

True / False

1. **Forwarding**: move packets from router's input to appropriate router output.
2. **Routing**: determine route taken by packets from source to destination.
3. **Time to live**: max number remaining hops (decremented at each router).
4. **RIP** is distance vector algorithm.
5. **UPDATE**: advertises new path (or withdraws old).
6. **KEEPALIVE**: keeps connection alive in absence of UPDATES; also ACKs OPEN request.
7. **Network loss**: IP datagram lost due to network congestion (router buffer overflow).

Comparison

1. IPV4 Vs. IPV6

IPV4	IPV6
IPV4 addresses are 32 bit length	IPV6 address are 128 bit length
IPV4 addresses are binary numbers represented in decimal	IPV6 addresses are binary numbers represented in hexadecimal
IPsec support is only optional	Inbuilt IPsec support
Fragmentation is done by sender and receiver	Fragmentation is done only by sender
No packet flow identification	Packets flow identification is available within the IPV6 header using the flow label field
Checksum field is available in IPV4 header	No checksum field in IPV6 header
Options fields are available in IPV4 header	No option fields, but IPV6 Extension headers are available

2. Intra-AS Vs. Inter-AS

Policy
Inter – AS: admin wants control over how its traffic routed, who routs through its net.
Intra – AS: single admin, no policy decision needed.
Scale
Hierarchical routing saves table size, reduce update traffic.
Performance
Intra – AS: can focus on performance.
Inter – AS: policy may dominate over performance.

3. Real – Time Protocol (RTP) Vs. Real – Time Control Protocol (RTCP) “greened text: I think its not important” **only in “RTP / RTCP comparison”**

RTP	RTCP
RTP specifies packet structure for packets carrying audio, video data.	Works in conjunction with RTP.
RFC 3350.	Each participant in RTP session periodically transmits RTCP control packets to all other participants.
RTP packet provides: <ul style="list-style-type: none"> • Payload type identification. • Packet sequence numbering. • Time stamping. 	Each RTCP packet contains sender and/or receiver reports. <ul style="list-style-type: none"> • Report statics useful to application: #packets sent, #packet lost, interarrival jitter, etc.
RTP run end systems.	Feedback can be used to control performance <ul style="list-style-type: none"> • Sender may modify its transmissions based on feedback.
RTP packets encapsulated in UDP segments.	
Interoperability: if two Internet phone applications run RTP then they may be able to work together.	

4. SIP Vs. H.323

SIP	H.323
Comes from IETF.	Comes from ITU.
Single component work with RTP.	H.323 is complete, vertically integrated suite of protocols for multimedia conferencing.
Has Web flavor.	Has telephony flavor.

5. PVCS Vs. SVCS

• PVCs:

are Permanent Virtual Circuits. These connections are always open, ready for data to be sent and/or received.

• SVCs:

are Switched Virtual Circuits. These connections must be re-established every time a new session of data exchange is to take place, and the connections are broken at the end of the session.

6. Frame Relay Vs. X.25

Frame Relay	X.25
Layer 2 (physical and data link layers) protocol suite.	Provides services at layer 3 (physical, data link, and network "packet") layers.
Offers higher performance.	Less performance than Frame relay.
Provides grater transmission efficiency than X.25	Less transmission efficiency.

7. 802.11 a/b/g

Version	Speed	Band	Range	Prone to interference
802.11a	Up to 54Mbps.	5 GHz.	50 feet.	Less prone to interference.
802.11b	Up to 11Mbps.	2.4 GHz.	100 feet.	Prone to interference.
802.11g	Up to 54Mbps.	2.4 GHz.	100 feet.	Prone to interference.

Definitions

1. **Network loss:** IP datagram lost due to network congestion (rout buffer overflow).
2. Link Access Protocol Balanced (LAPB):

The LAPB of X.25 adopts the frame structure of High – Level Data Link Control (HDLC).

3. **Virtual Path (VP):** A VP is a route through the network representing a group of virtual channels (VCs).
4. **Virtual Channel Connection (VCC):** A virtual channel connection is the end-to-end connection along which a user sends data.
5. **data terminal equipment (DTE)**
 - terminating equipment for a specific network.
 - typically are located on the premises of a customer.
6. **access point:** bridges wireless LAN traffic into the wired LAN, It can also act as a repeater for wireless nodes.
7. **Roaming:** Users maintain a continuous connection as they roam from one physical area to another.
8. **sensor:** A transducer converts physical phenomenon into electrical signals.
9. **sensor node:** basic unit in sensor network; contains on-board sensors, processor, memory, transceiver, and power supply.
10. **sensor network:** consists of a large number of sensor nodes that deployed either inside or very close to the sensed phenomenon.

List:

- **Media Player:**
 - Jitter removal.
 - Decompression.
 - Error concealment.
 - Graphical user interface with controls of interactivity.

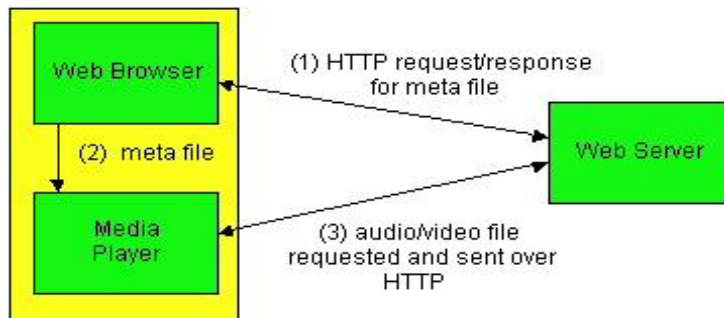
- **Disadvantages of Serial Line Internet Protocol (SLIP):**
 - Does not support error detection and correction.
 - Supports only IP.
 - Requires advance knowledge of the peer's IP address.
 - Is not approved internet standard.
 - Does not provide any form of authentication.

- **Ad – hoc properties:**
 - Requires devices to cooperate autonomously.
 - Without user intervention.
 - Rapid self-organizing wireless network.
 - Independent of infrastructure.
 - Heterogeneous & adaptive.

- **Sensor node components:**
 - Sensing Unit.
 - Processing Unit.
 - Transceiver Unit.
 - Power Unit.
 - Location Finding System (optional).
 - Power Generator (optional).

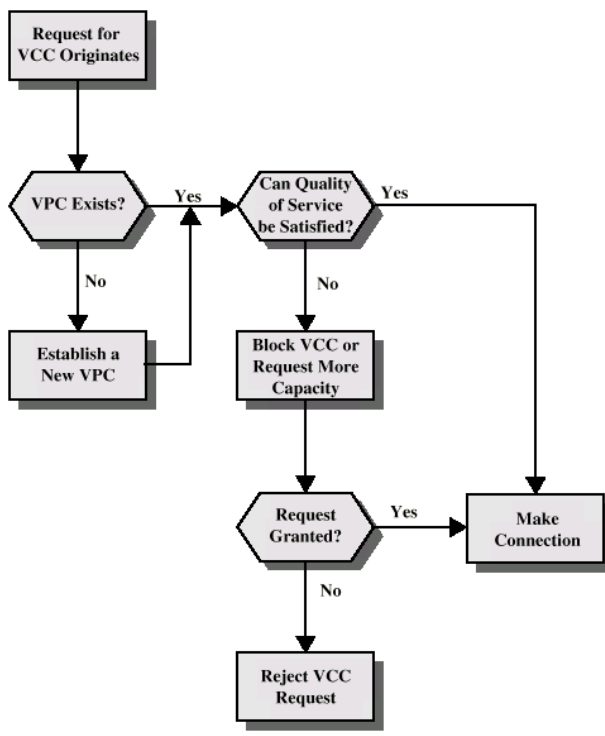
Diagrams to complete:

streaming approach: “with explanation”



- browser GETs metafile
- browser launches player, passing metafile
- player contacts server
- server streams audio/video to player

Call Establishment Using VPs:



Multiple choices: IDK how ' :)

- ✓ **QoS:** network provides application with level of performance needed for application to function.
- ✓ **Classes of MM applications:**
 - 1) stored streaming
 - 2) live streaming
 - 3) interactive, real-time
- ✓ **Jitter:** is the variability of packet delays within the same packet stream.
- ✓ **RTCP: RFC 2326:**
 - Client – server application layer protocol.

And last but not least the fragmentation 😊 :

Example

- 4000 byte datagram
- MTU = 1500 bytes

1480 bytes in data field

offset =
 $1480/8$

	length	ID	fragflag	offset	
	=4000	=x	=0	=0	

One large datagram becomes several smaller datagrams

	length	ID	fragflag	offset	
	=1500	=x	=1	=0	
	=1500	=x	=1	=185	
	=1040	=x	=0	=370	