EXPERIMENT - 5

Computer Networks Lab

Aim

Write a program in NS3 to connect 3 nodes.

Syeda Reeha Quasar
14114802719
4C7

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Aim:

Write a program in NS3 to connect 3 nodes.

Source Code:

```
#include "ns3/core-module.h"
#include "ns3/network-module.h"
#include "ns3/internet-module.h"
#include "ns3/point-to-point-module.h"
#include "ns3/applications-module.h"

// Network Topology
//
// n0(client) -------------- n1(server) -------------- n2(client)

using namespace ns3;

NS_LOG_COMPONENT_DEFINE ("FirstScriptExample");

int
main (int argc, char *argv[])
{
  CommandLine cmd (__FILE__);
  cmd.Parse (argc, argv);

  Time::SetResolution (Time::NS);
  LogComponentEnable ("UdpEchoClientApplication", LOG_LEVEL_INFO);
  LogComponentEnable ("UdpEchoServerApplication", LOG_LEVEL_INFO);

  NodeContainer nodes;
  nodes.Create (3);

  PointToPointHelper pointToPoint;
  pointToPoint.SetDeviceAttribute ("DataRate", StringValue ("10Mbps"));
  pointToPoint.SetChannelAttribute ("Delay", StringValue ("5ms"));

  NetDeviceContainer devices;
  devices = pointToPoint.Install (nodes.Get (0), nodes.Get(1));
```

```
  devices.Add(pointToPoint.Install (nodes.Get (1), nodes.Get(2)));

  InternetStackHelper stack;
  stack.Install (nodes);

  Ipv4AddressHelper address;
  address.SetBase ("10.1.1.0", "255.255.255.0");

  Ipv4InterfaceContainer interfaces = address.Assign (devices);

  UdpEchoServerHelper echoServer (5);

  ApplicationContainer serverApps = echoServer.Install (nodes.Get (1));
  serverApps.Start (Seconds (1.0));
  serverApps.Stop (Seconds (10.0));

  UdpEchoClientHelper echoClient1 (interfaces.GetAddress (1), 5);
  echoClient1.SetAttribute ("MaxPackets", UintegerValue (1));
  echoClient1.SetAttribute ("Interval", TimeValue (Seconds (1.0)));
  echoClient1.SetAttribute ("PacketSize", UintegerValue (1024));

  UdpEchoClientHelper echoClient2 (interfaces.GetAddress (1), 5);
  echoClient2.SetAttribute ("MaxPackets", UintegerValue (1));
  echoClient2.SetAttribute ("Interval", TimeValue (Seconds (1.0)));
  echoClient2.SetAttribute ("PacketSize", UintegerValue (5026));

  ApplicationContainer clientApps = echoClient1.Install (nodes.Get (0));
  ApplicationContainer clientApps1 = echoClient2.Install (nodes.Get (2));

  clientApps.Start (Seconds (2.0));
  clientApps.Stop (Seconds (10.0));

  clientApps1.Start (Seconds (2.0));
  clientApps1.Stop (Seconds (10.0));

  Simulator::Run ();
  Simulator::Destroy ();
  return 0;
}
```

Output:

```
reeha@Reeha:~/networkEng/ns-allinone-3.35/ns-3.35$ ./waf --run three_nodes
Waf: Entering directory `/home/reeha/networkEng/ns-allinone-3.35/ns-3.35/build'
[2946/2999] Compiling scratch/three_nodes.cc
[2960/2999] Linking build/scratch/three_nodes
Waf: Leaving directory `/home/reeha/networkEng/ns-allinone-3.35/ns-3.35/build'
Build commands will be stored in build/compile_commands.json
'build' finished successfully (4.887s)
At time +2s client sent 1024 bytes to 10.1.1.2 port 5
At time +2s client sent 5026 bytes to 10.1.1.2 port 5
At time +2.00584s server received 1024 bytes from 10.1.1.1 port 49153
At time +2.00584s server sent 1024 bytes to 10.1.1.1 port 49153
At time +2.0091s server received 5026 bytes from 10.1.1.4 port 49153
At time +2.0091s server sent 5026 bytes to 10.1.1.4 port 49153
At time +2.0182s client received 5026 bytes from 10.1.1.3 port 5
reeha@Reeha:~/networkEng/ns-allinone-3.35/ns-3.35$
```