

OSPF Lab

OSPF with redundant paths

KTHNOC/SUNET

February 13, 2004

This lab covers routing between four routers connected in a square topology. You will see how OSPF sends packets in different directions depending on accessibility.

When connecting the routers to each other, use the Serial interfaces on your router. Your Ethernet 0 interface should be plugged to your host. *Note! When connecting the serial cable between two routers, make sure that the DCE end of the cable is connected to the s0 interface.*

<p>Save the commands you commit in the router in your favourite text-editor (e.g. emacs, vi). By saving the configuration you can run the same commands several times with small modifications using the famous copy and paste technique between windows. Make sure you save your buffer regularly so you can recover from “disasters”.</p>

1 Router pairs

1. Connect the routers in pairs (using half the network topology handout). I.e. RTX1 to RTX2, RTX3 to RTX4. Don't forget which end of the cable is DCE/DTE.

Start OSPF on each router, and add all networks to your OSPF process. All networks should belong to the same area.

Checklist:

- Which area should your networks be assigned to?
 - Do `ping`, `traceroute` and `telnet` function on all interfaces?
 - Are the net interfaces correctly configured? (nb: netmask!)
 - What is the metric to your neighbours router-workstation network?
 - Study the router-LSAs in the link state database by entering the command `show ip ospf database router`. Describe what you see. How does it differ from the database you saw in the previous lab?
2. Turn OSPF's spf debug announcements on. Note: Connect to the router via `telnet`, and issue your commands there. Use the console for debug info. That way you won't be spammed with debug data. After turning on debugging, disconnect the serial cable between the routers.

Checklist:

- How long does it take the router's datalink layer to discover a link failure?
 - How long does it take OSPF to discover a link failure?
 - Which messages from the router does not belong to the debug print-outs?
 - What does the routing table say?
 - What does the link state database say?
3. Disconnect the console line. How long does it take before you notice anything?

2 Router quads

1. Connect the routers in a square, as specified in the network topology handout.

Checklist:

- Does `ping`, `traceroute` and `telnet` function on all interfaces?
 - Check whether the metric to exit each interface is correct.
 - Is the metric to each net correct?
 - Do all packets follow the same path when you do a traceroute from your router to the computer diagonal to you? What command do you use to see this?
 - Do all packets follow the same path when you do a traceroute from your computer to the computer diagonal to you? What command do you use to see this?
2. Study the Link State database on your router. How many LSAs are in your database? Discuss what each LSA contains with a lab partner.
 3. Turn OSPF's `spf debug announcements` on (if you've turned it off).

Checklist:

- How long does it take for the net to discover a link failure?
- How long does it take for the net to discover a link reparation?