

GPRS
General Packet Radio Service

"Always on" internet access

Multimedia messaging service (MMS)

Push to talk over cellular (PoC/PTT)

Instant messaging and presence

Internet applications for smart devices through
wireless application protocol (WAP)

Point-to-point (P2P)

Class A

Can be connected to GPRS service and GSM service (voice, SMS), using both at the same time.

Class B

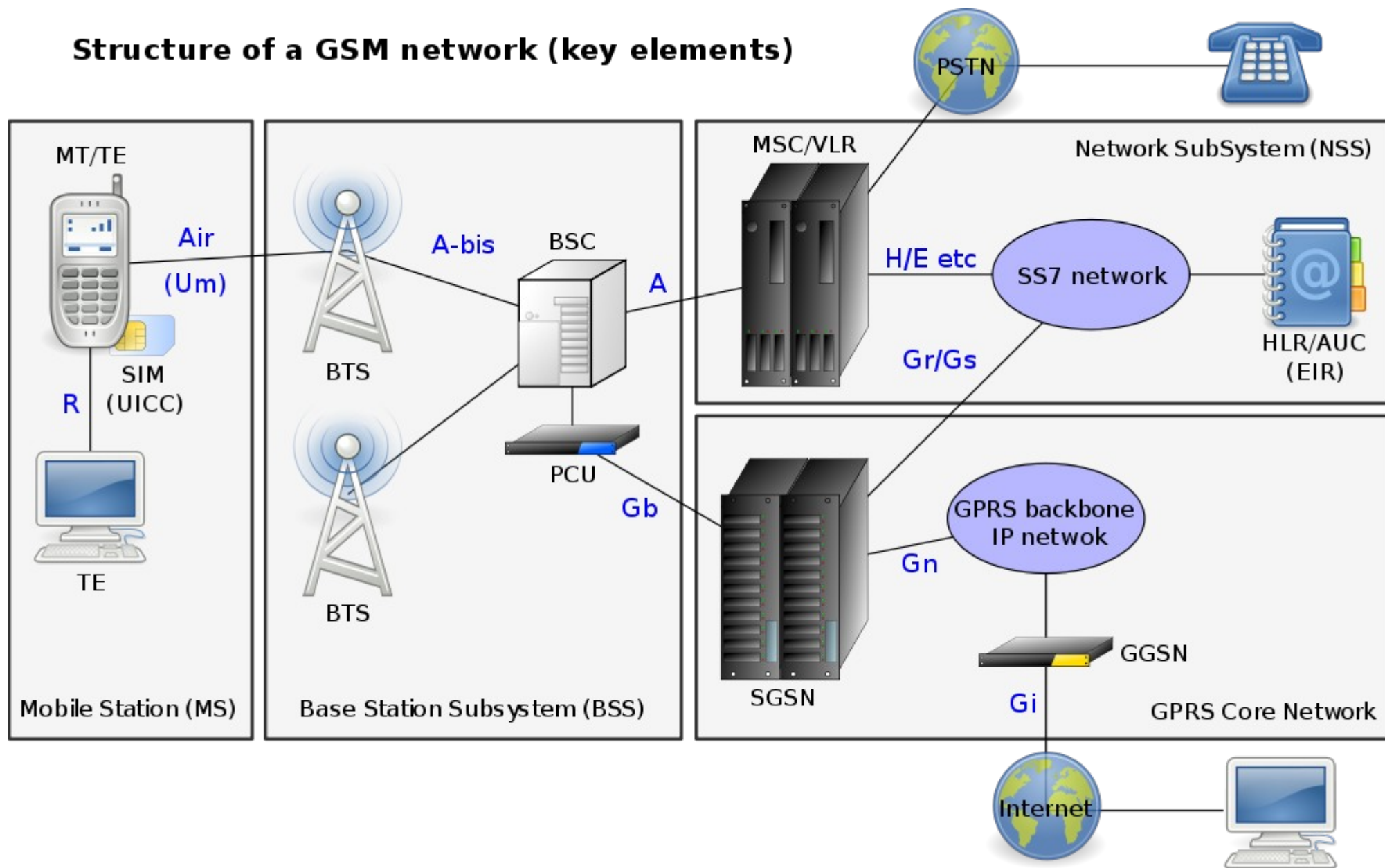
Can be connected to GPRS service and GSM service (voice, SMS), but using only one or the other at a given time. During GSM service (voice call or SMS), GPRS service is suspended, and then resumed automatically after the GSM service (voice call or SMS) has concluded.

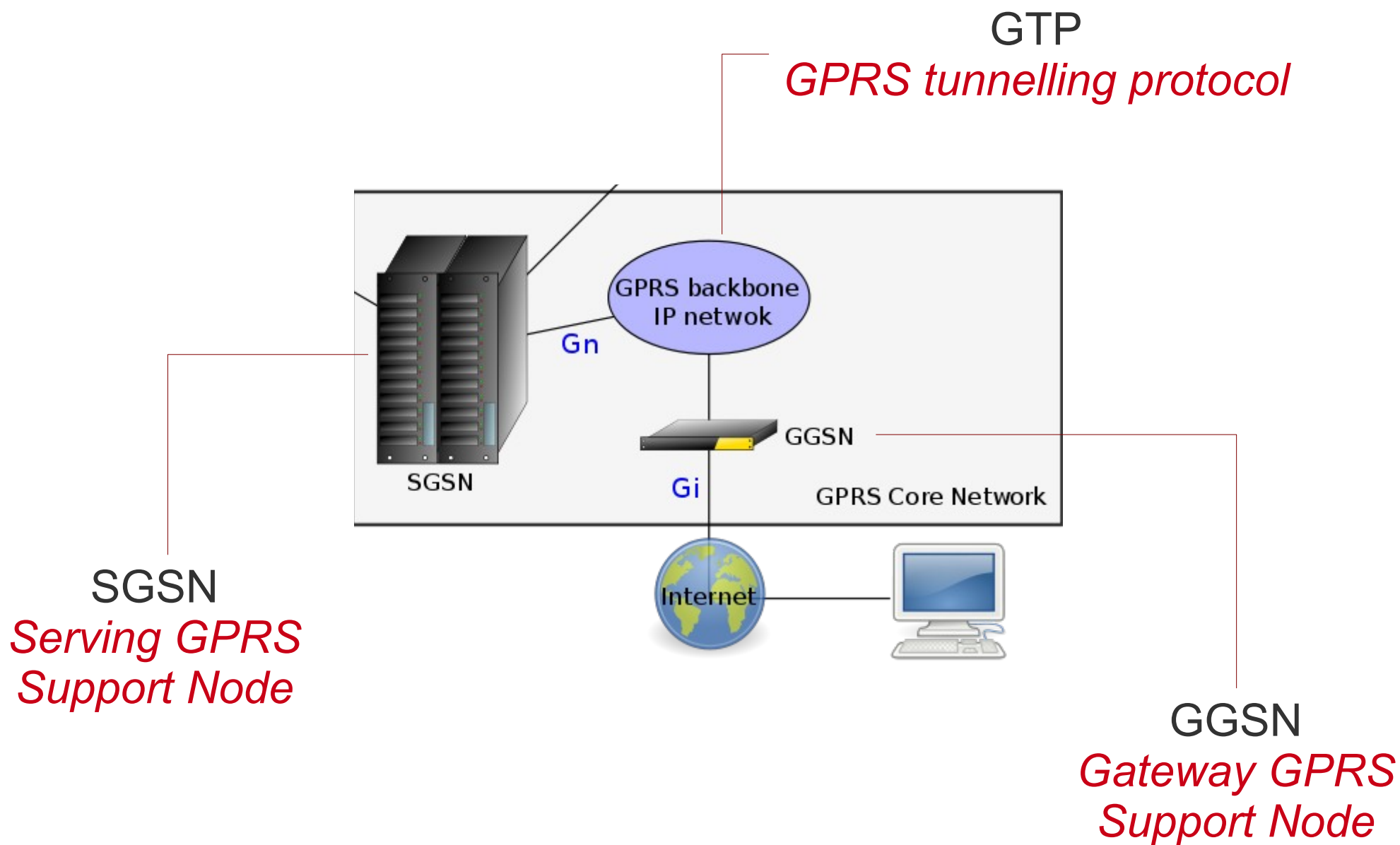
Class C

Are connected to either GPRS service or GSM service (voice, SMS). Must be switched manually between one or the other service.



Structure of a GSM network (key elements)





SGSN

Serving GPRS Support Node

- szyfrowanie

- autoryzacja

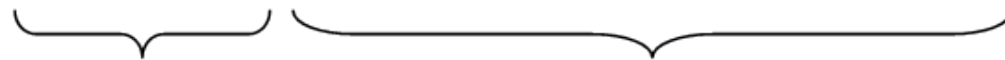
- mobilność

Routing Area (RA)

Routing Area Identity (RAI)

Access Point Name (APN)

network id. mnc<MNC>.mcc<MCC>.gprs



Network Identifier

Operator Identifier

aricentechnologies.mnc012.mcc345.gprs

Internet

mywap

GGSN *Gateway GPRS Support Node*

przydziela numer IP

aktywuje *PDP context*

Subscriber's IP address

Subscriber's IMSI

Subscriber's

Tunnel Endpoint ID (TEID) at the GGSN

Tunnel Endpoint ID (TEID) at the SGSN

GPRS tunnelling protocol

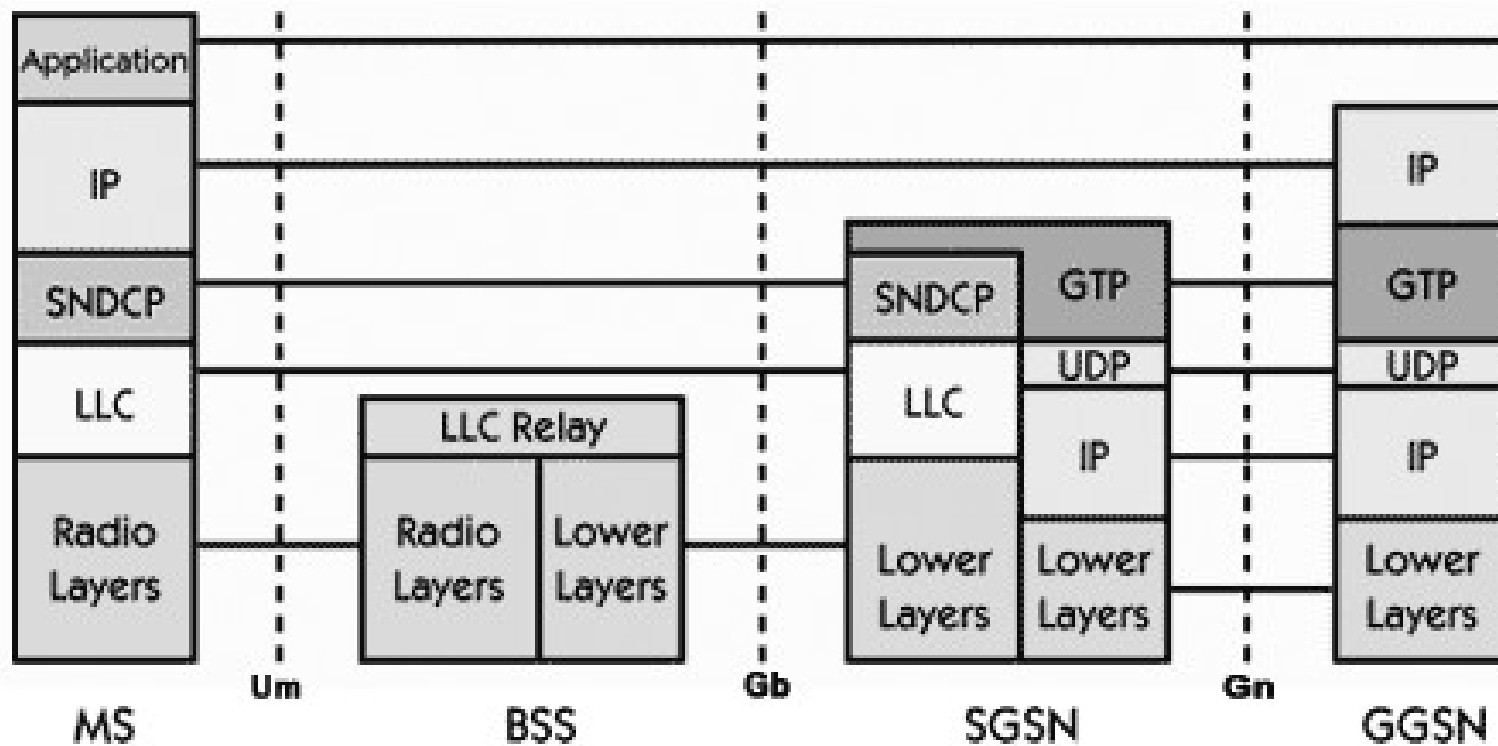
GTP-U dane

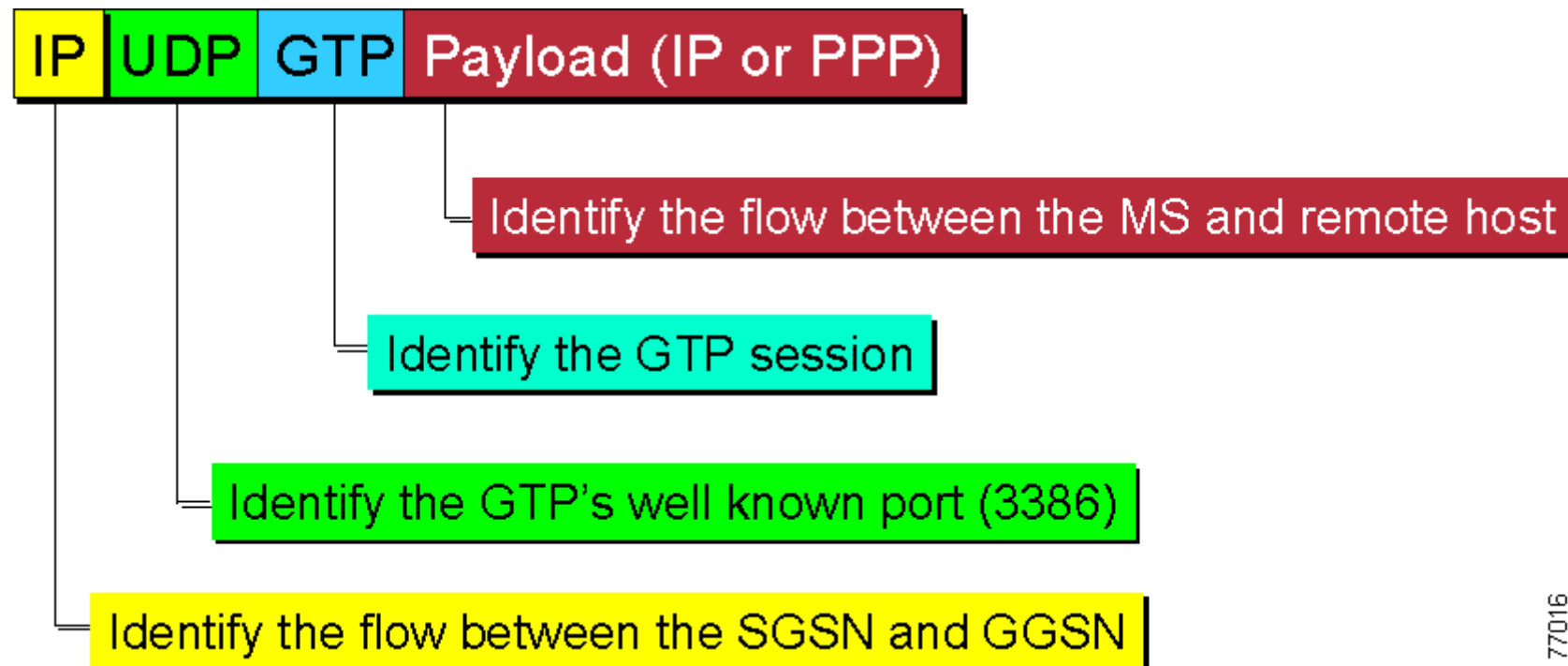
GTP-C kontrola

GTP' rachunki

SubNetwork Dependent Convergence Protocol (kompresja)

Logical Link Control (szyfrowanie)





GPRS Class	Slots	Max. data transfer speed
Class 2	3	8 - 12 kbps upload / 16 - 24 kbps download
Class 4	4	8 - 12 kbps upload / 24 - 36 kbps download
Class 6	4	24 - 36 kbps upload / 24 - 36 kbps download
Class 8	5	8 - 12 kbps upload / 32 - 40 kbps download
Class 10	5	16 - 24 kbps upload / 32 - 48 kbps download
Class 12	5	32 - 48 kbps upload / 32 - 48 kbps download

Enhanced Data Rates for GSM Evolution

EDGE

Incremental redundancy

Hybrid automatic repeat request (HARQ)

3 bity na każdą zmianę fazy fali nośnej
→ 3x większy strumień danych

PSK/8 Phase shift keying
zamiast
Gaussian Minimum Shift Keying

Coding and modulation scheme (MCS)	Bit Rate (kbit/s/slot)	Modulation
MCS-1	8.80	GMSK
MCS-2	11.2	GMSK
MCS-3	14.8	GMSK
MCS-4	17.6	GMSK
MCS-5	22.4	8-PSK
MCS-6	29.6	8-PSK
MCS-7	44.8	8-PSK
MCS-8	54.4	8-PSK
MCS-9	59.2	8-PSK

236.8 kbit/s / 4 szczeliny (4x GPRS)

473.6 kbit/s / 8 szczelin (max)

