Twenty concepts

Rong Zhuang

Total word count: 3454

1. **LAN or Local Area Network**

LAN is a computer network, which locates in a small area. It consists of multiple computers, printers, mobile devices or other facilities. All of them are connected with cables or wifi. Within this network, each device has a unique IP address to identify itself. LAN is a closed group. One device can contact another, send or receive data. Multiple desktop computers can share a printer. The transportation speed within LAN is very quick. The performance is reliable and the communication cost is low.

1. **WAN or Wide Area Network**

Compared with LAN, WAN covers a larger area, cross the cities, countries. WAN is also a computer network, which has the same components with LAN. Most of WAN are connected with switchers. Several LANs can be combined to generate a WAN. Generally, it costs more time to transfer data from one place to another within WAN. There are more delays of data transportation in WAN than in LAN. It is more complicated to manage a WAN.

1. **WLAN or Wireless Local Area Network**

WLAN enables computers or smart devices be connected to network with wireless signals. There is no need to plug cables into devices. There are two popular approaches for connecting, one is mobile signal, and another is wifi. For wifi, there is a router provides the service. Each time a device is trying to connect, it will be assigned a temp IP address. If this device turn off the wifi and it lost connection. Router will recycle the address and assign to a new device. For device, it may be assigned with different IP address for each connection. WLAN reduce the cost to build network since no need to place cables, less limitations.

1. **VLAN or Virtual Local Area Network**

VLAN is like LAN, but it is virtual. It is built from logical view not physical view. There is no limitation of physical location for VLAN. You can build VLAN for several machines which are located in difference LANs. For example, there are two department in a company, Sale Department and Development Department. Each department has its own sub network. Sale Department owns the IP address from 192.168.1.0 to 192.168.1.127. Development department owns the IP address from 192.168.1.128 to 192.168.1.255. With VLAN, these two network segments are combined together.

1. **VPN or Virtual Private Network**

VPN is network which is built upon public network, usually is internet. The communication is encrypted, so it is secure like private network. VPN is widely used in enterprise companies. The VPN gateway implements the remote access by encrypting the data packets and transforming the destination address of packets. One example of the usage for VPN is remote access internal enterprise network. An employee travels to another city or country, he can access company’s private network via VPN, if he can access internet.

1. MAC Address or Medium/Media Access Control

MAC Address is a unique identifier of a node in the network. It is an address of a physical device, like network card. It is has 6 bytes(48-bit) address space. They are divided into two parts. The first 24-bits is called Organizationally Unique Identifier(OUI). This part is assigned to the manufactories to identify the device producer. The second 24-bits are determined by the manufacturers themselves. And it is called Extended Unique Identifier(EUI). We have network cards in our desktop, laptop, phone and tablet. Each network card has a global unique MAC address.

1. **DNS or Domain Name System**

DNS is used to convert host name to IP address and vice versa. In the network of internet, each server within it has a unique IP address. We can access any of them if we know its IP address. However, it is hard for people to remember such number address. Instead, it is easy for us to remember meaningful names of these servers. DNS can help us to achieve this purpose because DNS has a table which stores the mapping relationship between IP address and host name. Each server should be registered to DNS, then DNS adds the new IP address and host name to it table. Any client wants to access a server, it will first ask DNS for the IP address. DNS will search the host name in its table and return the IP address to the client. Then client navigates to the destination server with this IP address.

1. **CDN or Content Delivery Network**

CDN is another virtual network, which is built upon Internet. The purpose of CDN is to delivery web pages or data more quickly and more efficiently. The key point for CDN is to avoid any bottleneck or node which may cause latency and instability. One approach to achieve this is to setup more nodes to the places where the network is so busy. The most important technology for CDN is load balance. Whenever a request is received, CDN must find a nearest location of the resource. So the requester can get the resource quickly. Many big websites which requires high volume network throughput put their content to several CDN nodes to accelerate the access speed.

1. **SSL or Secure Sockets Layer**

SSL is a security transportation protocol. It use the encryption technology to guarantee the security of transferring data through internet. There are three main functions for SSL. Firstly, it makes sure that data can be received properly by authorized client and server. Secondly, it makes sure the encrypted data won’t be stolen during transportation. Last, make sure data won’t lost or be changed during transportation.

Before transportation occurs, both server and client will be authorized first. Client sends a ‘hello’ message to server to setup a new conversation. Server send back a message which contains the information to create a new main key. Client gets the information and generate a main key and encrypt it with public key provide by server. Server receives the main key and acknowledge the key. After above steps, client will send data encrypted by the public key to server.

1. **HTTPS or Hypertext Transfer Protocol Secure**

HTTPS is the secure version of HTTP. The basic of HTTPS is SSL. It is widely used in internet, especially for banking and online shopping stores.

1. **Distributed Computing**

Distributed Computing use multiple independent machines to do calculation. In the reality, there are some calculation cases, like in math, biology, which need enormous time to finish the calculation. It is nearly impossible to do this if using a central machine, even it is powerful. In Distributed Computing, a master node will divide the calculation task to small pieces and assign each of them to a worker node. Each worker node only works on a piece of task, which is small enough for them to afford. After finishing the calculation, the result will be send to another separate node, which will merge the results all together and output it.

1. Cloud Computing
2. Cloud Storage
3. SaaS or Software-as-a-Service
4. REST or Representational State Transfer
5. JSON or Javascript Object Notation
6. Google File System
7. Big Table
8. MapReduce
9. Hadoop