Science and Tech

Topics – Mobile Generation, Many issues in ICT
Govt. Programme.

Mobile Generation

Chronology

1st G = 1979, Japan

2nd G = 1991, Finland

3rd G = 2001, Japan.

0G = Radiophone / Taxiphone
1971 : Finland

1G = FDMA (Freq. Division Multiple Access)
→ based on Analog Signal.

→ Less battery life
→ Poor Quality
→ Tower introduced here – cellphone
→ 2.4 kbps speed.

2G – { TDMA (Time) – GSM
         { CDMA (Code)

→ Digital Signal
→ Dataspeed = 64 Kbps
→ Text Message.
→ Unable to handle complex data. (Video)

(2)

2.5 G
→ Specially came for GPRS (General Packet Radio Services)

→ WAP - (Wireless Application Protocol)
  └→ Browsing & Surfing
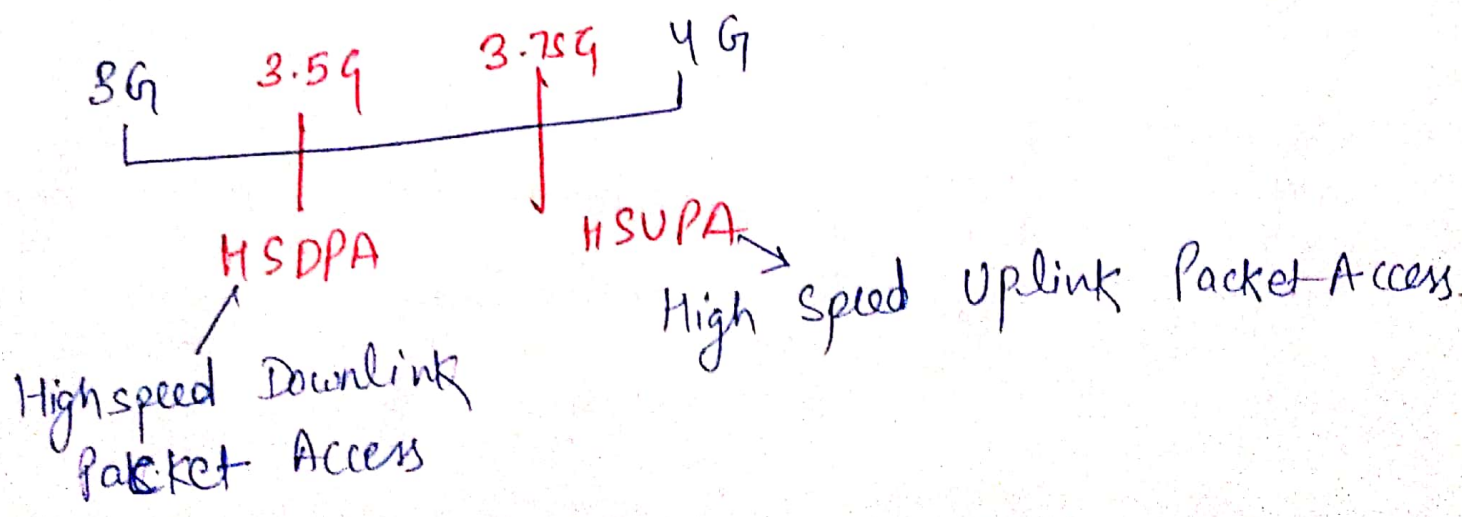 └→ MMS - Multimedia Messaging Services

→ 64-144 Kbps

2.75 G
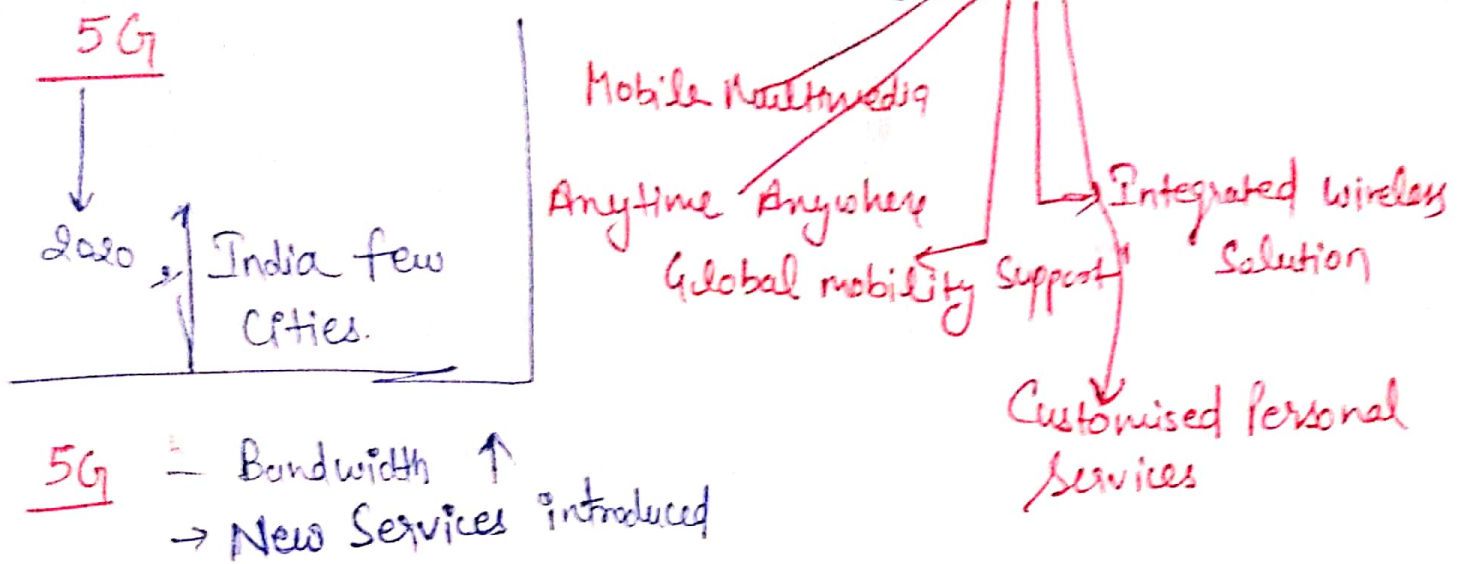→ Quality phone required (Nokia N95, N97, Blackberry)

Characteristic	3 G	4 G
frequency Band	1.8 - 2.5 GHz freq	2 - 8 GHz
Data speed (throughput)	upto 3.1 mbps	3 to 5 mps are the normal speed but also have potential to enhance 100 to 300 mbps. upto 2 Gbps
Services and Applications	UMTS, EDGE, CDMA2000, W-CDMA	LTE Wimax, and Wi-fi VOLTE HSPA+

Scanned by CamScanner

Different Transponders and its Uses

Transponder BAND	Range of frequency	Application
L	1 to 2 GHz	Mobile Satellite Service (MSS)
S	2 to 4 GHz	MSS and Space research, TV and Radio broadcasting
C	4 to 8 GHz	fixed Satellite Communication (FSC) Telecommunication
X	8 to 12.5 GHz	Military Application & Metrological Satellite
KU	12.5 to 18 GHz	Broad Casting Satellite Service, Internet, DTH, Satellite news gathering, Business Networking
K	18 to 26.5 GHz	BSS & FSS
Ka	26.5 GHz to 40GHz	FSC.

8G   3.5G   3.75G   4G

HSDPA — Highspeed Downlink Packet Access

HSUPA — High Speed Uplink Packet Access

④   4G services are also famous as <u>MAGIC</u>

<u>5G</u>

↓

2020 → | India few Cities.

MAGIC:
- Mobile Multimedia
- Anytime Anywhere
- Global mobility Support
- Integrated wireless Solution
- Customised Personal Services

<u>5G</u> = Bandwidth ↑
→ New Services introduced

<u>Note:</u>
- 95% + optical fibre based connection } Internet
- <5% − Satellite based

<u>Distribution of Optical fibre</u>

Company → Tier I − (O.f in Ocean)
→ Tier II − (O.f ocean to country)
→ Tier III − (Country to your door steps)

<u>Internet</u> <u>Governance</u>

How internet is going to regulate?

<u>UN</u>
↓
ITU − International Telecommunication Union.
↳ HQ → Geneva (Switzerland).

<u>**ICANN**</u> – Internate Corporation for Assigned name and Numbers.

ICANN plays impostant role in quardination of the global internet system of unique identifiers particularly ensuring its stable and secure operation. Largely ICANN is under controlled of USA.

1. China ⎤
2. India ⎤ Internet
3. US   ⎤ User Ranking.
4. Russia ⎦

<u>Multi lateral approach</u> → every country will be given a power to contral over internet services.

<u>Multi stake holder</u> → only some countries will have power to contral over internet service.

<u>IOT (Internet of things)</u>
⎣→ (any Physical objects)

IOT is the network of physical objects which access through the internet.

Net Neutrality

That users get unrestricted access of internet traffic without any discrimination.

It is a freedom of speech and expression without partiality

federal communication Commission :-

enacted the open internet order in 2010. In order to prevent large telecommunication firms from stiffling, competition and innovation online.

The FCC in its order stated that the net neutrality rules were intended to preserve the internet as an open platform enabling consumer choice, freedom of expression, end user control, competition and the freedom to innovate without permission.

few countries like Chili have enacted laws to protect net neutrality.

* Telecom Commission approved TRAI recommendation on Net Neutrality. └─→ (A group of members of India's telecom department).

* TRAI
Telecom Regulatory Authority of India.

Jamming
Mostifying
Slowing down
Giving way diffiaugtial speed.

} — Problem solved by Net Neutrality.

2.12

Under Net neutrality access of online contents is not restricted and nondiscriminatory. The only exception are fresh and such as autonomous driving , tele medicine . rising services.

Networking

(upto those distance — connect & share information

→ Size

Bluetooth , NFC
wi-fi direct

1. PAN (Personal Area Network)
2. LAN (Local Area Network) —— Hotspots, wi-fi
3. MAN) (Metropolitean Area Network) → FM , wi-max, STD Code, (oll)
4. WAN (Wide Area Network) — Com, in , ISD (+91), AM

Topics —
Bluetooth   NFC
wi-fi direct   Lifi
Cordless phone   White-fi
Hotspot
Wi-fi
wi-max

1. Bluetooth — encryption — 128 bits
→ ~~Scavandian~~ Scandinavian king — Harald Bluetooth.
→ Bandwidth (freq) — 2.4 — 2.485 GHz
→ Work with the help of Radio wave.
→ It has two types of version — 4.0, 5.0

→

Version	Speed	Distance
4.0	25 Mbps	200 feet (61 m)
5.0	50 Mbps	800 feet

2. Wi-fi Direct
→ Speed — 250 Mbps, Distance — 600 feet
→ Highly encrypted — 256 bits
→ Frequency — 2.4 GHz
→ Radio wave based

3. Hotspot
→ derived by Henrik Stodin
→ Band width — 2.45 GHz
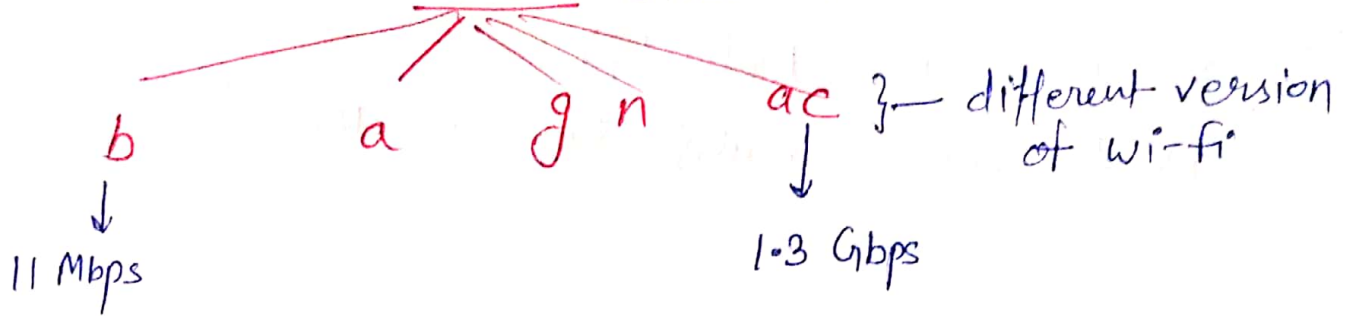→ distance — 100 mtr
→ Microwave based.

4. Cordless Phone (Portable Phone)
→ based on Radio wave & Amplitude modulation.
→ frequency → 2.45 GHz
→

5. __Wi-fi__ — Wireless - fidelity

    ↳ father of wi-fi — Vic Hayes

→ It was wi-fi — __802·11__ standard — first wi-fi in 1997.

    b   a   g n   ac } — different version of wi-fi

    ↓

11 Mbps   1·3 Gbps

→ This is also based on Radio waves.

→ Bandwidth — 2·45 – 5 GHz.

6. __Wi-Max__ — (Worldwide interoperability for Microwave access).

→ __Bigger__ form of wi-fi

    ✓ Distance ———————— entire city — (48 – 50 km)

    ✓ Number of Users.

    ✓ freq — 2·4 – 5·8 GHz

    ✓ speed — upto 1 Gbps.

7. __NFC__ — Near field Communication.

→ Short Range wireless technology.

→ typically require a distance of 4 cm or less to initiate a Connection

→ This network carries point to point range upto 20 cm

→ freq — 13.56 MHz

    Speed — 106 kbps – 424 kbps

→ Working through RFID system.

(Radio frequency Identification)

8. Li-fi (Light-Fidelity)
⇒ invented by Harald Haas (2011).
⇒