**Assignment 02 -Task 2**

**Task 2:**

**Experimental Setup:**

The part of the code which I modified (task1 code) to complete task 2 is as follows:

Line 28: Modified log component parameter

NS\_LOG\_COMPONENT\_DEFINE("WLANInfraStructureMode");

Line 76: added this code to create Access Point Node

 NodeContainer wifiApNode;

  wifiApNode.Create (1);

Line 93: changed the network name (SSID) to PNET

Ssid ssid = Ssid ("PNET");

Line 96: Added this code for wifi nodes

 mac.SetType("ns3::StaWifiMac", "Ssid", SsidValue(ssid), "ActiveProbing", BooleanValue(false));

Line 99: added this code for WifiApNode

NetDeviceContainer apDevice;

    mac.SetType ("ns3::ApWifiMac",

    "Ssid", SsidValue (ssid));

    apDevice = wifi.Install (phy, mac, wifiApNode);

Line 127: added this code to install wifiApNode

  mobility.Install (wifiApNode);

Line 138-139: added this code

  Ipv4InterfaceContainer wifiInterfaces=address.Assign(staDevices);

  Ipv4InterfaceContainer wifiApInterfaces= address.Assign (apDevice);

Line 168-174: Modified code to enable tracing at wifiApNode and wifiNode 5.

 phy.SetPcapDataLinkType (WifiPhyHelper::DLT\_IEEE802\_11\_RADIO);

    phy.EnablePcap (useRts ? "rtscts-AT22" : "nortscts-AT22", staDevices.Get (5), true);

    std::ostringstream oss;

    oss <<"/NodeList/" << wifiNodes.Get (5)->GetId ()

    <<"/$ns3::MobilityModel/CourseChange";

    phy.EnablePcap (useRts ? "rtscts-AT22" : "nortscts-AT22", apDevice.Get(0), true);

    Config::Connect (oss.str (), MakeCallback (&CourseChange));

1. **Explain the behaviour of the AP. What is happening since the very first moment the network starts operating?**

Wi-Fi access point (AP) node is a hardware device or configured node, which allows wireless devices to connect to a wired network. Beacon frames are transmitted as soon as the network is operational to inform surrounding nodes of the presence of the AP.

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1. **Take a look to a beacon frame. Which are the most relevant parameters defined in it?**

The relevant parameters defined in beacon frame are beacon interval, timestamp, and capabilities information under fixed parameters and we have SSID, supported rates, DS parameter, ERP Information and Extended Supported rates under the tagged parameters. In IEEE 802.11-based WLANs, the beacon frame is one of the management frames.

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1. **Are there any collisions in the network? When are these collisions happening?**

Yes, there is a collision between Frame 90 and 92 as they are trying to communicate with the access point at the same time.

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1. **As in Task 1, force the utilization of the handshaking process and repeat the simulation. Are there any collisions now? Explain why.**

There will be no collisions observed in the network because the RTS/CTS handshaking process is enforced, and it helps to eliminate the collision.

**Output of task2 without RTS/CTS**

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Description automatically generated

A screenshot of a computer program

Description automatically generated with medium confidence

**Output of task2 with forcing the utilization of RTS/CTS**

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