

Cybersecurity Concepts

Prepared by Dr. Diaa Salama

FNT625
Network Basics

Lecture 1





مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
UNIVERSITY

Cybersecurity Concepts

Lecture 1

FNT625
Network Basics

Prepared by
Dr. Diaa Salama

www.midocean.ae

- Associate Professor, Data Science Department, Faculty of Computers Science , Misr International University, On Leave from Faculty of Computers & Artificial Intelligence, Banha University, Banha, Egypt.
- Member, National Committee of Communications and Information Technology, Academy of Scientific Research & Technology, CAIRO, Egypt.
- Member, International Telecommunication Union (ITU), United Nations (UN)
- Member, International Federation for Information Processing - IFIP
- Winner of the Arab Republic of Egypt Encouragement Award for Advanced Science and Technology in the Field of Engineering Sciences 2021
- Winner of the Benha University Encouragement Award for Advanced Science and Technology in the Field of Engineering Sciences 2019
- Winner of the DELL EMC AWARD for the academic year 2015/2016, 2016/2017, and 2017/2018



Dr.Diao Salama Ph.D

One of the top 2% Scientists worldwide 2023 by Stanford university ranking.

Lecture

01

Course Info

Instructor:	Associate Professor : Diao Salama
Subject Name:	Cybersecurity Concepts
Subject Code:	FNT625
Program name:	Master of Financial Technology
University Name:	Midocean
Faculty	Faculty of Humanities
Department	Financial Technology
Academic Year	2024
Teaching Language	English
Date of establishment of the curriculum plan/Date of review of the curriculum plan.	2024

Lecture

01

Lets Start our Course



Basics Terminology



What is Cyber Security (Network Security) !

- **A network** is simply two or more computers linked together to share data, information or resources.
- **Security** : prevention of system Crash

Basic Terminologies

- ❑ **Computer Security** - generic name for the collection of tools designed to protect data
- ❑ **Network Security** - measures to protect data during their transmission
- ❑ **Internet Security** - measures to protect data during their transmission over a collection of interconnected networks

Cryptography

- ❑ Cryptography: is the science of secret writing and is an ancient art; the first documented use of cryptography in writing dates back to 1900 B.C. when an Egyptian scribe used non-standard hieroglyphs in an inscription (handwriting).

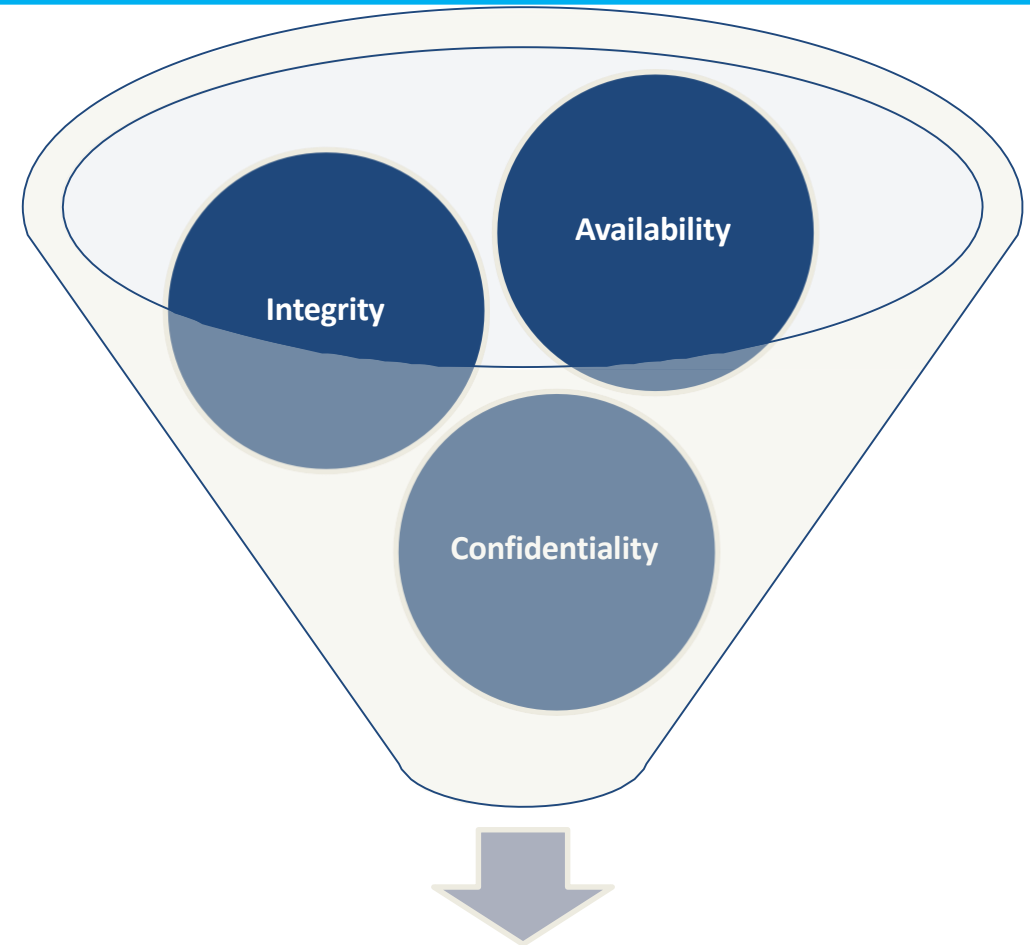


Lecture

01

Basic Terminologies

- ❑ The protection afforded to an automated information system in order to attain the applicable objectives of preserving the **integrity, and confidentiality** of information system resources includes hardware, software, firmware, information/data, and telecommunications)

**CIA triad**

confidentiality

- ❑ Ensuring that no one can read the message except the intended receiver.
- ❑ Preserving authorized restrictions on information access and disclosure (detection), including means for protecting personal privacy and proprietary information. A loss of confidentiality is the unauthorized disclosure of information.



integrity

- ❑ Assuring the receiver that the received message has not been altered in any way from the original.
- ❑ Guarding against improper information modification or destruction, including ensuring information nonrepudiation and authenticity. A loss of integrity is the unauthorized modification or destruction of information.



availability

- ❑ Ensuring timely and reliable access to and use of information.
- ❑ A loss of availability is the disruption (confusion) of access to or use of information or an information system.



Network Basics



CISCO Company



Introduction to CCNA



Introduction to Computer Networks



How to Setup a LAN



Lecture

01

CISCO Company

- It is an **American** multi-national corporation technology company headquartered in **San Jose**, California.
- The **company** designs, manufactures and sells **networking equipment** worldwide (such as switches, routers,...).
- It is the **largest networking company** in the world.
- **Cisco Systems** was founded in **December 1984** by **Leonard Bosack**.



CISCO Company

- **Leonard Bosack** was in charge of the **Stanford University** computer science department's computers.
- His wife **Sandy Lerner**, who managed the Graduate School of Business' computers.
- The name "**cisco**" was derived from the **city name**, San Francisco, which is why the company's engineers insisted on using the lower case "**cisco**" in its early years.
- The **logo** is intended to depict the **two towers** of the **Golden Gate Bridge**.



CISCO Company

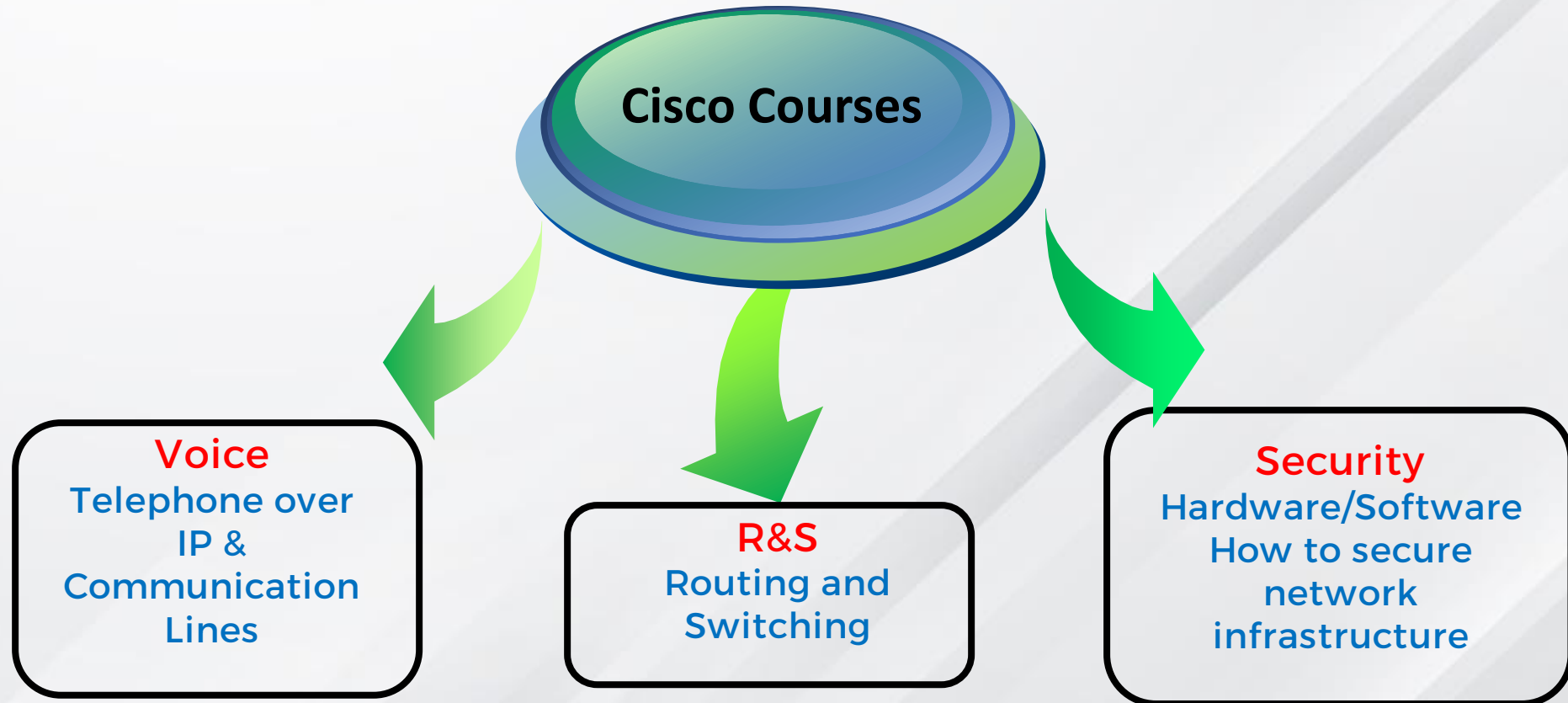


The two towers of the Golden Gate Bridge.

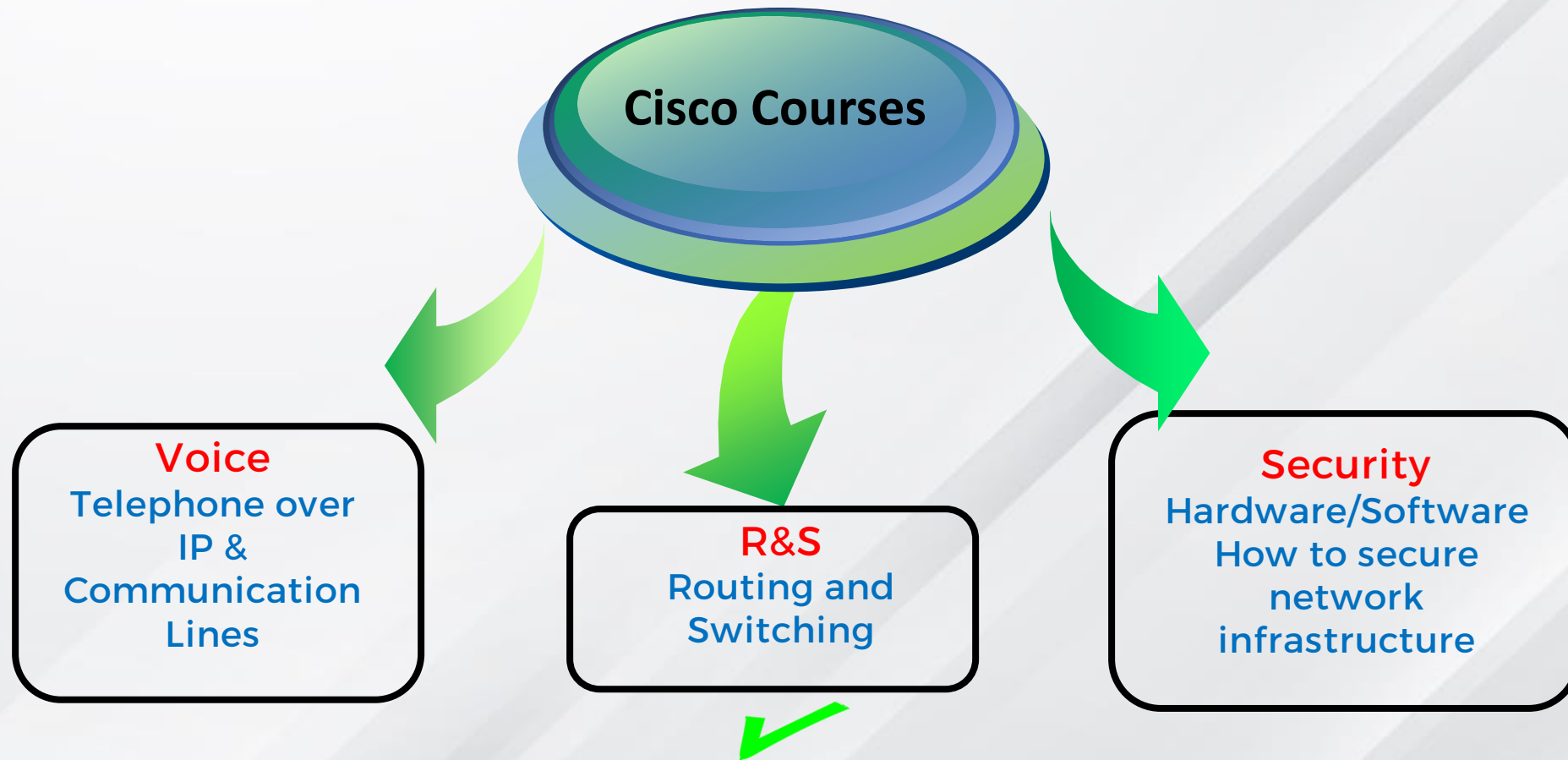


Introduction to CCNA

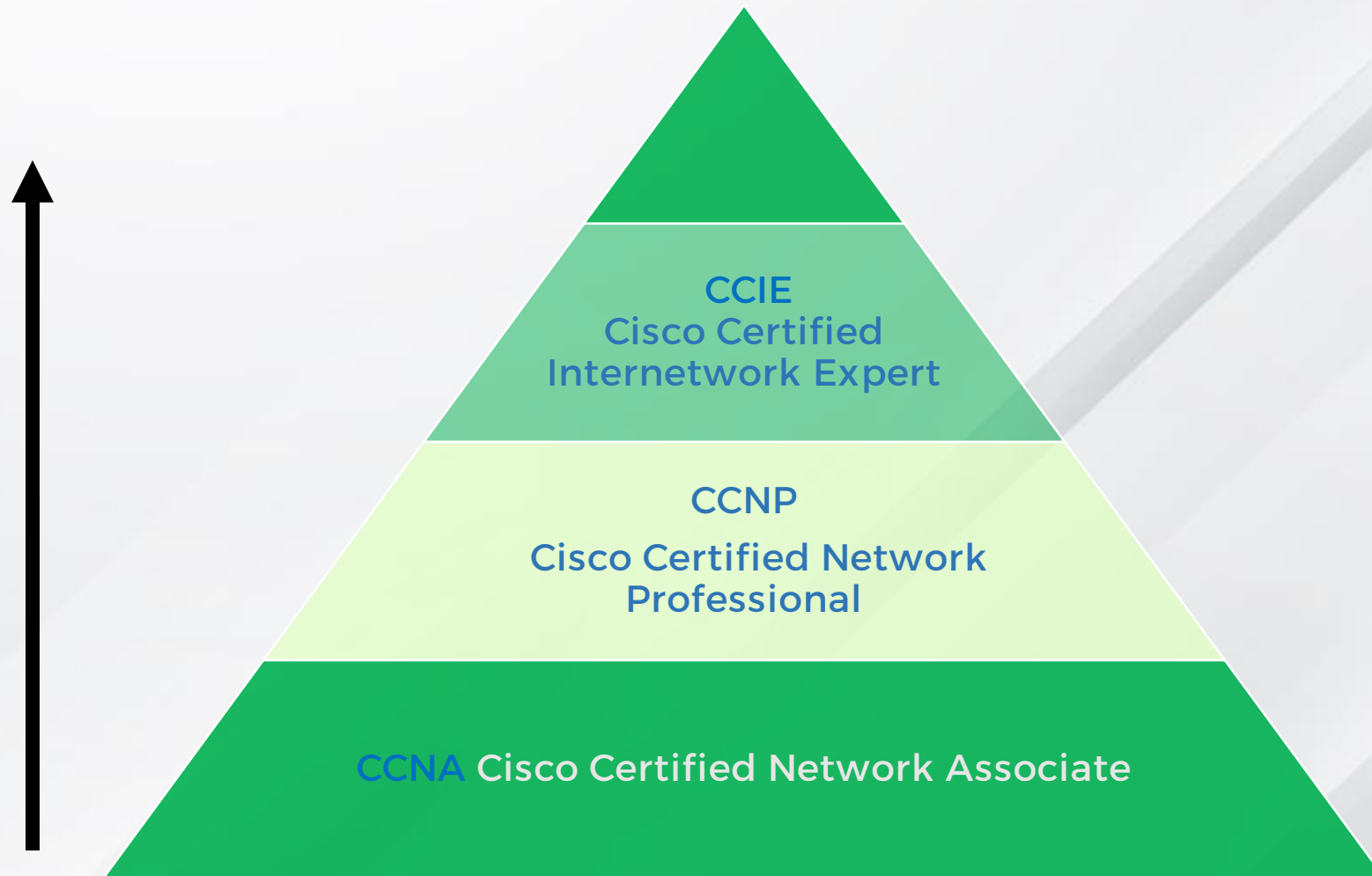
Cisco Courses



Cisco Courses



List of Acronyms



Cisco Certificates

- **Cisco Voice Certificates Levels:**

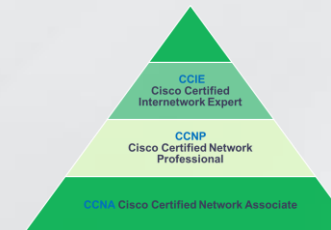
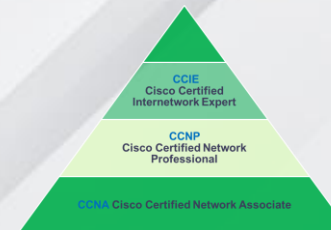
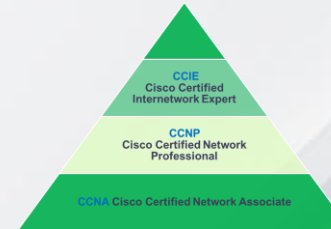
- CCNA Voice.
- CCNP Voice.
- CCIE Voice.

- **Cisco R&S Certificates Levels:**

- CCNA R&S.
- CCNP R&S.
- CCIE R&S.

- **Cisco Security Certificates Levels:**

- CCNA Security.
- CCNP Security.
- CCIE Security.



Cisco Certificates

- **Cisco Voice Certificates Levels:**

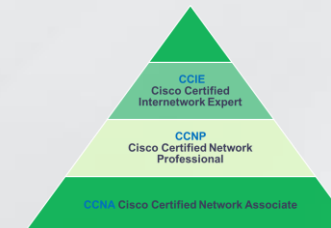
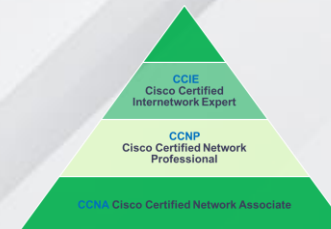
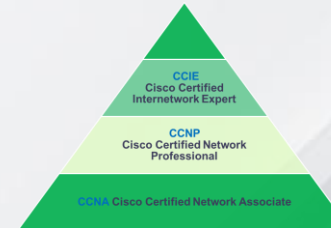
- CCNA Voice.
- CCNP Voice.
- CCIE Voice.

- **Cisco R&S Certificates Levels:**

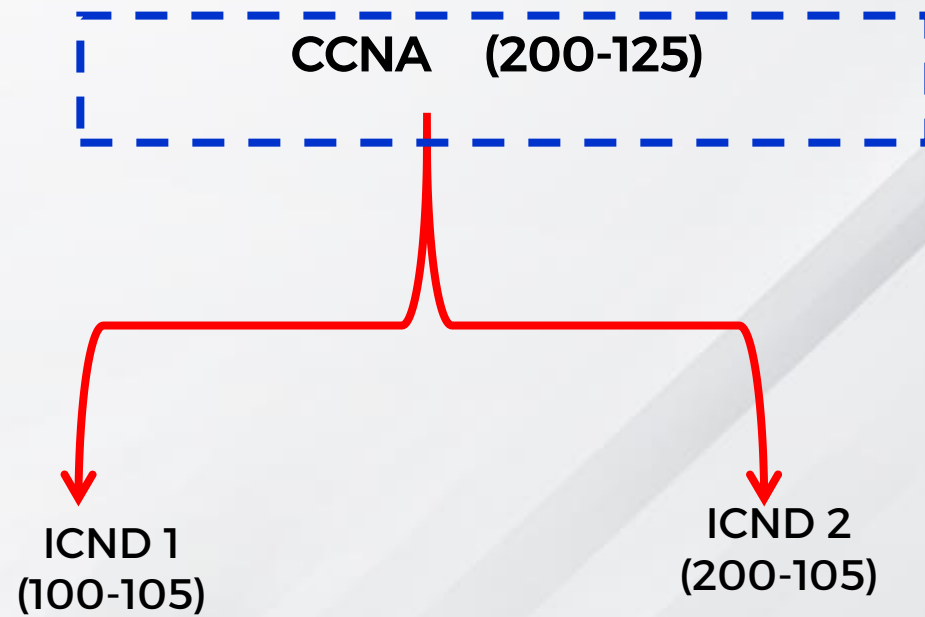
- CCNA R&S.
- CCNP R&S.
- CCIE R&S.

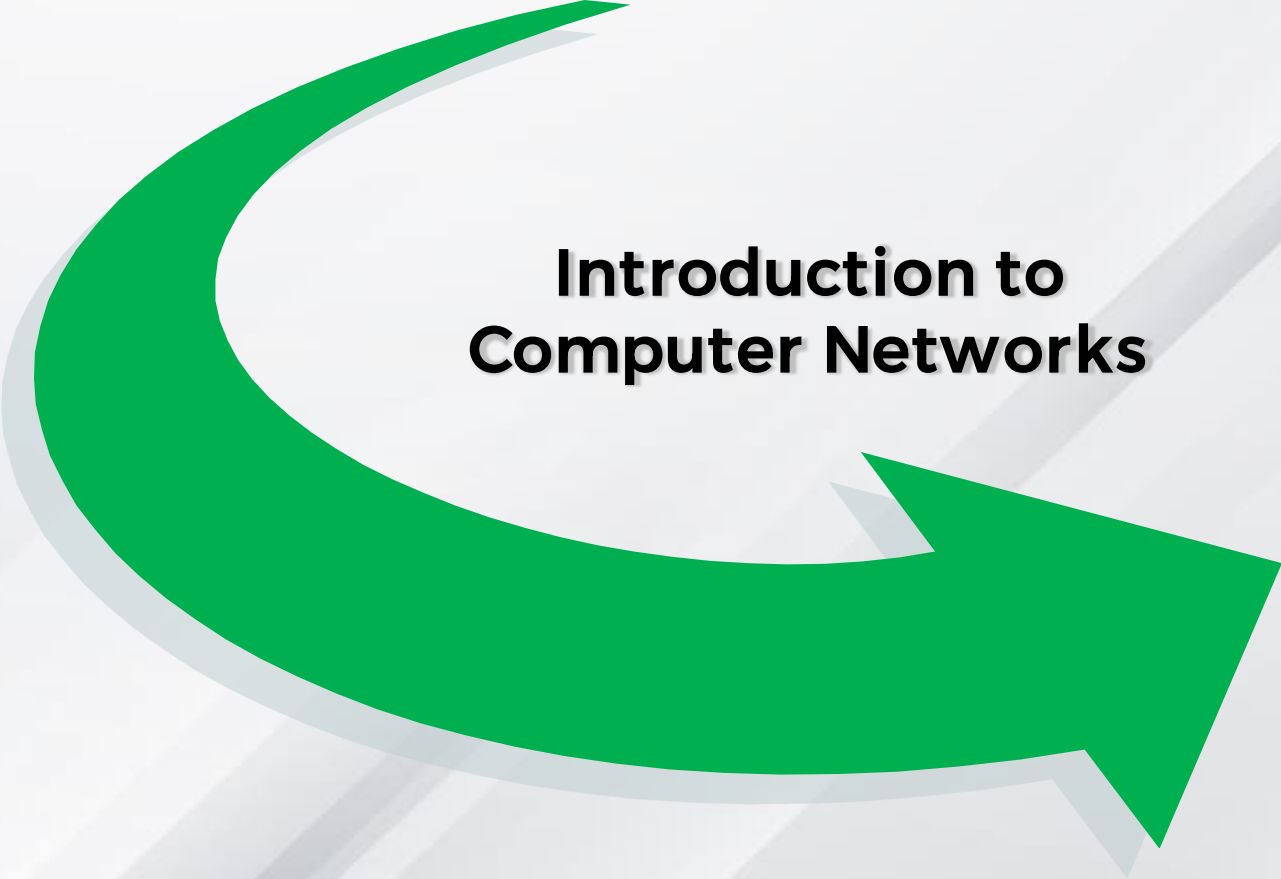
- **Cisco Security Certificates Levels:**

- CCNA Security.
- CCNP Security.
- CCIE Security.



Cisco CCNA R&S Certificates





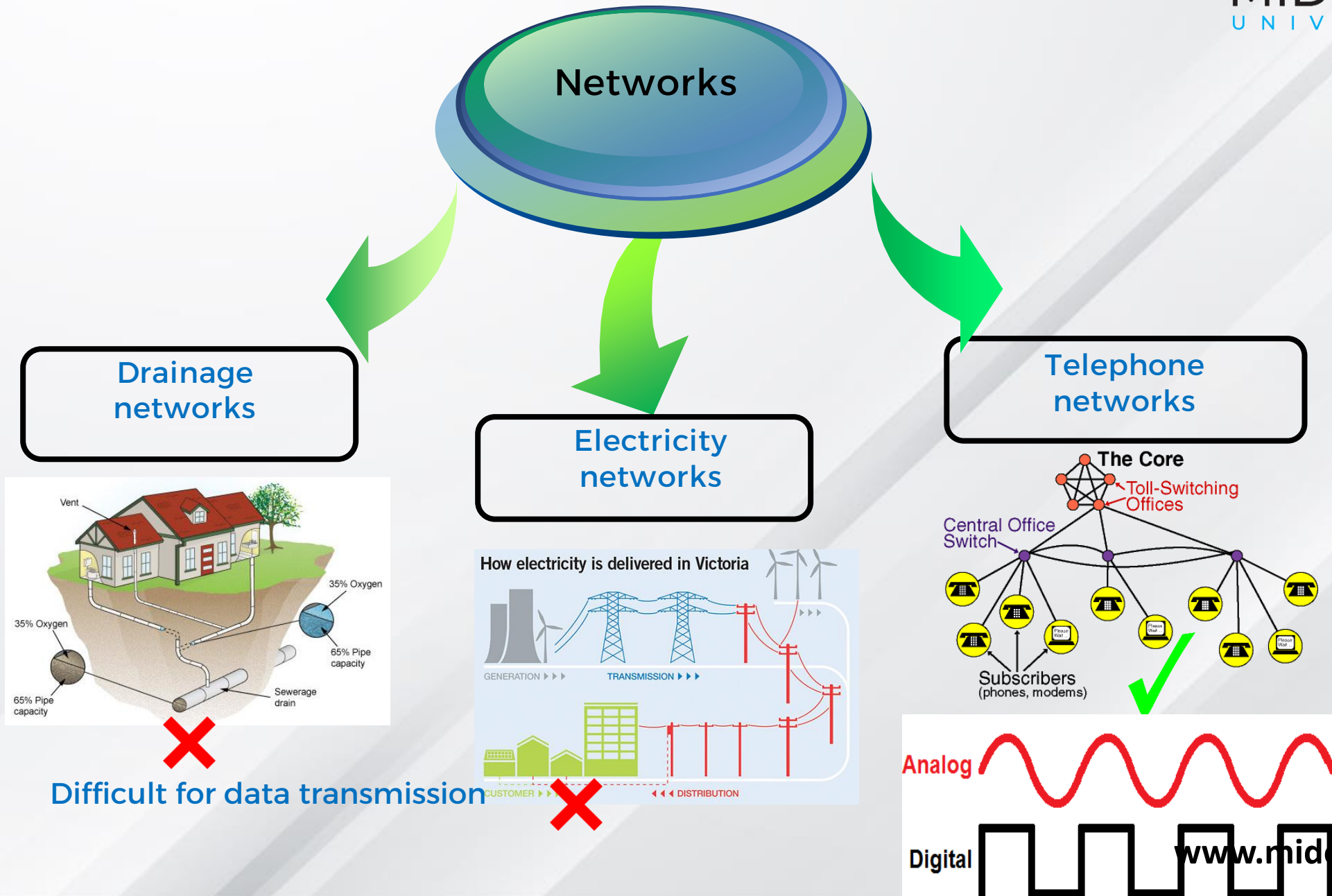
Introduction to Computer Networks

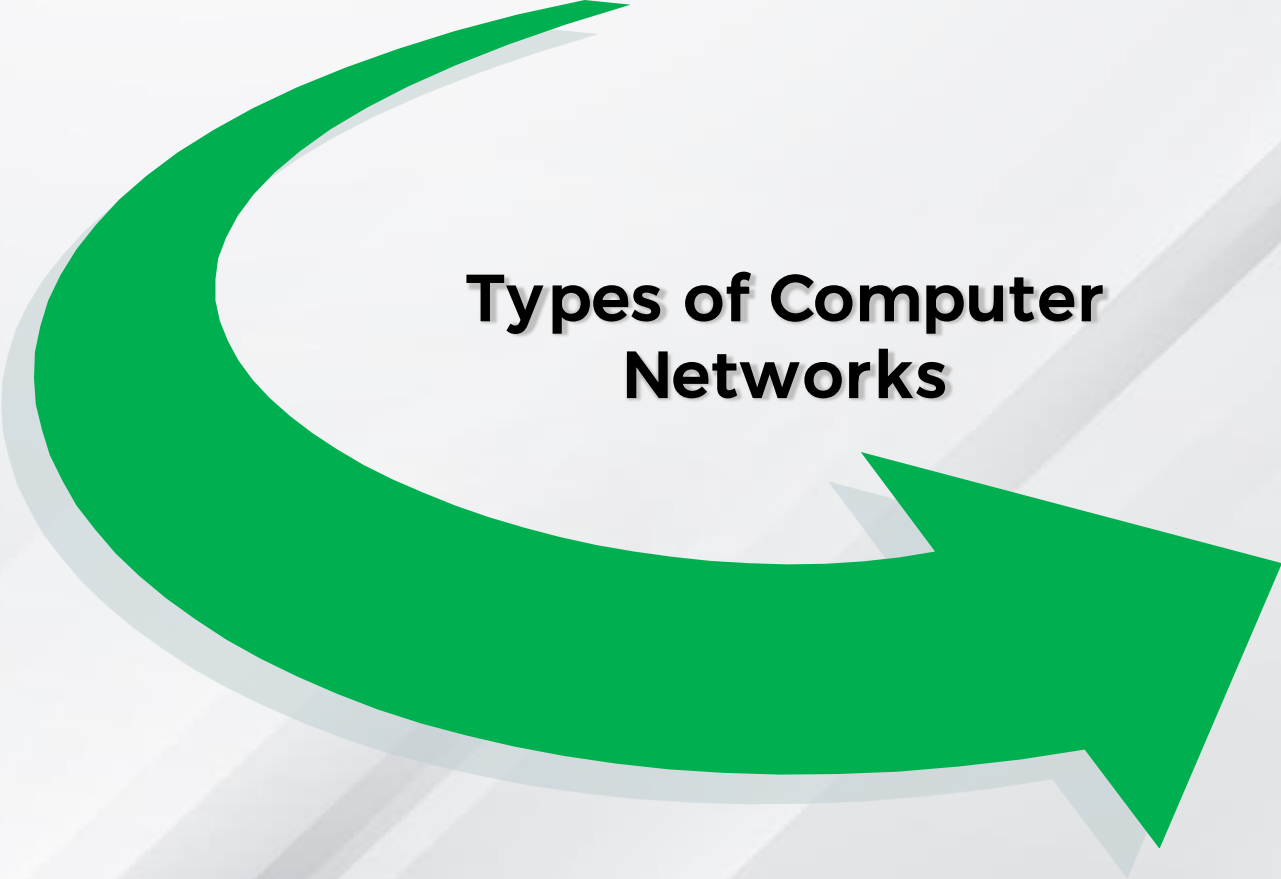
Introduction to Computer Networks

- How to communicate each point to another point or points.



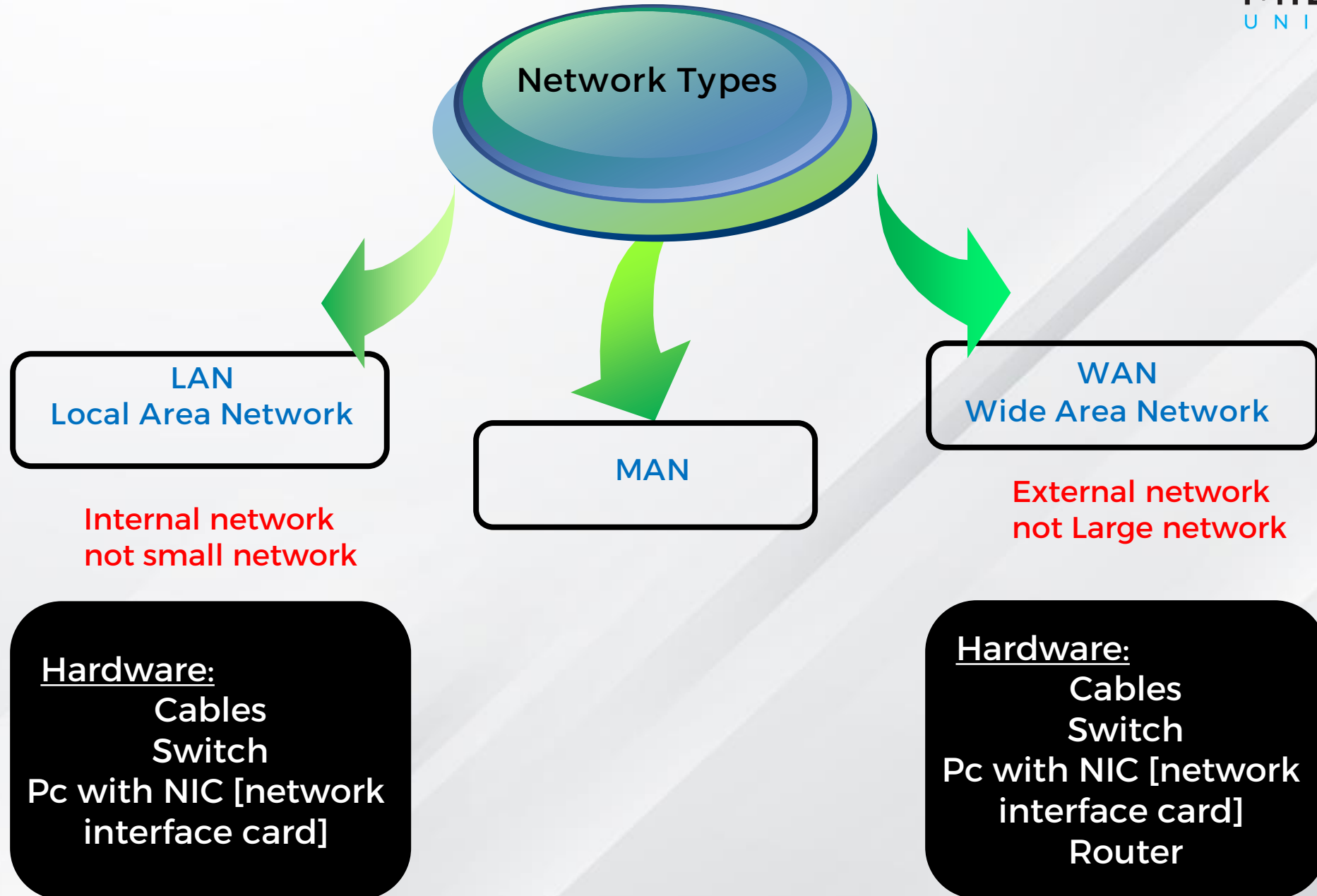
Introduction to Computer Networks





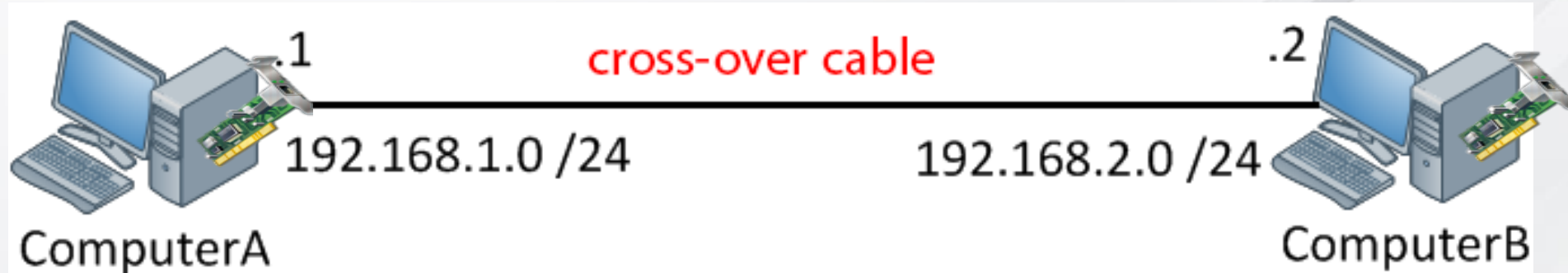
Types of Computer Networks

Types of Computer Networks

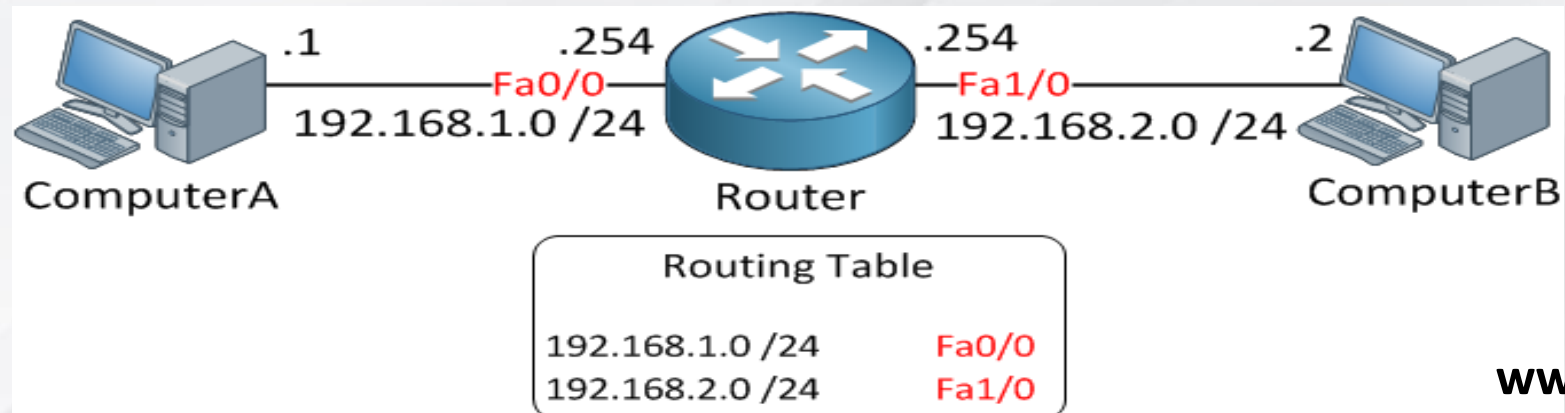


Introduction to Computer Networks

- ❑ Connecting two Computers on the same location



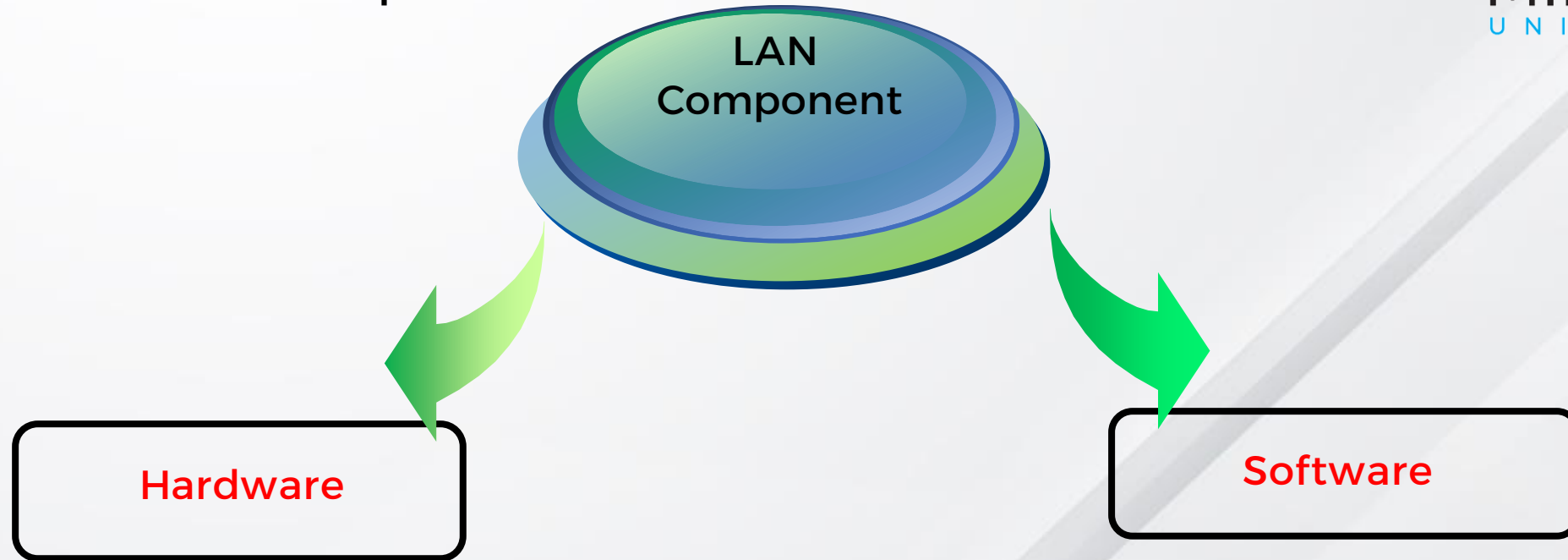
- ❑ Connecting two Computers on different and distant locations.





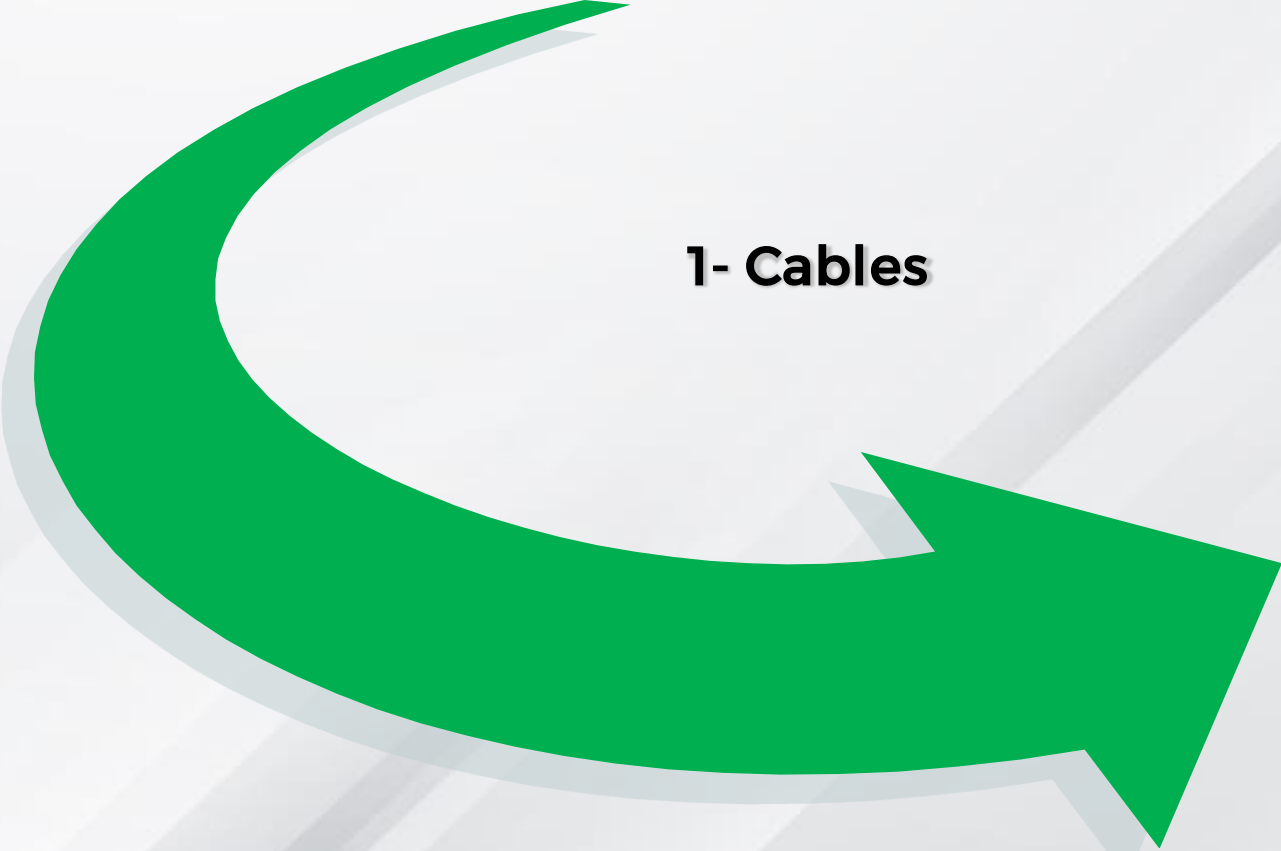
How to Setup a LAN

How to Setup a LAN



Hardware:

Cables
Switch
Pc with
NIC [network
interface card]



1- Cables

Cables

Type	Scientific Name	Speed/distance Data transfer	Comments
Coaxial Cable Max Speed	Thin 10 base 2 (20 milli) (Megabit/s) Thick 10 base 5 (50 milli) (Megabit/s) Thick 100 base 5 (Megabit/s) Thick 1000 base 5 (1000 Megabit/s)	100 m (long distance need repeater). 500 m	Cable is not elastic so it is not practical for long distance. It uses BNC connector for terminals so it needs a converter to connect to a switch or router device . It is expensive
UTP unshield ed twisted pair	10 base T (Twisted Pair). In market it is famous with Cat 5 (max speed 10 Megabit/s) Cat 5 e (enhanced max) max speed 100 Megabit/s Cat 6 (max speed 1000 Megabit/s)	100 m Connector RJ45	It is not expensive It is connected directly to switch or router.

- ❑ If cable speed is 10 means 10 Mega bits/second
- ❑ Network speed is measured by bit.
- ❑ While storing data is measured by byte.

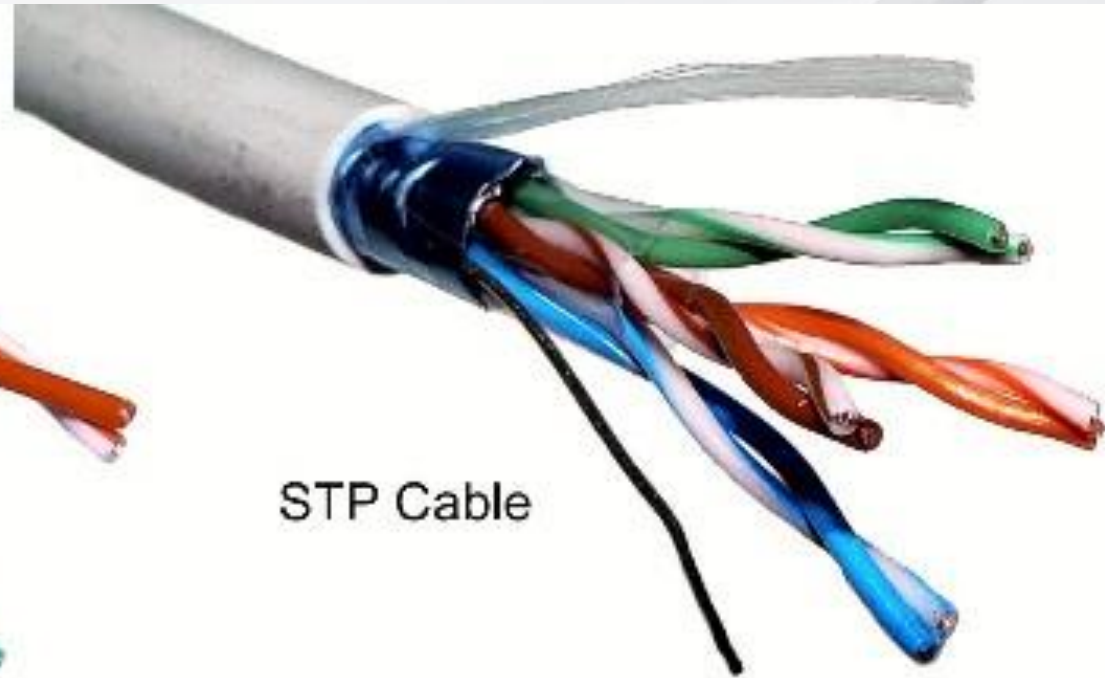
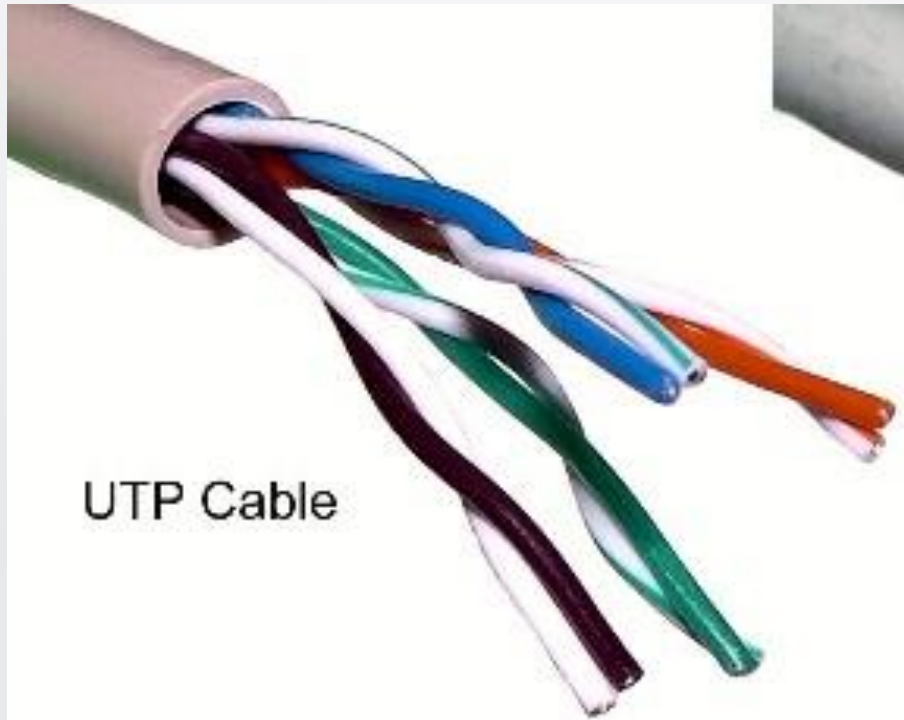
Cables

Type	Scientific Name	Speed/distance (Data transfer)	Comments
STP shielded twisted pair	10 base T (Twisted Pair). In market it is famous with Cat 5 (max speed 10 Megabit/s) Cat 5 e (enhanced max) max speed 100 Megabit/s Cat 6 (max speed 1000 Megabit/s)	100 m Connector RJ45	It is expensive It is connected directly to switch or router.
Fiber Optics	10 base F	300 km/s	

Coaxial Cable



Unshielded Twisted Pair (UTP) VS (STP)



Fiber Optics



Standard Connector



Lucent Connector

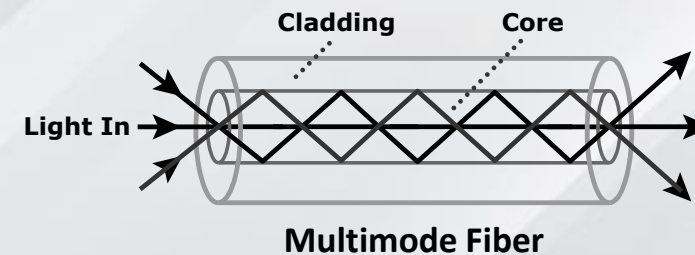
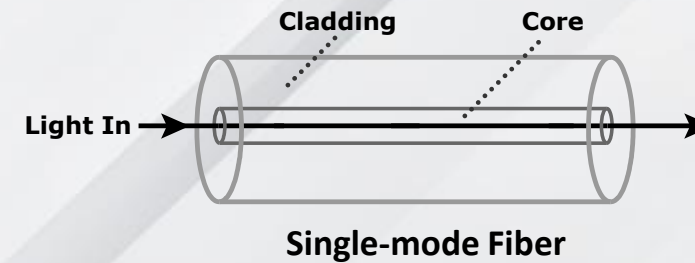


Straight Tip Connector

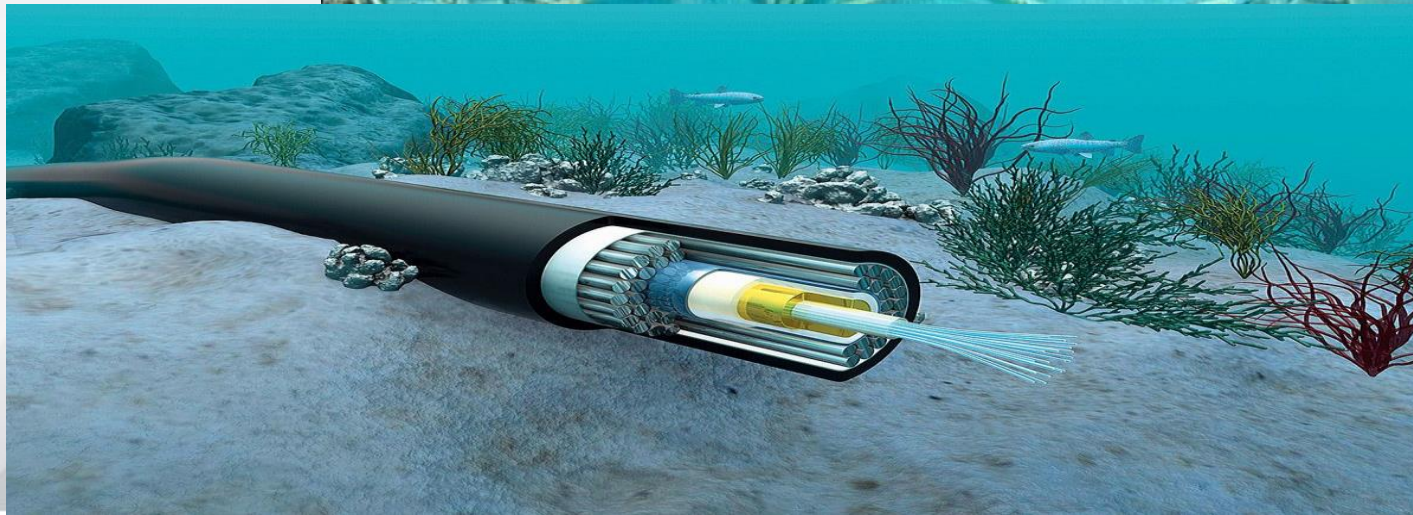
Fiber optics Cables

- Two types of optical cables: single-mode and multimode

Single-mode	Multimode
Carries single beam of light	Can carry multiple beams of light simultaneously
Distance up to 10km	Used for short distance (Modal dispersion weakens signal strength after certain distance)



Fiber Optics



Standard Connector



Lucent Connector



Straight Tip Connector



مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
UNIVERSITY



Thank You

