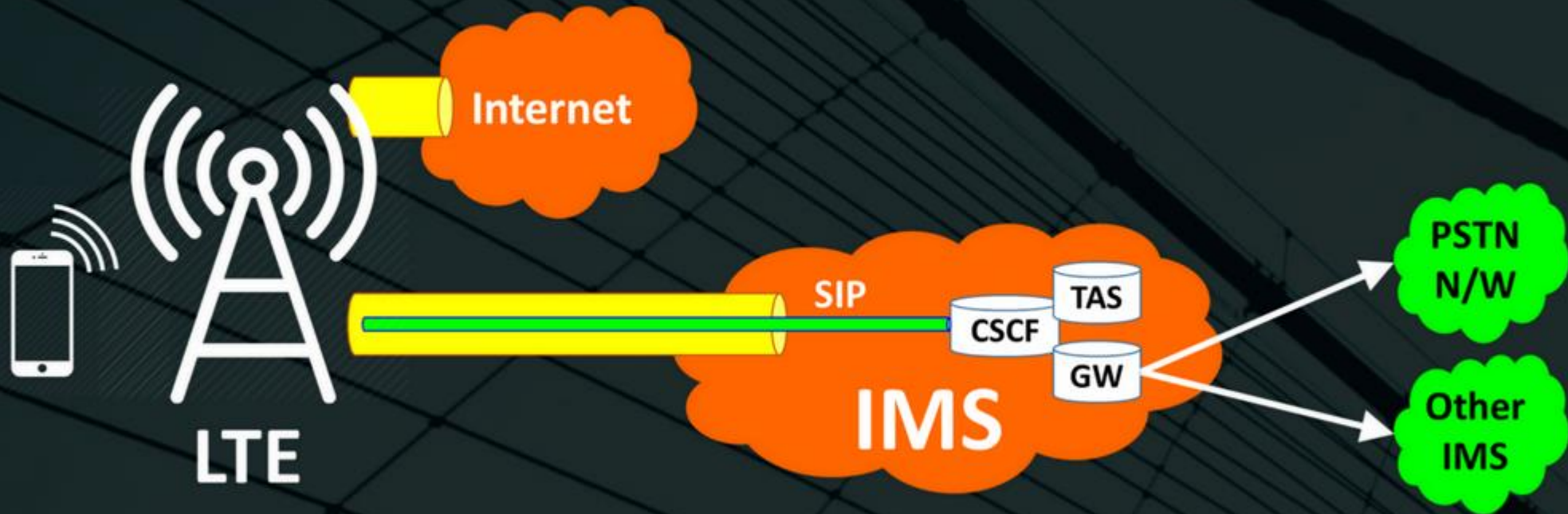


# VOLTE IMS



## SIP Registration Flow

## VoLTE Registration

- LTE Attach
- Default Vs Dedicated Bearer
- IMS Bearer
- SIP and IMS Registration
- TAS Registration

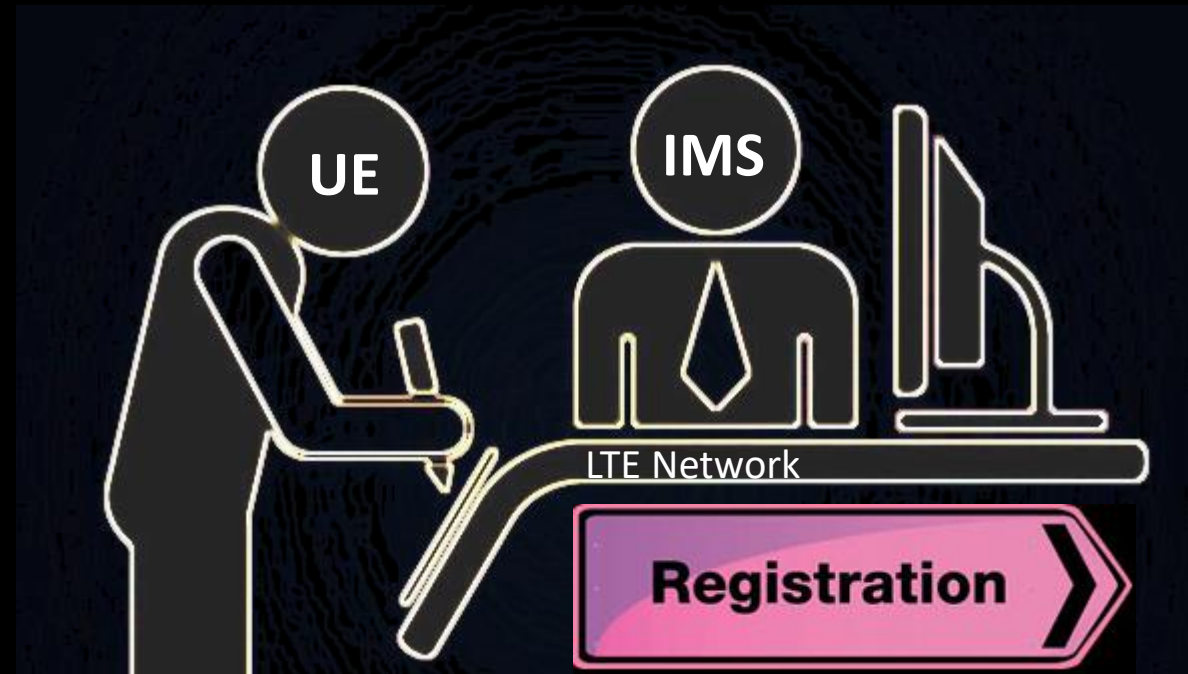
*Without a Solid foundation, you'll have trouble creating anything of value*

**Disclaimer :** Views expressed in this blog or Video are strictly mine and not of my employers or Equipment Manufacturers

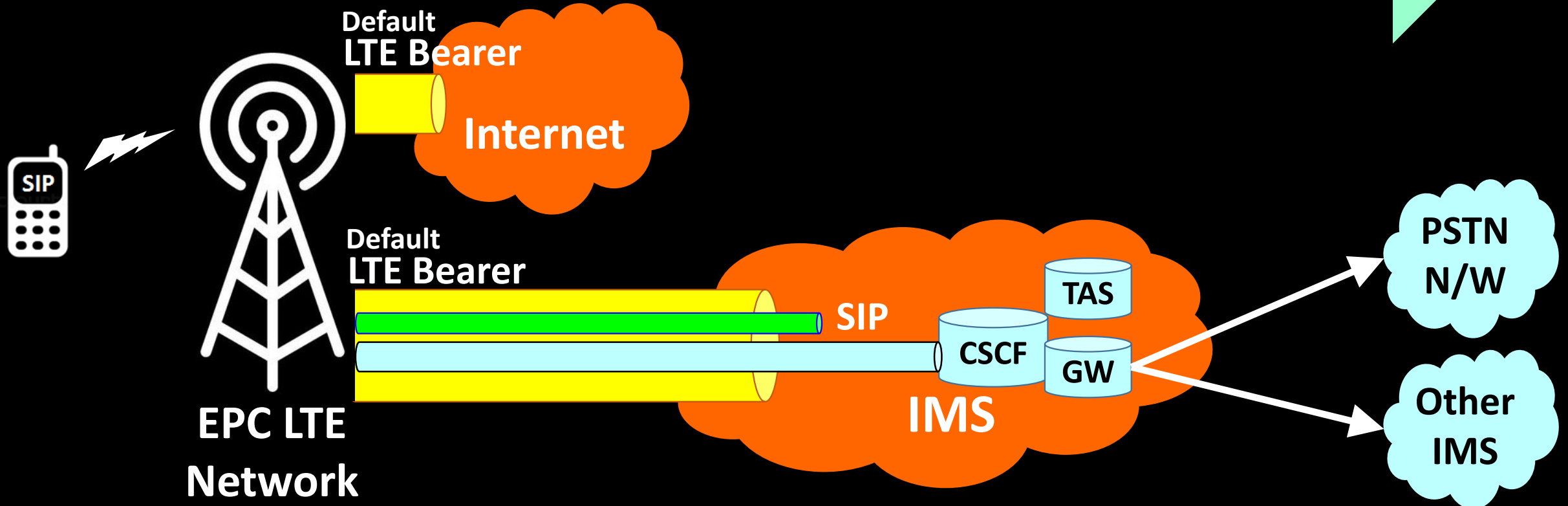
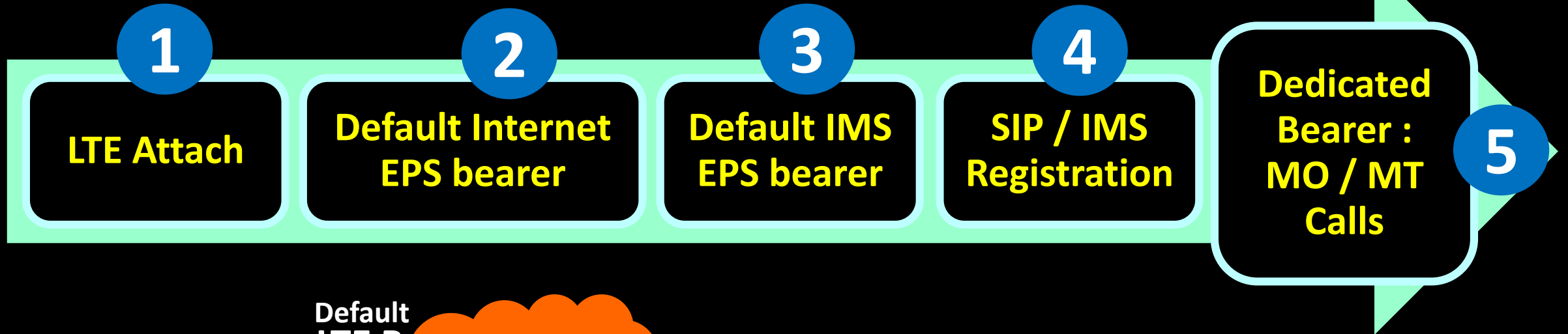
# VoLTE Registration

## VoLTE UE Behavior

1. LTE Attach
2. IMS Registration
  - Enables VoLTE Services
  - Ex : Calls , SMS ,  
Supplementary Services etc..



# VoLTE IMS Registration



# EPS bearer



## Default EPS Bearer

- Established during LTE Attach
- Allocate IP address to UE
- **Used for Always connected bearer :-**
  - **Internet Connectivity ( QCI : 6-9 )**
  - **SIP Signaling Connectivity ( QCI : 5 )**

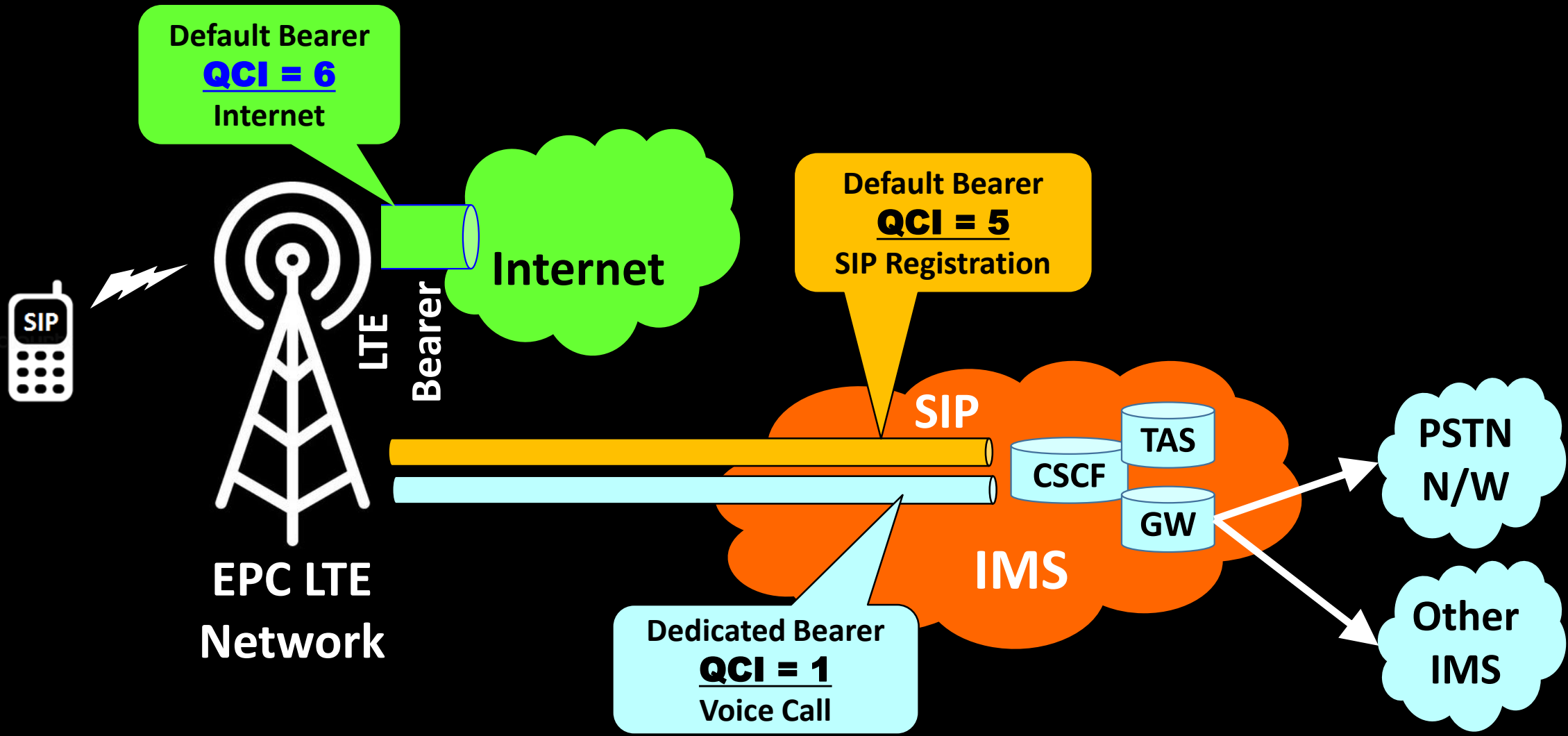
## Dedicated EPS Bearer

- Established during call
- No IP Address Allocation
- Linked to particular Default EPS Bearer
- Have a specific (usually guaranteed) QoS
- **Used for On-Demand bearer for :-**
  - **Voice Call ( QCI : 1 )**
  - **Video Call ( QCI : 2 )**

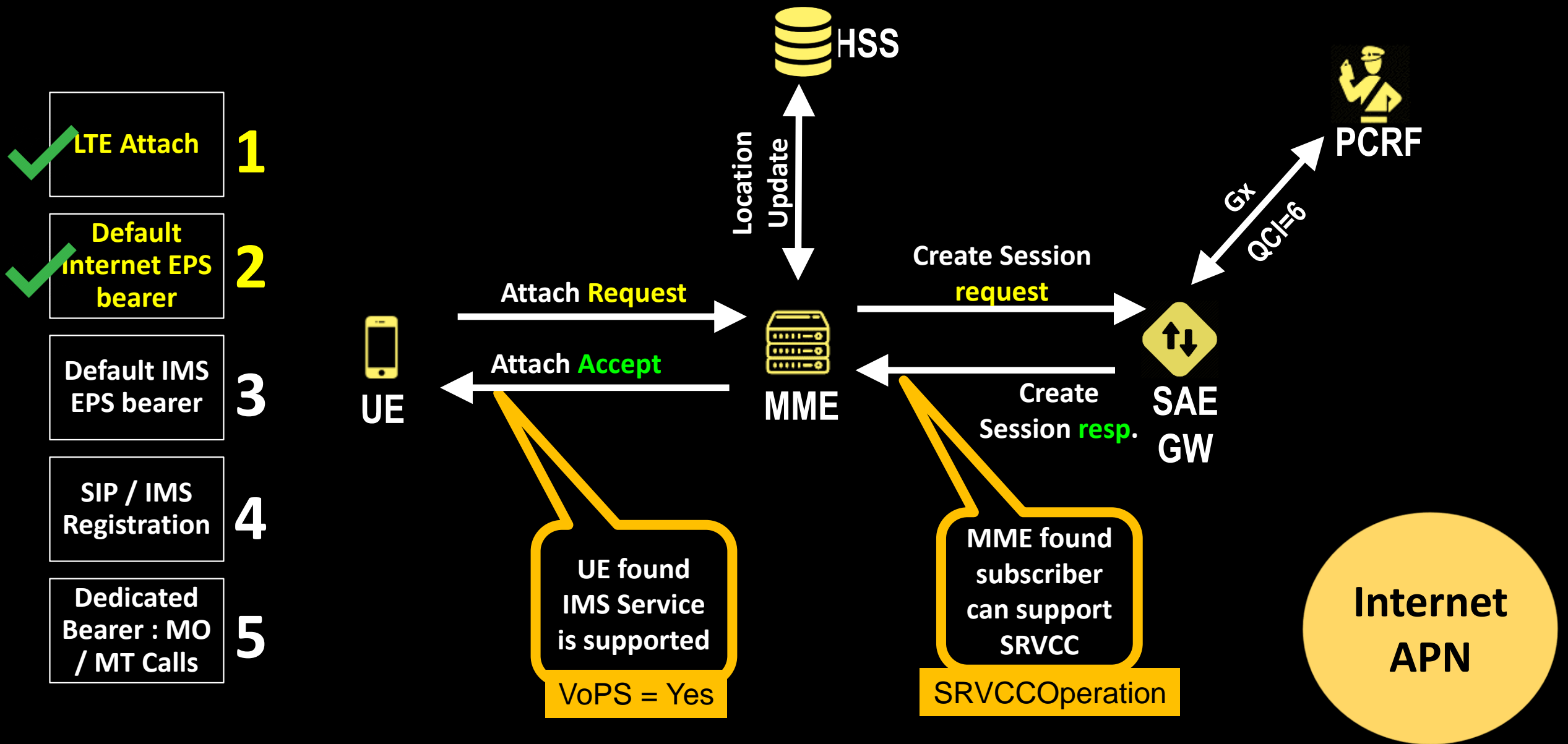
# What if LTE Radio is Congested ??

| Priority | QCI | Resource Type             | Packet Delay Budget    | Packet Error Loss Rate | Example Services                                     |
|----------|-----|---------------------------|------------------------|------------------------|--|
| 1        | 5   | non-GBR                   | 100ms                  | $10^{-6}$              | <b>Volte</b> , IMS Signaling                         |
| 2        | 1   | Guaranteed Bit Rate (GBR) | 100ms                  | $10^{-2}$              | <b>Volte</b> , Conversational Voice                  |
| 3        | 3   |                           | 50ms                   | $10^{-3}$              | Real Time Gaming, V2X messages                       |
| 4        | 2   |                           | 150ms                  | $10^{-3}$              | <b>Volte</b> , Conversational Video (Live Streaming) |
| 5        | 4   |                           | 300ms                  | $10^{-6}$              | Non-Conversational Video (Buffered Streaming)        |
| 6        | 6   |                           | non-GBR<br>Best Effort | 300ms                  | $10^{-6}$  |
| 7        | 7   | 100ms                     |                        | $10^{-3}$              |  |
| 8        | 8   | 300ms                     |                        | $10^{-6}$              |  |
| 9        | 9   | 300ms                     |                        | $10^{-6}$              |  |

# VoLTE UE Attach and IMS Registration



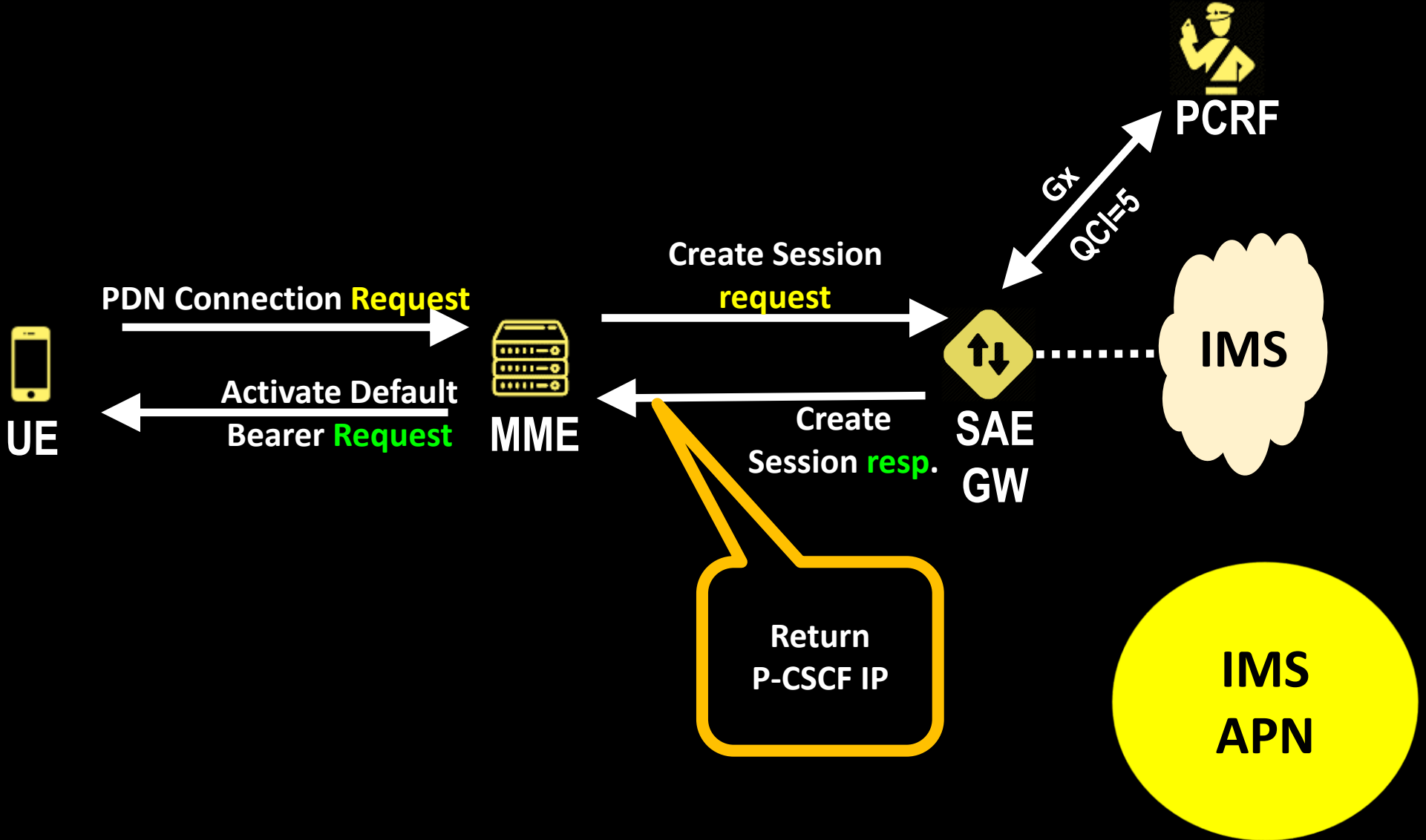
# LTE Attach & Default Internet EPS Bearer



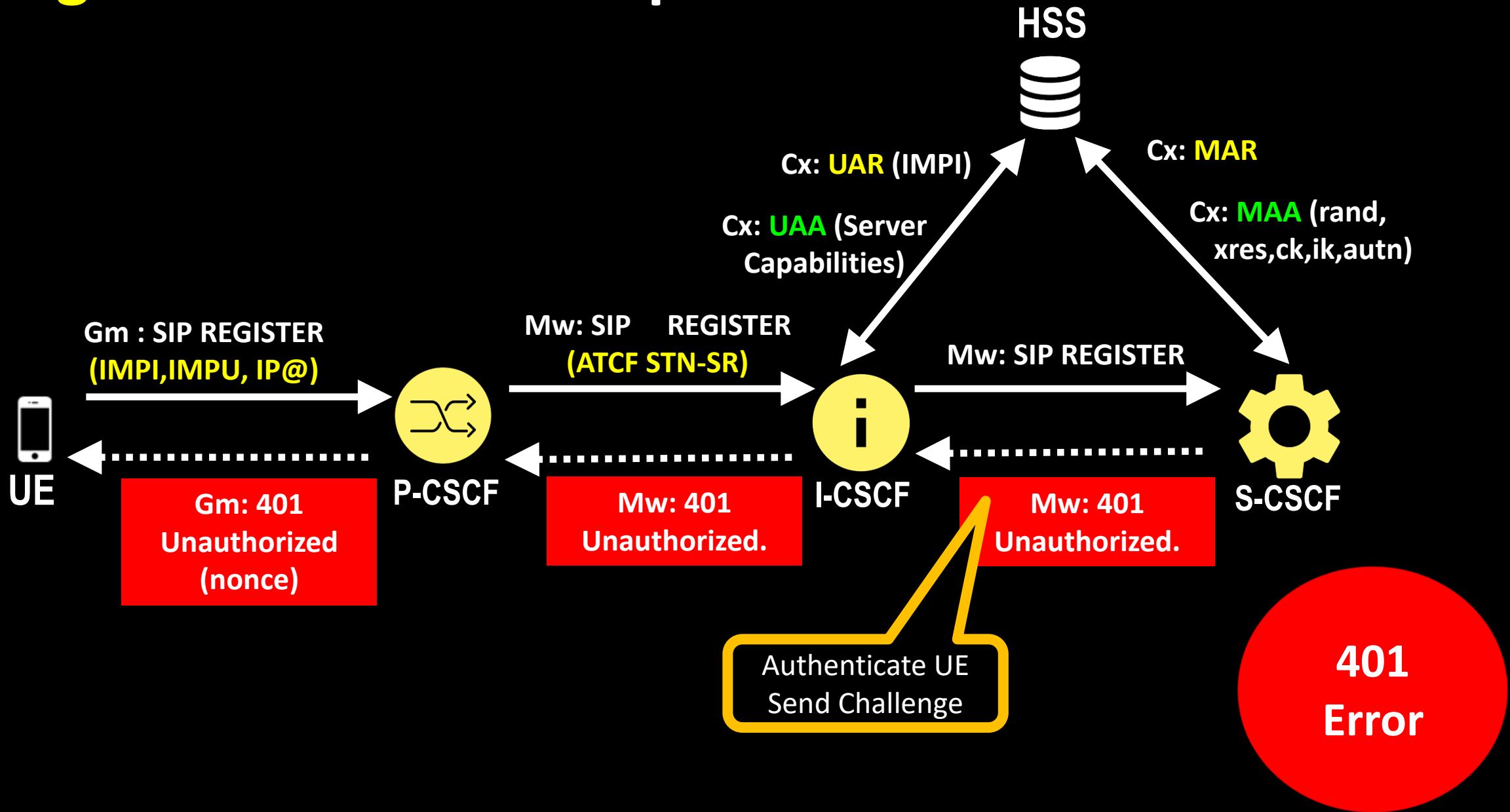


# Default IMS EPS bearer

- ✓ LTE Attach 1
- ✓ Default Internet EPS bearer 2
- ✓ Default IMS EPS bearer 3
- SIP / IMS Registration 4
- Dedicated Bearer : MO / MT Calls 5

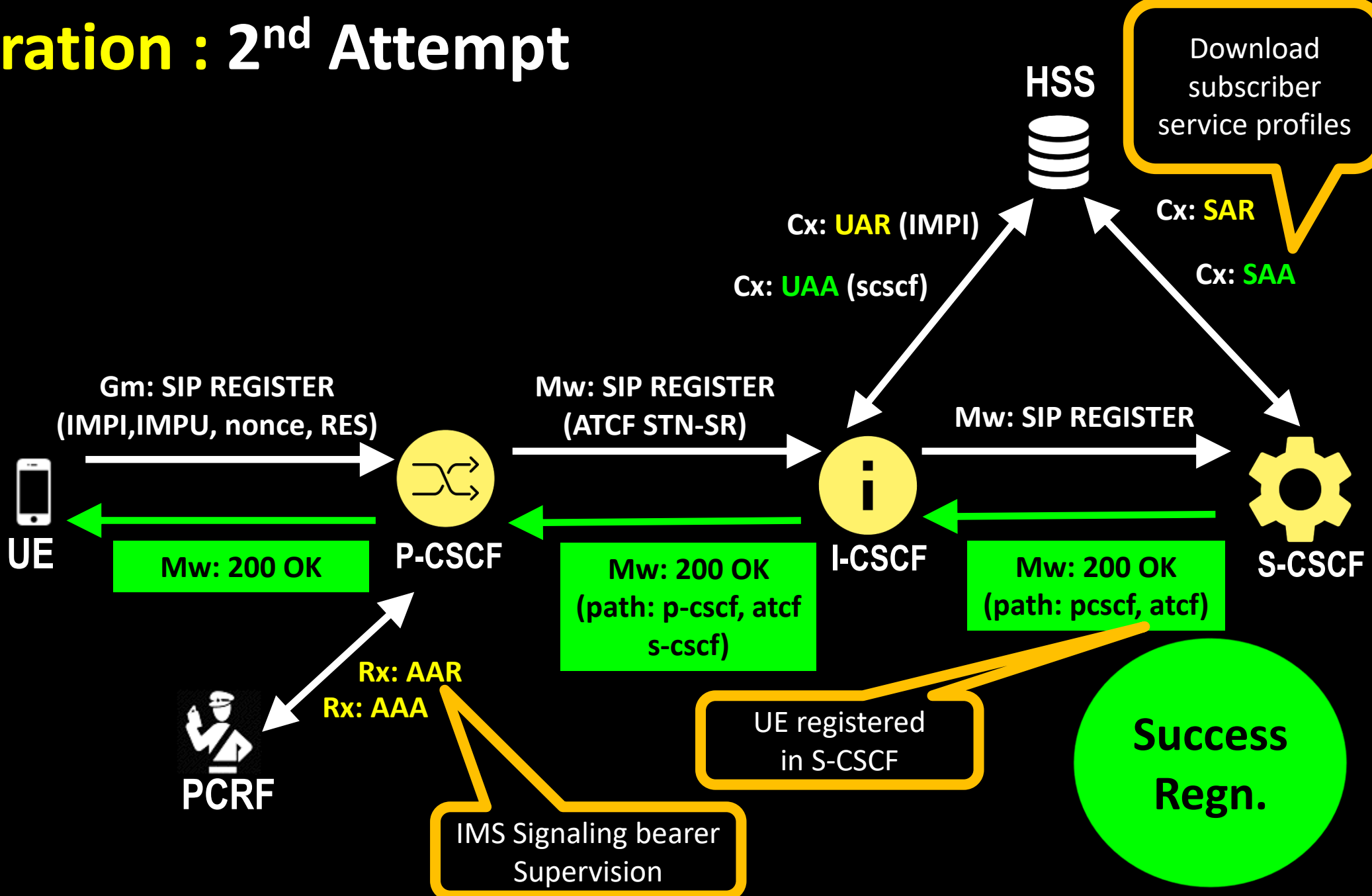


# SIP Registration : 1<sup>st</sup> Attempt

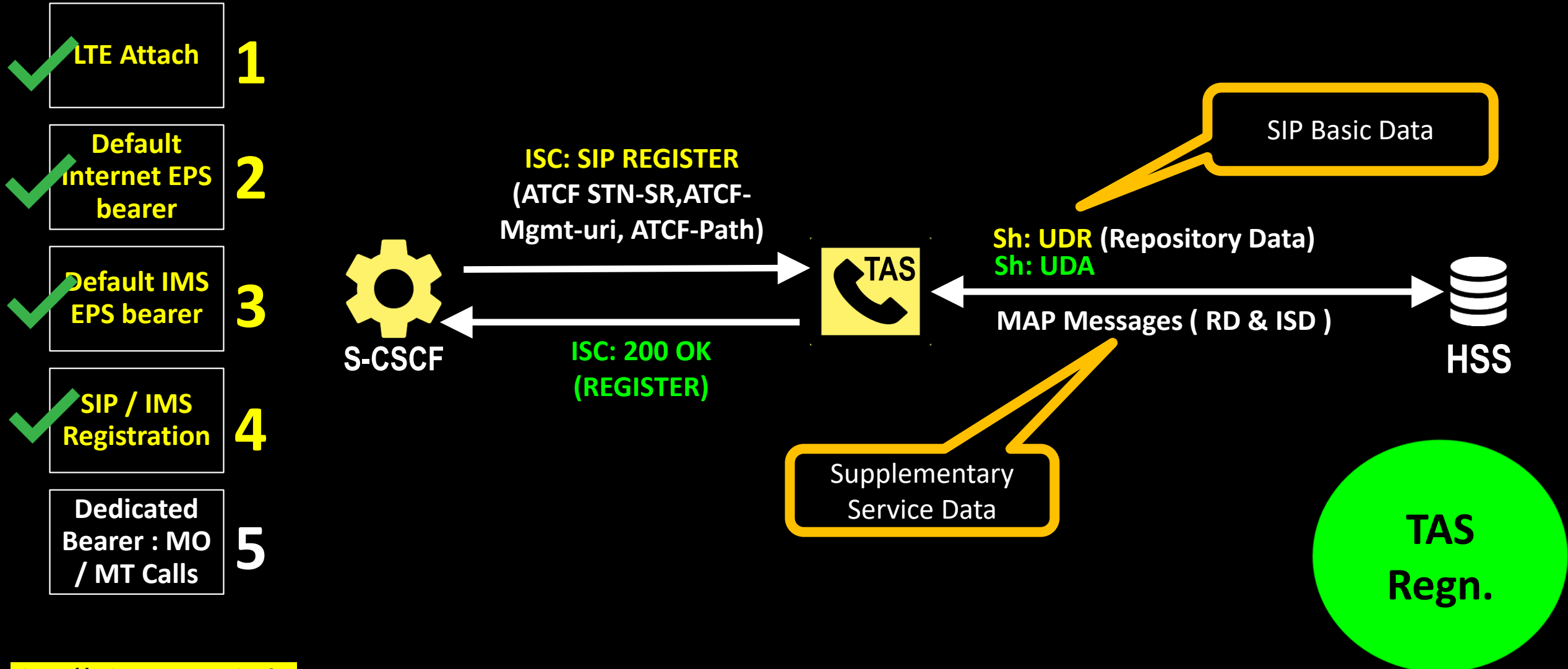


# SIP Registration : 2<sup>nd</sup> Attempt

- ✓ LTE Attach **1**
- ✓ Default Internet EPS bearer **2**
- ✓ Default IMS EPS bearer **3**
- ✓ SIP / IMS Registration **4**
- Dedicated Bearer : MO / MT Calls **5**

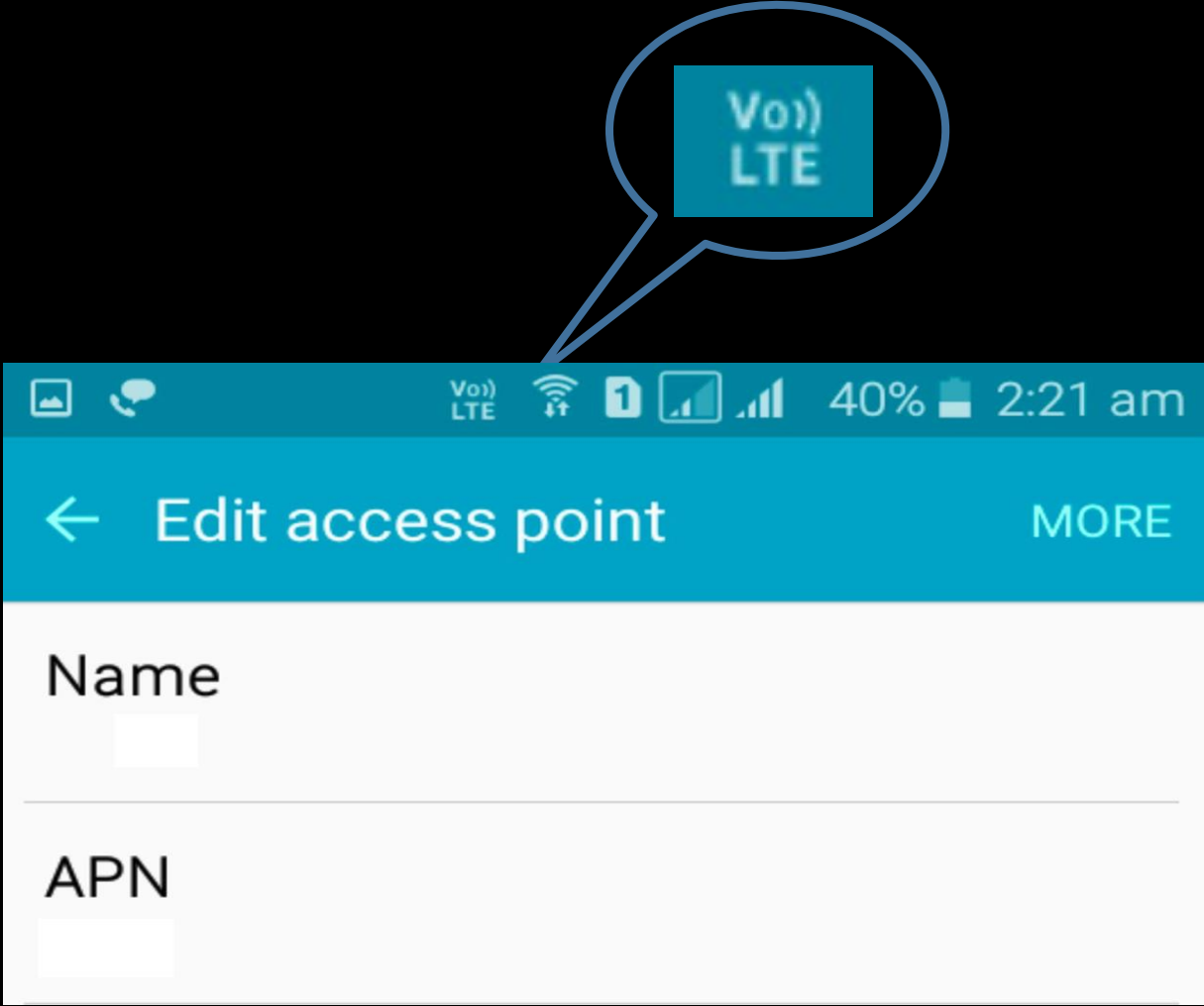


# SIP Registration : TAS Update



# SIP Registration : TAS Update

- ✓ LTE Attach **1**
- ✓ Default Internet EPS bearer **2**
- ✓ Default IMS EPS bearer **3**
- ✓ SIP / IMS Registration **4**
- Dedicated Bearer : MO / MT Calls **Ready**



# Thanks



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