

杭州电子科技大学网安学院 计算机网络 B 卷 答案及评分标准

2017-2018-2

**Part One : Multiple Choice (每题 1 分, 共 20 分)**

C-C-C-A-B

A-C-B-C-A

C-B-C-B-C

B-D-A-D-D

**Part Two : Fill-in-the-blank (每空 1 分, 共 15 分)**

1、 five

2、 datagram (数据报)

3、 interdomain or inter-AS (域间路由)

4、 16

5、 well-known; registered; dynamic or private (熟知端口 ; 注册端口 ; 动态或私有端口)

6、 transport (传输层)

7、 16

8、 0

9、 fourth; third

10、 channel partitioning protocols; random access protocols; taking-turns protocols (信道划分协议 ; 随机访问协议 ; 轮流协议) (前后顺序可替换)

**Part Three: Answer the following question briefly (每题 7 分, 共 35 分)**

1. The five layers in the Internet protocol stack are – from top to bottom – the application layer, the transport layer, the network layer, the link layer, and the physical layer.

Application layer: exchange information message of network application in another end system;

Transport layer: transport application-layer messages between application endpoints as segments;

Network layer: deliver datagrams from one hosts to another;

Link layer: deliver the packet from one node (host or router) to the next node in the route;

Physical layer: move the individual bits within the frame from one node to the next node in the route.

评分标准 : 5 个层名共 2 分, 每 1 层的服务各 1 分。

2.

Slow start: The value of cwnd begins at 1 MSS and increases by 1 MSS every time a

transmitted segment is first acknowledged.

Congestion avoidance: The value of `cwnd` is approximately half its value and increases the value by just a single MSS every RTT.

Fast recovery: The value of `cwnd` increases by 1 MSS for every duplicate ACK received for the missing segment. When an ACK arrives for the missing segment, TCP enter the congestion avoidance state after deflating `cwnd`.

评分标准：slow start 和 congestion avoidance 要点各 2 分，fast recovery 为 3 分

3.

- 1) The browser extracts the domain name from the URL;
- 2) The browser queries DNS for the IP address of the domain name;
- 3) The DNS server lookup 是 and return the corresponding IP address;
- 4) Browser initiates a TCP connection with the IP address and the Port;
- 5) Browser sends a HTTP request message to the server;
- 6) Server handles the incoming request and return the HTTP response message that contains required files.
- 7) Close TCP connections.
- 8) Browser extracts the file from the response message and display.

评分标准：前 7 步每步 1 分。

4. Framing

link access;

reliable delivery

flow control:

error detection

error correction;

full duplex:

评分标准：每个要点 1 分。

5.

- 1) Step 1. The client-side TCP first sends a special TCP segment to the server-side TCP.

This special segment contains no application-layer data. The **SYN** bit is set to 1 and the **seq** field is assigned with an initial sequence number `client_isn`.

- 2) Step 2: The server extracts the TCP SYN segment from received datagram,

allocates the TCP buffers and variables to the connection, and sends a connection-granted segment to the client TCP. The **SYN** bit is also set to 1. The **acknowledgment** field of the TCP segment header is set to `client_isn+1`. the server also chooses its own initial **sequence** number with a number `server_isn`.

3) Step 3: Upon receiving the SYNACK segment, the client also allocates buffers and variables to the connection. The client host then sends the server yet another segment; this last segment acknowledges the server's connection-granted segment by putting the value `server_isn+1` in the **acknowledgment** field. The **SYN** bit is set to zero. The **seq** field is set to `client_isn+1`.

评分标准：第 1 步 1 分，后两步各 3 分。

#### Part Four: Analysis and computing （每题 10 分，共 30 分）

1. 评分标准：每错一个空格扣 1 分，行与行之间可替换顺序

<i>Destination Subnet</i>	<i>Next Router</i>	<i>Number of Hops</i>
w	A	2
y	B	2
z	A	5
x	-	1

2. 评分标准：答案不唯一，各子网的网络号各 2 分，IP 起始范围错 1 个扣 1 分

Subnet1: 223.1.17.0/26      223.1.17.1~223.1.17.63

Subnet2: 223.1.17.128/25    223.1.17.129~223.1.17.191

Subnet3: 223.1.17.192/28    223.1.17.193~223.1.17.206

3. 评分标准：第 1 小题 4 分，第 2 小题 6 分

a) The length of the sequence field is 32 bit. So, the maximum size file that can be sent from A to B is  $2^{32}=4.19\text{Gbytes}$ .

b) The number of segments is  $2^{32}/536=8012999$ .

The total data need to be sent is  $2^{32}+2^{32}/536*66$ .

The transmit time is  $(2^{32}+2^{32}/536*66)*8/155$ , i.e., about 249 seconds.