



**Technical Documentation**

**PROTOCOL STACK**

**GPF**

**SNS – SAP NUMBERING SCHEME**

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**Note s:**

1. Initial version
2. Replace 16bit opcodes by 32bit opcodes for GSM voice&sms where possible (no "external" SAPs)
3. New opcodes for EOTD and new SAP PKTIO Replace 16bit opcodes by 32bit opcodes for GSM fax&data
4. New opcode for UDP
5. New opcode for AAA
6. Update UMTS SAP numbers
7. New SAP DMI, TCPIP, DCM
8. New SAP CL
9. Added: GPSDRV, GPSM and GPSC SA P
10. Updated document number, change-history and page titles
11. New SAPs: L2TEST; L1/ESF-Mapping-SAPs; Virtual SAPs for tracing
12. Added L1/ESF; changed number for L2TEST; Updated to the status of umts and added GMMMA, DRRC, MPHI, SN, UPM, AUDIO SAP and removed RRRRC and GRRRC.
13. Added flag description in 32bit opc for bit 30 and 29
14. TCSD and PSI added
15. FFS SAP added.
16. ATLAS SAPs added
17. ETM SAP added

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| <b>[ISO 9000:2000]</b> | International Organization for Standardization. Quality management systems - Fundamentals and vocabulary. December 2000 |
|------------------------|---|

## 1.1 Abbreviations

- |     |                      |
|-----|----------------------|
| SAP | Service Access Point |
| OPC | Operation Code       |

## 2 Introduction

Currently the opc in the primitive header consists of 16 bits. They have the following meaning:

SysPrim	UL/DL	SAP	Primitive Number
Bit 15	Bit 14	Bit 8...13	Bit 0..7

- SysPrim = 0                      Protocol Primitives
- SysPrim = 1                      System Primitives
  
- UL/DL = 0                      uplink, that means in the direction to lower layers (XXX\_REQ and XXX\_RES)
- UL/DL = 1                      downlink, that means in the direction to the upper layers (XXX\_IND and XXX\_CNF)
  
- SAP                                XX decimal entity number (see following table)
  
- Primitive Number                incrementing index of the primitives for one SAP, separated by uplink and downlink, starting with 0

The SAP number coding with 6 bits will not be sufficient for future applications. Therefor the opc will be extended to 32 bit corresponding to the following scheme. The meaning of the lower 16 bits will remain unchanged to be downwards compatible.

Flags	Reserved	Primitive Number	SysPrim	UL/DL	SAP
Bit 31...26	Bit 25...24	Bit 23...16	Bit 15	Bit 14	Bit 13...0

- Flags Bit 31 = 1                32 bit opc used
- Flags Bit 31 = 0                16 bit opc used
  
- Flags Bit 30 = 1                virtual opc (GPF internal, not passed through PCON)
- Flags Bit 30 = 0                'normal opc'
  
- Flags Bit 29 = 1                primitive contains MEM entity handle
- Flags Bit 29 = 0                primitive does not contain MEM entity handle
  
- Flags Bit 28...26                unused
  
- SysPrim = 0                      Protocol Primitives
- SysPrim = 1                      System Primitives
  
- UL/DL = 0                      uplink, that means in the direction to lower layers (XXX\_REQ and XXX\_RES)
- UL/DL = 1                      downlink, that means in the direction to the upper layers (XXX\_IND and XXX\_CNF)
  
- SAP                                XX decimal entity number (see following table)
  
- Primitive Number                incrementing index of the primitives for one SAP, separated by uplink and downlink, starting with 0

## 3 SAP Numbers

### 3.1 G23/GPRS

Currently for some SAPs (mainly GPRS) 16 bit opc is used whilst for others 32 bit opc is used.

SAP Number	SAP Name	opc/UL(hex)	opc/DL(hex)
0	MPHC	0x00xx	
1	PH	0x01xx	0x41xx
2	MPHP	0x02xx	
3	DL	0x80xx0003	0x80xx4003
4	MDL	0x80xx0004	0x80xx4004
5	SIM	0x80xx0005	0x80xx4005
6	RR	0x80xx0006	0x80xx4006
7	MMCC	0x80xx0007	0x80xx4007
8	MMSS	0x80xx0008	0x80xx4008
9	MMSMS	0x80xx0009	0x80xx4009
10	MMREG	0x80xx000A	0x80xx400A
11	MNCC	0x80xx000B	0x80xx400B
12	MNSS	0x80xx000C	0x80xx400C
13	MNSMS	0x80xx000D	0x80xx400D
14	MMI	0x0Exx	0x4Exx
15	MON	0x0Fxx	
16	RA	0x80xx0010	0x80xx4010
17	RLP	0x80xx0011	0x80xx4011
18	L2R	0x80xx0012	0x80xx4012
19	FAD	0x80xx0013	0x80xx4013
20	T30	0x80xx0014	0x80xx4014
21	ACI	0x15xx	0x55xx
22	CST	0x16xx	0x56xx
23	MPH	0x17xx	0x57xx
24	TB	0x18xx	
25	TRA	0x80xx0019	0x80xx4019
26	DMI	0x80xx001A	0x80xx401A
27	IDA	0x80xx001B	0x80xx401B
28	DCM	0x80xx001C	0x80xx401C
29	PSI	0x80xx001D	0x80xx401D
30	FRM	0x80xx001E	0x80xx401E
31	GMMRR	0x1Fxx	0x5Fxx
32	GRR	0x20xx	0x60xx
33	LLGMM	0x21xx	0x61xx
34	LL	0x22xx	0x62xx
35	GMMSMS	0x23xx	0x63xx
36	GMMSM	0x24xx	0x64xx
37	GMMAA	0x25xx	0x65xx
38	SMREG	0x26xx	0x66xx
39	SNSM	0x27xx	0x67xx
40	SN	0x28xx	0x68xx
41	GSIM, to be removed	0x29xx	0x69xx
42	TCSD	0x80xx002A	0x80xx402A
43	ETM	0x80xx002B	0x80xx402B
44	unused		
45	RRGRR	0x2Dxx	0x6Dxx
46	MMGMM	0x2Exx	0x6Exx
47	unused		

48	unused		
49	unused		
50	MAC	0x32xx	0x72xx
51	GMMREG	0x33xx	0x73xx
52	UART	0x34xx	0x74xx
53	PPP	0x35xx	0x75xx
54	CCI	0x36xx	0x76xx
55	DTI	0x37xx	0x77xx
56	PPC	0x38xx	0x78xx
57	TOM/IP	0x39xx	0x79xx
58	BTP	0x3Axx	0x7Axx
59	UDPA	0x3Bxx	0x7Bxx
60	IPA	0x3Cxx	0x7Cxx
61	WAP	0x3Dxx	0x7Dxx
62	EM	0x3Exx	0x7Exx
63	EXTDSPL/GTI	0x3Fxx	0x7Fxx
64	RRLC	0x80xx0040	0x80xx4040
65	RRRLP	0x80xx0041	0x80xx4041
66	RRLP	0x80xx0042	0x80xx4042
67	CSRLC	0x80xx0043	0x80xx4043
68	MNLC	0x80xx0044	0x80xx4044
69	PKTIO	0x80xx0045	0x80xx4045
70	UDP	0x80xx0046	0x80xx4046
71	AAA	0x80xx0047	0x80xx4047
72	TCPIP	0x80xx0048	0x80xx4048
73	GPSDRV	0x80xx0049	0x80xx4049
74	GPSPM	0x80xx004A	0x80xx404A
75	GPSC	0x80xx004B	0x80xx404B
76	L2TEST	0x80xx004C	0x80xx404C??
77	unused		
78	unused		
79	unused		
80	customer 6379	0x80xx0050	0x80xx4050
81	customer 6379	0x80xx0051	0x80xx4051
82	customer 6379	0x80xx0052	0x80xx4051
83	customer 6379	0x80xx0053	0x80xx4053
84	customer 6379	0x80xx0054	0x80xx4054
85	customer 6379	0x80xx0055	0x80xx4055
86	customer 6379	0x80xx0056	0x80xx4056
87	customer 6379	0x80xx0057	0x80xx4057
88	customer 6379	0x80xx0058	0x80xx4058
89	customer 6379	0x80xx0059	0x80xx4059
90	customer 6379	0x80xx005A	0x80xx405A
...			

### 3.2 G23Net

Currently only 16 bit opc is used.

SAP Number	SAP Name	opc(16bit)/UL(hex)	opc(16bit)/DL(hex)
2	MMCC	0x02xx	0x42xx
3	RM	0x03xx	0x43xx
4	MMSS	0x04xx	0x44xx
6	RR	0x06xx	0x46xx
7	MNCC	0x07xx	0x47xx

8	MNSS	0x08xx	0x48xx
9	MNMM	0x09xx	0x49xx
10	LAPD	0x0Axx	0x4Axx
11	HO	0x0Bxx	0x4Bxx
13	OMHO	0x0Dxx	0x4Dxx
14	OMRM	0x0Exx	0x4Exx
15	OMRMB TSM	0x0Fxx	0x4Fxx
16	OMMM	0x10xx	0x50xx
17	OMCC	0x11xx	0x51xx
18	MMSM	0x12xx	0x52xx
19	MNSMS	0x13xx	0x53xx
20	SMRL	0x14xx	0x54xx
21	SMGT	0x15xx	0x55xx
22	SMGVM	0x16xx	0x56xx
23	OMSMC	0x17xx	0x57xx
24	OMSMR	0x18xx	0x58xx
25	OMSMG	0x19xx	0x59xx
26	CBS	0x1Axx	0x5Axx
27	RA	0x1Bxx	0x5Bxx
28	RLP	0x1Cxx	0x5Cxx
29	L2R	0x1Dxx	0x5Dxx
30	DTI	0x1Exx	0x5Exx
31	IM	0x1Fxx	0x5Fxx

### 3.3 UMTS

32 bit opc will be used:

SAP Number	SAP Name	opc(32bit)/UL(hex)	opc(32bit)/DL(hex)
128	CPHY	0x80xx0080	0x80xx4080
129	PHY	0x80xx0081	0x80xx4081
130	CUMAC	0x80xx0082	0x80xx4082
131	UMAC	0x80xx0083	0x80xx4083
132	CRLC	0x80xx0084	0x80xx4084
133	RLC	0x80xx0085	0x80xx4085
134	CBM	0x80xx0086	0x80xx4086
135	HC	0x80xx0087	0x80xx4087
136	CPDCP	0x80xx0088	0x80xx4088
137	PDCP	0x80xx0089	0x80xx4089
138	RRC	0x80xx008A	0x80xx408A
139	MEM	0x80xx008B	0x80xx408B
140	DRRC	0x80xx008C	0x80xx408C
141	MPHI	0x80xx008D	0x80xx408D
142	RCM	0x80xx008E	0x80xx408E
143	GMMRABM	0x80xx008F	0x80xx408F
144	SM	0x80xx0090	0x80xx4090
145	PMMSMS	0x80xx0091	0x80xx4091
146	PHYSTUB	0x80xx0092	0x80xx4092
147	PHYTEST	0x80xx0093	0x80xx4093
148	MMREG	0x80xx0094	0x80xx4094
149	MMCM	0x80xx0095	0x80xx4095
150	MMPM	0x80xx0096	0x80xx4096
151	GRLC	0x80xx0097	0x80xx4097
152	CGRLC	0x80xx0098	0x80xx4098
153	EINFO	0x80xx0099	0x80xx4099
154	SL2	0x80xx009A	0x80xx409A
155	L1TEST	0x80xx009B	0x80xx409B
156	CL or COMLIB	0x80xx009C	0x80xx409C
157	UPM	0x80xx009D	0x80xx409D
158	SN	0x80xx009E	0x80xx409E
159	AUDIO	0x80xx009F	0x80xx409F
160	FFS	0x80xx00A0	0x80xx40A0
...			

1024	range reserved	0x80xx0400	0x80xx4400
To	for		
2047	L1/ESF	0x80xx04FF	0x80xx44FF
2303	range reserved	0x80xx08FF	0x80xx48FF
To	for		
23559	Atlas (DIN)	0x80xx09FF	0x80xx49FF

### 3.4 Virtual SAPs

32 bit opc will be used:

SAP Number	SAP Name	opc(32bit)/UL(hex)	opc(32bit)/DL(hex)
2048	Binary Traces	0xC0xx0800	0xC0xx4800
2049	ASCII Traces	0xC0xx0801	0xC0xx4801
2050	PCON-Filter	0x80xx0802	0x80xx4802

## Appendices

### A. Acronyms

**DS-WCDMA** Direct Sequence/Spread Wideband Code Division Multiple Access

### B. Glossary

**International Mobile Telecommunication 2000 (IMT-2000/ITU-2000)** Formerly referred to as FPLMTS (Future Public Land-Mobile Telephone System), this is the ITU's specification/family of standards for 3G. This initiative provides a global infrastructure through both satellite and terrestrial systems, for fixed and mobile phone users. The family of standards is a framework comprising a mix/blend of systems providing global roaming. <URL: <http://www.imt-2000.org/>>