Internship Program for TEIN3 HRD in VinaREN

WEEKLY REPORT (for first week of the program, 02nd to 06th July, 2012)

02nd July 2012

The first day, he was asked me about my experiences and knowledge. He was explaining topology in Vietnam and tells about objectives that we will study in this Internship.

03rd July 2012

This day we have studied about OSI TCP/IP Application layer Services, Basic Router Configuration and how to reset password CISCO Router 2800.

Open Systems Interconnection (OSI) model

It is a reference tool for understanding data communications between any two networked systems. It divides the communications processes into seven layers. Each layer both performs specific functions to support the layers above it and offers services to the layers below it. The three lowest layers focus on passing traffic through the network to an end system. The top four layers come into play in the end system to complete the process.

There are Sever Layers of OSI Model:

7. Application Layer: The application layer provider different services to the application. Examples of services provided by this layer are file transfer, electronic messaging e-mail, virtual terminal access and network management.

6. Presentation Layer: The Presentation layer is responsible for protocol conversion, date encryption/decryption, Expanding graphics command and the date compression. This layer makes the communications between two hosts possible.

5. Session Layer: This layer is responsible for establishing the process-to-process communication between the hosts in the network. This layer is responsible for establishing and ending the sessions across the network. The interactive login is an example of services provided by this layer in which the connectives are re-connected in care of any interruption.

4. Transport Layer: This layer is responsible for end-to-end delivers of messages between the networked hosts. It first divides the streams of data into chunks or packets before transmission and then the receiving computer re-assembles the packets. It also guarantees error free data delivery without loss or duplications.

3. Network Layer: This layer is responsible for translating the logical network address and names into their physical address (MAC address). This layer is also responsible for addressing, determining routes for sending and managing network problems such as packet switching, data congestion and routines.

2. Data Link Layer: Data link layer is responsible for controlling the error between adjacent nodes and transfer the frames to other computer via physical layer. Data link layer is used by hubs and switches for their operation.

1. Physical Layer: Physical Layer is responsible for transmitting row bit stream over the physical cable. The physical layer defines the hardware items such as cables, cards, voltages etc.

Basic Router Configuration

This lesson makes me understanding the basic Router mode and how to use commend for configuring on the CISCO router. Gave the documentation for read, explain some of commends and practice configuration with the basic commends router.

-Configuration Example on the Router CISCO 2800 series

Router>en

Router#conf t

Router(config)#hostname CamREN

CamREN(config)#enable password XXX

CamREN(config)#enable secret XXXXX

The enable secret password is encrypted by default. The enable password is not. For this reason, recommended practice is that never use the enable password command. Use only the enable secret password commend in a router or switch configuration.

CamREN(config)#int f0/0

CamREN(config-if)#ip add 192.168.10.1 255.255.255.0

CamREN(config-if)#no shut

CamREN(config-if)#exit

CamREN(config)#int f0/1

CamREN(config-if)#ip add 192.168.20.1 255.255.255.0

CamREN(config-if)#no shut

CamREN(config-if)#end

CamREN#show ip interface brief

Interface	IP-Address	OK? Method Status	Protocol
FastEthernet0/0	192.168.10.1	YES manual up	up
FastEthernet1/0	192.168.20.1	YES manual up	up

……………………………………………………………………………….

CamREN#copy running-config startup-config

Save the running configuration to NVRAM, meaning that it saved even when power to the devise is turned off.

Recovery password Cisco Router 2811

If we forgot the password to login cisco router 2800 we can reset it, but we make sure we had to copy running-config startup-config because when we recovery password it will be loss all configuration.

First we must to make sure show version the router

Router>show version

Cisco IOS Software, 2800 Software(C2800NM-ADVIPSERVIPSERVICESK9-M), version

………………………………

………………………………

Configuration register is 0x2102

Just remember the current cisco router register number "2102", after that, off and on cisco router, pass **Ctrl**+**backspace**+**break** to enter the NVram or the easy way to do it we can off on cisco router, and **remove compact flash** then turn on. Router will be start on the rommon mode.

Self decompreeing the image:

####################################

Monitor: command "boot" aborted due touser interrupt

Rommon 1>confreg 2142

Rommon 2>reset

…………………………………

………………………………

####################################

Router>en

Router>conf t

Router(config)#copy startup-config running-config   **(reload old configuration)**

CamREN(config)#en secret XXXX

CamREN(config)config-register 0x2102

04ᵗʰ July 2012

For today in the morning he have to give the quiz that relative the lesson on 3ʳᵈ and learn about IP addressing CIDR-VLSM, How to Subnet and did activity Basic VLSM Calculation and addressing Design

IP Addressing-CIDR-VLS

Introduction of CIDR and VLSM, ISPs could now assign one part of a classful network to one customer and different part to another customer.This discontiguous address assignment by ISPs was paralleled by the development of classless routing protocols.

– Classless routing protocols do include the subnet mask in routing updates and are not required to perform summarization.

– The classless routing protocols discussed in this course are RIPv2, EIGRP and OSPF.

Classful and Classless IP Addressing

Classes of IP addresses are identified by the decimal number of the 1st octet

Class A address begin with a **0** bit

Range of class A addresses = 0.0.0.0 to 127.255.255.255

Class B address begin with a **1** bit and a **0** bit

Range of class B addresses = 128.0.0.0 to 191.255.255.255

Class C addresses begin with **two 1s** bits & a **0** bit

Range of class C addresses = 192.0.0.0 to 223.255.255.255.

- Multicast addresses begin with three 1s and a 0 bit. Multicast addresses are used to identify a group of hosts that are part of a multicast group.
- IP addresses that begin with four 1 bits were reserved for future use.

   The IPv4 Classful Addressing Structure (RFC 790)
   -An IP address has 2 parts:
   　-The network portion
   　　Found on the left side of an IP address
   　-The host portion
   　　Found on the right side of an IP address
-Class A, B, & C addresses were designed to provide IP addresses for different sized organizations
-The class of an IP address is determined by the decimal value found in the 1ˢᵗ octet

-IP addresses are running out so the use of Classless Inter Domain Routing (CIDR) and Variable Length Subnet Mask (VLSM) are used to try and conserve address space

-Classful Routing Updates

Subnet masks are not sent in routing updates

-Classless IP addressing

Benefit of classless IP addressing

Can create additional network addresses using a subnet mask that fits your needs

Uses Classless Interdomain Routing (CIDR)

-CIDR

Uses IP addresses more efficiently throughuse of VLSM

VLSM is the process of subnetting a subnet

-Allows for route summarization

Route summarization is representing multiple contiguous routes with a single route

-Classless Routing Updates

Subnet masks are included in updates

How to Subnet

For this chapter he was teach me how to calculation number to Binary. And have many examples in this chapter for explain me like "converting between decimal number and binary, Subnetting a Calss C Network using Binary, Subnetting a Class B network using Binary andBinary ANDing"

VLSM (Variable-length subnet masking

VLSM is the process of subnetting a subnet and using different subnet mask for different network in your IP plan. What you have to remember is that you need to make sure that there is no overlap in any of the addresses.

After we finished this chapter he was give exercises about Basic VLSM Calculation and addressing Design
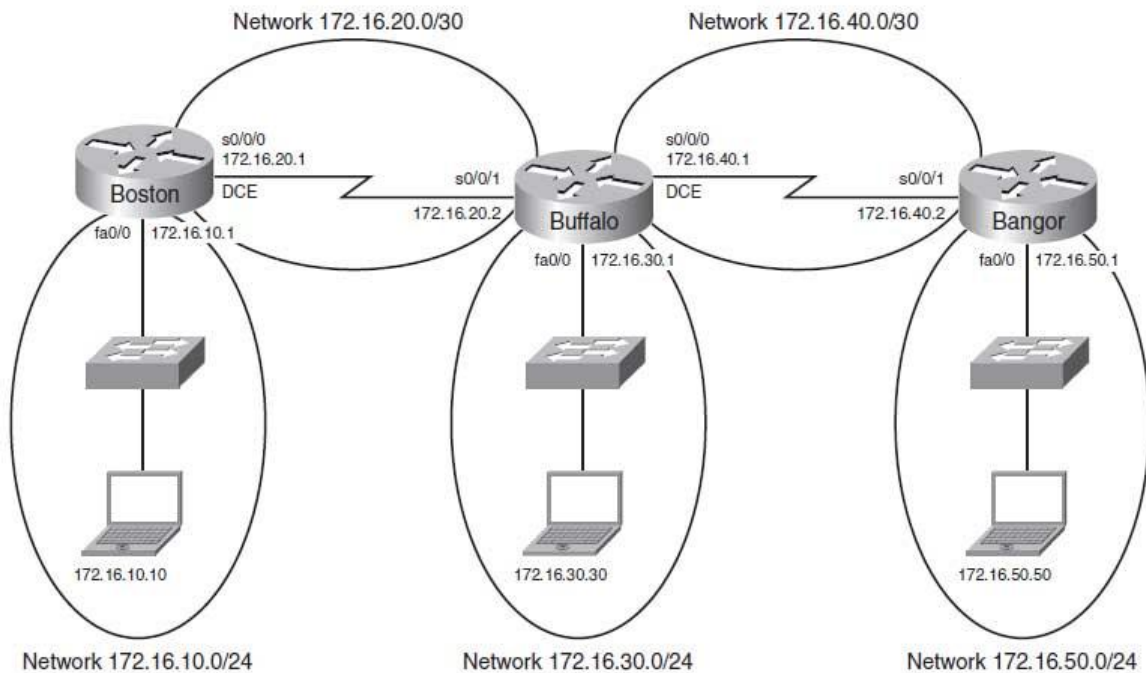
05th July 2012 Static

Static Routing

Static Routing are very common and do not require the same amount of processing and overhead as we will see with dynamic routing protocols.

For this chapter have the simple Topology about static routing for practice

Figure 7-6   Network Topology for Static Route Configuration


```
Boston>en
Boston#conf t
Boston(config)#int f0/0
Boston(config-if)ip add 172.16.10.1 255.255.255.0
Buffalo(config-f)#no shut
Boston(config-if)exit
Boston(config)#int s0/0/0
Boston(config-if)#ip add 172.16.20.1 255.255.255.252
Boston(config-if)#clock rate 64000
Boston(config-f)#no shut
Boston(config-f)#exit
Boston(config)#ip route 172.16.30.0 255.255.255.0 172.16.20.2
```

Boston(config)#ip route 172.16.40.0 255.255.255.0 172.16.20.252
Boston(config)#ip route 172.16.50.0 255.255.255.0 172.16.20.2

Buffalo>en
Buffalo#conf t
Buffalo(config)#int f0/0
Buffalo(config-if)ip add 172.16.30.1 255.255.255.0
Buffalo(config-f)#no shut
Buffalo(config-if)exit
Buffalo(config)#int s0/0/1
Buffalo(config-if)#ip add 172.16.20.2 255.255.255.252
Buffalo(config-f)#no shut
Buffalo(config-f)#exit
Buffalo (config)#int s0/0/0
Buffalo (config-if)#ip add 172.16.40.1 255.255.255.252
Buffalo(config-if)#clock rate 64000
Buffalo(config-f)#no shut
Buffalo(config)#ip route 172.16.10.0 255.255.255.0 172.16.10.1
Buffalo(config)#ip route 172.16.50.0 255.255.255.0 172.16.50.2

Bangor>en
Bangor#conf t
Bangor(config)#int f0/0
Bangor(config-if)ip add 172.16.50.1 255.255.255.0
Bangor(config-f)#no shut
Bangor(config-if)exit
Bangor(config)#int s0/0/1
Bangor(config-if)#ip add 172.16.40.2 255.255.255.252
Bangor(config-f)#no shut
Bangor(config-f)#exit
Bangor(config)#ip route 172.16.10.0 255.255.255.0 172.16.40.1
Bangor(config)#ip route 172.16.20.0 255.255.255.252 172.16.40.1
Bangor(config)#ip route 172.16.30.0 255.255.255.0 172.16.40.1

The clock rate commend is use only on a serial interface

06th July 2012 Static

Distance Vector Routing Protocols

Distance Vector routing protocols use frequent broadcasts (255.255.255.255 or FF:FF:FF:FF) of their entire routing table every 30 sec. on all their interfaces in order to communicate with their neighbours. The bigger the routing tables, the more broadcasts. This methodology limits significantly the size of network on which Distance Vector can be used.

Link State Routing Protocols

+Link State Routing protocols are also known as Shortest Path First protocols

+Summarizing the link state process

      -Routers 1ST learn of directly connected networks

      -Routers then say "hello" to neighbors

      -Routers then build link state packets

      -Routers then flood LSPs to all neighbors

      -Routers use LSP database to build a network topology map & calculate the best path to each destination

+Link

   -An interface on the router

+Link State

      -Information about an interface such as

            -IP address

            -Subnet mask

            -Type of network

            -Cost associated with link

            -Neighboring routers on the link

+Link State Packets

      -After initial flooding, additional LSP are sent out when a change in topology occurs

+Examples of link state routing protocols

      -Open shortest path first

      -IS-IS

Interior and Exterior Gateway Protocols

IGP

An IGP (Interior Gateway Protocol) is a protocol for exchanging routing information between gateways (hosts with routers) within an autonomous network (for example, a system of corporate local area networks). The routing information can then be used by the Internet Protocol (IP) or other network protocols to specify how to route transmissions.

EGP

Exterior Gateway Protocol (EGP) is a protocol for exchanging routing information between two neighbor gateway hosts (each with its own router) in a network of autonomous systems. EGP is commonly used between hosts on the Internet to exchange routing table information. The routing table contains a list of known routers, the addresses they can reach, and a cost metric associated with the path to each router so that the best available route is chosen. Each router polls its neighbor at intervals between 120 to 480 seconds and the neighbor responds by sending its complete routing table. EGP-2 is the latest version of EGP.

OSPF

Open shortest Path First (OSPF) is a link-state routing protocol that was developed as a replacement for the distance vector routing protocol RIP. RIP was an acceptable routing protocol in the early days of networking and the internet, but its reliance on hop count as the only measure for choosing the best route quickly became unacceptable in larger networks that needed a more robust routing solution. OSPF is a classless routing protocol that uses the concept of areas for scalability. RFC 2328 defines the OSPF metric as an arbitrary value called cost.

We have studied about configuring OSPF: Mandatory Commands, Using wildcard masks with OSPF, Configuring OSPF: Optional commands, Verifying OSPF configuration, Troubleshooting OSPF and have configuration example: single area OSPF.