APN Configuration using `AT+CGDCONT` on Real GSM/LTE Modems

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1. Introduction

This report presents an in-depth explanation of the `AT+CGDCONT` command, which is critical for setting up mobile internet connectivity on GSM and LTE modems. While the CelerSMS AT Emulator does not support this command or simulate internet-related AT instructions, this document offers both theoretical and practical insights for real modem implementations, especially in embedded and IoT scenarios.

2. PDP Context and Its Importance

The **Packet Data Protocol (PDP) context** defines how the modem connects to a packet-switched data network such as the internet. It contains parameters like the context ID, PDP type, and APN (Access Point Name), which are essential for establishing mobile broadband sessions.

3. Command Overview: `AT+CGDCONT`

3.1. Syntax

AT+CGDCONT=<cid >,<PDP_type>,<APN>

3.2. Parameter Explanation

- `<cid>`: Context ID (1–16). Specifies the profile slot used.

- `<PDP_type>`: Type of connection: `"IP"`, `"IPV6"`, or `"IPV4V6"`.

- `<APN>`: Access Point Name, provided by the network operator (e.g., `"jionet"` or `"airtelgprs.com"`).

4. Practical Example: Jio (India)

To configure a Jio SIM for mobile internet:

AT+CGDCONT=1,"IP","jionet"

Explanation:

- `1` is the PDP context ID.

- `"IP"` indicates IPv4.

- `"jionet"` is the APN for Jio India.

This instructs the modem to prepare for an internet session via the 'jionet' APN using IPv4 addressing.

5. Follow-up Commands (Real Modem Usage)

After configuring the PDP context with `AT+CGDCONT`, you must activate the session using additional commands. These vary slightly between modem manufacturers.

5.1. Standard GSM/UMTS modems

AT+CGACT=1,1

Explanation: Activates PDP context 1.

5.2. Dial-up method (older 2G modems)

ATD*99#

Explanation: Initiates a data call using the active PDP context.

5.3. Quectel LTE modems (IoT modules)

AT+QIACT=1

Explanation: Activates PDP context 1 in Quectel modules.

6. Example Response from Real Modem

Once the context is set and queried, a typical output might be:

AT+CGDCONT?

+CGDCONT: 1,"IP","jionet","0.0.0.0",0,0
OK

7. Common APNs in India

Operator	APN
Jio	jionet
Airtel	airtelgprs.com
Vi (Vodafone-Idea)	www
BSNL	bsnlnet

8. Conclusion

Though the CelerSMS emulator lacks support for `AT+CGDCONT` and internet session commands, mastering this command is vital for real-world applications. In embedded systems and IoT devices, automating APN setup ensures seamless cellular connectivity. Knowledge of the `AT+CGDCONT` syntax, use cases, and follow-up commands prepares developers to configure and debug modems for reliable data communication.