EFFICIENT SIGNAL SCHEDULING AND TRANSMISSION IN OPTICAL BRUST SWITCHING NETWORKS

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Abstract**—** The Purpose of Optical Burst Switching (OBS) is a capable of transferring data in high speed transmission.The main problem in Optical brust switching is to reduce the schedule brusts. The transmission of data is not efficient in single method and cannot improve the performance range. The proposed system includes feasilble methods and enhances the higher performance without affecting the implementation complexity.The Optical brust switching have more bandwidth flexibility comparing to wavelength routing. It provides optical end-to-end communication.The Optical brust interface include fiber delay lines (Feed-forward or feedback), setting up the transmission of the offset time randomly, channel scheduling and Burst Delay Feedback scheduling (BDFS).There are more defeat in switching the optical switching paradigm to optical brust switching in the process of aggregation of brust,routing,authentication and quality of service. The paper describes about the WDM network to control packet range and separated the wavelength capability. It deals with more issues and intimidation and different solution to handle the network limits. The optical buffering(FDLs) is used to speeds switching process faster.The incoming data are transmitted from one node to another node through routing path in FDL. The offset time(OT) with FDL buffering and Brust length achieve high traffic data ratios..The offset time techniques does not require multi hardware components. The optical brust is transmitted a time offsets and prevents a brust to entered the switch before the data configuration. The Channel scheduling brusts in OBS networks and Fiber Delay Lines(FDL) is proposed algorithm. The bandwidth arise more fragmented in wavelength channels. The proposed algorithm reduces brust loss and provides fast and efficient bandwidth .Simulation results shows that proposed algorithm reduces the loss rate compared to the previously known algorithm. The search time of this algorithm is reduces from that of the existing algorithm. The OBS are designed to be flexible and cost effective and faster compared to the wavelength division multiplexing methods.
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Keywords – OBS, BDFS, FDL, Scheduling,Data transmission,Optical Buffering.

I INTRODUCTION

Nowdays, there are increasing growth of the optical usage and transmission of bandwidth are the main traffic in data loss. There is in need to increase data taransmission speed and bandwidth in the communication networks. The Optical brust switching is enhanced to achieve the sophisticated optical hardware. The Wavelength division multiplexing has a capacity to transmit data simultaneously on a fiber with higher throughput. The deployment of WDS networks optical signal cannot have capability to hold the whole network and it slowdown the processing speed from one node to another node. It causes more traffic to send nodes information to receiver.For this problem,here introduces the optical brust switching.The optical brust switching eliminating the data conversion and working directly in the optical hardware.The OBS assembled the data in the header and control the information in the header. The optical circuit switching and packet switching techniques are used as proposed techniques. The router will control the information while transferring the data through the network.The hardware complexity is reduced through the two-way resource reservation. The benefit is share data from multi sources and it provides the efficient bandwidth utilization and wavelength are not reserved. In general, only a first-come-first-served (FCFS) algorithm can be used to schedule the incoming data bursts. The OBS is control information separately from the user data channels. The OBS is based on the one-way reservation protocol. The Figure 1 brust is transferred without the intermediate nodes.The brust is transmitted entirely in the optical domain and internet protocol(IP) packets are the logical aggregation. Through the IP are migrated into the brust. The performance of OBS, the example are adding optical buffers to OBS nodes, burst segmentation, centralized resource reservation, and dynamic routing. The OBS control data packet transferring from the core network to the incoming burst. The burst disassembles the data transmission and forwards the packets to the destination networks. The WDM controls packets or header in a separate wavelength. The burst is transmitted the data in full wavelength form and schedule bandwidth reservation and makes switches to be simpler.OBS transferred the data based on non-zero offset time.It reserved and released the bandwidth and control the data bursts using the different channel. The burst switching technique used two-way resource reservation technique. The data cannot retrieve back in the one-way reservation techniques. The end-end data can be transferred more quickly in the two way reservation techniques.

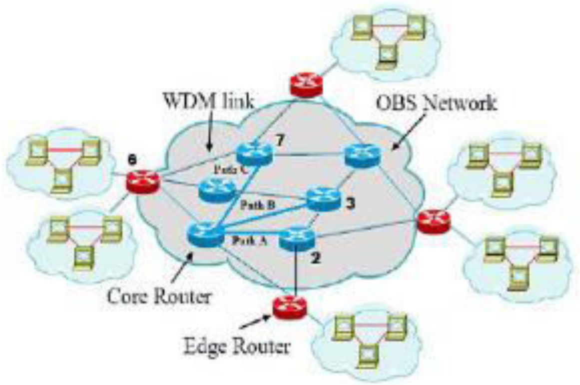


Figure 1 OBS router architecture.

The Optical brust switching performance is increased based on different improvement approaches and control processing time and increasing the time complexity and differnt merits approaches are used. The main goal is to improve performance level within the lower priorities. To achieve this here combined multiple methods and using those methods achieved the throughput and loss rate performance.

Our main contributions include the following:

Introduce the Fiber Delay Lines (FDL) before the core nodes. The Fiber Delay lines is used to improves the burst loss probability based on the offset-time approach and QoS performance. The OBS has intermediate nodes to improve the incoming and outcoming links with the condition of burst. Based on the burst size we collaborate the burst loss and throughput.The channels are implemented to improves the bursts controlling with the others.

The Quality of Service is perceived the end users services and measures the network transmission. The OBS represents the congestion state of the networks and burst loss rate in the interest of QoS merits. It burst are lost in the OBS networks because of the failure on resource reservation and it shows more number of reservation attempts.The rest of the chapter are describes about the optical circuit and packet switching.The WDM with FDM.

II LITERATURE SURVEY

. **Y. Li, P. K. A. Wai, and Victor O.K. Li (2011), "Performance Improvement Methods for Burst-Switched Networks," J. OPT. COMMUN. NETW./VOL. 3, NO. 2:**

The performance model of optical burst switching (OBS) is describes about the degradation of OBS and throughput performance of packet and packet controlling processing times. The three methods are implemented to increase the performance of the OBS significantly they are addition of simple fiber delay lines (FDLs), random extra offset time, and window-based channel scheduling (WBS). The packets processing time is controlled using Additional FDLs .It is easier to increases the offset time without any additional hardware and nodes capability thorugh the random extra offset time.

WBS is capable of providing better throughput and if it used the nodes processing time using FDLs. There are two cases are considered in WBS scheduling (i) both the window time Twd and the control packet processing time Tcp are compensated by FDLs, and (ii) no FDL is used for Twd and Tcp compensation, but Tcp is much larger than the data burst transmission time L. The WBDs also can improve the throughput than the random extra offset time.

2) **C. Qiao and M. Yoo (1999), "Optical Burst Switching (OBS) – A New Paradigm for an Optical Internet," J. High Speed Netw., vol. 8, pp. 69 – 84:**

The optical burst switching is introduced in this paper. The main objective of this paper is to introduce the new switching paradigm. The JET is used for OBS protocols and it is applicable of transmitting IP over WDM. The Fiber delay lines and there processing accomdation are discussed in this paper.

The one way reservation is used in an effective and feasible way for sending the data from one node to another. While

transferring the data requires the high bit-rate and a low latency but because of the short time cannot compared to the end to end propagation delay of the network. The JET-based protocol is used to send data from the source to the destination with multi path routing and waits for each hops to reach the destination nodes. It preserve more bandwidth to support the intermediate nodes. The FDLs are not support the JET-based protocol for limited adaptivity.
It is capacity to achieve the higher bandwidth utilization using delayed reservation and using additional offset time can provide the higher priority to bursts travelling with multi hops.OBS has some of the advantage that is efficient to support multicasting to the optical layer and multicasting capability and knowledge of the physics topology.

III PROPOSED WORK

BRIEF DESCRIPTION ABOUT OPTICAL FIBERS IN NETWORK

Nowdays, the network bandwidth is increasing globally in the internet through various applications.To enhance the bandwidth level optical data communication has been acknowledged as the best solution. The optical fiber can support the 50THz bandwidth level. It has capacity to maintain more bits of information,shorter wavelength and provides higher frequency for light waves. To tap the copper wires the fiber cables have more difficults. The optical communication is used many security to avoid the fiber difficults.

WAVELENGTH DIVISION MULTIPLEXING:

WDM is the most popular in the multiplex signals optical domain. WDM is capable of transmit the signals from the different wavelengths at a time to the same fiber. WDM is operates in the single communication channel for each wavelength. The optical networking techniques are used in the WDM networks. The signal transparency, scalability and flexibility are advantages of the WDM Networks. This WDM communicates has the bidirectional communication over one strand of fibers.

Broadcast and Select Networks:

The broadcast and select networks is used broadcasted special wavelength to all the network nodes. The receivers accept only certain data channels. The data nodes are rejected if it does not belongs to that data channels. There is no routing information is passed into the network.

Wavelength Routed Networks:

Wavelength routed networks provides the routing information and network are interconnected like point to point fiber links based on mesh topology. Lightpath is used to setting the two interconnected nodes in the network.Routing of the wavelengths along the optical networks is carried through optical channels called light paths. The light path is a circuit that uniquely identified the route and wavelength. The routing and wavelength assignment(RWA) algorithms establish the lightpath by selecting the route and wavelength.Once lightpath is established between source-destination pair, data is transmitted between the end points of the lightpath without processing, buffering or optical-electronic-optical (O-E-O) conversion at intermediate nodes.

OPTICAL NETWORKS SWITCHING TECHNIQUES

Three switching techniques are carried out in the IP traffic over WDM networks. They are optical circuit switching, optical packet switching and optical burst switching.

Optical Circuit Switching:

The network is configured with circuit and establish from an entry to an exit node. It adjust the optical cross connection circuits in the core routers and data signals in the optical form can travel in an optical manner from the entry node to exit node. This system cases more disadvantages to circuit switching, the circuit require more time to create and delete and the circuit is established, there source node is not used efficiently.

Optical Packet Switching:

The analysis of the optical packet switching provides the consumption of the energy in a number of optical switch fabrics for optical packet-switched applications Optical packet switching does not appear to present any considerable power consumption advantages over electronic packet switching. The burst traffic is allows statistical sharing of the channel bandwidth form different source and destination pairs. In optical packet switching the header is processed electronically or optically and that will remain the payload in the optic form. The headers can be transmitted on a separate wavelength or subcarrier channel. The payload is fully stored form the node to header using wavelength and subcarrier channel.

In packet switched networks, IP traffic is processed at every router on a packet by packet basis. So, it takes more transmission time. To overcome this limitation, we go for optical burst switching (OBS).

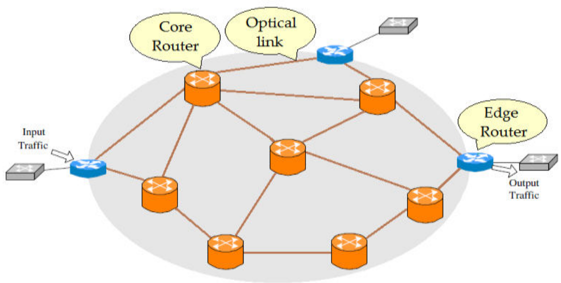
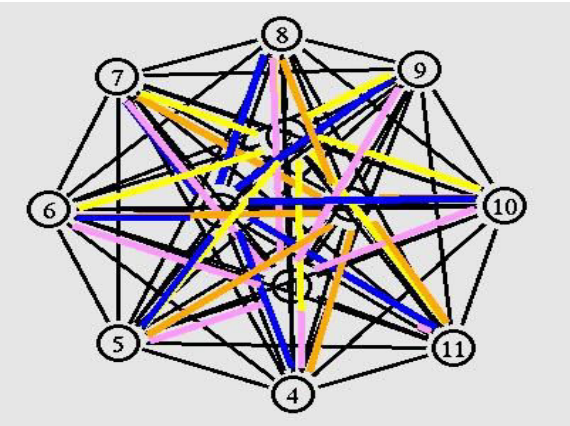


Fig: Architecture of OBS

IV RESULTS AND DISCUSSIONS

The feedback scheduling algorithm is used as proposed techniques and NS2 platform is used to analysis the simulation model. By using the NS2-we discussed the Discarded Traffic Retransmit Approach instead of Discarded Traffic Clear Approach. There are around 22 nodes are taken into simulationprocess to make Optical Burst Switched Network. The data burst get transferred from source node to destination node are shown in Network Animator (nam). Here assume that all links are bidirectional and Burst arrivals to the network are Poisson process. The assume transmission rate is 1 Gbps.

The JET Protocol is used in routing and the reservation scheme with fixed shortest path routing. The maximum number of paths per link is 23. Therefore, the maximum throughput per node is 13/23 or around 0.565. This value is our maximum achievable throughput.



In the simulations, The switch reconfiguration time in the OBS node (T_sw= 0). The traffic loading to a node is the number of data burst arrivals to the node per unit time divided by the number of wavelength channels per link. The performance of proposed model with and without existing methods. In the Window Based Channel Scheduling with FDLs, throughput performance was improved.

Figure 2 NAM output showing Data Burst Transmission

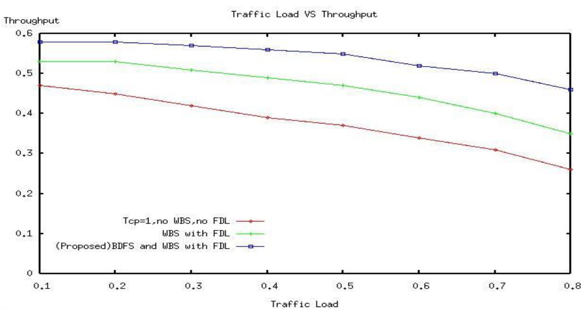


Fig: Trace graph for Traffic load vs Throughput

IV CONCLUSION

Optical Brust switching is related to the bandwidth network traffic and is schedule data bursts with minimum loss. The internet traffic is the major problems in the fields of networks traffic. It creates the inefficiency bandwidth due to the high number of network users. The optical cables has better communication than the copper cables. The addition of Fiber Delay Lines, addition of offset time and Window Based Channel Scheduling with proposed Burst Delay Feedback Scheduling are different methods. The WDM is used as full bandwidth for the optical fiber. The basic channel has different wavelengths with different channels. The paper mainly discusses about the optical circuit switching and optical packet switching. The optical packets switching plays are feasible role than the optical burst switching networks. The limitation is bandwidth utilitization and period of data broadcast services. In Window Based Scheduling, both the window time T_{wd} and the control packet processing time T_{cp} are provide further throughput improvement. Finally, the combination of BDFS, WBS with window time T_{wd} and FDL with delay time T_{FDL} can have better throughput and loss rate performance and measured successful burst delivery ratio. From the simulation results, the throughput is increased and also burst loss rate is reduced significantly.

IV REFERENCE

[1] 1. Barakat. N and Sargent. E.H (2005), 'Analytical modeling of offset-induced priority in multiclass OBS networks,' IEEE Trans. Commun., vol. 53, pp. 1343–1352.

2. Duser. M and Bayvel. P (2002), 'Analysis of a dynamically wavelength routed optical burst switched network architecture,' J. Lightwave Technol., vol. 20, pp. 574–585.

3. Hernandez. J.A, Aracil. J, Pedro. L, and Reviriego. P (2008), 'Analysis of blocking probability of data bursts with continuous-time variable offsets in single-wavelength OBS switches,' J. Lightwave Technol., vol. 26, pp. 1559–1568.

4. Kim. B.C, Cho. Y.Z, and Montgomery. D (2004), 'An efficient optical burst switching technique for multi-hop networks,' IEICE Trans. Commun., vol. E87-B, pp. 1737–1740.

5. Li. C.Y, Wai. P.K.A, and Li. V.O.K (2011), 'Performance Improvement Methods for Burst-Switched Networks,' J. OPT. COMMUN. NETW./VOL. 3, NO. 2

6. Li. C.Y, Li. G.M, Wai. P.K.A, and Li. V.O.K (2007), 'Optical burst switching with large switching overhead,' IEEE J. Lightwave Technol., vol. 25, pp. 451–462.

7. Li. J, Qiao. C, Xu. J, and Xu. D (2007), 'Maximizing throughput for optical burst switching networks,' IEEE/ACM Trans. Network., vol. 15, pp. 1163–1176.

8. Li. H, Neo. H, and Ian. T.L.J (2003), 'Performance of the implementation of a pipeline buffering system in optical burst switching networks,' in Proc. Global Communications Conf., pp. 2503–2507.

9. Maxemchuk. N.F (1987), 'Routing in Manhattan Street network,' IEEE Trans. Commun., vol. 35, pp. 503–512.

10. Lu. X and Mark. B.L (2004), 'Performance modeling of optical- burst switching with fiber delay lines,' IEEE Trans. Commun., vol. 52, pp. 2175–2183.

11. Pedro. J, Monteiro. P, and Pires. J (2009), 'Traffic engineering in the wavelength domain for optical burst switched networks,' J. Lightwave Technol., vol. 27, pp. 3075–3091.

12. Qiao. C and Yoo. M (1999), 'Optical burst switching (OBS)—a new paradigm for an optical Internet,' J. High Speed Netw., vol. 8, pp. 69–84.

13. Shalaby. H.M.H (2007), 'A simplified performance analysis of optical burst-switched networks,' J. Lightwave Technol., vol. 25, pp. 986–995.

14. Tuner. J.S (1999), 'Terabit burst switching,' J. High Speed Netw., vol. 8, pp. 3–16.

15. Vokkarane. V.M and Jue. J.P (2003), 'Prioritized burst segmentation and composite burst-assembly techniques for QoS support in optical burst-switched networks,' IEEE J. Sel. Areas Commun., vol. 21, pp. 1198–1209.

16. Vazquez-Abad. F, White. J, Andrew. L, and Tucker. R (2004), 'Does header length affect performance in optical burst switched networks,' J. Opt. Netw., vol. 3, pp. 342–353.

17. Verma. S, Chaskar. H, and Ravikanth. R (2000), 'Optical burst switching: a viable solution for terabit IP backbone,' IEEE Network, vol. 14, pp. 48–53.

18. Wei. J.Y and McFarland Jr. R.I (2000), 'Just-in-time signaling for WDM optical burst switching networks,' J. Lightwave Technol., vol. 18, pp. 2019–2037.

19. Widjaja. I (1995), 'Performance analysis of burst admission-control protocols,' IEE Proc. Commun., vol. 142, pp. 7–14.

20. Xiong. Y, Vandenhoute. M and Cankaya. H.C (2000), 'Control architecture in optical burst-switched WDM networks,' IEEE J. Sel. Areas Commun., vol. 18, pp. 1838–1851.