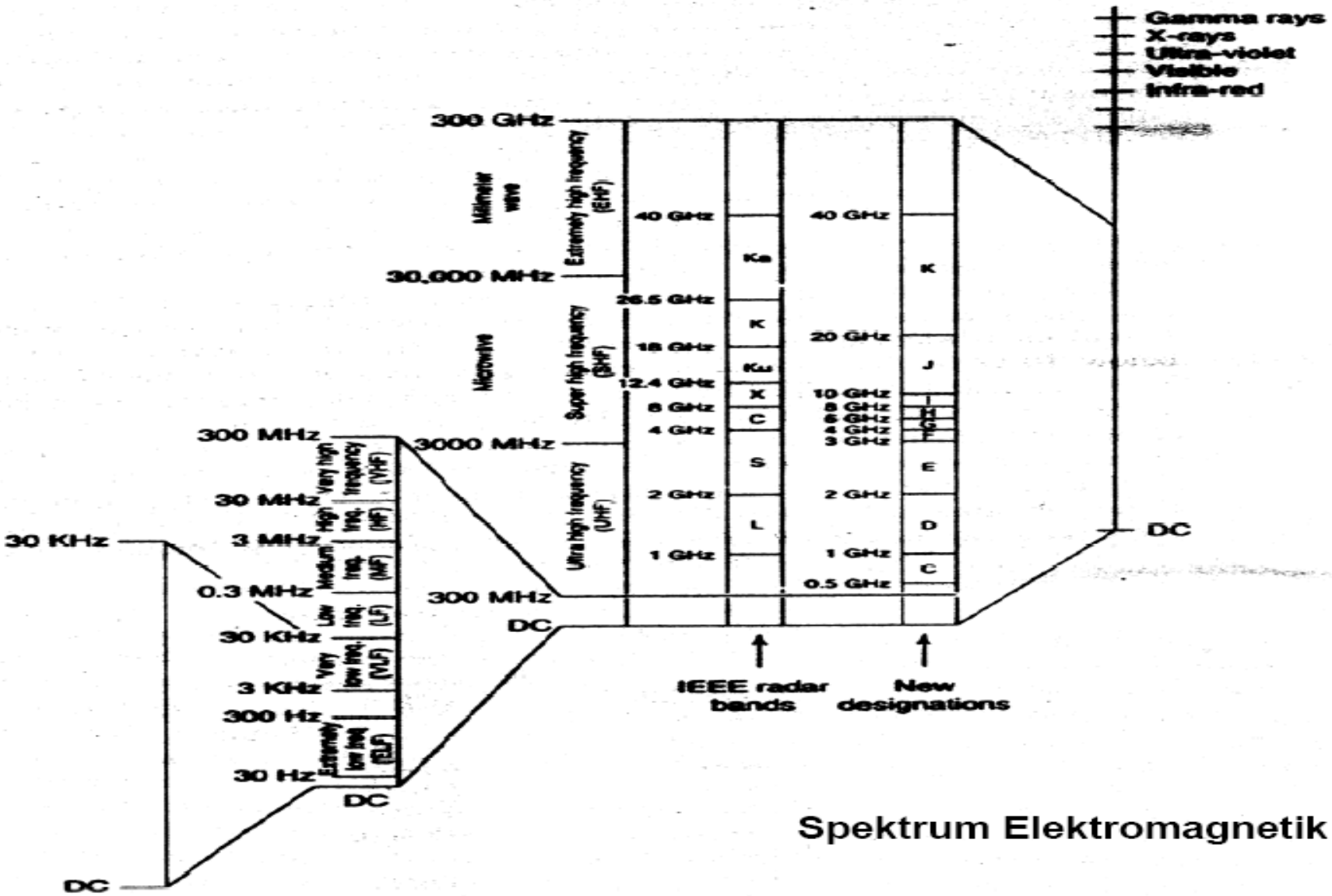
PENGENALAN TEKNIK TELEKOMUNIKASI

Modul : 01
Perkembangan Teknologi Telekomunikasi

Faculty of Electrical Engineering

BANDUNG, 2015

Spektrum Elektromagnetik



Spektrum Elektromagnetik

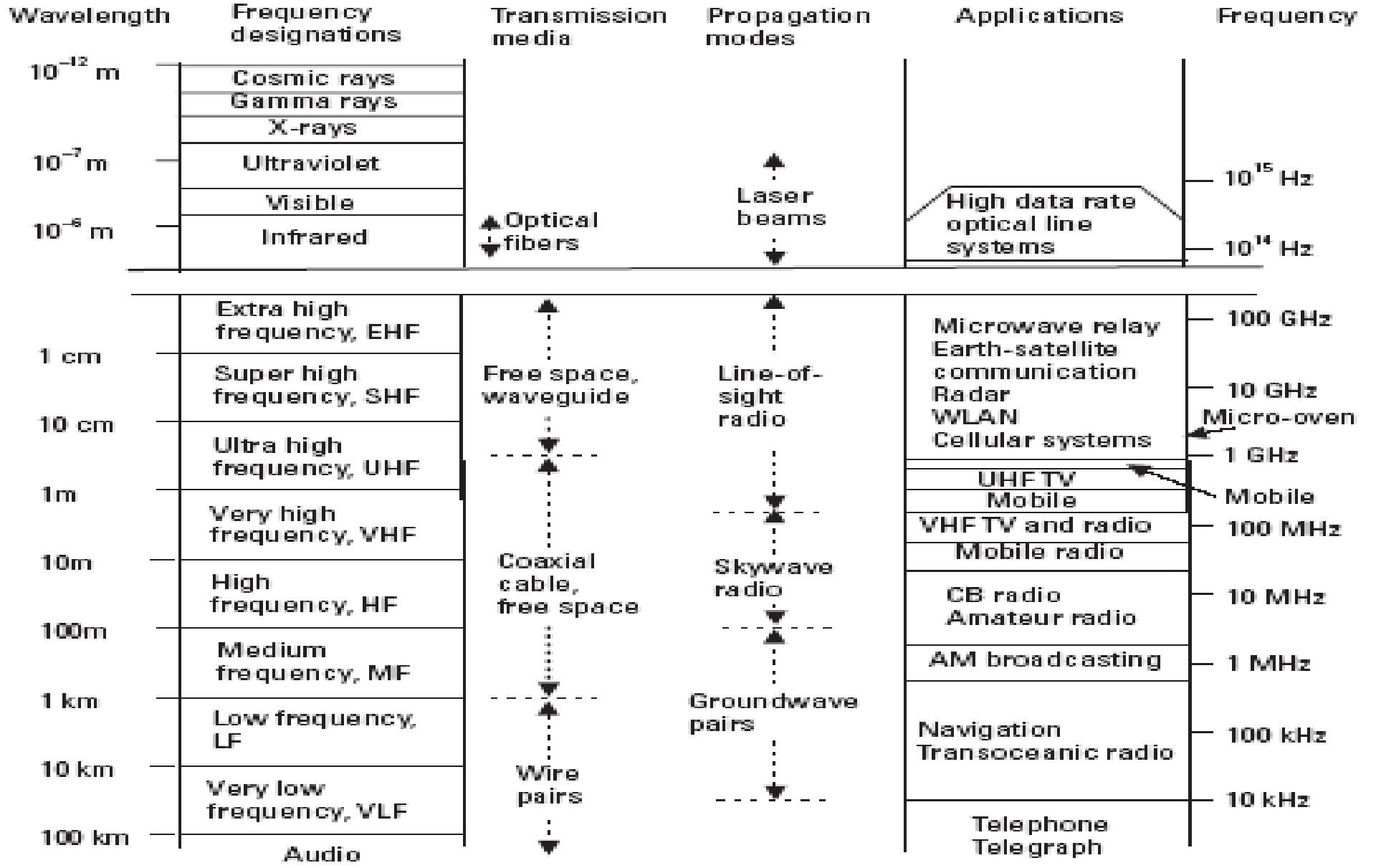
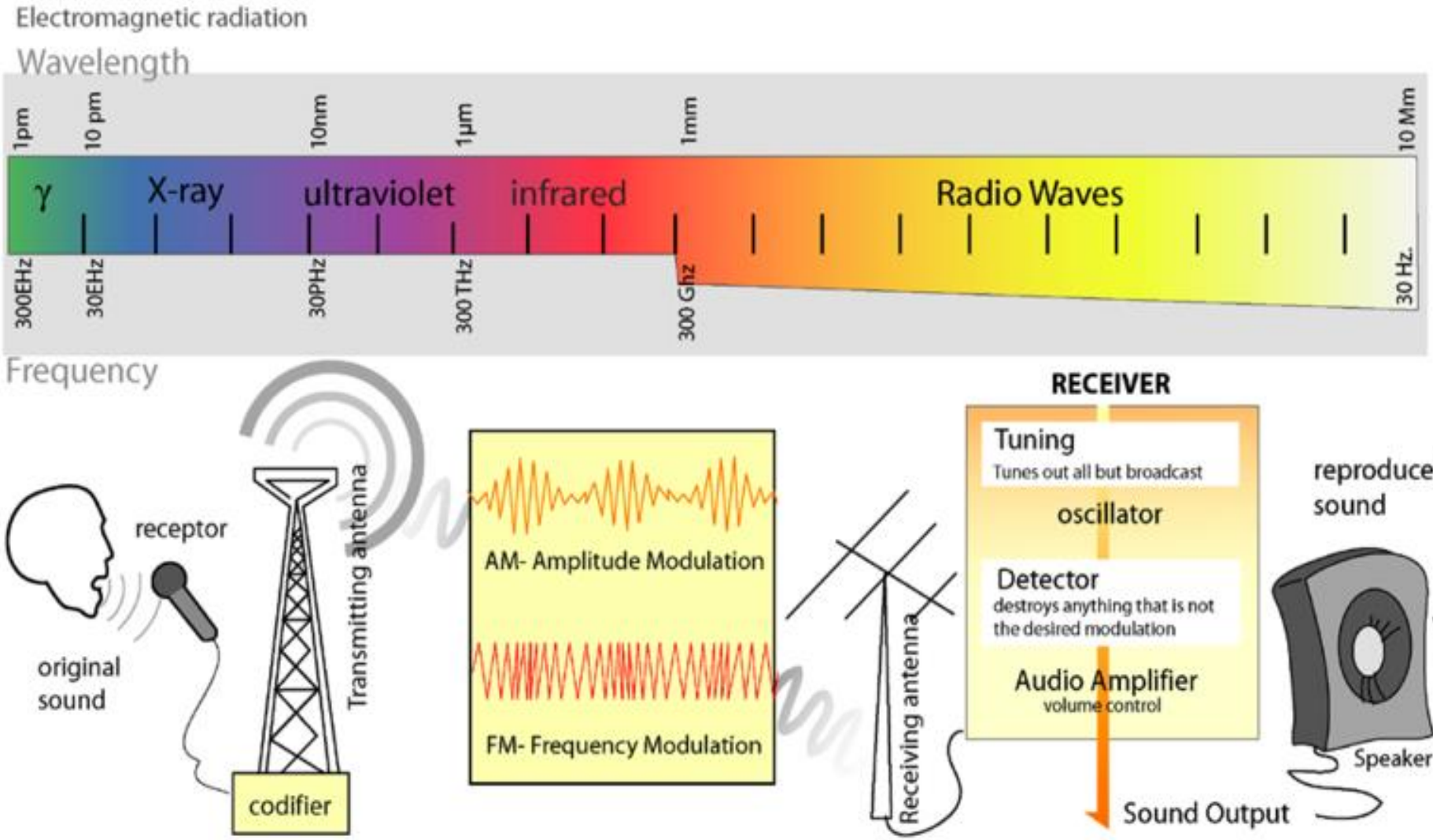


Figure 4.10 Allocation and applications of electromagnetic spectrum.

Radio Transmisi



Frekuensi radio menunjuk ke spektrum elektromagnetik di mana gelombang elektromagnetik dapat dihasilkan oleh pemberian arus bolak-balik ke sebuah antena. Frekuensi seperti ini termasuk bagian dari spektrum di bawah ini:

Nama band	Singkatan	band ITU	Frekuensi	Panjang gelombang
			< 3 Hz	> 100,000 km
Extremely low frequency	ELF	1	3–30 Hz	100,000 km – 10,000 km
Super low frequency	SLF	2	30–300 Hz	10,000 km – 1000 km
Ultra low frequency	ULF	3	300–3000 Hz	1000 km – 100 km
Very low frequency	VLF	4	3–30 kHz	100 km – 10 km
Low frequency	LF	5	30–300 kHz	10 km – 1 km
Medium frequency	MF	6	300–3000 kHz	1 km – 100 m
High frequency	HF	7	3–30 MHz	100 m – 10 m
Very high frequency	VHF	8	30–300 MHz	10 m – 1 m
Ultra high frequency	UHF	9	300–3000 MHz	1 m – 100 mm
Super high frequency	SHF	10	3–30 GHz	100 mm – 10 mm
Extremely high frequency	EHF	11	30–300 GHz	10 mm – 1 mm
			Di atas 300 GHz	< 1 mm

PESAWAT TELEPON

Teleponi

- 1870 an telegrapi tlh digunakan didunia dan telah digunakan umum, pemerintahan dan bisnis

- 1876 Alaxander Graham Bell mematenkan telepon, pesawat utk menyalurkan suara melalui kawat

- 1890 an layanan telepon terdapat di hampir semua kota2 Amerika

Alexander Graham Bell and his phone
from 1876 demonstration

Telephone Line Installation Crew
1880's

FAX

- Menggunakan kanal teleponi
- BW sama dgn bw teleponi

Telegraphy

-1833 Samuael F.B. Morse memiliki ide membangun hub telegrap mel laut.

-1835 mendemostrasikan prototipe hub tsb

- 1837 mempatentkannya.

- Turunan kode morse biner masih digunakan spi sek

- 1844 selesai pembangunan Washington – Baltimore dan mulai digunakan utk umum. Western Union prsh KA menggunakan utk komunikasi antar stasiun dan sisa kapasitasnya digunakan utk umum.

- 1857 dibangun kabel laut pertama Trans Atlantik.

Samuel F. B. Morse
at the peak of his career

Submarine Cable Installation
news sketch from the 1850's

Field Telegraphy
during the US Civil War, 1860's

Pesawat telex/teleprinter

Sentral Telephone

Pesawat Radio

- BW baseband : 40 Hz s.d. 15 kHz
- Frek RF :
  - **MW : 540 – 1600 KHz**
  - **SW : 2,3 – 22 MHz**
  - **VHF : 88 – 108 MHz**

Mikropon

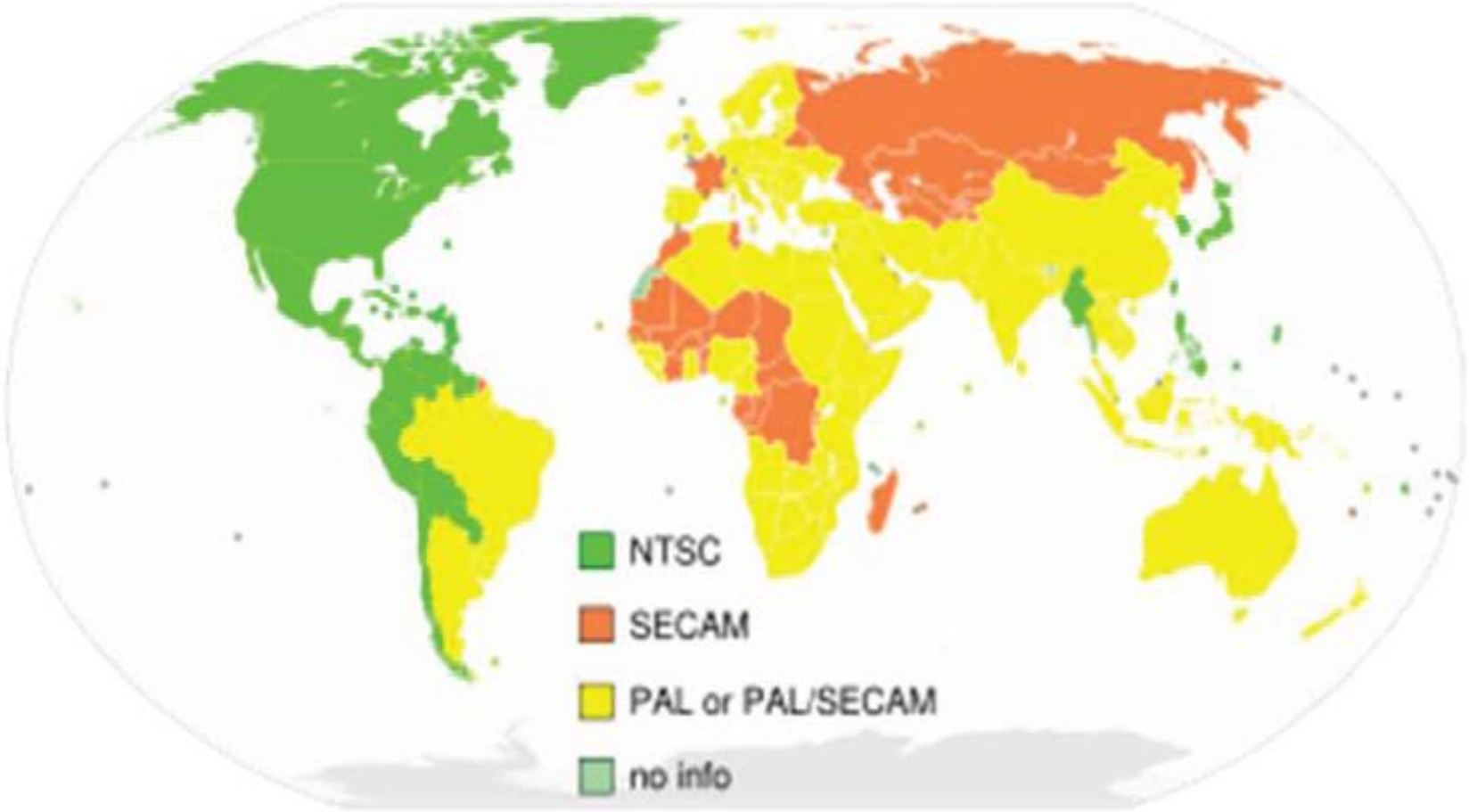
Penerima Radio

Pesawat TV

Kamera

Penerima TV

Standar TV Beberapa Negara



Sinyal Televisi

- **Standar televisi berwarna :**
  - **NTSC (National TV Standard Committee) : Japan, USA, Canada, Mexico, Asia, Amerika Selatan → 30 frame/s, 525 line/frame**
  - **PAL (Phase Alternating Line) : Europe kecuali Perancis, Australia, Amerika selatan, dan Afrika → 25 frame/s, 625 line/frame**
  - **SECAM (SEquentiel Couleur A Memoire) :Perancis, USSR, Timur Tengah & Afrika**
  - **MAC(Multiple Access Componen) → Satellite broadcasting**
- **Sinyal televisi terdiri dari**
  - **Luminance → black & white**
  - **Chrominance → warna**
  - **Sound**
- **Phase Alternating Line : menyatakan cara bhw phasa bagian informasi warna pd sinyal video dibalik tiap garis, shg secara otomatis mengoreksi error phasa saat tranmisi sinyal.**

Apa ItuVoIP ?

Voice-over-IP = Internet telephony

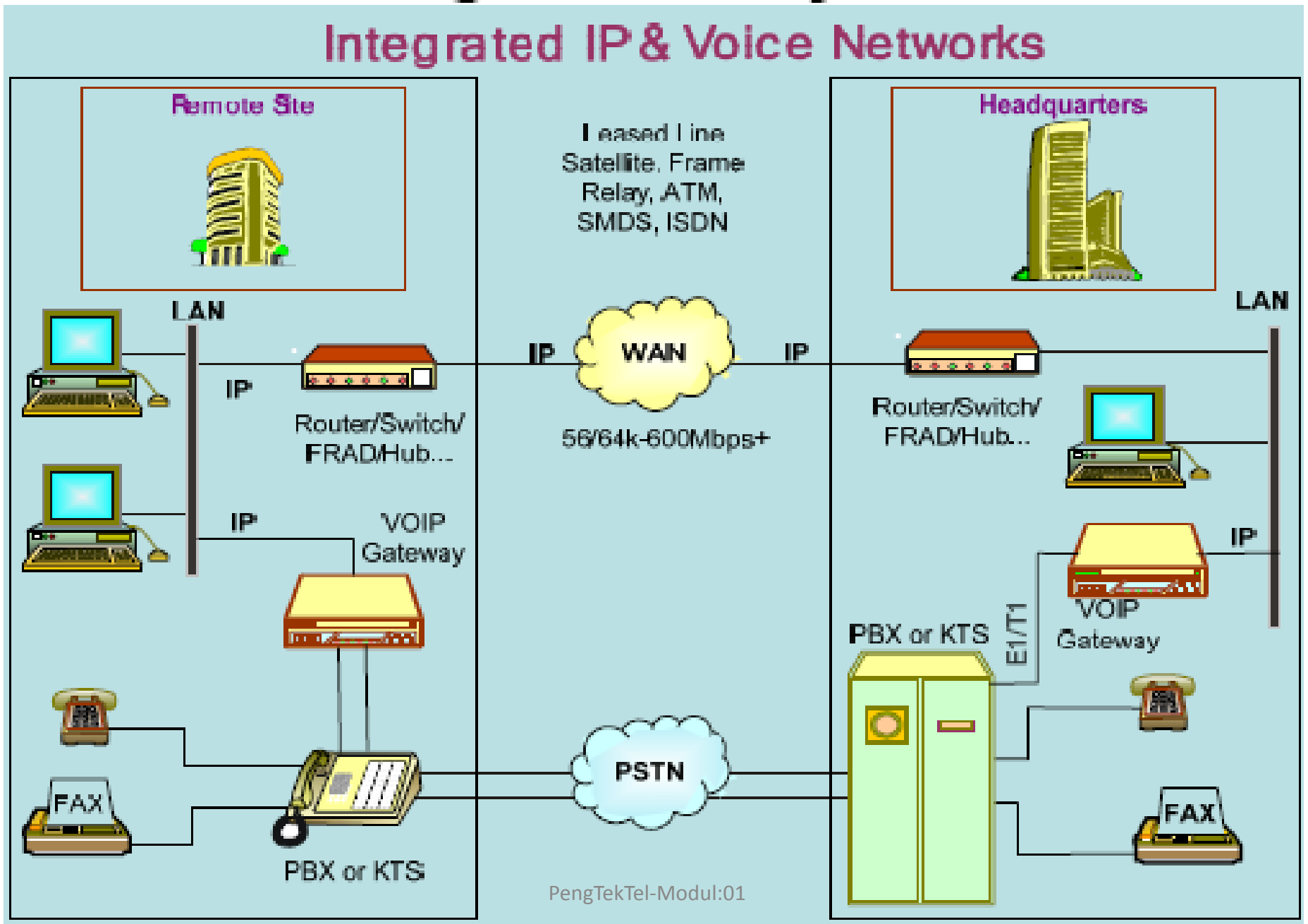
–"Internet telephony refers to communications services—voice, facsimile, and/or voice-messaging applications—that are **transported via the Internet**, rather than the public switched telephone network (PSTN).

- The basic steps involved in originating an Internet telephone call are conversion of the analog voice signal to digital format and compression/translation of the signal into Internet protocol (IP) packets for transmission over the Internet; the process is reversed at the receiving end."(IEC)

Bukan single technology, melainkan kombinasi beberapa teknologi Internet

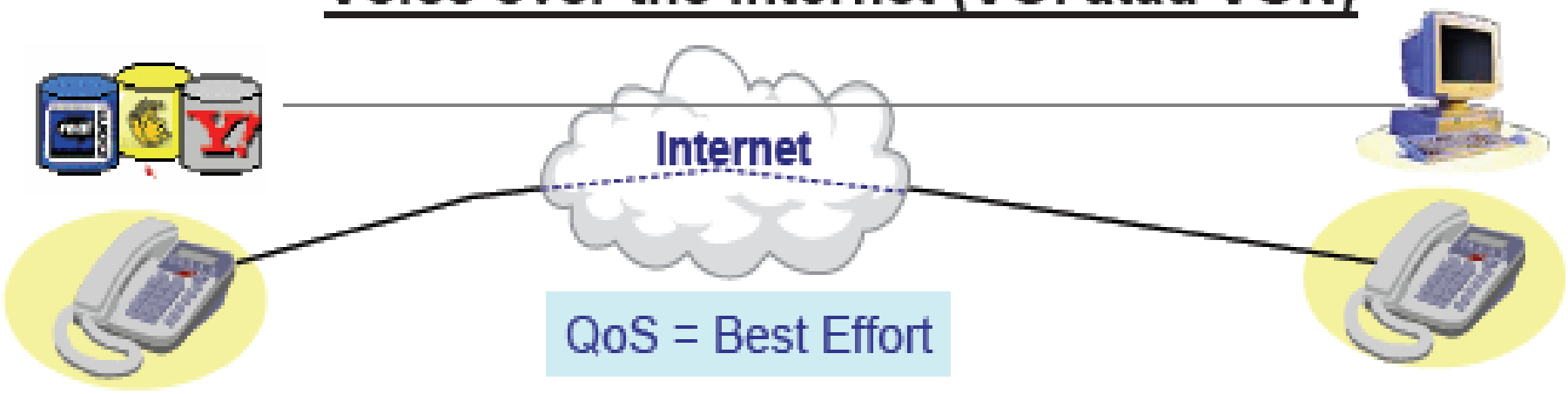
Saat ini hanya suara, tetapi dapat dikembangkan dengan mudah ke video

Dengan adanya VoIP

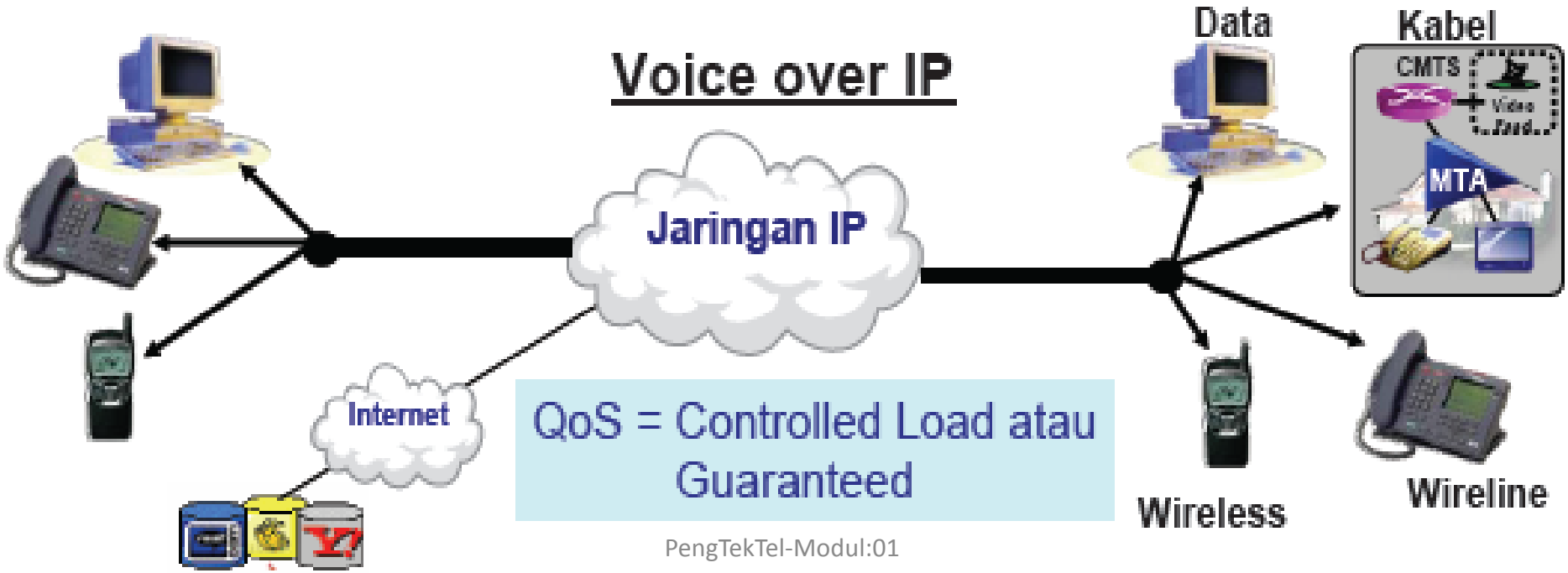


Voice over Internet Protocol (VoIP)

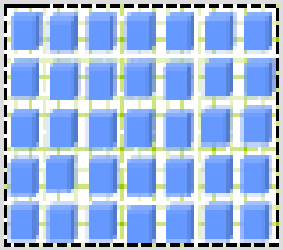
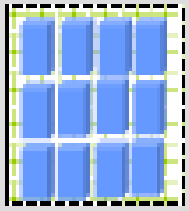
Voice over the Internet (VOI atau VON)



Voice over IP



Transisi Jaringan Telekomunikasi

	Analog	Analog ke Digital	Digital ke Paket
Service Drivers	POTS 	SS7 	Multimedia, Personalisasi 
Operation Drivers	Sentral Besar 	Sentral Kecil 	Konsolidasi Jaringan 
Regulasi & Standar	Monopoli 	Regulasi/Standar Jelas  Bellcore	Evolusi Regulasi  Multiple Forum Menciptakan Standar

These 25 Top Technology Innovations have truly changed our lives for the past 25 years

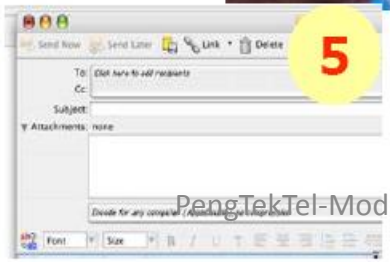
TOP INNOVATIONS

The number one innovation will be announced on Sunday, January 16, at 8 p.m. ET.

2. Cell phone
3. Personal computers
4. Fiber optics
5. E-mail
6. Commercialized GPS
7. Portable computers
8. Memory storage discs
9. Consumer level digital camera
10. Radio frequency ID tags
11. MEMS
12. DNA fingerprinting
13. Air bags
14. ATM
15. Advanced batteries
16. Hybrid car
17. OLEDs
18. Display panels
19. HDTV
20. Space shuttle
21. Nanotechnology
22. Flash memory
23. Voice mail
24. Modern hearing aids
25. Short Range, High Frequency Radio

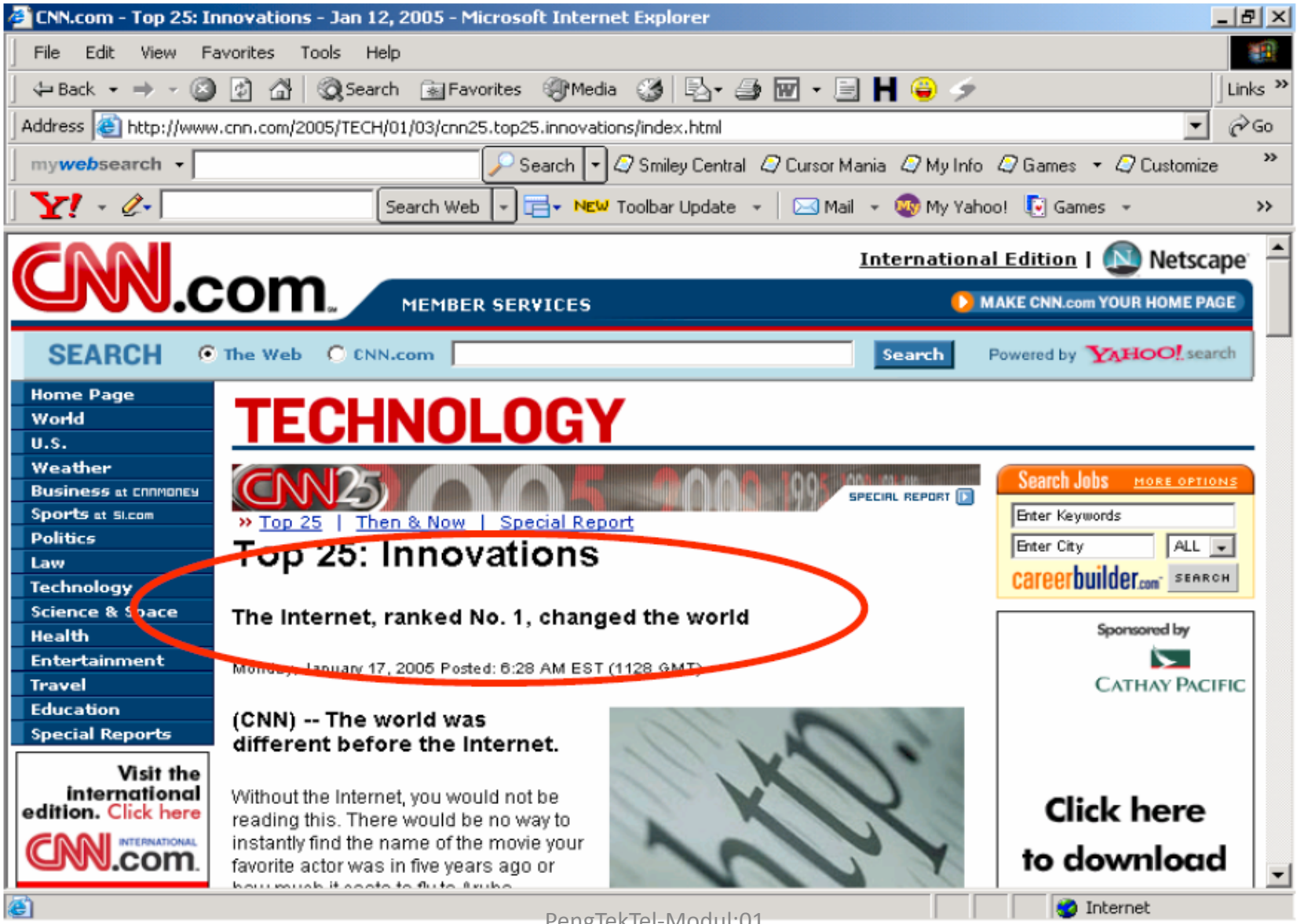
Source: cnn.com

The Top 5



What is the number one?

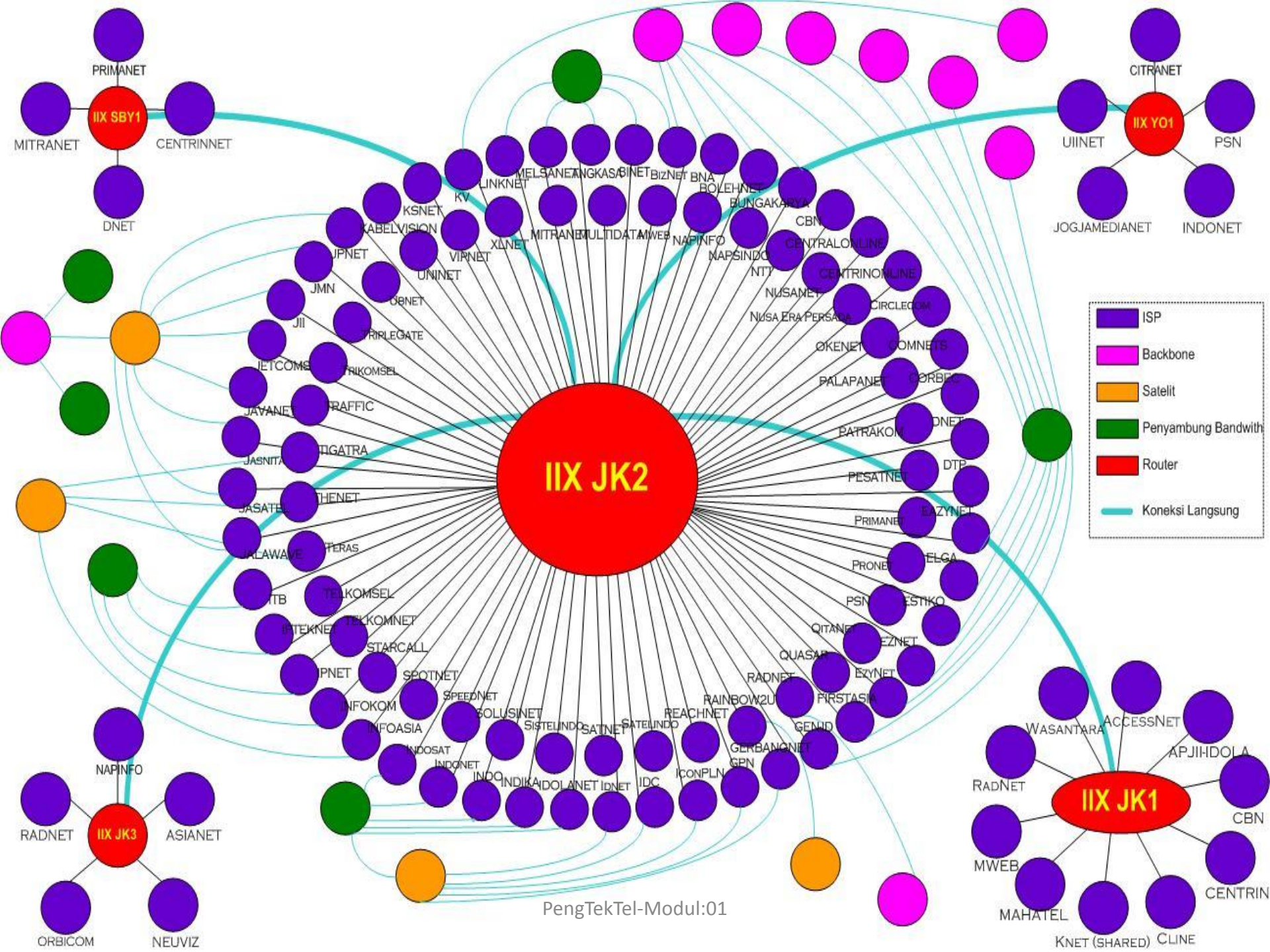
The Internet!!!



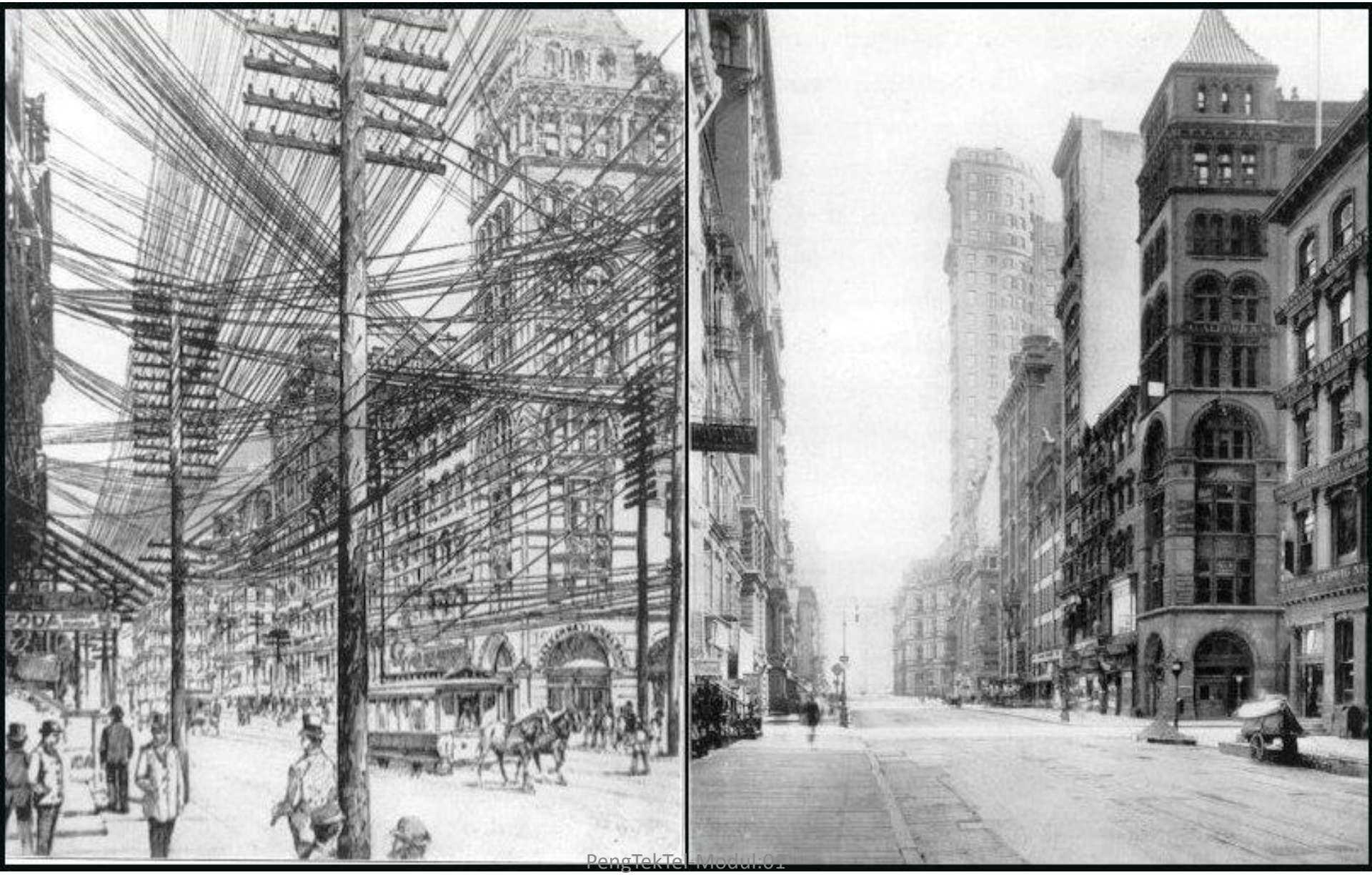

THE INTERNET

Identitas dalam Internet

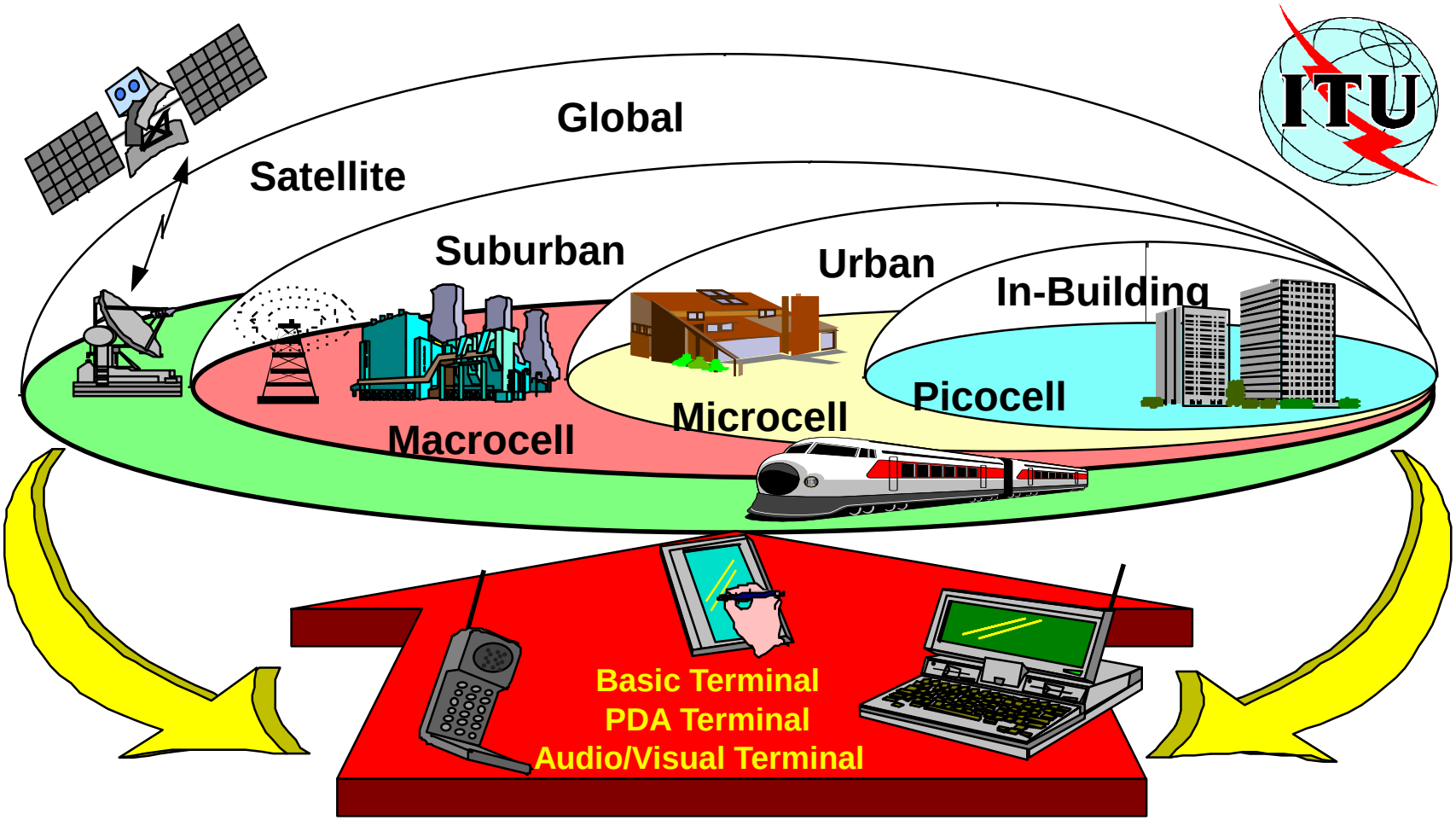
- IP Address
  - 202.xxx.xx.xx
- Domain Name
  - generic (misal: www.detik.com)
  - Cc-TLD (www.ittelkom.ac.id, www.ittelkom.ac.id/staf/UKU)


IIX JK2
IIX SBY1
PRIMANET
MITRANET
CENTRINNET
DNET
IIX YO1
CITRANET
UIINET
PSN
JOGJAMEDIANET
INDONET
IIX JK3
NAPINFO
RADNET
ASIANET
ORBICOM
NEUVIZ
IIX JK1
WASANTARA
ACCESSNET
APJII-IDOLA
RADNET
CBN
MWEB
MAHATEL
KNET (SHARED)
CLINE
CENTRIN
ISP
Backbone
Satelit
Penyambung Bandwith
Router
Koneksi Langsung

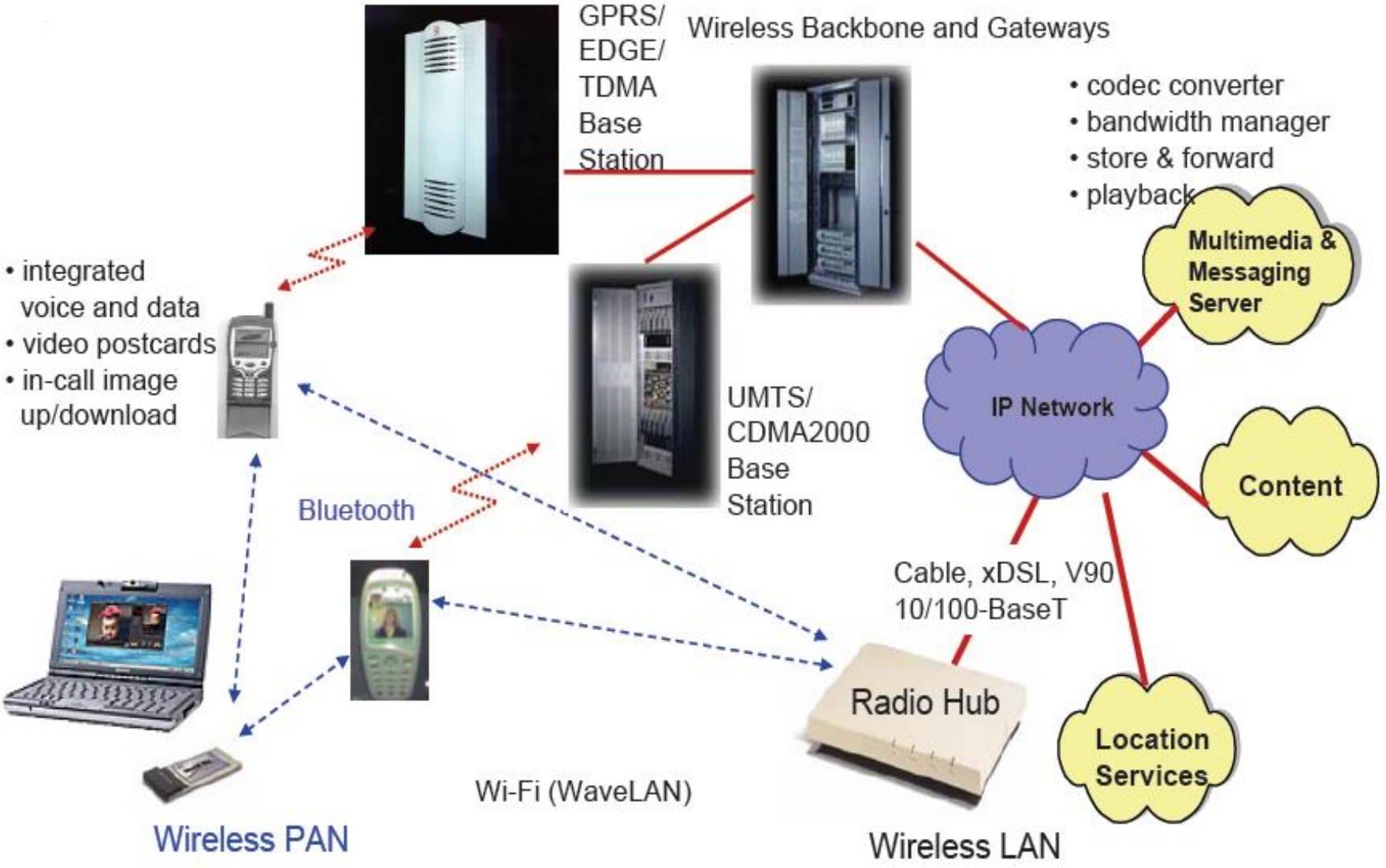
WIRELESS



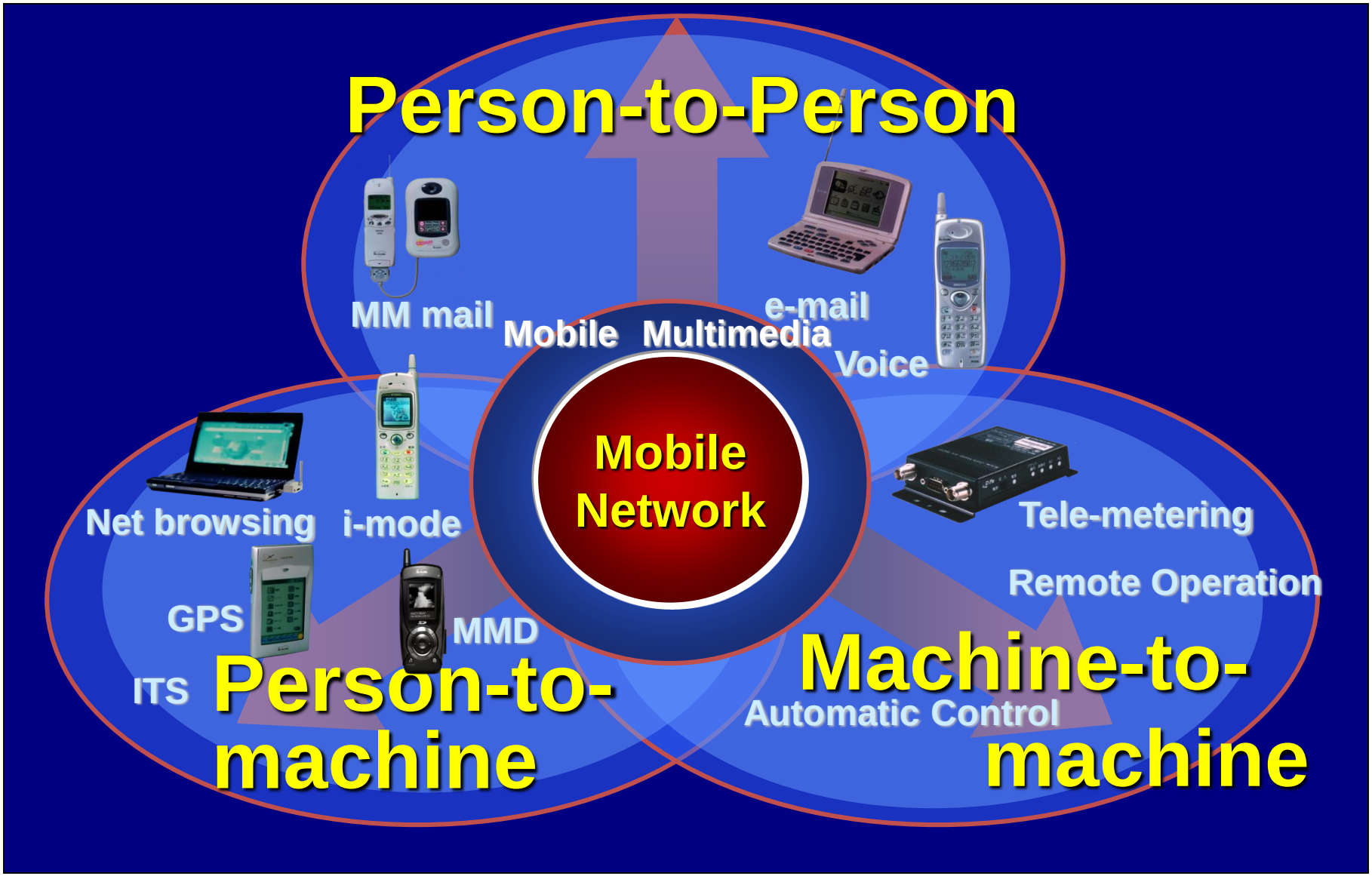
IMT-2000 Vision Includes LAN, WAN and Satellite Services



Integrated wireless service: the Vision

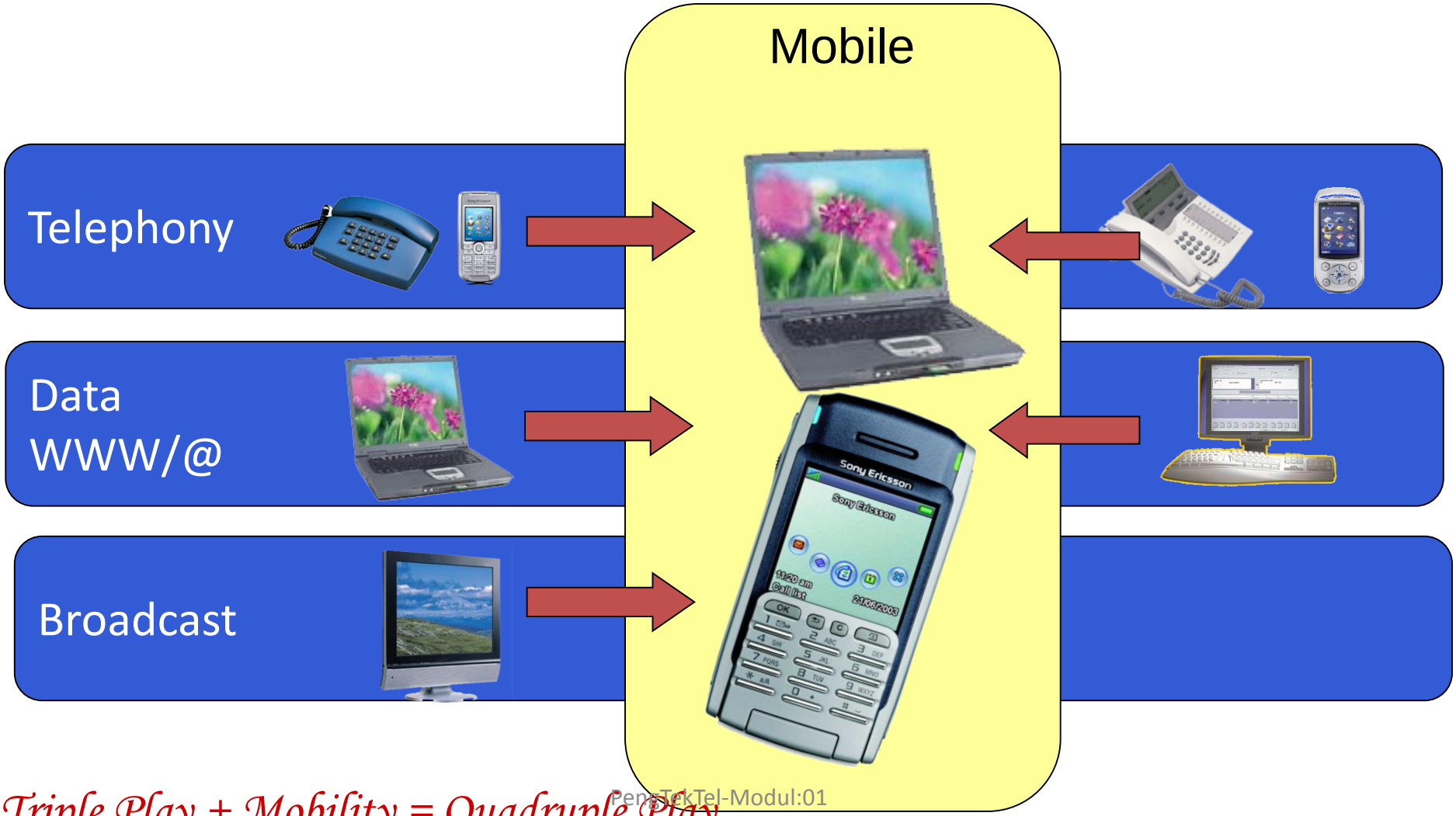


Sifat yg ada dimana-mana



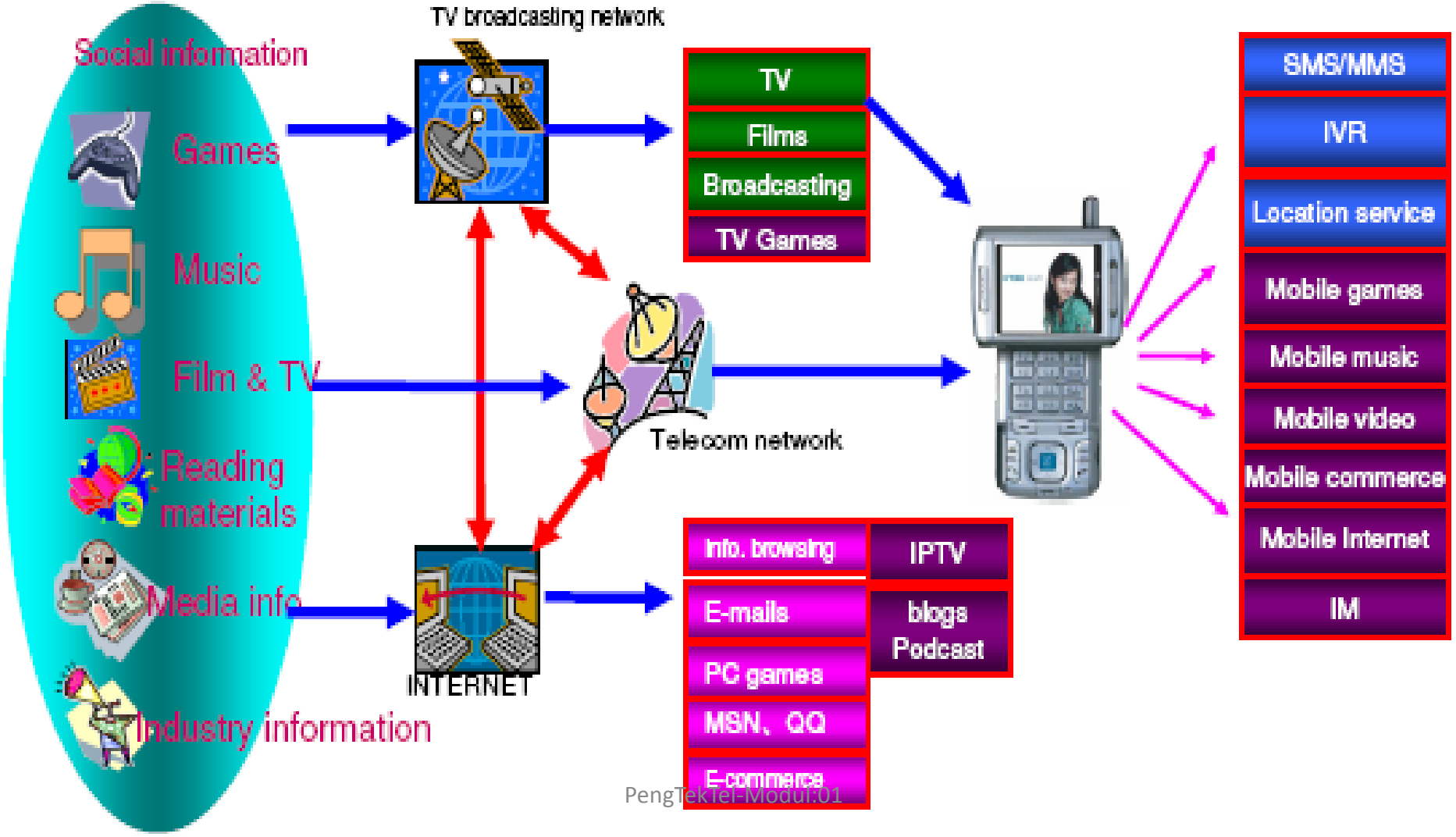
Mobile Triple Play

Telephony, Data and Video/TV delivered by BWA networks



Triple Play + Mobility = Quadruple Play

The Increasing Derivative Services in Communication Network



NGN NETWORK ELEMENTS AND INTERFACES