Vanier College

Computer Science Department

Advanced Networks

Lab #6

Title: TCP/IP and Transport Layer

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Review Questions:

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1. D) None of the above.
2. D) MAC addresses must be unique in a broadcast domain.
3. D) None of the above.
4. A) 0000.2222.BBBB

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5. B) 80
6. D) None of the above.
7. B) The connection between Router-A and the hub is down.
8. C) The DNS server is down.
9. B) 0000.2222.BBBB

Subnetting Exercise #2:

1. *Assume that you have been assigned the 200.35.1.0/24 network block. Define an extended network prefix that allows the creation of 20 hosts on each subnet (subnet zero can be considered as a valid subnet number).*

   200.35.1.0 → Class C → /24

   $2^h - 2$ >= # of hosts/subnet
   $2^h - 2$ >= 20 hosts/subnet
   h = 5 host bits

   $8 - h = s$
   $8 - 5 = s$
   s = 3 subnet bits

   /24 + s =
   /24 + 3 = **/27**

2. *What is the maximum number of hosts that can be assigned to each subnet?*

   $2^h - 2$ >= # of hosts/subnet
   $2^h - 2$ >= 20 hosts/subnet
   h = 5 host bits

   $2^5 - 2$ = **30 hosts/subnet**

3. *What is the maximum number of subnets that can be defined?*

$2^h - 2 >=$ # of hosts/subnet
$2^h - 2 >= 20$ hosts/subnet
$h = 5$ host bits

$8 - h = s$
$8 - 5 = s$
$s = 3$ subnet bits

$2^s >=$ # of subnets
$2^3 =$ **8 subnets**

4. *Specify the subnets of 200.35.1.0/27 in dotted-decimal notation.*

$2^5 =$ 32 hosts

Regular Notation:

Subnet #0: 200.35.1.0/27
Subnet #1: 200.35.1.32/27
Subnet #2: 200.35.1.64/27
Subnet #3: 200.35.1.96/27
Subnet #4: 200.35.1.128/27
Subnet #5: 200.35.1.160/27
Subnet #6: 200.35.1.192/27
Subnet #7: 200.35.1.224/27

↓

Dotted-Decimal Notation:

Subnet #0: 11001000.00100011.00000001.00000000/27
Subnet #1: 11001000.00100011.00000001.00100000/27
Subnet #2: 11001000.00100011.00000001.01000000/27
Subnet #3: 11001000.00100011.00000001.01100000/27
Subnet #4: 11001000.00100011.00000001.10000000/27
Subnet #5: 11001000.00100011.00000001.10100000/27
Subnet #6: 11001000.00100011.00000001.11000000/27
Subnet #7: 11001000.00100011.00000001.11100000/27

5. *List the range of host addresses that can be assigned to Subnet #6 (200.35.1.192/27).*

   Subnet #6: 200.35.1.192/27
   $2^5 - 2 =$ 30 hosts/subnet

   ↓

   First Host: **200.35.1.193/27**
   Last Host: **200.35.1.222/27**

6. *What is the broadcast address for subnet 200.35.1.192/27?*

   Subnet #6: 200.35.1.192/27
   Subnet #7: 200.35.1.224/27
   $2^5 - 2 =$ 30 hosts/subnet
   224 - 1 = 223

   ↓

   Broadcast Address: **200.35.1.223/27**