Enhance and Optimize (BFOA) the Quality of Service using Border Gateway Routing Protocol

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Abstract- Over last few decades, there has been great advancement in the internet and communication technology. Computer and internet technology plays a crucial role in the communication over large networks. The inter domain background in internet technology acquire internet domain route protocol known as border gateway routing protocol. Communication over large automatic system is done through border gateway routing protocol along with management of data. However, it was determined by researchers that BGP is an advanced protocol with required QoS characteristics qualities. Automatic schemes through border gateway protocol assign direct factor of the connections requirements to other set of the networks. Border gateway protocol is more reliable protocol over the internet technology but unavailability of the quality of service , complex structure are few limitations of border gateway protocol. In this research, proposed a method to enhance and optimise the QoS parameters on the basis of the Inter domain route protocol as border gateway protocol. The two security methods domain names are server and threats utilise the route protocol was presented through BGP,first one to isolate defected area and right area, suppressedunrequired updates without hampering any effect on the define path. In addition, proposed a bacterial foraging optimisation approach to optimise and filter the route for the transmission of information from source to destination. Experimental analysis used parameters like as jitter, packets and throughput and comparison was done with previous parameters. Also, MATALAB version 2016 was used for computing and enhancing the performance with jitter value is 9.72ms, Delay value is 0.001968 sec, Packet value is 2.5 and Throughput value is 37 bytes/sec.

Keywords- Automatic system, Bacterial foraging optimisation, Border gateway protocol, Computer and internet technology

I. INTRODUCTION

Border Gateway Protocol is protocol used for exchanging the route data among the controller node on the system network of the automated technology. Border Gateway Protocol is utilised among the central node in the internet of things[1]. The method of the searching of the route that consists the recognised paths and addresses the destination collaborated among path of every router [2][3]. In such way best route are selected. Border Gateway Protocol has the internal gateway that is unorganised in an automated native system network. The internal controller is the route protocols that have the minimum route with better communication among similar system network [4]. Border Gateway Protocol is the space among the displacement trajectory conventions that is reliant on different trajectory method [5]. BGP group above the other protocol with exact nearest hop,relates the directional information and route table related to information [6] 7]. The displacement projection routing protocol have the direct measuring of the data and Border Gateway Protocol is dependent on different features of the nearest node[8]. The well-known features of the direct path are the exact approach of the achievement of the directed method [9].

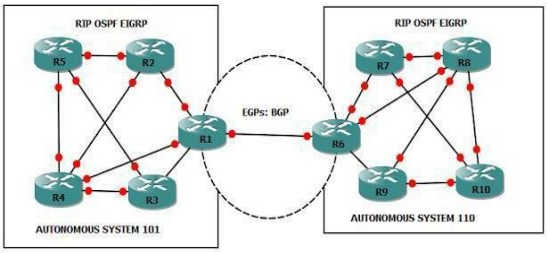


Fig.1: Border Gateway Protocol [8]

Consequently, BGP is regularly denoted to as a way trajectoryrouting convention. Border Gateway Protocol are classified as [10]:-

i) *External Border Gateway Protocol:* - In this protocol there is communication among the more than two controller host path or among two various automated scheme. Border Gateway Protocol is constructed as the middle path of numerous automated technologies or schema. The connecting path of the two automated system are linking of the two paths through External Border Gateway Protocol[11]. The main benefits of the External Border Gateway Protocol reliable control displacement.Managerial displacement is the method selects the steering convention if the two conventions present the path data for same receiver.That helps in selection of the best route [12].

ii) *Internal Border Gateway Protocol:* - The method of the same related scheme used in the Internal Border Gateway Protocol [13]. The routing of the data in similar automated scheme is done through IBGP.For instance, route data convention,free shorter route and so forth. Some of the issues in Border Gateway Protocol is used in internal BGP. Information is not broadcasted along other group of information in internal BGP dependent on path. BGP are entirelinked in order to avoid the twisting subject [14].

In Previous method,BGP routing protocol is used for acquiring the optimum quality of service standard along with variety of

frequencies. The experimental results used testing procedure having frequencies level up to 126kbps for performing every test scheme which is thrice that of bandwidth of quality of service. The comparison was done with delay, jitter, packet loss and throughput acquired from internet protocol based on ITU-T G.114, bandwidth of quality of service gives best results value.

In proposed research work, establishment of the bacterial foraging optimisation algorithm was proposed for optimisation and filtration of the route for communication among the system network.Performance was evaluated on the basis of the jitter, throughput and packet delivery ratio.The Simulation Tool utilised MATLAB 2016a and constraintsplanned by mathematical terms and improved performance jitter value is 9.72ms, Delay value is 0.001968 sec, Packet value is 2.5 and Throughput value is 37 bytes/sec.

II. PRIOR WORK

Ramadhan, E., Firdausi, A. and Budiyanto, S. et al., 2017 [15] explained the routing of the border gateway protocol for acquiring the quality of service related to frequency. The experimental results determine through the test procedure utilising frequency up to 64kbps, 128kbps and 256kbps. It was observed that testing frequency was thrice the value as quality of service. Moreover, performance metrices are delay, jitter, packet loss and throughput acquired from internet network on basis of ITU-g11.4.***Jennifer Seberry et.al 2014[16]***proposed a research on the method of the append only signature (AOS) scheme. The protocol increases the efficiency of the computed signature value.They proposed a new protocol from a concept within in append only signature (AOS) scheme, but in a many realistic broadcast model. The protocol has better efficiency & security, by using pre-computation of signatures, & server aided confirmation. They include signature aggregation features to minimise signature size, to further improve efficiency.***Parvesh Kaushal et.al 2015[17]***described the performance of the border gateway protocol. In this research, the fact conversion technique is explained like as Fall over and External Failover. Both IPv4 & IPv6 based on border gateway protocol are explained in this research. Along with that, IP security wereanalysed on the basis of the traffic of the BGP.***P. R. Gundalwar et.al 2013[18]***determined the various routing approaches of Border gateway protocol and routing features related to implemented network. Internet of things is automated scheme used for border gateway protocol related to sensor automatic scheme or intra-AS IP routing policies. Border gateway protocol established route policy related to group of the features of each path in the multiple automated system networks selects the shortest path. They used an OPNET simulator for analysis the performance of the border gateway protocol. In this research, comparison was done on basis of the route policies of border gateway protocol in organisation criteria of system network.***Stephen Kent et.al,2000 [19]***studied the security structure of the border gateway protocol. The broadcasting of the route data among automated scheme was essential feature of the internal route system network. Secure border gateway protocol used for presenting the reliable method of the recognition and identification of the controlled traffic of BGP. In this research, secure-BGP helps to enhance the security standard of the protocol.They developed a prototype implementation of S-BGP and organised it in DARPA's CAIRN test bed. ***Stephen Kent et.al,2000 [20***] discussed about the attacks and safety features of border gateway protocol. Secure-BGP countermeasures and described the threats and techniques for the security of the protocol.This research described the comparative analysis of existing research. The structure of projected BGP and demonstrate the prototype establishment.

III. RESEARCH METHODOLOGY

In this section, explained in the main aims of border gateway protocol follows as:

1. To study and evaluate various protocols and attacks in BGP (Border Gateway Protocol) and calculate vulnerabilities.
2. To develop intruders which is using Border gateway routing protocol, first one to isolate defected region and accurate region, suppressed un-necessary informs without hampering any effect on the define path.
3. To implement the detection (BFOA) approach to mitigate the attacker effect in the network.
4. To evaluate the performance parameters (Delay, bandwidth utilization, packet sent, Throughput, Packet Delivery Rate and energy consumption) and compare the existing parameters (Delay, Bandwidth utilization).

Proposed Description Steps are:

In research work, developedCN (Computer Network) architecture or network, Assumed a number of data users can generate their request. Then, session assigned means unique id of the data users. Request sent for packets the Host server, data user than generate the session identity, host server forward request to the GWU (Gateway User). Then it will free at that movement then respond back to the host server, host server to the data users. Data user sent the request to host server create the SSI (Session ID) limited decide 1000. If a data user request sent to server then further sent the Gateway User. Back respond to the server, sever to data user. In case session limit exceed then load occur in the computer network and loss the data packets in shot issues developed. In research proposal has implemented IBGP and EBGP protocol to find the load. After that searching has implemented a Bacterial Foraging Optimization Algorithm to recover the requests, packets and enhance the network performance. In this work, plot the DU (Data Users), GWU (Gateway Users) and HS (Host Server).

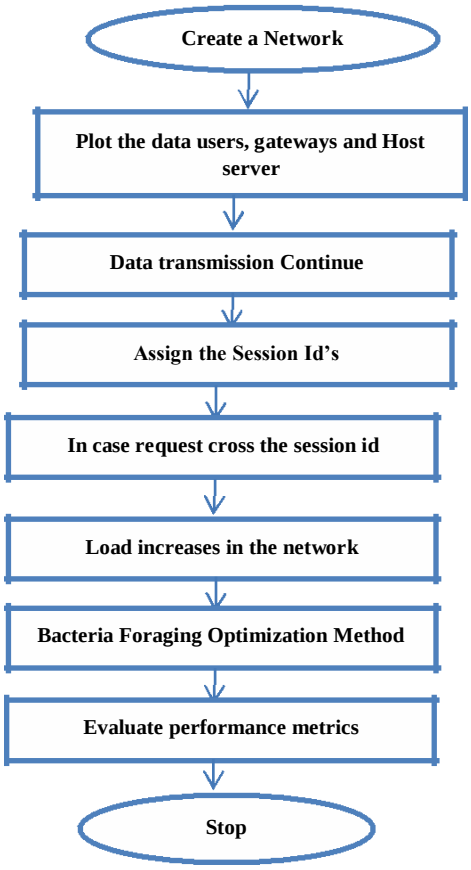


Fig.2: Research Flow Chart

IV. RESULT AND DISCUSSION

Below Fig 3establishes plot the Data Users, Gateway Users and Host Server. It makes the 8 Data Users, Gateways and 1 Host Server. Packets sent the demand to HS (Host Server) and HS normally ask for an interchange the Gateway User as defined by the portal agreement and division of authorities. Different ways data transfer the packets of the system through them packet out starting with one then onto the next field in the computer network system.

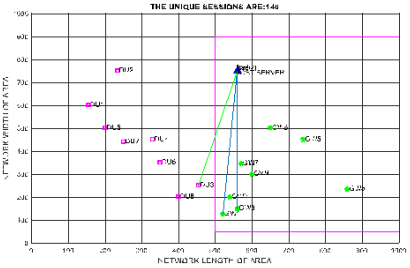


Fig.3: Network Deployment

Steps are:-

(i) Assign Data Users
(ii) Assign Gateway Users
(iii) Host Server
(iv) Load Increases
(v) Session ID
(vi) Proposed Algorithm (BFOA)
(vii) Performance Metrics
(viii) Comparison

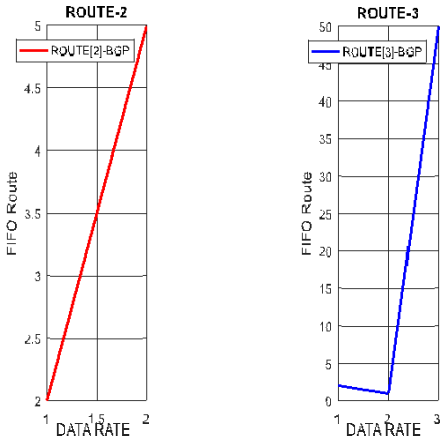


Fig.4: Route calculation in FIFO wise (Priorities)

Given figure demonstrate the primary path express the section of path for handling the information through the system network. The method selects the handled information above the system network on the basis through system network. The processing of the information based on the selected metrics. However, similar primary route other processed with FIFO method.

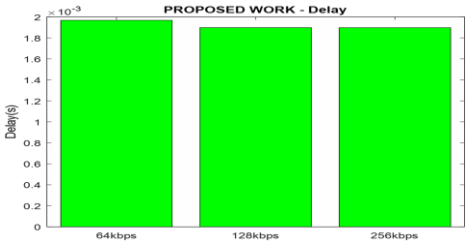


Fig.5: Transmission Delay (Second) in BGP-BFOA Algorithm

The above figure 5 defined that the transmissions delay parameter with the help of data rate or data users. Transmission delay means time taken for packets to be transmitted over the computer network form start node to sink node. Route with data transmission delay in the system. Sometime scope set the network framework plan an interesting series for data transmission and simple to process. Moreover in the event that the series produced by means of network framework will more than one. The major goal of this research work with BFOA calculation used to reduce the transmission time or delay.

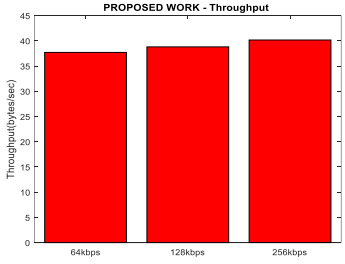


Fig.6: Throughput in BGP-BFOA Algorithm

Above figure 6 shows that the throughput with BGP-BFOA algorithm. In this performance metrics calculated the throughput with respect to the bandwidth 64kbps, 128kbps and 256kbps. In proposed work using BFOA algorithm to improve the accuracy rate with recover the data packets but only BGP protocol to loss the data packets.

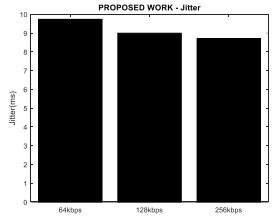


Fig.7: Jitter (ms) in BGP-BFOA Algorithm

Given diagram describe that the research work is on the jittering in msec. The measurement of the liveness or strength released in proposed method. The above figure describe about the previous research work in the form of jitter in milisec.

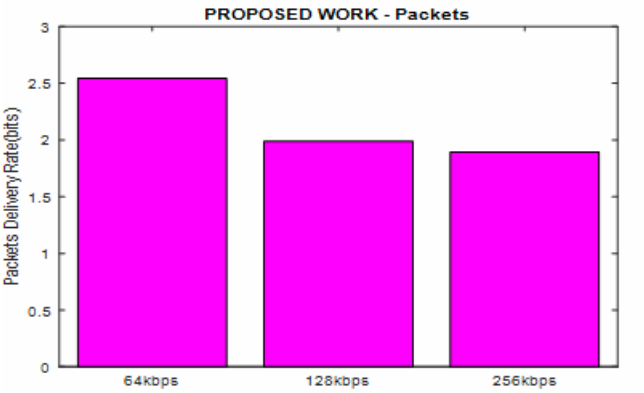
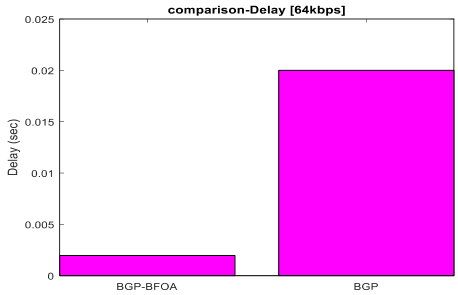


Fig.8: Packet Delivery Rate in BGP-BFOA Algorithm

Figure 8 describe improvement of the BFOA algorithm and the experimental results determine the packet delivery rate are more accurate as compared to BGP.



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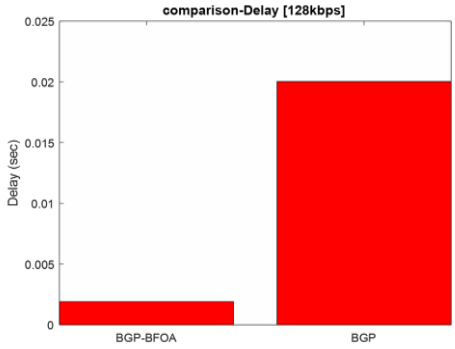

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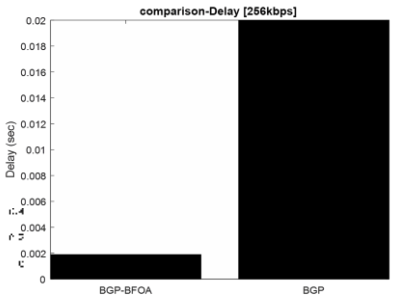


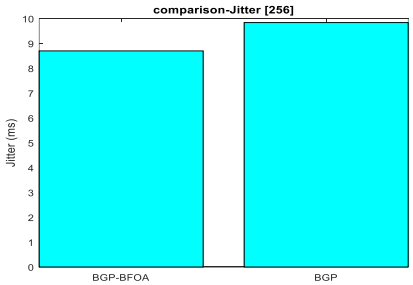
(iii)

Fig.9: Comparison Between proposed and existing work (DELAY 64,128 and 256 kbps)

Table 1: - Comparison – Delay with BFOA Algorithm (sec)

Bandwidth	Existing Work Delay (s)	Proposed Work Delay (s)
64kbps	0.020003	0.001968
128kbps	0.020029	0.001898
256 kbps	0.019995	0.001897

Above table 1 defines that the co-relation in scene of border gateway protocol with network issues and Improved BFOA evaluation. In Existing work transmission delay is increases, because of approximation fore searing of main issues. It verifies the issues and reduces the delay factor with bacteria foraging optimization method.



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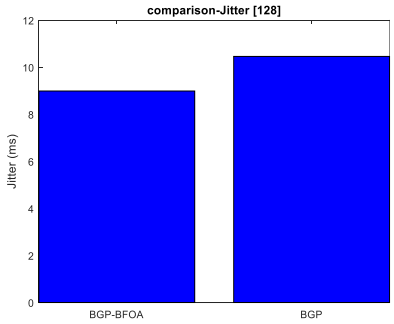

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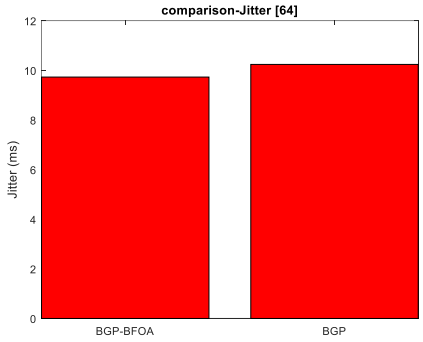


(iii)

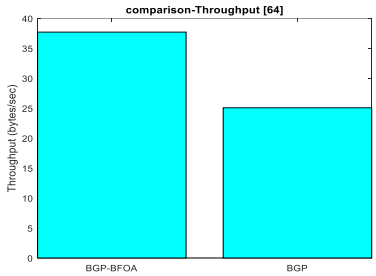
Fig.10: Comparison Between proposed and existing work in JITTER

Figure 10 describes the comparison of the proposed and the existing work. The data rate described in the form of the jitter in msec where the delivery rate are proportional to the packet rate. The improvement in the packet delivery rate improves the performance of the BFOA algorithm.

Table 2 : Comparison – Jitter (msec) BGP and BFOA Algorithm

Bandwidth	Existing Work Jitter (ms) [BGP]	Proposed Work Jitter (ms) [BFOA]
64kbps	10.24	9.72
128kbps	10.46	8.98
256kbps	9.84	8.71

Table 2 define the comparative analysis of the Jitter in proposed and existing work with improve jitter performance with BFOA algorithm.



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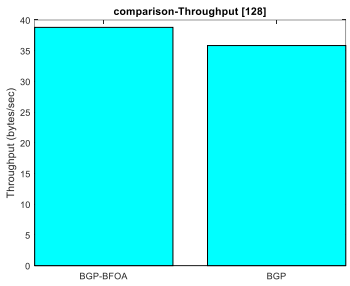

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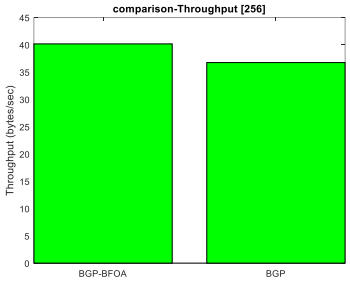


(iii)

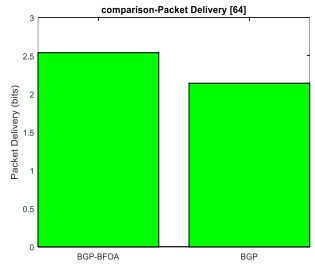
Fig.11: Comparison between proposed and existing work in Throughput byte/sec

The given figure describe the throughput measurement in form of the bits per second and data groups each second or the data rate for required situation.

TABLE 2: Comparison – Throughput

Bandwidth	Existing Work - Throughput (Bytes/sec)	Proposed Work - Throughput (Bytes/sec)
64kbps	25.167	37.5
128kbps	35.839	38.9
256kbps	36.74	40.27

The given table describe the establishment of the fraud attack related to BFOA algorithm. The enhancement of the scheme leads to improvement and discrimination of the central node and recovery the data. The data in the communication transmitted above the physiological links and passed through specified arrangement node.



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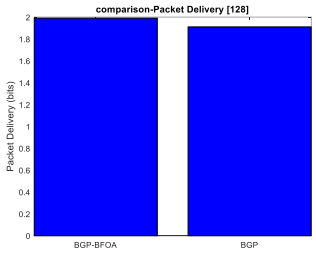

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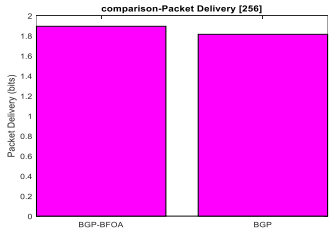

(iii)

Fig.12: Comparison between proposed and existing work in Packet Delivery Rate

The group percentage amount is the proportionality of performance efficiently developed related to aggregated data. Here, an enhancement of the group transmission rate of the BFOA algorithm.

TABLE 3: Comparison – Packet Delivery Rate

Bandwidth	Existing Work Packet Delivery	Proposed Work Packet Delivery
64kbps	2.143	2.543
128kbps	1.91	1.99
256kbps	1.814	1.894

The given table describe the transmission rate executed between proposed and previous results. Here, an enhancement of the transmission rate related to BFOA method and fading the transmission rate related to BGP routing algorithm.

V. CONCLUSION AND FUTURE SCOPE

Border gateway protocol is the method of the communication among the various stages in absence of the supplementary usage of the hardware is called as BGP. It presents the transmission links among various protocols like as IPV4 and IPV6 in order to have exact infrastructure communication among them. Various tunnelling method that are related with various infrastructure in absence of the related price utilising Border gateway protocol law group. The other benefit of this method has reliable procedure where the integration related to optimisation of BFOA approach. The whole method helps in the creation of the improved infrastructure of the handling and communication data in various system networks. The optimisation method accomplishes the route where the procedure will not have any data about the receiver node. The reporting group helps to demonstrate the receiver node during forwarding of the information above system network hops. In proposed infrastructure, border gateway protocol (BGP) works with BFOA (Bacteria Foraging Optimization Algorithm) for presenting the high velocity transmission rate below 17 ms. In addition, internet of things faced few challenges related to attacks and security. Such attack damages the different resources and degradation of the performance of the system network. These methods lead to packet loss during the communication in the network. Moreover, two approaches are used for resolving the issue. That drops and removes the undesired demands from the system network and isolation of the linked areas from other networks. Experimental results analyse the delay of the network. An enhanced BGP with BFOA algorithm utilised improving the delay, throughput, packet loss, delivery rate, energy consumption.

In future scope, main research in the deployment of the planned method will be on internet of things along with encrypted methods. The method will develop to improve the security factor using with border gateway protocol.

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