

Bidirectional between Nodes in MATPLAN WDM Make a Big Impact in Efficiently

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1.0 ABSTRACT

Optical network are being deployed on internet backbones paving the way for the next generation high speed Internet. Technology in the internet architecture brings in new challenges and performance issue. In this research we try to gain and overview of optical networks planning using MATPLAN WDM. Previously many of virtual topology has been done. For example our previous literature reviews about the MATLAB. This tool is help in networking field but MATLAB have their own weakness in designing new algorithm. We review the main research paper for optical networking with particular focus on all packet switching. Packet switching networking is a communications method in digital form that groups all transmitted data including of content, type, or structure called packets. Packet switching features delivery of variable-bit-rate data streams (sequences of packets) over a shared network. When traversing network adapters, switches, routers and other network nodes, packets are buffered and queued, resulting in variable delay and throughput depending on the traffic load in the network. We then try to create new topology using Matplan WDM to improve the network performance. In the end of this research we try to come out with an new topology that will solve this existing problem in the WDM.

2.0 INTRODUCTION

The most interesting in optical networking is boosted by the advances in coherent optical transmission, leading to MatPlan WDM able to capture hundred of data transmitting traffic. The target of this paper is multiplying the overall network capacity and connectivity opportunities. With integrated optics the implementation of active network components such as switches and multiplexers is becoming more and more realistic. The first thing we do is know the algorithm and get the network data to be process in next step in MatplanWDM. Then, the purpose of this paper is to evaluate about the generation and transmission infrastructure of data using MatPlanWDM to support high performance data transport. Issues such as optical switching and transparent optical networking have emerged as the next step in high-speed network evaluation. What do we mean by performance is to know the concept of delay, packet lost rate and file transfer time.

3.0 MATERIALS AND METHOD

Firstly we try to observe the transmitting data in the transferring process. Second, we also try to show the transmitting results in different kind of format. Both are the research objective in this project. This research paper was focus to the end user who use optical cable to in transferring data or using internet. By using a 10 nodes, we can evaluate a simple topology that have a difference number of bidirectional by using simulation topology in Matplan WDM.

In a MatPlan WDM optical packet switch network, despite the limitations of optical buffer capacity, node architecture and wavelength multiplexing technique can be define to achieve very low optical lose profanities. We can then assume that congestion within the optical network is rare event. The main characteristic of the optical network is that the packets are generally delayed for a short amount of time in the nodes, while there is an additional delay at the network edges, where optical packets are built. Therefore, because of this architecture, the end to end delay is typically made of the following main contributions:

- Delay in the access interface (incoming and out coming)
- Delay in the network nodes

The simulations have been performed in order to indentifying the differences between transmitting data. Our main idea in this project is a network simulation technique where a program models the behavior of a network either by calculating the interaction between the different network entities (hosts/routers, data links, and packets.) using mathematical formulas, or actually capturing and playing back observations from a production network.

We try to use a network simulator that predicts the behavior of a network, without an actual network being present. In simulators, the computer network is typically modeled with devices and traffic and at the end, the performance is being analyses. Typically, users can then customize the simulator to fulfill their specific analysis needs. Simulators typically come with support for the most popular protocols in use today, such as WLAN, Wi-Max, UDP, and TCP. But in this paper, we focus on topology type.

This part briefly overview some relevant educational planning tool for traffic in existing MatPlanWDM. The way to know about the generation and transmission of multimedia traffic we use software to get the data called

Communication Wifi View.

RESULT

We try to create the efficiently network by using simulation method. By linking between a 10 nodes, we can reveal a simple result to being refers when doing a observation about a WDM. As a result, we come out with our topology data where Topology Two is more efficient than Topology One.

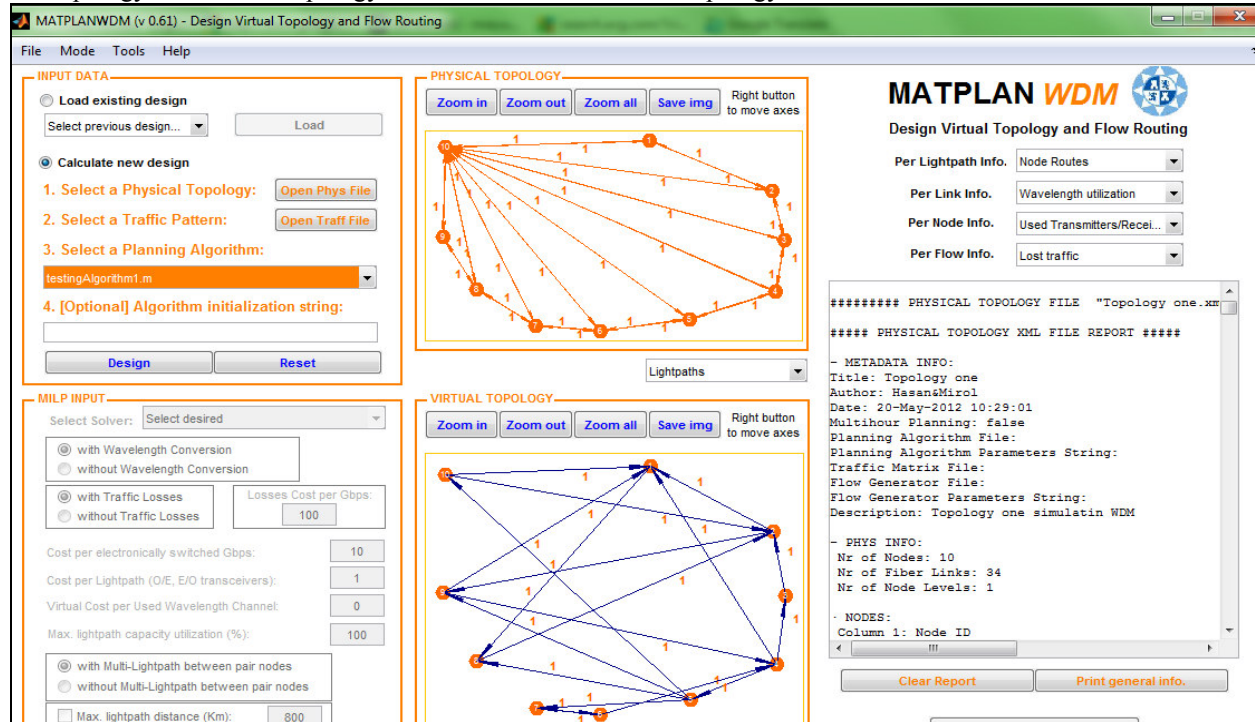


Figure 4 Design Virtual Topology and Flow Routing Interface

In order to create a topology, we should define the input parameters for the simulation in the *input area*. We can choose between calculate a new design and load an existing design. If the user prefer to calculate a new design, he has to specify three files: (1) a XML file describing the physical topology (*.xml* file), (2) a text file describing the traffic matrix (*.traff* file), (3) a MATLAB code file (*.m* extension), implementing the planning algorithm to be applied. This latter module can receive a user defined input string for initialization. We have used a planning algorithm and we can see the input data of what if analysis. In this paper we create two different topology as shown below. The *.xml* files in the input data panel contain the list of nodes and fiber links in the network. The planning algorithm module is an *.m* file. In Matplan WDM we can choose a built-in heuristic algorithm, or implement its own one.

Multi-Hour Analysis

File Mode Tools Help

Select a time slot: - 02:00 Save net state for a time slot

MATPLAN WDM
Multi-Hour Analysis

INPUT DATA

Load existing design
Select previous design... Load

Calculate new design

1. Select a Physical Topology: Open Phys File

2. Select a Traffic Pattern: Open Traff File

3. Select a Planning Algorithm:
testingAlgorithm1_MH.m

4. [Optional] Algorithm initialization string:

Start Reset

PHYSICAL TOPOLOGY

Zoom in Zoom out Zoom all Save img Right button to move axes

VIRTUAL TOPOLOGY

Zoom in Zoom out Zoom all Save img Right button to move axes

PERFORMANCE REPORTS

Node X:	1	2	3	4	5	6	7	Total
Hour 00h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 01h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 02h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 03h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 04h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 05h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 06h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 07h:	0.184	0.149	0.226	0.241	0.260	0.175	0.219	2.075
Hour 08h:	0.948	0.765	1.164	1.240	1.338	0.900	1.129	10.684
Hour 09h:	2.196	1.771	2.694	2.872	3.098	2.083	2.615	24.739
Hour 10h:	3.119	2.516	3.827	4.080	4.401	2.959	3.715	35.147

Clear Report Save full XML net state

PERFORMANCE REPORTS

Node X:	1	2	3	4	5	6	7	Total
Hour 00h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 01h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 02h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 03h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 04h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 05h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 06h:	0.035	0.029	0.044	0.046	0.050	0.034	0.042	0.400
Hour 07h:	0.184	0.149	0.226	0.241	0.260	0.175	0.219	2.075
Hour 08h:	0.948	0.765	1.164	1.240	1.338	0.900	1.129	10.684
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Hour 10h:	3.119	2.516	3.827	4.080	4.401	2.959	3.715	35.147

In this paper we try to compare the two of design topology and the implementation we assume that the result will show the different thing. The related work as shown below.

MATPLAN WDM

Traffic Generation

PARAMETER INPUT

Number Of Nodes:

PATTERN GENERATION

NORMALIZATION

TRAFFIC FILE

```

                // Information File

                //Number of Nodes
                10

                //Traffic Table - Traffic

                0.000    2.436    1.749    0.684    7.060    3.180    5.324
                2.601    0.000    1.386    4.363    6.451    6.086    7.165
                0.868    0.741    0.000    1.739    5.523    9.102    1.793
                4.294    3.939    9.011    0.000    2.181    9.091    3.365
                2.573    0.034    9.394    9.547    0.000    5.916    1.877
                2.976    2.207    2.212    4.306    2.280    0.000    3.219
                4.249    0.013    4.827    9.616    3.709    8.531    0.000
                1.192    1.892    3.760    7.624    8.909    4.424    5.486
                4.951    1.425    5.238    0.073    8.564    9.044    0.487
                7.064    2.681    2.649    6.800    4.024    0.332    5.527
            
```

Figure 5 Topology one

PHYSICAL TOPOLOGY

Right button to move axes

VIRTUAL TOPOLOGY

Right button to move axes

Figure 6 Topology one

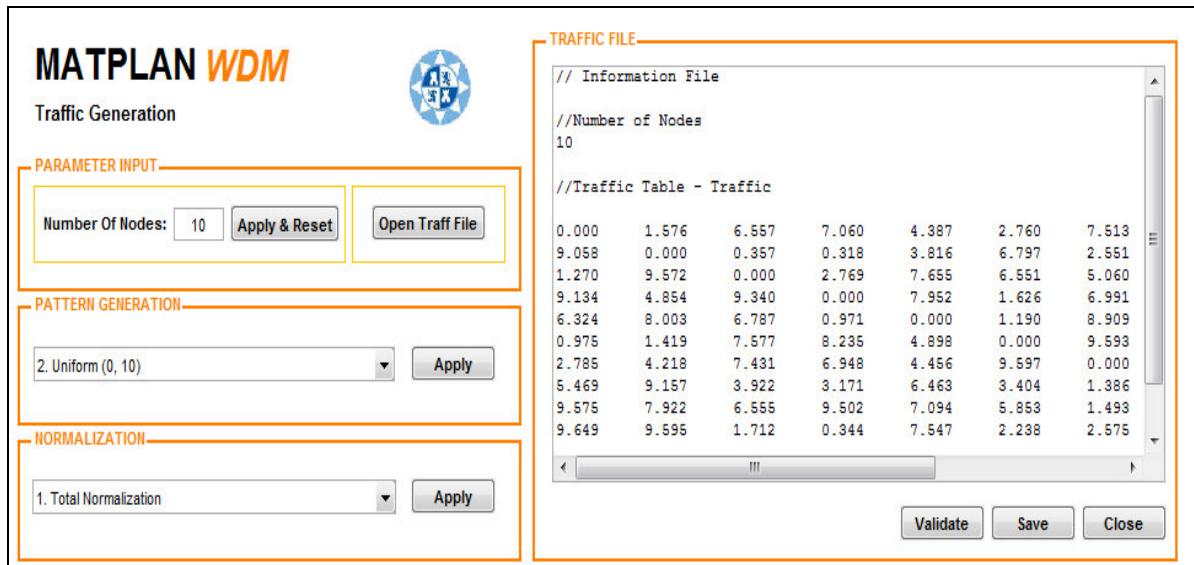


Figure 7 Topology two

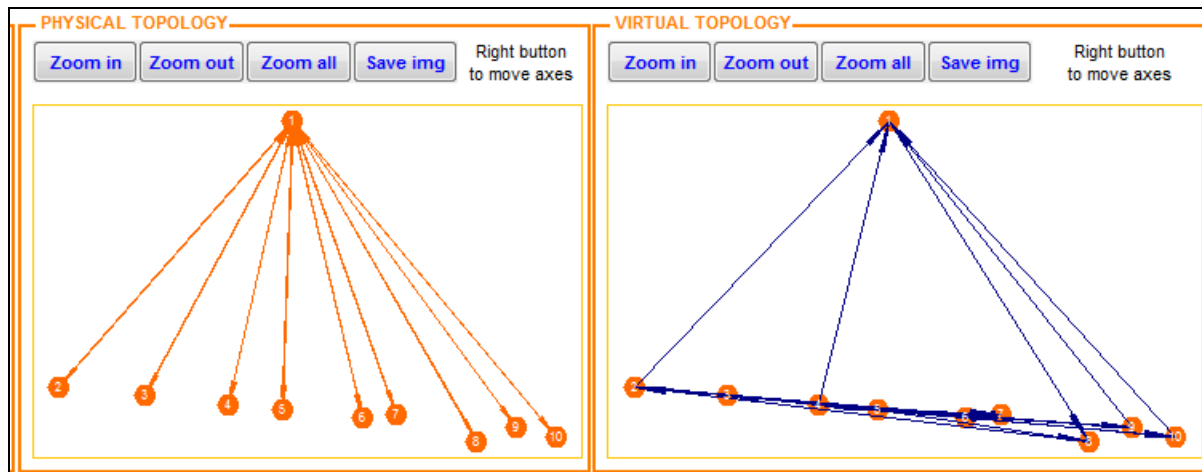


Figure 8 Topology two

TOPOLOGY ONE ANALYSIS	TOPOLOGY TWO ANALYSIS
##### WHAT IF ANALYSIS REPORT #####	##### WHAT IF ANALYSIS REPORT #####
Simulation date: 20/5/2012 - 12:10	Simulation date: 20/5/2012 - 12:10
INPUT DATA OF THE WHAT IF ANALYSIS:	INPUT DATA OF THE WHAT IF ANALYSIS:
- Physical Topology File: Topology one.xml	- Physical Topology File: topology two.xml
- Traffic File: Topology one.traff	- Traffic File: topology two.traff
- Number Of Simulations: 9	- Number Of Simulations: 9
- Planning Algorithm(s): 1. testingAlgorithm1.m -	- Planning Algorithm(s): 1. testingAlgorithm1.m -
- First Sweep Parameter: Number of Wavelengths per Fiber (%) :	- First Sweep Parameter: Number of Wavelengths per Fiber (%) :
9 18 27 36 45 54 63 72 81	9 18 27 36 45 54 63 72 81

The below table shown the dynamic analysis design analysis output.

DYNAMIC ANALYSIS

- PHYS INFO: TOPOLOGY ONE	- PHYS INFO: TOPOLOGY TWO
##### PHYSICAL TOPOLOGY FILE "Topology one.xml" LOADED #####	##### PHYSICAL TOPOLOGY FILE "topology two.xml" LOADED #####
##### PHYSICAL TOPOLOGY XML FILE REPORT #####	##### PHYSICAL TOPOLOGY XML FILE REPORT #####
- METADATA INFO:	- METADATA INFO:
Title: Topology one	Title: topology two
Author: Hasan&Mirol	Author: hasan&mirol
Date: 20-May-2012 10:29:01	Date: 20-May-2012 11:34:54
Multihour Planning: false	Multihour Planning: false
Planning Algorithm File:	Planning Algorithm File:
Planning Algorithm Parameters String:	Planning Algorithm Parameters String:
Traffic Matrix File:	Traffic Matrix File:
Flow Generator File:	Flow Generator File:
Flow Generator Parameters String:	Flow Generator Parameters String:
Description: Topology one simulatin WDM	Description: topology two wdm
- PHYS INFO:	- PHYS INFO:
Nr of Nodes: 10	Nr of Nodes: 10
Nr of Fiber Links: 34	Nr of Fiber Links: 18
Nr of Node Levels: 1	Nr of Node Levels: 1
· NODES:	· NODES:
Column 1: Node ID	Column 1: Node ID
(Column 2: Node Name) (Optional)	(Column 2: Node Name) (Optional)
Column 3: Node Position(X,Y)	Column 3: Node Position(X,Y)
Column 4: Node Population	Column 4: Node Population
Column 5: Node Timezone	Column 5: Node Timezone
Column 6: Node Level	Column 6: Node Level
Column 7: Nr Available TXs	Column 7: Nr Available TXs
Column 8: Nr Available RXs	Column 8: Nr Available RXs
Column 9: Nr Available TWCs	Column 9: Nr Available TWCs
1 Node 1 (0.31,0.72) 1 0 1 1000000000000 100000000000 1000000000000	1 Node 1 (0.40,0.85) 1 0 1 1000000000000 100000000000 1000000000000
2 Node 2 (0.44,0.63) 1 0 1 1000000000000 1000000000000 1000000000000	2 Node 2 (0.05,0.64) 1 0 1 1000000000000 1000000000000 1000000000000
3 Node 3 (0.45,0.54) 1 0 1 1000000000000 1000000000000 1000000000000	3 Node 3 (0.18,0.63) 1 0 1 1000000000000 1000000000000 1000000000000
4 Node 4 (0.44,0.45) 1 0 1 1000000000000 1000000000000 1000000000000	4 Node 4 (0.31,0.63) 1 0 1 1000000000000 1000000000000 1000000000000
5 Node 5 (0.35,0.40) 1 0 1 1000000000000 1000000000000 1000000000000	5 Node 5 (0.39,0.62) 1 0 1 1000000000000 1000000000000 1000000000000
6 Node 6 (0.26,0.38) 1 0 1 1000000000000 1000000000000 1000000000000	6 Node 6 (0.51,0.61) 1 0 1 1000000000000 1000000000000 1000000000000
7 Node 7 (0.20,0.39) 1 0 1 1000000000000 1000000000000 1000000000000	7 Node 7 (0.56,0.62) 1 0 1 1000000000000 1000000000000 1000000000000
8 Node 8 (0.14,0.45) 1 0 1 1000000000000 1000000000000 1000000000000	8 Node 8 (0.68,0.60) 1 0 1 1000000000000 1000000000000 1000000000000
9 Node 9 (0.10,0.55) 1 0 1 1000000000000 1000000000000 1000000000000	9 Node 9 (0.74,0.61) 1 0 1 1000000000000 1000000000000 1000000000000
10 Node 10 (0.10,0.71) 1 0 1 1000000000000 1000000000000 1000000000000	10 Node 10 (0.80,0.60) 1 0 1 1000000000000 1000000000000 1000000000000
· FIBER LINKS:	· FIBER LINKS:
Column 1: Fiber Link ID	Column 1: Fiber Link ID
Column 2: Origin Node ID	Column 2: Origin Node ID
Column 3: Destination Node ID	Column 3: Destination Node ID
Column 4: Link Length (Km)	Column 4: Link Length (Km)
Column 5: Nr Available Wavelengths	Column 5: Nr Available Wavelengths
1 1 2 0 40	1 1 2 0 40

DISCUSSION

This paper studies the problem of finding the result between transmitting with others data in MATLAB and we want to create specific mode to evaluate the transmitting data. We use the simulation test as a method to get the result in our research. For future this research might be use in other field not only for data transmitting. The important things is how to create the traffic and we have to know how to design the topology after that we can know the forward step in the MatPlan WDM.

In this paper we try to compare the different topology to choose which one can be the best algorithm in our research paper. Actually, The thing that distinguishes different kinds of geometry from each other (including topology here as a kind of geometry) is in the kinds of transformations that are allowed before you really consider something changed. This paper prove the additional link between nodes, make it more efficiently.

CONCLUSION

In this paper, we try to compare between both topology. We can conclude that, topology one is more efficient than topology two. Difference between both of them only the additional link between them. So this paper make a addition prove about effect of additional link of optical cable between nodes can make it more efficiently.

REFERENCES

1. P. Pavon-Mariño, B. García-Manrubia, R. Aparicio-Pardo, J. García-Haro, "An educational RWA network planning tool for dynamic flows", Proc. of the VII Workshop G/MPLS networks, Vilanova i la Geltrú (Spain), March 2008.
2. Pablo Pavon-Marino, M.V. Bueno-Delgado, W. Cerroni, A. Campi, F. Callegati, "A parallel iterative scheduler for asynchronous Optical Packet Switching networks", *Optical Switching and Networking*, vol. 8, no. 2, pp.103-115, April 2011.
3. Pablo Pavon-Marino, Ramon Aparicio-Pardo, Belen Garcia-Manrubia, Nina Skorin-Kapov, "Virtual topology design and flow routing in optical networks under multi-hour traffic demand", *Photonic Network Communications*, vol. 19, no.1, pp. 42-54, February 2010
4. Christos B. Apostolos G. and Georgios K. "Challenges in Cross Layer Design for Multimedia Transmission over Wireless Networks". Research Academic Computer Technology Institute, vol. 1, no. 1, pp. 1-2, April 2002

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