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Experiment:2

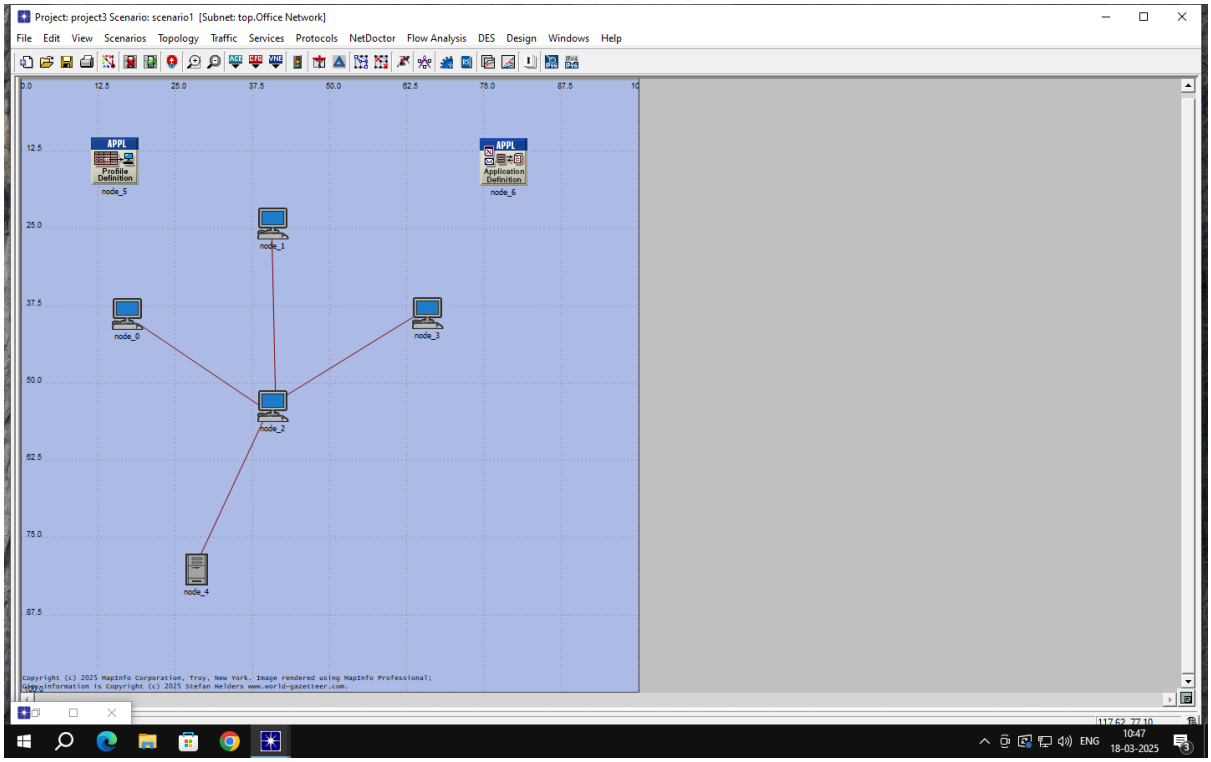
Aim

Simulate a 4 node point to point network and connect the links as follows:

n0-n2, n1-n2 and n1-n3. Apply TCP agent between n0-n3 and UDP n1-n3. Apply relevant applications over TCP and UDP agents changing the parameters and determine the no. of packets sent by TCP/UDP.

Network Design

Topology Used is STAR



PARAMETER

Application Configuration

- Right-click and select "Edit Attributes."
- Go to "Application Definitions."
- Change rows from 0 to 2
- Set the name to "tcp"
- In the description, change “ftp" to "high load"
- Set the name to “udp”

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- In the description change “video conferencing “ to “ High resolution video conference”
- Check "Apply changes to selected objects" and press OK to save.

2. **Program Configuration**

Here’s the step-by-step configuration in a clear, single-point format:

1. Right-click and select Edit Attributes.
2. Click on Profile Configuration and set the number of rows to 2.
3. Select Row 0 and enter Profile Name as tcpp.
4. Under Profile Name, select Applications and set the Name as tcp.
5. Set Start Time Offset to constant[1].
6. Under Repeatability, set Inter-repetition to constant[1] and Repetition Pattern to Concurrent.
7. Set Start Time to constant[1].
8. Under Repeatability, set Inter-repetition to constant[1], Number of Repetitions to constant[1], and Repetition Pattern to Concurrent.
9. Select Row 1 and enter Profile Name as udpp.
10. Under Profile Name, select Applications and set the Name as udp.
11. Set Start Time Offset to constant[1].
12. Under Repeatability, set Inter-repetition to constant[1] and Repetition Pattern to Concurrent.
13. Set Start Time to constant[1].
14. Under Repeatability, set Inter-repetition to constant[1], Number of Repetitions to constant[1], and Repetition Pattern to Concurrent.
15. Click Apply Changes to Selected Objects and then press OK.

3**. Configure All Multimode Servers**

- Right-click and select "Edit Attributes."
- Go to "Application Supported Profiles" and press Edit.
- Change rows to 2
- Row 0 : set name as “tcpp”
- Row 1: set name as “udpp”
- Go to "Application Supported Services" and press Edit.
- Change rows to 1
- Row 0: set name as “udp”

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- Press OK to save changes.

4. **Enable Individual Statistics**

- Go to "Node Statistics”
- Navigate to “TCP” and “UDP” and then tick "Traffic Received," and "Traffic Sent." In both TCP and UDP.
- Press OK to save changes.

5. **Run Simulation and View Results**

- Press Ctrl + R or go to the DES Panel and select "Configure/Run Discrete Event Simulation."
- Set Duration to 15 seconds and start the simulation.
- Close the newly opened tab.
- Go to DES Panel > Results > View Results.
- Under "Object Statistics," select "Office Network, Node 2," and enable TCP and UDP Traffic ent and Traffic Recived
- In "Presentation," change "As Is" to "Sample Sum."
- Enable “overlaid statistics”.
- Click "Show" to view the graphs.

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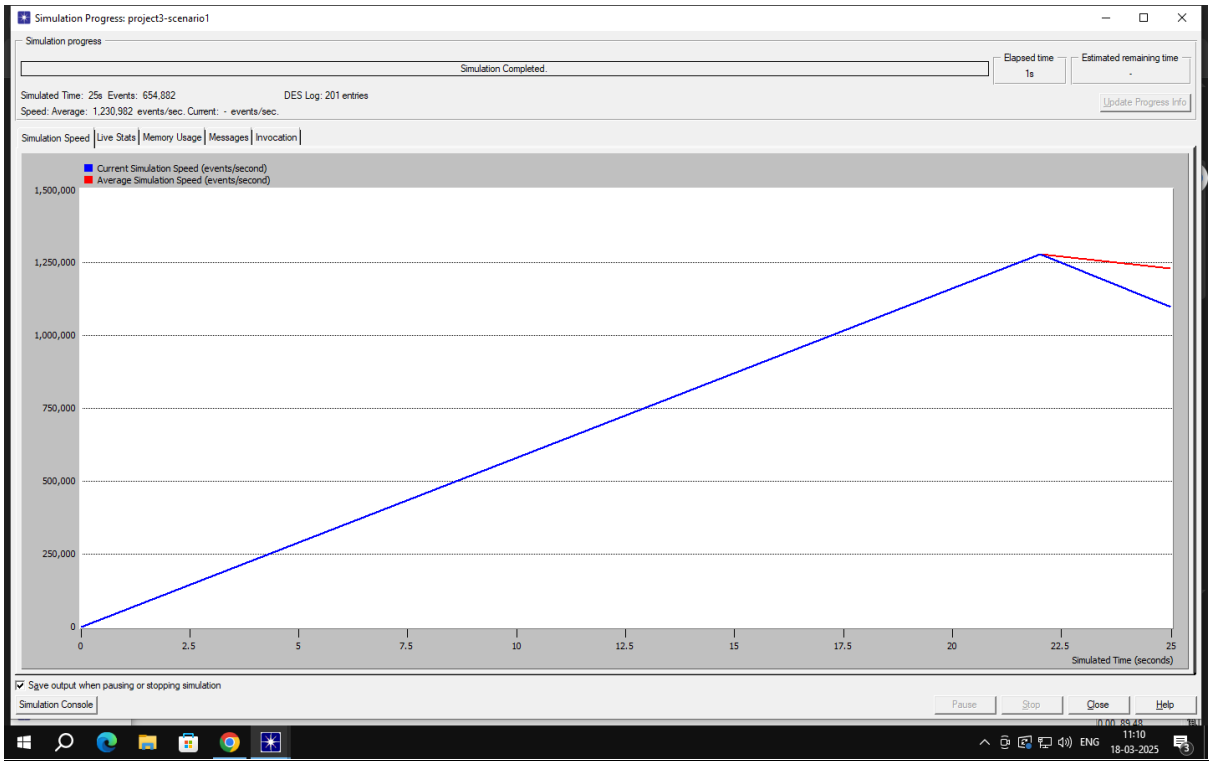

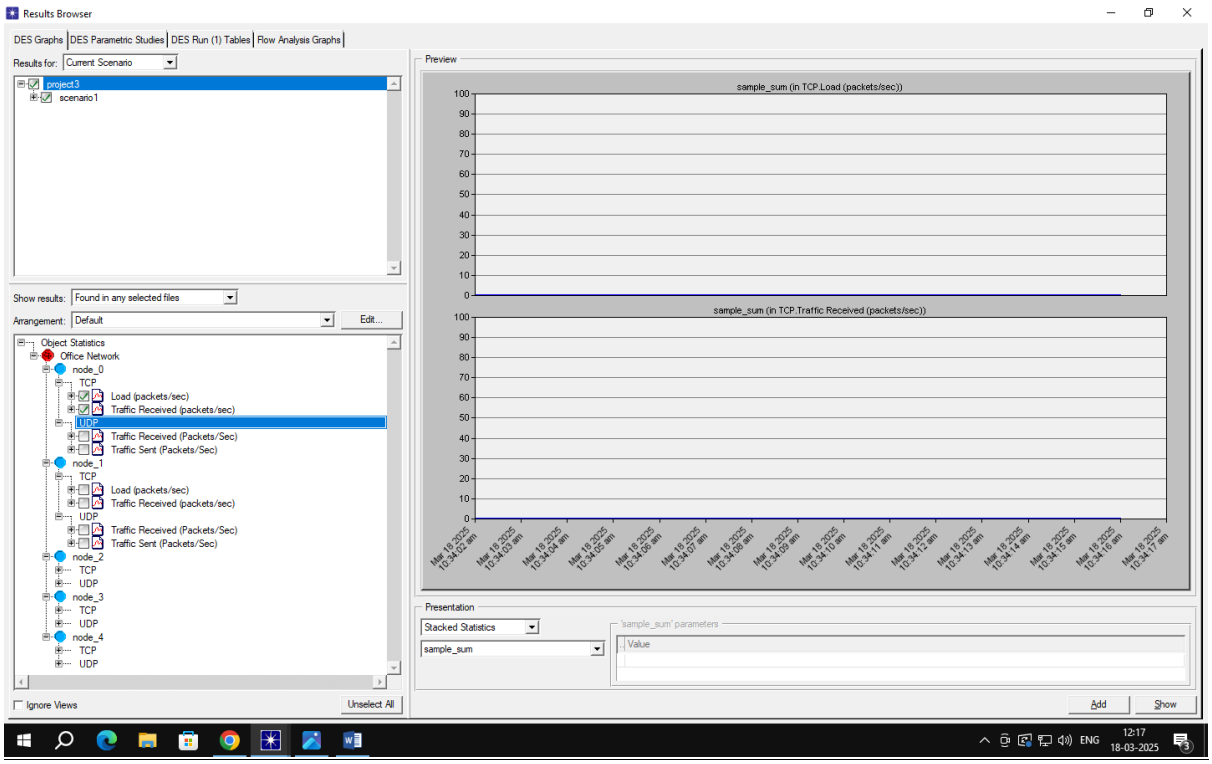

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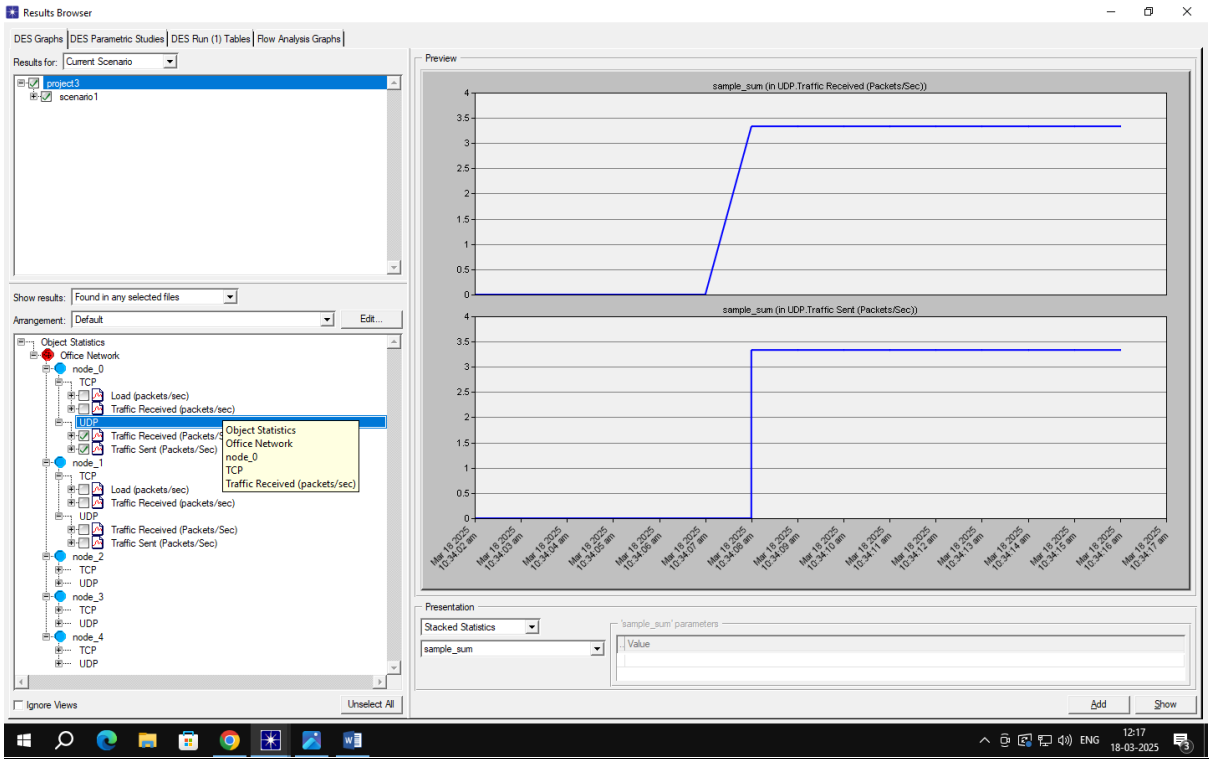

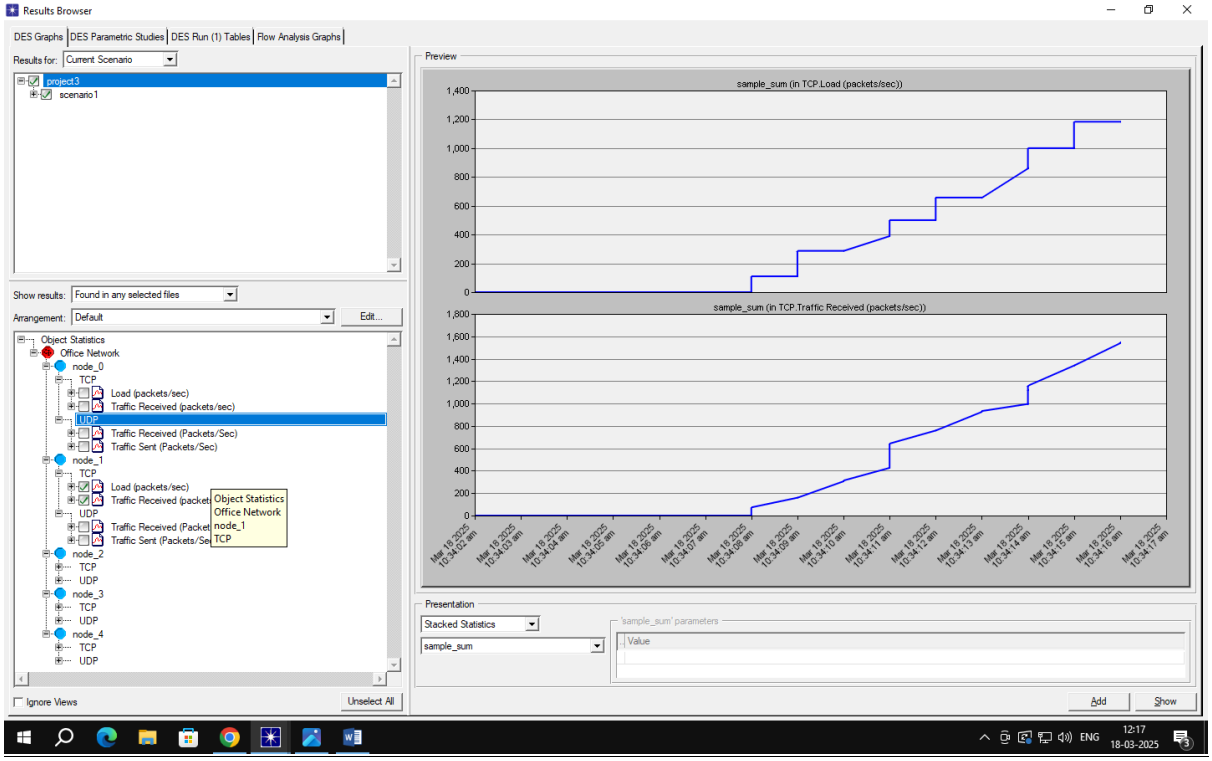

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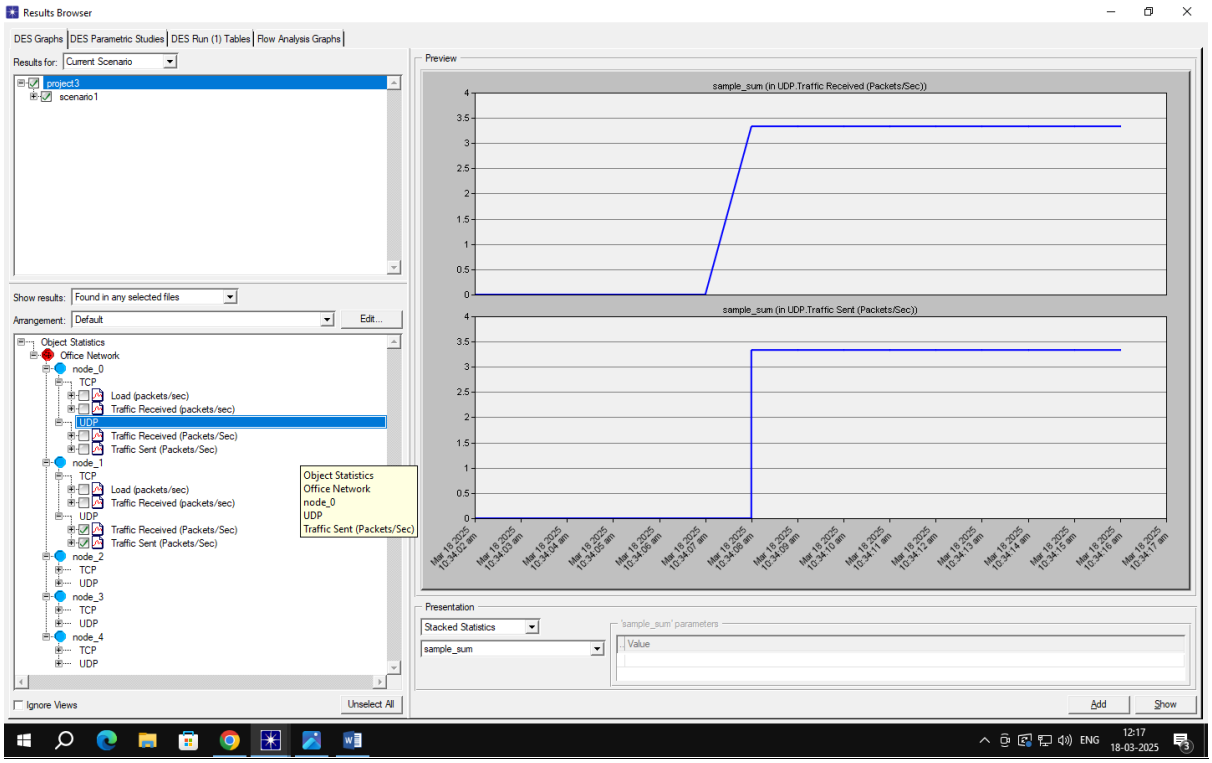

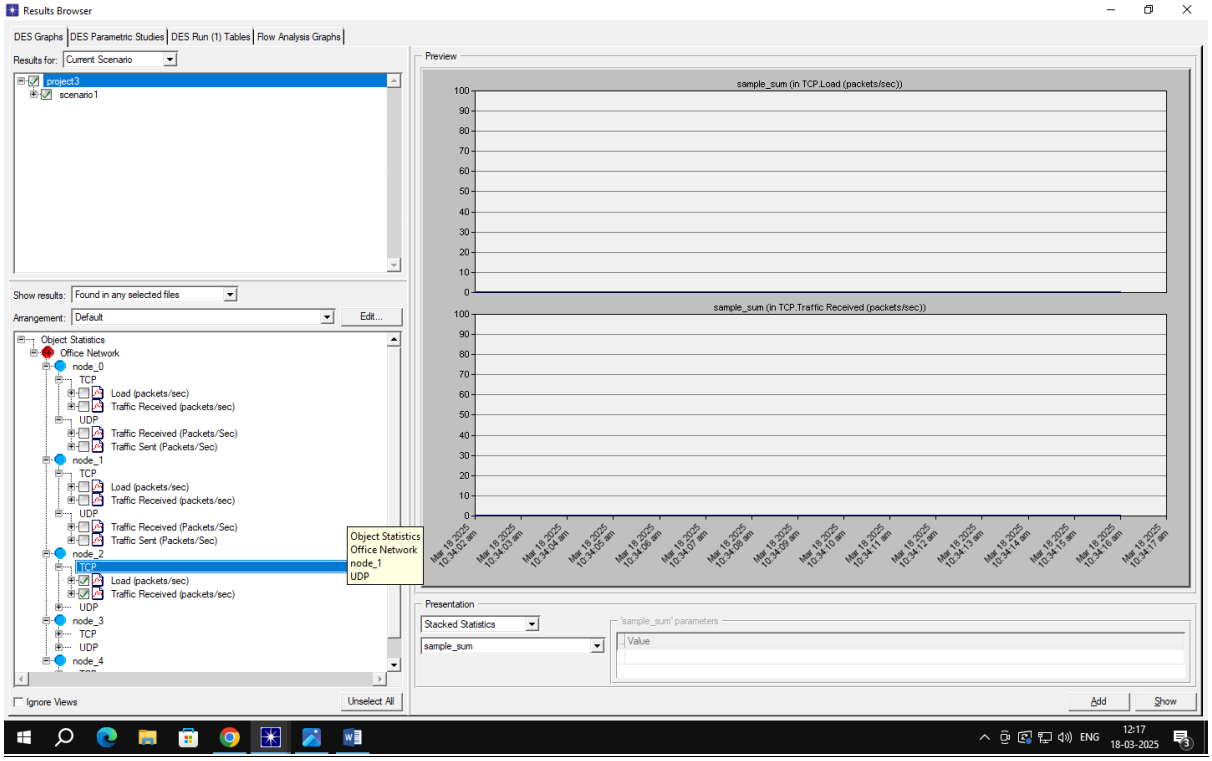

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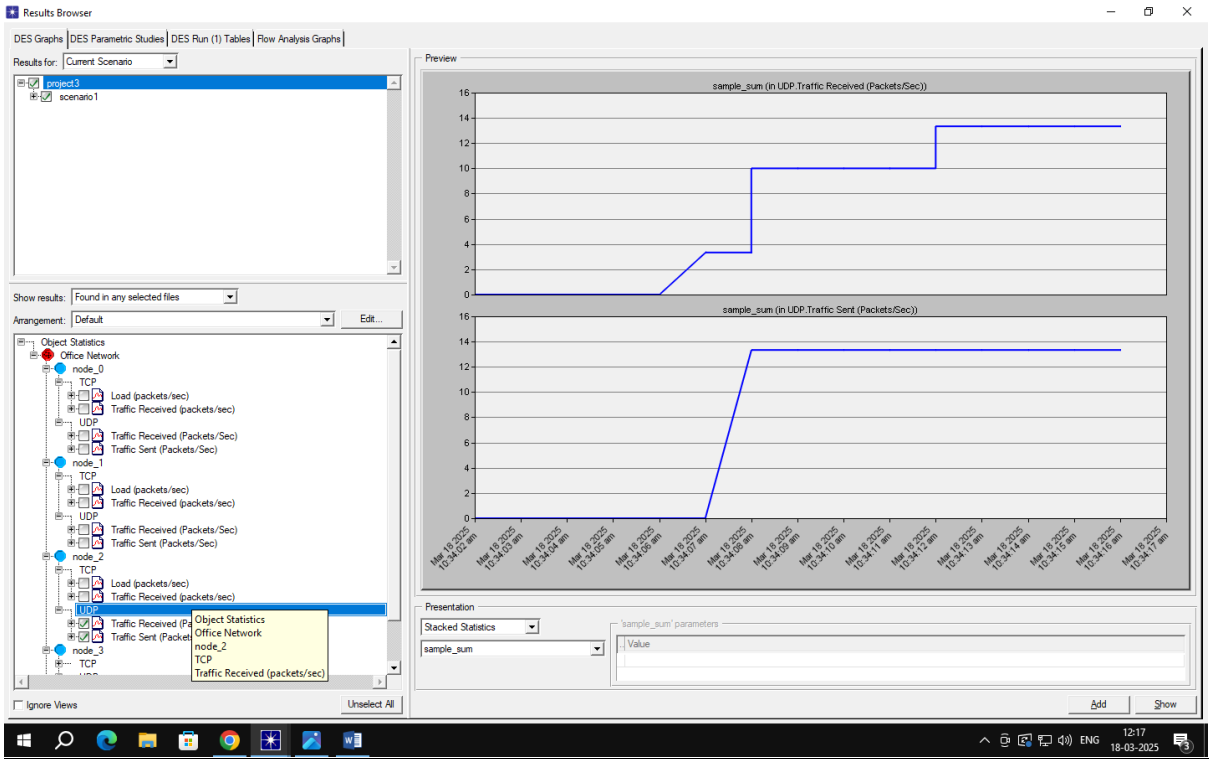

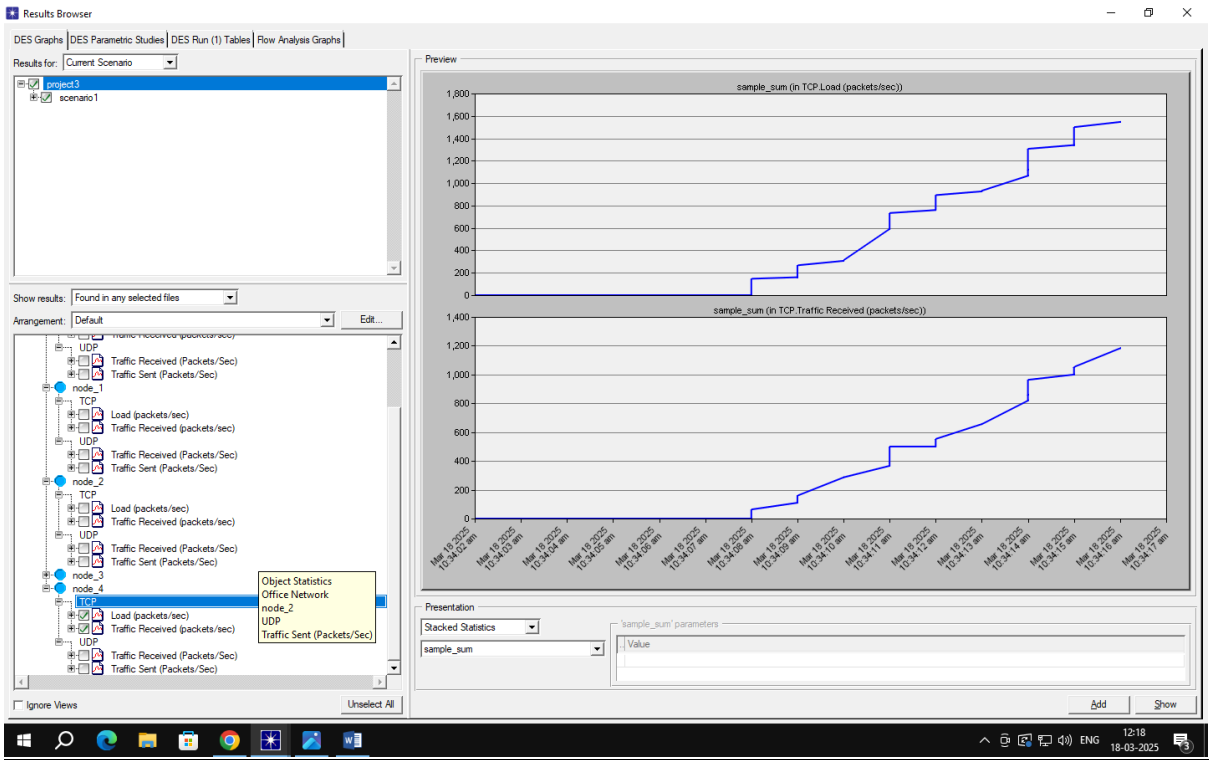

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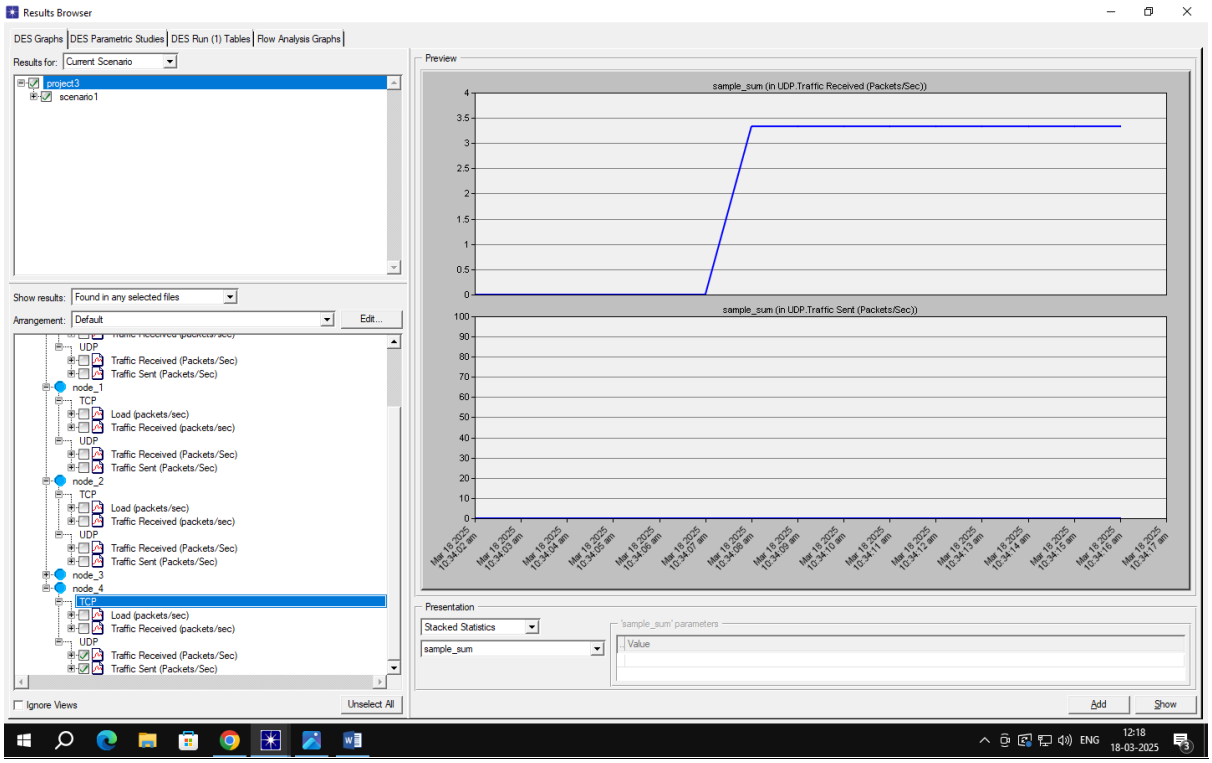

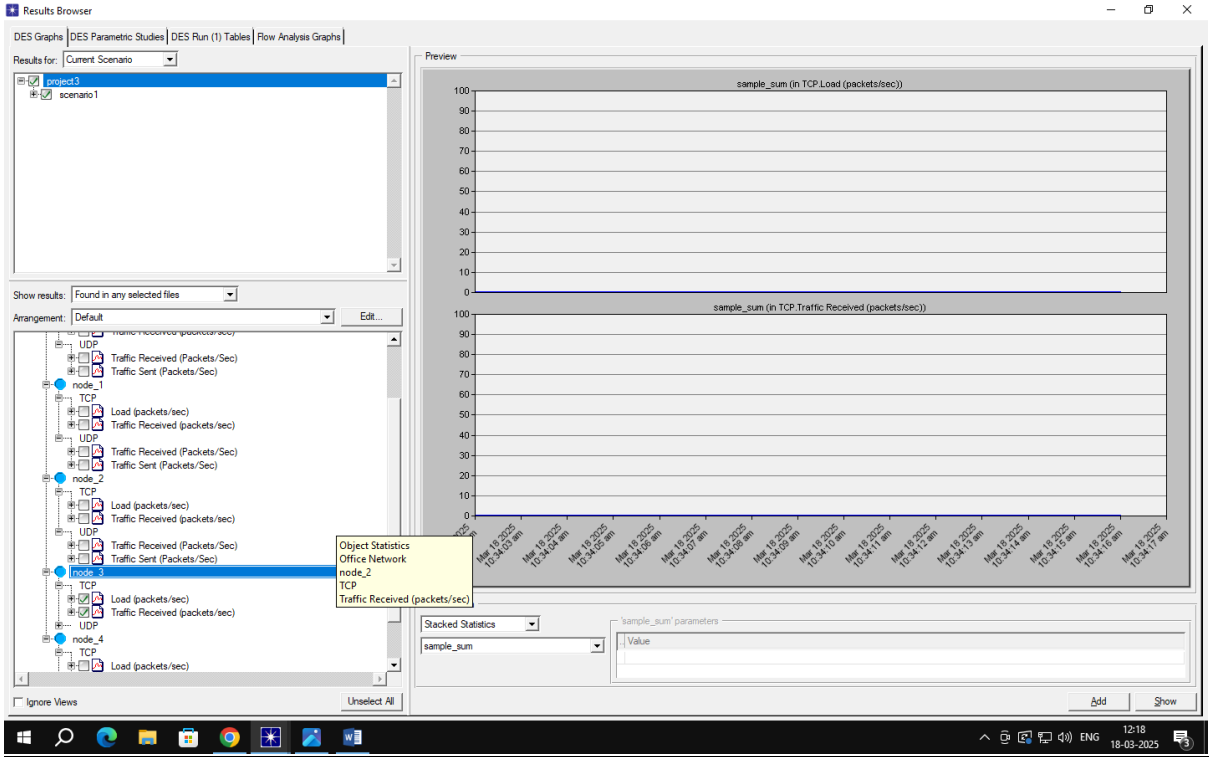

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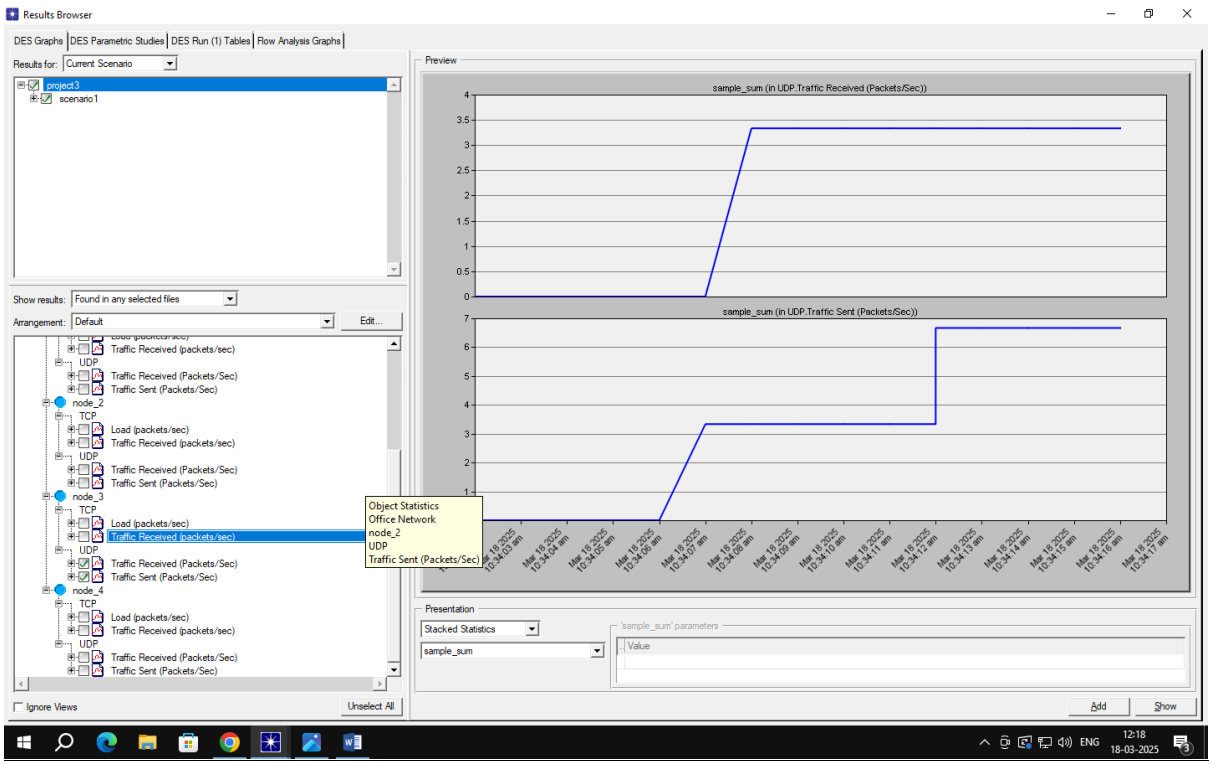

INTERPRETATION:

- We can observe the difference in the Y axis in both the output graphs that is it is in the range of 100s for TCP and it is in the range of 10000s for UDP.
- This implies or indicates that there is higher data rate in UDP. And therefore a higher data loss.
- The loss rate is high in UDP especially since it is a video conferencing application with high data rate.
- Whereas in TCP since congestion control is applied the loss rate is less and the graph is more even.
- TCP is more reliable but has higher overhead. And UDP is faster but there is loss of packets.