

Group Project- A Home Network Design and Connectivity

Troubleshooting Simulation

Objectives

- Design and correctly assign IP addresses using CIDR notation to network device interfaces.
- Build a home network in Packet Tracer emulator in the Logical Workspace and connect the network to the Internet to access Internet - External web servers.
- Configure a remote DNS server.
- Configure the Home wireless router to assign dynamic IP addresses to its local devices using DHCP and connect the home network to WAN through the Internet Service Provider (ISP) router.
- Configure a wireless router to secure the communication with local network wireless devices.
- Configure a File server to share files in the local network.
- Implement a routing protocol to route the traffic to the external network
- Verify network configuration and Internet connectivity.
- Troubleshoot network connectivity and access to Web servers.

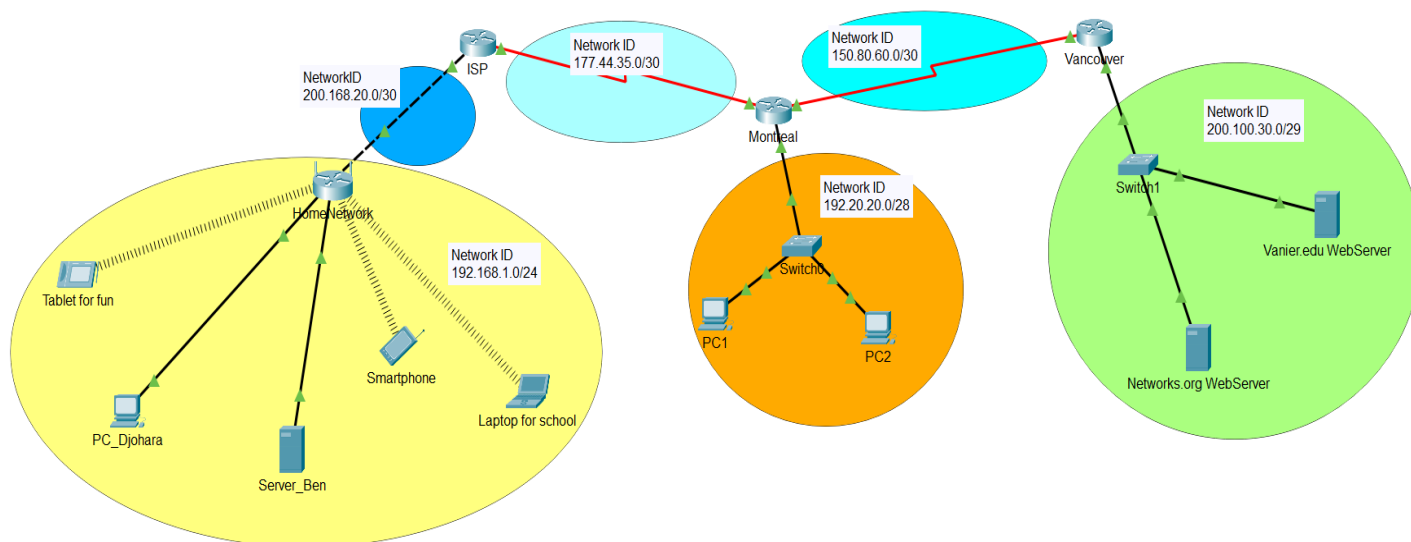
Instructions

To do the following tasks you need to refer to Lab7 and Lab8 to review the steps done in class.

Task 1: Create the Network topology in the Logical Workspace. (5%)

In this task, you need first to build the network topology. Start by adding network end devices and routing devices. Use the model 2901 for the WAN network backbone (ISP, Montreal, and Vancouver routers). The home router is a wireless router to be configured later in Task 2.

- Change the display name of all devices as shown by the figure below.
- Change the display name of PC0 in the yellow network to **PC<yourFirstName>** and Server0 to **Server<yourLastName>**.
- Change the display name of the two PCs in the orange network to **PC<Firstname>** and **PC<LastName>** of the second student in the group.



- At this step, add only the physical cabling and proceed to the IP address calculation for each networking interface:
 - Given the Network ID for each network segment, design the IP addressing scheme. Start by determining the range of IP addresses to be assigned to hosts in each network. Include the IP address to assign to each device interface as a **label** on the network topology. This information will be used in the IP configuration step -Task2.
 - Report in a document, all the steps involved in the IP address calculation given the network ID (refer to assign4).
 - Take a snip of the network as created on Packet Tracer showing the IP addressing scheme (labels). Insert the snip in the report. Name the report – **Network addressing scheme Report**

Task2- Implementation

(10%)

Step1- Configure the Wireless Router

The server **Vanier.edu** Web server is also a **DNS server**. Use its static IP address to complete the configuration of the wireless router.

We also want to use the **DHCP** to assign dynamically IP addresses starting from IP address **192.168.1.5** for a maximum of **15** devices

- Follow the same steps as done in class to complete the **Internet Setup** and the **Local Network Setup** of the wireless router.
- For the **Wireless Authentication**, choose **WPA2 Personal** as the security mode, Encryption **AES** and provide a **passphrase** of your choice.

Step2- Configure the Wireless Devices

Configure the wireless end devices – Tablet for fun, smartphone, and Laptop for school to receive the **Secure** wireless connection.

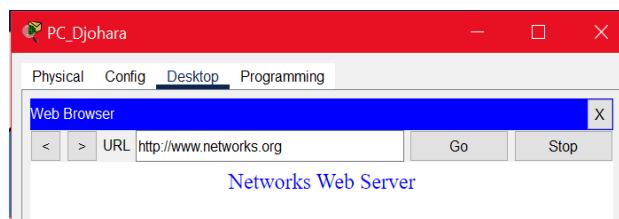
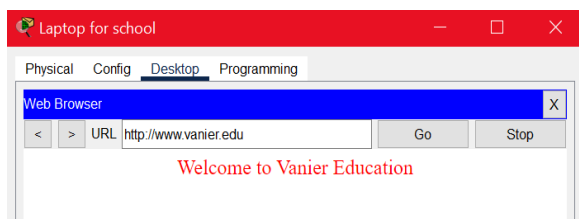
Step3- IP Configuration

- Use the IP address scheme from Task1 and configure all network interfaces.
 - All end-devices in the **192.168.1.0/24** network except the local server should be configured to receive **DHCP-IP address**. You should see a successful DHCP request message and the right DNS server assigned.
 - The two PCs in the Orange network have a static IP address and use the same DNS server as the Wireless router.
 - After the correct IP configuration of all network interfaces, the network links should all turn to green.**

Take a snip of the final network in a Packet Tracer window.

Step4 – Servers' Configuration- All servers should have a static IP address.

- We want to have a file server in the local network (Home network-yellow segment). Configure the **FTP service** on the device to be the only service and add **two users** with the **Read/Write** permissions only. The username should reflect each student **First Name**.
- Vanier.edu server is a **DNS server** to resolve the FQDN of the two web servers to their IP addresses.
- Each device in the Yellow and the Orange networks should be able to access the two web servers. Configure the **Networks.org** server and the **Vanier.edu** server each to display a customized web page.



Step5: Configure the Routing Protocol

The dynamic routing is more performant in real-life scenario. We will use the Rip routing protocol where each router should advertise the networks propagated from their interfaces.

Configure each router to use **RIP** as the Routing protocol and add the routes (Network IDs) connected to it. Note that the network you entered will be super-netted by the protocol. Please refer to Lab7-Task4 or Lab 8 to correctly configure the WAN backbone.

Step 6: Troubleshoot Network Connectivity

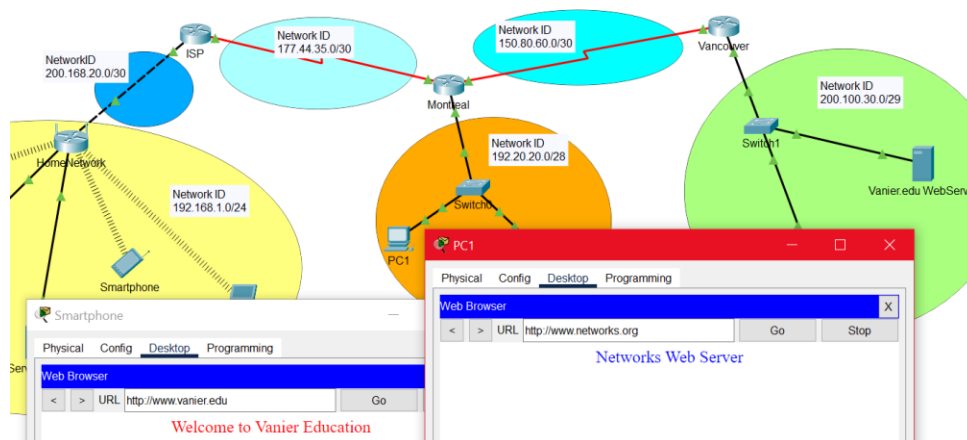
We want all end devices from the yellow and the orange zones to connect to the web servers in the green zone and all yellow network devices to be able to share files.

A- Local connectivity: You can use the simulator or the Desktop Command Prompt to check for network local connectivity. check if all devices can ping each other in the same network.

B- File sharing: A user can use any device from the local network (Home network) to **put** a file into the File server and share it with the second user from a different device.

C- Internet connectivity

All end devices (yellow and orange networks) should access the two web servers.



Deliverables:

Deliverable 1- Submit Task1-Report by **Friday, April 8 (5%)**.

Deliverable 2- Submit the following by **Friday, April 22**.

- Task2- The implementation of the project saved as a .pkt file **(10%)**.
- A report detailing each step involved in the project implementation (Task2). Document your test plans to troubleshoot the network connectivity, file server access, and Internet access to the Web servers **(5%)**.

Each group of 2 students should submit the same deliverables.