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Networking — Something Good to Know



May 8, 2008

Mobile Network Evolution: GSM to UMTS

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1. GSM: the 2G mobile network

Global System for Mobile communications (GSM) is the most popular standard for mobile communications in the world. Its network architecture is shown in figure 1.

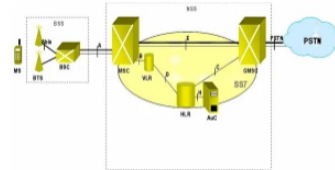


Figure 1. GSM network architecture

2. GPRS: the 2.5G mobile network

General Packet Radio Service (GPRS) is a packet oriented mobile data service developed on the GSM infrastructure. It provides data transfer rate from 56 to 114 kbits/s. GPRS network architecture is as shown in figure 2.

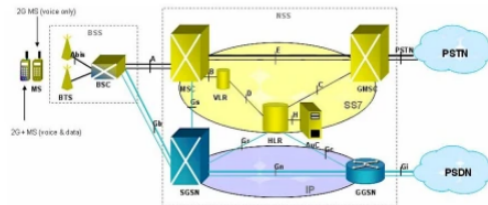


Figure 2. GPRS network architecture

3. EDGE (EGPRS): the 2.75G mobile network

Enhanced data rates for GSM evolution (EDGE), enhanced GPRS (EGPRS) or IMT Single Carrier (IMT-SC) is a packet mobile technology evolved from the GPRS infrastructure providing enhanced data transfer rate and reliability.

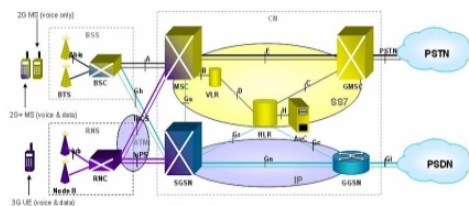
The network architecture for EDGE is basically the same as that for GPRS, the same network elements, the same interfaces, the same protocols and the same procedures. The only minor differences lie in the air interface improvement for supporting higher data transfer rate and reliability.

4. UMTS: the 3G mobile network

Universal Mobile Telecommunications System (UMTS) is the 3G mobile network technology evolved from the GSM-GPRS based network architecture. The overall UMTS evolution experienced different stages (also widely called stages).

4.1 Release 99

- 64kbits/s circuit switched bearer services
- 384 kbits/s packet switched bearer services
- location services
- call services



4.2 Release 4

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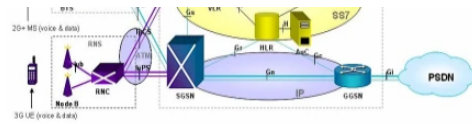
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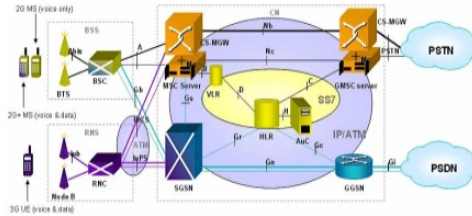
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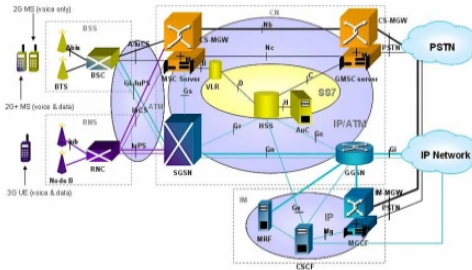
4.2 Release 4

- EDGE radio
- multimedia messaging
- MExE (mobile execution environment)
- Improved location services
- IP multimedia services (IMS)



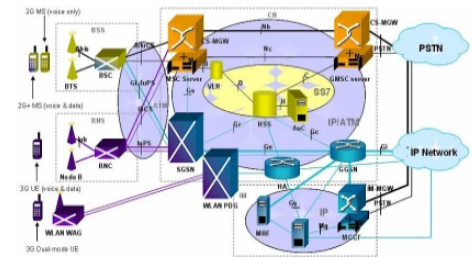
4.3 Release 5

- IP multimedia subsystem (IMS)
- IPv6, IP transport in UTRAN
- Improvements in GERAN, MExE etc,
- HSDPA



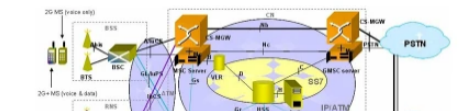
4.4 Release 6

- WLAN integration
- multimedia broadcast and multicast
- improvements in IMS
- HSUPA



4.5 Release 7

- Fix mobile convergence
- DSL access



- WLAN integration
- multimedia broadcast and multicast
- improvements in IMS
- HSPA



- Fix mobile convergence
- DSL access



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