

The following notes for the NET3012-IP Architectures and Solutions course are based on the Nokia MPLS (p/n 3HE02276AA) and Nokia Services Architecture (p/n 3HE02277AA) courses from the Nokia Service Routing Certification Program curriculum. These are copyrighted products of Nokia.

Lab 1: Introduction to the Nokia SR7750 CLI

Or: Cards, MDAs, Interfaces, and static routing

What you will do:

1. Use the Aventail remote access VPN, connect to the lab equipment.
2. Investigate CLI basics for the SR7750 family of devices and naming conventions.
3. Learn important basic commands for configuring the installed cards & modules.
4. Configure hostname, system and hardware interface addresses, and static routes.
5. Capture all configs using your terminal program's logging facility.
6. Save configs

Things that you will need to know or learn:

1. Current Aventail credentials for In-lab sessions
2. Topology of the Nokia lab infrastructure (see next page)
3. CLI commands for configuring interfaces and static routing

What you need to submit and when:

1. Complete the pre-lab (Nokia account creation), **before** the start of **your next lab** period.
2. Complete the in-lab part of the exercise (see below), **before** the **end of this lab** period.
3. Complete the "Lab 1 Post-lab" exercise on BrightSpace, **before** the assigned due date.

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.~~
- Computer running MS-Win 7, 8, or 10 (either natively or in a VM) with internet access, Internet Explorer or Java, and a terminal program; eg. Putty (Provided by you)

Marks:

Each of the lab parts identified above are weighted equally, even though they may have a different number of points assigned to them.

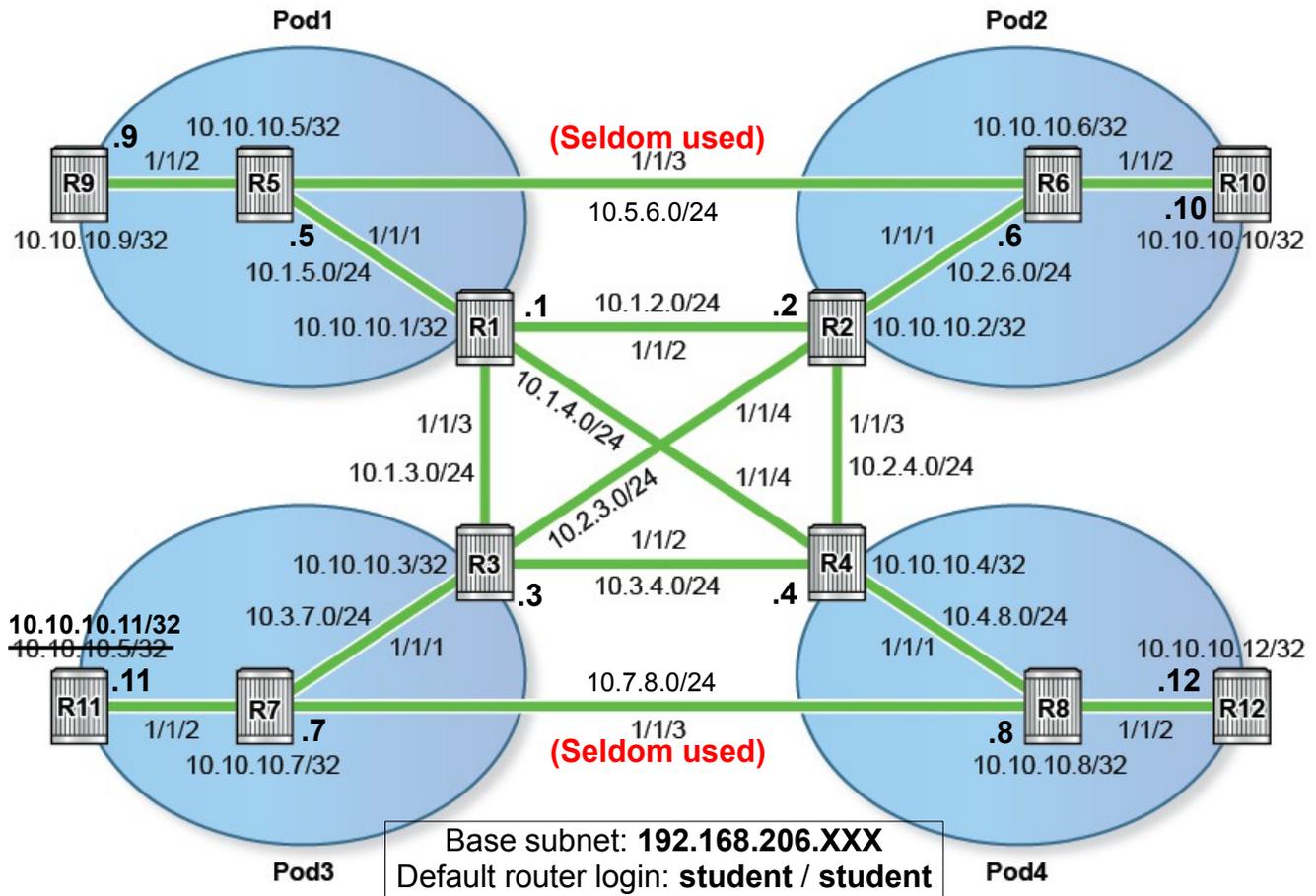
40% (Percentage TBA) of your final mark is for labs done during the course of the semester.

References and Resources:

- **putty** a terminal program for MS-Windows (other terminal programs can also work):
32-bit version: <https://the.earth.li/~sgtatham/putty/latest/w32/putty.exe>
64-bit version: <https://the.earth.li/~sgtatham/putty/latest/w64/putty.exe>
- Emails sent to your Algonquin college email address during the first two weeks of Jan
- ebook to which you will gain access via Adobe reader and FileOpen
- Topology diagram (next page)
- Command reference (see next page)
- MyNetworkLab: remote-access lab facility hosted at Nokia's Kanata campus

Topology

This is the full network *topology* available to us during weekly labs for the rest of the semester. We will use **Telnet** to access the devices. Understanding the rationale behind the cabling and addressing makes it much easier to remember all the values. You should become very familiar with this topology (ie. memorize it!) so that you don't need to constantly flip back to it!



Addressing & Login Table

	Edu Lab 1	Edu Lab 2
R1	.164	.196
R2	.165	.197
R3	.166	.198
R4	.167	.199
R5	.168	.200
R6	.169	.201
R7	.170	.202
R8	.171	.203
R9	.172	.204
R10	.173	.205
R11	.174	.206
R12	.175	.207

	My specific login information
EDU Lab # (1, 2)	
Individual login ID	
Corresponding password	

See BrightSpace for a list of login IDs and passwords; write **yours** in the space above.

Command Reference

configure • system • name {name} # MUST use format "Rx-yourNetworkID"
configure • system • login-control • idle-timeout 180

show card
configure • card {#} • card-type {card-type-from-show-command} # could be "iom3-xp"

show mda
configure • card {#} • mda {#} mda-type {mda-name} # could be "m10-1gb-xp-sfp"

configure • router • interface **system** • address {address}
configure • router • interface {name} • address {address}
configure • router • interface {name} • loopback
configure • router • interface {name} • port {port}

configure • router • static-route {remote network /mask} next-hop {next-hop-address}

configure • port 1/1/X • no shutdown
configure • port 1/1/X • shutdown

pwc
tree
exit
back
info [detail]
admin • display-config
show • router • interface
show • router • route-table
show • router • static-route

trace {ip address}
ping {ip address}

environment • no more # Enable/disable pagination of output text
admin • save
history
logout

Notes on the SR7750 CLI

- Help is available by using the "?" key
- Command completion **always** occurs whenever you hit the spacebar
- You have the choice of typing a complete, entire command on a single line, or entering deeper sub-levels (context) and providing addition detail (eg. like Cisco)
- `show run sucks`; now the `info` command shows you *only* what you've configured; `info detail` shows you all the config (ie. Including defaults); both versions give you configuration for the current context and below (no extra junk!)
- `admin display-config` is similar to `info`, except that it displays the entire configuration from the root level
- You have a choice of typing a complete, entire `show` command on a single line; or entering deeper sub-levels and providing additional specifiers for what you'd like.
- `tree` gives you a complete listing of all available commands from the current context

Please IGNORE and work through any warnings about expired certificates when connecting to the website during the 1st week.

Task 1: FIRST Time Connect to an Edu Lab via Dell / Aventail VPN

Required resources:

- a role & login credentials, as designated by the lab Professor
- the password, as retrieved from BrightSpace

Step 1. Review the lecture notes to gain familiarity with the process (Wk01Day1 ~page 9)

Step 2. Download the list of passwords from BrightSpace (under Assignments / Labs)

Step 3. What OS are you using? If you're using MS-Win 8-10, go back to BrightSpace and grab the file(s) under: "IMPORTANT: Procedure for installing Aventail on Win8-10" Carefully read and follow the instructions in: "Win_8_10_Aventail_Install_v2.0.pdf" If you're using MS-Win 7 (real or virtual), you're ready for the next step.

Step 4. Try using **Internet Explorer** before other browsers; don't even bother with **Edge!** Open a browser window and navigate to: <https://learningserviceslabs.nokia.com> (or if problems: <https://training-ottawa1.alcatel-lucent.com>)

Step 5. Be prepared to *fight* your way through the installation of the Dell/Aventail VPN in the next step, especially if you are using MS-Win 10. You will need to logout of the VPN, close/re-open the browser multiple (3-4) times, and possibly reboot for good measure!

Step 6. For the **service**, type "student" (or "training") Next, use your assigned login & password, and continue through the documented sequence in Wk01Day1 notes, until you see the window identifying **Access: Full Network Access** .

Step 7. If you don't have any luck with Internet Explorer, you could try Chrome and then Firefox. For both these browsers, you will need to have a recent version of Java installed.

Step 8. Refer to the Addressing & Login Table (see above), then use Putty (or similar) to connect via Telnet (**not SSH!**) to your designated routers.

CHECK POINT #1: If there's more than 15 mins left in the lab period, continue with the next task. If not, ask the lab Professor to verify your connectivity.

Task 2: Confirm that the hardware is properly registered

Required resources

- "show card" and "show mda" commands

Step 1. Confirm that the line IOM line card #1 is Up/Up using the "show card" command. If not, configure it using the commands given in the reference. (Sample output below.)

```
=====
Card Summary
=====
```

Slot	Provisioned Card-type	Equipped Card-type	Admin State	Operational State
1	iom3-xp	iom3-xp	up	up
A	sfm-400g	sfm-400g	up	up/active
B	sfm-400g		up	down/standby

```
=====
```

Step 2. Confirm that the **first** MDA on card 1 is Up/Up using the "show mda" command. If not, configure it using the commands given in the reference. (Sample output below.)

```

=====
MDA Summary
=====
Slot  Mda      Provisioned      Equipped      Admin      Operational
      Mda-type      Mda-type      Mda-type      State      State
-----
1      1      m10-1gb-xp-sfp  m10-1gb-xp-sfp  up      up
      2      m10-1gb-xp-sfp  m10-1gb-xp-sfp  up      unprovisioned
=====

```

CHECK POINT #2: If there's more than 30 mins left in the lab period, continue with the next task. If not, ask the lab Professor to verify your configuration of the hardware.

Task 3: Configure hostname, system & other interface addresses, and static routes

Use your general knowledge of network configuration, together with the command reference provided above, to configure a basic network setup for *full reachability*.

- Core routers (R1-R4) should have a default route pointing to the **next router clockwise** as well as specific routes to associated PE and CE routers.
- PE routers (R5-R8) should have a default route to the core router as well as specific routes to the CE routers.
- CE routers (R9-12) should have a default route to the PE router.

Verify your configuration by pinging across all directly connected segments, then pinging to every other address in the topology. You should have *full network reachability*.

CHECK POINT #3: Ask the lab Professor to verify your configuration of routing. If there's more than 15 mins left in the lab period, continue with the next task.

Task 4: Capture the configs for all your assigned routers

Did you remember to assign a hostname? (use a format of *RouterNumber-AlgNetID* eg. R1-ande0001) If not, do it now.

Using the logging facilities of your terminal program, capture the result of displaying each routers configuration. Save this to disk and *also* to an external drive (USB stick or other). **Submit it to BrightSpace.**

Help any of your classmates who haven't yet succeeded in getting all the network configuration complete.

Accounts and Passwords

NB When required, you must supply your **Algonquin** email address to ensure consistency between Nokia systems, as well as with Adobe ID & DRM.

1. FileOpen account for use with Adobe reader (e.g. one-time-only use, *per device*)
 - For unlocking of Nokia MPLS + SA courseware
2. Support account for Nokia website:
 - Required to make for weekly bookings for MyNetworkLab (for **all** post-lab exercises)
 - You **must** use your **Algonquin email**
 - Login ID is your email address + a chosen password
(password rules: 8 char min, 1+ alpha characters; 1+ non-alphanumeric chars)
3. MyNetworkLab account
 - Login ID and password assigned to you; neither can be changed; received by email
4. Aventail Service identifier for In-lab access (ie. regular weekly In-lab period)
 - every week: **student** (or **training** if using <https://training-ottawa1.alcatel-lucent.com>)
5. Aventail account credentials for In-lab access (available on BrightSpace)
 - One acct+psswd per "role" (e.g. **aca001-37917**); stays the same for the semester
6. Credentials for router access during lab periods
 - always **student / student**
7. FTP account for saving, checking, restoring config files during In-lab access
 - **edu1 / dEEtgx2Y, edu2 / dEEtgx2Y, or edu3 / dEEtgx2Y ...**
~~mkdir: file md ftp://edu1:dEEtgx2Y@192.168.181.81/Rxx/ande0001~~
save: admin save ftp://edu1:dEEtgx2Y@192.168.181.81/Rxx/ande0001-L1.cfg
check: file dir ftp://edu1:dEEtgx2Y@192.168.181.81/Rxx/
restore: exec ftp://edu1:dEEtgx2Y@192.168.181.81/Rxx/ande0001-L1.cfg
8. Aventail Service identifier for MyNetworkLab access (other than In-lab period)
 - always **mynetworklab**
9. Aventail account credentials for MyNetworkLab access (other than In-lab period), i.e. for weekly post-lab work:
 - New **numeric** login ID and password for every booking; sent by email
10. Credentials for router access in MySRLab (other than In-lab period)
 - always **student / student**
11. FTP account for saving, checking, and restoring config files during MySRLab access (for non-inlab sessions) (Note: DNS for mysrlab = 192.168.181.90) **Ry = R1, R2, R3, ...**
 - same as #4 above (eg. your individual, assigned MyNetworkLAB login + password)
~~mkdir: file md ftp://{login}:{pswd}@mysrlab/STD/Ry/L2-OSPF~~
save: admin save ftp://{login}:{pswd}@mysrlab/STD/Ry/L2-OSPF.cfg
check: file dir ftp://{login}:{pswd}@mysrlab/STD/Ry/
restore: exec ftp://{login}:{pswd}@mysrlab/STD/Ry/L2-OSPF.cfg

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