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IP FAST RE ROUTE FRAMEWORK

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ABSTRACT

The Algorithm as described below find a shortest path after link failure from source node to destination node.However, IGP Re-Covergence may take hundreds of milliseconds or even seconds, and the packet loss may be occured during recovery time. Fast Re-Route method establish a new path from source and asure no packet loss. We prove that it will find a path during recovery time and will reach to the destination node to in much less time than required for IGP re-convergence. Link state protocols provide topology information, which facilitates the computation of repairs paths.Non-link state Interior Gateway protocol is a matter for further study, but the correct operation of the repair mechanisms for traffic with a destination outside the Interior Gateway Protocol domain is an important consideration for solutions based on this framework.

Keywords: Alternate routing , lexicographically node, Network simulator version 2,Open Shortest Path First,Routing protocol

I. INTRODUCTION

This project would be focused on the Fast Re Route module where an alogorithm finds an alternative path after a link failure before the Interior Gateway Protocol had a chance to reconverge in response to failure. This module will consider a source node (s) for sending data to destination node (d). Suppose some link(i,j) on the shortest path s to d fails.An IGP will an alternate path from s to d that avoids(i,j).When a failure occurs in an IP network, the routers adjacent to the failing resource must react by distributing new routing information to make each router of the network to update its routing table.

However , re-convergence of IGP may take hundreds of milliseconds or even seconds, and the packet loss during this time peiod may be unacceptable. Fast Re-Route method establish a new path from sourde to destination in much less time required for IGP re-convergence. This project shows that the packet which is travelling from source to destination takes very less time including link failure as compared to other alogorithms.

II. RELATED WORK

Routing technique, "recursive Loop-Free Alternates (RLFAs)", to alleviate packet loss due to transient link failures. This technique consists of a backup path calculation with corresponding re-routing scheme based on the Loop-Free Condition (LFC) as mentioned in the basic specification for IP Fast Re-Route (IPFRR)[9]. Under this

routing strategy, nodescalculate backup paths by making modification on the weights of links in the primary shortest path tree. If a failure happens , the detecting node determines the number of recursions, which indicates the number of times packets must be moved along the alternate next hops to bypass the failed link. This technique guarantees full repair coverage for single link failures. We calculate the performance of our proposed technique through simulations and show that the overheads, the stretch of its pre-computed alternate paths, and the failure-state Maximum Link Utilisation (MLU) are minimal.

As the Internet takes an increasingly central role in our communications infrastructure; the slow convergence of routing protocols becomes a growing problem aftera network failure. To assure fast recovery from link and node failures in IP networks, we show a new recovery scheme called Multiple Routing Configurations (MRC)[7]. Our proposed scheme guarantees full recovery in all scenarios of failure, using a single mechanism to handle both link and node failures, and without knowing the failure of root cause. MRC is strictly connectionless, and assumes only destination based hop-by-hop forwarding. MRC is based on storing additional routing information in the routers, and allows packet forwarding to continue on an another output link immediately after the detection of a failure. It can be implemented with only minor changes to available solutions. In this paper we show MRC, and analyze its performance with respect to scalability, backup path lengths, and equal load distribution after a failure. We also show how an estimate of the traffic demands in the network can be used to upgrade the distribution of the recovered traffic, and thus reduce the chances of congestion when MRC is use

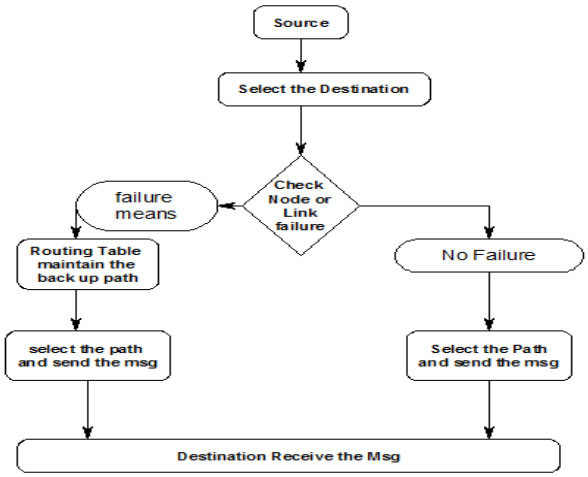

Fig:1 Multiple Routing Configuration

MPLS[6] is a widely used technology in the service providers and enterprise networks across the globe. MPLS-enabled infrastructure has the power to transport any type of payload (ATM, Frame Relay and Ethernet) over it, subsequently providing a versatile architecture. An incoming packet is classified only once as it enters into the MPLS domain and gets assigned labeldetails;[3] thereafter all decision processes along a specified path is based upon the attached label rather than destination IP addresses. As network functions are becoming mission critical, the requirements for fault tolerant networks are growing , as a basic requirement for carrying sensitive traffic.Fault tolerance mechanisms as givenby an IP/MPLS network helps in giving end to end "Quality of Service" within a domain, by better handling blackouts and brownouts. This theory work reflects how MPLS increases the capability of deployed IP infrastructure to transport traffic in-between end devices with sudden failures in place. It also focuses on how MPLS converts a packet switched network to a circuit switched network,

while owning the characteristics of packet switched technology. A new mechanism for MPLS fault tolerance is proposed.

LDP creates an RSVP [1] primary tunnel between a pair of nodes. In addition, a bypass tunnel is pre-defined for each arc(i, j); the tunnel which is bypassed for(i, j) is a path from i to j that is physically disjoint from the link(i, j). When the packet reaches node i and link (i, j) is failed, a local repair forwards the traffic along the bypass tunnel for(i, j); when the packet reaches node j , it does not stop to move on the path defined by the RSVP primary tunnel. The disadvantage of this method is that, for a network of N nodes and A arcs,N(N−1) uni-directional primary tunnels and 2A uni-directional bypass tunnels are required.

An another way to build tunnels is to use a Loop Free Alternative (LFA) method ([2], [4]). For nodes i and j let c*(i, j) be the minimal distance between i and j. Suppose node n is a neighbor of s(i.e., they are connected by a single arc.Then the neighbor n of source node s is an LFA for destination d if

c*(n, d)<c*(n, s)+c*(s, d).

That is, node n is an LFA if the path which is shortest from n to d does not return to s on the arc(n, s). To ascertain whether an LFA exists for a given s and d it suffices to determine if (1) holds for some neighbor n of s.

III.PROPOSED SYSYEM

The existing system describes the concept of routing from the source to destination within the network. It deals with many available techniques to handle data loss, delayed timing, loss of acknowledgement , but it does not describe how the packet should be forwarded once node within the path is unavailable or corrupted. The existing system faces link and node failure in IP networks. The convergence of routing protocol becomes a growing problem after a link failure. Due to congestion packet loss or packet delay can be occured. Time consumed to send the data is increased due to resending of lost data. There is no back-up path and it has no precise knowledge of failure location.

The proposed system would be focused on the Fast Re Route module where an alogorithm finds an alternative path after a link failure before the Interior Gateway Protocol had a chance to reconverge in response to failure.This module will consider a source node (s) for sending data to destination node (d). Suppose some link(i,j) on the shortest path s to d fails.An IGP will an alternate path from s to d that avoids(i,j).When a failure occurs in an IP network, the routers adjacent to the failing resource must react by distributing new routing information to make each router of the network to update its routing table.

IV.THE METHOD

Domain of this project is networking. The technology used in this project is NS2. The most common IGP's used by ISP networks today are OSPF which is Link State Routing Protocol but OSPF can take hundredof milliseconds for reconvergence. FastRe-Route method create a new path from source to destination in much less time than required for IGP re-convergence.The details of this method is described below.

Algorithm steps:

1. Select source node and destination node. Send packet from source node, set P(ordered list of node that has been visited) to zero and node n belongs to the set of neighbours (N). Let source node (s) set to (x).Set delta(n)=0 delta(x) means multiplicity of node x indicating how many times n has been visited by packet.

2. Check for the condition if source node is not equal to destination node,if this condition satisfies then proceeds sending the packet.

3. Set Y to y belongs to set of neighbour of x and multiplicity of node y equal to minimum of multiplicity of node n where n belong to set of neighbour of x.

4. From all neighbour of x select any y belong to Y that satifies the condition. c(x,y)+c(y,d) is smallest among all neighbour of x.*

5. After selecting the neighbouraugument multiplicity of node x by 1 ie.increment delta(x) by 1.And P belong to {P,x} ie,x is inserted after rightmost element in P. And send packet and P from x to y.

6. Set x to y.

7. Goto step 2 until packet reaches the Destination.

Algorithm:For sending packet to destination

procedure Route(s, d)
1: initialize P=∅, Δ(n)=0 for n∈N , and x=s ;

2: while(x=d)
{

3: LetY={y∈N(x)|Δ(y)=minn∈N(x)(n)}

4: Pick any y ∈Y for which the sum
c(x, y)+c*(y, d) is smallest;

5: Set Δ(x)←Δ(x)+1,P←{P,x},and send the packet and P from x to y;

6: Set x ← y;

7: }

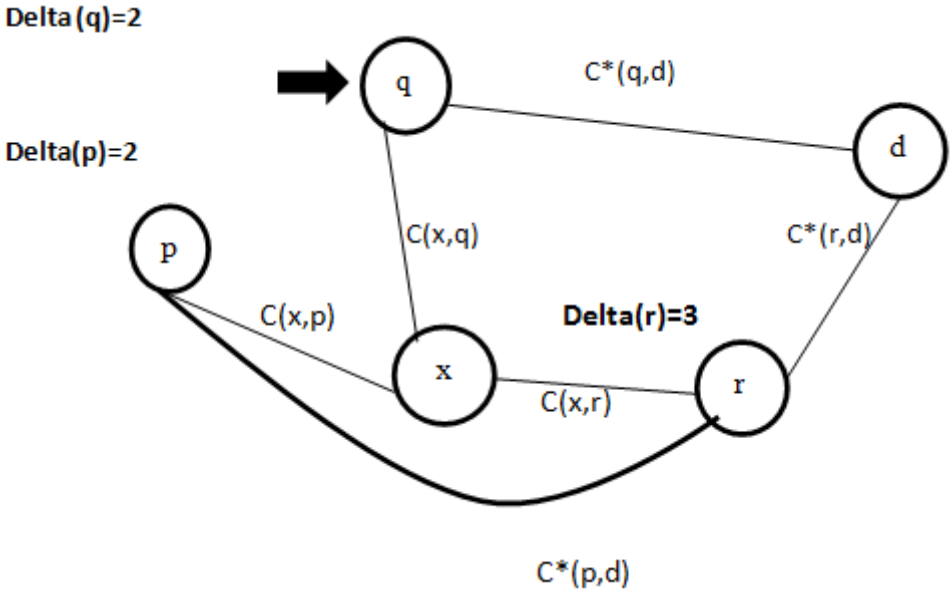

Fig 2 : Picking the next node

The neighbor of x from the above figure are p,q and r of these, p and q have the lowest multiplexityi.e:*delta*(p)=2 and *delta*(q)=2. Since c(x,q)+c*(q,d) < c(x,p)+c*(p,d), the packet is next forwarded to q.

V.ARCHITECTURE OF PROPOSED SYSTEM

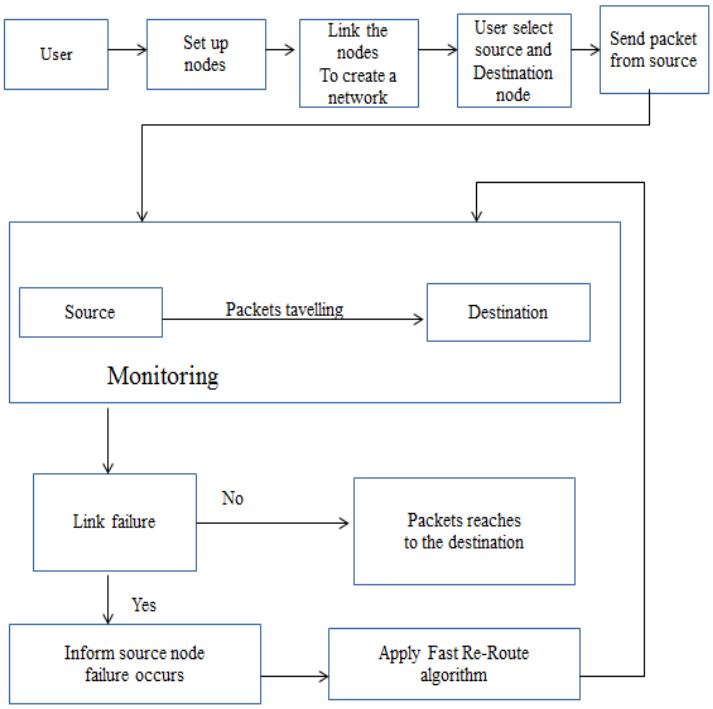

Fig 3: Architecture Diagram

Here we have describe thesystem architecture for our proposed system.In the beginning we need to need to set up different nodes in a wired network.The user first select the source node from where the packets are sent and destination node where we want the packets should bedelievered.Once packets from source node are sent we monitor the packets continuously in a network to know the status of sent packet.If there is a link failure in the network then inform the source node about link failure,and the source node apply fast re route method in response to link failure.

Fast re route method select neighbour of source node with minimized path cost and lowest multiplicity and send packet to destination.Wecreate a new protocol in NS2 and make use of Link state protocol for routing of packets.We also introduce the concept of lexicographically smallest node (closed to a in the alphabet) and lexicographically largest node (closest to z in the alphabet) and forward the packet to next node.We apply fast re route method in response to link failure until packet reaches the destination.

VI. EXPERIMENTAL RESULTS

To perform the entire simulation we need Network Simulator Version 2 which is compatible with windows(using cygwin) and Linux operating system.To implement this proposed system we need a configuration of the system having 2GB RAM,minimum, 10GB of disk space and i3 processor.Trace graph to plot the analyzed result in NS2.In response to link failute Fast Re Route method establish a new path from source to destination in avery less time than required in other existing systems. Fast re route proved to be very efficient method in selecting an alternate path in response to link failure so that re convergence time is reduced to 100ms.

VII. CONCLUSION

IP Fast Re Route Framework takes very less time in finding an alternate path in response to link failure as compared to other existing systems.And the reconvergence time is reduced to lower extent. Link state protocols proved to be very efficient in reducing reconvergence time as compared to non link states IGP protocol.

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