

# Mawlana Bhashani Science and Technology University



## Lab-Report

Report No: 01

Course code: ICT-4202

Course title: Wireless and Mobile Communication Lab

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### Submitted by

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## **LAB NO.:01**

### **Name of Experiment: Simple Client-Server communication (NS-3warmup)**

#### **Objectives:**

1. To create a simple topology of two nodes (Node1 and Node2) separated by a point to point link.
2. To setup a UDP client on one node (Node-1) and a UDP server on another (Node-2). Let it be of a fixed data rate 1.
3. To start the Client application and measure end to end throughput whilst varying the latency.

#### **Source Code:**

```
/* -*- Mode:C++; c-file-style:"gnu"; indent-tabs-mode:nil; -*- */
/*
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License version 2 as
 * published by the Free Software Foundation;
 *
 * This program is distributed in the hope that it will be useful,
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 * along with this program; if not, write to the Free Software
 * Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA
 */

#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"

// Default Network Topology
//
// 10.1.1.0
// n0 ----- n1
// point-to-point
//
```

```

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 (2);

    PointToPointHelper pointToPoint;
    pointToPoint.SetDeviceAttribute ("DataRate", StringValue ("5Mbps"));
    pointToPoint.SetChannelAttribute ("Delay", StringValue ("2ms"));

    NetDeviceContainer devices;
    devices = pointToPoint.Install (nodes);

    InternetStackHelper stack;
    stack.Install (nodes);

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

    Ipv4InterfaceContainer interfaces = address.Assign (devices);

    UdpEchoServerHelper echoServer (9);

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

    UdpEchoClientHelper echoClient (interfaces.GetAddress (1), 9);
    echoClient.SetAttribute ("MaxPackets", UintegerValue (1));
    echoClient.SetAttribute ("Interval", TimeValue (Seconds (1.0)));
    echoClient.SetAttribute ("PacketSize", UintegerValue (1024));

    ApplicationContainer clientApps = echoClient.Install (nodes.Get (0));
    clientApps.Start (Seconds (2.0));

```

```
clientApps.Stop (Seconds (10.0));
```

```
Simulator::Run ();
```

```
Simulator::Destroy ();
```

```
return 0;
```

## **Output:**

A terminal window with a dark purple background. The title bar shows the user 'raisa' on a machine named 'raisa-HP-Pavillon-Laptop-15-cc0xx' in the directory '~/repos/ns-allinone-3.31/ns-3.31'. The terminal output shows the execution of './waf --run scratch/first'. It displays Waf's directory navigation, the successful completion of the 'build' command in 0.930s, and a series of network test results. These results show a client sending 1024 bytes to 10.1.1.2 port 9, a server receiving it at 2.00369s, the server sending 1024 bytes to 10.1.1.1 port 49153, and the client receiving it at 2.00737s.

```
raisa@raisa-HP-Pavillon-Laptop-15-cc0xx: ~/repos/ns-allinone-3.31/ns-3.31
raisa@raisa-HP-Pavillon-Laptop-15-cc0xx:~/repos/ns-allinone-3.31/ns-3.31$ ./waf --run scratch/first
Waf: Entering directory `/home/raisa/repos/ns-allinone-3.31/ns-3.31/build'
Waf: Leaving directory `/home/raisa/repos/ns-allinone-3.31/ns-3.31/build'
Build commands will be stored in build/compile_commands.json
'build' finished successfully (0.930s)
At time 2s client sent 1024 bytes to 10.1.1.2 port 9
At time 2.00369s server received 1024 bytes from 10.1.1.1 port 49153
At time 2.00369s server sent 1024 bytes to 10.1.1.1 port 49153
At time 2.00737s client received 1024 bytes from 10.1.1.2 port 9
raisa@raisa-HP-Pavillon-Laptop-15-cc0xx:~/repos/ns-allinone-3.31/ns-3.31$
```

**Conclusion:** Here in this experiment, Basic client server paradigm, reading of pcap traces are found and it's the basic of NS-3 simulation and it was successfully done.