

5G Enhancements to Non-3GPP Access Security



Andreas Kunz | 13th June 2018



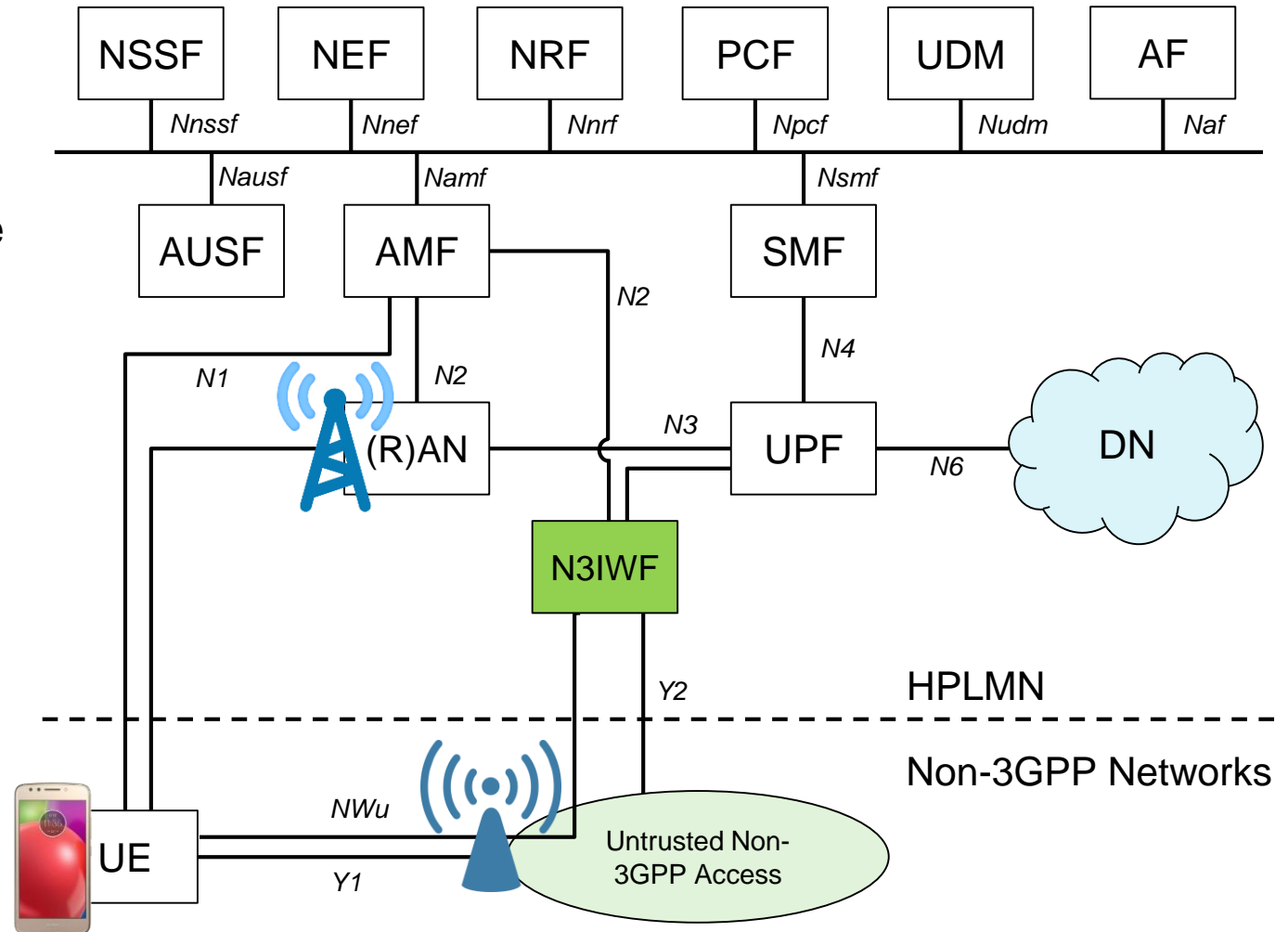
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Outline

- Non-3GPP Access in 3GPP
 - System Architecture
- New 5G Features for Non-3GPP Access
 - NAS over Non-3GPP Access
 - Authentication methods
 - Protocol Enhancements
- Deployment options and new opportunities

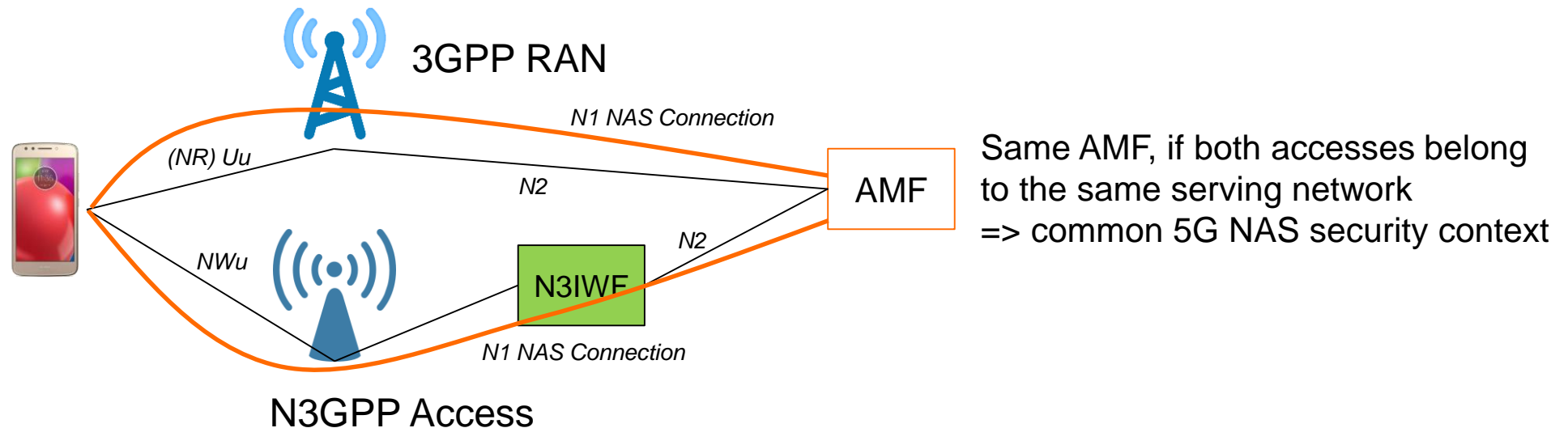
Non-3GPP Access in 3GPP

- Non-3GPP Access is mostly referred to IEEE 802.11 types of WLAN
- Two different options based on trust relationship:
 - Trusted Access: the UE connects to the core network via an access gateway (TNGF)
TNGF = Trusted Non3GPP Gateway Function (it exposes the N2/N3 interfaces)
 - Untrusted Access: The UE connects to the core network via an interworking function (N3IWF)
- For 5G Phase 1 (Release 15) only **Untrusted Access is standardized**
- Trusted Access part of Phase 2 study for Release 16 (SA2)



New 5G Features for Non-3GPP Access: NAS

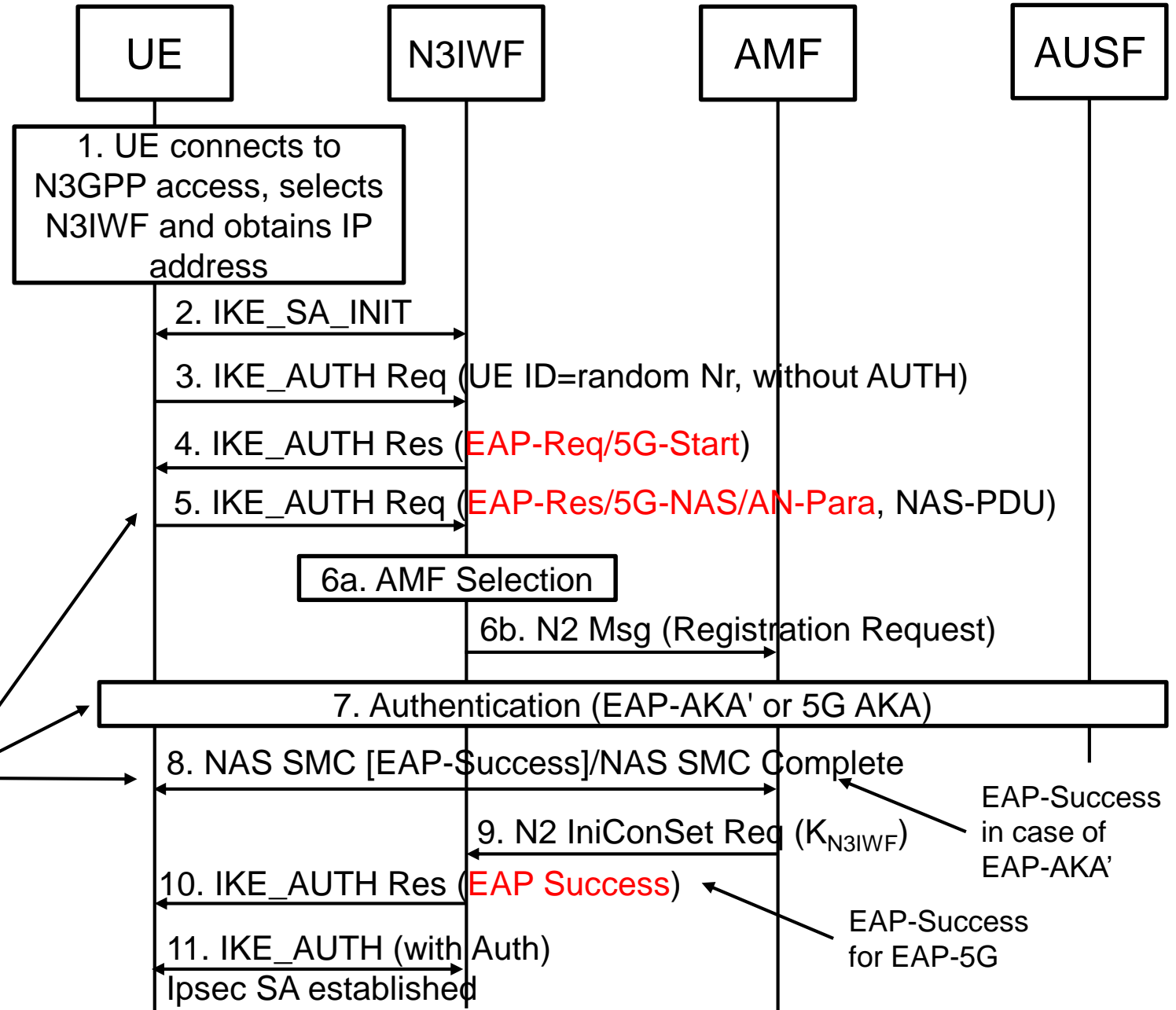
- Non Access Stratum (NAS) Signalling now possible via Non-3GPP Access
- A UE can register to the 5G Core Network with the normal registration procedure
- Simultaneous registrations over 3GPP and non-3GPP accesses are possible
- Since a UE is always connected, it cannot be paged on Untrusted Non-3GPP access



New 5G Features for Non-3GPP Access: Authentication

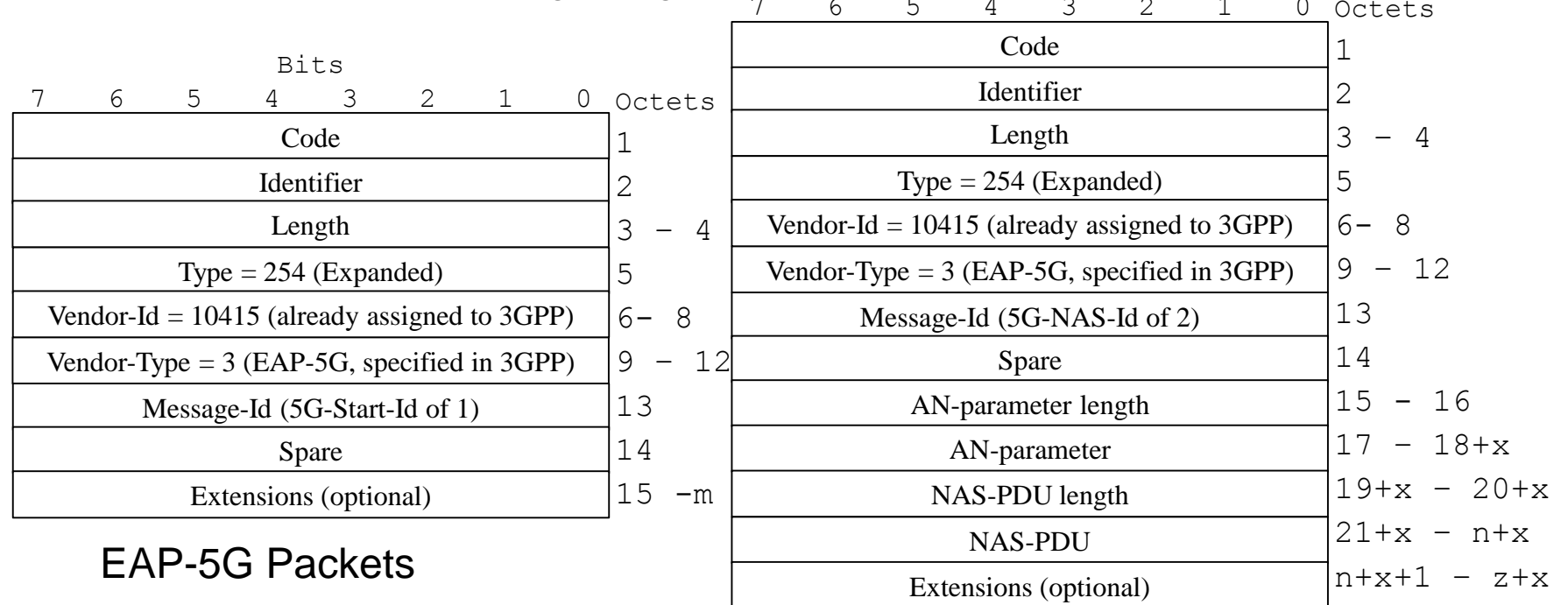
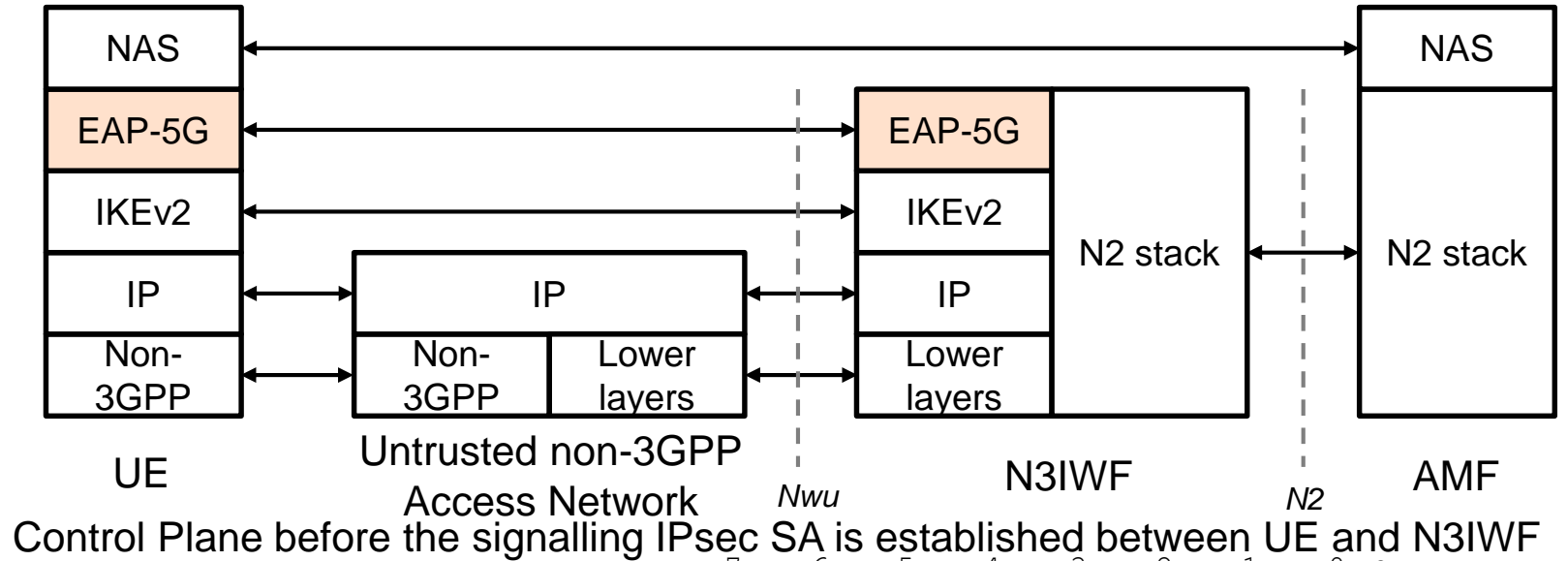
- 5G offers different authentication methods:
- EAP-AKA' and 5G AKA
- Optional EAP-TLS for IoT/Private NW
- Uses a new transport method "EAP-5G" utilizing the "Expanded" EAP type and the existing 3GPP Vendor-Id

Encapsulated within EAP-5G/5G-NAS packets



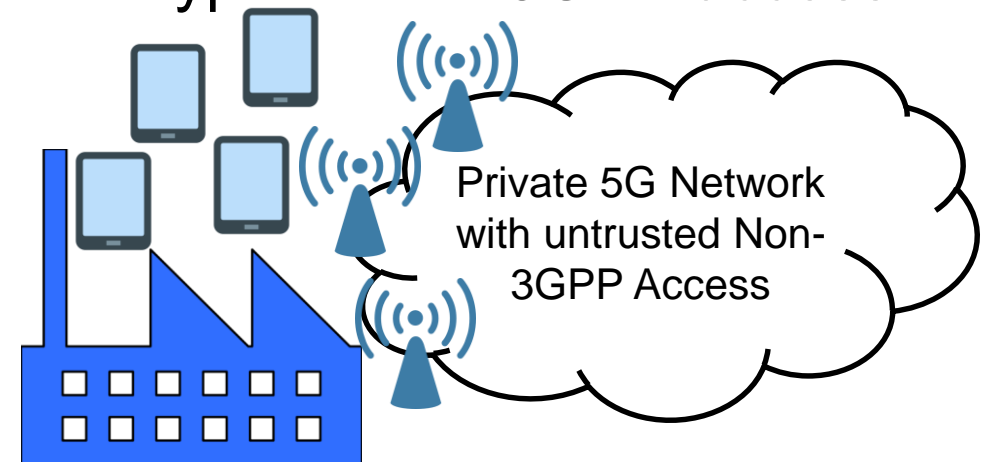
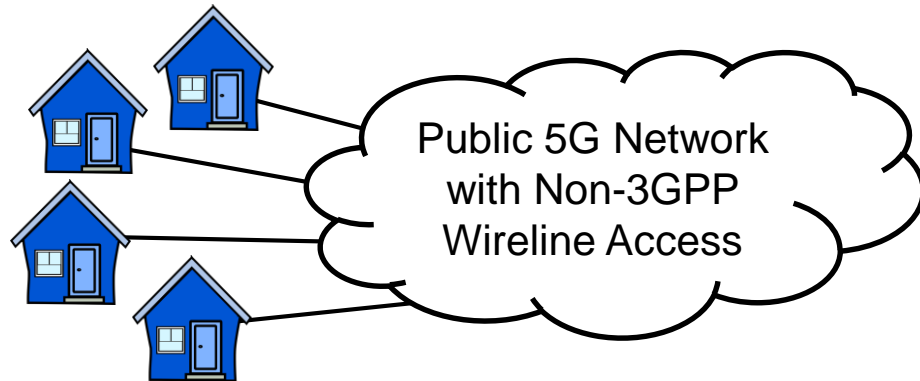
New 5G Features for Non-3GPP Access: Protocols

- EAP-5G needs to support the following information elements:
 - EAP-5G Type field
 - EAP-Request/5G-Start message
 - Two Attributes to indicate the AN Parameters and NAS PDU payload



Deployment Options

- Additional EAP methods can be used for primary authentication for private networks or with IoT devices in isolated deployment scenarios, i.e. roaming/interaction with public network is not considered
- New business opportunities with 5GC private network deployments:
 - Minimum UE Requirement: WLAN (Untrusted Non-3GPP Access) with 5G NAS support
 - UE may not require a UICC for Non-3GPP only access and could use EAP-TLS
 - For EAP-TLS, the UE is required to be pre-configured with a UE certificate and also certificates that can be used to verify server certificates
- Current “Study on the Wireless and Wireline Convergence for the 5G system architecture” is ongoing and can be seen as another type of Non-3GPP access



thanks.

Different is better

