [../main.c:5346] no LRC connection during more than 1200sec => revssh
```

The packet forward stops furter initialisation and does not attempt to connect to the TPE or TPW LRC.

Solution

The reason, although not clear from the error message, for the error is because the radio hasn't been started on the IXM.

This is called "out-of-the-box".

You can check this as follows:

```
Gateway#show radio
LORA_SN: FOC203310DG
LORA_PN: 95.1602T00
LORA_SKU: 868
LORA_CALC: <135,123,115,107,99,95,91,87,78,70,62,53,45,41,37,33-
133,120,112,104,96,92,88,84,75,67,59,51,43,39,35,31>
CAL_TEMP_CELSIUS: 34
CAL_TEMP_CODE_AD9361: 90
RSSI_OFFSET: -204.07,-203.78
LORA_REVISION_NUM: A0+
RSSI_OFFSET_AUS:

radio status:
off
```

As you can see in the last line, the radio is marked as off.

In order to turn the radio on, follow this:

```
Gateway#configure terminal
Gateway(config)#no radio off
Gateway(config)#exit
*Aug 06 03:45:28: Configured from console by console
Gateway#copy running-config start
!

Copy 333 bytes took 00:00:01 [hh:mm:ss]
```

Then, restart the packet forwarder:

```
Gateway#configure terminal
Gateway(config)#packet-forwarder restart
Restarted packet-forwarder
Gateway(config)#exit
*Aug 06 03:46:07: Configured from console by console
```

As you can see in the TRACE.log now, the packet forwarder is able to start:

```
Gateway#show packet-forwarder log name trace 250
...
######################################################################
### restart(1) : 20160806  03:45:43
### pid=2741 szmax=unlimited (config files not yet read)
######################################################################
03:45:43.479  (02741) Traces activated for startup
03:45:43.515  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/bootserver.ini'
03:45:43.515  (02741) no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/bootserver.ini'
03:45:43.515  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/_system.sh'
03:45:43.515  (02741) load custom '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/_system.sh'
03:45:43.516  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/_parameters.sh'
03:45:43.516  (02741) load custom '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/_parameters.sh'
03:45:43.516  (02741) search '/tmp/mdm/pktfwd/firmware/lrr/config/defines.ini'
03:45:43.516  (02741) load default '/tmp/mdm/pktfwd/firmware/lrr/config/defines.ini'
```

```
03:45:43.516  (02741) search '/tmp/mdm/pktfwd/firmware/lrr/config/defines.ini'
03:45:43.516  (02741) load default '/tmp/mdm/pktfwd/firmware/lrr/config/defines.ini'
03:45:43.516  (02741) search '/tmp/mdm/pktfwd/firmware/lrr/config/lrr.ini'
03:45:43.516  (02741) load default '/tmp/mdm/pktfwd/firmware/lrr/config/lrr.ini'
03:45:43.519  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/lrr.ini'
03:45:43.519  (02741) load custom '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/lrr.ini'
03:45:43.519  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/gpsman.ini'
03:45:43.519  (02741) no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/gpsman.ini'
03:45:43.519  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/custom.ini'
03:45:43.519  (02741) load custom '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/custom.ini'
03:45:43.519  (02741) search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/_state.ini'
03:45:43.519  (02741) no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/_state.ini'
03:45:43.522  (02741) [trace.c:128] TRACE used szmax: 1000000
03:45:43.522  (02741) [../main.c:7781] start lrr.x/main th=b6adc010 pid=2741 sickrestart=0
03:45:43.522  (02741) [../main.c:7782] @(#) Actility lrr 2.4.21 07/09/18 target=ciscoms
host=Ubuntu14-dev
03:45:43.522  (02741) [../main.c:7783] SX1301_AR
03:45:43.522  (02741) [../main.c:7785] HAL 5.1.0
03:45:43.522  (02741) [../main.c:7788] lrrid=68480c3f lrridext=0000 lrridpref=04
03:45:43.522  (02741) [../main.c:979] search '/tmp/mdm/pktfwd/firmware/lrr/config/lowlvlgw.ini'
03:45:43.522  (02741) [../main.c:2020] load default
'/tmp/mdm/pktfwd/firmware/lrr/config/lowlvlgw.ini'
03:45:43.522  (02741) [../main.c:979] search
'/tmp/mdm/pktfwd/firmware/lrr/config/lowlvlgw_ciscoms.ini'
03:45:43.522  (02741) [../main.c:2030] load default
'/tmp/mdm/pktfwd/firmware/lrr/config/lowlvlgw_ciscoms.ini'
03:45:43.523  (02741) [../main.c:979] search
'/tmp/mdm/pktfwd/firmware/lrr/config/lgwx8_eu868_2015.ini'
03:45:43.523  (02741) [../main.c:2041] load default
'/tmp/mdm/pktfwd/firmware/lrr/config/lgwx8_eu868_2015.ini'
03:45:43.523  (02741) [../main.c:951] search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/lowlvlgw.ini'
03:45:43.523  (02741) [../main.c:2065] load custom
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/lowlvlgw.ini'
03:45:43.523  (02741) [../main.c:951] search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/lgw.ini'
03:45:43.523  (02741) [../main.c:954] no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/lgw.ini'
03:45:43.523  (02741) [../main.c:951] search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/dyncalib.ini'
03:45:43.523  (02741) [../main.c:954] no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/dyncalib.ini'
03:45:43.523  (02741) [../main.c:979] search
'/tmp/mdm/pktfwd/firmware/lrr/config/channels_eu868_2015.ini'
03:45:43.523  (02741) [../main.c:2127] load default
'/tmp/mdm/pktfwd/firmware/lrr/config/channels_eu868_2015.ini'
03:45:43.524  (02741) [../main.c:951] search '/tmp/mdm/pktfwd/firmware/usr/etc/lrr/channels.ini'
03:45:43.524  (02741) [../main.c:954] no custom configuration file
'/tmp/mdm/pktfwd/firmware/usr/etc/lrr/channels.ini'
03:45:43.525  (02741) [../main.c:7119] IfaceDaemon disabled
03:45:43.525  (02741) [../main.c:2296] gps thread is started
03:45:43.525  (02741) [../main.c:2354] lgw thread is started
03:45:43.525  (02741) [../shellcmd.c:155] cmd thread is started
03:45:43.525  (02741) [../rttping.c:406] thread itf idx=0 name='eth0' is started
03:45:43.525  (02741) [../main.c:7831] TRACE LEVEL IS SET TO 0
03:45:43.525  (02746) [../rttping.c:342] thread itf idx=0 name='eth0' is looping
03:45:43.526  (02744) [../lgw_gen.c:1820] start lrr.x/lgw th=b62da380 pid=2741 count=1 capture=0
03:45:43.527  (02743) [../gps.c:148] start lrr.x/gps th=b6adb380 pid=2741 count=1
```