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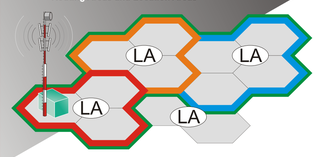
MONITORS

The WORLD OF GPRS

IN YOUR NETWORK

RADCOM, an acknowledged leader in network test and quality management solutions, offers innovative multi-technology testing equipment for VoIP, Cellular and Datacom system performance, providing session, network and service level analysis for troubleshooting and monitoring the UMTS, GPRS and CDMA2000 networks, as well as a range of applications for establishing, maintaining and monitoring VoIP networks.



RADCOM Hardware

R4000
Rack-mount 5U, High performance multi-segmented Performer/Probe Server

R1000
Rack-mount 2U, High performance Performer/Probe Server

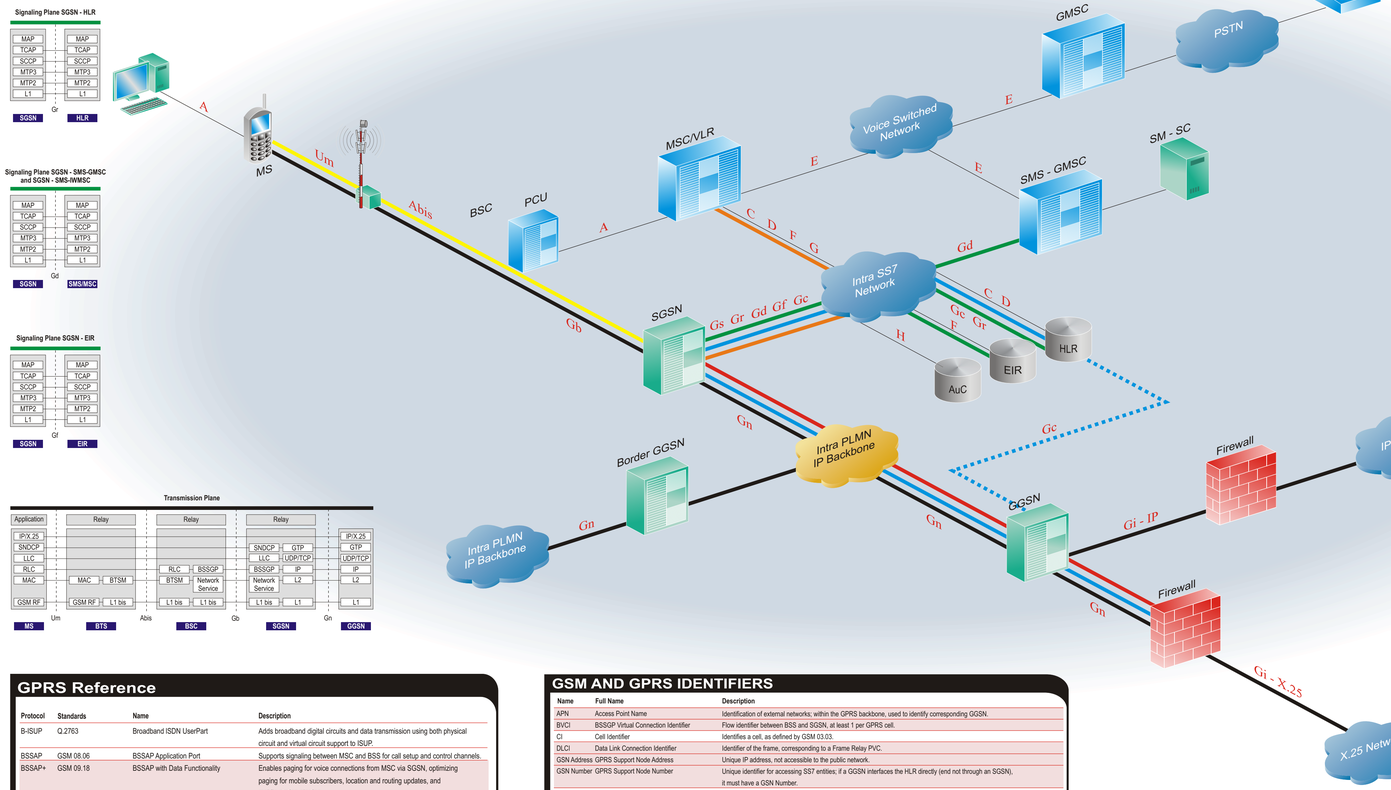
P1000
High performance Portable Server

LIMs
Line Interface Modules

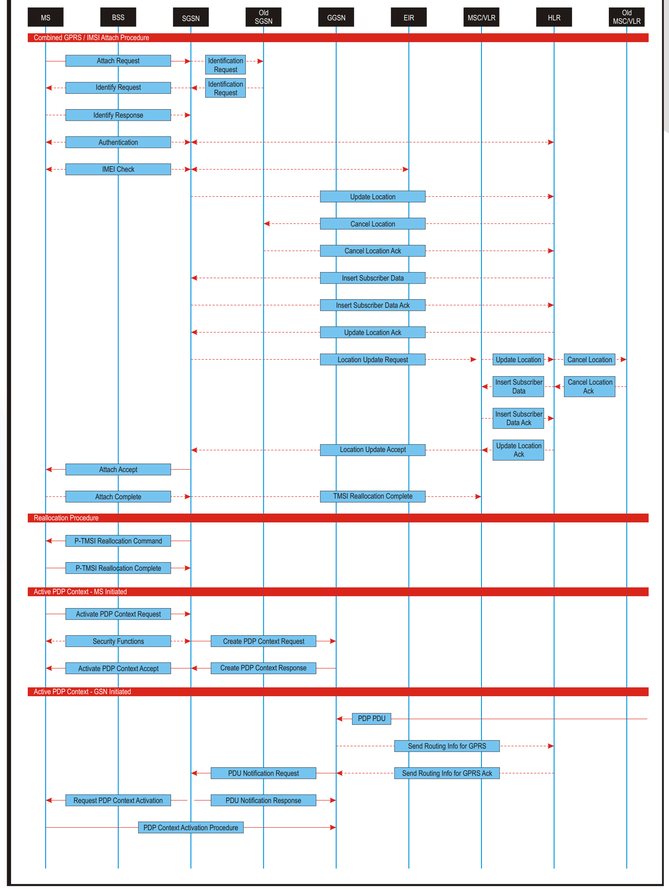
Legend

GPRS Entities

GSM Entities



GPRS Call Setup



GPRS Reference

Protocol	Standards	Name	Description
B-ISUP	Q.2763	Broadband ISDN UserPart	Adds broadband digital circuits and data transmission using both physical circuit and virtual circuit support to SUP
BSSAP	GSM 08.06	BSSAP Application Port	Supports signaling between MSC and BSS for call setup and control channels.
BSSAP+	GSM 09.18	BSSAP with Data Functionality	Enables paging for voice connections from MSC via SGSN, optimizing paging for mobile subscribers, location and routing updates, and mobile station alerting.
BSSGP	GSM 08.18	Base Station System GPRS Protocol	Routing and quality of service (QoS) information for the BSS.
BSSMAP	GSM 08.08	BSS Management Application Part	Supports the procedures between MSC and BSS.
BSTM	GSM 08.58	Base Station Controller to Base Transceiver Station	Interfaces the BSC with the BTS.
CM/CC	GSM 04.08	Connection Management	Handles general call control and supplementary services.
DTAP	GSM 04.08, 08.08, 08.06 IS -634A	Direct Transfer Application Sub-part	Transfers call control messages and mobility management messages between the MSC and the MS.
DUP	ITU Q.741, X61	Data User Part	Call control, facility registration and cancellation for common signaling.
GMM/SM	GSM 04.08	GPRS Mobility Management	Handles mobility issues such as roaming, authentication and selection of encryption algorithms, and maintains PDP context.
GTP	GSM 09.60	GPRS Tunnel Protocol	Tunnels protocol data units through TCP/UDP over IP.
INAP		Intelligent Network Application Part	Service-independent capabilities in SS7.
IS-41/MAP	EIA/TIA-41	Mobile Application Part for IS-41 Networks	Supports authentication, equipment identification and roaming in IS-41 networks.
ISUP	ITU Q.763, ANSI TI.112	ISDN User Part	Sets up, manages and releases voice/data calls.
LAPD	ITU Q.921	Link Access Protocol - Channel D	Balanced layer 2 protocol.
LLC	GSM 04.64	Logical Link Control	Data link layer protocol assuring reliable transfer of user data.
MAP	GSM 09.02	Mobile Application Part	Supports signaling between SGSN/GGSN and HLR/ AuC/ EIR.
MM	GSM 04.08	Mobility Management	Manages location updating, handovers and registration procedures.
MTP1		Message Transfer Part - Level 1	Used as the physical layer for SS7 signalling.
MTP2	ITU Q.703 ANSI T1.111	Message Transfer Part - Level 2	Supports Mobile Application Part (MAP) and BSSAP+ in the circuit-switched PLMNs for layer 2.
MTP3	ITU Q.704 ANSI T1.111.4	Message Transfer Part - Level 3	Supports Mobile Application Part (MAP) and BSSAP+ in the circuit-switched PLMNs for layer 3.
NS-Network	GSM 08.16	Network Service	Manages the convergence sub-layer that operates between BSSGP and the Frame Relay Q.922 core by mapping BSSGP's service requests to the appropriate Frame Relay services.
O&M		Operation & Maintenance	Vendor-specific protocols for operating and maintaining the BTS and BSC.
RLC	GSM 04.60	Radio Link Control	Provides a logical link control over the radio interface.
RLP	GSM 04.22	Radio Link Protocol	Provides non-transparent data services of GSM circuit-switched network.
RR	GSM 04.08	Radio Resource Management	Controls setup, maintenance and termination of radio channels.
SCCP	ITU Q.713, ANSI TI.112	Signaling Connection Control Part	Supports Mobile Application Part (MAP) and BSSAP+ in circuit-switched PLMNs.
SMS	GSM 04.11, 04.12	Short Message Service	Transfers short text messages between an MS and a Short Message Entity.
SNDCP	GSM 04.65	Sub-Network Dependent Convergence Protocol	Maps IP to the LLC; also provides functions such as compression, segmentation and multiplexing of network-layer messages to a single virtual connection
SS		Supplementary Services	Supports supplementary services such as call forwarding.
TCAP	ITU Q.773, ANSI TI.1149	Transactions Capabilities Application Part	Supports functions and procedures for an application running on one network node to invoke execution of an application of another node and exchange results / database information.

GSM AND GPRS IDENTIFIERS

Name	Full Name	Description
APN	Access Point Name	Identification of external networks; within the GPRS backbone, used to identify corresponding GGSN.
BVCI	BSSGP Virtual Connection Identifier	Flow identifier between BSS and SGSN, at least 1 per GPRS cell.
CI	Cell Identifier	Identifies a cell, as defined by GSM 03.03.
DLCI	Data Link Connection Identifier	Identifier of the frame, corresponding to a Frame Relay PVC.
GSN Address	GPRS Support Node Address	Unique IP address, not accessible to the public network.
GSN Number	GPRS Support Node Number	Unique identifier for accessing SS7 entities; if a GGSN interfaces the HLR directly (and not through an SGSN), it must have a GSN Number.
IMEI	International Mobile Equipment Identifier	Unique identifier for each GSM and GPRS handset.
IMSI	International Mobile Subscriber Identity	Unique identifier for each GSM and GPRS MS, as defined by GSM 03.03.
LAI	Location Area Identifier	Defined by operator, spanning one or more routing areas.
MS-ISDN	Mobile Subscriber ISDN	ISDN access number.
N-SAPI	Network Service Access Point Identifier	Identifies the PDP SAP for network routing.
NSEI	Network Service Entity Identifier	Network entity address, with end-to-end significance.
NS-VCI	Network Services -Virtual Connection Identifier	End-to-end logical identifier between BSS and SGSN.
NS-VLI	Network Services -Virtual Link Identifier	Physical (local) link identifier between BSS and SGSN.
PDP Address	Packet Data Protocol Address	Network layer address (e.g. IPv4, IPv6, X.25).
P-TMSI	Packet TMSI	Temporary packet identity for each attached GPRS MS.
RAI	Routing Area Identifier	Defined by operator, spanning one or more location area.
TID	Tunnel Identifier	Used by GTP between GSNs to identify a PDP context consisting of an IMSI and an NSAPI.
TLLI	Temporary Logical Link Identifier	Used to identify logical links between the SGSN and MS.
TMSI	Temporary Mobile Subscriber Identity	Temporary identity for each attached GSM MS.

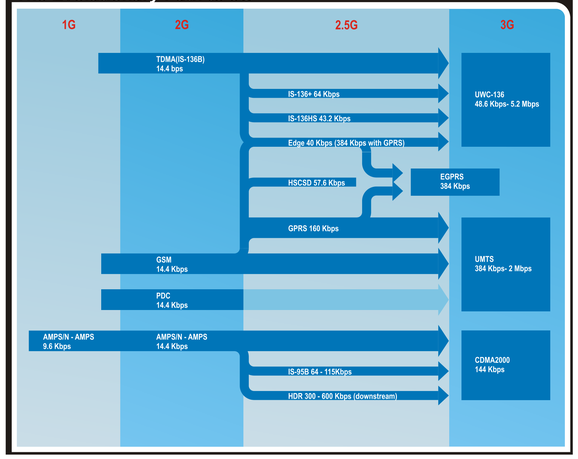
GSM AND GPRS Interfaces

Interface	Between
A	BSC and MSC
Abis	BTS and BSC
Air (Uu)	MS and BTS
B	MSC and VLR
C	MSC and HLR
D	VLR and HLR
E	MSCs
F	MSC and EIR
G	VLRs
H	HLR and AuC
Gb	BSC and SGSN
Gc	GGSN and HLR
Gd	SGSN and SMS Gateway
Gf	SGSN and EIR
Gi	PLMN and external packet data networks (public or private)
Gn	SGSN and GGSN on same PLMN
Gp	SGSN and GGSN on different PLMN
Gr	SGSN and HLR
Gs	SGSN and VLR

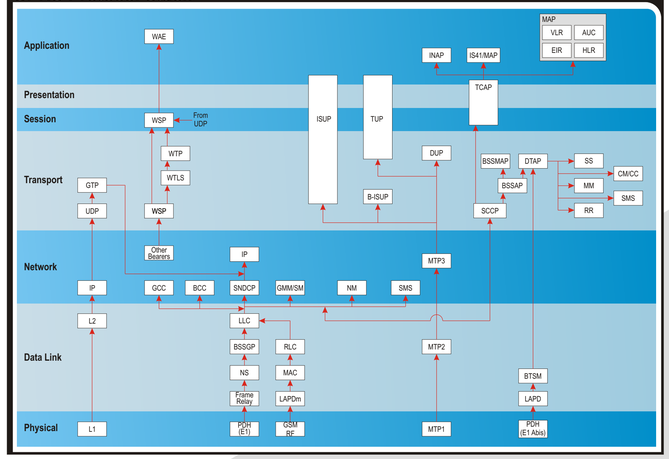
GSM AND GPRS ENTITIES

Interface	Description
AuC	Authentication Center
Border Gateway	Gateways between PLMNs and external inter-PLMN
BSC	Base Station Controller
BSS	Base Station Sub-system
BTS	Base Transceiver Station
EIR	Equipment Identity Register
GGSN	Gateway GSN
GMSC	Gateway MSC
GSN	GPRS Support Node
HLR	Home Location Register
LA	Location Area
MS	Mobile Station
MSC	Mobile Switching Center
NSS	Network Switching Sub-system
PCU	Packet Control Unit
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
RA	Routing Area
SGSN	Serving GSN
Subscriber	Registered user of a mobile station
TRAU	Transcoding Rate and Adaptation Unit
TRX	Transmission/Reception Unit
VLR	Visitor Location Register

The Evolutionary Path to 3G



GPRS Protocol Stack



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