



## GPRS



**General Packet Radio Service (GPRS)** is a packet oriented mobile data standard on the 2G and 3G cellular communication network's global system for mobile communications (GSM). GPRS was established by European Telecommunications Standards Institute (ETSI) in response to the earlier CDPD and i-mode packet-switched cellular technologies. It is now maintained by the 3rd Generation Partnership Project (3GPP).

GPRS is typically sold according to the total volume of data transferred during the billing cycle, in contrast with circuit switched data, which is usually billed per minute of connection time, or sometimes by one-third minute increments. Usage above the GPRS bundled data cap may be charged per MB of data, speed limited, or disallowed.

GPRS is a best-effort service, implying variable throughput and latency that depend on the number of other users sharing the service concurrently, as opposed to circuit switching, where a certain quality of service (QoS) is guaranteed during the connection. In 2G systems, GPRS provides data rates of 56–114 kbit/sec. 2G cellular technology combined with GPRS is sometimes described as 2.5G, that is, a technology between the second and third generations of mobile telephony. It provides moderate-speed data transfer, by using unused time-division multiple access (TDMA) channels in, for example, the GSM system. GPRS is integrated into GSM Release 97 and newer releases.

GSM module or GPRS modules are similar to modems, but there's one difference: the modem is an external piece of equipment, whereas the GSM module or GPRS module can be integrated within an electrical or electronic equipment. It is an embedded piece of hardware. A GSM mobile, on the other hand, is a complete embedded system in itself. It comes with embedded processors dedicated to provide a functional interface between the user and the mobile network.

GPRS provides the following services to its users

- ✚ Instant messaging and presence
- ✚ Multimedia messaging service
- ✚ Point-to-Point and Point-to-Multipoint services
- ✚ SMS messaging and broadcasting
- ✚ Push-to-talk over cellular

The upload and download speeds that can be achieved in GPRS depend on a number of factors such as:

- ✚ The number of BTS TDMA time slots assigned by the operator
- ✚ The channel encoding used.



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- ✚ The maximum capability of the mobile device expressed as a GPRS multislot class

The main advantage of GPRS is the 'always on' feature of GPRS. There is no need for any connection set up prior to data transfer. But GPRS needs some additional network components including software and hardware components to transfer the data from source to destination.

GSM system allocates between one and eight time-slots within a TDMA frame for the new GPRS radio channels. Time slots are not allocated in a fixed, pre-determined manner but on-demand bases only. All the time slots can be shared between the active users, Up and downlink channels are allocated to the time slots separately. The allocation of the slots is based on current load and operator needs and preferences. Depending on the coding system, a transfer rate of up to 170 kbit/s.

For GPRS, operators often reserve at least a time slot per cell to guarantee a minimum data rate. The GPRS concept is independent of the channel features of the channels. Also, there is no limit to the maximum data rate. Only the GSM transport system can limit the rate. All GPRS services can be used in parallel to the already present services.

GPRS architecture works in the same as the gsm does. But it needs some extra components. The execution of GPRS needs the installation of new network components called the serving GPRS support node (SGSN) and gateway GPRS support node (GGSN). It needs the following two protocols to send a packet from source to destination.

- ✚ Internet Protocol
- ✚ Point to point protocol

