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Draft-mokdad-schc-into-5g-00

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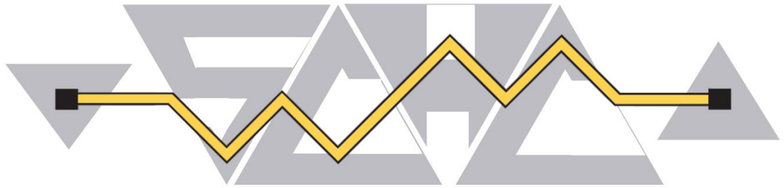
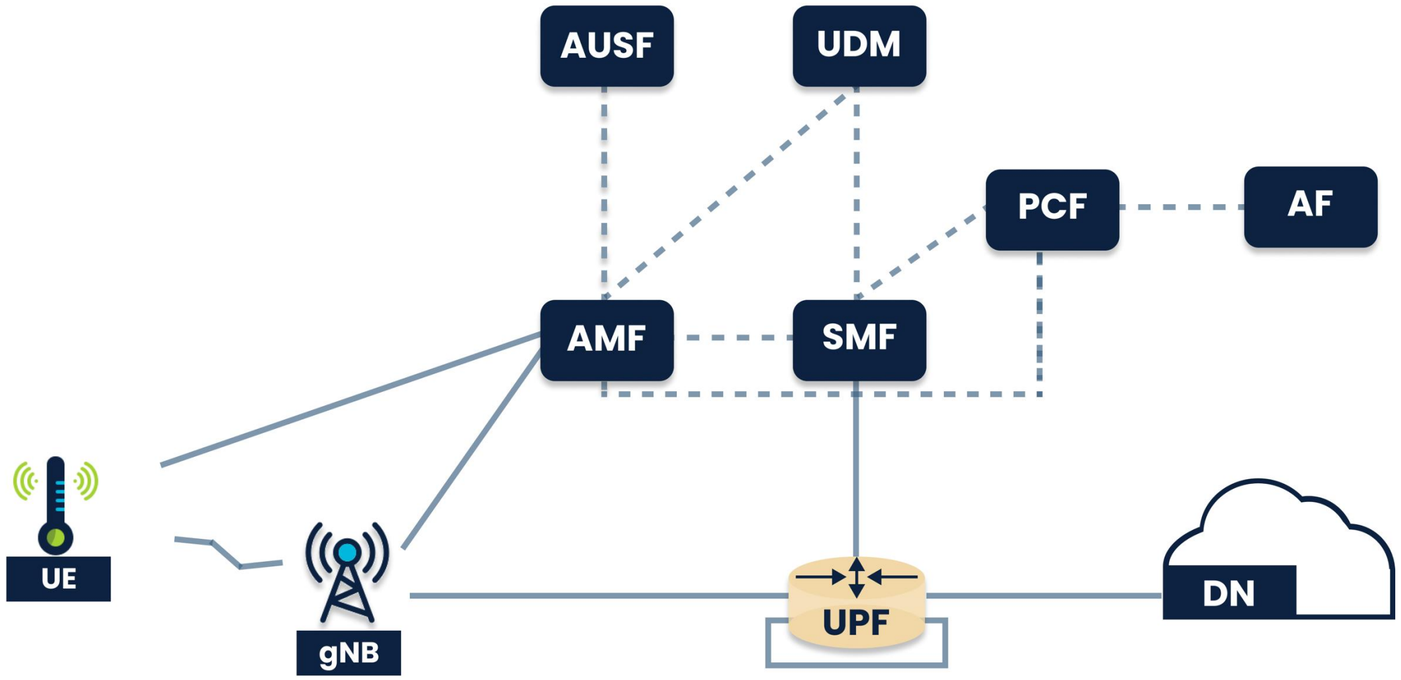


Introduction

This presentation focuses on integrating SCHC into 5G networks, we will cover:

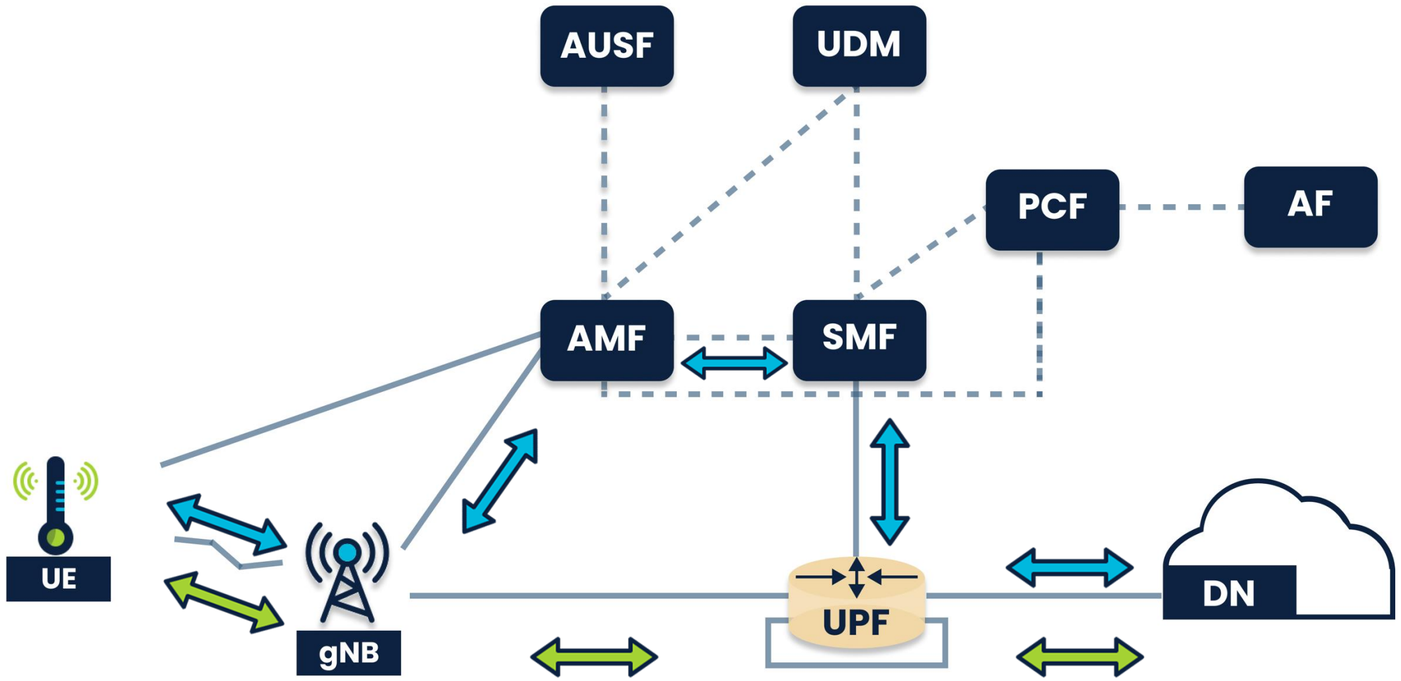
- SCHC entities placing over 5G
- SCHC Parameters
  - SCHC Signaling over 5G
  - Device identifier
- SCHC Packet handling in 5G

5G: Architecture and Data Transmission



- **User Equipment (UE)**: a device that can connect to 5g networks.
- **Radio Access network (RAN)**:
  - **gNodeB**: The 5G base station
- **5G core networks (5GC)**: Various network function working together to provide network services.
  - **UPF**: routing and forwarding user data packets.

5G: Architecture and Data Transmission



Data transmission

⟷ in **the User Plane**.

⟷ in **the Control Plane**.

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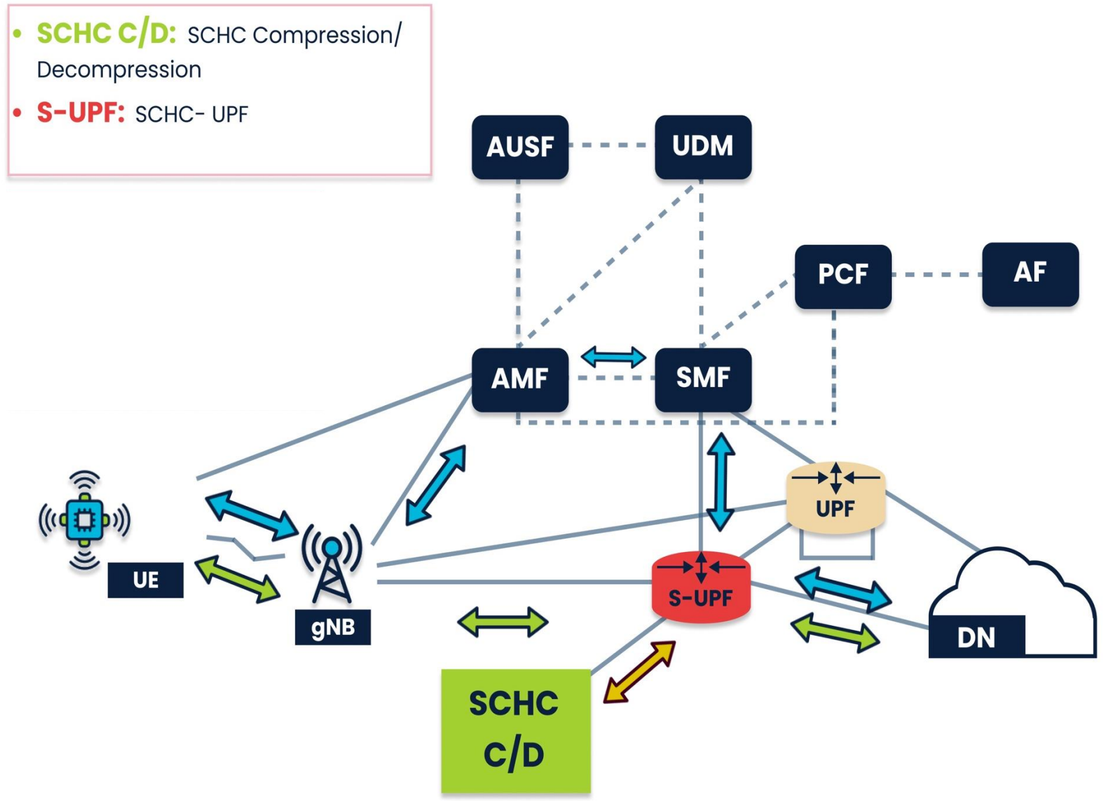
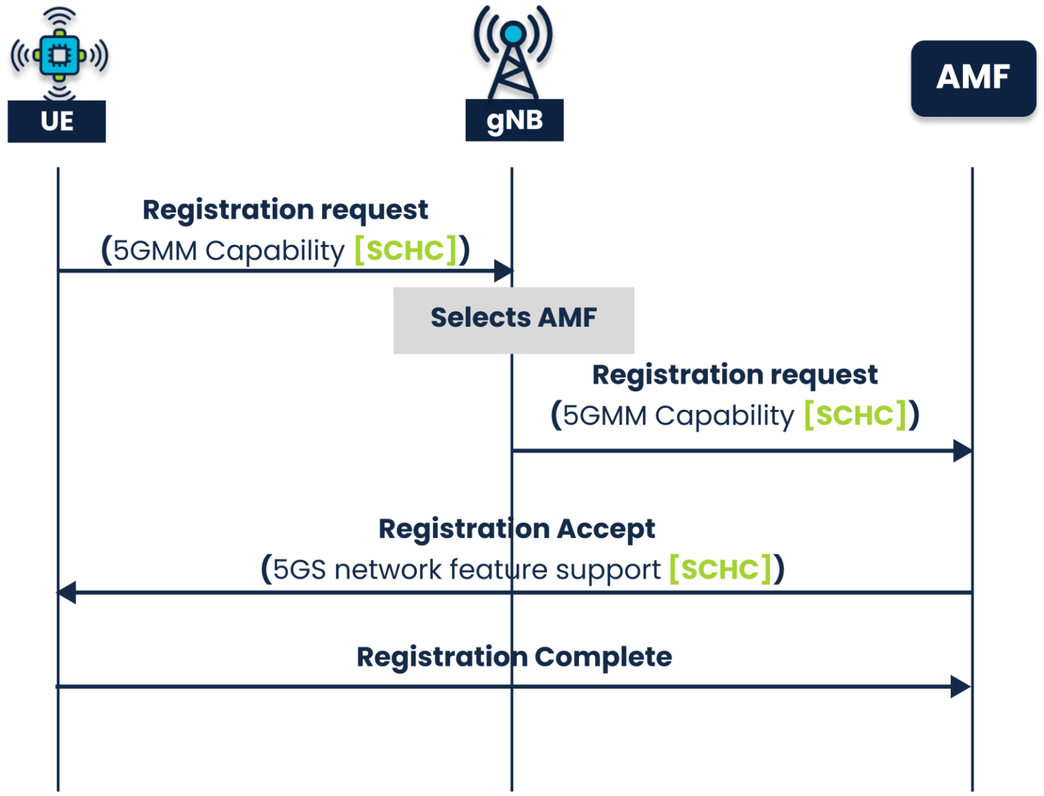
SCHC entities placing over 5G

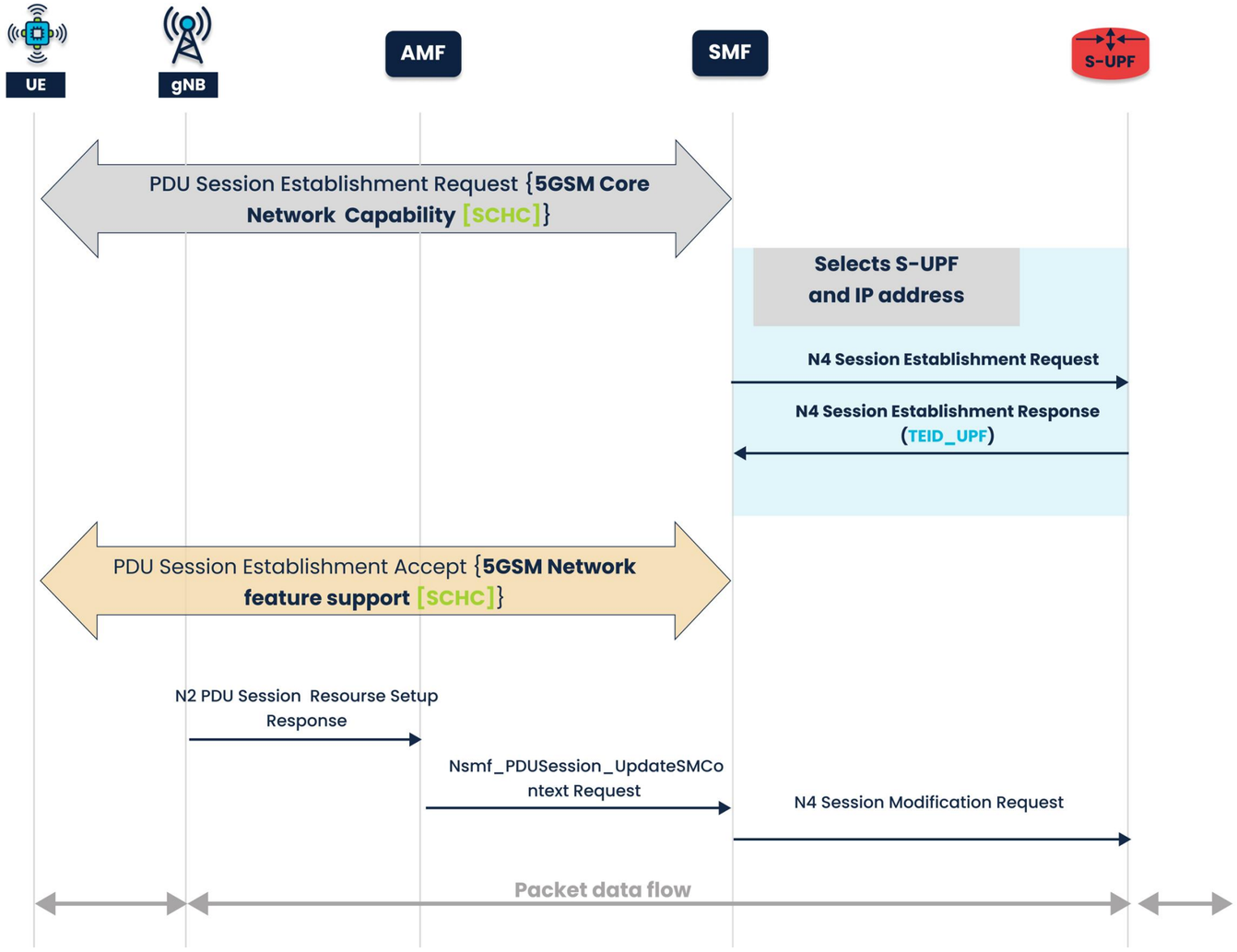


- Deploying SCHC entities over 5G requires placing them between the UE and the Data Network:
  - **1st endpoint:** UE
  - **2nd endpoint**: UPF
- **S-UPF:**
  - Handle SCHC Compression decompression.
  - Redirect the SCHC pakets to the SCHC C/D.
  - Function similarly to a standard UPF.
- **Why UPF:**
  - Intersection point.
  - No context exchange during mobility.

SCHC Signaling over 5G

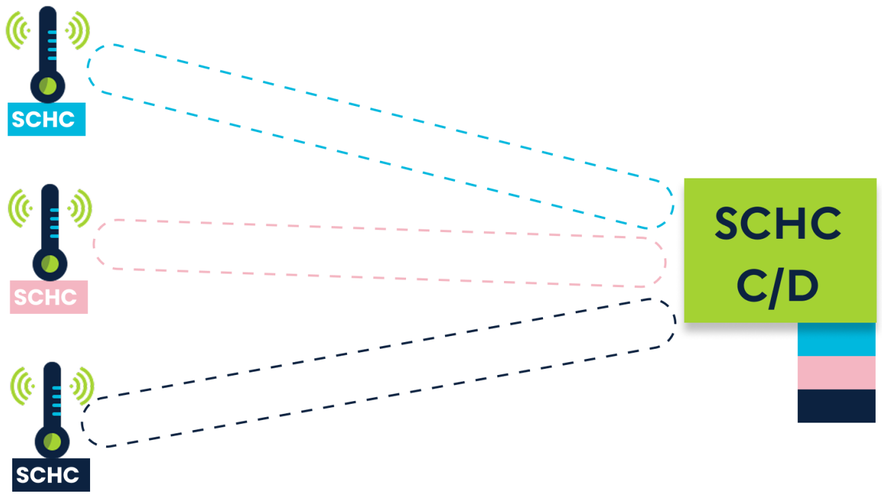


Registration procedure [1]



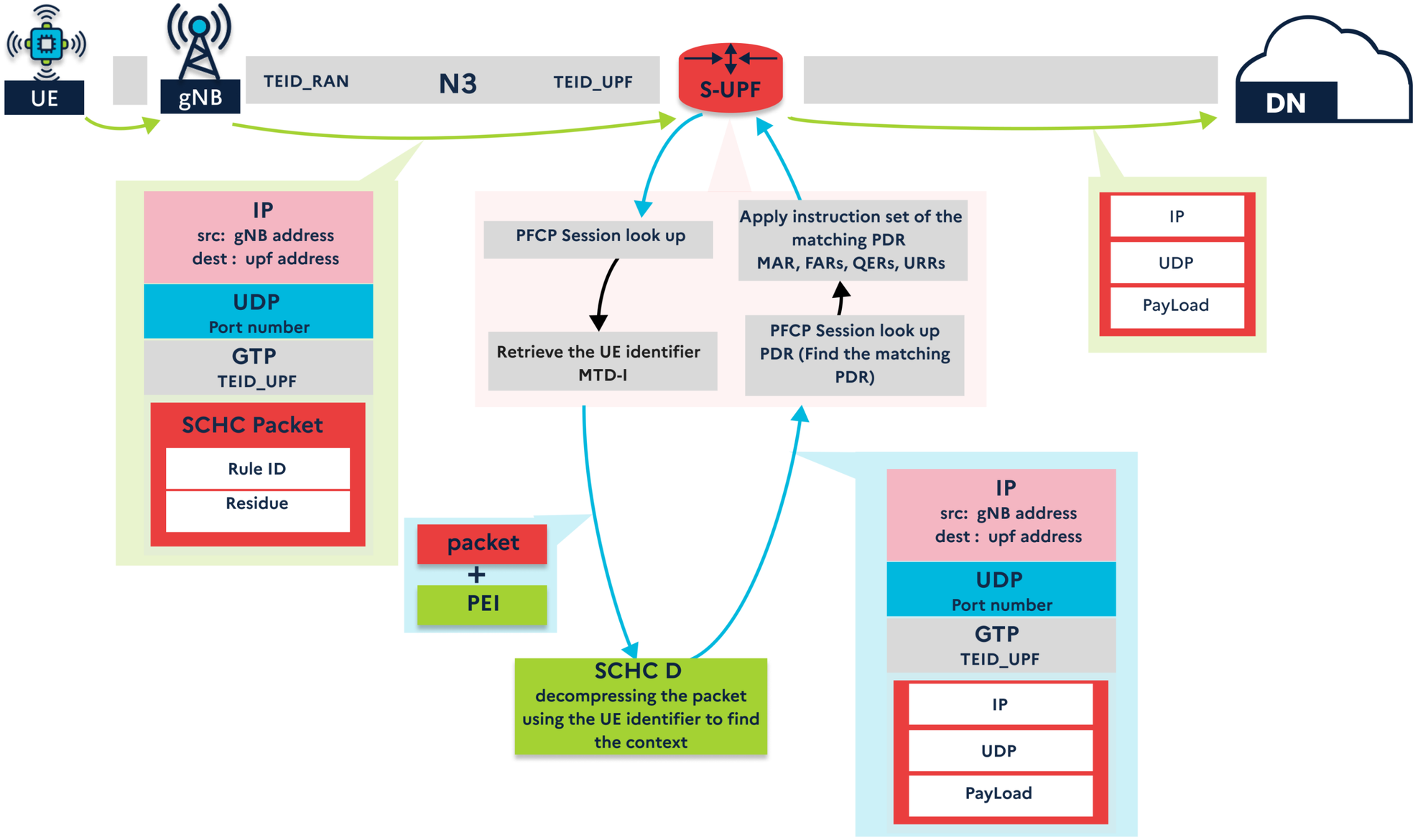
PDU session establishment procedure [1]

Device identifier



- SCHC C/D must identify the device context once it receives a SCHC packet:
  - ➢ **Use a unique identifier**
- 5G uses multiple identifiers for the device, but most of them can change by the end of the device connection session.
  - ➢ **Use the Permanent Equipment Identifier (PEI)**
- The device PEI is sent to the S-UPF within the User ID IE during the PFCP session establishment request.

SCHC Packet handling in 5G



Thank you for your attention
Questions?

References

[1] 3GPP. Technical Specification Group Services and System Aspects. Procedures for the 5G System (5GS). TS 23.502, 12 2023.

A. MOKDAD, A. PELOV, L. TOUTAIN and X. LAGRANGE, "Integrating SCHC into 5G Networks: Enhancing Latency and Efficiency for IIoT Applications," *2025 WCNC*, Milan, Italy, 2025, doi: 10.1109/WCNC61545.2025.10978315.

Proposed approach

	8	7	6	5	4	3	2	1
octet 1	5GMM capability IE							
octet 2	Length go 5GMM capability contents							
octet 3	SGC	5G-IPHC-CP CIoT	N_3 data	5G-CP CIoT	Restrict EC	LPP	HO attach	S_1 mode
octet 4*	RACS	NSSAA	5G-LCS	V2XCNP C_5	V2XCEP C_5	V2X	5G-UP CIoT	5GSR VCC
octet 5*	o	o	o	SCHC	5G-EHC-CP CIoT	multiple UP	WUSA	CAG
octet 6*-15*	o	o	o	o	o	o	o	o
	Spare							

5GMM Capability IE [5]