

YateUDM

The YateUDM stores and manages the SIM database for mobile networks. It also manages multiple subscriber identities (from different technologies) in one server, providing seamless services over different networks. It is designed for use in GSM, UMTS, LTE, IMS, WiFi and 5G SA / NSA networks or any other type of network that uses MAP, Diameter or CAPIF for authentication.

The YateUDM for 5G includes Authentication Server Function (AUSF), Unified Data Repository (UDM) and Network Slice Selection Function (NSSF).

For LTE, GSM and 3G Includes a Home Location Register (HLR), an Authentication Center (Auc) (2G/3G) and a Home Subscriber Server (HSS) (4G LTE). The YateUDM exports a JSON API for integration with any SIM management and CRM systems. It is capable of interconnecting with all the VLRs implemented in a GSM mobile network, with any MME from a conventional LTE network, or with the YateUCN5G core network server.

As it is also an AuC and AuSF, the YateUSM authenticates subscribers as they try to connect to the GSM, UMTS, LTE, or the 5G networks to make phone calls, send SMSs and access mobile data

YateUDM is easy to operate and manage remotely using the Yate Mobile Management Interface (MMI) online.

The interface makes it accessible to add a new YateUDM unit, to setup a cluster of YateUDMs, to add subscribers, to modify and configure subscribers' profiles and more. YateMMI's main benefit is the fact that operators can remotely manage their entire network equipment using a single web interface.

Features & benefits

- ✓ Available anywhere - containers(dockers, kubernetes), VM's and baremetal.
- ✓ Cloud support
 - public clouds - google cloud, AWS
 - private cloud
- ✓ Cloud Auto Scaling supports both private and public clouds.
- ✓ Unified subscribers solution
- ✓ Simplify your network with a unique subscribers database
- ✓ Supports 2G,3G,LTE, 5G
- ✓ Flexible license so you can start small and scale up to tens of million of subscribers
- ✓ The YateHSS/HLR is fully implemented in software and uses commodity hardware
- ✓ Can serve as a proxy between an existing 2G/3G HLR and an LTE network
- ✓ Uses the SS7 MAP interfaces when serving as an HLR with other 2G/3G network equipment
- ✓ Provides Diameter support
- ✓ Supports groups for mobile data and CAMEL profiles
- ✓ Scalable by adding more HSS/HLR components, either distributed or load balanced
- ✓ Exports a JSON API for custom features
- ✓ Managed via a web-based management interface

Components

API Interface

All 5G Core components support CAPIF to implement the Service Based Architecture.

- HTTP/2 support by default
- HTTP/2 over TLS (needs a proper certificate installed)
- Configurable support for HTTP/2 over TCP without upgrade
- Configurable support for HTTP/1 for test purposes

UDM

Holds subscriber data and registration, provides security material for authentication

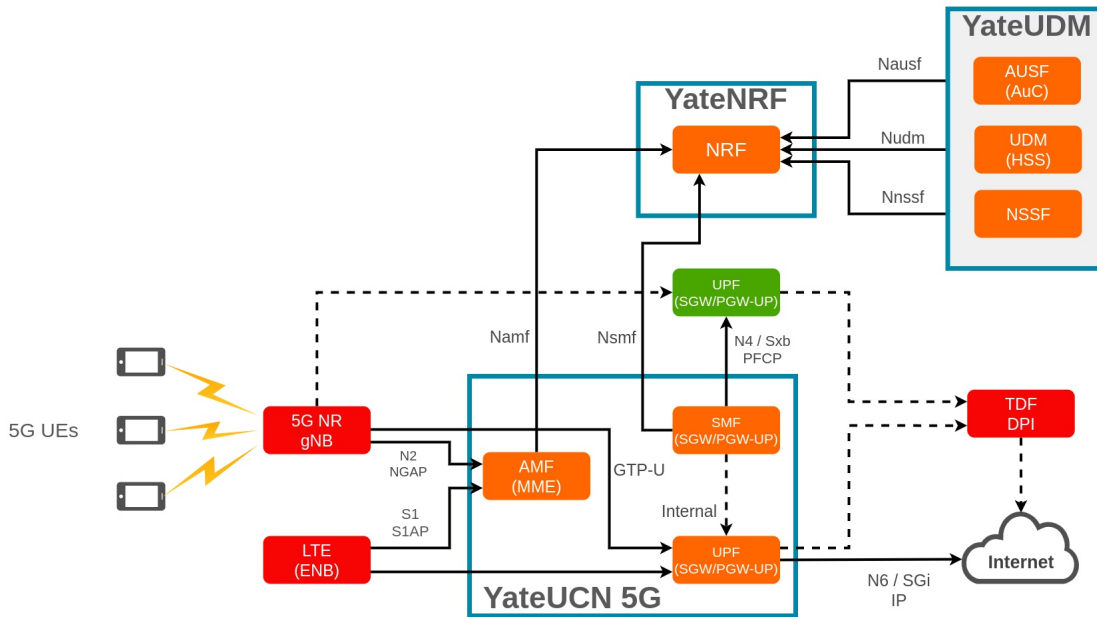
CAPIF interfaces	Direction	Interface	Node
Nudm_UEContextManagement	Incoming	N8	AMF
		N21	SMSF
Nudm_SubscriberDataManagement	Incoming	N8	AMF
		N10	SMF
		N21	SMSF
Nudm_UEAuthentication	Incoming	N13	AUSF

AUSF

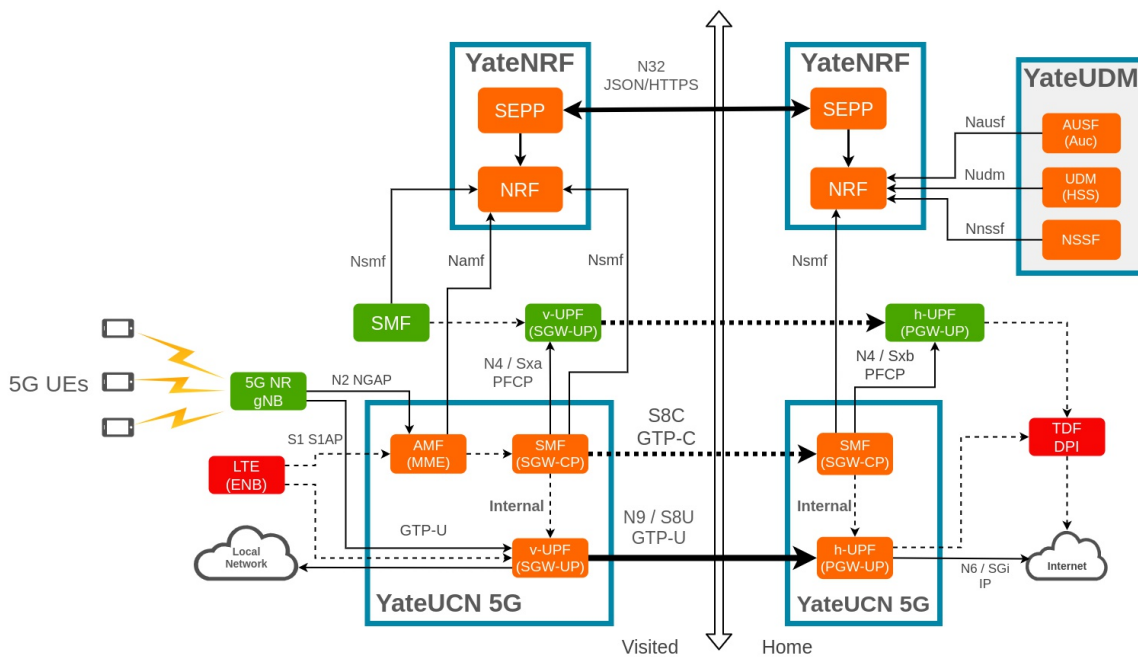
Provides security keys derivation

CAPIF interfaces	Direction	Interface	Node
Nausf_UEAuthentication	Incoming	N12	AMF
Nudm_UEAuthentication	Outgoing	N13	UDM

5G Core network Non-Roaming diagram



5G Core network Roaming diagram



Software Specifications

Roaming	<ul style="list-style-type: none"> • SS7 MAP (2G/3G) Diameter (4G)
Interfaces	<ul style="list-style-type: none"> • S6a/S6d (MME/SGSN to and from YateHSS/HLR) Cx/Dx • (I-CSCF/S-CSCF to and from YateHSS/HLR)
Supported networks	<ul style="list-style-type: none"> • 2G/3G over MAP (ETSI) protocol • 4G over MAP or Diameter protocol • IMS (VoLTE) over Diameter protocol
Supported authentication	<ul style="list-style-type: none"> • 2G SIM using COMP128-1, 2 or 3 algorithms • 3G/4G USIM using MILENAGE algorithm • Derivation of 2G triplets from USIM quintuplets • IMS AKAv1-MD5 ISIM/USIM using MILENAGE algorithm • SIP MD5 Digest • Configurable partitioning of USIM/ISIM sequence number indexes
MAP/SS7/SIGTRAN	<ul style="list-style-type: none"> • ITU TCAP, ETSI MAP v3 • ITU or ANSI SCCP and SS7 MTP • M2PA or M3UA-ASP over SIGTRAN, SCTP (CRC32) • E.164, E.212, E.214, TT or PC SCCP addressing • can connect to multiple STP/GW
Diameter	<ul style="list-style-type: none"> • 3GPP Applications S6a/S6d, Cx/Dx • SCTP or TCP transport • can establish or listen for connections • can connect to multiple Routing Agents
HTTP	<ul style="list-style-type: none"> • JSON API server for configuration and subscriber management • REST API client for visited network change notification
SNMP	<ul style="list-style-type: none"> • SNMP v2 or v3 for information retrieval • Traps sending for alarms
Telnet	<ul style="list-style-type: none"> • management CLI • optional SSL and password protection

CS Services

Supplementary Services (per subscriber)

- call barring: BAOC, BOIC, BOIC-ExHC, BAIC, BIC-Roam
- call forwarding: CFU, CFB, CFNRC, CFNRY
- other: CLIR, CW, HOLD, MultiPTY
- password protection for service change

Operator barring (per subscriber)

- ROAM, BAOC, BOIC, BOIC-ExHC, BAIC, BIC-Roam

CAMEL subscription (per profile)

- O-CSI, T-CSI, VT-CSI, D-CSI, M-CSI, SS-CSI
- MO-SMS-CSI, MT-SMS-CSI

USSD subscription (per profile)

- arbitrary number of prefixes to independent gateways

PS Services

Operator barring (per subscriber)

- ALL-PS, ROAM, HPLMN-AP, VPLMN-AP

PDP Contexts (per profile)

- name, type, charging characteristics
- QoS (basic + extensions)
- VPAA, SIPTO, LIPA
- APN OI Replacement, AMBR

CAMEL subscription (per profile)

- GPRS-CSI, MG-CSI

EPS Services

PDN Connections (per profile)

- name, type, charging characteristics
- QoS (LTE QCI, priorities)
- VPAA, SIPTO, LIPA
- APN OI Replacement, AMBR
- PGW address and name

APN OI Replacement, AMBR, SRVCC, vSRVCC (per profile)

IMS Services

IMS private and public identities (per subscriber)

SIP username, authentication, realm (per subscriber)

Domain and CSCF configuration (per profile)

Initial Filter Criteria (per profile)

- configurable list of SPT groups
- SPT types: RequestURI, Method, SIPHeader, SessionCase, SessionDescription

CAMEL subscription (per profile)

- O-CSI, VT-CSI, D-CSI

High availability

- Can be configured in a cluster of equal nodes
- Subscriber data is replicated across all nodes
- Requests can be distributed or balanced between nodes
- Detection of communication failures
- Automatic synchronization of new nodes
- Automatic synchronization after failure