MIKROTIK ROUTEROS ONLINE TRAINING CLASS – CHAPTER 3

i-BEAM steering ahead

BURMESE VERSION

Phyo Phyo Hein

B. C. Tech (hons) MTCNA, MTCRE, MTCWE, MTCTCE, MTCUME, MTCINE CCNA R&S, CCNP R&S, CCIP, JNCIA-Junos, JNCDA September 16, 2016

MORE TCP/IP & IP SUBNETTING PRACTICE

TCP/IP DoD Model

Private IP

IP Subnetting Calculation

TCP/IP DOD MODEL



• TCP/IP and the DoD Model

- The Transmission Control Protocol / Internet Protocol (TCP/IP) was created by the Department of Defense (DoD)
- the Department of Defense (DoD) Model is a reduced version of the OSI Reference Model. The DoD model based on four layers:
 - 1. Process/Application layer
 - 2. Host-to-Host layer
 - 3. Internet layer
 - 4. Network Access layer

TCP/IP DOD MODEL



	OSI	DoD Model	Protocols	
7	Application			
6	Presentation	Process Application	SQL,TFTP,DHCP	
5	Session Layer			
4	Transport Layer	Host to Host Layer	TCP/UDP	
3	Network	Internet	IPv4,IPv6,ICMP	
2	Data Link Layer	Notwork Access	Ethernet, Token Ring, Frame Relay,	
1	Physical Layer	Network Access	ADSL,	

Private IP



- IP Address also divided into Public IP and Private IP.
- Public IP is used for global internet routing.
- Private IP is used in internal networks:
 - Defined in RFC1918 by IETF in 1996.
 - To delay IPv4 address exhaustion.
 - Commonly used for home, office, and enterprise LANs, when globally routable addresses are not mandatory.
 - Needs to be translated to Public IP by NAT when routing to internet.

RFC1918 Name	Number of Addresses	CIDR	Address Range
24-bit block	16,777,216	10.0.0/8	10.0.0.0 ~ 10.255.255.255
20-bit block	1,048,576	172.16.0.0/12	172.16.0.0 ~ 172.31.255.255
16-bit block	65,536	192.168.0.0/16	192.168.0.0 ~ 192.168.255.255

EXERCISE: CALCULATE IP RANGE



Prefix

11.11.11/26

22.22.22/28

33.33.33.33/25

44.44.44/29

55.55.55/27

66.66.66/28

77.77.77.77/30

88.88.88.88/31

• How many IPs in each prefix?

• Find out following IP addresses:

Network ID

- Broadcast IP
- Host IP Addresses
- What is the subnet mask?

EXERCISE: CALCULATE IP RANGE (ANSWER)



Prefix	IPs	Network ID	Broadcast IP	Host IPs	Subnet Mask
11.11.11.11/26	64	11.11.11.0	11.11.11.63	11.11.11.1 to 11.11.11.62	255.255.255.192
22.22.22.22/28	16	22.22.22.16	22.22.22.31	22.22.22.17 to 22.22.22.30	255.255.255.240
33.33.33.33/25	128	33.33.33.0	33.33.33.127	33.33.33.1 to 33.33.33.126	255.255.255.128
44.44.44.44/29	8	44.44.44.40	44.44.44.47	44.44.44.41 to 44.44.44.46	255.255.255.248
55.55.55.55/27	32	55.55.55.32	55.55.55.63	55.55.55.33 to 55.55.55.62	255.255.255.224
66.66.66.66/28	16	66.66.66.64	66.66.66.79	66.66.66.65 to 66.66.66.78	255.255.255.240
77.77.77.77/30	4	77.77.77.76	77.77.77.79	77.77.77.77, 77.77.77.78	255.255.255.252
88.88.88.88/31	2	88.88.88.88	88.88.88.89	N/A	255.255.255.254

ASK QUESTIONS?



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TO BE CONTINUED...

THANKS FOR YOUR ATTENTION!

Contact Me

phyo@informationbeam.net

Skype: pphein82