CS & IT ENGINEERING

COMPUTER NETWORKS

IPv4 Addressing

Lecture No-15

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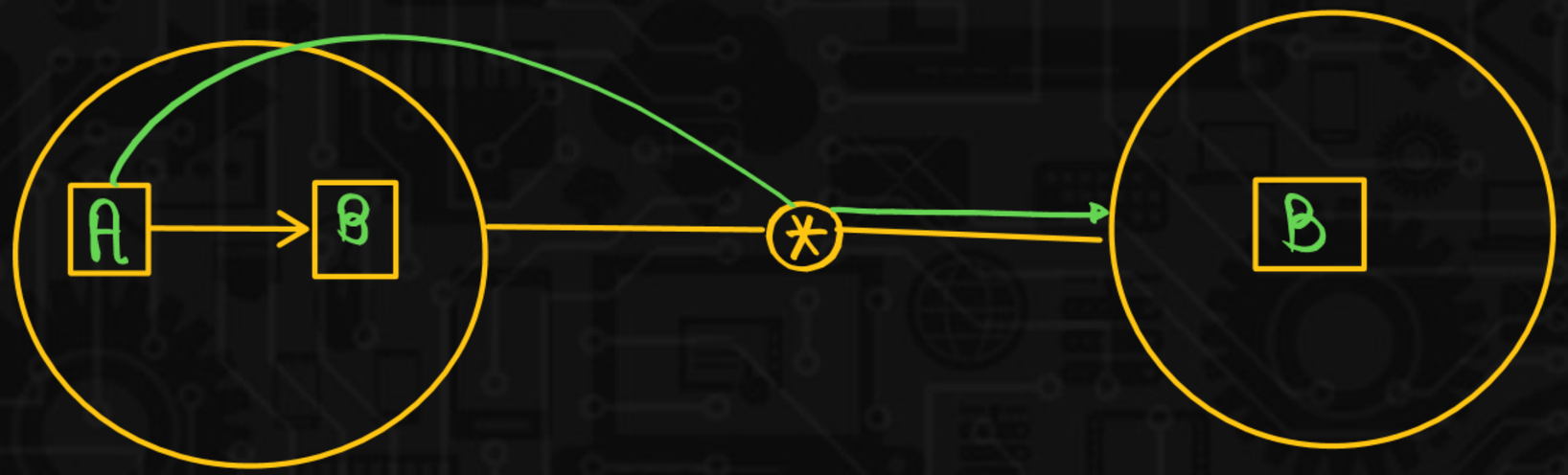
Problem Solving on Subnetting

Subnetting Category 10



A

IP_A

SM_A

B

IP_B

IP_A AND SM_A

NID_{AA}

IP_B AND SM_A

NID_{BA}

1. IF $NID_{AA} = NID_{BA}$ then A assume that B is present in the same Network.

2. IF $NID_{AA} \neq NID_{BA}$ then A assume that B is present in the different Network.

Q.1

A

$IP_A = 200.200.200.15$

$SM_A = 255.255.255.128$

B

$IP_B = 200.200.200.132$

Soln:

$IP_A = 200.200.200.00001111(15)$

AND

$SM_A = 255.255.255.10000000(128)$

$NID_{AA} = 200.200.200.0$

$IP_B = 200.200.200.10000100$

AND

$SM_A = 255.255.255.10000000$

$NID_{BA} = 200.200.200.128$

$NID_{AA} \neq NID_{BA}$ so 'A' assume that 'B' is present in the different N/w.

Q.2 A

$IP_A = 200.200.200.15$

$SM_A = 255.255.255.128$

B

$IP_B = 200.200.200.66$

$SM_B = 255.255.255.192$

Soln:

$IP_A = 200.200.200.15$
AND AND
$SM_A = 255.255.255.128$
$NID_{AA} = 200.200.200.0$

$IP_B = 200.200.200.66$
AND AND
$SM_A = 255.255.255.128$
$NID_{BA} = 200.200.200.0$

$NID_{AA} = NID_{BA} = 200.200.200.0$ so 'A' assume that 'B' is Present in the same Network

$IP_B = 200.200.200.66\ (64+2)$
AND AND
$SM_B = 255.255.255.192\ (128+64)$
$NID_{BB} = 200.200.200.64$

$IP_A = 200.200.200.15\ (00001111)$
AND AND
$SM_B = 255.255.255.192\ (11000000)$
$NID_{AB} = 200.200.200.0$

$NID_{BB} \neq NID_{AB}$ so 'B' assume that 'A' is Present in the different Network

A

IP_A : 200.200.200.15

SMA : 255.255.255.128

255.255.255.1 0000000

NID | SID | HID

NID	SID	HID
24	1	7

$2^1 = 2$ subnet

$2^7 - 2 = 126$ Host|subnet

B

IP_B = 200.200.200.66

SM_B = 255.255.255.192

255.255.255.11 000000

NID | SID | HID

NID	SID	HID
24	2	6

$2^2 = 4$ subnet

$2^6 - 2 = 62$ Host|subnet


A
B
X
B

Q. Two computers C1 and C2 are configured as follows. C1 has IP address 203.197.2.53 and netmask 255.255.128.0. C2 has IP address 203.197.75.201 and netmask 255.255.192.0. which one of the following statements is true? [GATE CS 2006]

A. C1 and C2 both assume they are on the same network

B. C2 assumes C1 is on same network, but C1 assumes C2 is on a different network

C. C1 assumes C2 is on same network, but C2 assumes C1 is on a different network

D. C1 and C2 both assume they are on different networks.

Soln: C_1

IP_{C_1}: 203.197.2.53

SM_{C_1}: 255.255.128.0

Soln:

IP_{C_1} = 203.197.2.53
AND AND
SM_{C_1} = 255.255.128.0
$NID_{C_1C_1}$ = 203.197.0.0

IP_{C_2} = 203.197.75.201
AND AND
SM_{C_1} = 255.255.128.0
$NID_{C_2C_1}$ = 203.197.0.0

$NID_{C_1C_1} = NID_{C_2C_1} = 203.197.0.0$ so 'C_1' Assume that C_2 is Present in the Same N/W

C_2

IP_{C_2}: 203.197.75.201

SM_{C_2}: 255.255.192.0

IP_{C_2} = 203.197.75.201
AND AND
SM_{C_2} = 255.255.192.0
$NID_{C_2C_2}$ = 203.197.64.0

IP_{C_1} = 203.197.2.53
AND AND
SM_{C_2} = 255.255.192.0
$NID_{C_1C_2}$ = 203.197.0.0

$NID_{C_2C_2} \neq NID_{C_1C_2}$ so 'C_2' Assume that C_1 is Present in the different N/W


THANK YOU
GW
SOLDIERS !