

WEEK 10:

Networks: Mobile Business
Overview of a Connected World
Internet - World Wide Web



MIS

Management
Information
System

LECTURER: Sam Yuan Permadi, M.Sc

OVERVIEW OF CONNECTED WORLD

How old when you have your 1st smart phone?

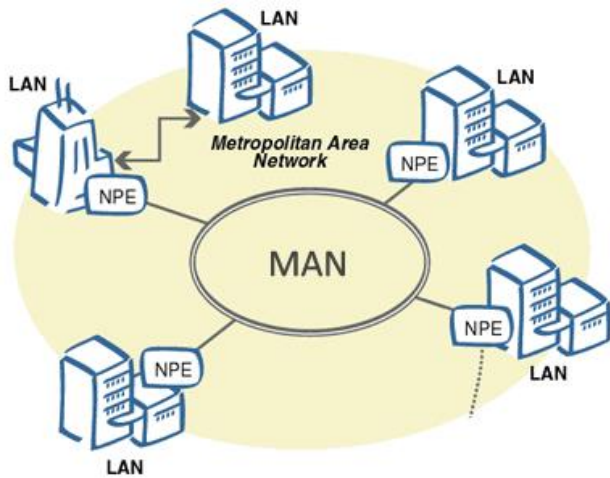


Our Focus: Networking Technologies

- **How Wireless Started**
- **Network Categories**
- **Challenge**
- **Wireless Network Implementation in Business**

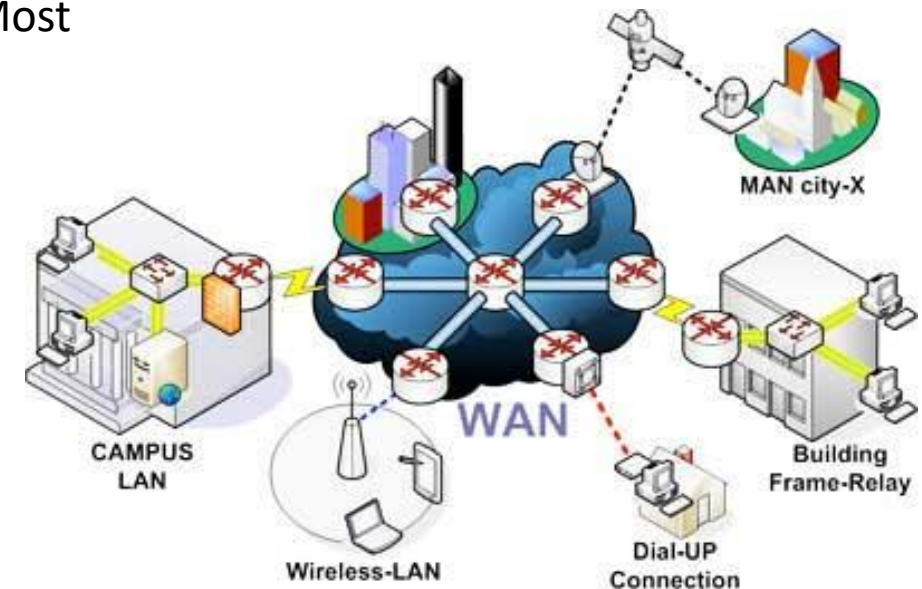
OVERVIEW OF CONNECTED WORLD

Local area network (LAN) connects a group of computers in close proximity, such as in an office building, school, or home. LANs allow the sharing of files, printers, games, and other resources (Baltzan, 2020). Ex: Warnet, Office, Home network



Metropolitan area network (MAN) is a large computer network usually spanning a city. Most *colleges, universities, and large companies* that span a campus use an infrastructure supported by a MAN (Baltzan, 2020)

A **wide area network (WAN)** spans a large geographic area such as a state, province, or country. (Baltzan, 2020)



HOWEVER, These networks are all using cable as medium

S O S





ANCIENT WIFI



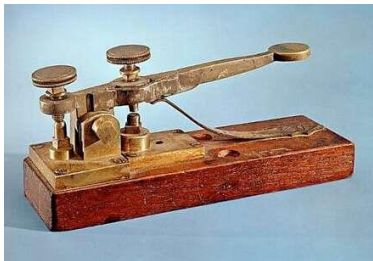
Guglielmo Marconi (Italian)
Wireless telegraph (1896)



Marconi's Wireless Telegraph Replica



Saves 700 lives in the Titanic Incident
(1912)



Electric Telegraph
By Samuel Morse (1837)

Students Activity: **GAMES!**

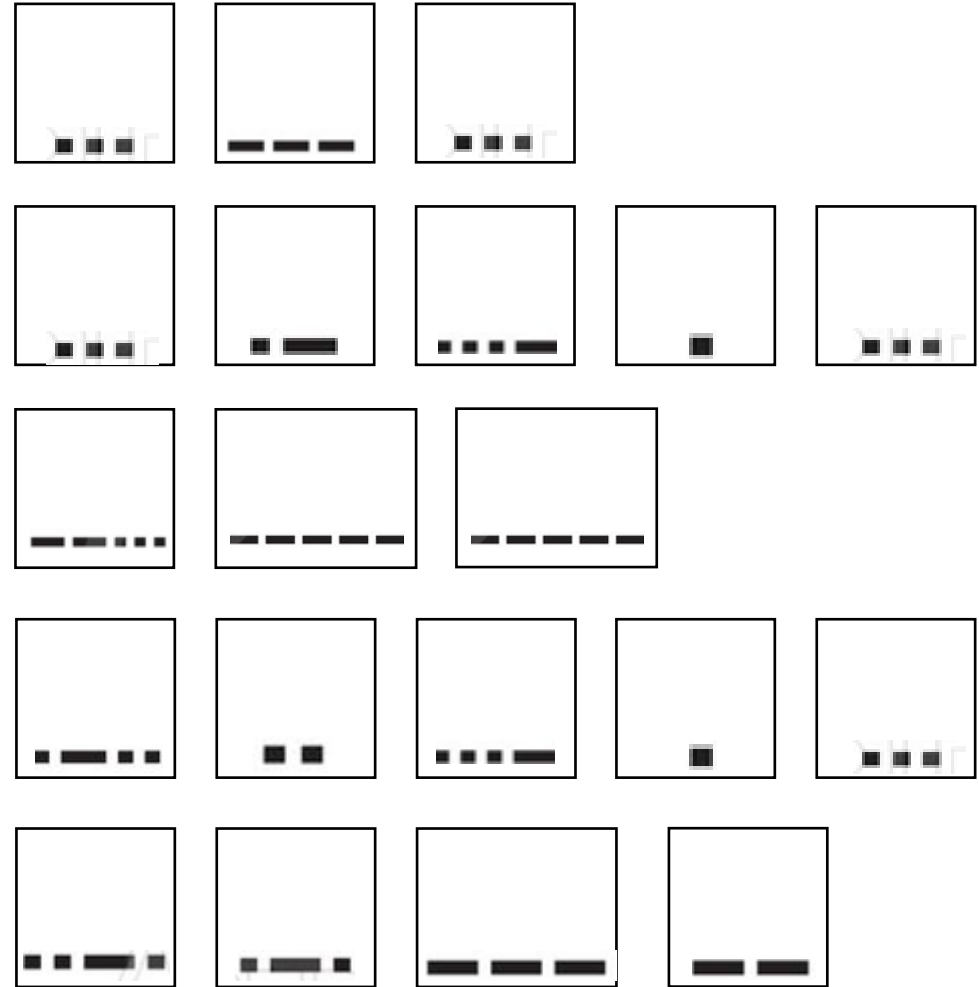
International Morse Code

A	.-	N	-.	1	-----
B	...-	O	---	2	..---
C	-.-.	P	-.--	3	...--
D	-..	Q	-.-.-	4-
E	.	R	.-.-	5
F	..-.	S	...-	6	-....
G	-...-	T	-	7	-----
H	U	..-	8	---..
I	..	V	...-	9	-----
J	.-.-.-	W	-.-	0	-----
K	-.-.-	X	-...-		
L	.-...-	Y	-.--		
M	---	Z	--...		

International Morse Code

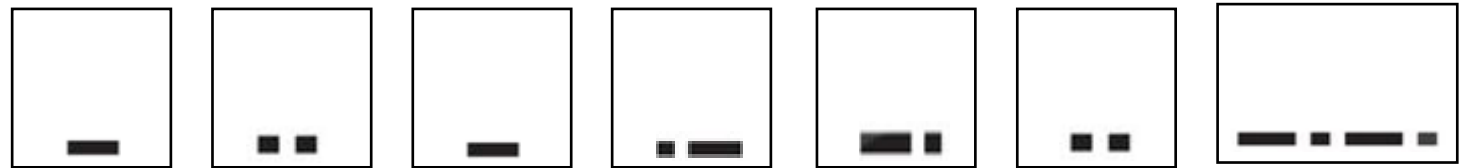
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A	· · ·	N	· · ·	1	· · · · ·
B	· · · · ·	O	· · · · ·	2	· · · · ·
C	· · · · ·	P	· · · · ·	3	· · · · ·
D	· · · · ·	Q	· · · · ·	4	· · · · ·
E	·	R	· · · · ·	5	· · · · ·
F	· · · · ·	S	· · · · ·	6	· · · · ·
G	· · · · ·	T	· · · · ·	7	· · · · ·
H	· · · · ·	U	· · · · ·	8	· · · · ·
I	· ·	V	· · · · ·	9	· · · · ·
J	· · · · ·	W	· · · · ·	0	· · · · ·
K	· · · · ·	X	· · · · ·		
L	· · · · ·	Y	· · · · ·		
M	· · · · ·	Z	· · · · ·		



RULES:

1. Take Turn
2. No Talking/Speaking
3. Provide Timer



International Morse Code

-----		
A ---	N --	1 -----
B ----	O -----	2 ----
C ----	P -----	3 ----
D ---	Q -----	4 ----
E .	R -----	5 ----
F ----	S ----	6 ----
G -----	T -	7 -----
H ----	U ----	8 -----
I --	V -----	9 -----
J -----	W -----	0 -----
K -----	X -----	
L ----	Y -----	
M ---	Z -----	

S O S

S A V E S

7 0 0

L I V E S

F R O M

T I T A N I C

MOBILE & WIRELESS

Are they the same? **Not The Same**



Mobile: the technology can travel with the user.
Ex: Walkman, Discman, Gameboy, VR. Other word: “Portable”

MOBILE Phone =

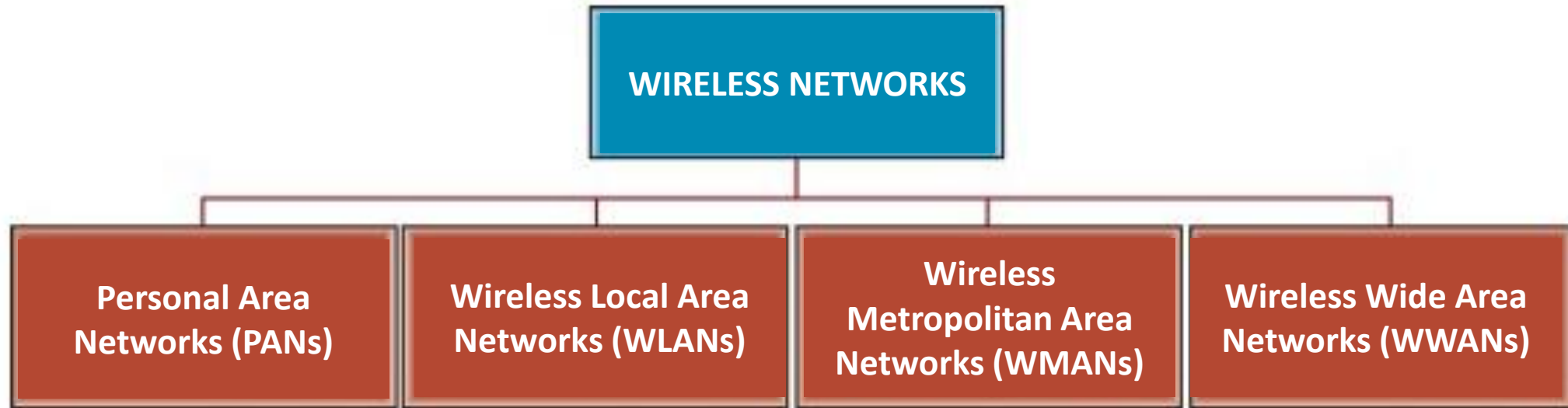


MOBILE = “Able to move”

Wireless: refers to any type of operation accomplished without the use of a hard-wired connection



WIRELESS NETWORK CATEGORIES



WIRELESS NETWORK CATEGORIES

PAN

Personal Area Network

Personal area network (PAN) provides communication for devices owned by a single user that work over a short distance.

Personal area networks generally cover a range of less than 10 Meters



WLAN

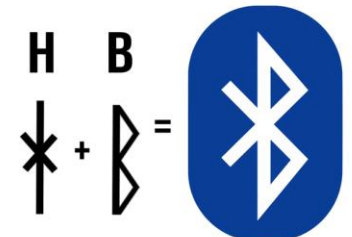
Wireless Local Area Network

wireless LAN (WLAN) is a local area network that uses radio signals to transmit and receive data over distances of a few hundred feet (around 60-100M)



This is King Harald "Bluetooth" Gormsson of Denmark and Norway.

His nickname allegedly comes from the extreme amount of blueberries he ate, staining his teeth. Commonly viewed as a great uniter, he is the inspiration for Bluetooth wireless technology (because it "unites" devices), and the logo is actually his initials in Nordic Runes.



WIRELESS NETWORK CATEGORIES



WMAN
Wireless Metropolitan
Area Network

WiMAX
FORUM®

Wireless MAN (WMAN) is a metropolitan area network that uses radio signals to transmit and receive data. WMAN technologies have *not been highly successful to date*, mainly because they are not widely available.
Ex: WiMax.



New York

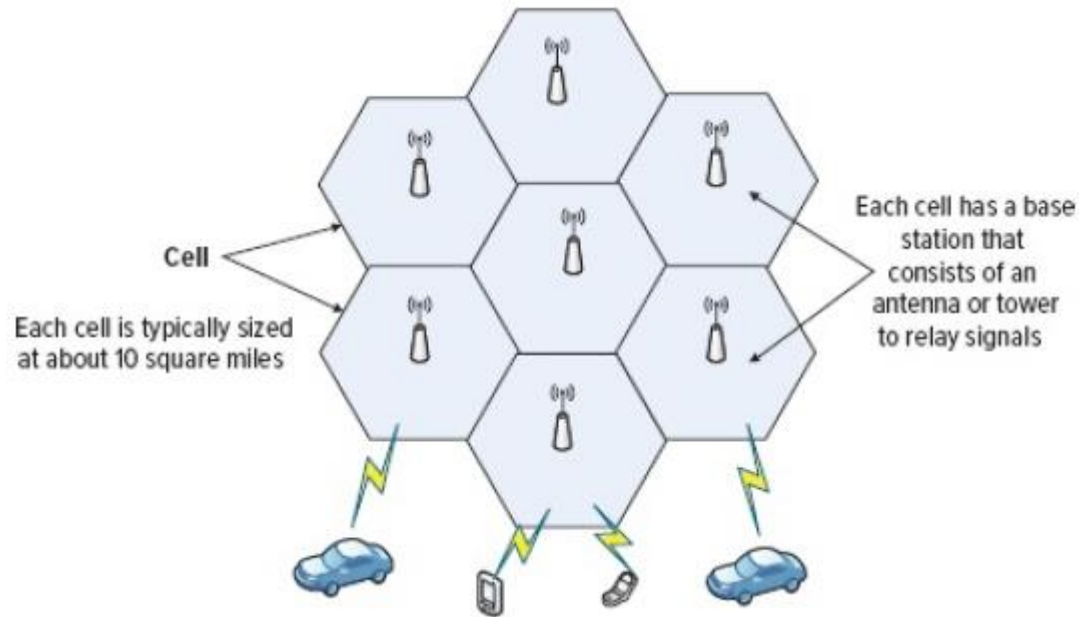
WIRELESS NETWORK CATEGORIES

WWAN

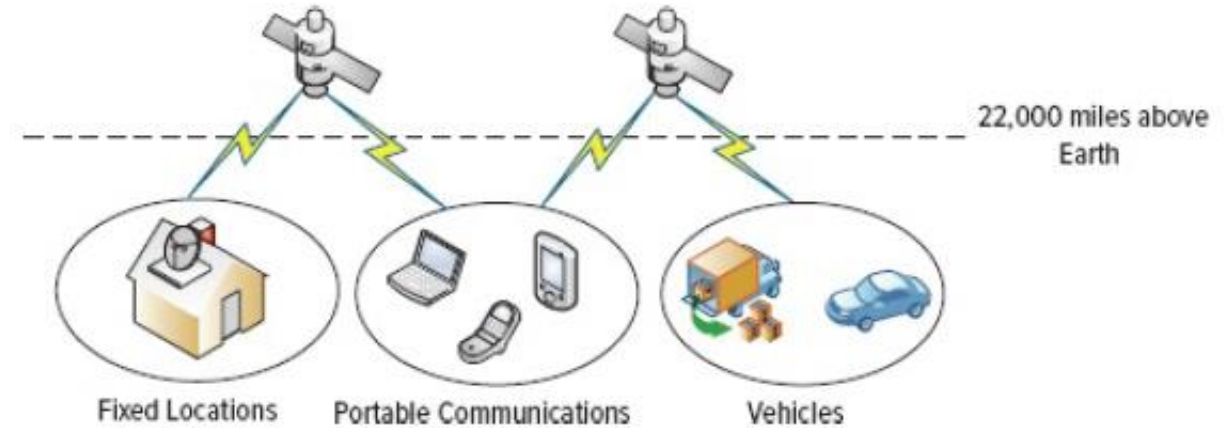
Wireless Wide Area Network

A **wireless WAN (WWAN)** is a wide area network that uses radio signals to transmit and receive data. WWAN technologies can be divided into two categories: **cellular communication systems** and **satellite communication systems**.

cellular communication systems



satellite communication systems



CHALLENGES IN WIRELESS NETWORK

MAKING BYOD SAFE

As more and more personal mobile devices get introduced to the company network, the challenge of balancing **employee freedom**, **app functionality**, and **data security** rises.

EMPLOYEE MOBILITY

82%

of companies let employees use personal devices for work

90%

of U.S. employees use their own smartphones at work

70%

of employees use company-issued tablets to download personal apps



DATA BREACHES

40%

of large data breaches were caused by lost or stolen devices

50%

of companies that allowed BYOD were breached via employee-owned devices

60%

of companies do not remove business data from their ex-employees' devices

(Brook, 2020)

IT consumerization is the blending of personal and business use of technology devices and applications. Today's workforce grew up with the Internet, and its members do not differentiate between corporate and personal technology (Baltzan, 2022).

Pervasive computing is the trend to make everyday object computable.

BYOD Corporate Culture (Bring Your Own Device) is rising during COVID19 Era and WFH culture – And if not maintained well, could cause problems.

(Brook, 2020)

HOW MIS DEPARTEMENT ENSURE THE SECURITY OF THE COMPANY'S WIRELESS NETWORKS ?

Uniformed Antivirus?
Premium or Free?

What if the phone or laptop stolen?

- The thief can misuse your corporate email
- Misuse your Corporate ID



HOW MIS DEPARTEMENT ENSURE THE SECURITY OF THE COMPANY'S WIRELESS NETWORKS ?

MDM MOBILE DEVICE MANAGEMENT



MDM is a security strategy that offer remote support for mobile devices, such as smartphones, laptops, and tablets (Baltzan, 2020).

Implementing **MDM** can be a bit complex (rigid) and overwhelming or annoying sometimes for the employee, because they still have to follow several rules of the company even if its their personal devices.

MOBILE DEVICE MANAGEMENT

THREE TYPES OF POLICY

Bring Your Own Device (BYOD)

Employees use their own device. Save company money. Zero control over security, reliability, and compatibility.

Choose Your Own Device (CYOD)

Employees choose a company approved and configured device. Costs company money to purchase and maintain device. No personal use allowed. Complete control over security, reliability, and compatibility.

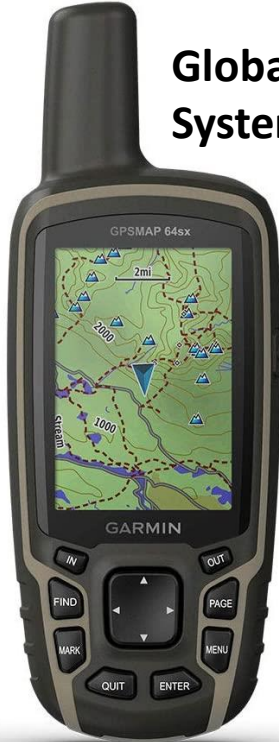
Company-Issued, Personally Enabled (COPE)

Employees provided with corporate devices. Costs company to purchase and maintain devices. Partial control over security, reliability, and compatibility as employees can use for personal use.

BUSINESS APPLICATIONS OF WIRELESS TECHNOLOGIES

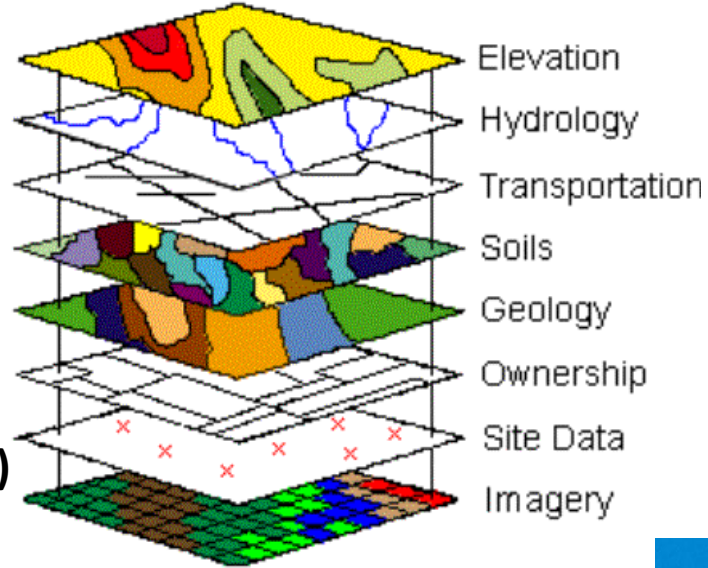


Package Tracking and Management



Global Positioning System (GPS)

Geographic Information System (GIS)



RFID
(Radio Frequency Identification)



Animal ear Tag

Digital Divide A worldwide gap giving advantage to those with access to technology (Baltzan, 2020)



Hotel Card Key



e-Money

THE INTERNET AS ULTIMATE BUSINESS DISRUPTOR



A large scale network system that connects devices (e.g. computers) around the world and let them to interact and communicate each other. (see Figure 3.1). Internet allows these device send and receive meaningful information, such as text, audio, graphics, video, software, currency and many more (Baltzan, 2020)



What is **INTERNET?**

In simple terms, the Internet is a system of communication between computer networks that allows information (whether it's text, images, sound, or video) to be passed from one location to another.

WIRELESS INTERNET BEFORE WIFI AND BLUETOOTH

1994 (1800)



INFRARED



1997



1999



Lock

Microphone

Speaker/
Headphone

Infrared

Wi-Fi

PC Card
Type I / II

WHY THE NAME IS "INTERNET" ?



Internetted

1849

**From Old English, Oxford Dictionary means
“interconnected” “Interwoven”**



ARPANET

1969

***Advanced Research Project Agency*
US Military communication system(2)**



Internetwork

1974

Shorten from “internetwork” to “internet” (1)



INTERNET

Interconnected Network(3)

(1) (Cerf, Dalal & Sunshine, 1974)

(2) (Andrews, 2013; Baltzan, 2020)

(3) (Vendantu, 2022)

ARPANET

Advanced Research Project Agency (1969)



Originally, the Internet was essentially an emergency military communications system operated by the U.S. Department of Defense

In time, all U.S. universities that had defense-related funding installed ARPANET computers, forming the first official Internet network.

(Baltzan, 2020)



DO YOU KNOW HOW INTERNET WORKS ?

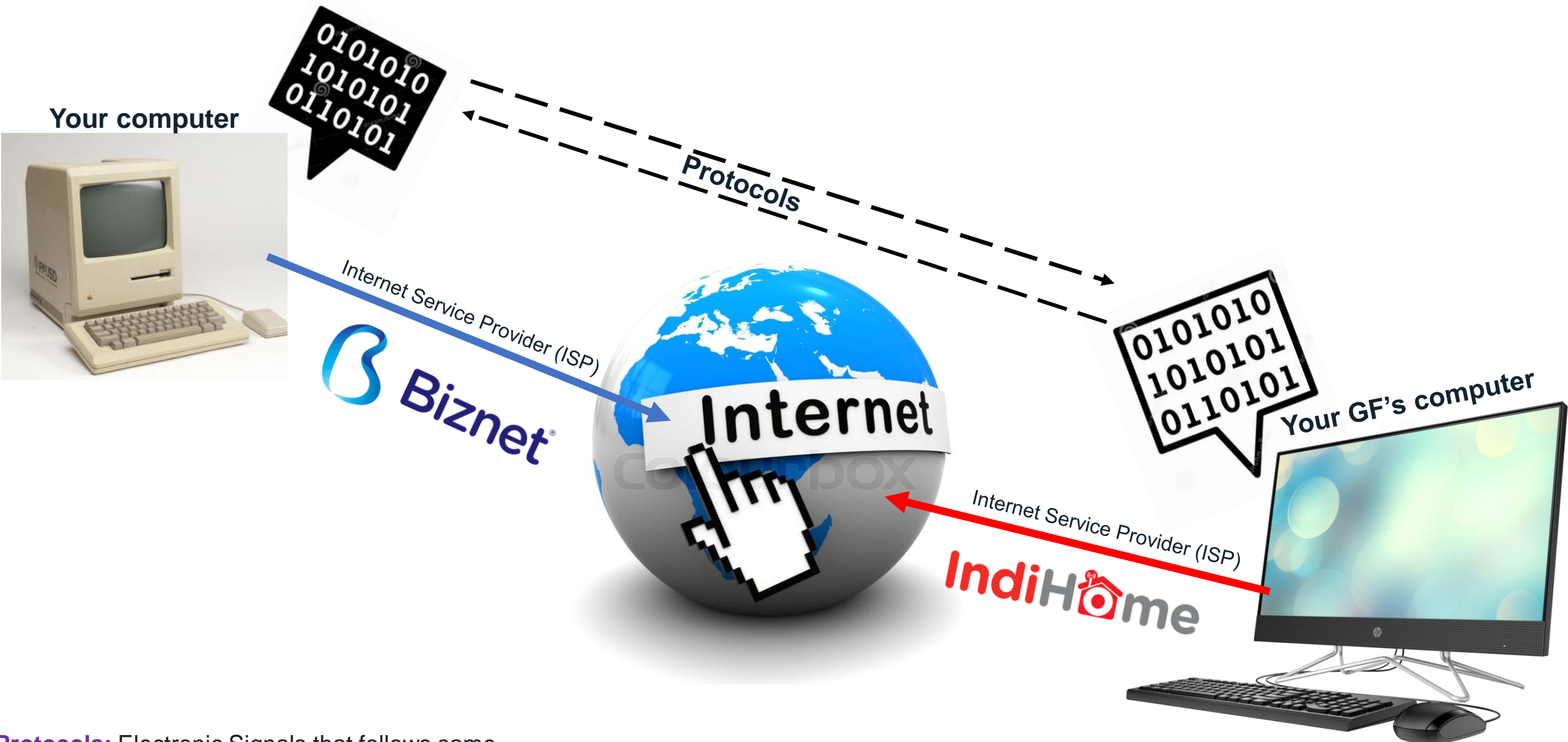
Anyone? I can take some answers

DO YOU KNOW HOW INTERNET WORKS ? 1



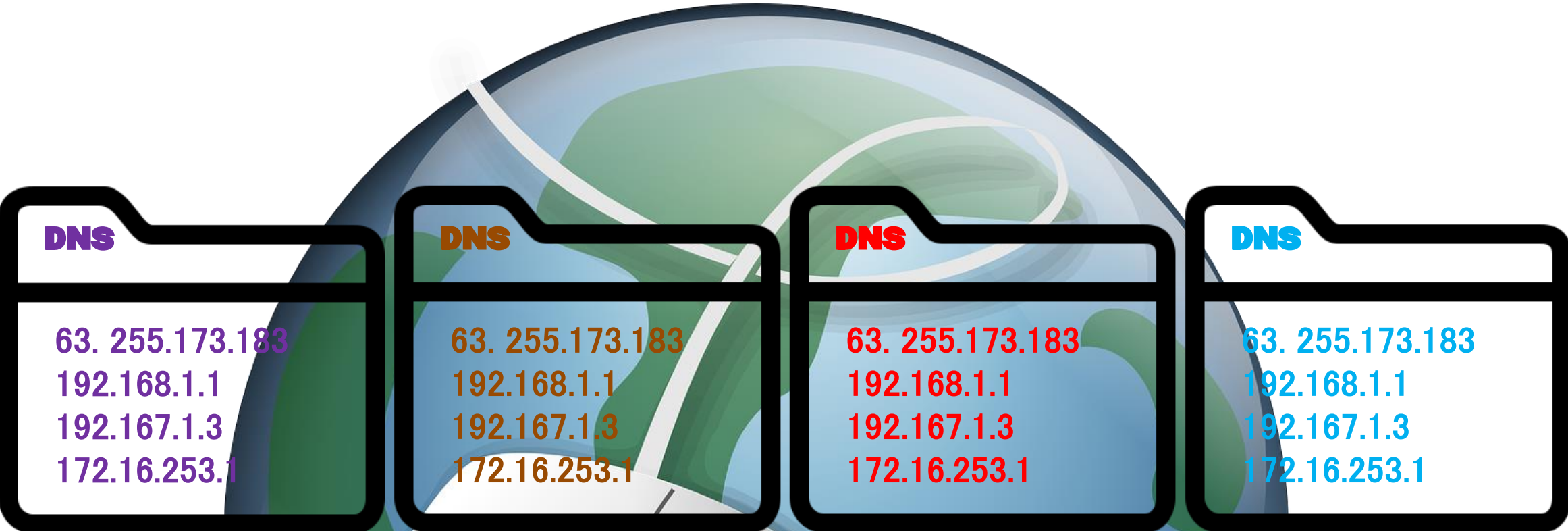
IP Address = Internet Protocol Address

DO YOU KNOW HOW INTERNET WORKS ? 2



Protocols: Electronic Signals that follows same rules and language (Baltzan,2020)

DO YOU KNOW HOW INTERNET WORKS ? 3



The Domain Name Service (DNS) is a series of databases that keeps track of every computer name and IP address on the Internet (Baltzan, 2020)

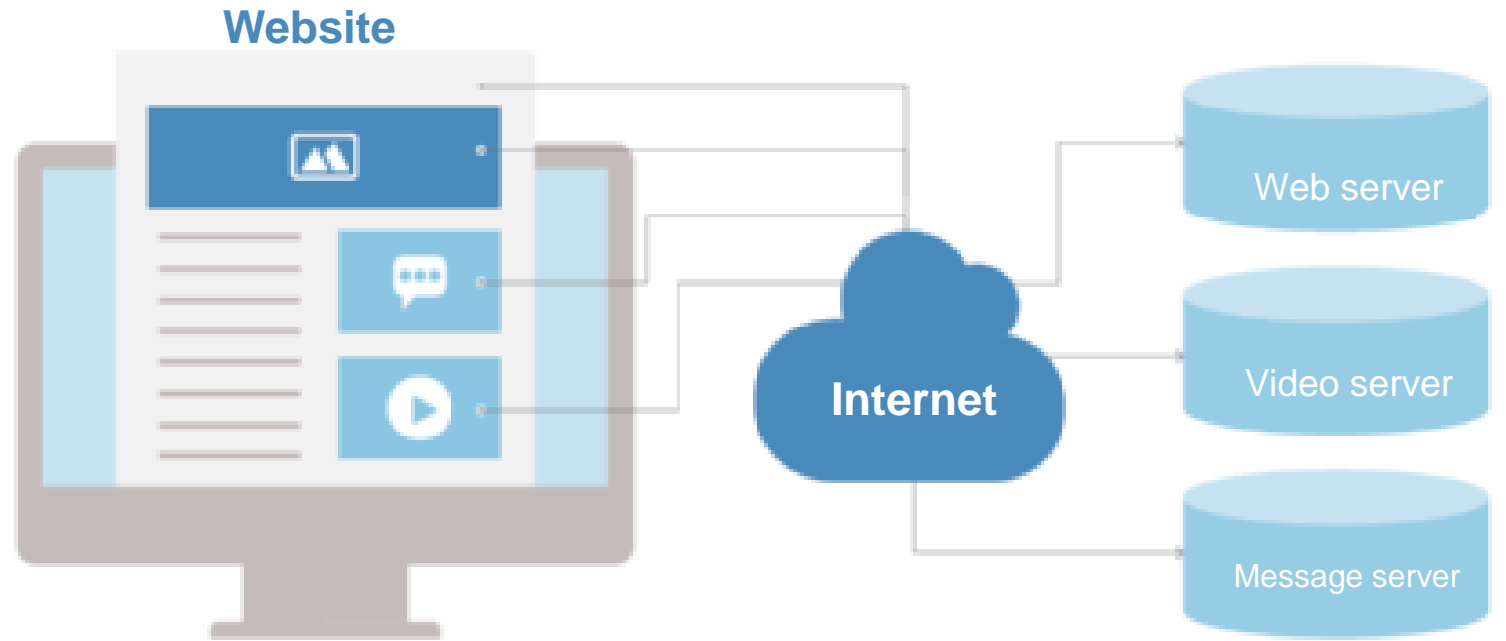
DO YOU KNOW HOW INTERNET WORKS ? 4a



HTTP(S)

Hypertext Transport Protocol (Secure)

(Baltzan, 2020)



HOW HTTPS WORKS?

<https://beadgrup.com/news/hypertext-transfer-protokol/amp/>

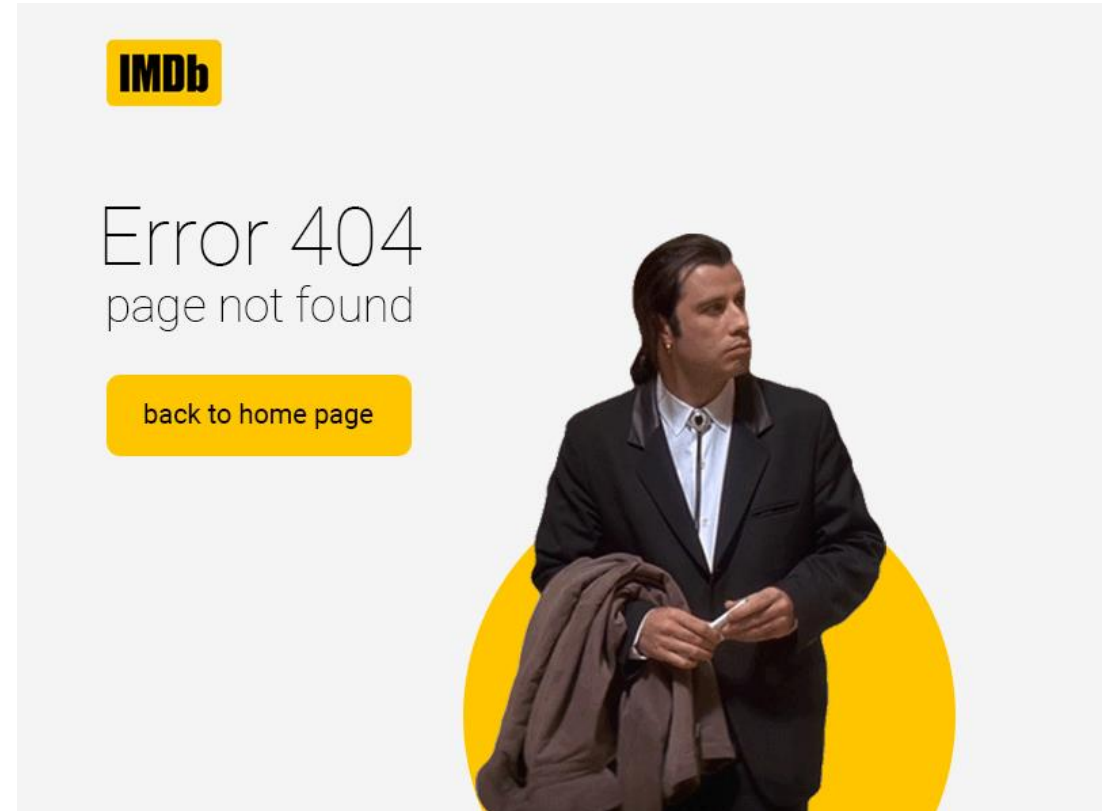
DO YOU KNOW HOW INTERNET WORKS ? 4b



HTTP(S)

(Hypertext Transport Protocol Secure)

(Baltzan, 2020, p. 84)



ERROR 404

“page not found”

WWW World Wide Web

Tim Berners-Lee, a British scientist, invented the World Wide Web (WWW) in 1989

The basic idea of the WWW was to merge the evolving technologies of computers, data networks and hypertext into a powerful and easy to use global information system.



Tim Berners-Lee

Is WWW an Internet ?

WWW

The world wide web, or web for short, are the pages you see when you're at a device and you're online.¹ It is a network of web pages found by their addresses²

Internet

The internet is the network of networks that provides the basis for the web.³ But the internet is the network of connected computers that the web works on, as well as what emails and files travel across. Think of the internet as the roads that connect towns and cities together.⁴



(2,3) (University of Alabama at Birmingham, 2020))

(1,4) (BBC, 2019)

SOME EVI- DEN- CES



The world's first email was sent in 1971.

The man who sent it said it was "entirely forgettable" such as :

"QWERTYUIOP"

Ray Tomlinson - First Email (1971)¹



NeXT Computer as the First Web Server (1989)¹

Is the very first email still exist???

<http://info.cern.ch/hypertext/WWW/TheProject.html>

First Website (1991)²



First Online Sale (1995)³



(1) (The Economic Times, 2018)

(2) (Keach, 2021)

(3) (Baltzan, 2020)

THANK YOU!

End of Presentation

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