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# A Proposed work on SSA Protocol to find reconfigured path & QOS Optimization approach in Mobile Ad-Hoc Network

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***Abstract:*** *The SSA protocol itself gives the concept of network reconfiguration to provide the network stability. The SSA protocol is capable to identify the broken link over the network. As the broken link is identified, it finds the reconfigured path to perform the rerouting for network communication. In this research paper the proposed model is also defined with modified SSA protocol to find Reconfigured path. The various stages to repair the path are discussed so that communication again starts from initial path.*

***Keywords-****Routing Protocol, Ad-Hoc, MANET, SSA, FP, DRP, RT, DSDV, AODV, DSR, SRMP, QOS*

## 1. INTRODUCTION

The key feature of [1] SSA protocol is making the routing decision based on the signal strength of the links. [2] SSA measures the signal strength of the periodically exchanged beacons between nodes in the network.

These measurements are used to classify the links as either stable or unstable. SSA [3] tries to find a completely stable path from the beginning, a process that if succeeded to find a path, it will be a very positive side of SSA. On the other hand if this process fails to find a path it may start the procedure from the beginning allowing paths with unstable link, which means additional effort to find a path.

SSA consists of two protocols which are working together, viz. the forwarding protocol (FP) and the dynamic routing protocol (DRP). When a source wants to send data packets to a destination, the FP checks the routing table (RT) of the source node to find any route to this destination. If it has a route the packets are directly forwarded, if not the FP initiates a route request packet to find a route.

Upon receiving a route request packet, the DRP on an intermediate node checks the list of the nodes already traversed by the packet to avoid forwarding it in a loop. Then it adds itself and forwards the packet over only stable links. This way, SSA tries to fine a completely stable path to the destination. But DRP is not able to find a path to the destination by forwarding over a stable link; the source node simply floods the network with route request packets which are then forwarded by the intermediate nodes to all links regardless of their stability. However, still the accepted route request packets are those received to the intermediate nodes through stable links. The destination node replies the first arriving route request packet, then the source node and each intermediate node along the selected path update it own RT to reflect the current state of that path. Then the FP can work to forward the packets form the source to the destination.

In case of a link break, the two ends of the broken link send two special update packets towards both the source and the destination. This way each node on the path can update its own RT to reflect the break and the source node can invoke the route discovery mechanism to find an alternative route.

SSA gives the concept of route stability [4]. A source start communication to search the route it perform a broadcast to all its neighbor nodes. These nodes propagate the broadcast in such way no looping will be done. The route will be selected that will first respond to it. It means the route will be shortest and less congested. The destination will reply along with selected route, each intermediate route along with next hop, destination pair in its routing table. In case of broken link, if no reply found it broadcast request to the neighboring nodes and find the next shortest and reliable node and provide the link stability.

## 2. PROBLEM DEFINITION

A mobile network is a dynamic reconfigurable network with heavy traffic over the network [5]. In such network the optimization of QOS is always the basic need of the network. When such kind of dynamic network having some problem of broken link or the node failure in such case the reconstruction of the network is required. In such case the work is divided in two phases, first to identify the problem node or the link and other to perform the optimized reconstruction of the network. In the existing SSA protocol, it can identify the broken link [7] and perform the reconfiguration efficiently. But it does not keep watch on this broken link so that if the link gets repaired some path is again carried on for the communication work. In this present work, we are defining the case when the broken link is repaired and the routing switch to the initial route. In this work we have setup an agent node neighbour (manager node) to the broken link node. This manager node will keep watch on the broken link and as the link gets repaired, the communication will be done on this existing optimized path.

## 3. EXPLANATION TO PROBLEM

SSA gives the concept of route stability [6]. The basic concept of SSA is

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- A source start communication to search the route it perform a broadcast to all its neighbor nodes. These nodes propagate the broadcast in such way no looping will be done.
- The route will be selected that will first respond to it. It means the route will be shortest and less congested.
- The destination will reply along with selected route, each intermediate route along with next hop destination pair in its routing table.
- In case of broken link, if no reply found it broadcast request to the neighboring nodes and find the next shortest and reliable node and provide the link stability.

## 4. PROPOSED WORK

In our proposed work we are providing an early decision about the node stability.

- Here each node will inform the node regarding the broken link earlier because of this the route can be changed earlier.
- A timeout based flooding will be performed by each node periodically. If some node is not responding for n number of trails then the decision will be taken that node is a bad node.
- The bad node will be marked as the inactive node in routing table and while communicating the earlier decision will be taken regarding this.
- As the bad node is identified an agent will be set as neighbour to the bad node. The agent will keep watch on this bad link or the node.
- As the bad link gets repaired the agent will inform the node to perform communication from the initial path.

In this present work we have improved the communication by representing the node as an intelligent node. In this present work the first time communication performed by the network is same as of existing SSA. It means it will detect the attack or the broken link in same way as of actual SSA. But once the attack is detected it will enable the immediate previous node to attack as the manager node that will track the attack position or the attack node periodically. Till there is attack in the network it will not allow the communication on that route. It means it will identify the preventive path to communicate from the alternate path or the node. As that manager node identify that the broken link or attack is repaired dynamically, it will start the communication from this previous path.

The proposed system will give the following benefits.

- It not only dynamically reconfigure the network as the attack found, it will also identify the dynamic repairing of the network. If the network is repaired dynamically it will move back to the previous effective path.
- The nodes are taken as intelligent node and converted to manager node as the attack found on their immediate communication path or the node.

The proposed work is basically divided into following phases:

**4.1 Breaking phase**
**4.2 Checking phase**
**4.3 Repairing phase**

**4.1 Breaking Phase:**

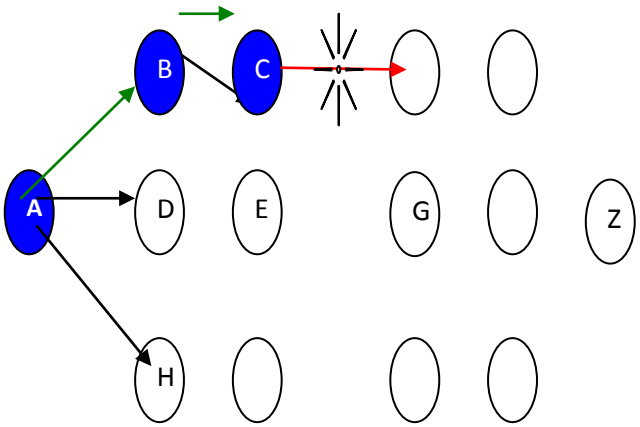


**Figure 1:** Broken Link in SSA Protocol

As we can see in Figure 1, the broken link is identified. Now a search is being performed for the next best node for the communication.

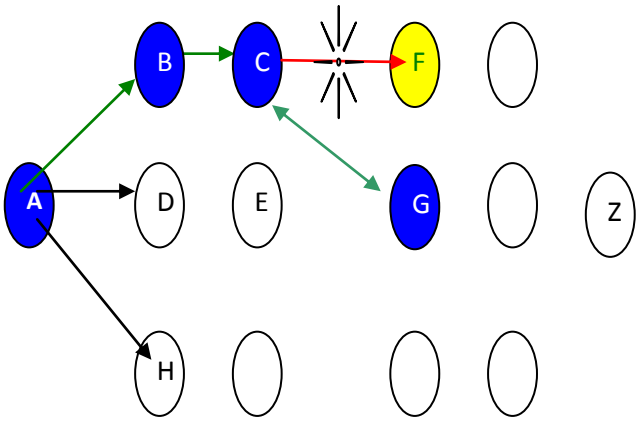


**Figure 2:** Compromising Node in SSA Protocol

As we can see in Figure 2, the broken link is identified. Now a search is being performed for the next best compromising node for the communication. Here Node G is elected as the next compromising node for communication.

**4.2 Checking Phase:**

Manager Node Periodic

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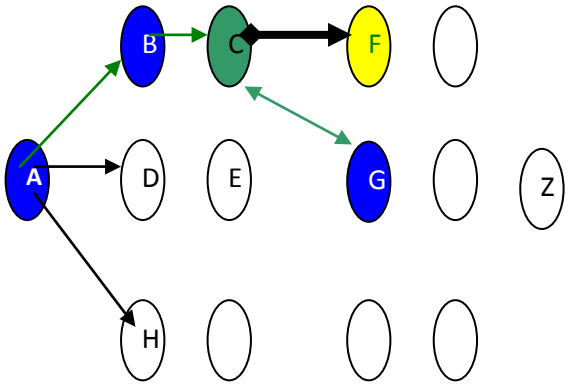


**Figure 3:** Agent in SSA Protocol (Checking Phase)

As we can see in Figure 3, as the new compromising node is identified, an agent is set on the neighbor node. The agent will keep watch on the broken link periodically to check the broken link gets repaired or not.

**4.3 Repairing Phase:**

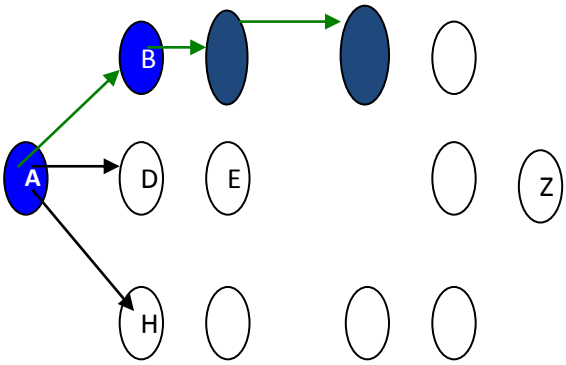


**Figure 4:** Repaired Path (Repairing Phase)

In Figure 4 we can see, as the node repair will follow the existing path.

## 5. CONCLUSIONS

In this research paper the proposed model acts as the improved SSA protocol. Here we defined that in new work, as the broken links get repaired, the control will be shifted to the existing path. The periodic check is being performed on broken link. The proposed work is about to find the optimal solution of any broken link or data loss in a high speed mobile network. The proposed work is about the generation of such an approach that will dynamically compensate the problem of link failure and provide the optimize solution without any data loss. The proposed system will give the benefit in terms of efficiency and accuracy.

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