

T5000 G8275.1 PTP Clock syn failure due to “managment message”

Country/Region: G

Equipment: ncell-T5000

Version: V3.6

1. Issue Description:

ITU-TG8275.1 PTP clock synchronize failed.

| AlarmSeverity | All | Alarm Raised Start Time | - - : : | End Time | - - : : | Filter |
|---------------|--------------------|-------------------------|---------------|---|---------|--------|
| SN | AlarmGID | AlarmName | AlarmSeverity | AlarmDesc | | |
| 1 | FM0000000430000001 | PTP STATUS ALARM | Critical | Cpgnbapp [All Active Cell] PTP Status Alarm | | |
| 2 | FM0600000130000004 | FHO ERROR | Major | FHO CLOCK is already unlock | | |

| AlarmSeverity | All | Alarm Raised Start Time | - - : : | End Time | - - : : | |
|---------------|--------------------|-------------------------|---------------|---|---------|--|
| SN | AlarmGID | AlarmName | AlarmSeverity | AlarmDesc | | |
| 1 | FM0000000430000001 | PTP STATUS ALARM | Critical | Cpgnbapp [All Active Cell] PTP Status Alarm | | |
| 2 | FM0600000160000000 | PTP PORT FAIL | Major | ptp clock class is not 6 | | |
| 3 | FM0600000160000000 | PTP PORT FAIL | Major | ptp clock class is not 6 | | |
| 4 | FM0600000160000000 | PTP PORT FAIL | Major | ptp clock class is not 6 | | |

2. Achieve Network Topology and NE Information

| | | | |
|--------------------|--------------------|--------------------|--------------------|
| GrandMaster | -> BC#1 | -> BC#2 | -> BBU |
| ClockIdentity: | Clock Identity: | Clock Identity: | Clock Identity: |
| 0x84c807fffe1d4358 | 0x649d99fffeb80040 | 0x649d99fffeb83c50 | 0x003064fffe6b2846 |

3. Suggested Troubleshooting Methods:

- 3.1 Compare ptp configurations
- 3.2 Check logs
- 3.3 Capture packets

4. Troubleshooting Procedures:

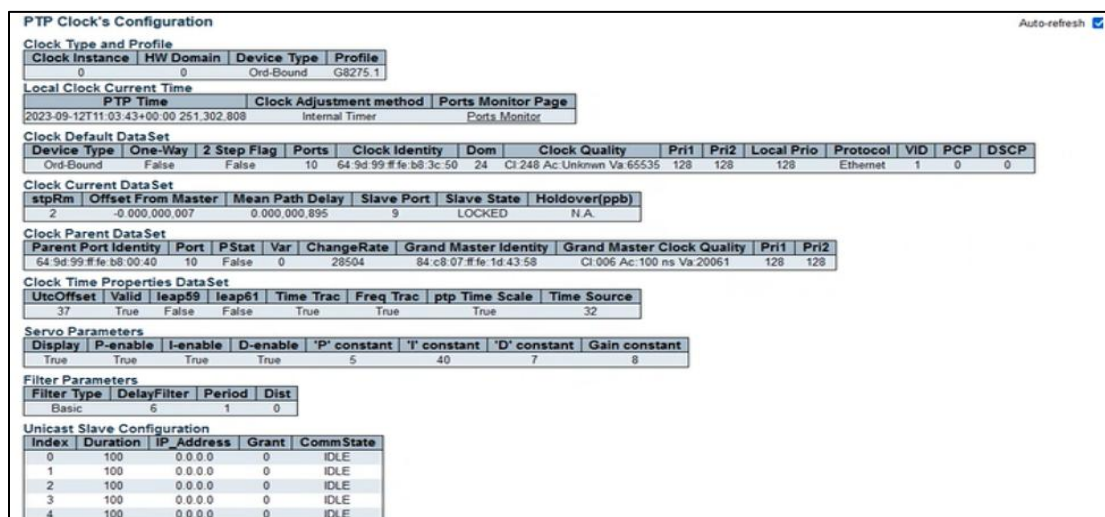
4.1 Align configurations with ptp server.

Align the eNodeB ptp syn protocol G82.75.1 profile and ptp server setting.

🕒 Upload **ptp4l-slave.cfg** to **/root**

🕒 In the directory **/opt/bbu/bts/scripts/**, backup the current **get1588Info.sh**, and upload the new **get1588Info.sh** (attached) in here

🕒 The configuration in PTP server as below picture:



PTP Clock's Configuration

Auto-refresh ☒

| Clock Type and Profile | | | |
|------------------------|-----------|-------------|---------|
| Clock Instance | HW Domain | Device Type | Profile |
| 0 | 0 | Ord-Bound | G8275.1 |

Local Clock Current Time

PTP Time: 2023-09-12T11:03:43+00:00 251.302.808

Clock Adjustment method: Internal Timer

Ports Monitor Page: Ports Monitor

| Clock Default Data Set | | | | | | | | | | | | |
|------------------------|---------|-------------|-------|-------------------------|-----|-----------------------------|------|------|------------|----------|-----|------|
| Device Type | One-Way | 2 Step Flag | Ports | Clock Identity | Dom | Clock Quality | Pri1 | Pri2 | Local Prio | Protocol | VID | DSCP |
| Ord-Bound | False | False | 10 | 64 9d 99 ff fe b8 3c 50 | 24 | Ci 248 Ac: Unknown Va 65535 | 128 | 128 | 128 | Ethernet | 1 | 0 |

| Clock Current Data Set | | | | | |
|------------------------|--------------------|-----------------|------------|-------------|---------------|
| stpRm | Offset From Master | Mean Path Delay | Slave Port | Slave State | Holdover(ppb) |
| 2 | -0.000.000.007 | 0.000.000.895 | 9 | LOCKED | N.A. |

| Clock Parent Data Set | | | | | | | |
|-------------------------|------|--------|-----|------------|-------------------------|-----------------------------|-----------|
| Parent Port Identity | Port | P Stat | Var | ChangeRate | Grand Master Identity | Grand Master Clock Quality | Pri1 Pri2 |
| 64 9d 99 ff fe b8 00 40 | 10 | False | 0 | 28504 | 84 c8 07 ff fe 1d 43 58 | Ci 006 Ac: 100 ns Va: 20061 | 128 128 |

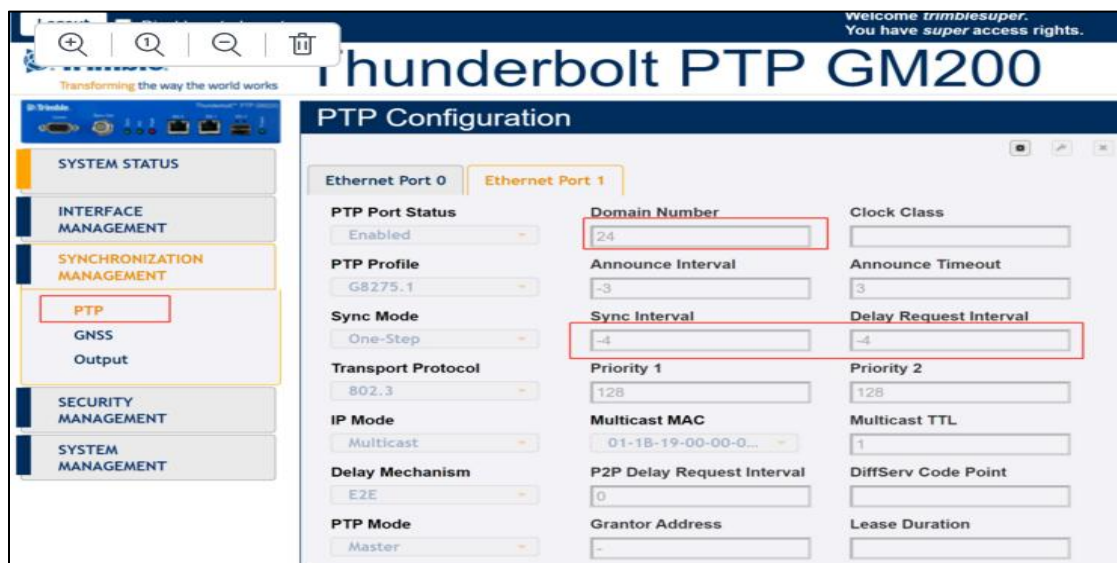
| Clock Time Properties Data Set | | | | | | |
|--------------------------------|-------|--------|--------|-----------|-----------|----------------|
| UtcOffset | Valid | leap59 | leap61 | Time Trac | Freq Trac | ptp Time Scale |
| 37 | True | False | False | True | True | 32 |

| Servo Parameters | | | | | | | |
|------------------|----------|----------|----------|--------------|--------------|--------------|---------------|
| Display | P-enable | I-enable | D-enable | 'P' constant | 'I' constant | 'D' constant | Gain constant |
| True | True | True | True | 5 | 40 | 7 | 8 |

| Filter Parameters | | | |
|-------------------|-------------|--------|------|
| Filter Type | DelayFilter | Period | Dist |
| Basic | 6 | 1 | 0 |

| Unicast Slave Configuration | | | | |
|-----------------------------|----------|------------|-------|-----------|
| Index | Duration | IP Address | Grant | CommState |
| 0 | 100 | 0.0.0.0 | 0 | IDLE |
| 1 | 100 | 0.0.0.0 | 0 | IDLE |
| 2 | 100 | 0.0.0.0 | 0 | IDLE |
| 3 | 100 | 0.0.0.0 | 0 | IDLE |
| 4 | 100 | 0.0.0.0 | 0 | IDLE |

Adjust the parameter as per below:



Thunderbolt PTP GM200

Welcome *trimblesuper*. You have *super* access rights.

PTP Configuration

Ethernet Port 0 | **Ethernet Port 1**

| | | |
|---------------------------|------------------------------------|----------------------------|
| PTP Port Status: Enabled | Domain Number: 24 | Clock Class: |
| PTP Profile: G8275.1 | Announce Interval: -3 | Announce Timeout: 3 |
| Sync Mode: One-Step | Sync Interval: -4 | Delay Request Interval: -4 |
| Transport Protocol: 802.3 | Priority 1: 128 | Priority 2: 128 |
| IP Mode: Multicast | Multicast MAC: 01-1B-19-00-00-0... | Multicast TTL: 1 |
| Delay Mechanism: E2E | P2P Delay Request Interval: 0 | DiffServ Code Point: |
| PTP Mode: Master | Grantor Address: - | Lease Duration: |

🕒 enable PTP manually with the command:

ptp4l -i enp184s0f0 -m -H -s -2 -f ptp4l-slave.cfg

4.2 Capture packets

| | | | | | | | | |
|-----|-----------|-------------------|-------------------|-------|-----|-------|------------|--|
| 130 | 13.602219 | FsCom_b8:3c:50 | IEEEI&MS_00:00:00 | PTPv2 | 60 | 14 | 1693989772 | Sync Message |
| 131 | 13.727237 | FsCom_b8:3c:50 | IEEEI&MS_00:00:00 | PTPv2 | 60 | 15 | 1693989772 | Sync Message |
| 132 | 13.852293 | FsCom_b8:3c:50 | IEEEI&MS_00:00:00 | PTPv2 | 60 | 16 | 1693989772 | Sync Message |
| 133 | 13.852405 | FsCom_b8:3c:50 | IEEEI&MS_00:00:00 | PTPv2 | 78 | 2 | | Announce Message |
| 134 | 13.94257 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 58 | 17346 | 0 | Delay_Req Message |
| 135 | 13.942962 | FsCom_b8:3c:50 | IEEEI&MS_00:00:00 | PTPv2 | 70 | 17346 | 1693989773 | Delay_Resp Message |
| 136 | 13.97725 | FsCom_b8:3c:50 | IEEEI&MS_00:00:00 | PTPv2 | 60 | 17 | 1693989773 | Sync Message |
| 137 | 14.037438 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 72 | 0 | | Management (Time properties dataset) GET |
| 138 | 14.047253 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 58 | 17347 | 0 | Delay_Req Message |
| 139 | 14.146736 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 100 | 0 | | Management (Parent dataset) GET |
| 140 | 14.255937 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 94 | 0 | | Management (Port dataset) GET |
| 141 | 14.268484 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 58 | 17348 | 0 | Delay_Req Message |
| 142 | 14.36528 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 118 | 0 | | Management (Unknown management id 49152) GET |
| 143 | 14.376423 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 58 | 17349 | 0 | Delay_Req Message |
| 144 | 14.579498 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 58 | 17350 | 0 | Delay_Req Message |
| 145 | 14.691352 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 58 | 17351 | 0 | Delay_Req Message |
| 146 | 14.736056 | AdlinkTe_6b:28:46 | IEEEI&MS_00:00:00 | PTPv2 | 72 | 0 | | Management (Time properties dataset) GET |

We can see an extract of the compatibility problem in the summary table below:

The BC#2 sends 8 sync message within a second: OK

The BC#2 sends 1 Announce message: OK

Followed by another set of 8 sync packet within a second: OK

The BC#2 sends 1 Announce message: OK

The BBU sends Delay Request message and the BC#2 responds with the Delay Response: OK

The BC#2 sends the first Sync message for the following seconds.

The BBU send a PTP Management message GET.

The BC#2 is not able to cope with that PTP Management message which may belong to the 1588 Profile but not to the G.8275.1 profile.

The BC#2 is not able to provide neither Sync nor Delay Response messages till the BBU stops during at least 3 seconds sending the PTP management messages.

At this point we come back to point 1 and the cycle repeat itself forever.

Customer Border clock source, according to 3GPP.

6.2.2 PTP messages used in the profile

This PTP profile uses the messages: *Sync*, *Follow_Up*, *Announce*, *Delay_Req*, and *Delay_Resp*.

The use of *Signalling* and *Management* messages is for further study.

Pdelay_Req, *Pdelay_Resp*, and *Pdelay_Resp_Follow_Up* messages are not used.

G.8275.1 not support “management” message.

5. Solution:

Modify the configuration of file /opt/bbu/bts/scripts/get1588Info.sh. Add “-b 0” after “-d 24” at place which invoke pmc.

As below:

```

> GET_1588_INFO_LOG
fi
msg="`pmc -u -d 24 -b 0 "get TIME_PROPERTIES_DATA_SET" 2>/dev/null | grep currentUtcOffset | head -n 1 | awk '{print $2}'`"
msg=$msg "`pmc -u -d 24 -b 0 "get PARENT_DATA_SET" 2>/dev/null | grep gm.ClockClass | awk '{print $2}' | head -n 1`"
portState=`pmc -u -d 24 -b 0 "get PORT_DATA_SET" 2>/dev/null | grep portState | awk '{print $2}' | head -n 1`
msg=$msg "$portState"
masterOffset=`pmc -u -d 24 -b 0 "get TIME_STATUS_NP" 2>/dev/null | grep master_offset | awk '{print $2}' | head -n 1`
msg=$msg "$masterOffset"
msg=$msg "`phc_ctl $OPTICAL_PORT1 get 2>/dev/null | tr -cd "0-9. " | awk '{print $2}'`"
echo "" >> $GET_1588_INFO_LOG
echo -n $msg >> $GET_1588_INFO_LOG

```

After modify and reboot. Clock locked.

Check the result in web GUI:

```

LST FGAFINFO;;
+++   BBU       2023-09-27 16:41:36
O&M   #1
%%LST FGAFINFO:;%%
RETCODE = 0   The command was executed successfully
List BBU Clock Synchronization Mode
*****
      ClockSynMode = 1588_mode
CurrentClockSynMode = 1588_mode
      ClockSyncStatus = lock

(Number of results = 1)

---   END

```

check the result in system:

a: `/opt/bbu/oam/log, tail -f get1588Info`


```
[root@localdomain ~]# tail -f /opt/bbu/oam/log/ptp41.log
2023/09/27 CST 16:25:53.913079 ptp41[209.657]: rms 9 max 24 freq -2488 +/- 15 delay 1374 +/- 1
2023/09/27 CST 16:25:54.915679 ptp41[210.657]: rms 9 max 16 freq -2503 +/- 8 delay 1374 +/- 1
2023/09/27 CST 16:25:55.913097 ptp41[211.657]: rms 14 max 30 freq -2478 +/- 21 delay 1374 +/- 1
2023/09/27 CST 16:25:56.913168 ptp41[212.657]: rms 11 max 20 freq -2466 +/- 15 delay 1374 +/- 2
2023/09/27 CST 16:25:57.913187 ptp41[213.657]: rms 14 max 25 freq -2502 +/- 13 delay 1377 +/- 1
2023/09/27 CST 16:25:58.913281 ptp41[214.658]: rms 10 max 19 freq -2487 +/- 16 delay 1376 +/- 1
2023/09/27 CST 16:25:59.913280 ptp41[215.658]: rms 9 max 19 freq -2489 +/- 15 delay 1375 +/- 1
2023/09/27 CST 16:26:00.913408 ptp41[216.658]: rms 7 max 14 freq -2501 +/- 8 delay 1375 +/- 1
2023/09/27 CST 16:26:01.913548 ptp41[217.658]: rms 13 max 22 freq -2480 +/- 19 delay 1372 +/- 2
2023/09/27 CST 16:26:02.913458 ptp41[218.658]: rms 7 max 13 freq -2480 +/- 11 delay 1373 +/- 1
2023/09/27 CST 16:26:03.913722 ptp41[219.658]: rms 11 max 23 freq -2499 +/- 14 delay 1374 +/- 1
2023/09/27 CST 16:26:04.913450 ptp41[220.658]: rms 9 max 17 freq -2482 +/- 15 delay 1374 +/- 2
2023/09/27 CST 16:26:05.913487 ptp41[221.658]: rms 8 max 19 freq -2484 +/- 13 delay 1373 +/- 2
2023/09/27 CST 16:26:06.913722 ptp41[222.658]: rms 11 max 23 freq -2505 +/- 13 delay 1375 +/- 1
2023/09/27 CST 16:26:07.913723 ptp41[223.658]: rms 11 max 24 freq -2502 +/- 18 delay 1373 +/- 2
2023/09/27 CST 16:26:08.913656 ptp41[224.658]: rms 7 max 10 freq -2500 +/- 11 delay 1376 +/- 2
2023/09/27 CST 16:26:09.913981 ptp41[225.658]: rms 11 max 22 freq -2481 +/- 13 delay 1376 +/- 1
2023/09/27 CST 16:26:10.913726 ptp41[226.658]: rms 13 max 26 freq -2464 +/- 14 delay 1374 +/- 1
2023/09/27 CST 16:26:11.913857 ptp41[227.658]: rms 9 max 14 freq -2482 +/- 13 delay 1375 +/- 1
2023/09/27 CST 16:26:12.913836 ptp41[228.658]: rms 13 max 24 freq -2504 +/- 14 delay 1375 +/- 1
2023/09/27 CST 16:26:13.913796 ptp41[229.658]: rms 10 max 19 freq -2508 +/- 14 delay 1374 +/- 2
2023/09/27 CST 16:26:14.913874 ptp41[230.658]: rms 8 max 14 freq -2507 +/- 13 delay 1374 +/- 2
```

b: login accelerator card, the result should be as below picture:

ssh [root@192.168.2.24](ssh://root@192.168.2.24)

sjnt1234

```
root@fgaf-zynqmp:/data#
root@fgaf-zynqmp:/data#
root@fgaf-zynqmp:/data# ./check_ad9545.sh
regval=00000033
root@fgaf-zynqmp:/data#
```

```
root@fgaf-zynqmp:/data# ./fpga rd 660
addr: 0x0660 value: 0x00000113
root@fgaf-zynqmp:/data#
```