

102 學年度第 1 學期 博班資格考 資訊網路試題

命題方式: close book 考試時間: 共 4 小時

共 2 頁 第 1 頁

第一部分：50 分

1. a) What is the most popular network architecture today? (5%)
b) Why do standards architectures break down the standards development process into layers? (5%)
2. a) How does CSMA/CD work? (5%)
b) How does CSMA/CA+ACK work? (5%)
3. a) Describe how SIP initiates a communication session. (5%)
b) What is the content of voice transport packet in SIP? (5%)
4. a) How do routers process packets? (5%)
b) How does Address Resolution Protocol (ARP) work? (5%)
5. a) What are Access Control Lists (ACLs)? Why are ACLs needed for stateful firewalls? (5%)
b) Why are stateful firewalls attractive? (5%)

第二部分：50 分(每題 10 分)

1. Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 201; the second has sequence number 305.
 - a) How much data in the first segment?
 - b) Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgment that Host B sends to Host A, what will be the acknowledgment number?
2. Consider a router that interconnects three subnets: Subnet1, Subnet2, and Subnet3. Suppose all of the interfaces in each of these three subnets are required to have the prefix 223.3.29/24. Also suppose that Subnet1 is required to support to 120 interfaces, and Subnets 2 and 3 are each required to support up to 50 interfaces. Provide three addresses (of the form a.b.c.d/x) that satisfy these constraints.

3. List five Internet applications and the application-layer protocols and the transport-layer protocols that they use.
4. Many of the functions of an adapter can be performed in software that runs on the node's CPU. What are the advantages and disadvantages of moving this functionality from the adapter to the node?
5. Suppose N people want to communicate with each of $N-1$ other people using symmetric key encryption. All communication between any two people, i and j , is visible to all other people in this group of N , and no other person in this group should be able to decode their communication. How many keys are required in the system as a whole? Now suppose that public key encryption is used. How many keys are required in this case?