The literature survey focuses its attention on optical networks, particularly to analyze the failures in the network, localize and recover the network from failures and optimize the utilization of resources available in the network.

2.1 FAULT DETECTION AND LOCALIZATION IN OPTICAL WDM NETWORKS

An efficient fault location algorithm was presented by Mas et al (2005), which points out the elements that could have triggered the received alarms. This algorithm addresses the redundancy and lack of coordination in internetworking at different layers of WDM, Synchronous Digital Hierarchy (SDH) / SONET, Asynchronous Transfer Mode (ATM) and Internet Protocol (IP). A single failure can trigger large number of alarms. Some failures are hard to detect resulting in missing or false alarms. Moreover, they addressed the behaviour of network components in transparent WDM networks as a result of failures. The non-polynomial complexity of the algorithm is pre-computed i.e., before a failure occurs in order to improve the efficiency of the multiple failure diagnosis problem which is found to be Nondeterministic Polynomial (NP) hard. The failure diagnosis phase is found to be very fast.

Fault localization is an important research issue in optical WDM networks since the light-path carries the information at high data rate. To
overcome the data loss in the network, Mehdi Khani et al (2010) developed a fast and robust fault-tolerance mechanism to localize the faulty component in optical networks. This mechanism handles multiple fault situations even with a reasonable amount of false or lost alarms. Results reveal that processing and memory usage of the reported mechanism is lower than the existing mechanisms.

Fault detection and localization become a challenging issue for providing survivability in optical networks since most commercially available all-optical space switches are incapable of detecting the loss of optical signals along the data-path between its input and output port. Jun Zheng et al (2006) employed a fault localization technique which identifies the location of a failure by detecting the power loss of optical signals in data and control channels. Based on the reported fault localization technique, they presented a fault advertisement protocol which incorporates the signaling protocol that can be used in the network to facilitate the provisioning of static protection (or) dynamic restoration. They analyzed different metrics such as data loss, fault detection time and connection recovery under different failure scenarios.

Fault management has a huge impact on other network management functions such as configuration management and performance management. Chung-Sheng Li and Rajiv Ramaswami (1997) examined the fault management mechanisms for a transparent optical network. Data is transmitted without passing through Optical-to-Electrical (O/E) or vice-versa conversion. They presented several mechanisms to detect and isolate the faults, which allow the non-intrusive device monitoring without requiring any prior knowledge of the actual protocols being used in the data transmission.

Hongqing Zeng et al (2004) showed the feasibility of a fault detection scheme for All-Optical Networks (AONs) based on their decomposition into monitoring-cycles (m-cycles). They also formulated an m-
cycle construction for fault detection as a cycle cover problem with certain constraints. A heuristic spanning-tree based cycle construction algorithm is developed. The results showed that the formulated technique achieves nearly optimal performance.

Based on a detailed study of survivability issues, Hongqing Zeng et al (2005) presented an end-to-end light-path fault detection and notification scheme in the data and control planes respectively. In this scheme, the source node sends the hello packets to the destination node along the light-path for data traffic. When the destination node misses a certain number of hello packets consecutively during a predetermined period of time, it notifies the network management unit by means of an alarm. This unit collects all the alarms and locates the faulty source. After locating the faults, the network management unit sends fault notification messages through control plane either to the source node or all upstream nodes along the light-path. The performance evaluation showed that the reported algorithm achieves fast fault detection. However, sending hello packets to the destination node brings high overhead cost to the user data, which creates significant impact.

Telecommunication networks are likely to adopt next generation optical technology to protect and restore the high capacity WDM networks from failures, which is an essential requirement for any high-speed networks. Ramesh and Sundaravadivelu (2010) presented a novel fault localization algorithm for WDM networks. This algorithm is developed for efficient identification and detection of failed connection by reducing the number of suspected components in the list. In addition, the alarm correlation algorithm analyzes the information about the alarms, which are generated by the optical network components. From the simulation, they showed that the reported fault localization algorithm minimizes the blocking probability and delay, thereby achieving higher throughput.
Shared Risk Linked Group (SRLG) is defined as a group of network elements subject to the same risk of single failure. An SRLG failure is a failure of multiple links due to the failure of a common resource. For unique localization of SRLG failures in all-optical networks, Satyajeet Ahuja et al (2008) introduced the concepts of monitoring paths and monitoring cycles. They are constructed such that any SRLG failure results in the failure of a unique combination of paths and cycles. Through extensive simulations, they demonstrated the performance of the reported monitoring technique.

Yonggang Wen et al (2005) investigated the problems associated with fault diagnosis and also addressed several practical issues in the implementation of run-length probing schemes over all-optical WDM networks. A set of failure localization algorithms is presented to reduce the cost of diagnosis, to locate failures. State of the network is inferred by means of a set of end-to-end measurements that involve sending optical signals sequentially along with a set of predetermined light-paths. They developed a class of near-optimum run-length probing schemes with low computation complexity. They proved that the reported probing scheme performs well than the existing greedy probing scheme of the same computational complexity, which provides a perceptive instruction to reduce the overhead cost of fault management for all-optical networks.

In optical WDM networks, finding primary route and backup route is an important service for improving the survivability of a network. Based on combination of the mobile agents’ technique and Genetic Algorithms (GA), a hybrid algorithm was presented by Vinh Trong Le et al (2005) which determines the first population of cycles for a new request based on the routing table of its source node, without requiring the time consuming process associated with current GA based light-path protection scheme. Information about the state of the network is explored and mobile agents update the
routing tables regularly. Introducing more advanced fitness function enhanced the performance of the algorithm. Through extensive simulation, they proved that the reported algorithm has a lower blocking probability and execution time compared to the existing routing algorithms.

Bin Wu et al (2009) developed an optical layer monitoring mechanism for fast link failure localization in all-optical WDM mesh networks. A novel framework called monitoring trail (m-trail), was introduced which differs from the existing monitoring cycle (m-cycle) method by removing the cycle constraint. To achieve precise localization of each link failure, they formulated an efficient Integer Linear Program (ILP) for m-trail design. Numerical results showed that the discussed m-trail scheme significantly outperforms the existing m-cycle scheme.

Researchers presented many fault localization mechanisms based on the detailed survey on the problems associated with fault diagnosis in all-optical WDM networks. It is observed that the existing run-length probing scheme suggested by Yonggang Wen et al (2005) reported a centralized fault management technique in which the agent communicates through a consistent out-of-band control channel to all nodes of the network. There is a possibility of overhead for agent and agent failure in centralized management. Also, end-to-end light-path fault detection scheme reported by Hongqing Zeng et al (2005) brought high overhead cost to the user data by hello packets. In order to overcome the above drawbacks, an Artificial Neural Network (ANN) based fault management algorithm is required to predict the failures and to guarantee proactive fast re-routing of these networks.
2.2 FAULT RECOVERY FOR NETWORK SURVIVABILITY IN OPTICAL WDM NETWORKS

Rajkumar et al (2008) presented a distributed QoS based routing algorithm, and it intends to establish the primary and backup light-paths by load balancing. With reference to the load on the links, this algorithm calculates the cost metrics based on load on the links and it routes the high priority traffic over the links with light load. In order to choose the primary and backup light-path, lighter loaded links are chosen instead of links with heavier loaded paths. Resources can be shared between high priority traffic and low priority traffic. Based on the simulation, they proved that the blocking probability and latency is reduced by means of increased throughput and channel utilization.

Laxman Sahasrabuddhe et al (2002) concentrated on single fiber failures and presented two fault management techniques in an IP-over-WDM network to provide protection at the WDM layer (i.e., set up a backup light-path for every primary light-path) and to provide restoration at the IP layer (i.e., overprovision the network after a fiber failure). In an optical WDM network, the failure in network elements such as fiber links and cross connects leads to heavy data loss. Performance analysis has been done for a representative network topology with random traffic demands. From the results, it was proved that recovery time for WDM shared-path protection is better than IP restoration.

Fault-tolerance becomes an important issue in optical WDM networks, since failures may seriously damage the end-user applications. Ramesh and Sundaravadivelu (2009) developed a reliable and fault-tolerant routing algorithm for establishing primary and backup paths. This algorithm uses load balancing to establish the primary path, in which link cost metrics are estimated based on the current load of the links. To establish the backup
path, the source calculates the blocking probability through the received feedback from the destination by sending a small fraction of probe packets along the existing paths. It then selects the optimal light-path with the lowest blocking probability. Simulation results showed that the reliable and fault-tolerant routing algorithm reduces the blocking probability and latency while increasing the throughput and channel utilization.

In a large optical network, multi-class routing schemes can be classified as low grade of services, where primary path can share resources with the backup path of high grade of services, and high grade of services which preempts low grade of services in case of any failures. However, they optimize the network resources without considering the high grade of services failure state. Xuetao Wei et al (2008) described an improved light-path allocation for grade of services to implement in single-link failure WDM mesh networks. When any failure occurs in highest level grade of services, this allocation strategy makes the best of working resources of lowest level grade light-path as the backup resources for highest level grade light-paths. Performance analysis with the existing works proves that the reported method performs better in terms of resource utilization ratio, light-path establishment and the average number of interrupted light-paths.

To focus on resilience issues, Tzanakaki et al (2008) studied the use of WDM in core optical networks. Investigations were made on the use and suitability of WDM to support differentiated survivability requirements of traffic generated by different applications. The reported approach combines various RWA schemes to facilitate efficient resource sharing. The objective of the approach is to enhance the spare capacity utilization significantly. Simulation results have shown significant improvement in network performance through the reported approach compared to the existing approaches.
Survivability is a critical network design issue for optical networks since any failure in the network results in huge data loss due to the large capacity of optical fibers. Optical Burst Switching (OBS) is a switching technology which combines the benefits of optical circuit switching and optical packet switching by reducing the implementation complexities (Amit Kumar Garg et al 2008). Yufeng Xin et al (2004) extended the early work on the fast restoration technique for OBS networks and presented a novel fast restoration mechanism based on distributed deflection routing. The reported fast restoration technique has the advantage of fast and low overhead fault management process and demonstrates excellent burst blocking performance over the other survivability schemes.

Nucci et al (2001) illustrated a new methodology for the design of fault-tolerant logical topologies in wavelength routed optical networks. The reported methodology supports both unicast and multicast IP datagram flows. This methodology relies on the dynamic capabilities of IP routing to re-route IP datagrams when faults occurs, thus leading to high performance, cost-effective fault-tolerant logical topologies. Their approach to protection and restoration for the first time considers the resilience properties of the topology. During the logical topology optimization process, it extends the optimization of network resilience on the space of logical topologies. Numerical results prove the ability of the reported approach to obtain very good logical topologies with low complexity.

Yousef Kavian et al (2009) presented a genetic algorithm based approach for designing DWDM optical networks in the presence of single link failure. Based on the fitness function, the best light-paths are found and minimum number of wavelengths are assigned using FF wavelength assignment algorithm. This approach has been evaluated for dedicated path
protection architecture. The results showed that the reported genetic algorithm based approach is well suited for fault-tolerance.

Based on the definition of appropriate requirements at network design and a WDM channel placement algorithm, Olivier Crochat et al (2000) presented a solution referred as Protection Interoperability for WDM (PIW). Numerical results reveal that it is possible for the higher level network to rely on the protection strategy through the reported PIW approach.

Srinivasan Ramasubramanian (2008) developed a framework to support multiple protection strategies in optical networks. The available capacity on a link is computed for routing primary and backup connection. They also developed a model for computing service outage and recovery time for a connection where failure location notifications are broadcast in the network. The effectiveness of employing multiple protection strategies are established by studying the performance of different networks.

Based on the investigation on optical layer constraints and dynamic allocation of regeneration resources, an intra-domain routing algorithm was developed by Xi Yang and Byrav Ramamurthyl (2005) to address the problem of translucent dynamic routing in a single routing domain. Extensive simulations are carried out for various performance metrics viz., blocking probability, resource utilization and running time under different resource allocation and routing schemes.

In addition to the algorithms discussed, considerable amount of prior studies have been made in path protection and restoration for network survivability(Rainer Iraschko et al 1998, Admela Jukan et al 2004, Dominic Schupke et al 2004, Jian Wang et al 2009 and Soares et al 2006).
To survive link failures in an optical network for a representative network topology, many researchers have studied the problem of multiple failures in WDM networks and implemented heuristic algorithms to improve the survivable performance in multiple failures. After investigating the existing works carefully, it is observed that the existing static (or) protection fault management algorithm has a faster recovery time, but it suffers from minimum capacity utilization. Whereas, the existing dynamic (or) restoration algorithm is more efficient in terms of capacity utilization. However, it involves high overhead and blocking probability. In order to improve the restoration efficiency and enhance the resource utilization, an efficient fault recovery algorithm by including the merits of the existing algorithms is to be implemented. The objective of the suggested algorithm would be to achieve reduced blocking probability and delay with increased channel utilization and throughput.

2.3 FLOODING ISSUES IN OPTICAL WDM NETWORKS

In a network with N routers running the Open Shortest Path First (OSPF) routing protocol, network topology information changes are communicated by flooding in the network with LSA messages. The number of LSA messages thus generated is of the order $O(N^2)$, and is referred to as the LSA N-squared problem. This problem leads to degradation of network performance and scalability. Alfred and David (2000) developed hierarchical OSPF network architectures, which minimizes the number of LSAs.

Inaccuracy in the information used in computing QoS routes were reviewed by Roch Guerin and Ariel Orda (1999). Their goal is to determine the impact of inaccuracy on the successful path identification process with adequate available resources. Their research mainly focused on devising algorithms capable of successful path selection that are most likely to
accommodate the desired QoS. Results proved that the formulated approach achieves near-optimal solution at a reasonable cost in terms of complexity.

Guanglei Liu et al (2003) investigated the network management information for light-path assessment to dynamically set up end-to-end light-paths across administrative domains. They cast the light-path assessment as a decision problem, and defined the performance as the probability of an erroneous decision. They apply the decision theory based on Bayes probability of error to show the optimal performance using the partial information. Also they derive an upper bound of the Bayes error in terms of blocking probability. Extensive study shows that the Bayes error decreases exponentially to ‘0’ with respect to load when the load is either below or above a threshold value. When the load is in a small duration around the threshold, the bayes error is found to be non-negligible. Their decision theory achieves small percentage of error decision which trade-off with a large saving in management information.

Garcia-Luna-Aceves and Jochen Behrens (1995) introduced the Link Vector Algorithm (LVA) for the maintenance of routing information in optical networks for different types of routing. In LVA, each router maintains a subset of topology for information transmission from source to destination. These links are used by its neighbour routers and communicates the corresponding link state information to its neighbours. LVA’s showed better performance than the conventional algorithms.

Ken Carlberg and Jon Crowcroft (1997) presented an approach for building shared trees to provide multiple routes from the joining node onto an existing tree. The reported approach operates independent of any unicast routing protocol based on the design parameter of Converged Backbone Transformation (CBT) and Pulse Interval Modulation (PIM). They also presented optimization of the new mechanism which achieves certain amount
of aggregation of control messages when several nodes in a similar domain join the same destination address.

Multicasting is an important service for improving the scalability of a network. Multicast capability is widely used in Local Area Networks (LANs). However, the multicast service is usually not offered when LANs are interconnected by store-and-forward routers. To address this limitation, Stephen Deering and David Cheriton (1990) specified the extension to two common internetwork routing algorithms viz., distance-vector routing and link-state routing algorithms. They also discussed how to use the multicast scope control and hierarchical multicast routing which offers the multicast service to scale up the large internetworks. The reported multicast routing algorithm provides increasing precision of delivery reducing the routing overhead.

QoS routing provides increased network utilization compared to routing which is not sensitive to QoS requirements of traffic. However, there are strong concerns about the increased cost of QoS routing. George et al (1998) developed a solution to achieve good routing performance with reduced processing cost. Initially they identified the parameters that determine the protocol traffic overhead, namely:

(a) Policy for triggering updates,
(b) Sensitivity of this policy and
(c) Clamp down timers that limit the rate of updates.

Simulation study reveals the relative significance of these factors and the relationship between routing performance and the amount of traffic update. It is clearly observed that they addressed the impact on the results of number of
secondary factors such as topology, high level admission control and characteristics of network traffic.

The light-paths based on connection traffic parameters and link load information can be selected to optimize QoS routing. However, link state information updates in the network leads to significant bandwidth requirement and processing overhead. Anees Shaikh et al (2001) implemented a QoS routing model, based on the investigation of performance evaluation in IP and ATM networks. The QoS routing model comprises the path selection algorithm, link cost function and link state update policy. Through extensive simulation, it is reported that the computational complexity of the algorithm is lowered without affecting the network performance.

Various network topology update strategies have been presented to minimize the number of LSAs, thereby reducing the flooding traffic. Many flooding algorithms have been analyzed and implemented to reduce the flooding overhead thereby increasing the network performance. After detecting the faults in the network and recovering the network from the failures, network topology information and load changes has to be updated to prevent blocking of calls. This updating of information is done by flooding approach. Flooding broadcasts the message to the neighbouring nodes, thus leading to degradation in the network performance. To improve the scalability of the network, a better flooding approach is to be implemented. The proposed approach should improve the scalability of the network by providing reduced blocking probability and better throughput.

2.4 WAVELENGTH ASSIGNMENT IN SURVIVABLE OPTICAL WDM NETWORKS

To design a robust network which tolerates the traffic imbalance, Anpeng Huang et al (2008) presented an Africa TWO network which
connects all countries in Africa by employing concentric two-ring layout in the network. To further exploit the properties of the designed network, they presented heuristic algorithms such as Little-Arc-First (LAF) routing algorithm, First-Matching (FM) wavelength assignment and Sharing Peer Protection (SPP) scheme. The reported algorithms LAF and FM are more efficient than the existing algorithms. Experimental results proved that the reported SPP scheme achieves high reliability at a significant lower cost. Simulation experiments proved that the concentric two-ring network was a natural better choice and it can also be extended to other countries.

Siamak Azodolmolky et al (2010) developed a set of offline Impairments Aware Routing and Wavelength Assignment (IA-RWA) algorithm by considering the physical layer impairments in the network planning phase. There are very few offline IA-RWA algorithms that consider dedicated path protection demands. They developed an offline IA-RWA algorithm, called Rahyab and performed a comparative performance evaluation study. Simulation results indicated that the reported algorithm achieves lower blocking rate. This achievement is due to demand pre-processing, diverse routing and adaptive wavelength assignment in IA-RWA.

A wavelength assignment algorithm was presented by Raul Almeida et al (2008) to diminish the impact of Cross Phase Modulation (XPM) on the loss probability of light-path request. This scheme was compared with the impairment-aware strict FF algorithm, and simulation results confirmed that the reported scheme improved the blocking performance in the network under distinct network scenarios.

Physical impairments from optical components and switching nodes can be the foremost reason for blocking of calls in WDM networks. Estimating the impact of physical impairments on the quality of light-path before provisioning will cause a significant delay with centralized network
controller used in the network. QoS-aware wavelength assignment technique called wavelength ordering algorithm was developed by Jun He et al (2009). Simulation results proved that the reported algorithm reduces the call blocking probability resulting from both physical impairments and excessive processing delay caused by channel Bit Error Rate (BER) estimation.

A novel algorithm was developed by Tarek Hindam (2009) to solve offline RWA problem. In order to analyze the behaviour of the RWA problem, the light-path requests are confined to repeat the uniform distributed traffic. They reported that the maximum number of assigned wavelengths depend on the number of traversed links and not on the shortest path length. Further, they stated that the reported approach has the capability to solve a scalable and large problem in reasonable time. From the results, it is also proved that there is a significant difference in the number of wavelengths used.

Ching-Fang Hsu and Fang-Sheng Lin (2009) studied the dynamic wavelength assignment problem in Wave-Band Switched (WBS) networks composed of wavelength-convertible Multi-Granular OXCs (MGOXCs). To minimize the extra port consumption and utilize wavelength converters in an efficient manner, they developed a heuristic wavelength assignment algorithm named Least Weighted Configuration Cost (LWCC) algorithm. Various performance metrics viz., blocking performance and converter utilization are considered for performance analysis. Numerical results showed that LWCC offers more benefit in waveband grouping, which results in significant improvement in terms of blocking probability over the existing Waveband Assignment with Path-Graph (WAPG) wavelength algorithm.

Security measures have become a prime issue in optical WDM networks due to high data rate involved. Physical layer attacks can seriously degrade network performance. Nina Skorin-Kapov et al (2010) presented an
approach to facilitate with the security issues and implemented a provisioning process as prevention mechanism. They investigated the routing of light-paths in such a way that it minimizes the potential damage caused by various physical layer attacks and routing of light-paths. They also presented a new objective criterion for the RWA problem, referred as maximum Light-path Attack Radius (maxLAR) algorithm. The reported maxLAR approach achieves significantly better results. For larger networks, they proposed a search method known as “tabu search” algorithm for attack-aware light-path routing, in combination with an existing graph-coloring algorithm for wavelength assignment. Testing and comparing with existing approaches, the reported “tabu search” algorithm performs well than the existing approaches.

Manousakis et al (2010) presented an extended online multi-cost algorithm to attain an IA-RWA algorithm. This works in translucent networks and makes use of regenerators at certain locations of the network when required. A multi-cost function has been formulated to characterize a path based on the cost parameters for the physical layer impairments, including the set of available wavelengths, length of the path, number of regenerators used and noise variance parameters. Results indicated that the employed IA-RWA algorithm has considered the parameters, namely, the Quality of Transmission (QoT) of the light-paths, the utilization of wavelengths and the availability of regenerators to serve the online traffic efficiently.

Kiyo Ishii et al (2010) developed an algorithm for assigning wavelength to any connection requests. The algorithm minimizes the number of wavelengths required in full-mesh node connectivity of two concatenated, bidirectional ring networks. When the algorithm was applied to different node architectures such as separation of intra-ring and inter-ring operation, hierarchical optical path switching and introduction of efficient protection
switching architectures, the reported algorithm reduces the switch scale and minimizes the number of wavelengths used.

Based on the investigation of light-path establishment problem in the optical layer, a heuristic algorithm, called Re-Ordered Light-path Establishment (ROLE) was developed by Namik Sengezer and Ezhan Karasan (2010). The algorithm was developed to set up as many of the light-paths by assigning the physical layer resources efficiently. For establishing static light-path with physical layer impairments, ILP formulation is developed, which is used as a performance benchmark for ROLE. ROLE significantly outperforms the existing algorithms in terms of number of light-paths established.

Selection of route and assignment of wavelength to any route upon the arrival of a connection request is known as RWA problem. To provide the connection establishment and teardown facilities, it is imperative to have a connection management scheme after routing and wavelength assignment. Jawwad Ahmad et al (2004) reviewed the working mechanism of well known distributed wavelength reservation scheme and investigated trade-offs involved. Also they discussed some important issues in wavelength reservation schemes.

High data rates employed by WDM transparent optical networks were highly vulnerable to faults and attacks, which leads to severe data loss and corruption. This makes fault management a crucial factor in maintaining a high QoS inside the network. Considering the physical layer attacks and causes of performance degradation, a new objective criterion for the wavelength assignment problem, called the bin-packing based heuristics was presented by Furdek and Skorin-Kapov (2009). They implemented and compared them with the actual Propagating Crosstalk Attack Radius (P-CAR)
approach. Results obtained for medium-sized networks showed that the P-CAR approach reduces the execution time dramatically.

Poompat Saengudomlert et al (2005) developed an algorithm for on-line wavelength assignment in a WDM tree network that is re-arrangeably non-blocking. The algorithm minimizes the number of wavelengths. Also, it needs $d^*-1$ light-path rearrangements per new session request, where $d^*$ is the degree of node which is the most heavily used. From the results, it is observed that the light-path rearrangements per new session request does not increase as $k$ increases by an integer-scaling factor, where $k$ is the amount of traffic in the network. Also, they observed that wavelength converters cannot reduce the number of wavelengths needed to support $k$-port traffic in a tree network.

Sangeetha et al (2009) analyzed the wavelength assignment problem in optical WDM networks. First, the random wavelength assignment algorithm is compared with the first fit wavelength assignment algorithm based on various performance metrics such as blocking probability, number of links and number of channels which are kept constant. Based on the above metrics, response is calculated by varying the load (Erlangs) per link. Results proved that the blocking probability in random algorithm is always greater than first fit wavelength assignment algorithm in case of wavelength conversion, whereas the first fit algorithm excels in performance compared to random wavelength assignment algorithm in case of no wavelength conversion.

Paulo Bezerra et al (2010) performed an analysis on RWA problem for allocating the wavelength in optical WDM networks. There are different approaches for wavelength allocation viz., FF, RF, MU and LU algorithms. The objective of the performance analysis was to simulate the performance of allocation algorithms based on metrics such as throughput and blocking
probability. Analysis was performed using Optical WDM Network simulator (OWNs) simulation tool.

Based on the impact of guaranteeing QoS, various heuristic wavelength algorithms for wavelength allocation was studied and implemented to achieve high level performance, better resource distribution and load balancing in the network. Earlier reported wavelength algorithms viz., FF, RF, MU and LU algorithms suffer from unbalanced utilization of wavelength which leads to blocking probability for any session request. The objective is to suggest a wavelength assignment algorithm to overcome the adverse effects addressed earlier.