AT Socket Communication in Cavli Modules

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July 15, 2025

Objective

- Understand how TCP/IP communication is established using AT commands.
- Explore ‘AT+QIOPEN‘ and ‘AT+QISEND‘ used in Quectel and Cavli modules.
- Present usage examples and expected responses.

Typical Use Case: IoT TCP Client

- A microcontroller or embedded Linux device sends sensor data to a server.
- The module acts as a TCP client and opens a socket to send data.
- Common in telemetry, pings, OTA updates.

Step 1: PDP Context Setup

```
AT+CGDCONT=1,"IP","airtelgprs.com"
OK

AT+CGACT=1,1
OK
```

Step 2: Open TCP Socket (AT+QIOPEN)

```
AT+QIOPEN=1,0,"TCP","example.com",80,0,1
```

Expected Response:

- `OK`
- `+QIOPEN: 0,0` (0 = socket ID, 0 = success)
- `+QIOPEN: 0,1` means error

Step 3: Send Data (AT+QISEND)

```
AT+QISEND=0,17
> Hello from modem
```

After sending: `SEND OK`

Step 4: Close Socket

```
AT+QICLOSE=0
OK
```

Real Module Support

- Cavli C10GS, C42GM, CQM220 — LTE/5G/NB-IoT modules with TCP stack.
- Based on Quectel chipsets internally.
- These AT commands work over UART or USB CDC interface.

Typical Application Flow

1. Define APN using `AT+CGDCONT`
2. Activate PDP context with `AT+CGACT`
3. Open socket using `AT+QIOPEN`
4. Send data using `AT+QISEND`
5. Close connection using `AT+QICLOSE`

Conclusion

- Socket-based AT commands allow embedded systems to communicate over TCP.
- These commands are not available in CelerSMS Emulator.
- Understanding them is essential for IoT development on real Cavli/Quectel modules.

References

- Quectel EC25/EG91 AT Command Manual
- Cavli Module Documentation (e.g., C10GS, CQM220)
- `https://www.cavliwireless.com`