Data communication and network basis :

You should be able to answer the following questions :

▪ What is communication? What is data communication network?

▪ How many different network types according to geographical coverage?

▪ What are the types of network topology?

Communication : Information transfer and exchange between people, between people and things and between things through a certain medium and behavior

Network communication : communication between terminal devices through a computer network

Device -> package -> router -> internet - > router -> package -> device2

Router -> IP address/ switch -> MAC address

Data communication : communication network that consists of routers, switches, firewalls, access controllers, access points, PCs, network, printers and servers. Function -> implement data

Switches (ethernet) -> a device closest to end users used to access the network and switch data frames (layer 2 TCP/IP)

Broadcast domain : A set of nodes that can receive broadcast packets from a node

Routers : A network layer device that forwards data packets on the internet. Based on the destination address in a received packet a router selects a path to send the packet to the next router or destination. The last router on the path is responsible for sending the packet to the destination host. (layer 2 TCP/IP)

They can implement communication between networks, isolate broadcast domains, maintaining the torturing table and running routing protocols, selecting routes and forwarding IP packets, implementing WAn access and network address translation (NAT) and connect layer 2 networks established through switches.

Firewalls : A network security device used to ensure secure communication between two networks. It monitors, restricts and modifies data flows passing through it to shield information, structure and running status of internal networks from the public network.

It is located between two networks with different trust levels. It controls the communication between the two networks and implements unified security policies to prevent unauthorized access to important information resources

Firewalls isolate networks of different security levels, implement access control between networks of different security levels, implement user identity authentication, implement remote access support data encryption and VPN services, implement network address translation and implement other security functions.

LAN : a network that consists of computers and servers and network devices in a geographic area. The coverage of a LAN is generally within several thousand square meters.

MAN : A man is a computer communication network established within a city

Wan : a WAN generally covers a large geographical area ranging from tens of square kilometers to thousands. It can connect networks of multiple cities or even countries.

OSI reference model :

Layer 1, physical layer : transmits bitstreams over transmission media and defines electrical and physical specification

Level 2, data link layer (ethernet) : encapsulate packets into frames transmits frames in p2p or p2mp mode to implements error checking

Level 3, network layer (ICMP, IGMP, IP) : defines logical addresses and transfers data from sources to destinations

Level 4, transport layer (TCP, UDP) : Establishes, maintains and cancels an end to end data transmission process controls transmission speeds and adjust data sequences

Level 5, session layer : establishes, manages and terminates sessions between communicating parties

Level 6, presentation layer : translates data formats to ensure that the application layer data of one system can be identified by the application layer of another system

Level 7, application layer (Telnet, HTTP, SMTP, FTP, TFTP, SNMP, DNS, DHCP) : provides interfaces for applications

HTTP : page web servers

FTP : transferring files

DNS : translates from host domain names to IP addresses

TCP : communication services

IP : encapsulates transport layer data into data packers and forwards packets from source sites to destination sites.

IGMP : manages the membership of hosts and routing devices in multicast groups

ICMP : diagnose problems that may exist in the communication environment