

Introduction to IMS

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IMS Benefits - Official Story

- Access Independence - not just Cellular: wired, WiFi, WiMax, etc
- Standards Based - IP, SIP, portable across providers
- QoS - ability to link application needs to provisioning
- Billing/Charging - for commercial viability, carrier ROI, “one bill”
- Integration of new services - no more stovepipe applications
 - presence, location, group management, PoC, voice, text, video

IMS Position

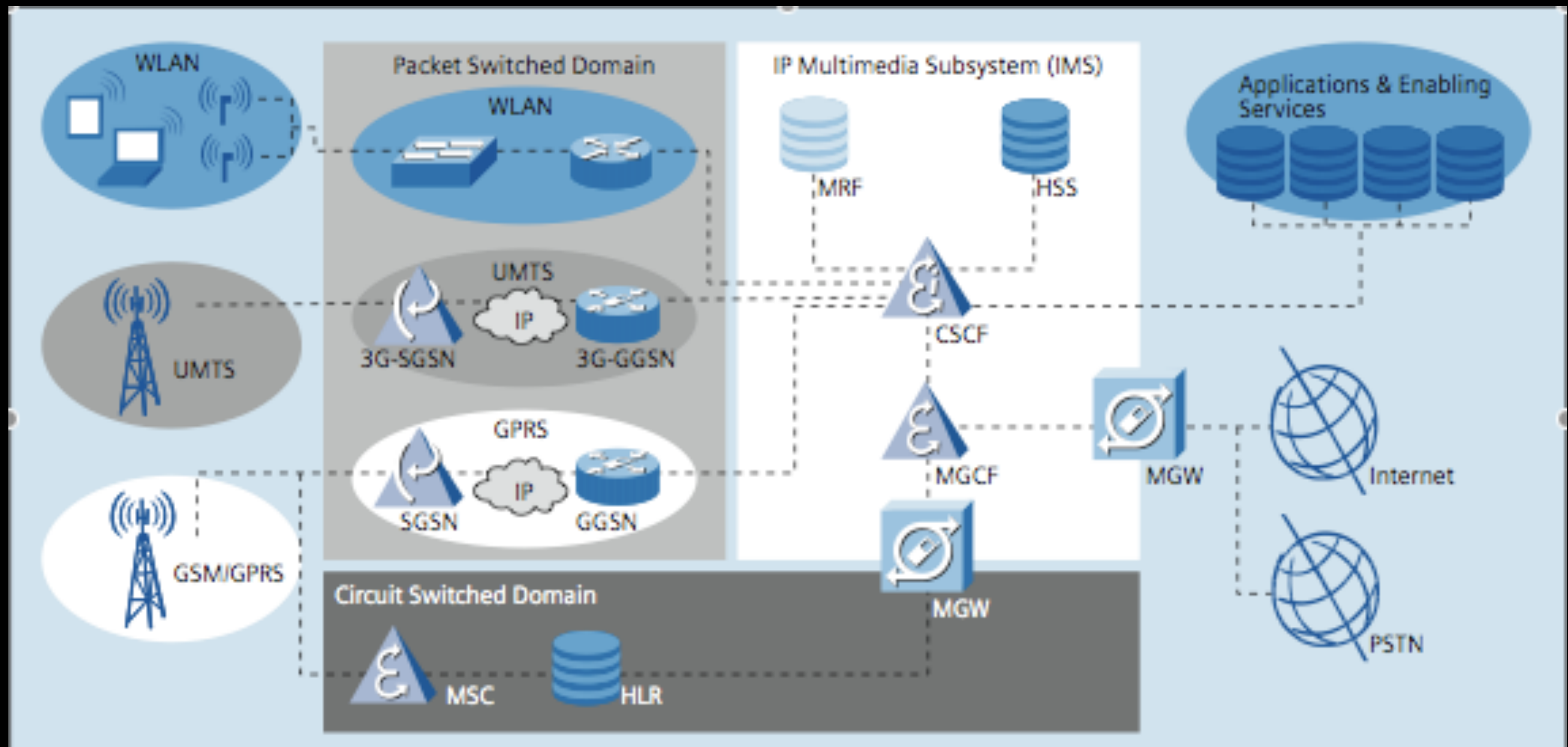
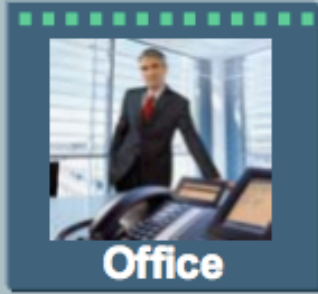
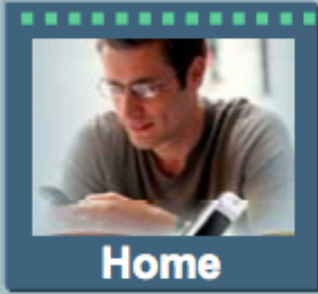


Figure 1: Position of the IP Multimedia Subsystem within a mobile network

Charging and Billing



Communication

- ▶ Push to Talk over Cellular
- ▶ Instant Messaging
- ▶ Mobile office
- ▶ Video call
- ▶ Multimedia Conferencing
- ▶ ...



Information

- ▶ Information Sharing
- ▶ Interactive guidance
- ▶ Collaborative working
- ▶ Internet Services
- ▶ ...



Entertainment

- ▶ Photo Share, Push to Show
- ▶ Person-to-Person Gaming
- ▶ Audio and video sharing – mobile and at home
- ▶ ...

Various charging models

\$
\$... **one bill** \$
\$

No Stovepipes

Vertical Solutions

Appli-
cation A.1
incl.
Service
platform
100%

Appli-
cation A.2
incl.
Service
platform
100%

Appli-
cation A.n
incl.
Service
platform
100%

IMS Solution

Application Logic Development

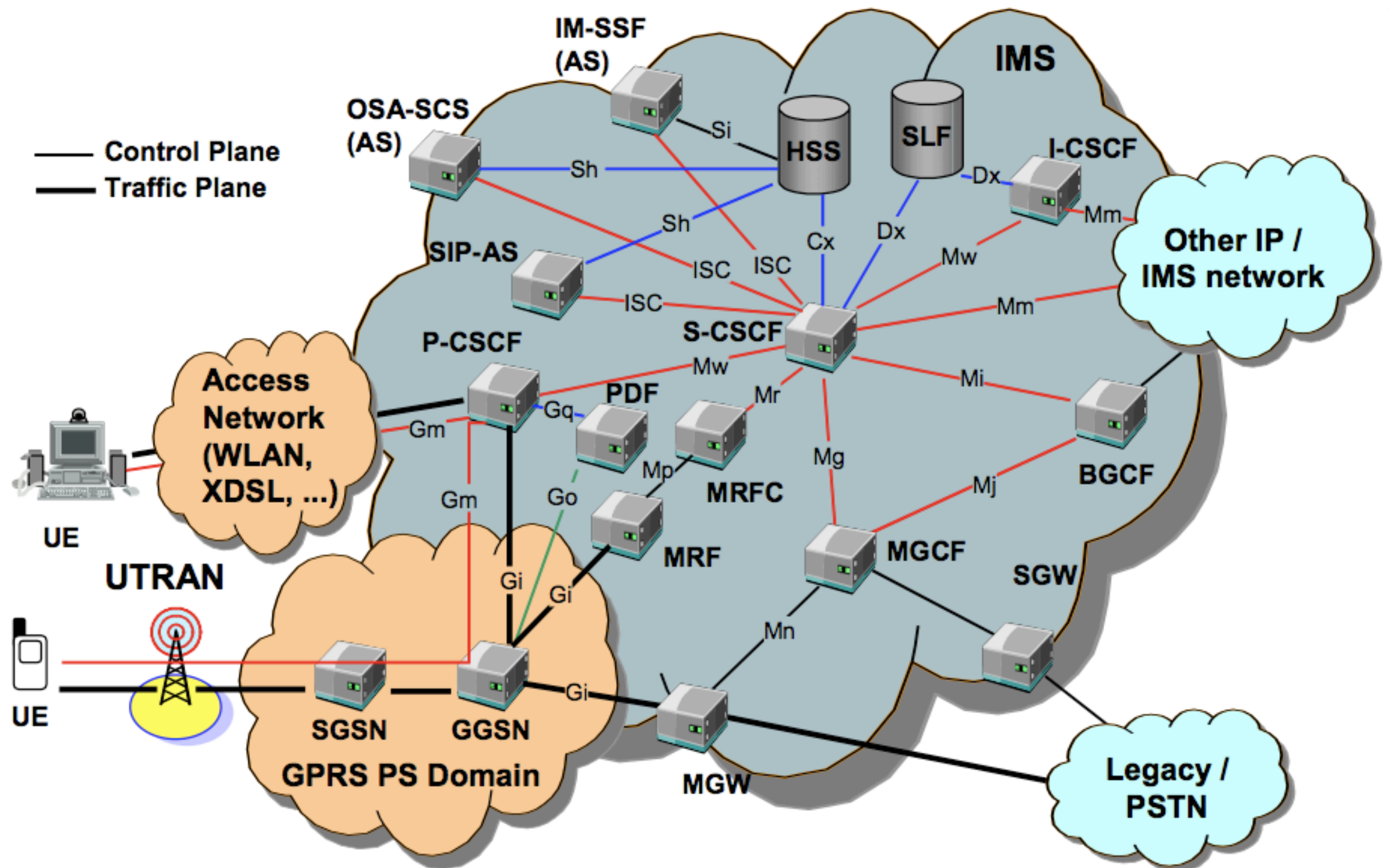
Programmable Application Creation
Layer

Enabling Services

Ubiquitous IP with IMS Core

Converged Network Infrastructure

IMS Architecture



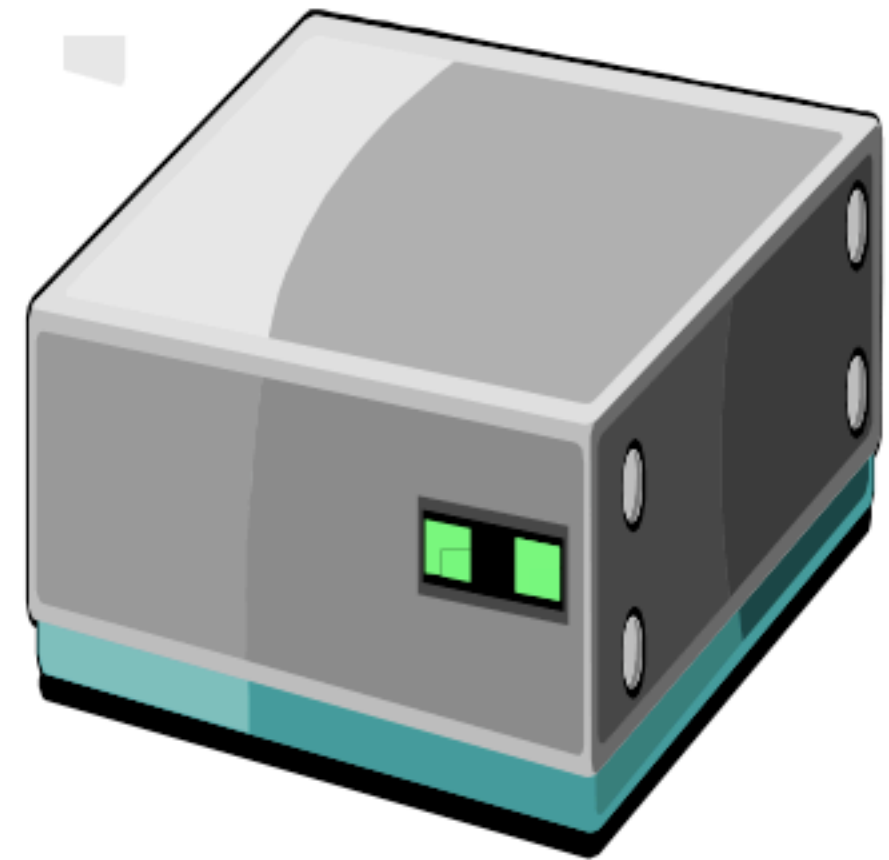
The CSCF

- CSCF - Call Session Control Function
- What IMS calls “The Main SIP Servers”
- Three flavors
 - Proxy CSCF
 - Interrogating CSCF
 - Serving CSCF

The CSCF Family

The **Proxy**-CSCF (**P**-CSCF)

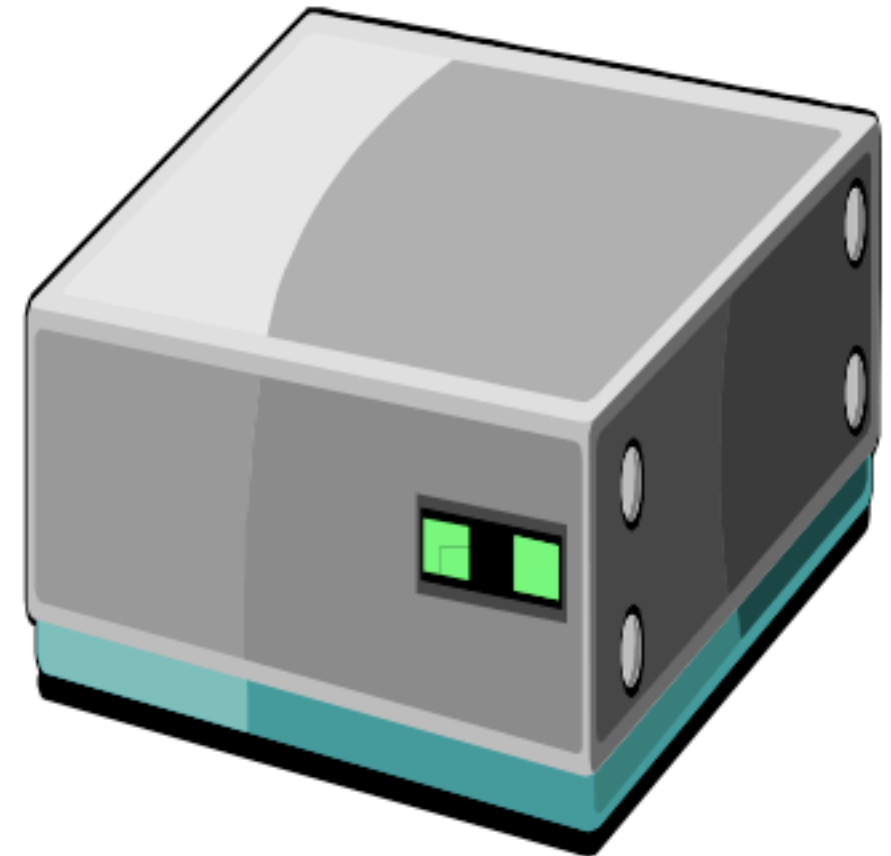
- acts as an outbound/inbound SIP proxy server
- is allocated to the IMS terminal during IMS registration
- does not change for the duration of the registration
- authenticates the user
- asserts the user's identity to the rest of the IMS network
- verifies the correctness of SIP requests sent by the IMS terminal
- may use SigComp
- may include a Policy Decision Function (PDF)
- generates charging information
- is always located in the same network where the GGSN is located (GPRS/UMTS access)



The CSCF Family

The **Interrogating** CSCF (I-CSCF)

- is a SIP proxy located at the edge of an administrative domain
- has Diameter-interfaces to the SLF and the HSS
- routes the SIP requests to the appropriate destination (typically an S-CSCF)
- is usually located in the home network
- may provide THIG functionality

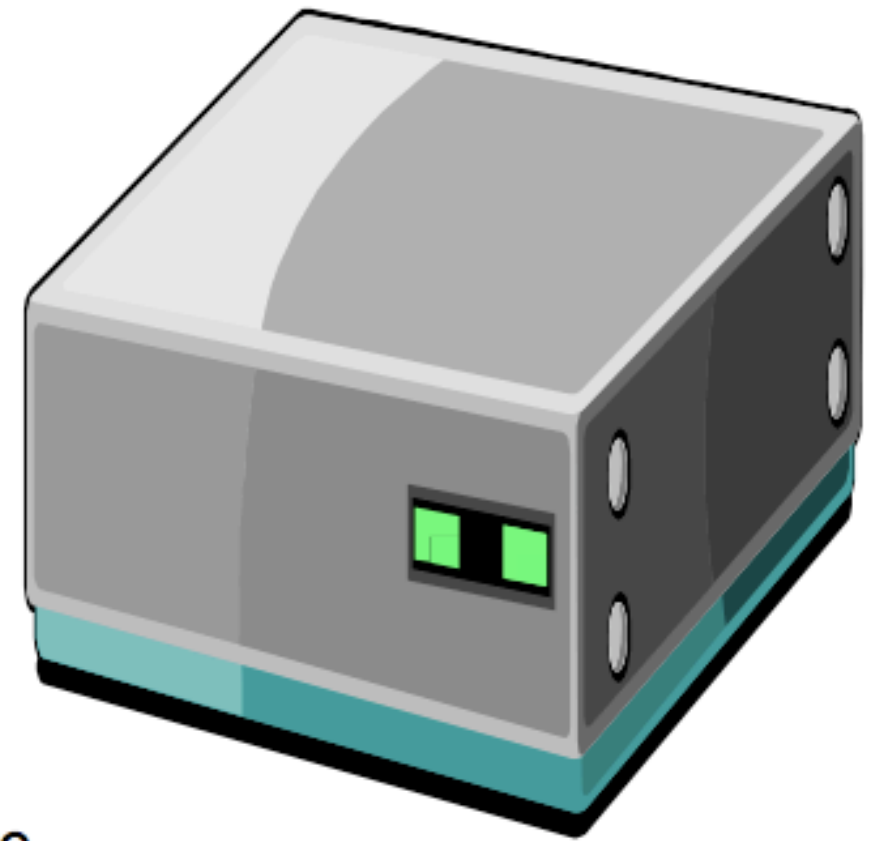


The CSCF Family

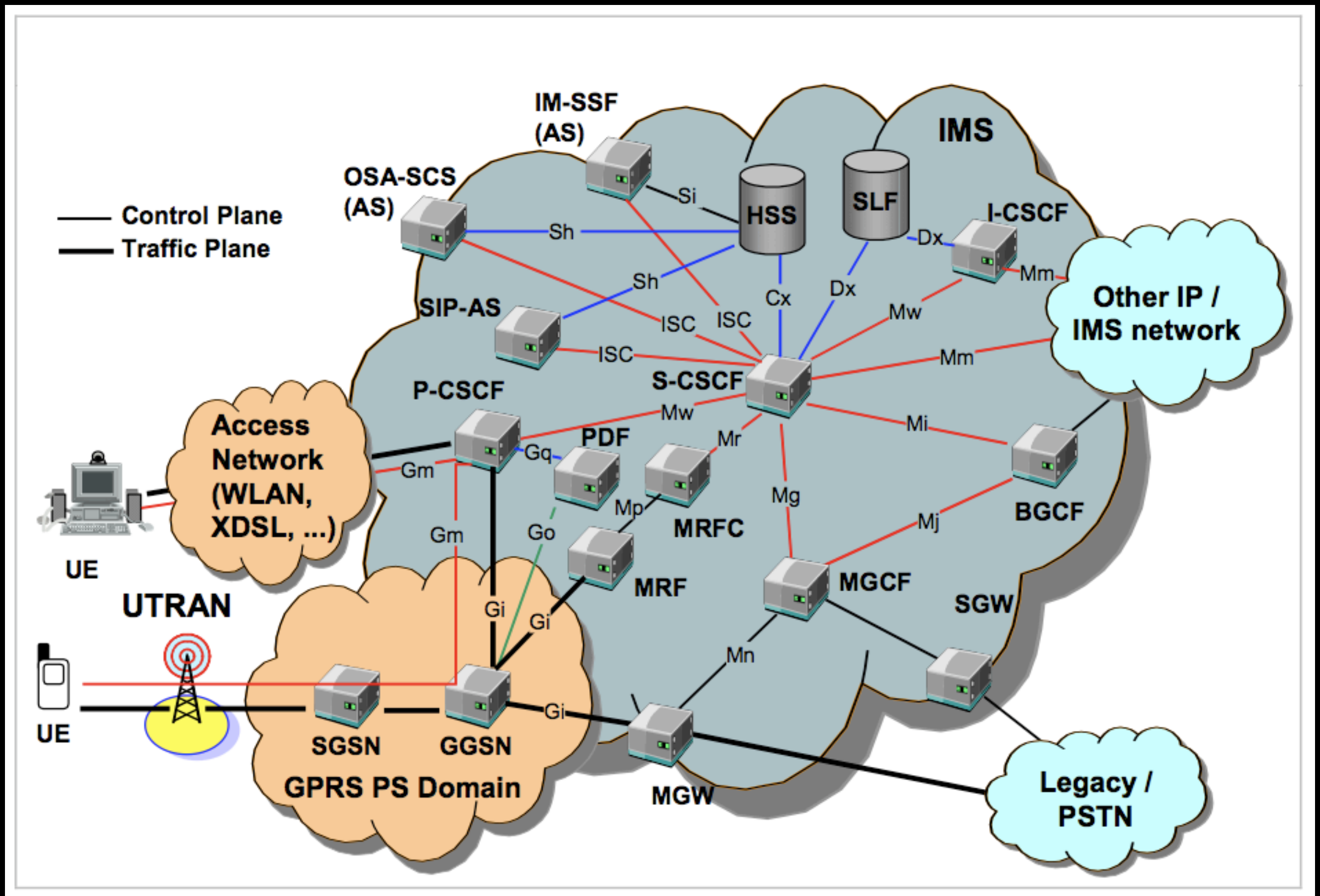
The **Serving** CSCF (**S-CSCF**)

- is a SIP server
- is the central node of the signalling plane
- acts as a SIP registrar
- interfaces the HSS (via Diameter) to
 - download authentication vectors
 - download user profiles
 - inform the HSS that this is the S-CSCF allocated to the user for the duration of the registration
- performs session control
- processes SIP messages according to the served users' service trigger profiles

All SIP signalling sent and received by the IMS terminal traverses the allocated S-CSCF.



IMS Architecture



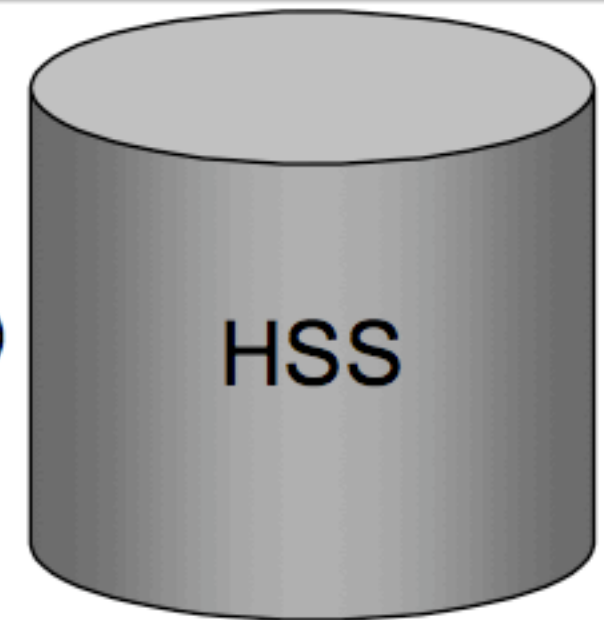
Other IMS Components

- HSS - Home Subscriber Server
- SLF - Subscriber Locator Function
- PDF - Policy Decision Function
- AS - Application Servers

Subscriber Information

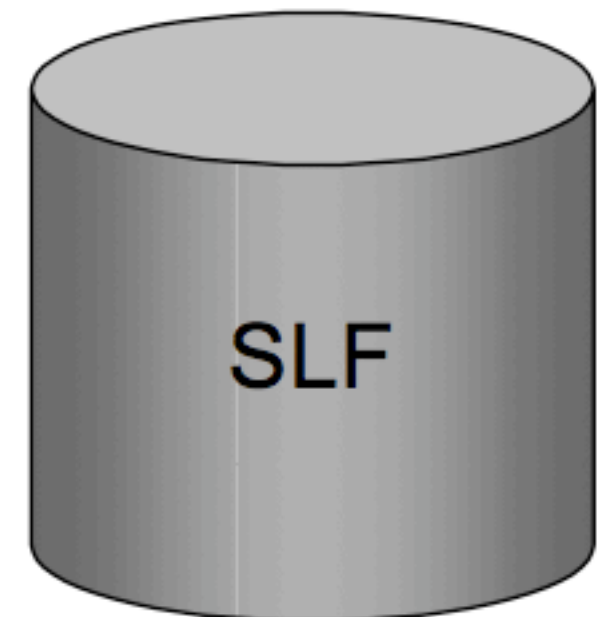
The Home Subscriber Server (HSS)

- contains location information
- contains security information (for authentication and authorization)
- contains user profile information (subscribed services, policies ...)
- the S-CSCF assigned to the user
- ...



The Subscription Locator Function (SLF)

- is necessary only if the IMS contains more than one HSS
- maps users' addresses to HSSs

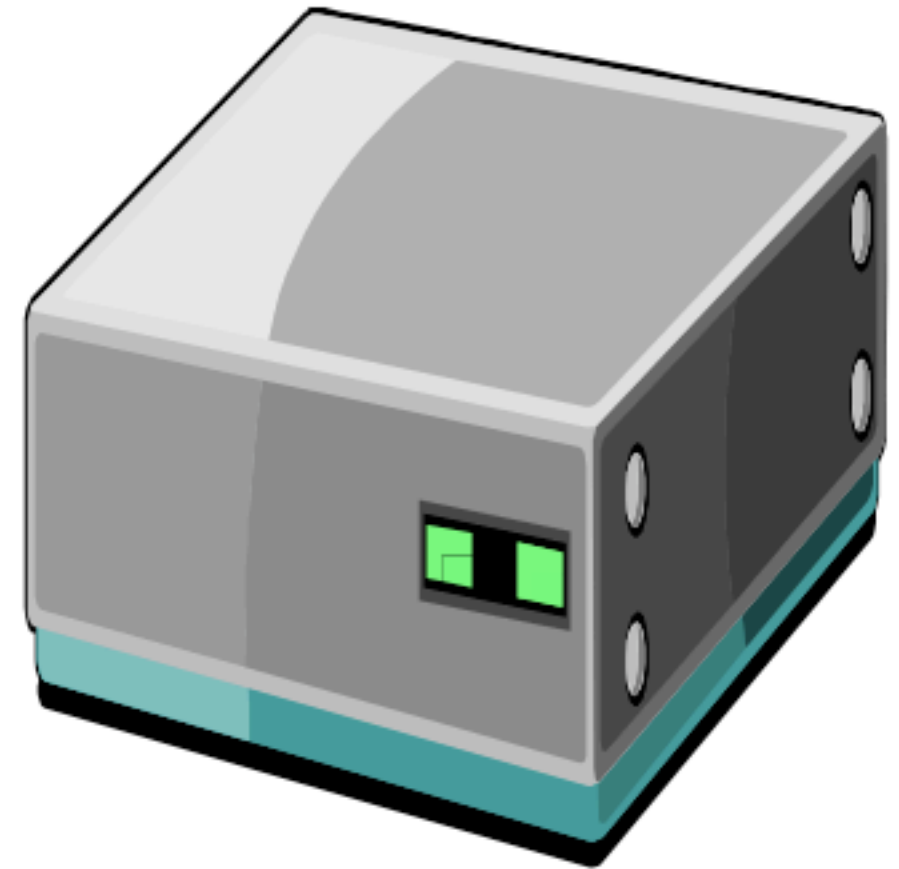


Both HSS and SLF implement the Diameter protocol

Policy Information

The **Policy Decision Function (PDF)**

- informs the GGSN about the characteristics of the session a user agent is authorized to establish at a particular time; the GGSN enforces these policy decisions by installing packet filters on the media path.
- has a COPS interface to the GGSN (Go)
- has a Diameter interface to the P-CSCF (Gq)



Application Servers

- Presence - user availability and status
- GLM - Group List Management - user groups
- Location - user's physical location
- PTT - Push To Talk - walkie talkie service
- IM - Instant Messaging - text messaging
- etc, etc, etc