Lab 2: IGP Routing
Or: Routing with static, default, and OSPF routes

What you will do:
1. Verify continuity of lab configurations from one week to the next
2. Determine how to use ping options to set the source address of the ICMP echo request
3. Configure and verify operation of single-area OSPF for IGP reachability
4. Capture all configs using your terminal program's logging facility
5. Submit configs to Blackboard

Things that you will need to know or learn:
1. Credentials for logging into the Nokia Edu labs (see previous lab)
2. Topology of the Nokia lab infrastructure (see previous lab)
3. CLI commands for configuring static / default routes; and OSPF routing
4. How to capture terminal output using the logging facility of your terminal emulator

What you need to submit and when:
1. Complete the "Lab 2 Pre-lab" exercise on Blackboard, **before** your lab period.
2. Complete the in-lab part of the exercise (see below), **before** the end of your lab period.
3. Complete the "Lab 2 Post-lab" exercise and quiz on Blackboard, by **11:59pm the day before** your next lab period. This consists of implementing multi-area OSPF (core = area 0; outer area = pod#).

Required Equipment:
- USB memory stick to save results for post-lab questions
- Hard-cover lab notebook, for reference during SBA at the end of the course.
- PC with internet access, Java, and terminal program; eg. Putty (Provided in T108)

In-Lab Marks:
[1 mark] Demo of end-to-end static & default routing across entire lab (incl system interfaces)
[1 mark] Demo of correct OSPF routing within your set of 3 routers (incl system i/f)
[1 mark] Demo of correct OSPF routing between upper & lower sides
[1 mark] Demo of correct OSPF routing across entire lab (incl system interfaces)
[1 mark] Submit complete router configs

The pre-lab is worth **20%**, the in-lab is worth **20%**, and the post-lab is worth **60%** of this lab, even though the number of points may not correspond to this weighting.

10% of your final mark is for labs done during the course of the semester.

References and Resources:
- ebook and eTextbooks to which you will gain access via your Nokia and Adobe accounts
- Topology diagram (see first lab)
- Command reference (see below)
- MySRLab: remote-access lab facility hosted at the Nokia Kanata campus

Addressing & Login Table

	Edu **Lab 1**	Edu **Lab 2**
R1	192.168.206.164	192.168.206.196
R2	192.168.206.165	192.168.206.197
R3	192.168.206.166	192.168.206.198
R4	192.168.206.167	192.168.206.199
R5	192.168.206.168	192.168.206.200
R6	192.168.206.169	192.168.206.201
R7	192.168.206.170	192.168.206.202
R8	192.168.206.171	192.168.206.203
R9	192.168.206.172	192.168.206.204
R10	192.168.206.173	192.168.206.205
R11	192.168.206.174	192.168.206.206
R12	192.168.206.175	192.168.206.207

Edu **Lab 1** Login	Passwd	Edu **Lab 2** Login	Passwd
src-otti**01**u1		src-otti**02**u1	
src-otti**01**u2		src-otti**02**u2	
src-otti**01**u3		src-otti**02**u3	
src-otti**01**u4		src-otti**02**u4	
src-otti**01**u5		src-otti**02**u5	
src-otti**01**u6		src-otti**02**u6	
src-otti**01**u7		src-otti**02**u7	
src-otti**01**u8		src-otti**02**u8	

See Blackboard for a list of passwords;
write **yours** in the space above.

Command Reference

configure • router • router-id <32-bit-ID>   # Let's use best practices! (Same as System i/f)
configure • router • ospf • area <area-id> • interface <int-name>

show • router • ospf • area <area-id> [detail]
show • router • ospf • status
show • router • ospf • interface [detail]
show • router • ospf • neighbor [detail]
show • router • ospf • database [detail]   # shows OSPF LSDB

Notes on the SR7750 CLI

- A good way of capturing the important configuration details for submission is:
  – get to the `configure • router` level, then use the command `info`
- At any point during configuration, you can go **directly** to the `show` command and enter as many commands as you like; afterwards, simply type `exit` to return to the exact configuration level where you left off.
- `admin display-config` captures the *entire* configuration, which is more than sufficient for submitting to Blackboard

Task 1: Verify continuity of lab configurations from one week to the next

Think about the configuration state at the end of last lab. Login to the routers in your pod and use the info and show commands to confirm that everything is as you left it: hostname, port states, interface addresses, and any static / default routes. Remember, the default routes were organized in a clockwise ring around the core.

Step 1.   Confirm proper operation of static and default routes across the entire lab network. You should be able to **reach any** address (including system interfaces) **from any** address. If necessary, work together as a group to get it all tested and working.

CHECK POINT #1 Be prepared with ping output on your screen to prove connectivity for each diagonal ie. R9-R12 and R10-R11.

Task 2: Configure and verify operation of single-area OSPF for IGP reachability

Step 1.   Remove all the static and default routes. (**How** can you confirm this is done?)
Step 2.   Complete the OSPF configuration for full reachability within your pod (ie. 3 routers)
Step 3.   Confirm proper operation of OSPF between upper and lower halves of your lab (ie. between pods 1 & 3, pods 2 & 4). Think about what you can test between just the pair of pods. Work together with the people in the adjacent pod to get it working.
Step 4.   Confirm proper operation of OSPF across the entire lab network. You should be able to **reach any** address (including system interfaces) **from any** address. Work together as a group to get it all tested and working.

Verify your configuration by pinging across all directly connected segments, then pinging to every other address in the topology.

CHECK POINT #2, #3, #4: Be prepared with ping output on your screen to prove connectivity for each of steps 2, 3, 4 above.

Task 3: Capture the configs for all your assigned routers

Using the logging facilities of your terminal program, capture the result of displaying each router's configuration. Save this to disk and *also* to an external drive (USB stick or other). Submit it to Blackboard. Remember to assign a hostname (use a format of *RouterNumber-AlgNetID* eg. R1-ande0001) !

Task 4: (Time permitting) OSPF multi-area configuration

Get a head start on the post-lab activity by implementing multi-area OSPF, as noted on the first page.