Week1 网络架构与七层参考模式简介

网络基础 1

1 1.2.Which of the following are NOT “internet applications” ?
下列哪些不是” 网络应用程序” ?

- (●) A. Transmission Control Protocol (TCP) 传输控制协议
- ( ) B. YouTube
- ( ) C. Gmail
- ( ) D. Skype

正确答案：A 你选对了

2 1.1.Which of the following are “internet applications” ?
下列哪些是” 网络应用程序” ?

- [ ] A. Switches 交换机
- [■] B. Facebook
- [ ] C. (c)Internet protocol (IP protocol) 因特网协议
- [■] D. On-line games 在线游戏

正确答案：B、D 你选对了

网络基础 2

1 1.3.Which of the following statements are correct for “links” of a network?
下列哪些对于网络”链路”的定义是正确的?

- [x] A. A “point-to-point” link is a link to connect two devices or hosts. 一个”点对点”的链路用来连接两个装置或主机
- [x] B. A “multiple access” link is a link to connect many devices or hosts. 一个”多方存取”的链路用来连接多个装置与主机
- [ ] C. A “point-to-point” link is a link to connect more than two devices or hosts. 一个”点对点”的炼路用来连接多于两个装置或主机
- [ ] D. A “multiple access” link is a link to connect only two devices or hosts. 一个”多方存取”的炼路用来连接两个装置或主机

正确答案: A、B 你选对了

2 1.4.Which of the following are “nodes” of a network?
下列哪些是网络中的”节点”?

- [x] A. Switches 交换机
- [ ] B. IEEE 802.3 Ethernet protocol IEEE 802.3 以太网络协议
- [ ] C. IEEE 802.11 wireless LAN (WiFi) protocol IEEE 802.11 无线局域网络(WiFi)协议
- [x] D. Wireless Access points (APs) 无线网络基地台 (APs)

正确答案: A、D 你选对了

3 1.5.Which of the following statements are correct for “store-and-forward” concept ?
下列哪些关于”储存并传送”的观念是正确的?

- [x] A. It’s a way for a network device to handle an incoming packet by storing the packet first and then forwarding the packet according to some switching/routing policy. 是一种网络装置处理封包的方法，先将进入的封包储存后，再依据交换或是路由原则将封包传送出去。
- [x] B. A router usually stores an incoming packet in the memory first and then lookups the routing table to determine which port to forward the packet. 一个路由器通常先将进入的封包储存在内存中，然后透过查询路由表来决定要将封包转送至哪个接口。
- [x] C. A switch usually stores an incoming frame in the memory first and then lookups the MAC address table to determine which port to forward the frame. 一个交换器通常先将一个进入的讯框储存在内存中，然后透过查询MAC位置表来决定该讯框应该要传送至哪个接口。
- [ ] D. The store-and-forward technology is usually used in a circuit switched network. "储存并传送”技术通常在电路交换网络上使用。

正确答案: A、B、C 你选对了

4 1.6.Which of the following are correct for a “switched network” ?
下列哪些对于一个”交换网络”的叙述是正确的

- A. A switched network is a network connected by switches and routers. 一个交换网络是指透过交换器与路由器联机的网络。
- B. A switched network is a network connected by switches. 一个交换网络是指透过交换器联机的网络。
- C. The “topology” of a switched network is limited to be a “spanning tree”. 交换网络的拓朴”必须是一个”扩张树”。
- D. The “topology” of a switched network is not limited, but the frames (packets) are delivered along the “spanning tree” of the switched network. 交换网络的”拓朴”并没有特别限制，但讯框(封包)会透过交换网络中的”扩张树”的路径来传送。

正确答案：B、D 你选对了

An interconnection of networks is a network connected by switches and routers. 互联网络才是透过交换器和路由器联机的网络。

5 1.7.Which of the following statements are correct for an “interconnected network” ?
下列哪些对于”互联网络”的叙述是正确的?

- A. An interconnected network is a network that several networks are connected by switches. 一个互联网络是一个用交换器连接多个网络的网络。
- B. An interconnected network is a network that several networks are connected by routers. 一个互联网络是一个用路由器连接多个网络的网络。
- C. The “topology” of an interconnected network is limited to be a “spanning tree”. 互联网络的”拓朴”必须是一个”扩张树”的架构。
- D. The packets are delivered along the routing path determined by the routing protocols. 封包会经由路由协议所决定的路径来进行递送。

正确答案：B、D 你选对了

6 1.8.Which of the following statements are correct for “unicast/broadcast/multicast” ?
下列哪些对于”单点传送/广播传送/群播传送 “的叙述是正确的?

- A. For unicast, a packet is delivered to only a destination station. 对于单点传送来说，封包只会被递送到一个目的地工作站。
- B. For broadcast, a packet is delivered to multiple but not all the stations. 对于广播传送来说，封包会被递送到多个但不是全部的工作站。
- C. For multicast, a packet is delivered to all stations of the network. 对于群播传送来说，封包会被递送到在网络中的所有工作站。
- D. In a switched network, a broadcast frame will be received by all the stations in the switched network. 在交换网络中，一个广播讯框将会被所有在交换网络上的工作站所接收。

正确答案：A、D 你选对了

unicast 单点传送——一个目的地工作站

multicast 群播传送——多个但不是全部工作站

broadcast 广播传送——网络中所有工作站

网络基础 3

1 1.9.Which of the following statements are correct for delivering packets (datagrams) over the Internet ?
下列哪些对于透过互联网递送封包(数据段)的叙述是正确的

A. All packets destined to the same destination will be forwarded along the same routing path. 所有要送给同一目的地主机的封包，都会沿着相同的路径传送给该目的地主机。

B. The routing path of a packet is determined first before the packet is sending into the Internet. 一个封包的路由路径在传送进网络前就会被决定。

C. The Internet is reliable so that all packets will be received by the destination correctly. 互联网是非常可靠的，因此所有封包都可以被目的地主机正确收到。

D. A packet may be partitioned into several fragments by routers. 一个封包可能会被路由器分成好几个小封包(资料片段)。

正确答案：D 你选对了

A：送往同一目的地主机的封包可能沿不同路径传送，网络状态发生变化，选择的路径也会发生变化

C：互联网是尽力式服务，并不可靠。TCP提供可靠服务

网络基础 4

1 1.10.Which of the following statements are correct for “multiplexing” ?
下列哪些对于”多任务”叙述是正确的?

A. Multiplexing is method usually used by a switch to transmitting multiple logical flows over a single physical link. 多任务通常是交换机用来在一个实体链路上传送多个逻辑数据流是的方法。

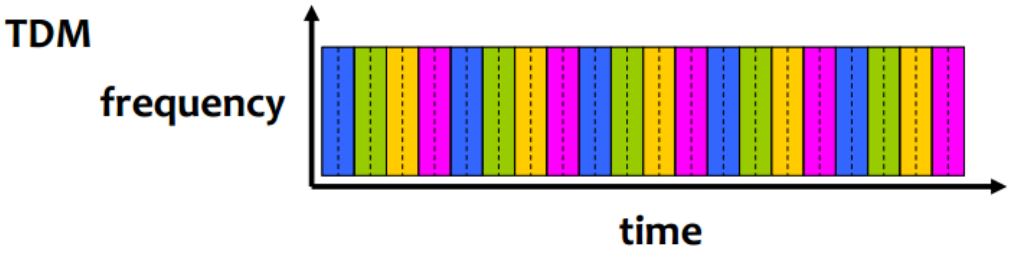
B. In TDM (Time-Division-Multiplexing), data are transmitted in predetermined frequency. 分时多任务技术将数据安排在预先规画好的频谱中进行传送。

C. In FDM (Frequency-Division-Multiplexing), data are transmitted in predetermined time slots. 分频多任务技术会将数据安排在预先规画好的时段中进行传送。

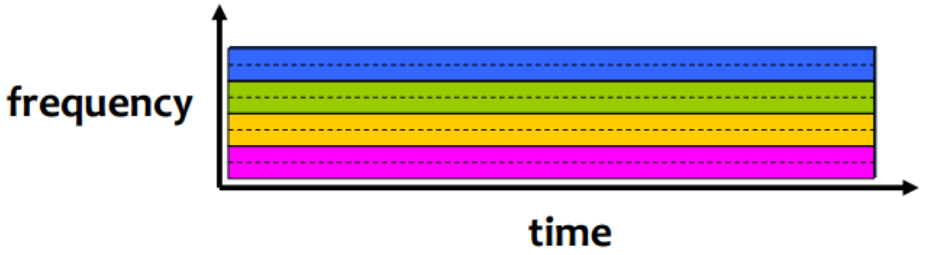
D. One of the drawbacks of TDM is that a flow can use only the time slots allocated to it. 一个数据流只能使用分配好的时段进行传送是分时多任务的缺点之一。

正确答案：A、D 你选对了

TDM (Time-Division-Multiplexing)分时多任务技术将数据安排在预先规画好的时段中进行传送。



FDM (Frequency-Division-Multiplexing)分频多任务技术将数据安排在预先规画好的频谱中进行传送。



2 1.11.Which of the following statements are correct for “statistical multiplexing” ?
下列哪些对于”统计多任务”叙述是正确的?

- [x] A. Data are transmitted based on demand of each flow. 数据的传输是依据每个数据流的不同需求。
- [ ] B. Data are transmitted based on the arrival time of each flow. 数据的传输是依据每个数据流的抵达交换器的时间。
- [x] C. The bandwidth used by different flows may be different. 不同数据流使用的带宽可能也不同。
- [ ] D. The statistical multiplexing is fair due to the bandwidth used by different flows are the same. 统计多工技术是公平的，因为每个资料流所使用的频宽是相同的。

正确答案: A、C 你选对了

统计多工根据流量传输数据，在负载均衡时是公平的，在负载不均衡时可减少资源浪费

3 1.12.Which of the following scheduling policies are usually used in “statistical multiplexing” to select flows for transmitting ?
”统计多任务” 通常使用下列哪些排程原则来选择要传输的数据流 ?

- [ ] A. 分时多任务法
- [x] B. Round-Rabin 循环法
- [x] C. Priority-based (based on flow priority) 优先权法(数据流的优先权)
- [x] D. FIFO (first-in-first-out) 先进先出法

正确答案: B、C、D 你选对了

网络基础 5

1 1.13.Which of the following statements are correct to describe the “network reliability” of Internet ?

下列哪些关于互联网”网络可靠度”的叙述是正确？

- [x] A. Packets may be lost due to network congestion. 封包可能会因为网络阻塞而遗失。
- [ ] B. Lost packets will be retransmitted by the routers. 路由器会重送遗失的封包。
- [x] C. Packets may be delayed for different delay time before reaching the destination. 不同封包在抵达目的地主机前可能会有不同的延迟。
- [x] D. Packets may be out-of-order due to different routing paths. 封包可能会因为走不同的路径而产生到达顺序不一致的状况。

正确答案: A、C、D 你选对了

路由器是第三层设备，不负责重送。

网络基础 6

1 1.14.Which of the following statements are correct to describe the “protocols” ?

下列哪些对于”协议”叙述是正确的?

- (•) A. Protocols are the building blocks of a network architecture. 协议是网络架构基本建构区块。
- ( ) B. The “service interface” of a protocol describes the messages exchanged with other peer. 协议的”服务接口”描述了对于其他对等节点的讯息交换内容。
- ( ) C. The “service interface” of a protocol describes the messages exchanged with other peer. 协议的”服务接口”描述了对于其他对等节点的讯息交换内容。
- ( ) D. The Internet Protocol (IP) provides a “reliable transmission service” to upper level protocols, such as TCP and UDP. IP协议为上层协议(如TCP/UDP) 提供可靠的传输服务。

正确答案: A 你选对了

Each protocol object has two different interfaces

- Service interface: operations on this protocol
- Peer-to-peer interface: messages exchanged with peer

2 1.15.Which of the following schemes are usually used to describe the “protocol specification” ?

列哪些方法常被用来叙述”协议规格”？

- [x] A. Pseudo-code 伪码
- [x] B. State-machine diagram 状态转移图
- [x] C. Message format 讯息格式
- [ ] D. Network topology 网络拓朴

正确答案: A、B、C 你选对了

3 1.16.Which of the following statements are correct to describe the “packet encapsulation”?
下列哪些对于“封包封装”的叙述是正确的?

- A. For sending node, the data from application level will be encapsulated larger and larger until to the physical level. 对于传送端来说，从应用层来的数据会被封装得越来越大, 直到物理层为止。
- B. For receiving node, the data from physical level will be decapsulated smaller and smaller until to the application level. 对于接收端来说，从物理层来的数据将会被拆装得越来越小, 直到应用层为止。
- C. The TCP segment is encapsulated into the IP datagram. That’s the IP protocol treats the TCP segment as data. TCP区段将被封装至IP封包，也就是IP协议会将TCP区段当作数据来处理。
- D. The IP datagram is encapsulated into the underlying MAC frame. That’s the MAC protocol treats the IP datagram as a data. IP封包段将被封装至下层的MAC讯框，也就是MAC协议会将IP封包视为数据来处理。

正确答案: A、B、C、D 你选对了

网络基础 9

1 1.18.In the OSI (Open Systems Interconnection) 7-layer model, which of the following layers are usually included in a “switch”?
在 OSI(开放式系统互联通讯) 的七层架构下，”交换器”通常会包含下列哪些层?

- A. Transport layer 传输层
- B. Network layer 网络层
- C. Data link layer 数据链结层
- D. Session layer 会议层

正确答案: C 你选对了

2 1.19.In the OSI (Open Systems Interconnection) 7-layer model, which of the following layers are usually included in a wireless “Access Point (AP)”?
在OSI (开放式系统互联通讯) 的七层架构下，”无线网络基地台”通常会包含下列哪些层?

- A. Application layer 应用层
- B. Transport layer 传输层
- C. Network layer 网络层
- D. Data link layer 数据链结层

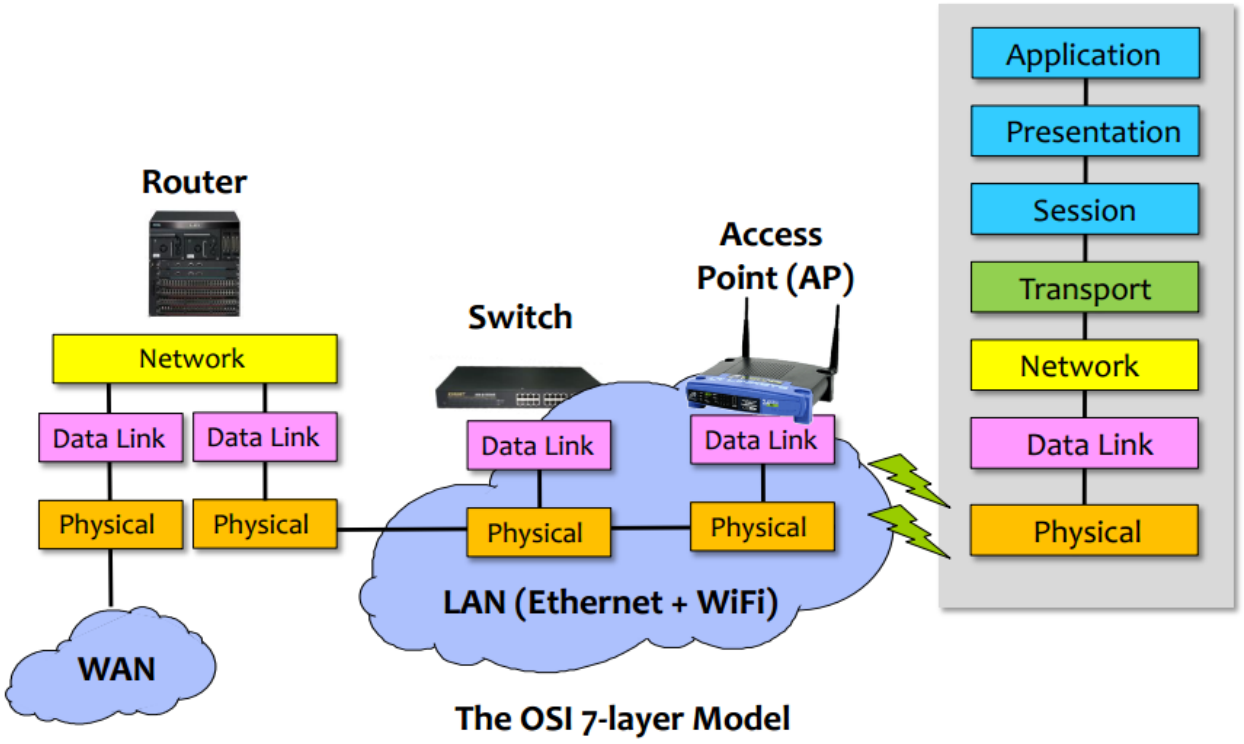
正确答案: D 你选对了

3 1.17.In the OSI (Open Systems Interconnection) 7-layer model, which of the following layers are usually included in a “router” ?
在 OSI (开放式系统互联通讯) 的七层架构下，”路由器” 通常会包含下列哪些层？

- [ ] A. Transport layer 传输层
- [x] B. Network layer 网络层
- [ ] C. Presentation layer 表示层
- [x] D. Data link layer 数据链结层

正确答案: B、D 你选对了

Switch, AP均为第二层设备，Router通常为第三层设备



网络基础 10

1 1.20.Which of the following statements are correct for the “physical layer” in the OSI 7-layer model ?
针对 OSI (开放式系统互联通讯) 的七层架构, 下列哪些对于 ” 物理层 ” 的叙述是正确的?

- [x] A. It handles the transmission of “raw bits” over a communication link. 它负责在通讯链路上传送原始位。
- [ ] B. It handles the transmission of “frames” over a communication link. 它负责在通讯链路上传送讯框。
- [x] C. To overcome noise or interference, different signal coding schemes may be used. 为了克服传输的噪声或干扰，可以使用不同的讯号编码方法。
- [ ] D. The physical layer must be a “wired link” 物理层一定是 ” 有线链路 ” 。

正确答案: A、C 你选对了

2 1.21.Which of the following links belong to the “physical layer” ?
下列哪些链路归属于”物理层”？

- [x] A. Coaxial cable 同轴电缆
- [x] B. Twisted pair cable 双绞线
- [x] C. Optical Fiber 光纤
- [x] D. Air space 无线空间

正确答案: A、B、C、D 你选对了

网络基础 11

1 1.22.Which of the following statements are correct for the “data link layer” in the OSI 7-layer model ?
下列哪些对于OSI 7层架构中的”数据链结层”叙述是正确的?

- [ ] A. It handles the transmission of “raw bits” over a communication link. 它负责在通讯链路上传送原始位。
- [x] B. It handles the transmission of “frames” to a directly connected device or host. 它负责在直接联机的设备或主机间传送讯框。
- [x] C. Different medium access control (MAC) protocols are used for different medium links. 不同的媒体链结可以使用不同的MAC协议。
- [ ] D. The CSMA/CD is the MAC protocol used by IEEE 802.11 wireless LAN network IEEE 802.11无线局域网络使用的 MAC 协议是 CSMA/CD。

正确答案: B、C 你选对了

2 1.23.We say that a device is a “layer 2” device if it implements only data link layer protocol and physical layer protocol. Which of the following devices are usually layer 2 devices ?
当我们说一个装置是第二层装置代表这个装置只实现了”数据链结层”与”物理层”，下列哪些装置是我们常说的第二层装置?

- [ ] A. Routers 路由器
- [x] B. Bridges 网桥
- [x] C. Switches 交换器
- [ ] D. Firewalls 防火墙

正确答案: B、C 你选对了

网络基础 12

1 1.25.We say that a device is a “layer 3” device if it implements network layer protocol, data link layer protocol, and physical layer protocol. Which of the following devices are usually layer 3 devices ?
当我们说一个装置是第三层装置代表这个装置只实现了”网络层”、”数据链结层”与”物理层”，下列哪些装置通常第三层装置?

- A. Routers 路由器
- B. Bridges 网桥
- C. Switches 交换机
- D. Wireless Access Points 无线网络基地台

正确答案: A 你选对了

2 1.24.Which of the following statements are correct for the “network layer” in the OSI 7-layer model ?
下列哪些叙述对于OSI 7层架构中的”网络层”叙述是正确的?

- A. It deals with the problem of how to transmit packets to a destination host via the Internet. 它负责处理如何将封包透过互联网传送至目标主机的问题。
- B. The Internet Protocol (IP) is a network layer protocol. IP 协议属于网络层协议。
- C. The User Datagram Protocol (UDP) is a network layer protocol. UDP协议属于网络层协议。
- D. The routing protocols are used by routers to establish the routing table. 路由协议被路由器用来建立其路由表。

正确答案: A、B、D 你选对了

3 1.26.Which of the following protocols are routing protocols ?
下列哪些协议是”路由协议”?

- A. Internet Protocol (IP) 互联网协议
- B. Router Information Protocol (RIP) 路由信息协议
- C. Open Shortest Path First (OSPF) protocol 开放最短路径优先协议
- D. Boarder Gateway Protocol (BGP) 边界网关协议

正确答案: B、C、D 你选对了

网络基础 13、14

1 1.27.Which of the following statements are correct for the “transport layer” in the OSI 7-layer model ?

下列哪些对于OSI 七层架构中”传输层”的叙述是正确的?

- [x] A. It deals with the problem of how to transmit packets between a pair of processes in different hosts. 它负责处理如何在不同主机上一对行程间的封包传输问题。
- [ ] B. The User Datagram Protocol (UDP) is a transport layer protocol that provides reliable transmission service. UDP协议是一个提供可靠传输服务的传输层协议。
- [x] C. The Transmission Control Protocol (TCP) is a transport layer protocol that provides reliable transmission service. TCP协议是一个提供可靠传输服务的传输层协议。
- [x] D. Routers usually not implement transport layer protocols. 路由器通常不实作传输层协议。

正确答案: A、C、D 你选对了

2 1.28.Which of the following are the main features of the Internet Architecture ?

下列哪些是互联网架构的主要特色?

- [ ] A. Strict layering. The layer N protocol is only allowed to use the services provided by layer N-1 protocol. 严格分层。第N层协议只允许使用由N-1层协议所提供的服务。
- [x] B. Not strict layering. The layer N protocol is allowed to use the services provided by layer N-2 protocol or other underlying protocols directly. 不严格分层。第N层协议允许使用由N-2层或更底层协议所提供的服务。
- [x] C. An hour-glass shape of protocols and IP serves as the focal point for the architecture 为沙漏状架构, 而 IP 协议为此结构的中心点。
- [ ] D. An hour-glass shape of protocols and TCP/UDP serves as the focal point for the architecture. 为沙漏状架构, 而 TCP/UDP协议为此结构的中心点。

正确答案: B、C 你选对了

网络基础 15

1 1.30.The “transmission time” of a network interface (card) to transmit a packet is defined as packet size/bandwidth. For a 1Mbps Ethernet interface, what is the transmission time to transmit a packet of size 1Kbytes ?

一个网络接口(卡)传输一个封包的“传输时间”是指将该封包大小除以网络卡带宽。在 1Mbps 以太网络接口上传输一个大小为 1K 字节的封包需多少时间??

- ( ) A. 1 ms (毫秒)
- (•) B. 8 ms (毫秒)
- ( ) C. 10 ms (毫秒)
- ( ) D. 80 ms (毫秒)

正确答案: B 你选对了

2 1.31.The “propagation time” of a link to transmit a bit from one end to another end is defined as link distance/speed of light. For a link of 30Km, what is the propagation time of such a link ? Assume the speed of light is 3 x 10^8 m/second.

一个位从链路的一端传送到另外一端点的“传播时间”是指该链路的距离/光速。若现有一链路长30公里，请问此链路的传播时间为何？假设光速是 3 x 10^8 公尺/秒。

- A. 1 us (微秒)
- B. 10 us (微秒)
- C. 100 us (微秒)
- D. 1 ms (毫秒)

正确答案：C 你选对了

3 1.29.Which of the following factors are usually included to calculate the delay (latency) of transmitting a packet from a source device (such as switch) to a destination device ?

下列哪些是计算从来源装置(例如交换机)到目的装置传输延迟时间的主要因素?

- A. Queuing time 排队时间
- B. Transmission time 传输时间
- C. Propagation time 传播时间
- D. Receiving time of the destination device 目的装置的接收时间

正确答案：A、B、C 你选对了

4 1.32.Which of the following statements are correct for “transmission time” and “propagation time” ?

下列哪些对于”传输时间”与”传播时间”的叙述是正确的?

- A. For short packet, the propagation time is more important as the packet will be complete transmitted quickly but needs a longer time to propagate to the other end of the link. 对短封包来说，传播时间较为重要，因为短封包会很快传送完成，但需要较长的时间来传送到另一端。
- B. For short packet, the transmission time (bandwidth) is more important as the packet will be complete transmitted quickly and only needs a shorter time to propagate to the other end of the link. 对短封包来说，传输时间(带宽)较为重要，因为短封包会很快传送完成，而且需要较短的时间来传送到另一端。
- C. For long packet, the propagation time is more important as the packet will be complete transmitted slowly but needs a longer time to propagate to the other end of the link. 对长封包来说，传播时间较为重要，因为长封包会较慢完成传送，但需要较长的时间来传送到另一端。
- D. For long packet, the transmission time (bandwidth) is more important as the packet will be complete transmitted slowly but the first bit only needs a shorter time to propagate to the other end of the link. 对长封包来说，传输时间(带宽)较为重要，因为长封包会较慢完成传送，但第一个位只需较短时间就可以传播到另一端。

正确答案：A、D 你选对了

网络基础 16

1 1.33.The channel between a pair of processes can be viewed as a pipe. Delay x Bandwidth means how many data can be stored in the pipe. For a pipe with a delay of 80 ms and bandwidth of 1000 Mbps, how many data can be stored in the pipe ?

在两个行程间的通道可视为一个管线。延迟 x 带宽 则代表有多少资料可以储存在管线之中. 若有一个管线的延迟是 80ms 且带宽是 1000Mbps，则此管线最多可以储存多少数据?

- A. 1 MB
- B. 8 MB
- C. 10 MB
- D. 80 MB

正确答案: C 你选对了