

# CSMA based network with bus topology

**Spoken Tutorial Project**

<https://spoken-tutorial.org>

**National Mission on Education through ICT**

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**VIT Chennai**

**29 November 2023**



# Learning Objectives

**In this tutorial, we will learn to**



# Learning Objectives

In this tutorial, we will learn to

- Create a CSMA based bus topology with 10 nodes



# Learning Objectives

In this tutorial, we will learn to

- ▶ Create a CSMA based bus topology with 10 nodes
- ▶ Configure client and server applications on the nodes



# Learning Objectives

- ▶ **Connect the two nodes and routing packets from one node to other**



# Learning Objectives

- ▶ **Connect the two nodes and routing packets from one node to other**
- ▶ **Visualize the network using NetAnim**



# System Requirements

**To record this tutorial, I am using**



# System Requirements

To record this tutorial, I am using

► **Ubuntu Linux OS version 22.04**





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- ▶ **ns-3.38**



# System Requirements

To record this tutorial, I am using

- ▶ Ubuntu Linux OS version 22.04
- ▶ ns-3.38
- ▶ NetAnim visualizer tool



# Pre-requisites

**To follow this tutorial,**



# Pre-requisites

**To follow this tutorial,**

- ▶ **The learner must have basic knowledge of using Linux terminal**



# Pre-requisites

**To follow this tutorial,**

- ▶ **The learner must have basic knowledge of using Linux terminal**
- ▶ **The learner must have understanding of network topologies**



# Pre-requisites

- For pre-requisite Linux and ns-3 tutorials, please visit this website <https://spoken-tutorial.org>



# Code Files

- The files used in this tutorial are provided in the Code Files link



# Code Files

- ▶ The files used in this tutorial are provided in the Code Files link
- ▶ Please download and extract the files





# Code Files

- ▶ The files used in this tutorial are provided in the Code Files link
- ▶ Please download and extract the files
- ▶ Make a copy and then use them while practicing



# Bus Topology

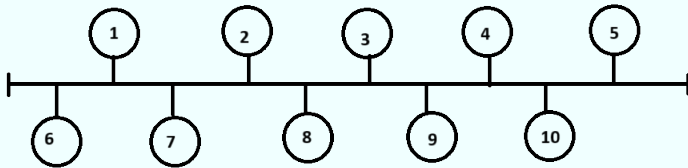


Fig. Bus Topology



# Summary

**In this tutorial, we have**

- ▶ **Created a CSMA based bus topology with 10 nodes**
- ▶ **Configured client and server applications on the nodes**



# Summary

- ▶ **Connected the two nodes and routing packets from one node to other**
- ▶ **Visualized the network using NetAnim**



# Assignment

**As an assignment, please do the following**

- ▶ **Create 10 nodes**
- ▶ **Connect each of them using p2p helper classes**
- ▶ **Initialize CSMA network using `csmaHelper()` class**



# Assignment

- ▶ **Set datarate and delay**
- ▶ **Route the packets from the second node to the eighth node**
- ▶ **Visualize the network using NetAnim**

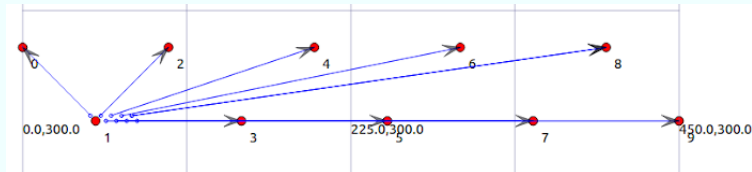


# Assignment-Observation

```
arun@arun-dot-com: ~/ns-allinone-3.38/ns-3.38
arun@arun-dot-com:~$ cd ns-allinone-3.38/ns-3.38
arun@arun-dot-com:~/ns-allinone-3.38/ns-3.38$ ./ns3 run scratch/assignment-exp4.cc
[0/2] Re-checking globbed directories...
[2/2] Linking CXX executable ../build/scratch/ns3.38-assignment-exp4-default
Average end-to-end delay from node 2 to node 9: 0.094696 ms
Average throughput of transmission from node 2 to node 9: 86508.4 bits/sec
arun@arun-dot-com:~/ns-allinone-3.38/ns-3.38$
```



# Assignment-Observation





# About the Spoken Tutorial Project

- ▶ Watch the video available at [http://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ It summarises the Spoken Tutorial project
- ▶ If you do not have good bandwidth, you can download and watch it



# Spoken Tutorial Workshops

## The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to [contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)



# Answers for THIS spoken tutorial

- ▶ Questions in THIS Spoken Tutorial
- ▶ Visit <https://forums.spoken-tutorial.org>
- ▶ Choose the minute and second where you have the question
- ▶ Explain your question briefly
- ▶ The Spoken Tutorial project will ensure an answer
- ▶ You will have to register to ask questions



- For any general or technical questions on ns-3, visit the FOSSEE forum and post your question

<https://forums.fossee.in/>



# Acknowledgement

- ▶ **The Spoken Tutorial project was established by Ministry of Education, Govt. of India**



# Acknowledgement

- ▶ We thank Dr.Moyukh Laha from IIT Kharagpur for his domain support
- ▶ We would also like to thank Dr. R. Radha, Dr. X. Anita, and Dr. T. Subbulakshmi from VIT Chennai for their support



# Thank you

- **This is Arun Santhosh, a FOSSEE Summer Fellow 2023, IIT Bombay signing off**

