Quiz 1 - C++ and Networking Programming

What is the first function a client must call to open a connection?

- socket()

What is the first function a server must call to open a connection?

- socket()

What is the second function a client must call to open a connection?

- connect()

How is the port no. used by a client assigned?

- Automatically by the operating system

Which must be run first, client or server?

- server

What happens when a server tries to bind to a port that's already in use?

- The binding fails

What does a program socket do?

- Creates an identifier for an endpoint on a communication channel.

What are network blocking functions?

- Functions where your program will wait for data to arrive, or a timeout.

What is the local loopback IP address on every computer?

- 127.0.0.1

What is the third function a server must call to open a connection?

- listen()

How many servers can a client connect to on the same port?

- One per different IP address

How is the port no. used by a client assigned?

- Automatically by the operating system
- randomly above a certain range (!Partially correct, this is how the os gets the number!)

Quiz 2 - The Physical and Datalink Layer

An n bit error detection code, can correct how many bits?

- n-1

Is it safe to look into the end of fibre optic cable if it is connected to a router?

- No

What does a broadcast protocol do with its packets?

- Sends the same information to all nodes listening.

What does PPP stand for?

- Point-to-Point Protocol

What does NACK stand for?

- Negative Acknowledgement

Given a set of signal samples, what is the smallest number of full cycles of a oscillating signal they must cover in order to be able to fully reconstruct the signal?

- 2

What does MAC stand for?

- Medium Access Control

What does ACK stand for?

- Acknowledgement

What does NIC stand for?

- Network Interface Card

What does LAN stand for?

- Local Area Network

What is Jitter?

- Variation in packet arrival latency

Which of the following are Data Link Functions (select all that apply)?

- Handle Flow Control
- Deals with Transmission Errors

Which has the lowest error rate as a Physical Medium?

- Fibre Optic Cable

What does multiplex mean?

- Mix data for different connections on the same channel.

What is a parity bit?

- A value added to a frame to ensure the number of 1 bits is always even.

Quiz 3 - Networking and MAC

What following qualities apply to Hierchical Topologies?

- Good at maintaining control
- Good at guaranteeing consensus

What is Address Resolution Protocol (ARP) good for?

- Finding the MAC address for a given IP

What kind of Multiplexing assigns time slots arbitrarily to every user?

- STDM

An IP header contains the following information…

- Transport Protocol Type
- Source and Destination addresses
- Time To live

What following qualities apply to Mesh Topologies?

- Good at exchanging information
- Robust to failure of nodes or links

Carrier Sense Multiple Access with Collision Detection (CSMA/CD) works by…

- ...stoping transmission as soon as a colission is detected
- ...waiting for an idle connection before transmitting

What kind of Multiplexing assigns specific frequencies to every user?

- FDM

What protocol layer does The Address Resolution Protocol (ARP) belong to?

- Layer 2 and 3

What kind of Multiplexing assigns fixed time slots to every user?

- TDM

If CSMA/CD needs to retransmit a package, how long does it normally wait before doing so?

- Random time with exponentially longer variable

How is a MAC address assigned?

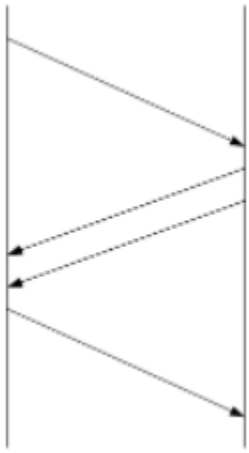
- By the System Administrator (But only with new equipment)
- By the Manufacturer

What does a subnet mask do?

- Identifies the ip range of a network

Quiz 4 - The internet and its Protocols

What flags are set in the closing TCP 4-way Handshake?



- FIN, ACK, FIN, ACK

What type of application topology does NAT bias the Internet towards?

- Client-server

What is the shortest valid IPv6 representation of 2003:DDB8:0000:0222:0000:0000:0012:0f00?

- 2003:DDB8:0:222::12:f00

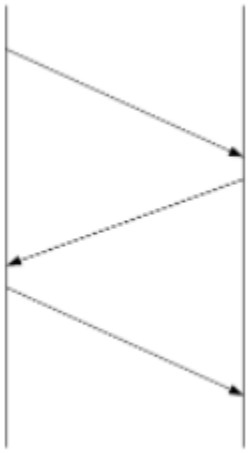
What is the correct parameter to pass to socket() to open a UDP connection between 2 hosts?

- SOCK_DGRAM

How is permanent ownership of IPv4 addresses handled?

- Purchased or obtained from holders of spare IP addresses

What flags are set in the opening TCP 3-way Handshake?



- SYN, SYN-ACK, ACK

What does a SYN Cookie do?

- Hash value transmitted to the client holding connection state.

Which founding principle of the Internet does NAT break?

- End to End principle (Connectivity). All internet hosts should be able to connect directly to each other.

What is Network Address Translation (NAT) used for?

- Translate an internal IP into an external IP
- Translate an external IP into an internal IP

If the Internet side of a NAT router has an IP address of 21.18.1.24, which of the following is a valid interior host address behind the NAT?

- 192.168.1.5

How is permanent ownership of IPv4 addresses handled?

- Purchased or obtained from holders of spare IP addresses

What will happen if the IP header TTL field is set to 0 at the host that sends the packet?

- The packet will be dropped immediately.

Quiz 5 - TCP/IP

What is network adminstrative overhead?

- Network traffic required to operate the network (retransmits, routing requests, etc.)

Which kind of traffic will an internet router preferentially drop on a congested link?

- UDP

What window size will a receiver signal the sender if its buffer is full?

- 0

Which of the following is not a strategy used in TCP for controlling the congestion window?

- exponential backoff

What best describes the Silly Window Syndrome?

- Host sends multiple messages with barely any data.

Which of the following is NOT a TCP algorithm?

- Springfield

What does Nagle’s algorithm do?

- Buffers data to be sent until it has a full segment or has not received a previous ack

What packages are likely to be dropped by Random Early Detection?

- Packages from the host that sends the most

If ECN is enabled, what will supporting routers do?

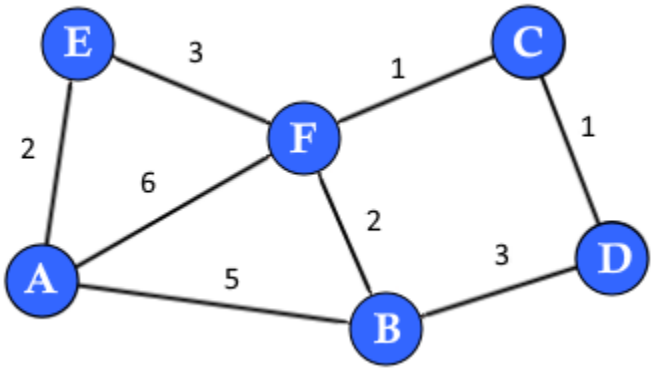
- Mark packets to signal network congestion

What is goodput?

- User supplied traffic transmitted by the network from source to destination.

Quiz 6 - Layers and Routing

In the following network, the shortest path from node A to node D has length 7.



Suppose all nodes start with only the information about their own links and in each iteration, every node with a changed distance-vector sends its distance vector to all its neighbours. How many iterations are needed until a message from A will be routed on the shortest path to D?

- 3

What is an Autonomous System (AS)?

- A network operator with a single and clearly defined routing policy

What does a network bridge do?

- Provide a direct connection between multiple network segments.

What is an Internet Exchange Point(IXP)?

- A physical site where equipment is located to connect different AS's.

What kind of routing algorithm does the Intermediate System to Intermediate System protocol (IS-IS) use?

- Link-State

What kind of routing algorithm does the Routing Information Protocol (RIP) use?

- Distance vector

What kind of routing algorithm does the Border Gateway Protocol (BGP) use?

- Path Vector

To how many AS's may a BGP Router belong?

- 1

Which of the following are routing protocols?

(select all that apply)

- RIP
- Babel
- BATMAN
- EGP

Quiz 7 - Queuing, Security

Which of the following is NOT an attribute of cryptographic hash functions?

- Small changes to the message produce small changes to the output(If this is true, then the other attributes won't hold)

Which mathematical model looks bursty on a short time scale, but becomes evenly distributed on a longer one?

- Poisson Process

In the context of computer networking, what does RPC stand for?

- Remote Procedure Call

What protocol layer are BGP and DNS classified as?

- Application

Using Kendall notation, what is the service characteristic of an M/D/3 queue?

- Deterministic (i.e. constant) service time

In queuing theory, what is μ ?

- Average service rate, the rate of removal of objects from the queue.

In queuing theory, what is λ ?

- The average rate of arrival of objects requiring service into the queue.

What attribute of queues is required to try and prevent congestion?

- Spare capacity to service the queue.

What is bufferbloat?

- The problem of uncontrolled growth in buffering in network systems leading to bad overall performance.

In a typical simple DMZ configuration, the Internet facing WWW server will be placed where?

- Between the interior firewall and the exterior firewall.