2021 Fall ELG 5142 Ubiquitous Sensing and Smart City Assignment 2 – LAN topology using NS3

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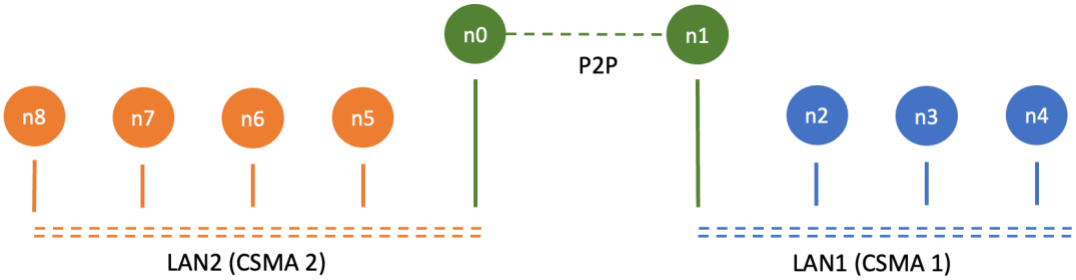
Assignment 2 is based on the second.cc example you learned in ns3 tutorial two.

You should design a network topology which consists of below parts:



1- **Point-to-Point part**
This part consists of two nodes (P2P always has 2 nodes) which are connected by P2P topology with rate of 10Mbps and delay of 2ms.
2- **LAN1**
This part consists of 4 nodes which are connected through CSMA topology with data rate of 100Mbps and delay of 50ms. Node n1 from P2P part is also a part of LAN1. So, you need to define 3 extra nodes for this part of the network.
3- **LAN2**
This part consists of 5 nodes which are connected through CSMA topology with data rate of 200Mbps and delay of 20ms. Node n0 from P2P part is also a part of LAN2. So, you need to define 4 extra nodes for this part of the network.

What you need to do is:

Part A (creating the topologies)

1. Define your nodes.
2. Use related ns3 helpers to configure the required topologies on the nodes.
3. Install protocol stack on the nodes.
4. Install IP on the nodes.
   - IP range of 10.1.1.0 (with subnet mask 255.255.255.0) for P2P nodes
   - IP range of 10.1.2.0 (with subnet mask 255.255.255.0) for LAN1 nodes
   - IP range of 10.1.3.0 (with subnet mask 255.255.255.0) for LAN2 nodes
5. Install mobility on the nodes (constant position mobility model for this assignment).

Part 2 (Creating the application)

Use **UDP Echo Client application** and **UDP Echo Server application** to send and receive packets between client and server. The server is installed on the last node of LAN1 (n4), and the client is installed on the last node of LAN2 (n8). Please use below attributes while creating your application:

- The maximum number of packets the application will send is 20.
- The time to wait between packets is 1 second.
- Size of echo data in the packets is 1024 bytes.
- Port number is 9.
- Run your applications for 10 seconds.

Part3 (Animation)

You need to add animation module to your script in order to visualize your simulation.

Deliverables:

1. Your code
2. A snapshot of the command line output showing the log of sent and received packets
3. A snapshot of the animation output