Mobile data connection troubleshooting

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Contents

Summary

This is a quick guide to help in the debugging process of a router if encounters issues with mobile data connection.

Preparation

- First, to establish a data connection only through mobile module on RUT, you need connect to router via CLI/SSH (use SSH software such as PuTTY client):

```
CLI/SSH username: root
CLI/SSH password: <your router's password>
```

- Connect to mobile module of the router:

```
...
root@Teltonika:~# ifdown ppp
root@Teltonika:~# /etc/init.d/gsmd stop
root@Teltonika:~# microcom /dev/modem_cmd
+QCSQ: "LTE",47,-75,166,-10
+QCSQ: "LTE",47,-75,161,-10
+CREG: 1,"008B","012CD17",7
...
```

- You probably won't see anything when you type commands, and that's because the screen echo may be disabled. **ATE1** command will enable it so that you can see what you write.

```
...
ATE1
OK
...
```

- Use commands **AT+QCSQ=0** and **AT+CREG=0** to stop showing unnecessary output:

```
...
at+qcsq=0
OK
at+creg=0
OK
...
```

- Check communication (wait for the module to respond **OK**):

```
...
AT
OK
...
```

Debugging process

- If PIN is required, initialize modem with your PIN code:

```
...
AT+CPIN="xxxx"
...
```

- Use command **AT+CPIN** to query SIM card status:

```
...
AT+CPIN?
+CPIN: READY
...
```

Note: reboot the module if it fails to identify SIM

- Use command **AT+CREG** to check GSM connection:

```
...
AT+CREG?
+CREG: 0,1
OK
...
```

Note: OK means that the module has registered on CS domain service

- Use command **AT+CGREG** to check PS Service:

```
...
AT+CGREG?
+CGREG: 0,1
OK
...
```

Note: OK means that the module has registered in UMTS/LTE network

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- Use command **AT+QICSGP** to configure APN, user name, password and auth type:

```
AT+QICSGP=<contextID>[,<context_type>,<APN>[,<username>,<password>)[,<authent
ication>]]]
```

<context type> The protocol type (1 – IPV4; 2 – IPv6);

<context id> The range is 1-16;

<authentication> The authentication methods (0 – NONE; 1 – PAP; 2 – CHAP; 3-PAP or CHAP).

Example: **AT+QICSGP=1,1,"APN_Name","","",1**

```
...
AT+QICSGP=1,1"bangapro","","",1
OK
...
```

- Use command **AT+QIACT=<contextID>** to activate a PDP context:

```
...
AT+QIACT=1
OK
...
```

- Use command **AT+QIACT?** to query IP Address of the PDP context:

```
...
AT+QIACT?
+QIACT: 1,1,1,"88.77.66.55"
OK
...
```

Note: try and activate a PDP context a few times. If failed, then reboot the module.

- Use command **AT+QIOPEN** to open connection:

```
...
AT+QIOPEN
OK
...
```

Note: if failed – deactivate PDP context - use command **AT+QIDEACT=<context ID>** to deactivate PDP context.

- Use command **AT+QPING** to ping a Remote Server:

```
...
AT+QPING=1,"8.8.8.8"
OK
+QPING: 0,"8.8.8.8",32,54,255
+QPING: 0,"8.8.8.8",32,30,255
+QPING: 0,"8.8.8.8",32,35,255
+QPING: 0,"8.8.8.8",32,34,255
+QPING: 0,4,4,0,30,54,37
...
```

1 –The context ID. The range is 1-16;

8.8.8.8 - The host address in string type.

Note: if ping a remote server successfully, response is **OK** (means that the module works properly). If there is any error, response is **ERROR** (means the problem is in the module).

Example for the provided configuration

```
...
root@Teltonika:~# ifdown ppp
root@Teltonika:~# /etc/init.d/gsmd stop
root@Teltonika:~# microcom /dev/modem_cmd
+QCSQ: "LTE",47,-75,166,-10
+QCSQ: "LTE",47,-75,161,-10
+QCSQ: "LTE",47,-75,156,-10
+CREG: 1,"008B","012CD17",7
AT+QCSQ=0
OK
+CREG: 1,"008B","012CD0D",7
+CREG: 1,"008B","012CD17",7
AT+CREG=0
OK
AT
OK
...

...
AT+CPIN?
```

```
+CPIN: READY
OK
AT+CREG
OK
AT+CREG?
+CREG: 0,1
OK
AT+CREG
OK
AT+CGREG?
+CGREG: 0,1
OK
AT+QICSGP=1,1"bangapro","","",1
OK
AT+QIACT=1
OK
AT+QIACT?
+QIACT: 1,1,1,"88.77.66.55"
OK
...

...
AT+QIOPEN
OK
AT+QPING=1,"8.8.8.8"
OK
+QPING: 0,"8.8.8.8",32,54,255
+QPING: 0,"8.8.8.8",32,30,255
+QPING: 0,"8.8.8.8",32,35,255
+QPING: 0,"8.8.8.8",32,34,255
+QPING: 0,4,4,0,30,54,37
...
```