

NETPLAN USER MANUAL VERSION 1.0.0

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I. Introduction:

This document design as an info and guide to use the NETPLAN programming including how to compiling, showing the results and analyzing the performance.

The NETPLAN program is used for calculate the shortest distance between locations base on time and cost of construct location. In most of situations, it is difficult to determine the minimum possible overall cost base on fast performance and vice versa. This tool could help to solve this problem.

II. Setting up:

For windows: use Xming and Putty program to ssh to the contained folder

For mac and Linux: typing the command on the command line

- Login with username and password
- Navigate to folder by either methods not limit to command or visual
- Example : nautilus

III. Install and run the program:

Because the bundle program is included with Makefile for user compiling the program more convenient. The command is:

- __ make
- __ ./netplan nameoffile
- __ make clean

For example:

- __ make
- __ ./netplan usa.net
- __ make clean

IV. NETPLAN including:

edges.hpp: contain instructions on how to make the edge

vertex.hpp: contain instructions on how to make the vertex

graphs.hpp: header file for find shortest path and minimum spanning tree methods

netplan.cpp: combine everything and display the program on the screen

V. Understanding the display:

Using the file usa.net as the model, the completely display on the screen include:

- _ 54 \leftarrow total cost of construct all possible links
- _ 34 \leftarrow total cost of using cheapest cost to travel from another place
- _ 20 \leftarrow difference or money saved in building from cheapest cost
- _386 \leftarrow the total transit time to send a packet with all possible links
- _482 \leftarrow the total transit time using minimum cost links
- _96 \leftarrow difference of better time on using cheap-cost network

Three numbers from the top are in million dollars and following by time consumption unit.

VI. Understanding the BLACKBOX inside:

- Step 1: the program creates a graph based on number of cost and time from the file
- Step 2: Links the network or edges altogether by undirected graph including same distances but different starts.
- Step 3: Building up the minimum spanning time base on number of edges and cost
- Step 4: By using the Dijkstra algorithm, calculate all the minimum path between pair of vertices.

VII. Reference:

<https://csemoodle.ucsd.edu/mod/resource/view.php?id=11308>