A Bit Deeper Into 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

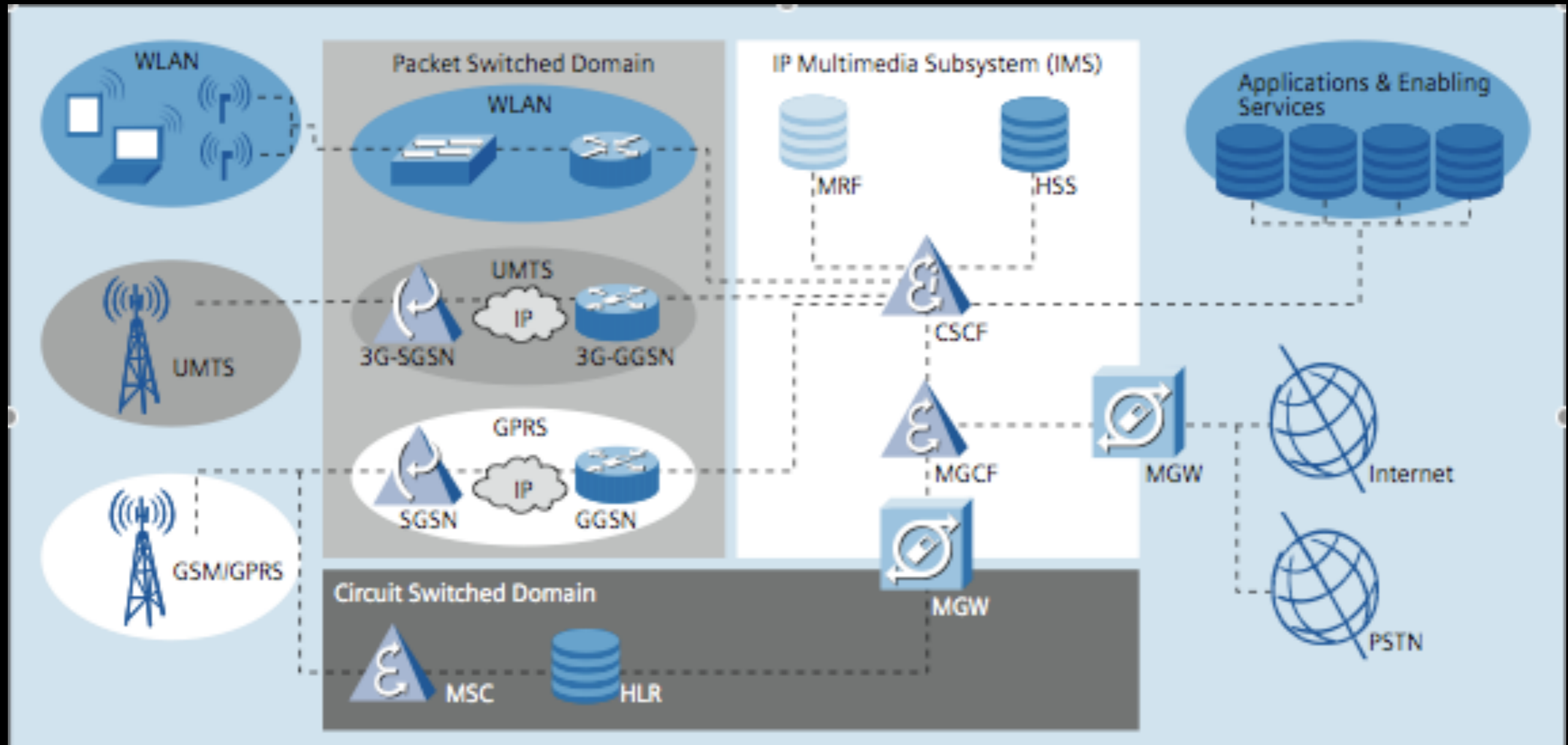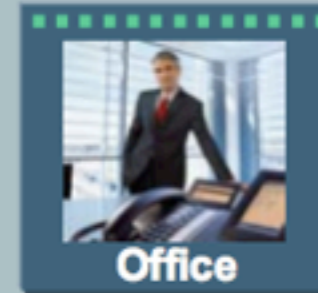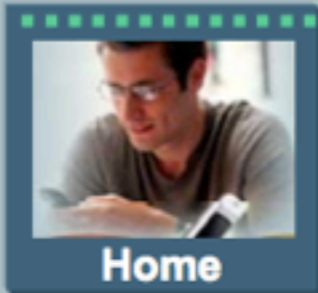 - presence, location, group management, PoC, voice, text, video

IMS Position

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

Charging and Billing

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
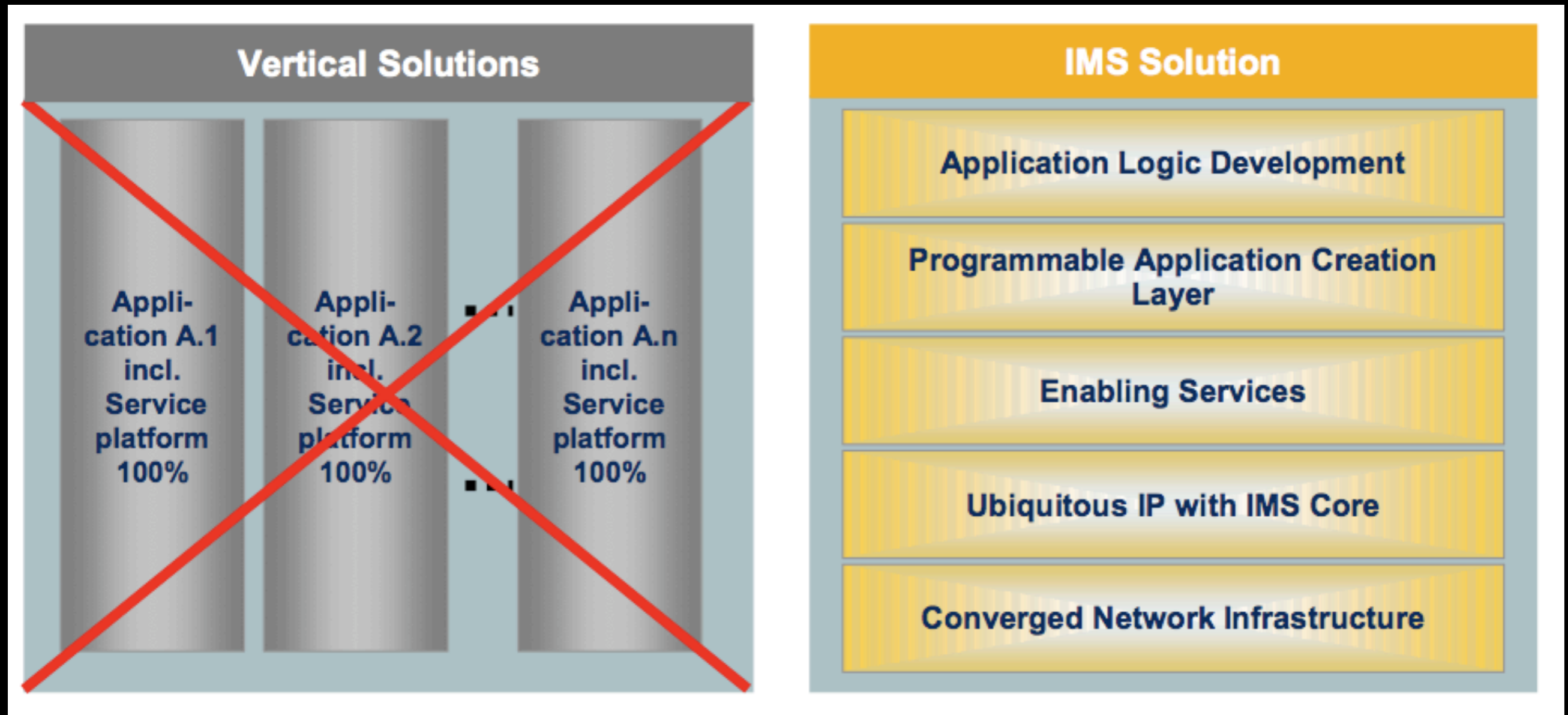
IMS Architecture
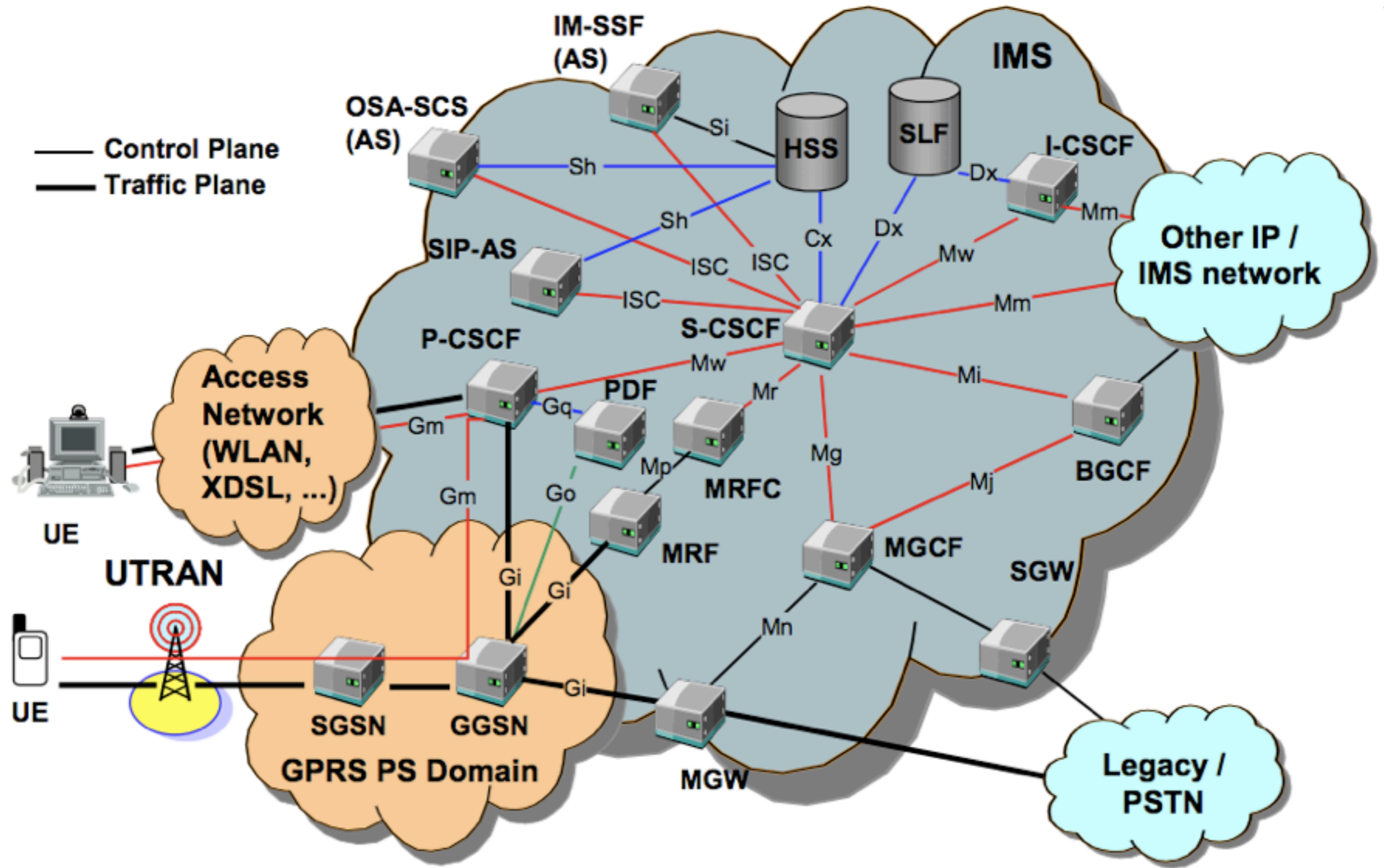
The CSCF

- 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)
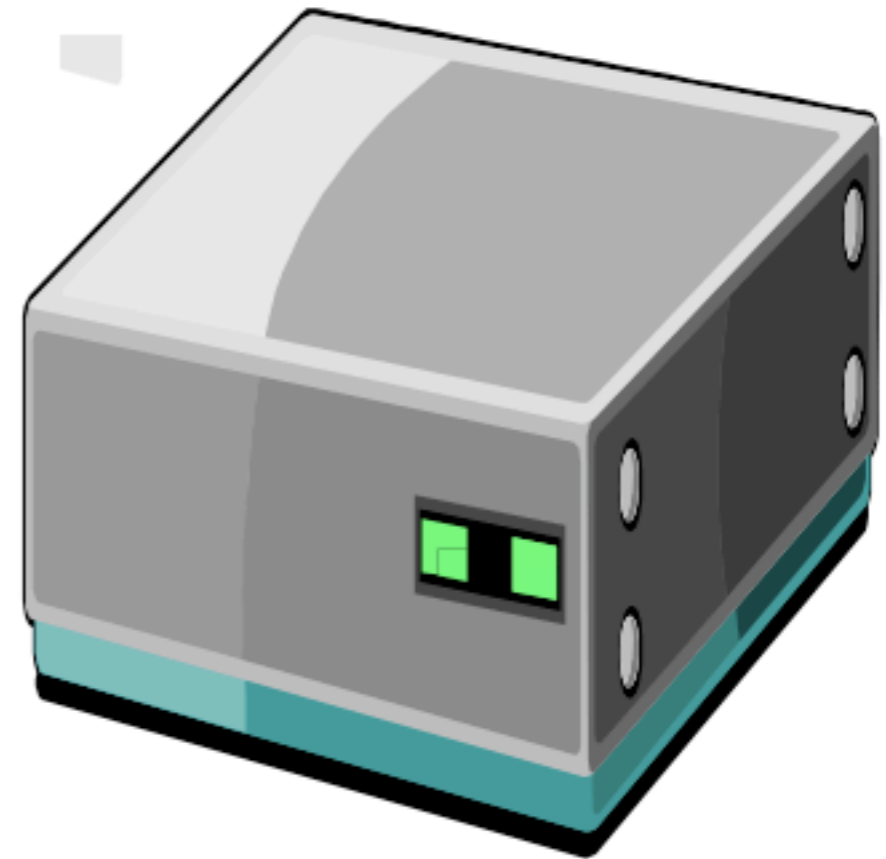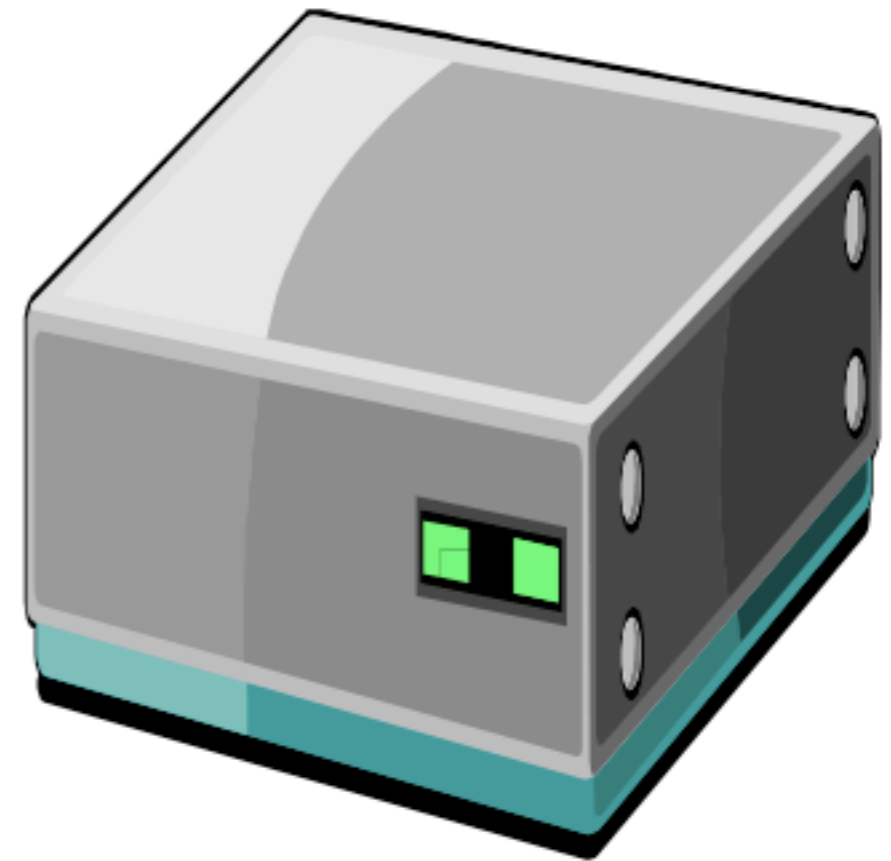
The CSCF Family

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.
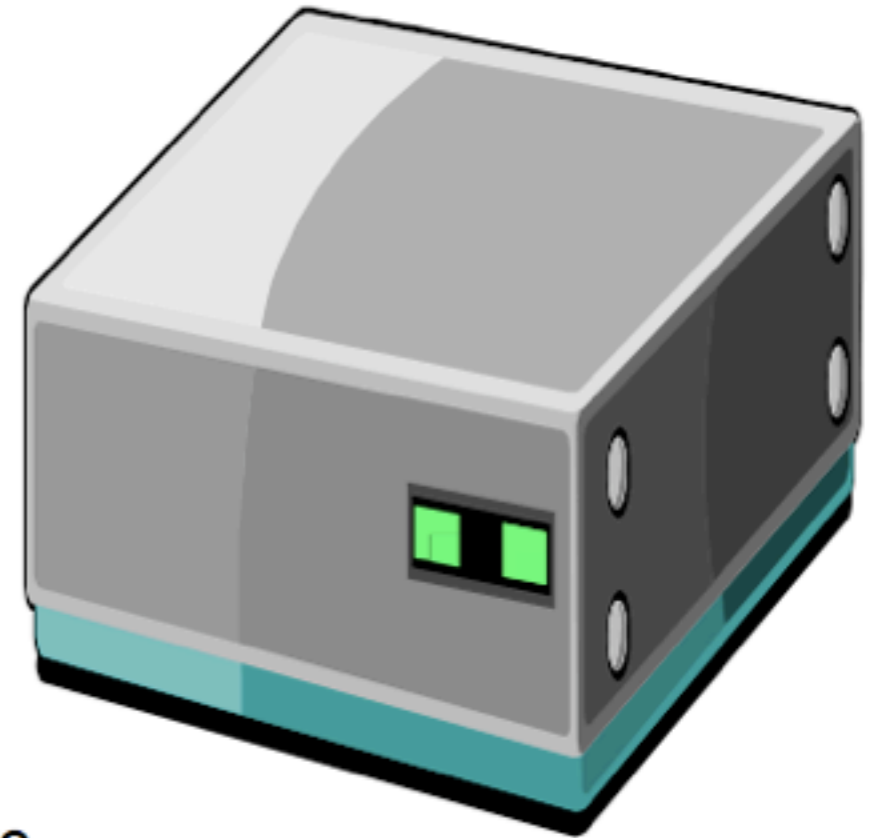
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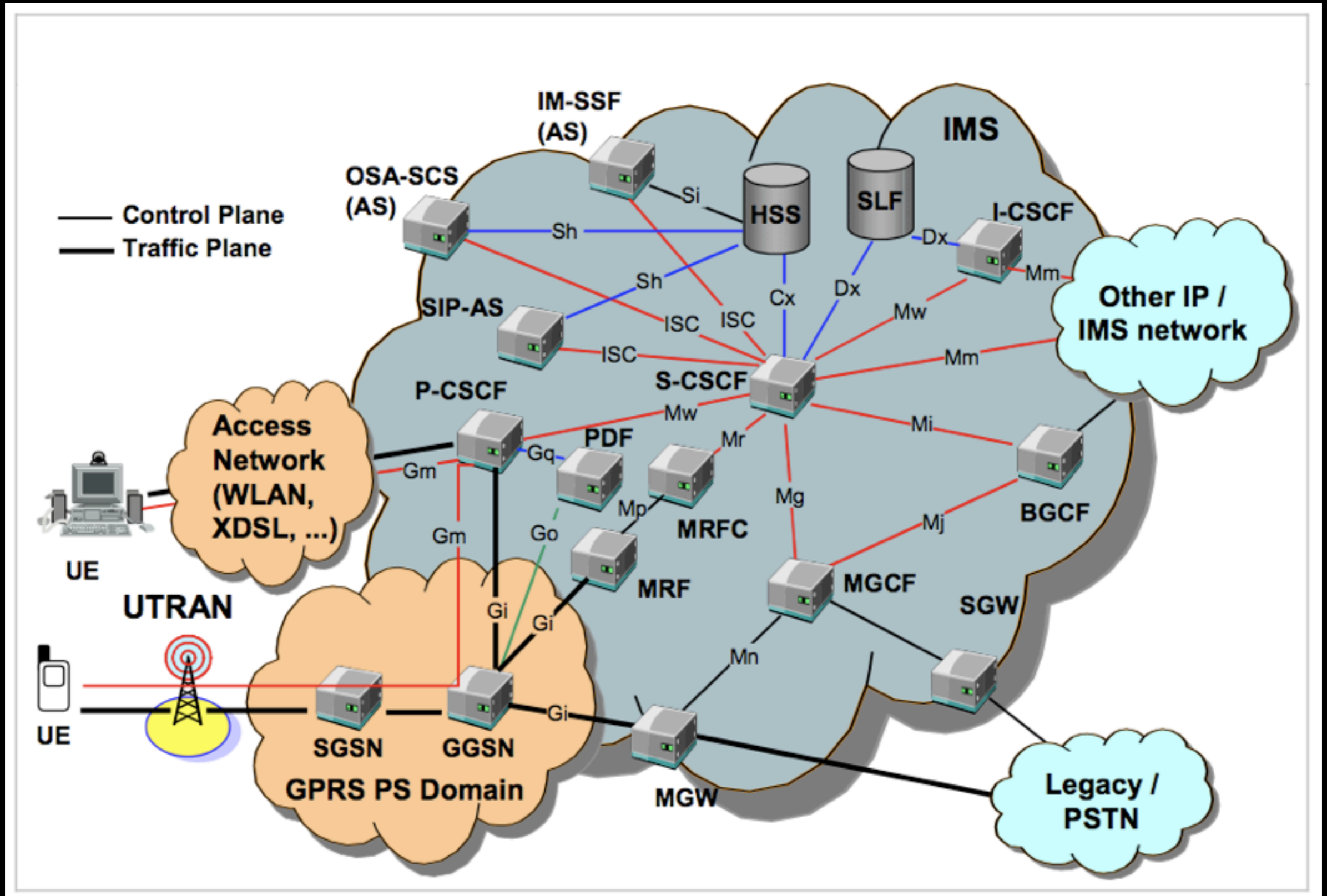
Other IMS Components

- 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

- ...

HSS
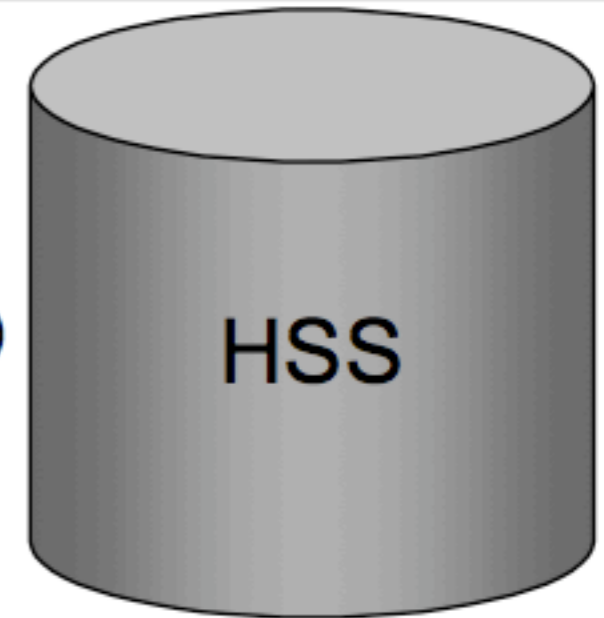
The Subscription Locator Function (SLF)

- is necessary only if the IMS contains more than one HSS

- maps users' addresses to HSSs

SLF
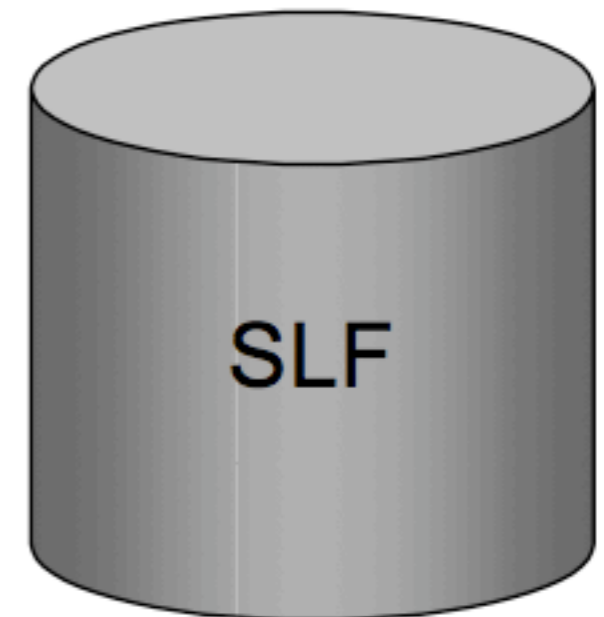
Both HSS and SLF implement the Diameter protocol

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)
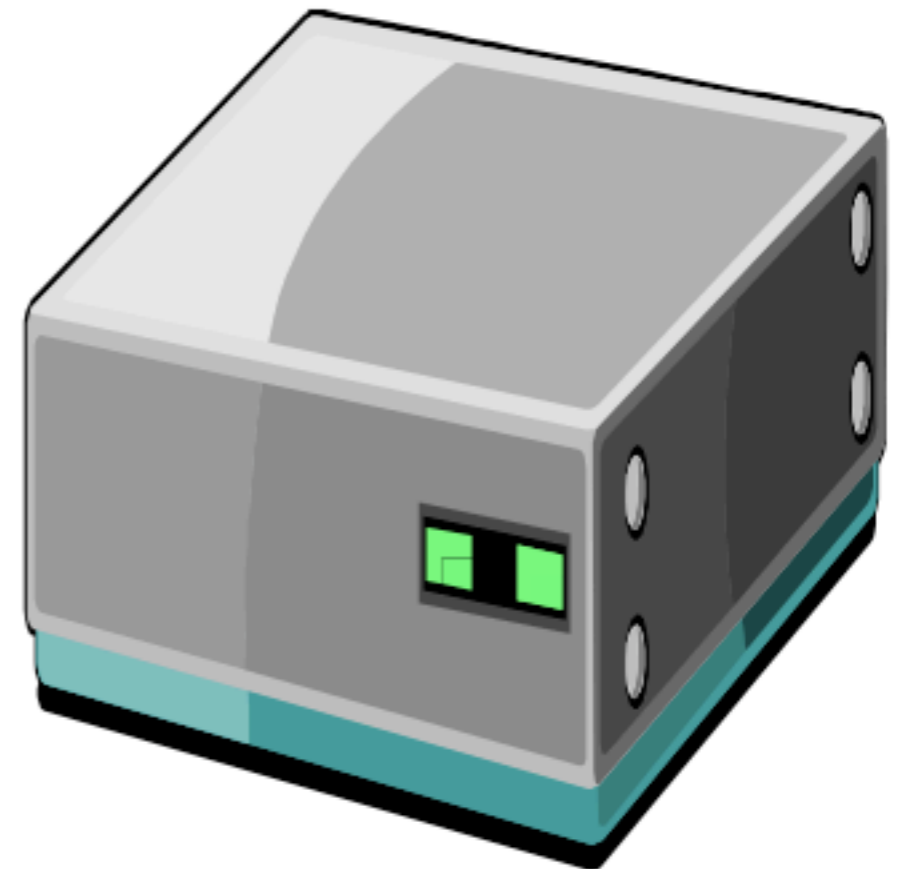
Application Servers

- 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