CSG 1105 / 5130 - Applied Communications

Week 7 & 8 Tutorial

Objectives

- To learn how to use the physical workspace in Packet Tracer
- To learn how to configure DHCP pools
- To learn how to configure VLANs
- To learn how to set port access by VLAN

By the end of this workshop you should be able to

- Make use of the physical workspace in Packet Tracer for organisation and WiFi communications
- Configure switches and routers to use VLANs and DHCP
- Perform subnet calculations to determine which mask to be used
- Configure the native VLAN
- Configure which VLANs have access on a port

Required Downloads

- Packet Tracer (Available from Unit Documents in Blackboard)
- Physical Topology (Found in Week 7 of Unit Schedule)

Optional Downloads

- A recording showing how to change the physical modules on your devices in Packet Tracer

Scenario

Wendigo Engineering have provided you with their final physical topology of their proposed network. It is up to you to create this network using this information. They have included in their topology the following information for you to implement:

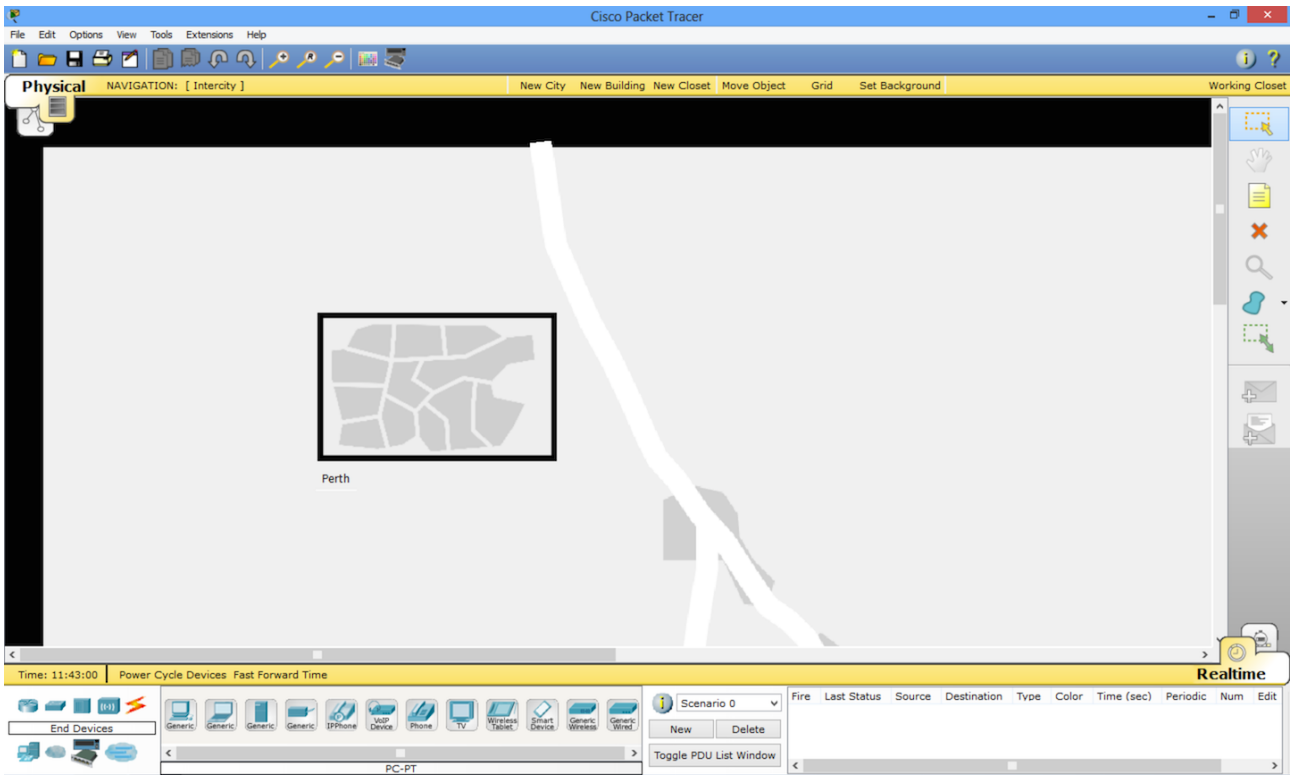
1. Physical Locations
2. Devices (Networking & Hosts)
3. Allocated Supernet (Week 8)
4. VLANs (Week 8)

It is up to you to implement all of the above and determine what subnetting is to be used from the original supernet provided. This means that you will need to work out what subnet mask should be used for the areas at hand, and they must all fall under the same supernet.

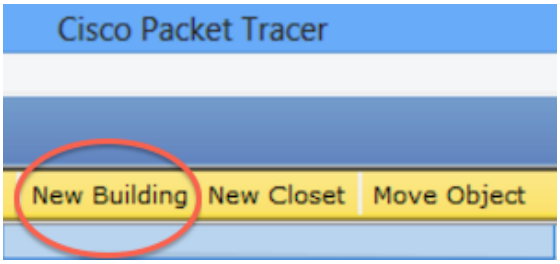
This tutorial will cover these steps so you can apply it to Assignment 2. *You will be equipped with all of the knowledge required over this tutorial document to be able to complete Assignment 2; you will not be instructed how to configure the Layer 3 Core Switch in Assignment 2 - that will require some personal research.*

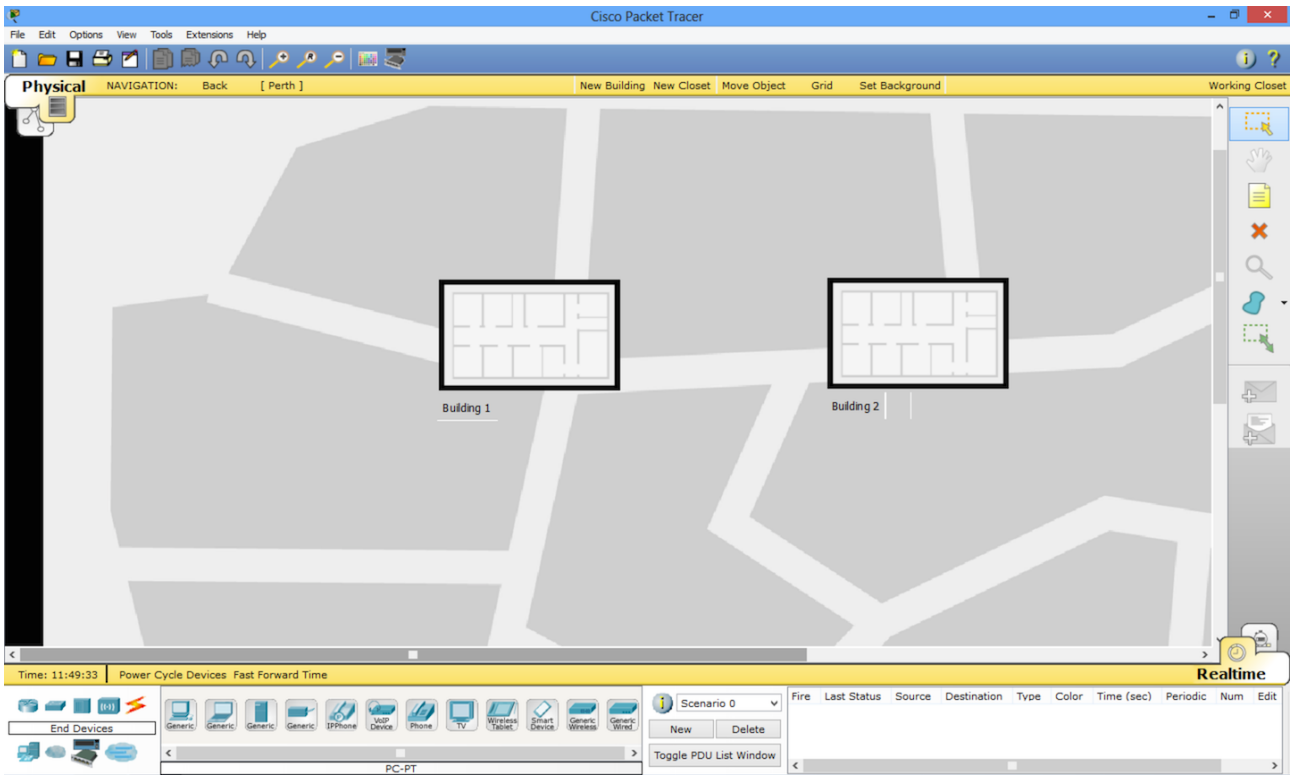
Task 1 - Navigating and Utilising the Physical Workspace
Firstly, to switch to the Physical Workspace you must select it as your active workspace - this is done by clicking on the Physical Workspace tab in the top left, just under where it says ‘Logical’.

Once in the Physical Workspace, the initial view we are in is called the ‘Intercity View’, you can immediately see that a City exists, by default it is called ‘Home City’. Let’s start by renaming this to whatever you wish, to rename it all you need to do is double-click the words ‘Home City’ and type in your desired name, I will call mine ‘Perth’.

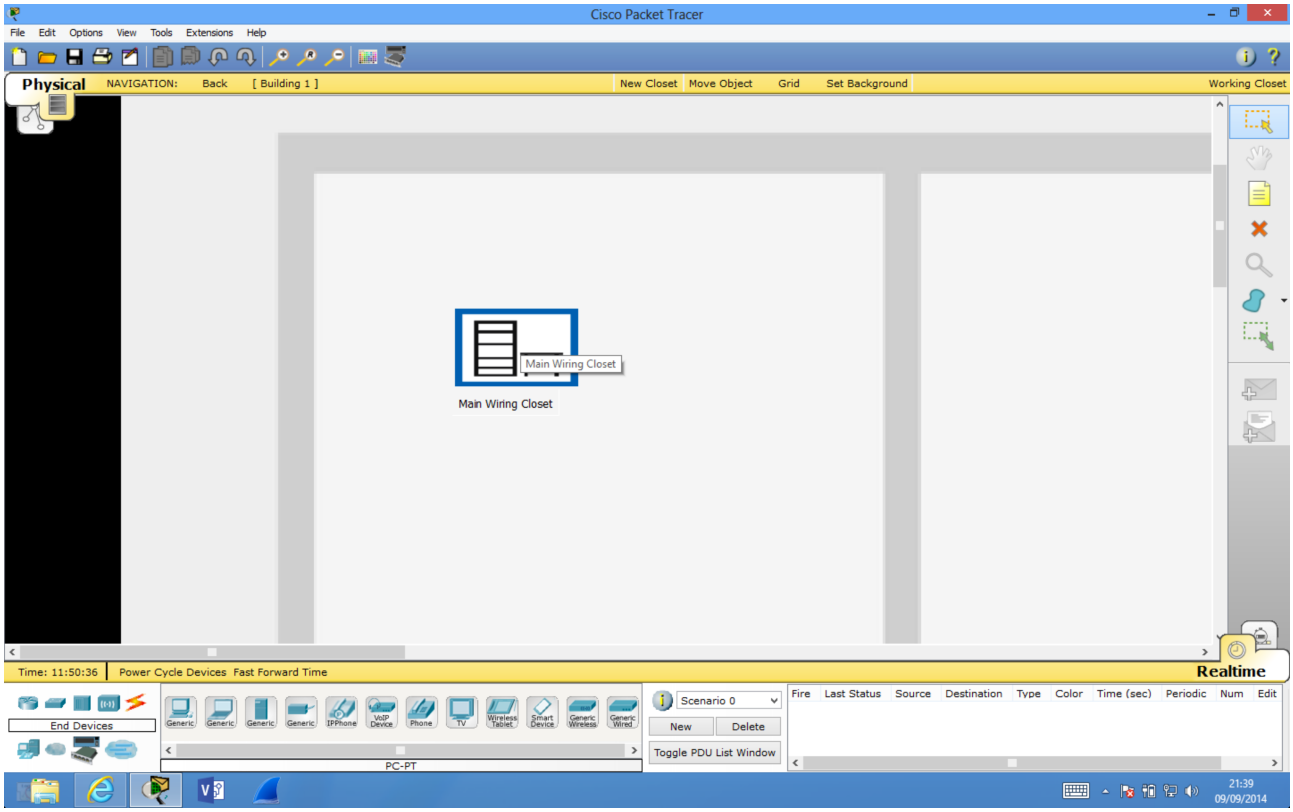


Now if we single click on the city it will take us into the ‘City View’. Here we can see we have a default building there called ‘Corporate Office’. Let’s make this our first building, I’ll rename it to ‘Building 1’. Once I’ve done that I will also add another building by clicking on the ‘New Building’ button (below) and renaming that to ‘Building 2’. You can see how this looks on the following page.



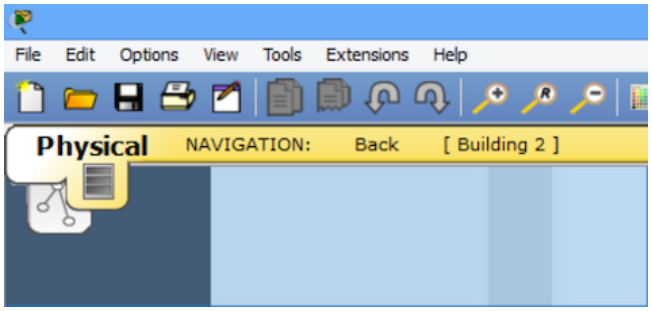


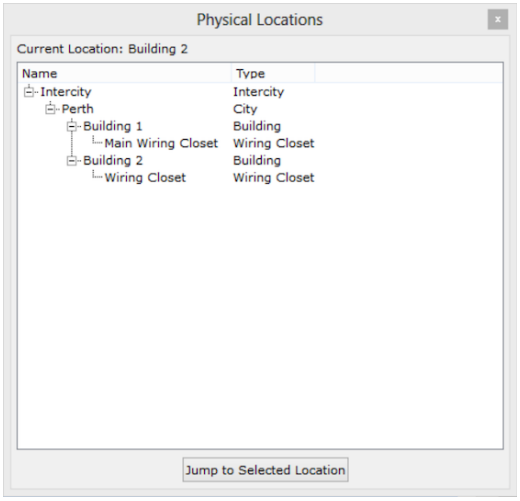
Now, we'll click on 'Building 1' to enter 'Building View' and we should see an icon called 'Main Wiring Closet'. This may be out of view so scroll around or zoom out to find it. (See below).



This is the default location that all of our hardware we place in the Logical Workspace will be stored in. There is no way to place the hardware in this view, but we can move between our Wiring Closets, let's go back to the City View and enter 'Building 2' and we'll create it's Wiring Closet by clicking on New Closet, similar to how we created the new building.

At any point you can always click the ‘Back’ button to go to the previous view. You can also click on the ‘NAVIGATION:’ button to show a tree-list of our locations we can jump to.





Now that we have our physical locations set up in the Physical Workspace, let’s go back to the Logical Workspace and begin creating the network given to us in the topology provided by Wendigo Engineering.

Task 2 - Building the Network
Take a look at the topology provided this week. You will notice that the icons in use are quite different. I will name the icons below:


Switch

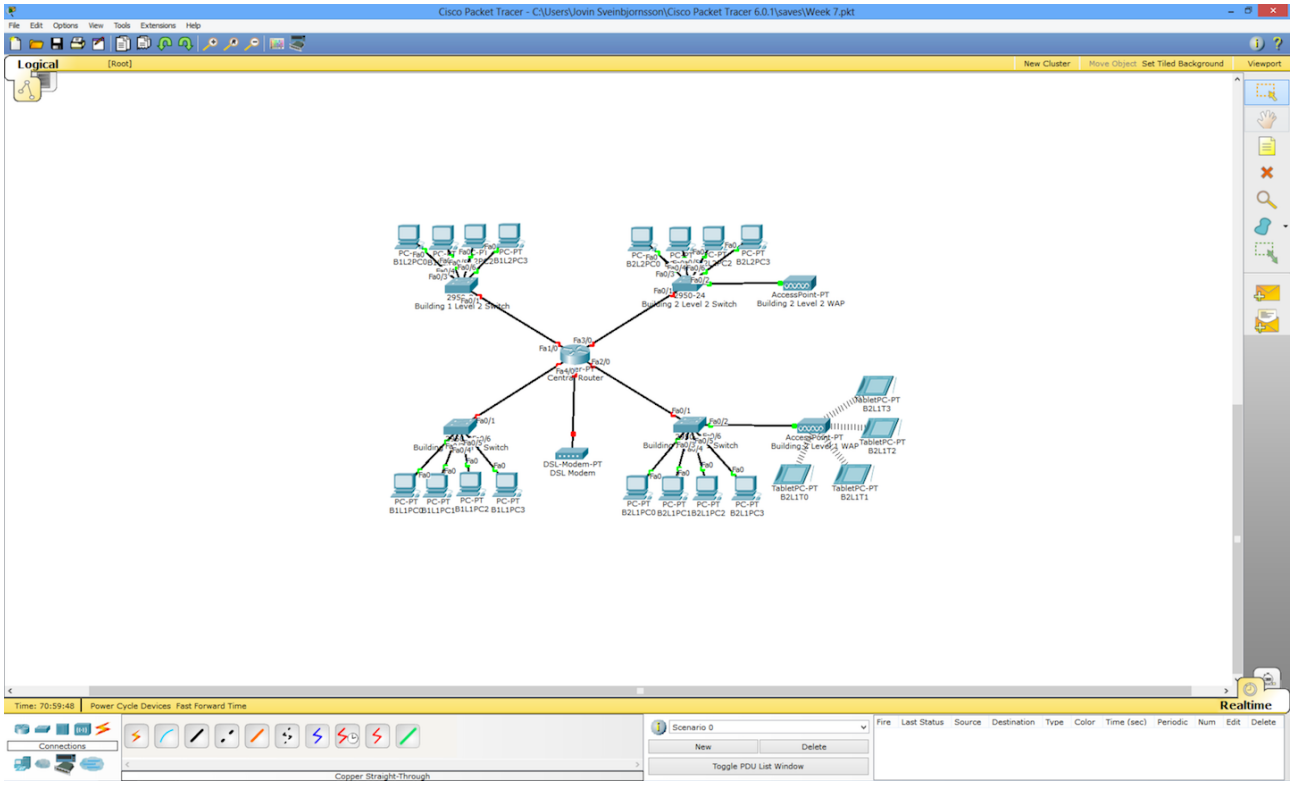

Router


Modem


Wireless Access Point


Layer 3 Switch (Only in Assignment 2).

The other icons should be fairly self-explanatory. Using this information provided we can see the devices we need to place in our packet tracer simulation. I will now place all of the devices from the topology into Packet Tracer in our logical workspace, creating a network which looks like so:



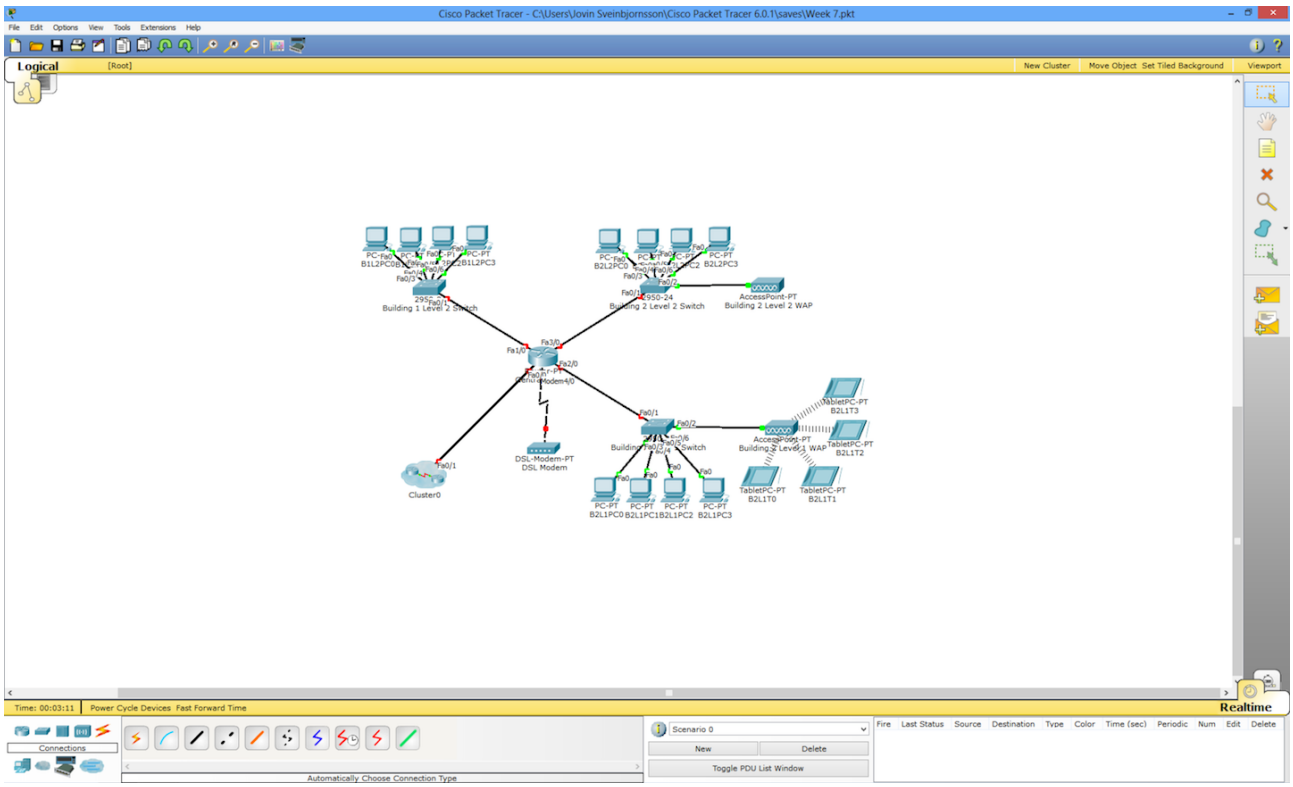
Tip: If your devices in your logical workspace do not have enough ports open their configuration pane and go to the Physical tab, then power the device down by clicking on it's power button. Now you should be able to drag the required module (FastEthernet) into the device and power it back on. There is a Video in Week 8 available for this.

You will want to name your networking devices appropriately so you can find them in the Wiring Closets in the physical workspace. Keep in mind, your wireless devices may connect to either of the access points - we will be covering how to rectify this in this next section, which will also show you how to represent your different floors (Basement, Ground, Level 1) in your assignment.

Task 3 - Assigning the Physical Spaces and Creating the Building Levels

Firstly, we'll create the different floors that are in our buildings. This can be done by creating what's called a 'Cluster'. We need to do this in the Logical Workspace as our Physical Workspace doesn't allow for multi-story buildings unfortunately.

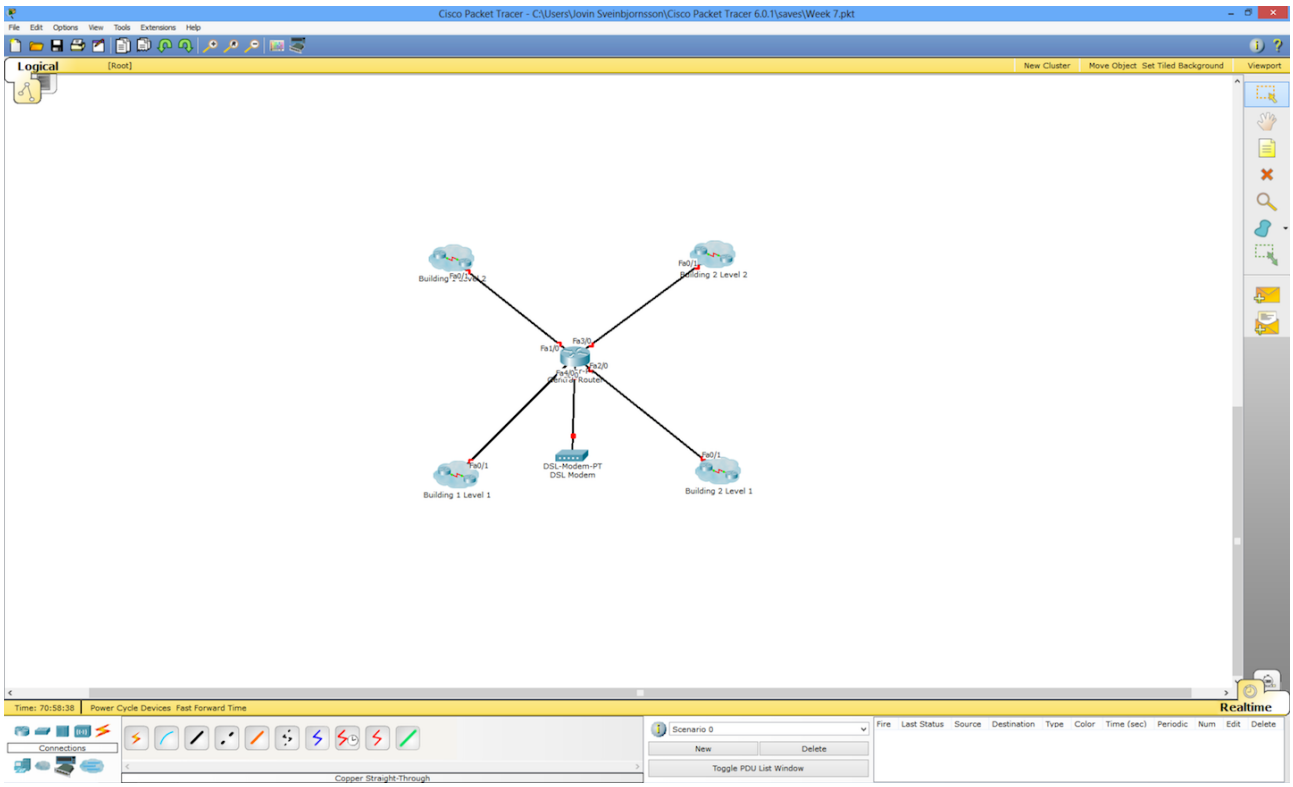
Drag select everything that belongs in Building 1 Level 1 (the bottom left wing of the network) and then click on the 'New Cluster' button towards the top (circled in red above). Once you have done this you'll notice it's replaced with a cloud icon called 'Cluster0'. I've renamed mine to 'Building 1 Level 1', see on the next page.



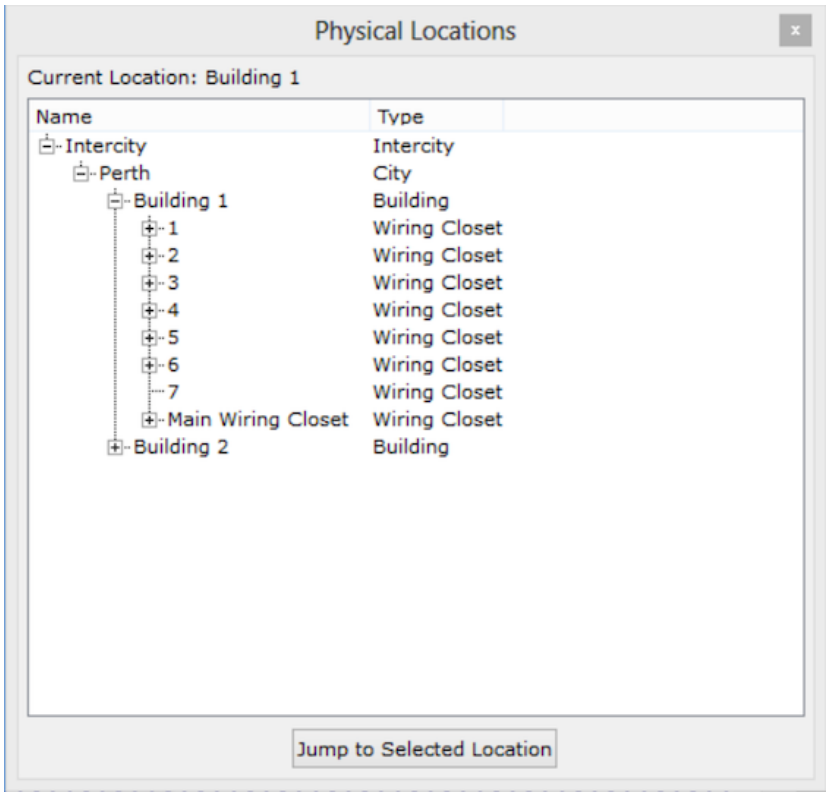
Now, repeat this process for the other 3 locations, this has no effect on the network's physical location, it is simply a way of making our view of the overall network much neater and easier to view. It can also reduce visual lag and responsiveness issues on machines.

Tip: You only need to have 1 device to create a cluster. My advice would be to place the switches down first and create the network without placing any of the workstations, then enter the clusters by clicking on them and placing them in there.

Once you've created all the clusters, your network should look like so (see next page):



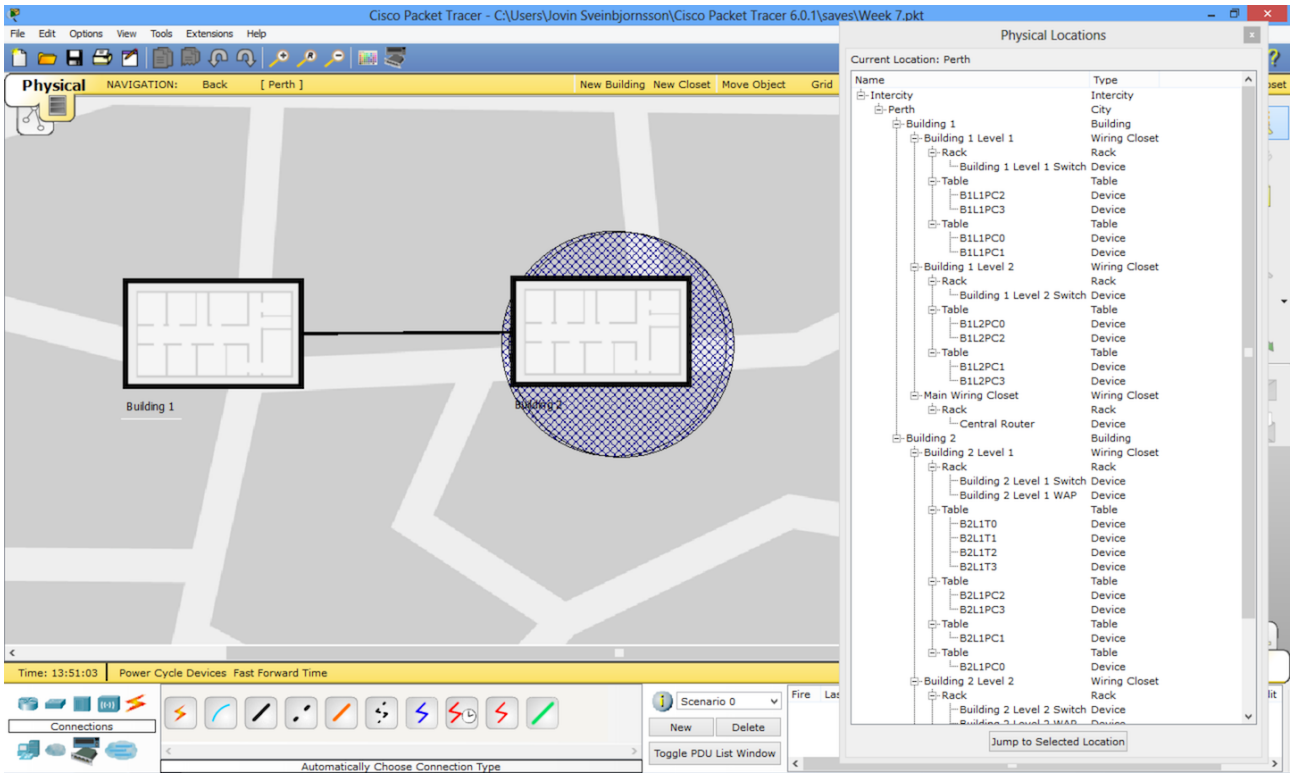
Now we'll enter the Physical Workspace and begin to assign the physical location (on a building basis) for our devices. This is necessary for the devices to be able to connect to their appropriate Wireless Access Points. If you enter the Physical Workspace and change your view to Building 1 you'll notice that you have another closet viewable in the top left corner. This will actually be a stack of several closets, you will want to move them so they are no longer on top of each other and then rename them to individualised names. At first I use the names '1', '2', '3' and so on, I leave Main Wiring Closet named as such though. Like below:



At this point you will want to ensure all of your switches and routers have appropriate names (‘Building 1 Ground’, ‘Building 2 Level 2’ etc.), this will help you in moving the devices around. The easiest way to move the devices around is to open the NAVIGATION window and expand all the extra views. You can then drag and drop the devices to the appropriate closet.

Tip: Your wireless devices MUST be in the same Wiring Closet as the Wireless Access Point they are meant to connect to, otherwise they will connect to any wireless access point available.

Prior to moving the devices around I renamed the wiring closets to reflect the location (Building 1 Level 1 etc.). This allowed me to organise the devices very easily with the tip below the photo. See my example below (Note: I have moved Building 2’s devices into Building 2 as well). I have left the Central Router in it’s own ‘Main Wiring Closet’ closet for ease of use, however you could place this in the IT Support closet.



Tip: Name all your devices with a quick to type naming system indicating where they are in the topology. I have used the naming convention of Building Number Level Number Device Number (ie, B1L2PC0, B2L1T0 etc). This helped immensely with moving the objects around.

Week 8 will continue with the configuring of the topology.