



# Cellular Back-Off

This is an overview of the Cellular-Back off feature. This feature was implemented as a result of seeing error codes 33 and 209 being returned from a service provider when IOS initiates a session activation start too many times. This router behavior was considered detrimental to the network, as it was occurring every 50 to 60 seconds.

This feature has been enabled by default in IOS. There is no Command Line Interface (CLI) to explicitly control the behavior. There are two commands to use to view the details about the behavior:

- Enable **debug cellular <> message call-control** to view details
- Use **show cellular <> connection** to display back-off status

This feature is generic, it does not apply to any particular service provider. Only Error codes 33 or 209 starts the cellular back-off. The back-off timer values are in minutes, and cover the value range of {1, 1, 1, 1, 5, 10, 15, 30, 60}. For example:

- Will start from 1 minute, after receiving the first error code 33

One minute for receiving the 2nd error code 33

- One minute for receiving 3rd error code 33 (non-vzw) / 209 (vzw)
- One minute for receiving 4th error code 33 (non-vzw) / 209 (vzw)
- Five minutes for receiving 5th error code 33 (non-vzw) / 209 (vzw)
- Continue until back-off timer value reaches 60 minutes

If the error conditions persist, a new error code 33 received every 60 minutes will trigger the back-off timer start with a 60 minute timer period.

The back-off will be disabled/reset if one of following three operations take place in router:

- Session activation request successfully goes through - Disabled
- Modem power cycle - Reset
- Radio on/off - Reset

When the back-off is active, the following IOS console message will be displayed every 30 seconds:

```
*May 26 22:25:08.008: back off timer is running for PDN 0
```

When the back-off is disabled, the following IOS console message will be displayed

```
*May 26 23:00:08.008: %CELLWAN-6-CELLULAR_BACKOFF_STOP: Cellular0: Cellular back-off has stopped on PDN 0.
```

Typical IOS output is shown in the following example:

```
router# show cell 0/1/0 connection
Profile 1, Packet Session Status = INACTIVE
Profile 2, Packet Session Status = INACTIVE
Profile 3, Packet Session Status = INACTIVE
Profile 4, Packet Session Status = INACTIVE
```

```
Call end mode = 3GPP
Session disconnect reason type = 3GPP specification defined(6)
Session disconnect reason = Option unsubscribed(33)
  PDN 0
  Back off timer has been initialized
  Back off timer is running
  Back off error count: 5
  Back off timer index: 5
  Back off timer array (in minutes): 0 1 1 1 1 5 10 15 30 60

Enforcing cellular interface back-off
Period of back-off: 5 minute(s)
```