The task

Write a program to calculate the maximum value of Root Path Cost in an IEEE 802.1d bridged LAN. The configuration parameters of bridges and the structure of the network are provided in the input data for the program.

The program must read input data from file. The name of file is specified in command line. If the name of the file is not provided, the program gets input data from the standard input.

Description of implementation

*For development used visual studio 2017*

To solve the problem was implemented Spanning Tree Protocol taken from Wikipedia. Implementation of Spanning Tree Protocol is presented in the STP class. It uses classes that implement the basic entities of Spanning Tree Protocol: Element, Message and Port. To create a network topology, use the methods of createBridge, createLAN, connectElements.

When the network is created, need to determine the root bridge and the cost of the path. To do this, use the sendMessageFromAllBridges or sendMessageFromRootBridge method.

To obtain information about the network, you need to call the getInfo method.

A user can create a network topology by reading it from the file transferred as an application startup parameter (for this, the TextParserSTP class is used) or by typing it manually (using the STPfromInput class).

Test instructions

1) Select a method :

a) run the application from the command line by preceeding as a parameter a file with a description of the network (in the form from the example).

*note: each parameter must be written with a new line*

b) run the application and follow the instructions to create a description of the network manually.

*note: executable in STP\Debug\STP.exe*

2) As a result, all ports and networks with the corresponding values from them to the root bridge on the shortest path will be displayed in the console.

3) Below will be deduced the cost of the most expensive of the paths.

Test example



Example of a file describing the network

[BRIDGE 1]

BridgeId = 42

[BRIDGE 1.Port 01]

PathCost = 10

ConnectedTo = LAN A

[BRIDGE 1.Port 02]

PathCost = 10

ConnectedTo = LAN B

[BRIDGE 2]

BridgeId = 97

[BRIDGE 2.Port 01]

PathCost = 05

ConnectedTo = LAN C

[BRIDGE 2. Port 02]

PathCost = 10

ConnectedTo = LAN A

[BRIDGE 2. Port 03]

PathCost = 05

ConnectedTo = LAN D

[BRIDGE 3]

BridgeId = 45

[BRIDGE 3.Port 01]

PathCost = 10

ConnectedTo = LAN B

[BRIDGE 3.Port 02]

PathCost = 10

ConnectedTo = LAN E

[BRIDGE 4]

BridgeId = 57

[BRIDGE 4.Port 01]

PathCost = 05

ConnectedTo = LAN B

[BRIDGE 4.Port 02]

PathCost = 05

ConnectedTo = LAN E

[BRIDGE 5]

BridgeId = 57

[BRIDGE 5.Port 01]

PathCost = 05

ConnectedTo = LAN A

[BRIDGE 5.Port 02]

PathCost = 05

ConnectedTo = LAN E