



**GROVE SCHOOL  
OF ENGINEERING**

## **Computer Communication Network- F6000**

### **7-Node Network Design Project**

**Project Contributor:**

**MD ABDUL KADIR**

**Submitted To:**

**Professor Tarek Saadawi, PhD**

**F6000 Course Instructor**

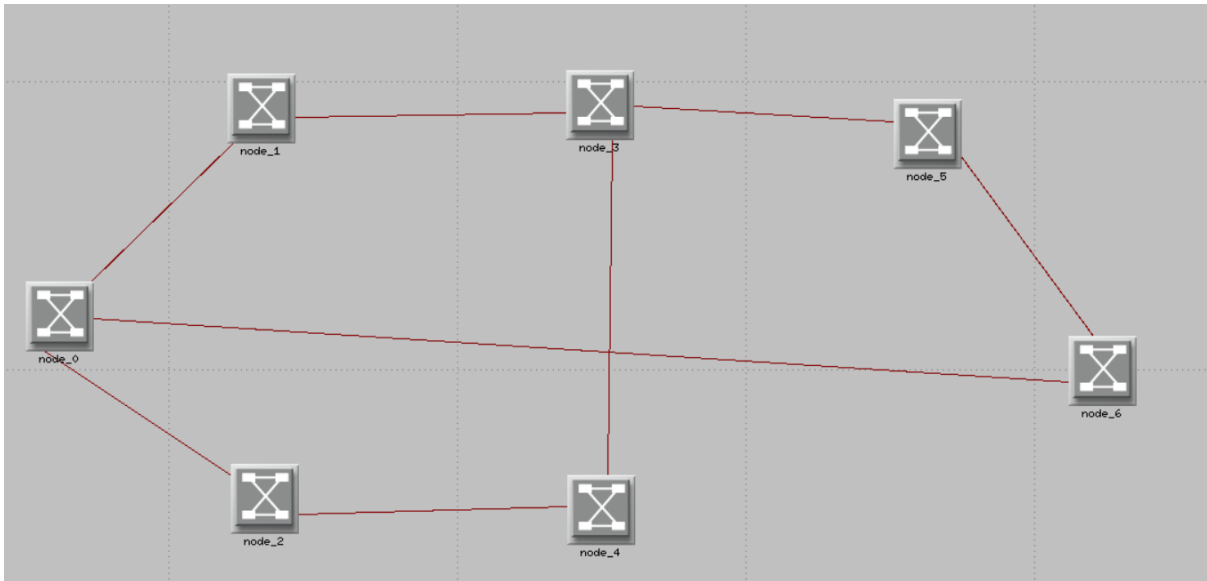
Associate Director of Cybersecurity MS Program,

*Director, Center of Information Networking and Telecommunications (CINT)*

Grove School of Engineering

The City College of New York

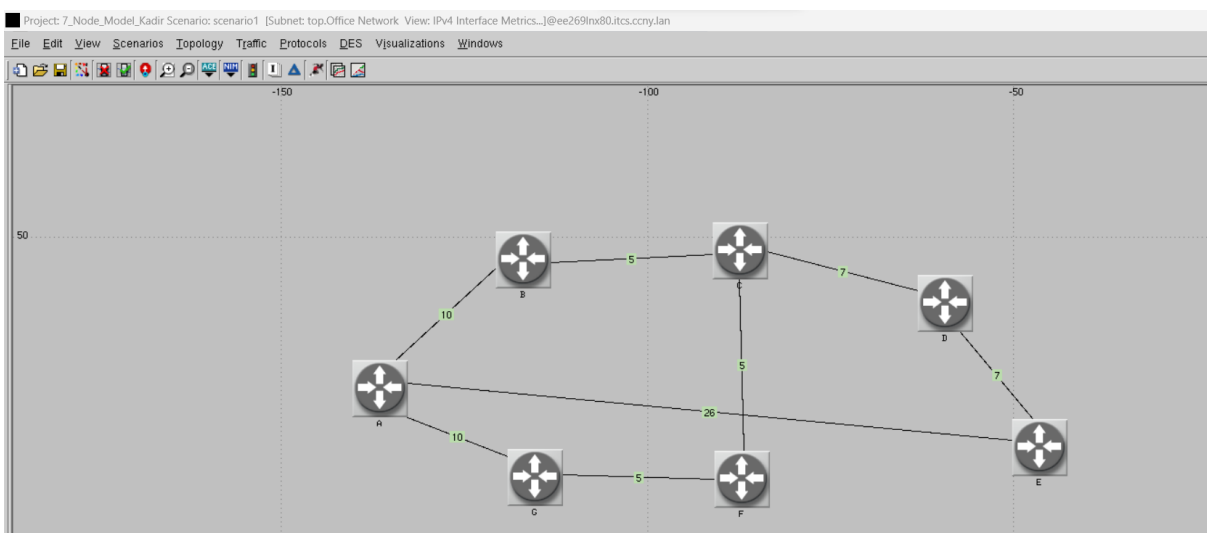
**Academic Session- Fall 2022**



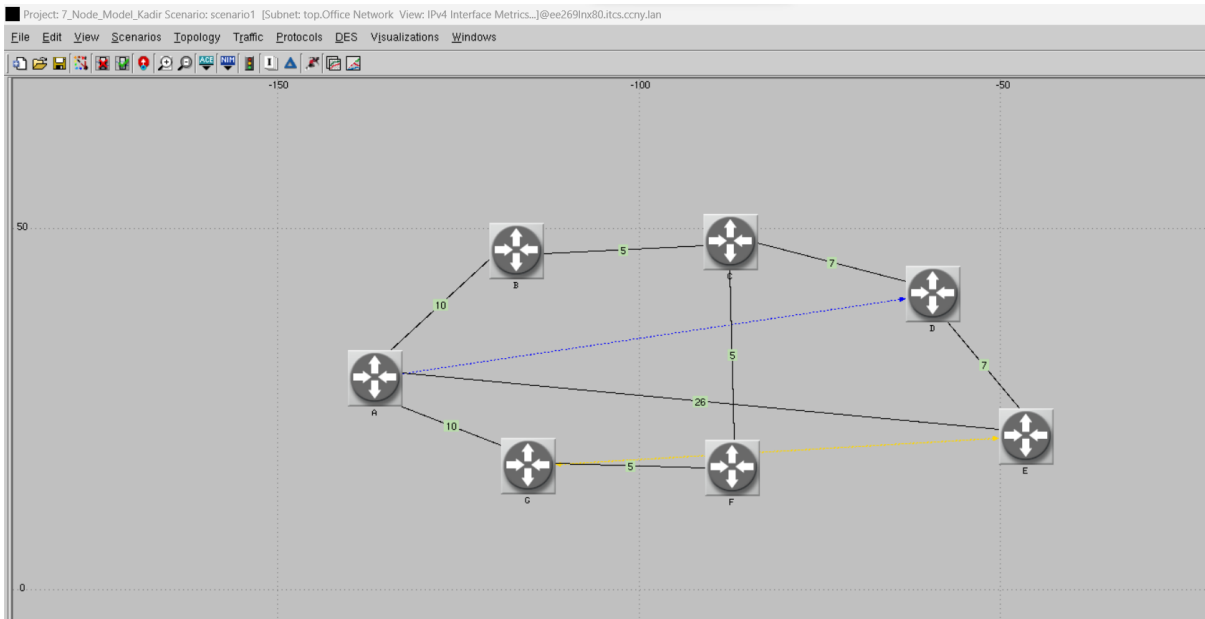
## NETWORK TOPOLOGY:

In this project we have 7-Nodes named (A,B,C,D,E,F,G) to design and form a network with a given traffic matrix. In the model we use node A as node 1, node B as node 2, node C as node 3, node D as node 4, node E as node 5, node F as node 6 and node G as node 7. Each node is itself a router which has a hub inside, which is further connected with the other nodes likewise (receivers & transmitters).

## Applying OSPF Between Nodes A → D and E → G



**Blue Line indicates Path between A to D and for yellow line it is E to G**



**Outcomes:**

The screenshot shows the same network topology as above. A blue dashed line highlights the path A-B-C-D. A yellow dashed line highlights the path E-G-F. Two windows are open:

- Path Details@ee269lnx80.its.cnyj.lan**:  
Path details (node, link pair) between the following nodes:  
Source: Office Network.A  
Destination: Office Network.D  
Number of paths: 1  
Path #1:  
Common Subnet: OFFice Network  
A <-> B  
B <-> C  
C <-> D
- Route Report for IP Traffic Flows@ee269lnx80.its.cnyj.lan**:  
Sources (Office Network)  

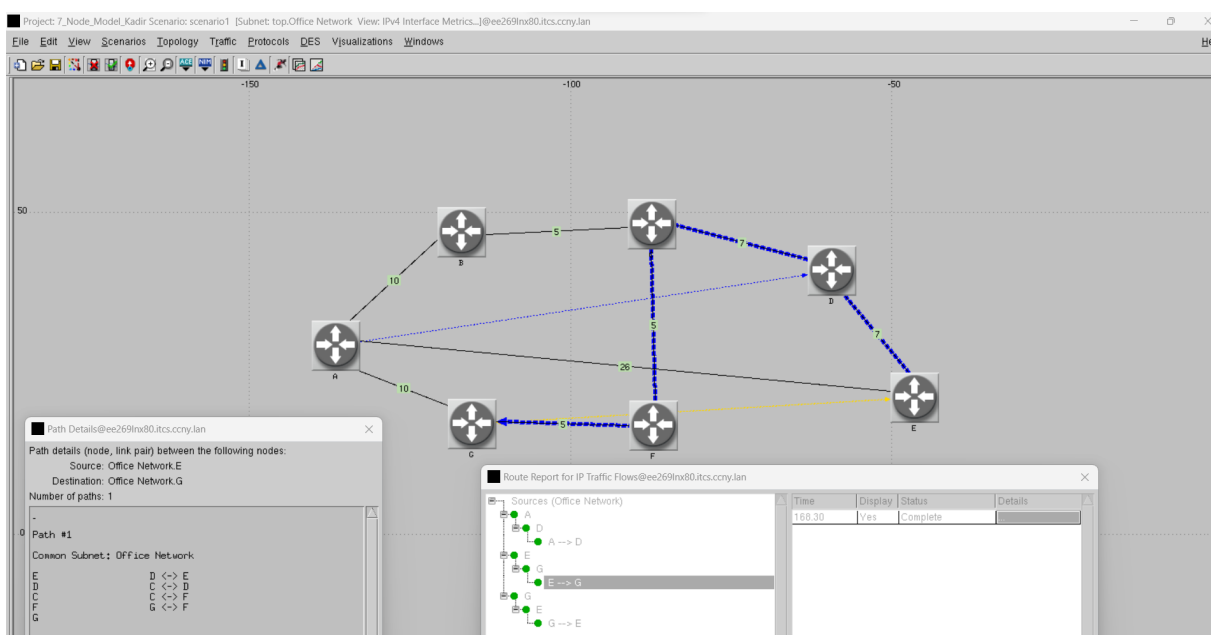
Time	Display	Status	Details
161.70	Yes	Complete	

  - A --> D
  - E --> G
  - E --> E
  - G --> E

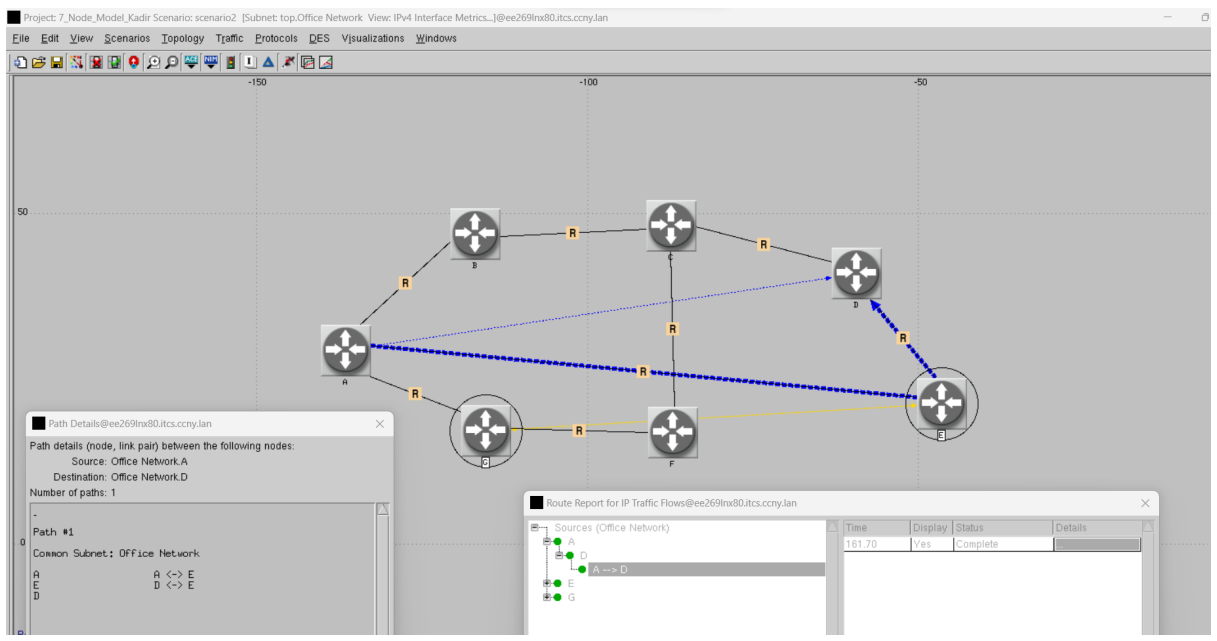
**A-B-C-D , Average Delay 161.70 Secs**

**We have also applied from source E to destination G and got avg delay 168.30 secs  
Hopes are :**

**E**    **D ↔ E**  
**D**    **C ↔ D**  
**C**    **C ↔ F**  
**F**    **G ↔ F**  
**G**



## Implementation of Routing Information Protocol (RIP)

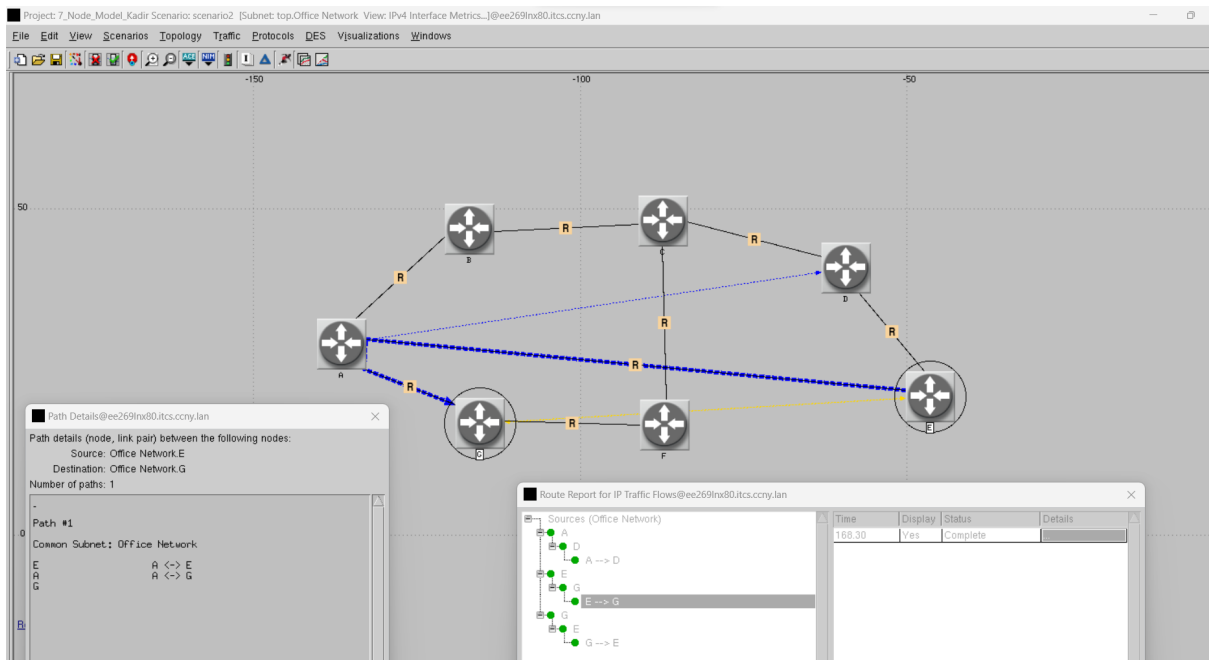


Now we have applied RIP on this 7 node structure to get destination D from our expected source A using best hops in between. The possible outcome is showing us the minimum shortest path to obtain D is

A ↔ E  
 E ↔ D  
 D

And average delay is 161.70 Secs.

In the meantime, we were looking forward to getting the another path from source E to destination G



E ↔ A and A ↔ G using total hops 2.

We have OSPF applied path and RIP applied path, now we are going to follow the outline procedure to get more insights on both of this Algo.

## Comparison Between OSPF and RIP:

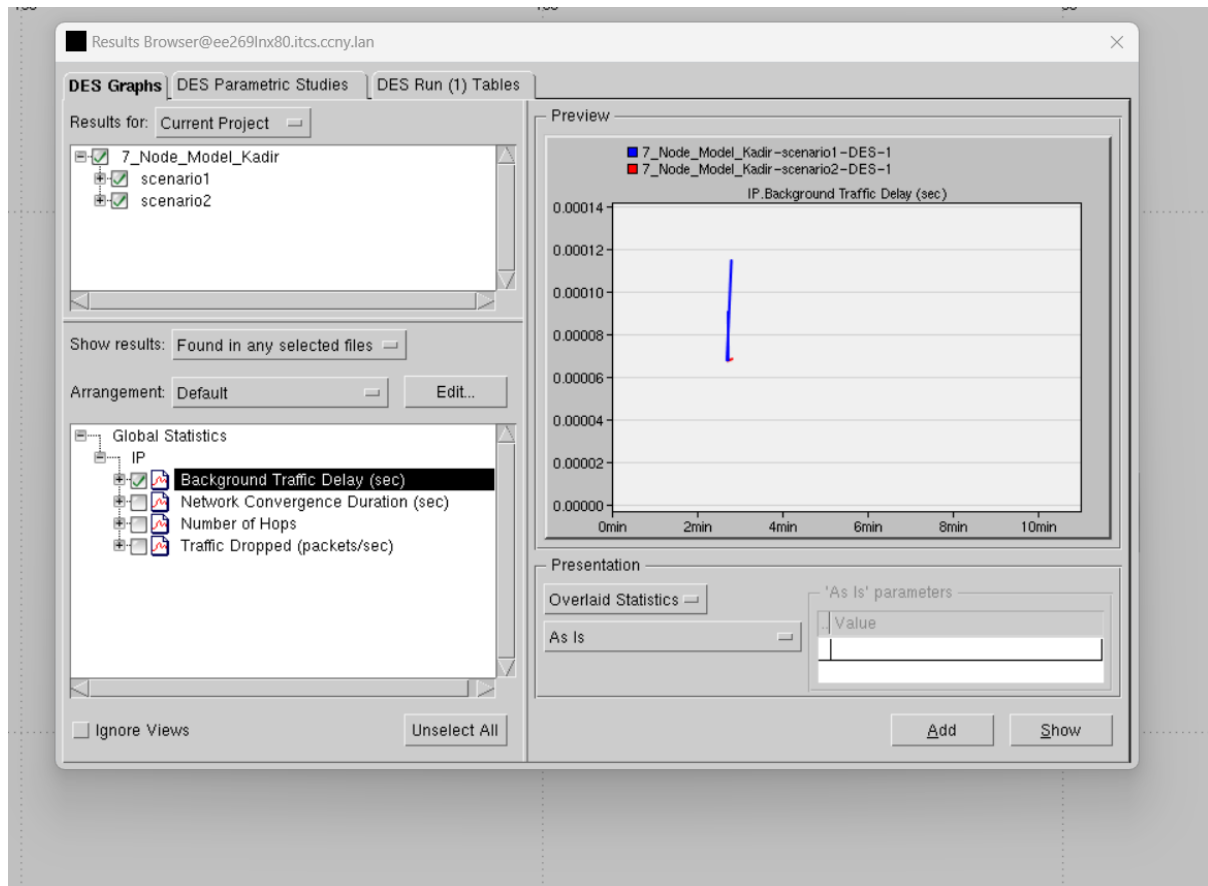
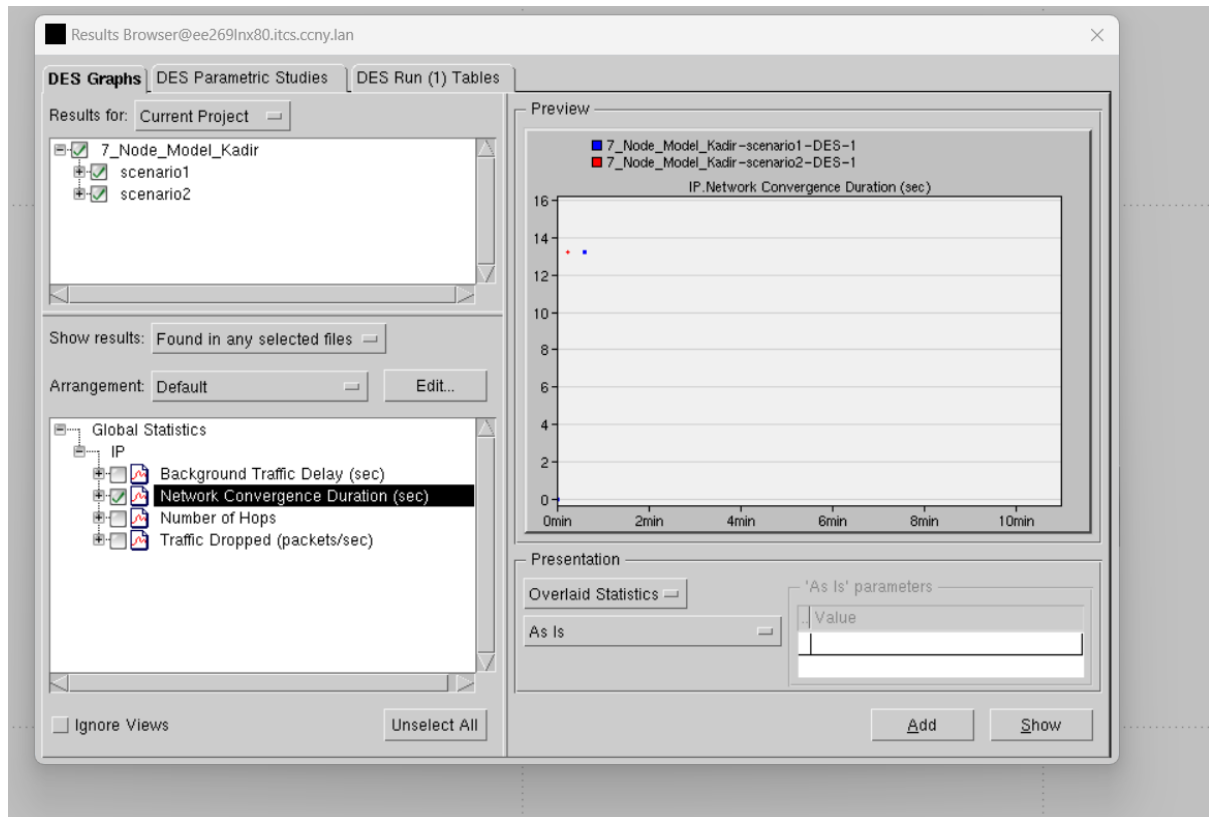
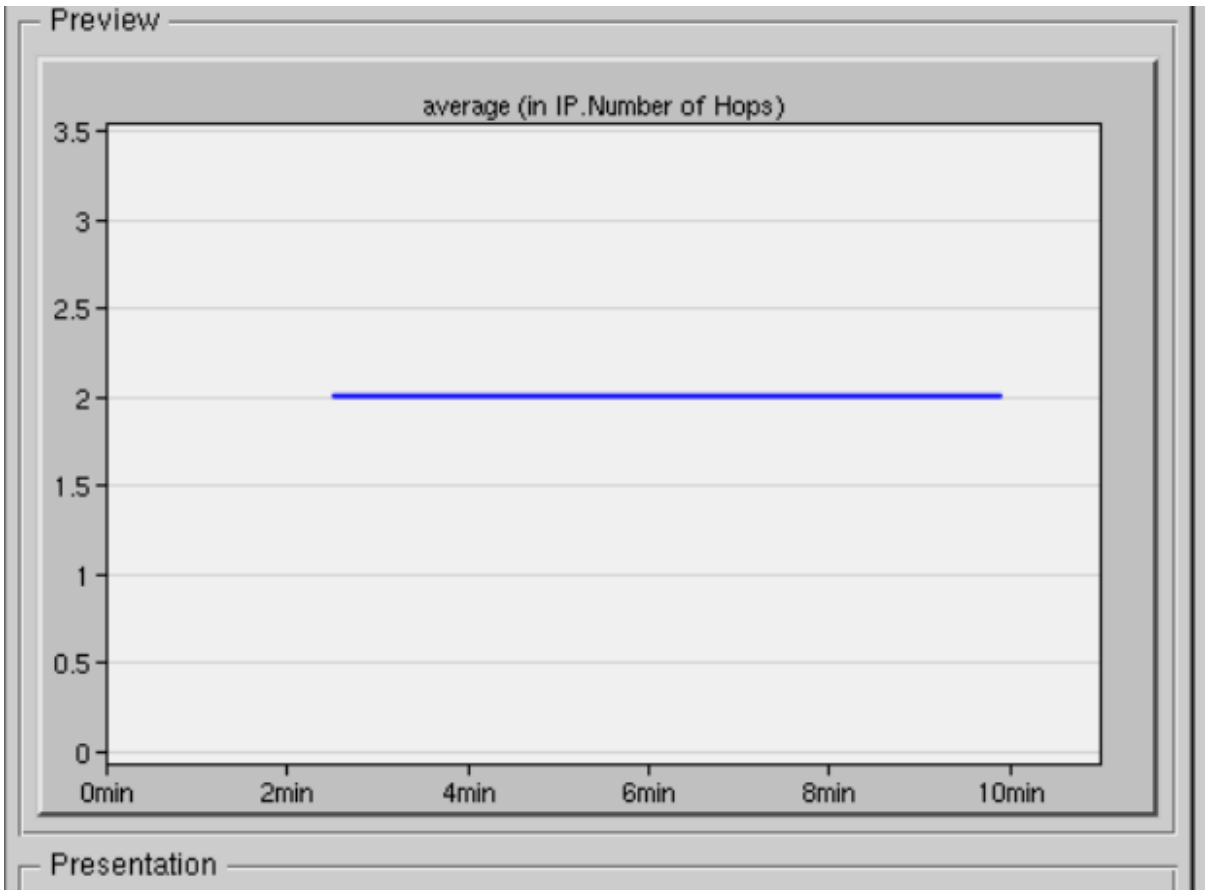


Fig: Background Traffic Delay Between 2

## Speed of Convergence:



## Average Number of Hopes:



Results Browser@ee269Inx80.itcs.cny.lan

DES Graphs | DES Parametric Studies | DES Run (1) Tables

Results for: Current Project

- 7\_Node\_Model\_Kadir
  - scenario1
  - scenario2

Show results: Found in any selected files

Arrangement: Default Edit..

- Global Statistics
  - IP
    - Background Traffic Delay (sec)
    - Network Convergence Duration (sec)
    - Number of Hops**
    - Traffic Dropped (packets/sec)

Ignore Views Unselect All

Preview

IP.Number of Hops

Time (min)	Scenario 1 (Blue)	Scenario 2 (Red)
2.5	3.4	2.0
3.0	4.0	2.0

Presentation

Overlaid Statistics

As Is Value

Add Show



## End to End Traffic Delay for Dropping Packets per second:

