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# A Novel Optimization Method to Mitigate Congestion in Edge Computing using Tabu Search Algorithm -Configuration Manual

MSc Research Project
Cloud Computing

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# A Novel Optimization Method to Mitigate Congestion in Edge Computing using Tabu Search Algorithm -Configuration Manual

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## 1 Introduction

A configuration handbook is a booklet that contains all the information necessary for downloading, installing, and configuring software. The comprehensive instructions for obtaining and configuring the NAM (Network Animator) program are included in this setup manual. The handbook is divided into three sections: Section 1 covers details on obtaining the tools and software needed for the research; Section 2 covers tool installation; and Section 3 covers details on software setup. The research has a strong emphasis on simulation studies utilizing the NS2 simulator in conjunction with NAM, which is utilized as a tool for creating simulation-related scenarios.To verify the configuration, a VMware virtual machine running the Ubuntu operating system is made to simulate the wireless network architecture.

## 2 System configuration requirements

The user rebuilding the configuration using this configuration manual must have a fundamental knowledge of TCL scripting. The user should also utilize a Windows or Linux machine.

### 2.1 Hardware requirements

The experiments was carried out on the fallowing environment.

1. **For Windows :**
   - Processor: 11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 2.42 GHz
   - RAM : 16.0 GB
   - System type : 64-bit operating system, x64-based processor
2. **For Ubuntu:**
   - RAM : 4 GB
   - Storage : 32 GB
   - System type : Ubuntu 64-bit operating system
   - version : 18.04.6 LTS

## 2.2 Minimum System Requirememnts

This subsection outlines the very system requirements needed to replicate the experiment situation.

- Operating System : Windows/Linux based OS.
- (RAM) : Minimum of 8 GB.
- Disk Space : At least 32 GB of empty space.

# 3 Downloading and Installation of Tools and Packages

To run Ubuntu, we downloaded VMware Workstation Player 16.2.5 on a Windows 10 machine.
The tools and packages are installed in the following steps:

## 3.1 Installation of NS2 package

The Network Simulator 2 is installed using the following procedures on Ubuntu 64-bit:
**Step 1:** The Ubuntu libraries must be updated using the command Fig.1 below in order to install the NS2 package.

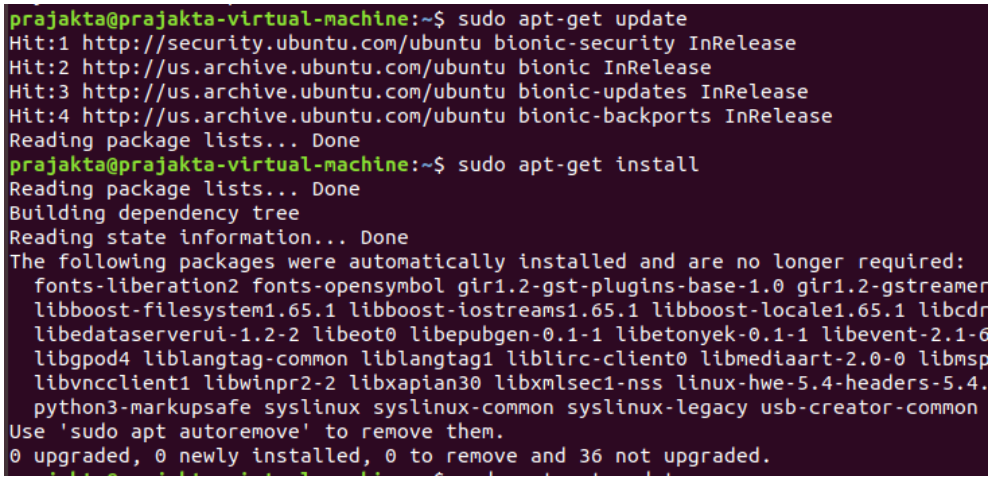


Figure 1: Ubuntu update installation

**Step 2:** The command shown below was used to install the Network Simulator 2 package Fig2.

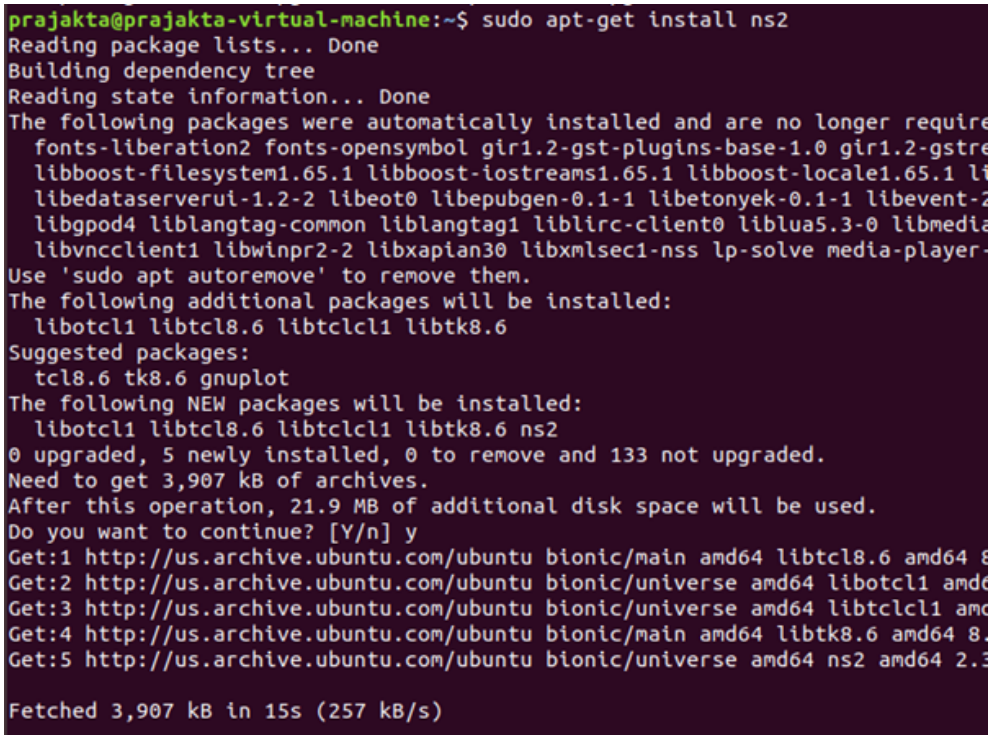


Figure 2: NS2 package installation

**Step 3:**The command shown below was used to install the tclsh package Fig3.

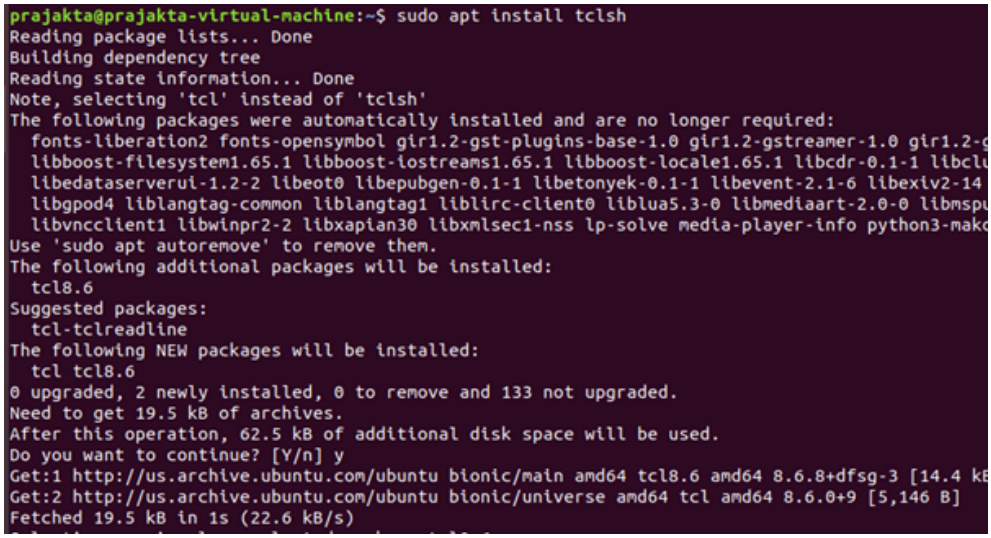


Figure 3: tclsh package installation

**Step 4:**To check NS2 is successfully installed, use the bellow command Fig4.

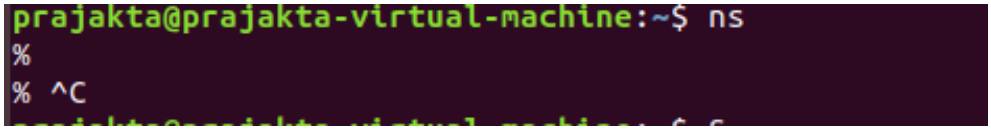


Figure 4: Successfully installation of NS2

### 3.2 Installation of NAM package

The NAM package is installed following the installation of NS2 to depict the network simulation results visually fig5.

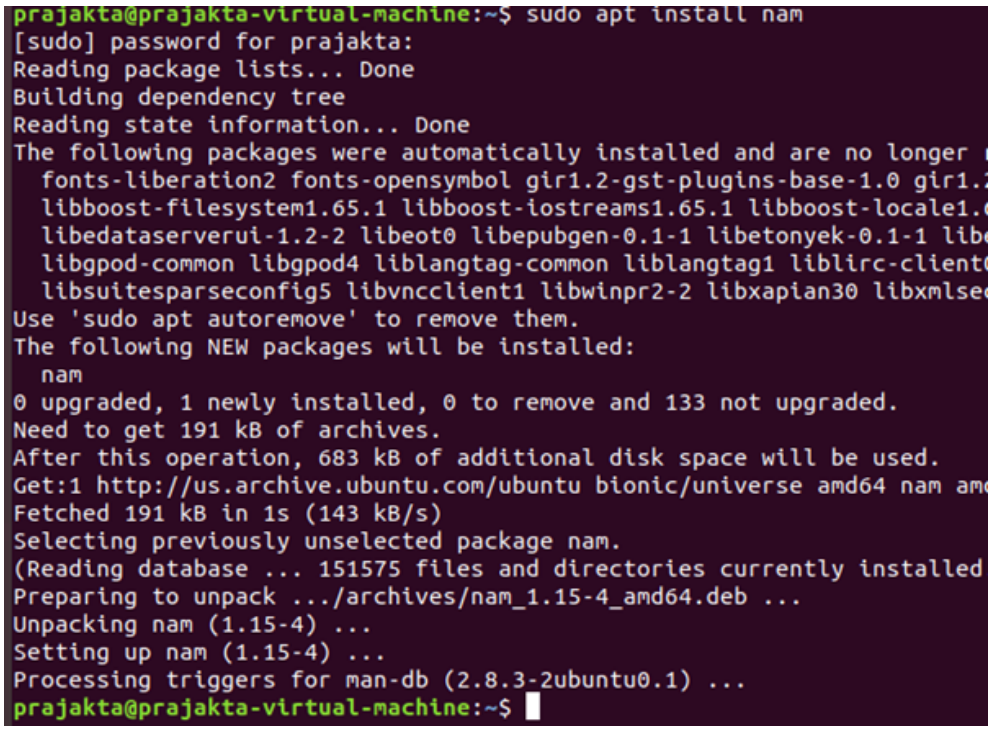


Figure 5: NAM package installation

# 4 Execution of NS file:

Instructions for extracting and running code files on NS2 can be found in the section below.

### 4.1 Extraction of the file

Utilize the command: "unzip filename.zip" by providing the path as shown in Fig. 6 to extract the zip file to one of the directories in Ubuntu.

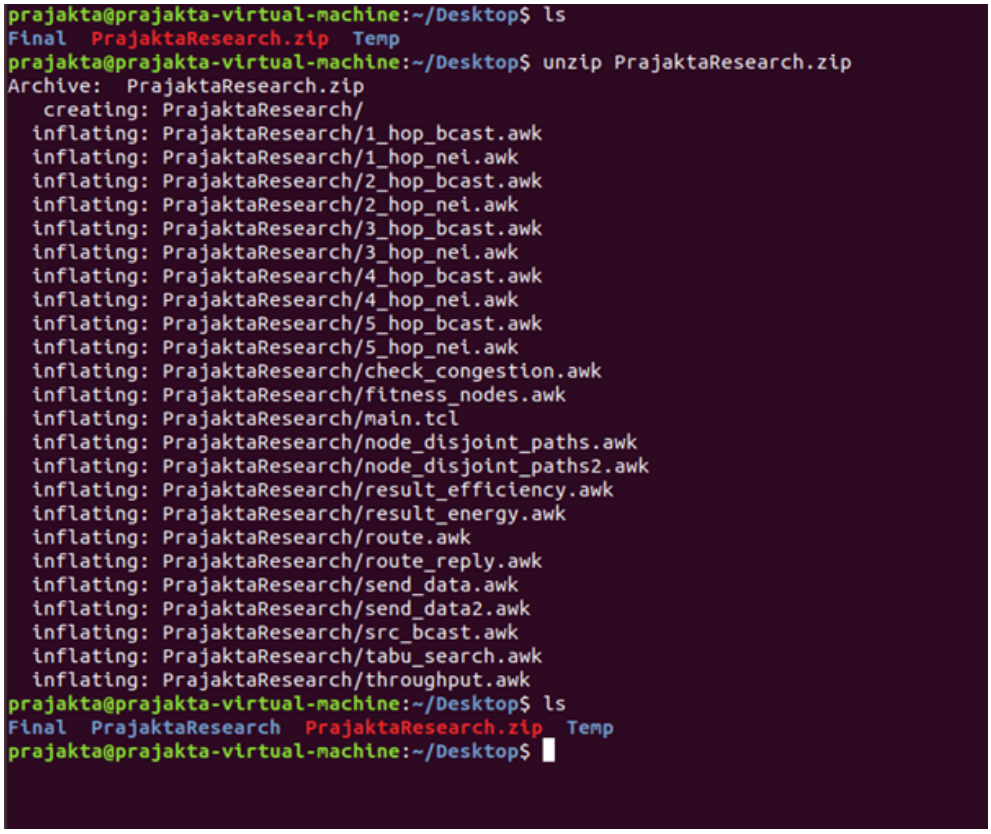


Figure 6: Extraction of zip file

## 4.2 Execution of main file in NS2

Run the command"ns main.tcl" to run the simulation ref Fig.7.

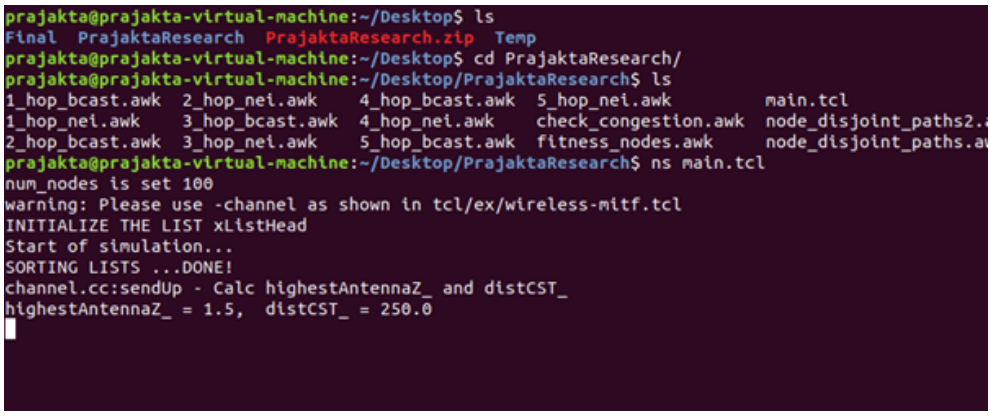


Figure 7: Run main.tcl file

## 4.3 Topology in NAM

Once we completed above steps successfully, we will get below network animator with created network topology Fig.8.

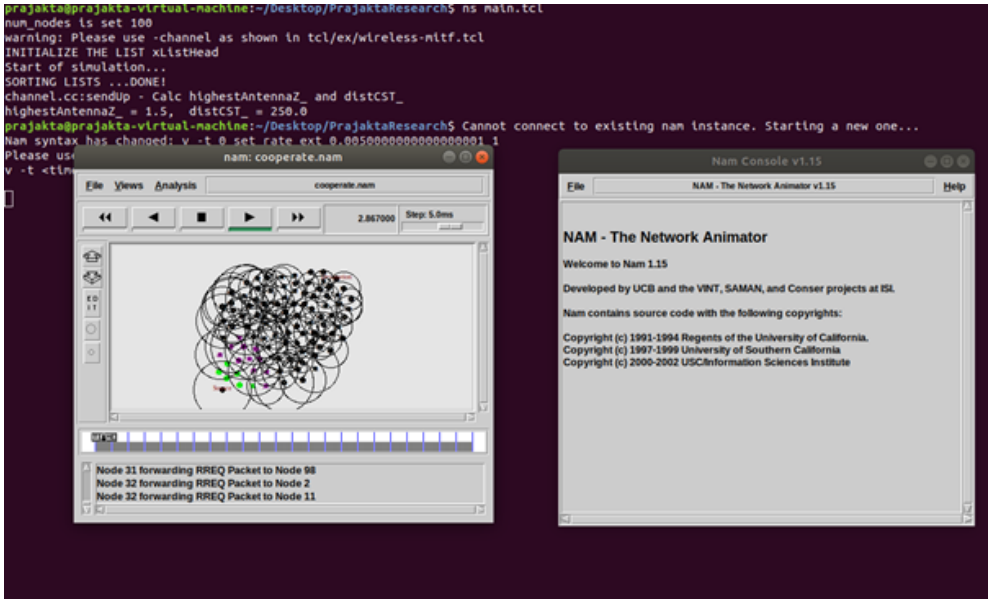


Figure 8: Network animator window and graphical presentation

# References

Canonical (n.d.), 'Ubuntu official website'.
**URL:** *https://releases.ubuntu.com/18.04/*

*The Network Simulator: Building NS* (n.d.).
**URL:** *https://www.isi.edu/nsnam/ns/ns-build.html*