

nkaliyamurthy 2/07/2024 ↻



Group Discussion - Lecture 2

- o How does data get from one computer to another on the Internet and what is the role of IP addresses in the transmission of data on the Internet?
- o How do you think routers and switches work on the Internet to facilitate the flow of data between different networks?

↻ NKALIYAMURTHY 2/7/24 6:47AM

Team 3

NAT is the system that converts internal private addresses into global public addresses, allowing them to be used in the network and internet.

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Anonymous 2/8/24 9:29AM

Switches connect devices on the network and forward packets to and from those devices. This can be done either by MAC address or IP address. Routers are responsible for controlling where packets are directed. They can be configured to do this manually or dynamically in a routing table.

Anonymous 2/8/24 9:31AM

There are two types of IP addresses, IPv4 and IPv6. IPv6 can have more IP addresses than IPv4 and was created to solve the problem of IPv4 being quite limited but IPv4 remains the most popular. There are public IP addresses used to communicate with devices outside your network and private IP addresses given to devices within your network so they can communicate.

Anonymous 2/8/24 9:32AM

IP addresses are used to form a connection between devices.

Anonymous 2/8/24 9:33AM

TCP and UDP are used to communicate with other devices. TCP is a connection based protocol and UDP is connectionless

Anonymous 2/8/24 9:35AM

There are two types of hypervisors, type 1 and type 2. Type 1 uses machine resources directly, making it quicker. type 2 hypervisors emulate these resources making it slowly but more secure.

↻ NKALIYAMURTHY 2/7/24 6:44AM

Team 1

IP addresses are used to establish communication between different devices, computers etc via the use of data packets (with the source and destination IP in each packet).

There are two types of IP addresses:

IPv4 - These are 32-bit addresses (4 bytes of 8-bits) and are created using binary (for example, if the beginning shows as 1 0 1 1 0 0 0 0, this would be 176).

IPv6 - These are 128-bit addresses that are becoming more commonly used within networking and have 8 parts of the address, the first three consisting of the routing/site prefix, the four part consisting of the subnet ID and the final four parts consisting of the Interface ID.

Leading zeroes can be omitted from the IPv6 address, though only once can one area with all zeroes be fully truncated via '::'.

Switches are used within internal networks to establish connections, while routers are used to establish connections externally to the internet to public networks.

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There's a limit to ipv4 addresses - ipv4 exhaustion. ISPs use CGNATs to pool ipv4 addresses

Anonymous 2/8/24 9:27AM

There are 2 types of IP : IPv4 and IPv6.
IPv4 is divided into 3 classes: A, B and C.
IPv4 are 32 bits and goes from 0 to 255.
IPv6 are 128 bits and hexadecimal

Anonymous 2/8/24 9:27AM

Data is transfered from one computer to another using either physical cables or wireless connections. To enable this to work efficiently tcp/ip protocols were created to create a unified system of communication to enable systems from different vendors and using different operating systems to communicate efficiently

Anonymous 2/8/24 9:28AM

Autonomous System Number (ASN):

An Autonomous System (AS) is a collection of IP networks and routers under the control of one or more entities that presents a common routing policy to the internet.

An ASN is a unique identifier allocated to each AS for use in Border Gateway Protocol (BGP) routing.

ASNs are crucial in the BGP for making routing decisions across the internet. They allow different ASes to communicate their routing information and ensure that data packets find the best path to their destinations.

Anonymous 2/8/24 9:30AM

The ip addressing protocols allow for efficient addressing of resources over networks ensuring that the right information ends up in the right place

Anonymous 2/8/24 9:33AM

IPv4 has a limited amount of users which can be on a network. For really big organisations ipv6 will be required

↩ **NKALIYAMURTHY** 2/7/24 6:47AM

Team 2

Ipv4 has 32 bits
Ipv6 has 128 bits

Ip is assigned to a host
MAC address is unique for each interface

Router connects different networks
Switch connects devices on an internal network

When data is sent over the Internet it is split into packets, those packets contain meta data

Packets are 1500 bytes in size

Summary:

UDP is faster and more reliable
TCP is connecting based, packets lost must be re sent

Router connects different networks
Switch connects devices on an internal network

The Internet backbone is the main pathway data takes to travel across the internet. It is a pre established pathway that has many branches to locations

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In summary data is transported over the Internet using packets which are transported across networks using router and switches.

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TCP establishes a connection and tracks packets sent across the network. Any lost packets are resent. Some examples include Web Browsing, file transfer, emailing. All scenarios where the data is more important.

⇒ **NKALIYAMURTHY** 2/7/24 6:48AM

Team 4

There are private IP addresses and public IP addresses.

The two types of IP addresses are IPV4, and IPV6.

IP addresses operate primarily within the Internet Layer, and here's how they contribute to data transmission:

1. Addressing and Identification
2. Routing
3. Data Packet Encapsulation
4. Supporting Multiple Network Types
5. Facilitating End-to-End Connectivity
6. Support for IPv4 and IPv6

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There are private IP addresses and public IP addresses. Private IP address can transfer communication internally and are assigned to local devices in the network. Public addresses are assigned by your ISP and can be accessed directly over the internet.

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A switch connects multiple devices over the network and a router connects multiple switches and their networks.

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The internet backbone is the main infrastructure of the internet, it comprises of long distance communication lines between different networks and regions. Usually fibre-optic cables.

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In the TCP/IP model, which is the foundational framework for most modern network communications, IP addresses play a crucial role in the data transmission process. The TCP/IP model has four layers: Link Layer, Internet Layer, Transport Layer, and Application Layer.

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Messages are broken down into packets. Packets contain a header and a payload. the header contains destination and source IP addresses. A router will look at the destination IP address and its routing table to decide the next hop, a packet will traverse many routers and networks on its way to the

destination IP address. Packets will not necessarily take the same route to the destination address.

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TCP (**Transmission Control Protocol**) is used for messages such as email, if packets are dropped they are resent. UDP (User Datagram Protocol) is used for time sensitive applications such as gaming or VoIP.

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Team 5

TCP/IP vs UDP

Summary:

TCP stands for transmission control protocol. TCP/IP is a suite of protocols/set of rules and procedures for connecting devices. When using TCP it establishes a connection before sending packets, to make sure everything is in order and received by the destination. TCP is more reliable than UDP because of the prior connection.

UDP stands for user datagram protocol. UDP doesn't require a prior connection so it's faster and less reliable

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TCP/IP is a suite of protocols / set of rules and procedures for connecting devices across the internet and is the basis for all internet communication.

Anonymous 2/8/24 9:28AM

TCP stands for Transmission Control Protocol

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TCP is reliable in terms of all bytes received will be identical and in the same order they were sent in

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When you are using TCP it establishes a connection before it sends any packets to its destination. It's slower than UDP but is a more reliable form of transmitting data and so is better for transmitting important data

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a switch connects multiple devices to create a network, a router connects multiple switches, and their respective networks, to form an even larger network

Anonymous 2/8/24 9:39AM

IP addresses are used to establish a connection between both devices, a router connects different networks, a switch connects devices on the same network. IPv4 or IPv6

Anonymous 2/8/24 9:46AM

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