

# Computer Network

## 1 Introduction 09/25

- definition of Telecommunication and base tech
- The history of the Internet
- OSI reference model
- Physical device

## 2 Data link layer 10/02

- Ethernet framework
  - some ways to send 0,1 information in the cables
  - ethernet frame is reached to every node in the same network first, which is one of the important features of ethernet communications
- MAC address
  - mac address is global unique. It includes a vendor code
- CSMA/CA
  - it is a set of rules determining how network devices respond when two devices attempt to use a data channel simultaneously
- Three ways to connect nodes
  - Point to point
    - \* there are only two nodes in the link
  - Broadcast Multiple Access
    - \* some nodes are on the same link, like the ethernet
  - Non-Broadcast Multiple Access
    - \* some nodes are on the same link.
    - \* What is different from the BMA is that there is no need to broadcast. The frame is sent to some nodes not all.
- Repeater and bridge
- ARP and NDP
  - ARP is a system to know MAC address from IP address using broadcast
- STP (spanning tree protocol)

- This is a protocol to convert loop into tree structure
- <https://www.infraexpert.com/study/stpz2.html>

### 3 Internet protocol 10/09

- Internet Protocol
  - How to express IPv4 and IPv6 addresses
  - Private and public IP addresses
  - Lack of IPv4 addresses
- Subnet
  - IP addresses that can be used in the subnet
  - How to allocate subnet addresses
  - Components of IPv4 and IPv6 packets

### 4 Routing 10/16

- routing table
- default route
- Static routing
  - sometimes, route is summarized
  - Longest match rule
  - In static routing, we have to repair it manually when some damage would happen → Dynamic routing
- Dynamic routing
  - three types of routing protocol
    - \* Distance vector model
    - \* Link state model
    - \* Path vector model
  - RIP
    - \* distance vector model
    - \* vulnerable to loop
  - OSPF
    - \* Link state model
    - \* It can be divided into some areas
  - BGP
    - \* loop free

## 5 Transport layer 10/23

- How TCP/IP headers are used
- port numbers
- TCP
  - 3 way handshake
- ICMP
- OS Fingerprint

## 6 application layer 10/30

- domain name
  - hierarchy
  - DNS
  - attack for DNS
- http
  - server client model
  - URL
  - HTML
  - fishing and education