

Cisco Router Experimentation

By Dave Cappelli

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Test 1 - Initial Setup

For the first step, I wanted to learn how to connect to the router. To start this, I need to find out what software to use. All of the Cisco documents say that they use HyperTerminal, but I have also heard that Putty works well. HyperTerminal comes pre-installed on all Windows machines.

After locating the software I could hook up the router. At first I tried to do this using an ethernet cable attached to the routers console Ethernet port. I did this by using the following tutorials I found online:

http://www.petri.co.il/csc_how_to_use_hyperterminal_with_cisco_routers_and_switches.htm

and

http://www-tss.cisco.com/eservice/compass/common/tasks/task_console_port_connect.htm

After several failed attempts, I realized that I did not have the right cable to make the connection. The routers require the use of a rollover Ethernet cable in order to connect to the console. A rollover cable is where all of the wires in the cable are reversed in order. This means the 1st was now the 8th, 2nd now the 7th, and so on. In order to continue and get this router to work, I need to find or build a rollover ethernet cable.

Test 2 - Make Rollover Cable, Sync with HyperTerminal

After getting the materials and tools needed to make a rollover cable, I was able to continue working with the router. The first thing I needed to accomplish was to create a rollover cable so I could actually connect to the device. A rollover cable is when the leads in an Ethernet cable are the opposite on the different ends, meaning pin 1 becomes 8, 2 becomes 7, 3 becomes 6 and so on. To do this, I snipped one end of a standard Ethernet cable off and left the other end in tact. Next, I cut the coating on the snipped end down so that the eight wires were exposed. Then the trick was to get all of the wires aligned in the new order and attempt to slide them into a new Ethernet plug so I could crimp them down. Eventually I managed to do this. Then, using the VDV MultiMedia tester, I ensured it was wired in the correct manner.

Now that I thought I had the necessary cable to connect to the router, I can continue on with the experiments I was originally planning on. The first test I wanted to do was to attempt to connect

the router with HyperTerminal on my machine. This is the software that will allow me to do all of the necessary configuration and complete the rest of the labs.

The next trouble encountered occurred when trying to get my machine with HyperTerminal to recognize and connect to the router. For some reason I am not able to see or connect to the router at all. I am not sure what is causing this. It could be a problem with the rollover cable, the router, the software, or my machine. I will continue experimenting with this in order to get it to work.

Test 3 - Troubleshoot why connection is not occurring

For quite awhile I was trying everything I could possibly think of to connect to a router. I tried various cables, routers, and programs in order to get the command prompt to show up. We attempted to use Linux with a program called Minicom. We also tried to connect using an ethernet to serial adapter. This went on for a couple of weeks until Professor Matthews and I decided that we had to order a Serial to USB adapter and an Ethernet rollover to serial adapter in order to get this connection to occur.

When this Cisco console cable connection kit arrived, I was able to install an included driver for the adapter. Once this completed, I set everything up and made the connection. Finally, I was given the command prompt for the routers.

Test 4 - Command Line Functions and Configuration

To start working with the Cisco routers, I first looked in the CCNA Lab Companion book. Starting on page 109, there are some labs that only required you to be hooked up to one router. These labs were a good starting point to learn how to navigate through the layers and get a basic idea of how everything works.

After searching through these and experimenting on the routers, I moved on to some more in depth processes, mainly focusing on configuration. The following two sources I found to be very helpful for configuration. They do a good job of explaining how the commands are structured and how to use them.

<http://www.joshgentry.com/cisco/cisco.htm>

<http://www.tele.pitt.edu/~telelab/labs/General%20Lab%20Documentation/pdf/Generallab%20Documentation~Cisco%20Router%20Configuration%20Tutorial~08.20.05.pdf>

Using these tutorials, I was able to configure the ports on the routers in the ITL. The follow demonstrates what I accomplished:

Router C - Furthest from ITL Lab - Below Catalyst 5000

Hostname: Cisco_Router_C14865

Ethernet 1/1:

IP Address = 113.113.111.1

Subnet Mask = 255.255.255.0

Ethernet 1/2:

IP Address = 113.113.112.2 - - -02 was not accepted, overlaps with 1/1

Subnet Mask = 255.255.255.0

Serial 4/1:

IP Address = 113.112.111.1

Subnet Mask = 255.255.255.0

Fddi 0/0:

IP Address = 113.111.111.1

Subnet Mask = 255.255.255.0

To finish up the work I have been doing this semester, I would like to hook up at least three routers and get them all talking to each other.

Test 5 - 4 Router Configuration 4/29/2011

For the final experiment of the semester, I wanted to get the routers hooked up, configured, and operating together. To do this, I used the three large routers in the ITL with one of the Cisco 1604 routers.

To begin, I connected the power supplies to the routers and powered them all up. The initial configuration for these included giving each router a host-name. For this, I used the number that was on the asset tag on each router. Next, I used the FDDI cables to connect the three larger routers. The FDDI cables are connected from the PHY A port to the PHY B port on the next router. With the three large routers I could make a loop. The configuration for each of these was as follows:

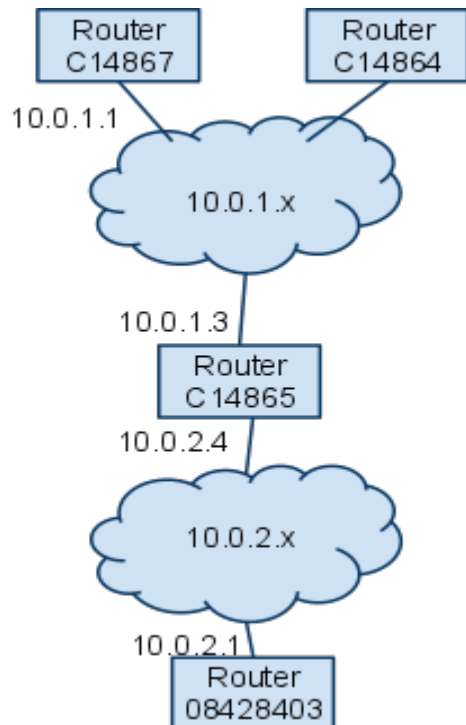
Router A (Closest to the ITL)	Router B	Router C (Closest to the COSI)
Hostname: C14867	Hostname: C14864	Hostname: C14865
Interface: fddi 3/0	Interface: fddi 0/0	Interface: fddi 0/0

IP Address: 10.0.1.1	IP Address: 10.0.1.2	IP Address: 10.0.1.3
Subnet Mask: 255.255.255.0	Subnet Mask: 255.255.255.0	Subnet Mask: 255.255.255.0

In order to program these, I used this site: <http://www.joshgentry.com/cisco/cisco.htm>. Once these three routers were connected, I attempted to ping each of the routers. This was successful. Knowing that the fddi cables I used were good, I labeled all of them as working for future use.

After this test, Professor Matthews and I decided to expand the topology to include another network by connecting the 1604 router via Ethernet. To do this, we needed a crossover Ethernet cable. I set the 1604 router up using its serial number as the host-name. Professor Matthews wired one of these up and labeled in properly. To show the configuration of the network we set up, I have included the following graphics:

Cisco 1604 Router Config
Hostname: 08428403
Interface: ethernet0
IP Address: 10.0.2.1
Subnet Mask: 255.255.255.0



As you can see from the above graphics, there are four routers configured in a two network topology. In order to get the networks talking to each other, each router had to be configured for RIP. To do this, you type the following:

```
>enable
>config
>router rip
>network 10.0.1.0
>network 10.0.2.0
```

This configuration will allow all of the routers to talk to each other. I was able to successfully program this on all but Router A, the one named C14867. For some unknown reason, this router did not recognize the “router rip” command.

After this was setup, all of the routers could ping each other, with the exception of C14867. This concluded the router test.

Everything was packed up and organized. All of the devices and cables were put in the cabinet in the back of the ITL.

Sources: Overview of Cisco Cabeling Connections and Techniques

<http://www.conserver.com/consoles/Cisco/ciscocons.html>

Cisco Documentation for Console Cabeling

http://www.cisco.com/en/US/products/hw/routers/ps332/products_tech_note09186a0080094ce6.shtml

Cisco Documentation for 1600 Router Console Connection

http://www.cisco.com/en/US/products/hw/routers/ps214/products_tech_note09186a00801f5d85.shtml?referring_site=smartnavRD

Wiki Page on Crossover Cables

http://en.wikipedia.org/wiki/Ethernet_crossover_cable

Wiki Page on Rollover Cables

http://en.wikipedia.org/wiki/Rollover_cable

Youtube Video on Cisco Console Cables

<http://www.youtube.com/watch?v=VIKB4tn6yXc>

Router Configuration Tutorial 1::

<http://www.joshgentry.com/cisco/cisco.htm>

Router Configuration Tutorial 2:

<http://www.tele.pitt.edu/~telelab/labs/General%20Lab%20Documentation/pdf/>

[GeneralLab%20Documentation~Cisco%20Router%20Configuration%20Tutorial~08.20.05.pdf](#)