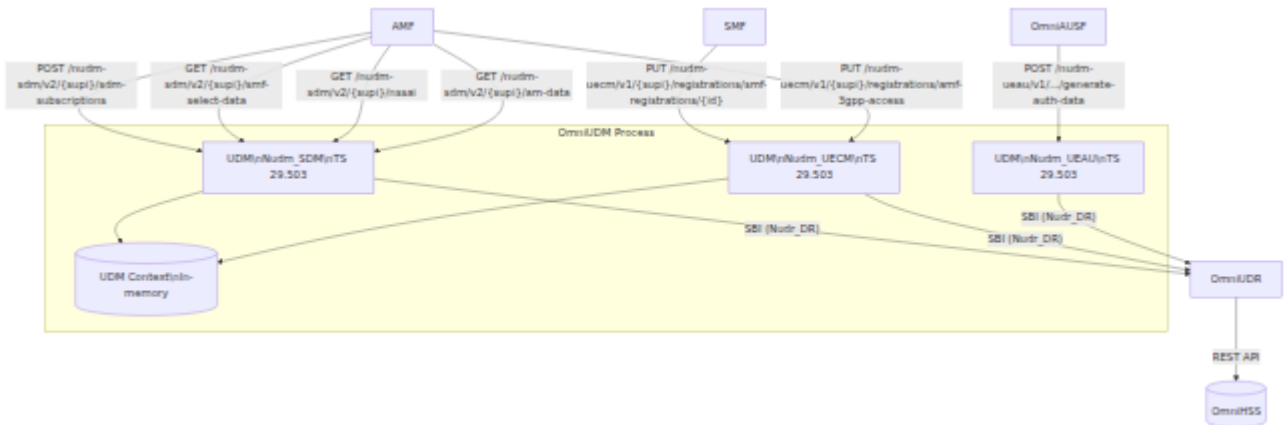


OmniUDM

1. Overview

OmniUDM is an Open Source 5G Network Function (UDM) implementation based on the 3GPP (Nudm_UEAU) (Nudm_UECM) (Nudm_SDM) Network Functions.

OmniUDM is implemented as a single process (OmniUDM) and is connected to the AUSF and UDR Network Functions (OmniAUSF and OmniUDR). OmniUDM is implemented as a single process (OmniUDM) and is connected to the AUSF and UDR Network Functions (OmniAUSF and OmniUDR). OmniUDM is implemented as a single process (OmniUDM) and is connected to the AUSF and UDR Network Functions (OmniAUSF and OmniUDR).



2. 3GPP

Item	Reference
UDM	TS 23.501 § 6.2.7
Nudm_UEAU	TS 29.503 § 5.2.2
Nudm_UECM	TS 29.503 § 5.3
Nudm_SDM	TS 29.503 § 5.2.3
Nudr_DataRepository	TS 29.504
5G-AKA	TS 33.501 § 6.1.3
Milenage	TS 35.206
SUCI /	TS 23.003 § 2.2B, TS 33.501 § 6.12
SQL	TS 33.102 § 6.3.5, TS 33.501 § 6.1.3.4
(Kausf, Kseaf, HXRES*)	TS 33.501 § A

3. SBI

HTTP/1.1 Content-Type: application/json

Nudm_UEAU (TS 29.503 § 5.2.2 §)

Method	URI	Request	Response
POST	/nudm-ueau/v1/{supi0rSuci}/security-information/generate-auth-data	5G-AKA	200 OK
POST	/nudm-ueau/v1/{supi}/auth-events		201 Created
DELETE	/nudm-ueau/v1/{supi}/auth-events/{authEventId}		204 No Content

Nudm_UECM (TS 29.503 § 5.3 §)

Method	URI	Request	Response
PUT	/nudm-uecm/v1/{supi}/registrations/amf-3gpp-access	AMF UE 3GPP	200 OK
GET	/nudm-uecm/v1/{supi}/registrations/amf-3gpp-access	AMF 3GPP	200 OK
PUT	/nudm-uecm/v1/{supi}/registrations/smf-registrations/{pduSessionId}	SMF PDU	200 OK
DELETE	/nudm-uecm/v1/{supi}/registrations/smf-registrations/{pduSessionId}	SMF PDU	204 No Content

□□□□

```
config :omniudm,  
  sbi_scheme: "http",  
  sbi_addr: "127.0.0.12",  
  sbi_port: 7777,  
  nrf_uri: "http://127.0.0.10:7777",  
  udr_uri: "http://127.0.0.22:7777",  
  mcc: "999",  
  mnc: "70",  
  heartbeat_interval: 10_000,  
  hnet_key_dir: "/etc/omniudm/hnet"
```

□□□

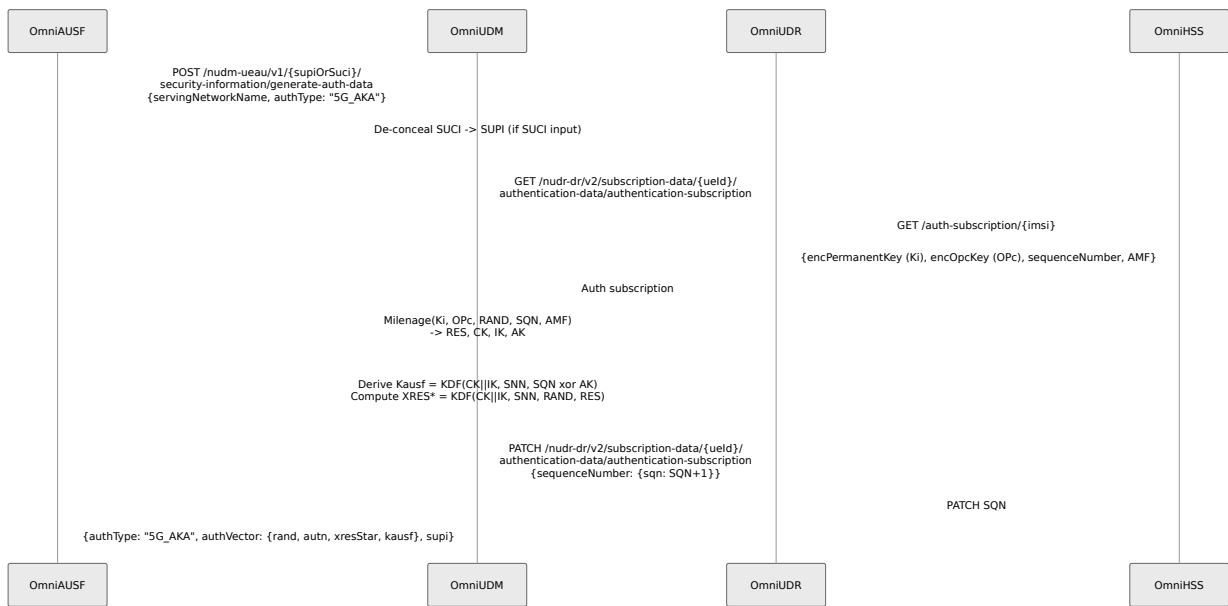
□□	□ □	□□□	□□
sbi_scheme	□ □ □	"http"	SBI HTTP □□□□ URI □□
sbi_addr	□ □ □	"127.0.0.12"	SBI HTTP □□□□□ □ IP □□
sbi_port	□ □	7777	SBI HTTP □□□□□ □ TCP □□
nrf_uri	□ □ □	"http://127.0.0.10:7777"	NRF □□□ URI□□□□ NF □□□□□
mcc	□ □ □	"999"	□□ PLMN □□□□□ □□□□□□□□□□□□□□ □□□□□
mnc	□ □ □	"70"	□□ PLMN □□□□□ □□
heartbeat_interval	□ □ (□ □)	10000	OmniUDM □□ NRF □□ PATCH □ □□□□
udr_uri	□ □ □	"http://127.0.0.22:7777"	□□ UDR (OmniUDR) □□□□ URI□UDM □□ SBI □□ UDR □□□□□□

ID	Type	Path	Description
			AM SM SQN UDR OmniHSS OmniUDR
hnet_key_dir		"/etc/omniudm/hnet"	ECIES SUCI <key_id>. <curve>.key x25519 (Profile A) secp256r1 (Profile B) HNET_KEY_DIR

5.

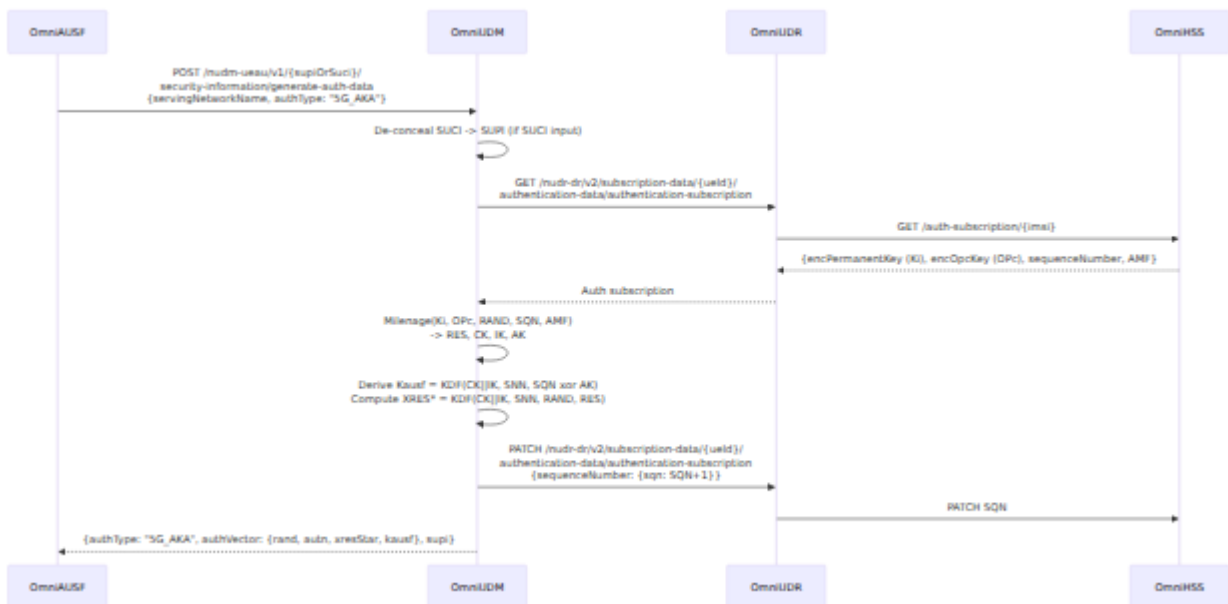
5.1 (Nudm_UEAU)

UDM AUSF AUSF (OmniAUSF) SBI UDM



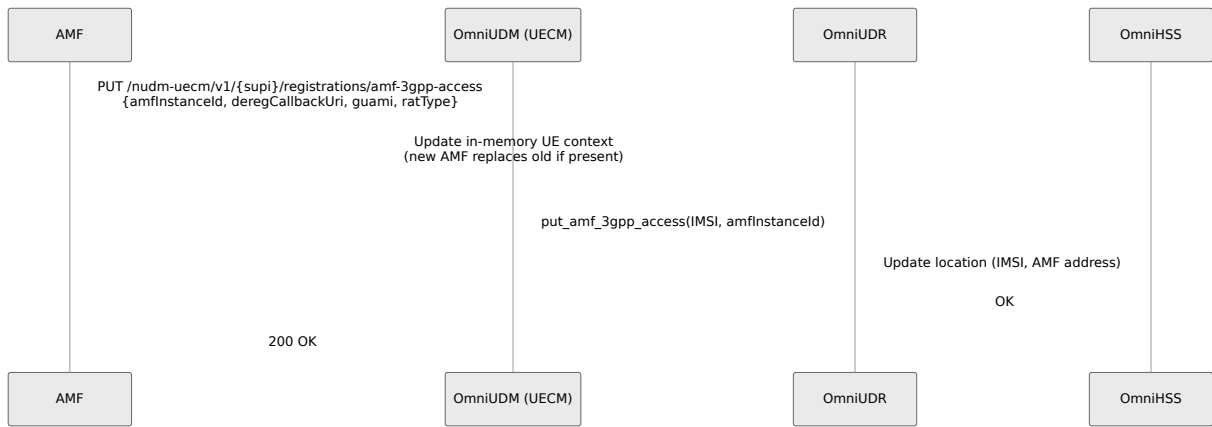
5.2 SQN

UE SQN AUTS AMF
AuthenticationInfo resynchronizationInfo



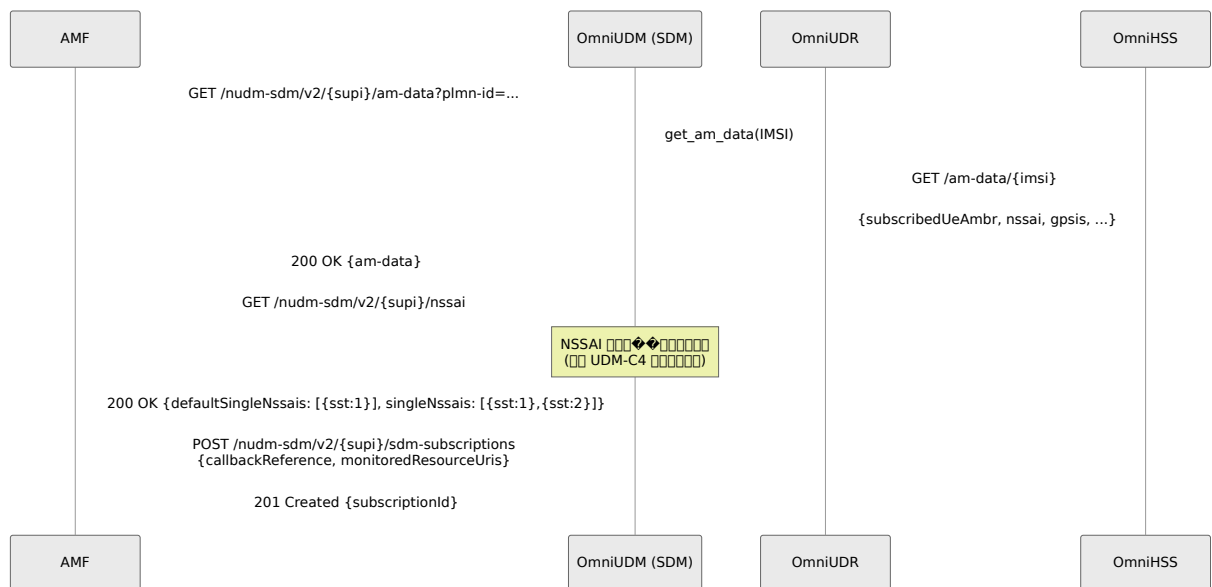
5.3 UE (AMF → UDM)

AMF UDM UE



5.4 网络切片选择策略 (SDM)

UE 网络切片选择策略



6. 网络切片

ID	名称	描述
UDM-M6	网络切片选择策略	网络切片选择策略 (UE 网络切片选择策略) 网络切片选择策略

7. Prometheus ☐☐

UDM ☐☐

☐☐	☐☐	☐☐	☐☐
<code>omni_udm.auth.requests.count</code>	counter	supi, result	☐☐☐☐ ☐☐☐☐
<code>omni_udm.uecm.amf_registration.count</code>	counter	supi	AMF ☐☐☐☐
<code>omni_udm.auth.result.count</code>	counter	supi, result	☐☐☐☐ ☐☐☐☐
<code>omni_udm.auth_vector_generations.total</code>	counter	result	☐☐☐☐ ☐☐☐☐ ☐☐☐☐
<code>omni_udm.uecm_registrations.total</code>	counter	result	☐ UECM AMF ☐☐
<code>omni_udm.sdm_queries.total</code>	counter	data_type	☐ SDM ☐☐☐☐
<code>omni_udm.active_ue_contexts.count</code>	gauge	--	☐☐ UE ☐☐☐☐ ☐☐
<code>omni_udm.nrf.registration.status</code>	gauge	nf_type	NRF ☐☐☐☐ (1=☐ ☐☐,

☐☐	☐☐	☐☐	☐☐
			0=☐☐ ☐)

BEAM VM ☐❓❓❓

☐☐	☐☐	☐☐
<code>beam.memory.total</code>	gauge	BEAM ☐☐☐☐☐☐
<code>beam.memory.processes</code>	gauge	Erlang ☐☐☐☐☐☐
<code>beam.memory.processes_used</code>	gauge	☐☐☐☐☐☐☐☐
<code>beam.memory.system</code>	gauge	☐☐☐☐ (ETS, atoms, code)
<code>beam.memory.atom</code>	gauge	☐☐☐☐☐
<code>beam.memory.atom_used</code>	gauge	☐☐☐☐☐☐☐
<code>beam.memory.binary</code>	gauge	☐☐☐☐☐
<code>beam.memory.code</code>	gauge	☐☐☐☐
<code>beam.memory.ets</code>	gauge	ETS ☐☐☐
<code>beam.processes.count</code>	gauge	Erlang ☐☐☐☐
<code>beam.ports.count</code>	gauge	Erlang ☐☐☐☐
<code>beam.atom.count</code>	gauge	☐☐☐☐
<code>beam.vm.uptime</code>	gauge	VM ☐☐☐☐☐☐☐

8. 404

404

OmniUDM SBI OmniUDR

1. `udr_uri` OmniUDM
2. OmniUDR OmniHSS IMSI
3. AMF/AUSF SUCI OmniUDM UDR SUCI SUPI
403 SUCI UDR

403 SUCI

OmniUDM AUSF SUCI

1. `hnet_key_dir` `/etc/omniudm/hnet`
2. `<key_id>.<curve>.key` — Profile A `1.x25519.key` Profile B `2.secp256r1.key` ID SIM `home_network_public_key_id`
- 3.
4. `SUCI de-concealment failed`
`:unknown_home_network_key_id`
`:ecies_mac_verification_failed` SUCI SUCI

401

AUSF RES* HRES* HXRES* UE Milenage (Ki, OPc) OmniHSS RAND/AUTN

SQL

UE AUTS AMF `resynchronizationInfo` OmniAMF (AMF-H7) AUSF UDM UDM UDR/HSS SQL SQL

AMF 获取 NSSAI

GET /nudm-sdm/v2/{supi}/nssai 获取 NSSAI (sst=1, sst=2) 获取 NSSAI (UDM-C4) NSSAI NudmSDM.get_nssai/1 OmniHSS NSSAI UDM-C4

注册 UE

UE (UDM-M6) AMF PUT /nudm-uecm/v1/{supi}/registrations/amf-3gpp-access UE UE

SDM 回调

SDM callbackReference URI OmniUDM Task.start SDM notification to {uri} failed GET /nudm-sdm/v2/{supi}/sdm-subscriptions/{id} (UDM-L3) SBI

SMF 注册

SMF SMF PDU SMF AMF PDU SM