

IMS SIGNAL PROTOCOLS

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Annotation: IMS was originally designed by the wireless standards body 3rd Generation Partnership Project (3GPP), as a part of the vision for evolving mobile networks beyond GSM. Its original formulation (3GPP Rel-5) represented an approach for delivering Internet services over GPRS.

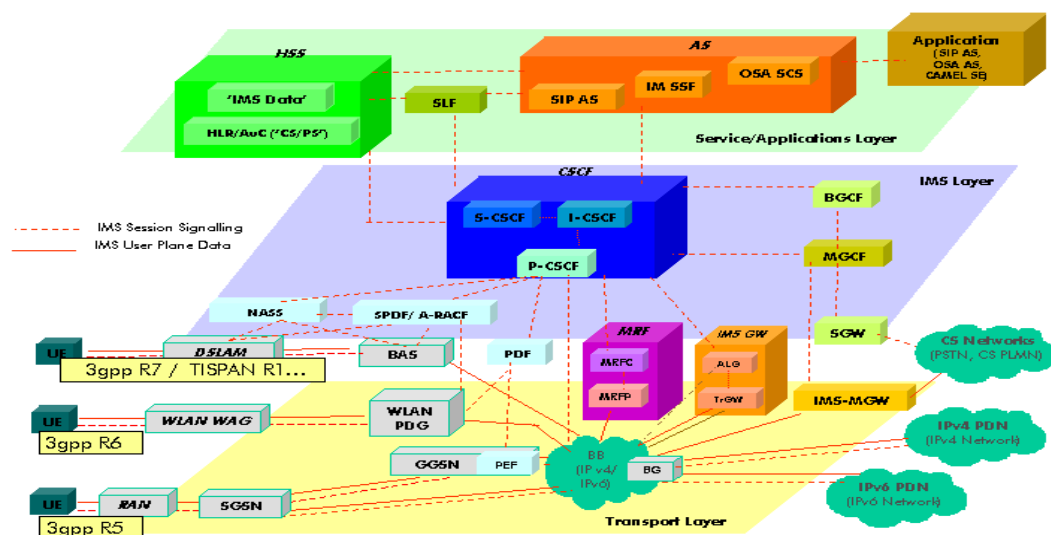
Key words: networks other than GPRS, access of multimedia and voice applications

This vision was later updated by 3GPP, 3GPP2 and ETSI TISPAN by requiring support of networks other than GPRS, such as Wireless LAN, CDMA 2000 and fixed lines.

IMS uses IETF protocols wherever possible, e.g., the Session Initiation Protocol (SIP). According to the 3GPP, IMS is not intended to standardize applications, but rather to aid the access of multimedia and voice applications from wireless and wireline terminals, i.e., to create a form of fixed-mobile convergence (FMC). This is done by having a horizontal control layer that isolates the access network from the service layer. From a logical architecture perspective, services need not have their own control functions, as the control layer is a common horizontal layer. However, in implementation this does not necessarily map into greater reduced cost and complexity.

Alternative and overlapping technologies for access and provisioning of services across wired and wireless networks include combinations of Generic Access Network, soft switches and "naked" SIP.

Since it is becoming increasingly easier to access content and contacts using mechanisms outside the control of traditional wireless/fixed operators, the interest of IMS is being challenged. Examples of global standards based on IMS are MMTel which is the basis for Voice over LTE (VoLTE), Wi-Fi Calling (VoWiFi), Video over LTE (ViLTE), SMS/MMS over WiFi and LTE, USSD over LTE, and Rich Communication Services (RCS), which is also known as or Advanced Messaging, and now RCS is operator's implementation. RCS also further added Presence/EAB (enhanced address book) functionality.



The IP multimedia core network subsystem is a collection of different functions, linked by standardized interfaces, which grouped form one IMS administrative network. A function is not a node (hardware box): An implementer is free to combine two functions in one node, or to split a single function into two or more nodes. Each node can also be present multiple times in a single network, for dimensioning, load balancing or organizational issues.

Access network

The user can connect to IMS in various ways, most of which use the standard IP. IMS terminals (such as mobile phones, personal digital assistants (PDAs) and computers) can register directly on IMS, even when they are roaming in another network or country (the visited network). The only requirement is that they can use IP and run SIP user agents. Fixed access (e.g., digital subscriber line (DSL), cable modems, Ethernet, FTTx), mobile access (e.g. 5G NR, LTE, W-CDMA, CDMA2000, GSM, GPRS) and wireless access (e.g., WLAN, WiMAX) are all supported. Other phone systems like plain old telephone service (POTS—the old analogue telephones), H.323 and non IMS-compatible systems, are supported through gateways.

Core network

HSS – Home subscriber server: The *home subscriber server* (HSS), or *user profile server function* (UPSF), is a master user database that supports the IMS network entities that actually handle calls. It contains the subscription-related information (subscriber profiles), performs authentication and authorization of the user, and can provide information about the subscriber's location and IP information. It is similar to the GSM home location register (HLR) and Authentication centre (AuC).

A *subscriber location function* (SLF) is needed to map user addresses when multiple HSSs are used.

Reference

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