

LAB SESSION WEEK 6 – TUTORIAL NOTES

GENERAL INFORMATION

Group Lab Activity 2 today

- Not necessarily same groups as last week
- Send group preferences via private message (if any)
- Need some time to finish Activity 1? → request to be placed in a Breakout session

Next Week is mid-semester break (non-teaching period)

- Use it to do revision for your upcoming assessments
- Several new revision resources in Echo360
- Discussions will be monitored during the break, use them for revision/questions/comments

Friday Week 7 is a Public Holiday – labs will not run ☹

- Wednesday Labs will still run
- Work on ***Karina's Sample Mid-Sem Skills Exam*** in your own time
Note: found on the lab session page and the Online Mid-Sem Skills page (show)
- Watch the [Mid-Sem Skills Demo](#) in Echo360 (Other Teaching Material folder)
- Use the discussion boards for questions/comments (or email your instructor)
- I might run an additional Q&A session for Mid-sem Skills revision (to be announced)
- The holiday does not change Group Lab Activity 2 submission date.

VLSM Test 1 on Week 7 (week after mid-semester break)

Summary revision resource list in the [VLSM discussion board](#)

Mid-Sem Skills Assessment in Week 8

Packet Tracer based and Online (during your lab session)

[Packet Tracer Demo](#) available in Echo360

[VLAN vs. Int VLAN Demo](#) in Echo360

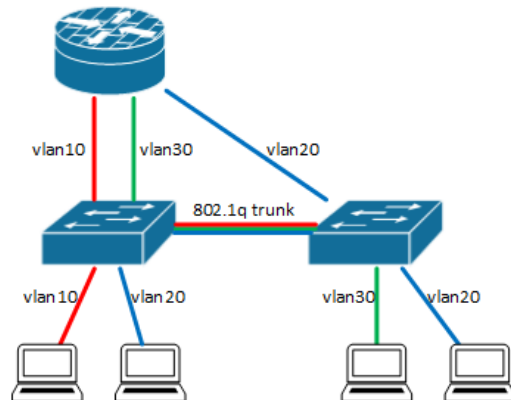
[Mid-Sem Skills Demo](#) in Echo360

Mid-Sem Skills Discussion coming soon!

TUTORIAL

Review from last week

1. Inter-VLAN routing → per-interface and router-on-a-stick approach
2. Per-interface:

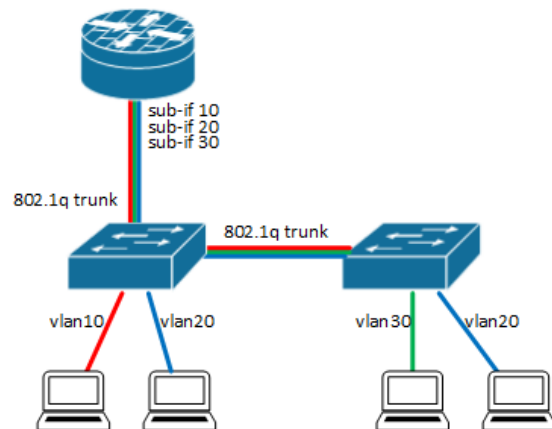


One router interface per VLAN (not scalable)

Directly connected networks into the routing table when configuring IP addresses to the router interfaces

Hosts send traffic to the router interface for their VLAN – i.e. their default gateway – to communicate with hosts in other VLANs

3. Router-on-a-stick:



One sub-interface per VLAN

802.1q between one interface router and a switch to carry all VLANs from the switches to the router

Directly connected networks into the routing table when configuring IP addresses to the router sub-interfaces

Hosts send traffic to the router sub-interface for their VLAN – i.e. their default gateway – to communicate with hosts in other VLANs

4. Switches MUST be configured with a default gateway too ← you are not given explicit instructions on this

In lab 5b, when changing the Mgmt. IP, you also needed to change the default gateway

5. You also learnt how to configure a loopback interface → “always-on” interface to simulate a network outside your switched network

6. Some sh commands

sh ip int brief

sh vlan brief

sh int trunk

sh ip route

Troubleshooting

1. Validate layer 1:

- All cables in place and interconnecting the right ports (in exam conditions you won't be able to walk up to the rack)
- **sh ip int brief** → check connected port status is **up**
- Status not up?

Disabled port (in which case status is **administratively down** in the sh ip int brief output)

The other end is disconnected or admin down.

Error disabled port → do **show interface <if_id>** for more details

If error disabled → **show port-security interface <if_id>** command → identify if in violation, and fix accordingly

2. Validate layer 2:

- **sh ip int brief** → check connected port protocol (second column) is **up**
If Ethernet is unlikely to be down when status is up, but if it is status up and protocol down, change the cable
- **sh vlan brief** → check vlan membership to validate hosts are connected to access ports for their corresponding vlan
- **sh int trunk** → check inter-switch and router-to-switch interfaces are in the trunking state
- **sh run (on router)** → validate encapsulation command on your subif

3. Validate layer 3:

- **sh ip int brief**
- **sh run** or **sh ip default-gateway?** On switches to validate that you have a default gateway.
- **sh ip route** on router

There must be one C entry for each VLAN and for each loopback interface

Check the exit interface for each network is as expected

If a route is missing → Layer 1 troubleshooting to validate the status of the corresponding router interface or sub-interface
Check the right IP address has been configured on the router interface (as this will be the default gateway for your VLAN)

- **ping** tests:

Ping the default gateway IP from each computer (when available) and from the switches

Ping the router loopback IP from each computer and from the switches

Ping all router IPs from the switches.

Overall review

1. Global tasks

Hostname

Banner motd

Line console configuration

Line vty configuration

Passwords → enable, console and line vty

Username/password entries → when using login local on console or line vty

Enable SSH (first have to set hostname, FQDN and generate rsa keys).

Logging synchronous

Disable ip domain name lookup

2. 802.1q tasks

Create and name VLANs

Configure VLAN membership → access ports

Configure 802.1q trunks → remember if from switch to router, switch must be explicitly on

Configure router sub-interfaces to send/receive dot1q tagged frames

3. Layer 3 and inter-VLAN routing tasks

Configure interface VLAN on a switch with the management IP

Configure default gateway for a switch

Configure router interfaces, sub-interfaces and loopback interfaces with their respective IPs

Configure IPv4 settings on a PC (including the default gateway)

4. Show commands:

sh run

sh startup-config

sh ip int brief

sh interface <if_id>

sh vlan brief

sh vlan id <vlan_id>

sh int trunk

sh ip route

ping tests

5. Switchport port-security tasks

Enable port-security on a port

Change violation action

Change max. MAC address allowed

Allow specific MAC addresses and/or set up sticky mode

Check >> sh port-security interface <if_id>