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Wireless Access Network

New Service Paradigm With 5G Private Network

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2021 Fall Technical Forum
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Author Acknowledgements

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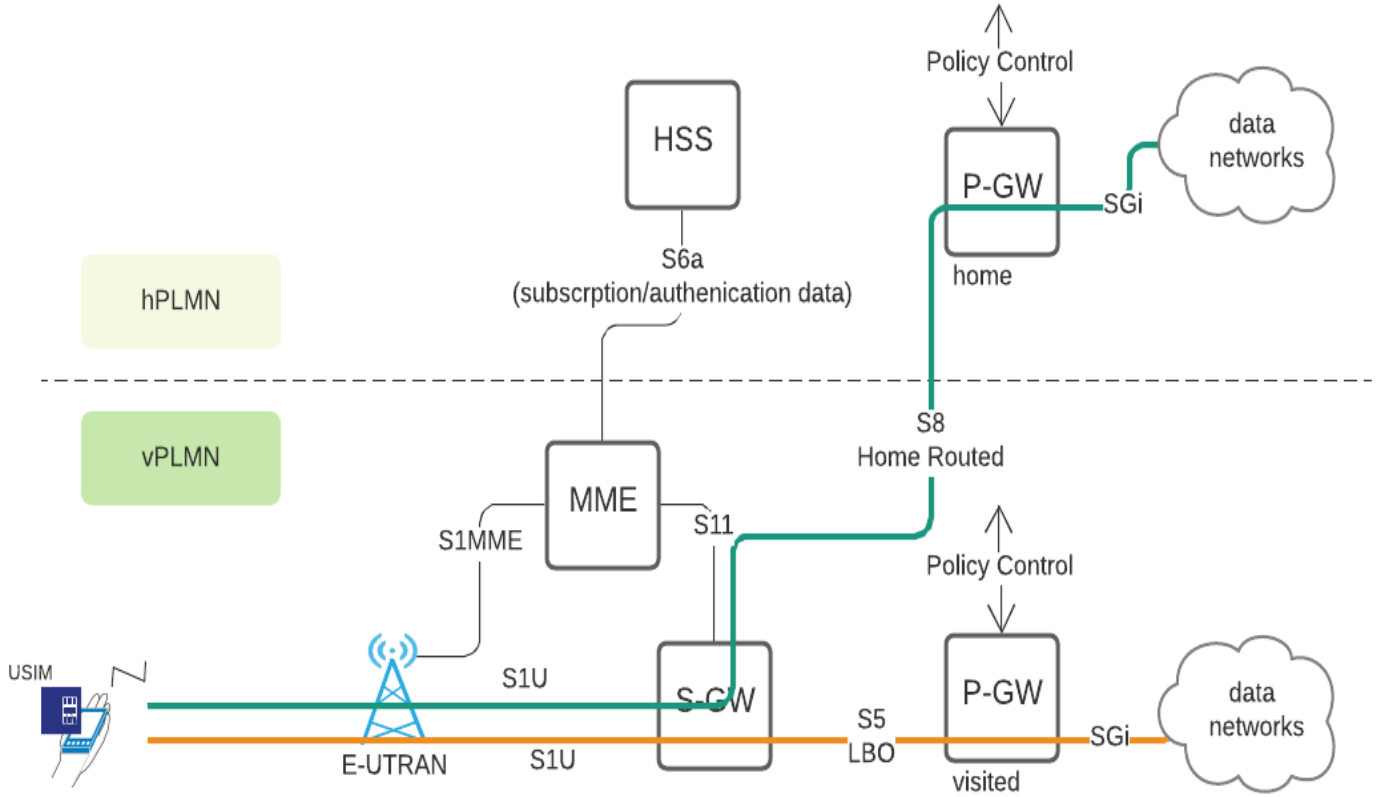
Why Doing Private Network With 5G - SNPN

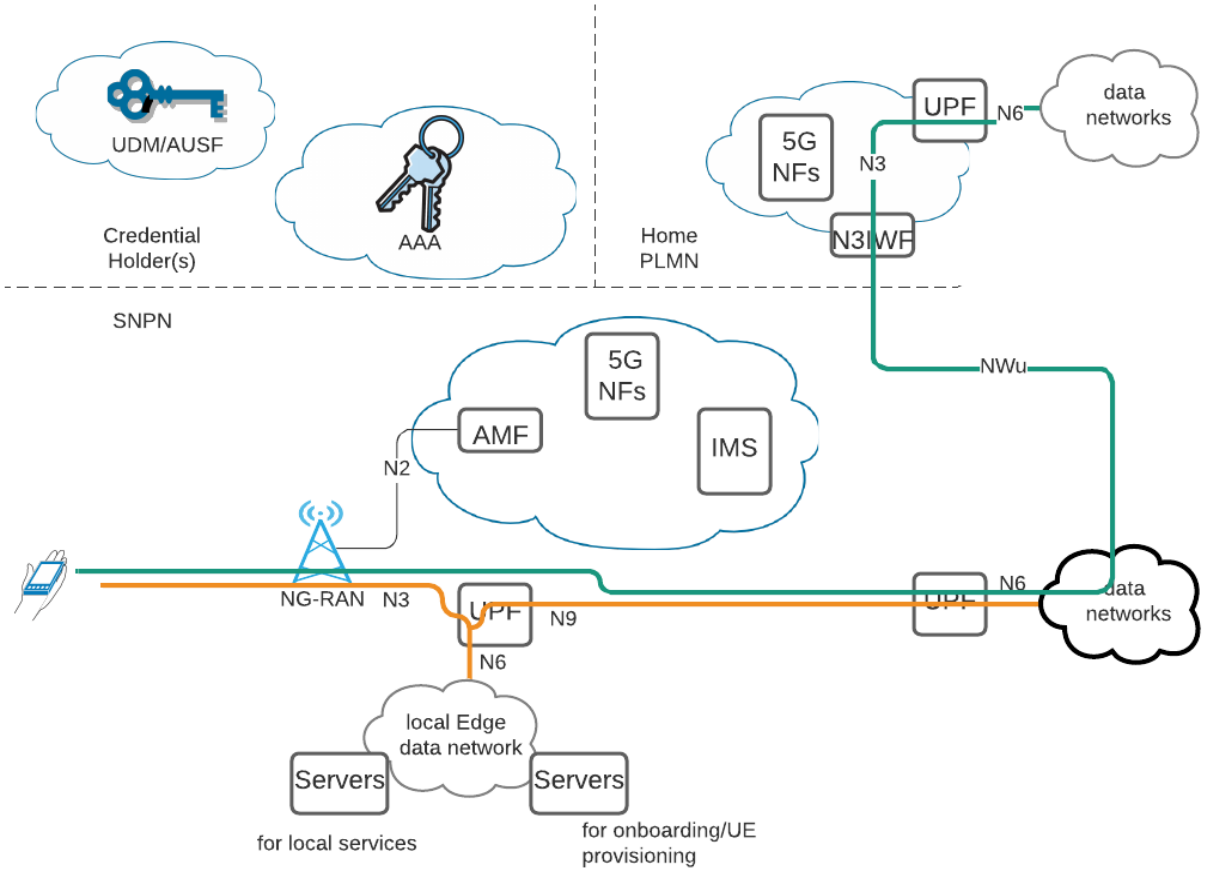
- Limitation of the current 4G system feature
- What are the new and unique system features in 5G private network to 4G
- New potential services to be developed
- Standards development roadmap

Basic Connectivity Model With 4G



- Prior relationship between the user and hPLMN in the form of USIM
- hPLMN controlled model – roaming relationship, QoS profile, S5/S8 usage

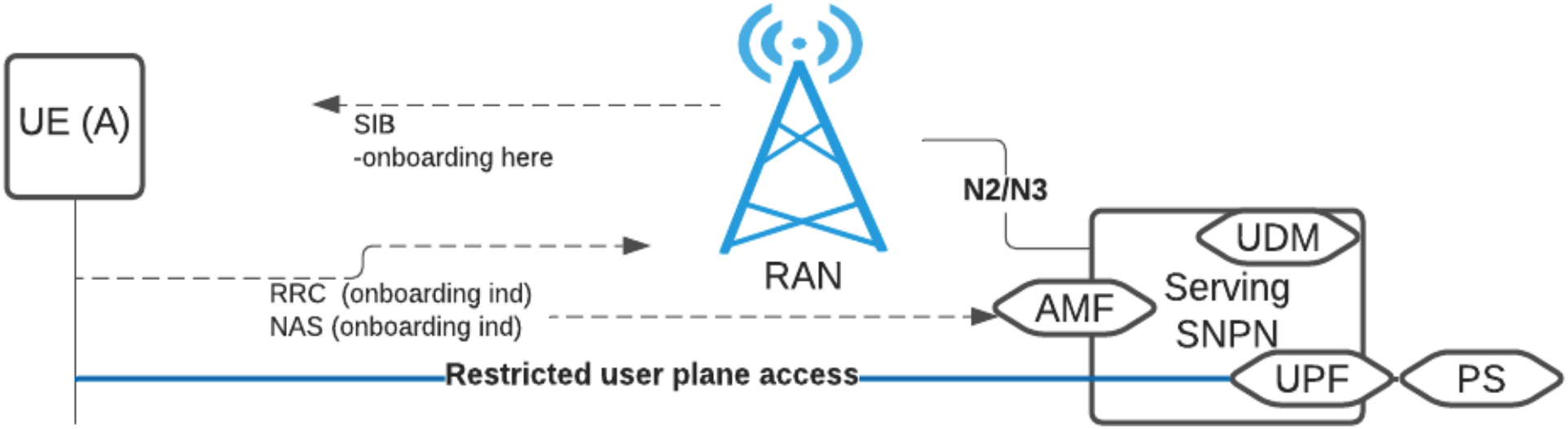
Simplified SNPN Architecture With Interworking To hPLMN



Features catered to 5G SNPN

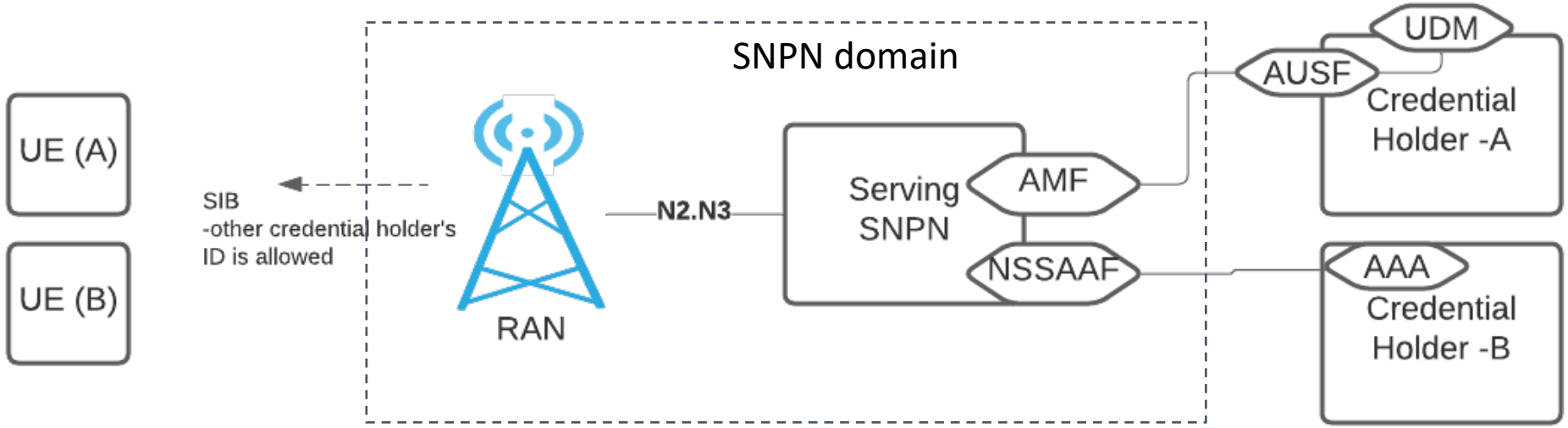
- NAI and EAP with non-USIM based authentication
- Shared PLMN ID and Network identifier usage
- Human-readable network name broadcasted by RAN
- Onboarding
- External credential holder(s)
- Accessing to hPLMN services

UE Onboarding



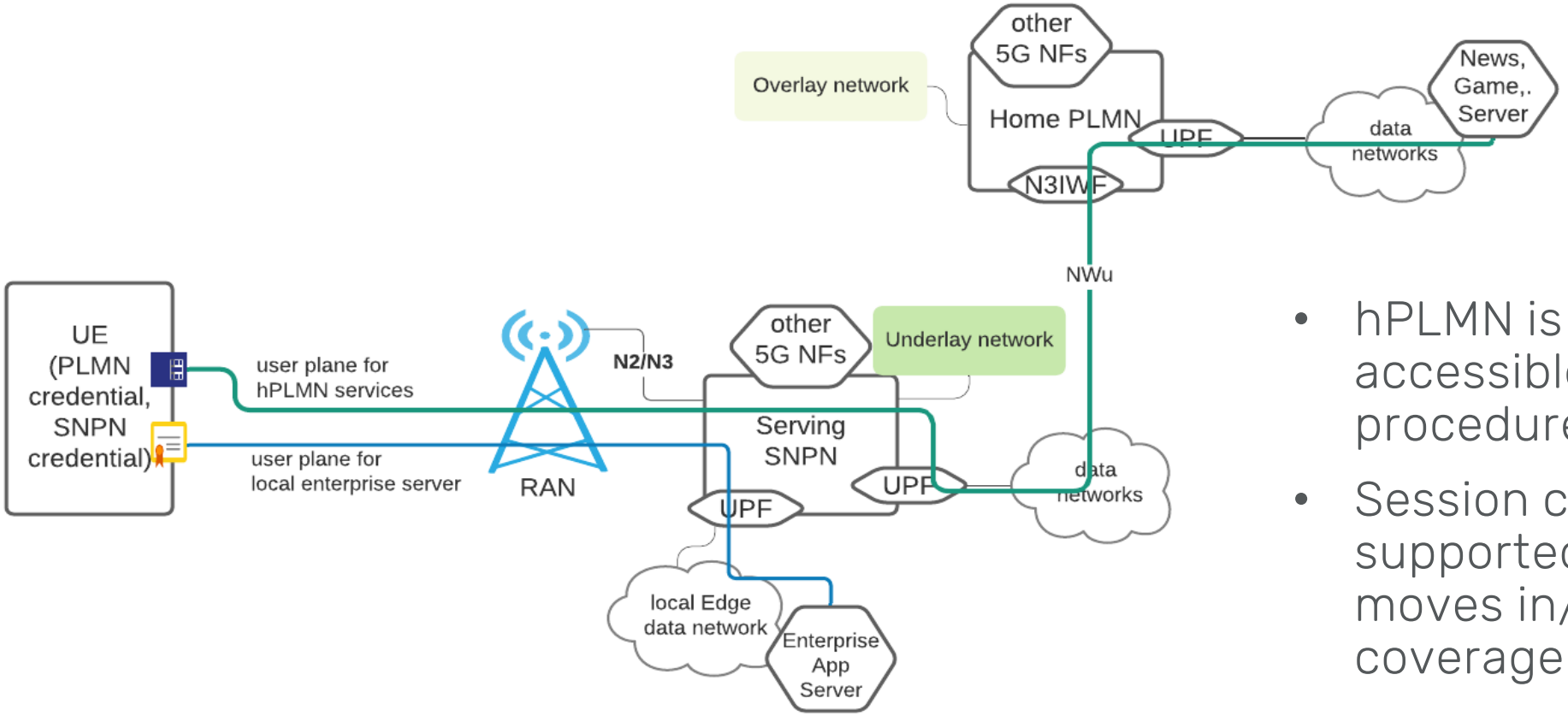
Provisioning of the UE credential via the 3GPP radio can be performed locally

Credentials Owned By A Separate Domain



- Neutral host offering by SNPN for 3rd party (e.g., Credential Holder–A)
- Enterprise environment when IT is managing user credential with AAA (e.g., Credential Holder-B)

Accessing HPLMN Services Via SNPN



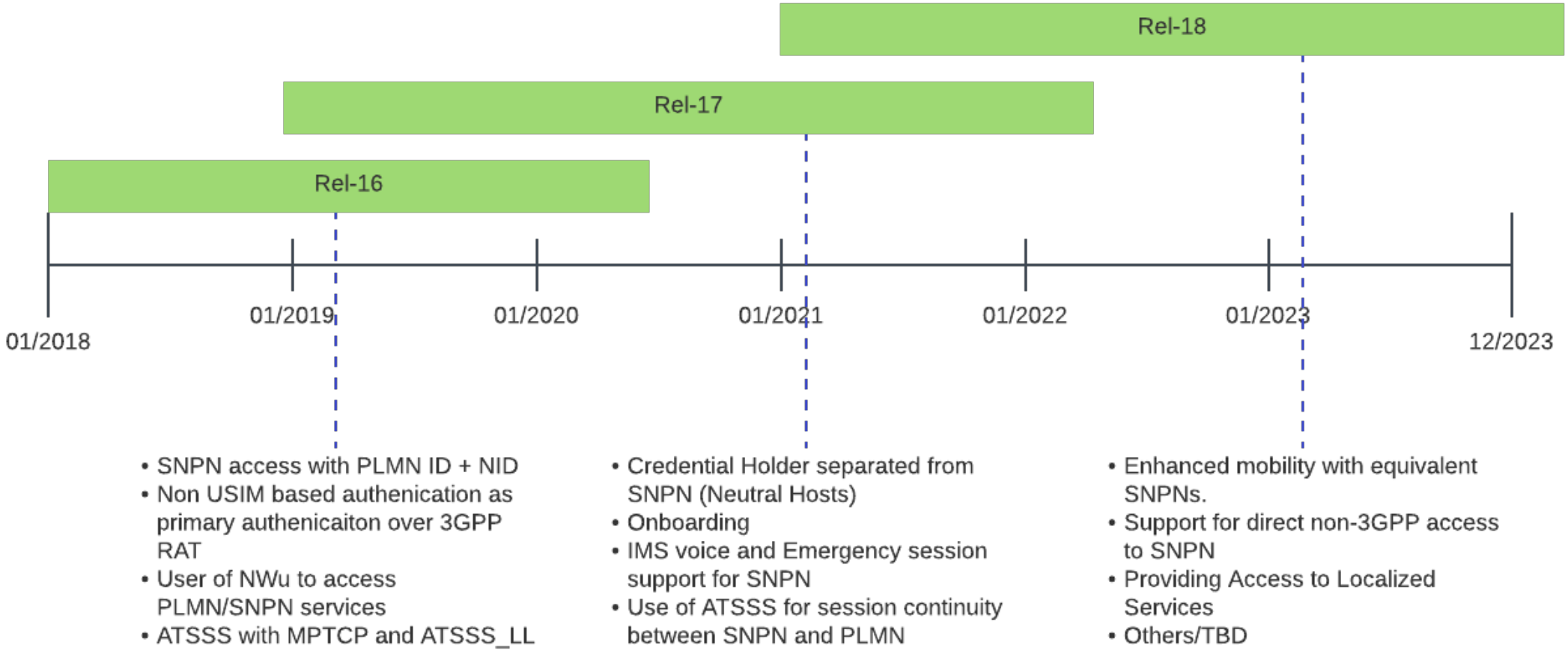
- hPLMN is continued to be accessible with NWu procedure
- Session continuity is supported when UE moves in/out of the SNPN coverage area

Example For Providing Access To Localized Services

For example, localized service offerings at a sporting venue:

- Localized services like internet, video, from different camera angles
- Any service offered by one or more key partners like sporting venue owner, TV station, sponsor, athletic club, etc.
- Inform visitors about service offerings by RAN broadcast
- Easy onboarding of any interested visitors/UEs
- When needed at any time, update service offerings and inform visitors

Journey In 3GPP So Far



Summary

- New capabilities available for 5G private networks (i.e., SNPN) open a new realm of service possibilities that was previously not available with 4G system based on evolved packet core (EPC). This includes (not exhaustive list)
  - On demand credential provisioning with onboarding feature
  - Adoption of network access identifier (NAI) for user identity and EAP with non USIM based authentication (e.g., TLS/TTLS)
  - Neutral host offering
  - Access to Localized Services in addition to HPLMN services with session continuity
  - plus all the native 5G capabilities (e.g., virtualized deployments, service based interface, Edge Computing, QoS, etc) and new future capabilities that will continue to be developed within the 3GPP ecosystem.

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Thank You!

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Abbreviation

AAA- authentication, authorisation, accounting

AMF- access and mobility management function

ATSSS- access traffic steering, switching and splitting

AUSF- authentication server function

(h/v)PLMN- Home or Visited public land mobile network

HSS- home subscriber server

MME- Mobility Management Entity

N3IWF- non-3GPP interworking function

NF- network function

NID- network identifier

NSSAAF- network slice-specific and SNPN authentication and authorization function

Nwu- reference point for untrusted non-3GPP access network to 5GC

PS- provisioning server

RAN- radio access network

S/P-GW- Serving/PDN Gateway

SIB- system information block

SNPN- stand-alone non-public network

UDM- unified data management

USIM- universal subscriber identity module

UPF- user plane function