

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 (2011/9)

第一部分: 50 分

一、簡答題(30 分): 每題 2 分

1. Distinguish between frames and packets.
2. Six switched networks are involved in transmissions from the source to the destination host. How many packets will there be along the way when the source host transmits a packet?
3. What is the advantage and disadvantage of multistate digital signaling?
4. Write the Shannon Equation. List what each letter is in the equation.
5. How does PSK mode differ from 802.1X mode?
6. If a company already has a multisite PBX network installed for site-to-site voice service, what must it add for site-to-site VoIP?
7. What is a remote access VPN? What is a site-to-site VPN?
8. Distinguish between ingress and egress filtering.
9. What are the three ranges of private IP addresses?
10. List one SNMP object in each of the following areas: IP and ICMP.
11. You are downloading a webpage that has three graphics and four sound clips. How many request-response cycles will be needed?
12. At what layer is the 100BASE-TX standard? What can you infer from the name 100BASE-TX?
13. What are the four fields in a UDP header?
14. How do WSDL and UDDI combine to help create an open market for Web services?
15. How will mobile IP work?

二、填入下列表格內容(20 分): 每題 5 分

1.

<i>Layer</i>	<i>Protocol</i>	<i>Connection-Oriented or Connectionless?</i>	<i>Reliable or Unreliable</i>
5 (Application)			
4 (Transport)			
3 (Internet)			
2 (Data Link)			

2.

<i>Characteristic</i>	<i>802.11a</i>	<i>802.11b</i>	<i>802.11g</i>	<i>802.11n</i>
Spread Spectrum Method, etc.				
Unlicensed Band				
Rated Speed				
Number of Nonoverlapping Channels (varies by country)				

3.

<i>Dynamic Routing Protocol</i>	<i>Interior or Exterior Routing Protocol?</i>	<i>Remarks</i>
BGP (Border Gateway Protocol)		
RIP (Routing Information Protocol)		
OSPF (Open Shortest Path First)		
EIGRP (Enhanced Interior Gateway Routing Protocol)		

4.

<i>Step</i>	<i>Description</i>				
1	Total size of IP address (bits)	32			
2	Size of network part assigned to firm (bits)	8		16	
3	Remaining bits for firm to assign				
4	Selected subnet/host part sizes (bits)				
5	Possible number of subnets				
6	Possible number of hosts per subnet				

第二部分：問答題(50 分)：每題 10 分

1. What is an overlay network in a P2P file-sharing system? Does it include routers? What are the edges in the overlay network? How is the Gnutella overlay network created and maintained?
2. Give a trace of the operation of protocol rdt3.0 when data packets and acknowledgement packets are garbled. Your trace should be similar to that used in book or with UML diagram.
3. Consider some of the pros and cons of virtual-circuit and datagram networks.
 - a.) Suppose that in the network layer, routers were subjected to stressful conditions that might cause them to fail fairly often. At a high level, what actions would need to

be taken on such router failure? Does this argue in favor of VC or datagram architecture?

b.) Suppose that in order to provide a guarantee regarding the level of performance (for example, delay) that would be seen along a source-to-destination path, the network requires a sender to declare its peak traffic rate. If the declared peak traffic rate and the existing declared traffic rates are such that there is no way to get traffic from the source to the destination that meets the required delay requirements, the source is not allowed access to the network. Would such an approach be more easily accomplished within a VC or a datagram architecture?

4. In CSMA/CD, after the sixth collision, what is the probability that a node chooses $K=4$? If the result $K=100$ corresponds to a delay of how many seconds on a 10 Mbps Ethernet? And how many seconds on a 100 Mbps Ethernet?
5. Suppose an 802.11b station is configured to always reserve the channel with the RTS/CTSS sequence. Suppose this station suddenly wants to transmit 1,000 bytes of data, and all other stations are idle at this time. As a function of SIFS and DIFS, and ignoring propagation delay and assuming no bit errors, calculate the time required to transmit the frame and receive the acknowledgement.