



SUBSCRIBER AND DATA
MANAGEMENT

Product Data Sheet

Home Subscriber Server (HSS)

Business Benefits

- From Private Network solutions with a handful of subscribers to multiple 10s of millions of subscribers for IoT
- The Authentication Center (AuC) application supports numerous cryptographic algorithms as well as secure SIM data import procedures
- Offering several configuration and deployment options to ensure highest service availability

Product Data Sheet

Home Subscriber Server (HSS)

+ Overview

Titan.ium's Home Subscriber Server (HSS) is designed for operational efficiency, high performance, and scalability. The built-in Titan™ database delivers virtually unlimited subscriber capacity.

Subscriber data is provisioned centrally in Titan.ium's Subscriber Data Management (SDM) application and distributed in real-time to the HSS signaling nodes.

Titan.ium delivers Home Location Register (HLR) and HSS as separate applications that share the same SDM and AuC data models.

⌵ The Titan.ium Solution

The HSS application can be deployed in an EPC (LTE, 5G-NSA), non-3GPP (WiFi) and IMS network as the central database that contains details of each subscriber that the system authorizes to use the operator's fixed, mobile, or IMS core services.

The HSS primarily provides security (authentication) procedures, location and registration management, and the delivery of subscriber profiles and call/SMS/data routing information. Additional features comprise service interworking capabilities, such as HSS-HLR interworking, S6a/d-Sh interworking, S6a/d-SWx interworking, IP-SM Gateway support and, enablement of Location Based Services and Subscriber Tracing.

Titan.ium HSS

☰ Multi-tenant, unlimited-scale, HSS subscriber profile services for the IMS, EPC (LTE, 5G NSA), WiFi, SMS, MTC and GBA domains.

Titan.ium HSS is part of the SDM framework allowing customer defined interfaces for the provisioning of user data into HSS, HLR, ENUM, EIR.

Cx/Zh Interface

Authorization (roaming, barring, emergency), SIP Digest / Digest AKA Authentication, Server Assignment, Location Information, IMS service profile, GUSS profile

SWx Interface

Authentication Procedure (EAP AKA/EAP AKA'), UE Registration Request, De-Registration Notification, PDN GW Identity Update Notification, User Profile Update Notification, Provide User Profile Procedure

S6a/d Interface

Authorization, Authentication, Location Management, Subscriber Data Management, Serving Node Notifications, Purge and Reset Operations, PGW Identity Update Notification

SLh Interface

MME Address, H-GMLC Address, SGSN Address/SGSN Diameter Identity, MSC Address, 3GPP AAA server address, V-GMLC address(es), Privacy Profile Register (PPR) address

S6m Interface

Variety of MTC related subscription data such as NBloT: eDRX, PSM, long latency communication and DL packet buffering, dedicated core networks and UE usage type, periodic location updates, Communication with network entities such as SCEF for non-IP PDN, NIDD, and MONTE, MTC-IWF, MTC-AAA

S6c Interface

SMS registration and deregistration in the MME with Cancel location towards existing VLR/MSC SMS routing information, processing SM delivery status, Diameter S6c interface for SC alerting, MAP-based SMS management during outbound roaming

Sh Interface

Subscribe/Notify, Repository Data, IMS Data, User State, Identities, Location Information, S6a/d Interworking, MMTel Service Synchronization

Lawful Interception

Provisioning and Event Notification Provisioning and Event Notification for target (subscriber) activity in the EPC networks.

Product Data Sheet Home Subscriber Server (HSS)

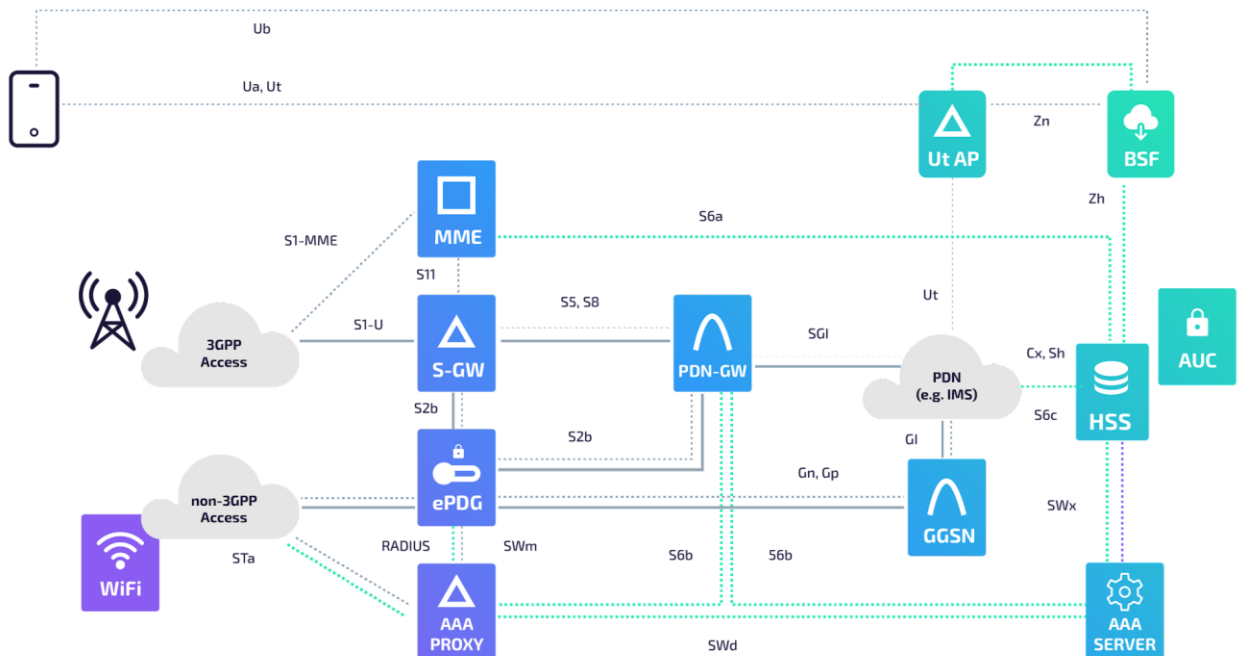
Functions and Interfaces

Titan.ium delivers HLR and HSS as separate applications that share the same SDM and AuC data model. The SDM performs interworking between the HSS and HLR, for example, location management. The SDM application is also responsible for synchronizing the status of the configured MM-Tel supplementary services.

HSS utilizes HTTP protocol for notification of events that occur when the system processes received requests, such as network attach/user registration.

Titan.ium HSS's logical functions interact with the following mobile core network elements:

- MME: Diameter S6a interface
- S4-SGSN: Diameter S6d interface
- I-CSCF: Diameter Cx interface
- S-CSCF: Diameter Cx interface
- AAA server: Diameter SWx interface
- BSF: Diameter Zh interface
- IMS AS: Diameter Sh interface
- IP-SM-GW: Diameter Sh/ S6c interface
- MTC-IWF: Diameter S6m interface
- MTC-AAA: Diameter S6n interface
- SCEF: Diameter S6t interface
- GMLC: Diameter SLh interface



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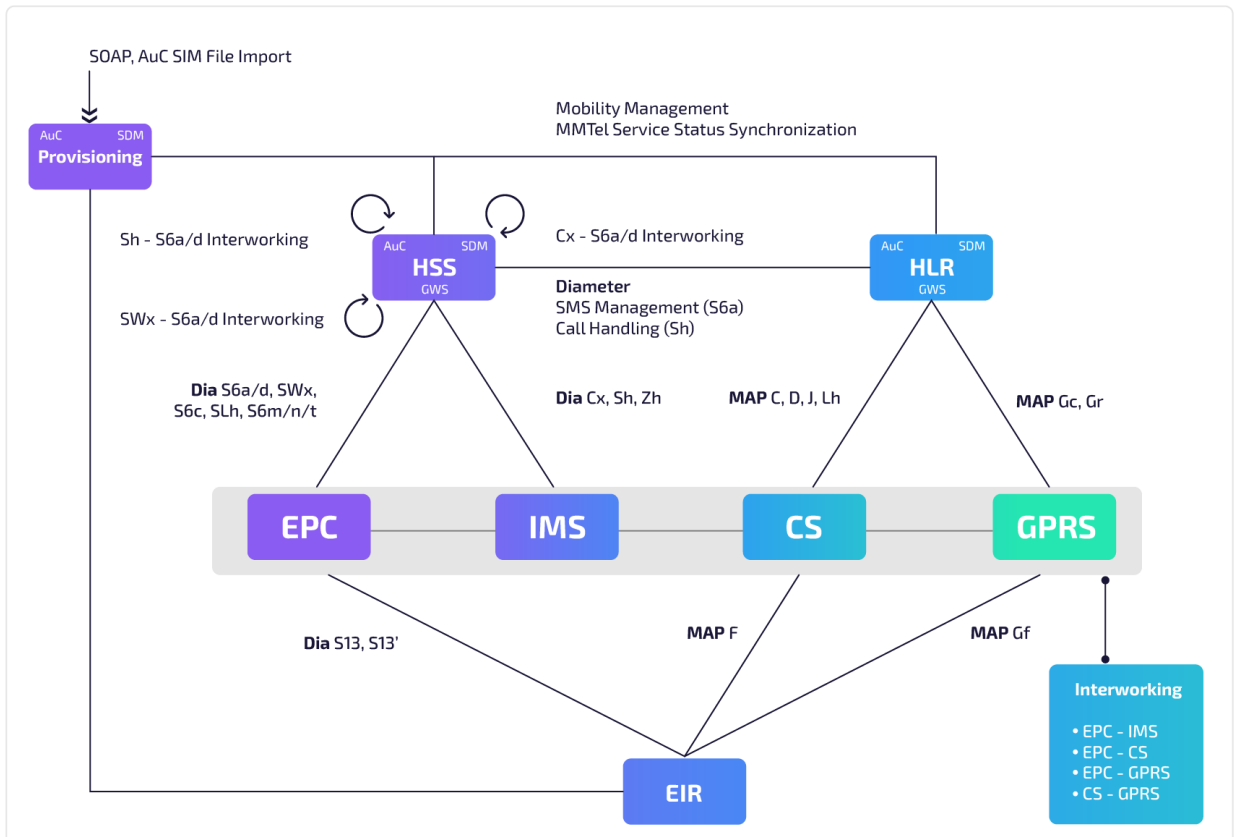
Subscriber Data Management

With the introduction of 5G and IMS (IP Multimedia System) services into their networks, carriers will be able to enable new revenue generating opportunities while consolidating older systems to an all-IP architecture. But with these new technologies there are complex signaling and migration challenges that are proving to be difficult and complex. Future 5G-IMS enabled mobile networks will host newer bandwidth hungry consumer mobile devices while simultaneously sharing the same network with a new generation of Internet of Things (IoT) devices that are expected to maintain its growth tendency for the next years.

SDM Solution for 2G/3G/4G/5G-NSA/IMS

The Titan.iium solution implements the Subscriber Data Management (SDM) applications to be upgradable software modules on a common platform. Titan™ hosts all subscriber management applications concurrently, serving 2G, 3G, 4G, 5G-NSA, IMS and VoWiFi on one infrastructure. All HSS and HLR service data can then be consolidated on a single, multi-tenant and highly scalable SDM and Authentication database with integrated Equipment Identity Register (EIR) capabilities.

Titan.iium's Subscriber Data Management does not sacrifice service, standards, or capabilities. It can be used as a front-end for existing hardware systems, giving carriers the ability to add the latest innovations without modifying or replacing their existing infrastructure. This non-disruptive approach preserves current assets yet makes new service rollouts painless, fast, and easy to maintain.



Product Data Sheet

Home Subscriber Server (HSS)

Key Capabilities

Authentication

The HSS authenticates each SIM card that attempts to connect to the mobile, wireless, or wireline core network based on the authentication vectors the AuC generates, or based on the username and password for a non-SIM UE. The request for authentication vectors is triggered from the MME, S4-SGSN, AAA, BSF, or CSCF node towards the HSS that invokes the AuC. The AuC uses the 3GPP Milenage algorithms to create the authentication challenge and expected response. If the UE attaches to the LTE or uses EAP-AKA', then the AuC applies the Key Derivation Function. The AuC generates an encryption key that is subsequently used to encrypt all communications between the mobile phone and the mobile core network.

Location Management

The HSS manages the mobility of subscribers by updating their position in LTE or in wireless/wireline access networks. To cancel an old location, the HSS sends a Cancel Location request to the previous serving MME, SGSN or VLR node. If a mobile phone is inactive for a long period of time, then the serving node deletes the subscription data it obtained from the HSS and informs the HSS about the purge operation it performed.

Other features

The HSS provides other features such as, but not limited to:

- MNO specific addressing (Multi-tenancy)
- IMSI Aliasing (programmable SIM)
- Security procedures that MME, S4-SGSN, BSF, S-CSCF, and AAA nodes request
- Subscriber profiles for CS, PS/GPRS, PS/EPS, non-3GPP (WiFi), and GBA (GUSS)
- IMS service profile with SIP Digest and Digest AKA authentication support
- IMS private user identities (IMPI)
- Roaming and Barring services
- Regional Subscription
- PLMN-specific APN configurations (including NB-IoT support via IP and non-IP PDN)
- Support of statically and dynamically assigned PDN-GW (incl. PGW identity update)
- SMS over IP Management services
- Subscriber Tracing
- Enablement of Location Based Services

Contact Titan.ium Today

Please visit www.titaniumplatform.com for product or solution information. For configuration and pricing details, please contact your local account representative via sales@titaniumplatform.com

About Titan.ium

Titan.ium Platform is a leader in signaling, routing, subscriber data management, and security software and services. Our solutions are deployed in more than 80 countries by over 180 companies, including eight of the world's top ten communications service providers and all of the top five. Titan.ium supports any network, domain, signaling protocol, and infrastructure with advanced routing capabilities and a unified end-user experience.

