3G Technology

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Definition of 3G

3G is the third generation of wireless technologies. It comes with enhancements over previous wireless technologies, like high-speed transmission, advanced multimedia access and global roaming. 3G is mostly used with mobile phones and handsets as a means to connect the phone to the Internet or other IP networks in order to make voice and video calls, to download and upload data and to surf the net.

Application services include wide-area wireless voice telephone, mobile Internet access, video calls and mobile TV, all in a mobile environment. To meet the IMT–2000 standards, a system is required to provide peak data rates of at least 200 Kbit/s. Recent 3G releases, often denoted 3.5G and 3.75G, also provide mobile broadband access of several Mbit/s to smartphones and mobile modems in laptop computers.
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3G International Standardization

3G or 3rd generation mobile telecommunications is a generation of standards for mobile phones and mobile telecommunication services fulfilling the Mobile Telecommunications-2000 (IMT-2000) specifications by the Telecommunication Union.

- ITU (International Telecommunication Union)
  
  Radio standards and spectrum

- IMT-2000
  
  ITU’s umbrella name for 3G which stands for International Mobile Telecommunications 2000

- National and regional standards bodies are collaborating in 3G partnership projects
  
  ARIB, TIA, TTA, TTC, CWTS. T1, ETSI – refer to reference slides at the end for names and links

- 3G Partnership Projects (3GPP & 3GPP2)
  
  Focused on evolution of access and core networks
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What is 3G?

2.5G / 3G Adds IP Data No Changes for Voice Calls

3G Partnership Project (3GPP)

3GPP defining migration from GSM to UMTS(W-CDMA)

Core network evolves from GSM–only to support GSM, GPRS and new W–CDMA facilities

3GPP Release 99

- Adds 3G radios

3GPP Release 4

- Adds soft switch/ voice gateways and packet core

3GPP Release 5

- First IP Multimedia Services (IMS) w/ SIP & QoS

3GPP Release 6

- “All IP” network; contents of r6 still being defined
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3GPP Release 99 Architecture

3G rel4 Architecture
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3G re!5 Architecture

3GPP Rel.6 Objectives

IP Multimedia Services, phase 2

IMS messaging and group management

Wireless LAN interworking

Speech enabled services

Distributed speech recognition (DSR)

Number portability

Scope and definition in progress
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3GPP2 Defines IS-41 Evolution

3rd Generation Partnership Project “Two”

Separate organization, as 3GPP closely tied to GSM and UMTS

Goal of ultimate merger (3GPP + 3GPP2) remains

Evolution of IS-41 to “all IP” more direct but not any faster

Skips ATM stage

1xRTT — IP packet support (like GPRS)

1xEVDV — adds soft switch/ voice gateways

3x — triples radio data rates

Mobile Services

3GPP Location Infrastructure

UE (User Entity)

May assist in position calculation

LMU (Location Measurement Unit)

distributed among cells

SMLC (Serving Mobile Location Center)

Standalone equipment (2G) or integrated into BSC (2G) or RNC (3G)

Leverages normal infrastructure for transport and resource management
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LCS Architecture (3GPP)

Location Request

**MLP — Mobile Location Protocol**

- From Location Interop Forum
- Based on HTTP/SSL/XML
- Allows Internet clients to request location services

**GMLC is the Location Server**

- Interrogates HLR to find visited MSC/SGSN
- Roaming user can be located
- UE can be idle, but not off!

**Immediate or deferred result**
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3G–324M Video Services

Initial mobile video service uses 3G data bandwidth w/o IP multimedia infrastructure

Deployed by DoCoMo in Japan today

Leverage high speed circuit-switch data path

64 kbps H.324 video structure

MPEG 4 video coding

AMR audio coding

Supports video clips, video streaming and live video conversations

MS to MS

MS to Internet or ISDN with gateways

Common Technology Platform for 3G–324M Services
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Gateway: 3G–324M to MPEG4 over RTP

Video Messaging System for 3G–324M
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References


http://en.wikipedia.org/wiki/3g