

# SMART NODE CONFIGURED IP ADDRESS IN AD HOC NETWORKS

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**ABSTRACT:** *Ad hoc networks do not contain a stable infrastructure, so address allocating process is too challenging. Automatic addressing protocols require a distributed and self-managed mechanism to avoid address crashes in an active network. We propose a lightweight procedure that is Filter-based Addressing Protocol (FAP) which plans nodes on ad hoc network based on an extent address database stored in filters. So all nodes can simply check whether an address is already assigned or not which reduces the control load and packet losses. We also suggest to use hash of this filter as a partition identifier, providing an essential feature for an easily detection of network partitions. We can humbly evaluate the performance of our protocol, joining nodes, network partition and network initialization. The proposed system decides all the address collision and also reduce the control traffic when match to previously proposed system. Analysis and simulation experiments show that proposed protocol achieves low communication overhead and low latency.*

**Index Terms-** *FAP, ad hoc network, DAD, multihop.*

## I. INTRODUCTION

Moveable ad hoc systems do not need some former substructure and depend on active multihop topologies for transportation forwarding. The lack of a centralized direction makes these networks beautiful for some distributed requests, such as sensing, Internet access to poor communities, and disaster improving [1]. A central and frequently unaddressed difficult of ad hoc systems is the everyday system panels. System panels, produced by node motion, diminishing stations and nodes assembly and send off the system, can interrupt the spread system switch. Set-up initialization is bonus exciting concern for of the lack of servers in the system. As additional wireless set-ups, ad hoc nodes likewise require a single network address to enable multi hop routing and full connectivity. Address transfer in ad hoc systems, though, is uniform extra interesting owing to the self-

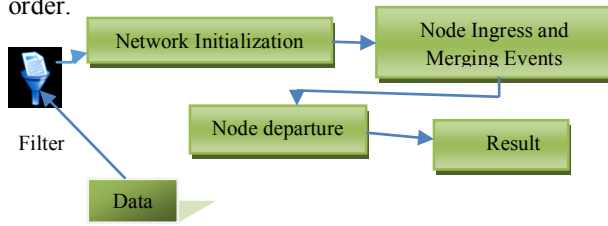
organized environment of these settings. Consolidated machines, such as the Dynamic Host Configuration Protocol (DHCP) encounter through the distributed environment of ad hoc systems then organize not address system subdividing in addition integration.

In this paper, we suggest and examine a proficient methodology called Filter-based Addressing Protocol [2]. The planned procedure continues a distributed catalog stored in filters holding the shortly allocated statements popular a compressed method. We reflect together the Bloom filter and a proposed filter, called Sequence filter, to project a filter-based procedure that declares together the univocal statement arrangement of the nodes linking the system and the recognition of statement accidents later integration barriers [3]. We also recommend to custom the hash of this filter as a divider identifier, provided that an significant article aimed at an relaxed uncovering of system panels. We link FAP presentation through the central statement auto arrangement applications for ad hoc systems. Investigation then replication research demonstration that FAP reaches little message above and low potential, determining all statement accidents straight in system panel integration actions. These outcomes exist generally associated to the custom of strainers since they decrease the amount of attempts to distribute a statement to a linking node, as well as they decrease the amount of incorrect positives in the panel amalgamation measures, when linked to supplementary suggestions, which decreases communication upstairs.

## II. FILTERBASED ADDRESSING PROTOCOL

The planned procedure objectives to dynamically auto configure system statements, determining accidents through a little switch weight, even in integration actions. To reach completely these purposes, FAP habits a distributed compact filter near denote the existing set of assigned statements [4]. This filter is current at each node to shorten everyday node assembly actions and decrease the switch upstairs mandatory to resolve statement crashes intrinsic in arbitrary tasks. Likewise, we suggest the filter monogram, which is the hash of the statement filter, as a partition identifier. The filter monogram is a significant feature aimed at simply identifying complex

assimilation actions, in which statement encounters might happen. We recommend the procedure of two dissimilar filters, contingent on the situation: the Bloom filter, which is based on hash functions, and the Arrangement filter, proposed in this paper, which wrappings documents constructed on the statement order.



### III. PROCEDURES OF FAP

#### a) *Network Initialization*

The system initialization technique contracts through the auto arrangement of the original fixed of nodes. Two dissimilar situations can occur at the initialization: the linking nodes extent one later the last with a extended sufficient break among them, called gradual initialization, or all the nodes reach at the equal time, called abrupt initialization. Greatest procedures undertake the gradual situation with a bulky time intermission among the entrance of the major and the subsequent linking nodes [5]. For sample, the procedure projected by Fan and Subramani accepts that the major node is only to indicate a panel identifier. Formerly, the resulting linking nodes are touched by the major node complete the linking node technique. If entirely nodes intersection the system almost at the equal period, all node will pick a dissimilar partition identifier. This activates countless partition integration actions concurrently, which generates a great switch weight and can source contradictions in the statement apportionment process, producing statement crashes. We contend that statement distribution procedures necessity function lacking some control to the method the nodes connection the system. Our filter-based suggestion turns healthy for together gradual and abrupt initialization situations, using Hello and AREQ messages, shown in Fig.1 (a) and (b).

The Hello letter is used by a node to promote its existing connotation position and partition identifier. The AREQ communication is used to promote that a formerly accessible speech is now allotted. Every AREQ has an identifier integer, which is used to discriminate AREQ letters produced by dissimilar nodes, but through the similar statement. In FAP, a node annoying to connection the system attends to the average for a period. If the node ensures not accept a Hello letter inside this period, then it starts the system, acting as the motivator node. An originator node can start the system only, or with other originator nodes. Then, if the node accepts a Hello letter, then the system previously occurs and the node items as a

connection node. An originator node casually selects a statement, considering the statement range defined by the bits of the system precede, generates a vacant statement filter, and starts the system initialization stage. In this stage, the node overflows the system periods with AREQ letters to growth the likelihood that all originator nodes accept the AREQ letter. If here exists extra originator nodes, they likewise show their AREQ periods, publicizing their arbitrarily selected statements. Later coming up a period lacking attending to AREQs after other originator nodes, in case they happen, the node leaves the initialization stage and additions on the statement clean all the statements acknowledged with AREQs. Next that, the node starts to show Hello letters with the statement filter autograph, which is a hash of the filter. This autograph categorizes the system and is used to notice panels, in case they happen. If the originator node accepts any AREQ with the identical statement that it has preferred, but through a dissimilar identifier digit, which funds that around is a statement crash, the node delays for a period and then selects one more existing statement and sends extra AREQ. Throughout the period the node accepts extra AREQs with other previously assigned statements. Hence, later the node sees a further whole tilt of assigned statement, which reductions the likelihood of selecting a used statement. Later, the period reduces the likelihood of accidents and accordingly decreases system switch capacity. When the initialization stage of FAP, all originator nodes must selected a single statement due to the random statement select and the authentication using AREQ letters with identifier records. Furthermore, each node tells all presently allotted statements with a great likelihood due to the periods overflowing the system. Accordingly, each node similarly produces a statement filter holding all the allotted statements.

#### b) *Node Ingress and Network Merging Events*

Later the initialization, both node jumps distribution interrupted Hello letters comprising its statement filter autograph. Upon the response of a Hello, neighbors calculate whether the autograph in the letter is the equivalent as its private autograph to identify integration measures. Individual the nodes that must previously combine the system are talented to conduct Hello letters, collect an invitation of a node to connection the system and perceive integration actions.

The node entry technique is defined in Fig. 2(a). Once a node cracks on, it attends to the average for a period. If the node attends to a Hello, around is at smallest unique node with a statement filter, and the system previously occurs. Later, the node identifies that it is a linking node instead of an originator node. The connection node then requests for the cause of the first attended Hello letter to direct the statement filter of the system using a Statement Strainer letter, shown

in Fig. 1(c). After the host node accepts the AF, it forms bit, which designates whether the letter is life used for a node-joining technique or a partition-merging method. Uncertainty, the letter arose after an assembly node. Before, the host node responses the invitation with alternative AF with bit set to 1, demonstrating that the AF is a response to a preceding filter invitation. After the assembly node obtains the AF reply letter, it provisions the statement filter, indicates a random existing statement, and overflows the system with an AREQ to distribute the fresh statement. Once the new nodes accept the AREQ, they enclosure the fresh statement in their screens and inform their filter autographs with the hash of the simplified sieve. Integration actions are also noticed built on Hello and AF letters, as designated in Fig. 1(b). Nodes in dissimilar panels select their statement founded single on the fixed of statements of their panel. Therefore, nodes in dissimilar panels can choice the similar statement, which could reason crashes later the panels combined. In FAP, while a node accepts a Hello, it authorizations whether the filter autograph on the letter is dissimilar than its existing autograph. If so, the node tells that they require dissimilar groups of assigned statements. If nearby is extra then the last integration result, a fresh merging technique is happening. In this method, both nodes communicate AF letters to broadcast the screens of the two panels. First, each node process whether its statement is identical or better than the statement of the extra node. The node with the extreme statement, or together nodes, in event statements are identical, starts the procedure.

The node starting the procedure shows an AF letter through its recent statement sieve to the extra node, which stocks the expected filter and sends hind an AF letter with the sieve of its panel. Then, both nodes flood their panels with a Partition letter, shown in Fig. 1 (d), so that completely nodes inform their filters with the other panel facts. Upon response of the Partition letter, all modules must checked the bit on the Panel letter to prove if it is on the last primacy panel. The lowermost importance panel is designated as the smallest panel or, if both panels are of the similar dimension, it is designated as the panel of the node that started the method. Each node on the lowest-priority partition must check whether its statement is on the extra panel filter to notice crashes. If near is a crash, the node casually selects an open speak in both filters and overflows the system with an AREQ to allot the

new statement. If the node accepts an AREQ with the similar statement that it has select, but with a dissimilar arrangement number, it chooses another address since additional node takes too preferred the similar statement.

Lastly, all the nodes combine the additional panel filter with its individual filter, enclosure the statements acknowledged in the AREQs into the new filter, and update the filter autograph. FAP needs a device to match the filter autograph fill in next a node entry or a integration incident to avoid untrue positives in system integration discoveries. For instance, let us undertake a situation with in which a node, called node A, lost the principal then the supplementary AREQ communications owing to crashes, but a neighbor of node A was able to accept the first broadcast of the letter. If the neighbor that established the message directly informs its filter autograph, node A may accept a Hello letter with a dissimilar filter autograph. Then, node A would wrongly recognize a system integration result, which personifies a false positive, producing a high letter below. The planned device to apprise filter autographs trusts on the loading of further autographs for a little period. In the suggested instrument, in its place of closely informing the filter autograph, the neighbor produces the new autograph and stocks it for a period. The period necessity stay extended plenty to agreement that all retransmissions of AREQ letters stayed previously flooded. Hence, during node A accepts the AREQ, creates the new autograph, and supplies it. Then, no integration result will be perceived by node A. To escape false positives, all the kept autographs are acknowledged as legal by a node. Later, once the neighbor informs its autograph, node A will poster that the new autograph used by the neighbor is kept and is legal, as well as the neighbor will agree the ancient autograph in the Hellos of node A since this autograph is too deposited.

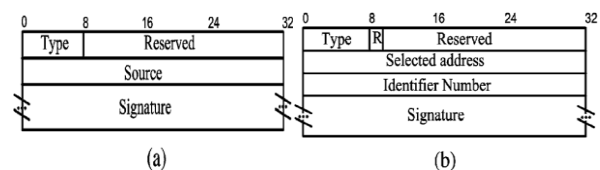
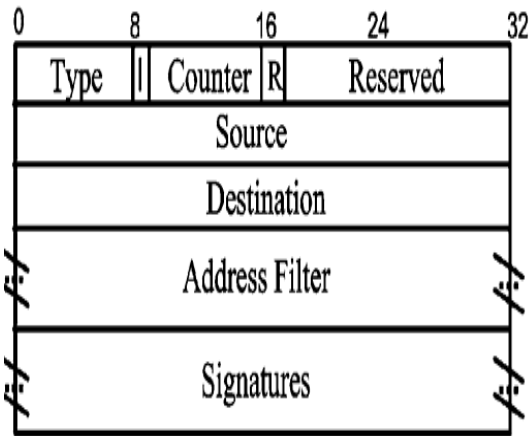
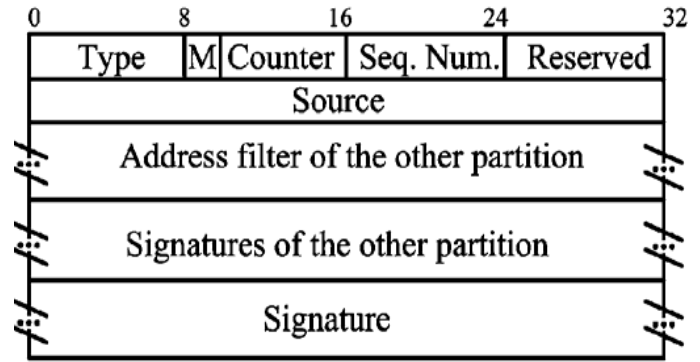


Fig.1. Messages of FAP for initialization



(c)

Fig.1. Messages of FAP for initialization



(d)

Fig.1. Messages of FAP for initialization

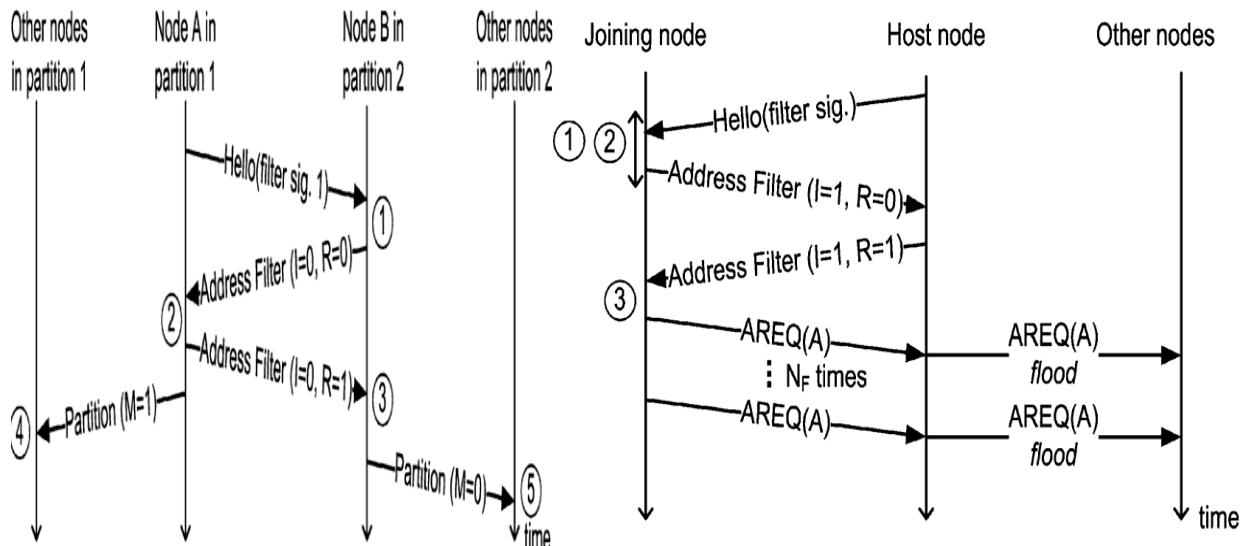


Fig. 2. FAP schemes for node ingress and network

- 1) Detect a merge event
- 2) Merge filter
- 3) Merge filter and check for collisions because 1 is greater than 2.
- 4) Merge filter
- 5) Merge filter and check for collisions because M=0

**c) Node Departure**

When a node plants the system, its statement must develop open aimed at the extra nodes. If the departure node is properly closed unhappy, it overflows the system by a notice to eliminate its statement after the statement filter. If the departure node ensures not alert the system, the statement relics allotted in the filters, which can make the existing statements rare by stage. This can be recognized popular the statement filter by the segment of bits set to 1 in the Bloom and in the Sequence filter then through the segment of hostages better than unique in the Security Bloom Filter. So, each node confirms this part in their statement sieves all period the filter is efficient. Uncertainty this part spreads a dawn that designates that the filter is filled or nearly full, all the nodes rearrange their statement sieves and revenues to the system initialization. In its place of selecting a new statement, the node usages its present statement, which is not hit, to decrease letter above and to duck breach dynamic data networks [6].

The AREQ letters used in filter repeats current the bit to show that very nodes necessity resume their filters. Though the initialization stage appears to cheat the system, it is equal in relations of switch capacity to panel integration in DAD-based auto structure procedures, such as the procedure future by Fan and Subramani. To evade common statement filter repeats now systems with sieves satisfied owing to a tall job, there is a smallest period among filter repeats, clear as A node can authority the system through any technique. FAP uses dials to evade that an exit node sources conflicts in the statement filter [7]. Later, if a host node leaves the system through a linking node way, the linking node will sign this result later minus a response after the host and resolve examine for a novel host node. After periods annoying to discovery a cloud node, the linking node deliberates it is only and starts the initialization way. A like tool is else used to evade conflicts in the panel merger way. In the initialization way, very nodes must like parts, and then, if an originator node fails, it fixes not stay or upset the initialization process. All the extra originator nodes tail with the statement distribution minus seeing the node disappointment.

**IV. SIMULATION RESULTS**

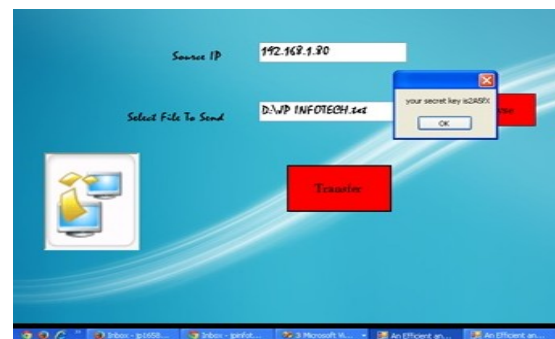
We applied FAP in the System Simulator-2 and assessed it seeing the Following model for radio propagation and the NS-2 IEEE 802.11 model for the Medium Access Control. These prototypes account

for making a situation like to an actual public system, by limits of salable equipments. So, the limits used aimed at our imitations are: a regular show kind of 18.5m, an all-out transporter intelligence kind of 108m, and a mass of 0.0121nodes/m [8].

We slow the switch movement, the stays, and the amount of statement collisions in FAP, considering a confidence level of 95% in the effects. We also applied in NS-2, the speak to procedures future by Perkins called DAD, by Fan and Subramani. Our main impartial is to show that our application also gifts a little above and workings in any set-up. Associating FAP to DAD-PD, we detect the presentation power of the use of the hash of the statement filters in its place of settled partition identifiers to detect partition integration actions. In the original DAD-PD, though the new panel identifier later panel integration is set by the sum of panel identifiers, which reasons variability in the procedure. So, we better the procedure act by selecting the chief panel identifier in system integration actions in its place of summing them, which decreases the amount of false partition integration findings. In adding, we likened FAP to MANET outline as both offers use a billed statement angle.



**Fig.4.1 Source**



**Fig 4.2 Select file to send**



Fig.4.3 key generation



Fig 4.4 Network path identification

## V. CONCLUSION

In this paper we have proposed a dispersed and self-managed addressing protocol, called Filter-based Addressing protocol, which turns healthy for active ad hoc systems with disappearing stations, common panels, and joining/leaving nodes. Our important knowledge is to use statement filters to escape statement crashes, decrease the switch capacity, and reduction the statement distribution postponement. We similarly planned to custom the hash of the filter as the panel identifier, if informal and correct articles for partition discovery by a minor amount of switch letters. Furthermore, our filter-based procedure raises the procedure strength to letter victims, which is a vital problem, aimed at ad hoc systems with vanishing networks and tall bit mistake degrees.

Future work will overcome the problems during the network creation or data transfer Mobile ad hoc networks which experience frequent link failures caused by channel interference, dynamic obstacles and/or applications' bandwidth demands. These failures cause severe performance degradation

in mobile ad-hoc networks or require expensive, manual network management for their real-time recovery. We are going to apply an *Autonomous network Reconfiguration System* (ARS) that enables a multi-radio WMN to autonomously recover from local link failures to preserve network performance. By using channel and radio diversities, ARS generates necessary changes in local and channel assignments in order to recover from failures. Next, based on the thus-generated configuration changes, the system cooperatively reconfigures network settings among *local nodes*.

## VI. ACKNOWLEDGMENTS

The authors are grateful for the anonymous reviewers' insightful comments and valuable suggestions sincerely, which can substantially improve the quality of this paper.

## VII. REFERENCES

- [1] S. Capkun, L. Butty'an, and J.-P. Hubaux, "Self-organized public-keymanagement for mobile ad hoc networks," *IEEE Transactions on Mobile Computing*, vol. 2, no. 1, pp. 25–64, Mar. 2003.
- [2] Z. Fan and S. Subramani, "An address autoconfiguration protocol for IPv6 hosts in a mobile ad hoc network," *Computer Communications*, vol. 28, no. 4, pp. 339–350, Mar. 2005.
- [3] A. Perrig, R. Szewczyk, V. Wen, D. Culler, and J. D. Tygar. SPINS: Security protocols for sensor networks. In *ACM Conference on Mobile Computing and Networks (MobiCom)*, July 2001.
- [4] "An Efficient and Robust Addressing Protocol for Node Autoconfiguration in Ad Hoc Networks" Natalia Castro Fernandes, Marcelo Duffles Donato Moreira, and Otto Carlos Muniz Bandeira Duarte.
- [5] D. O. Cunha, O. C. M. B. Duarte, and G. Pujolle, "A cooperation-aware routing scheme for fast varying fading wireless channels," *IEEE Commun. Lett.*, vol. 12, no. 10, pp. 794–796, Oct. 2008.
- [6] A.J. McAuley, K. Manousakis., Self-configuring networks, In *IEEE Milcom*, 2000, pp. 315–319.
- [7] S. Nesargi and R. Prakash, "MANETconf: Configuration of hosts in a mobile ad hoc network," in *Proc. 21st Annu. IEEE INFOCOM*, Jun. 2002, vol. 2, pp. 1059–1068.
- [8] D. Johnson and D. A. Maltz, "Dynamic source routing in ad hoc wireless networks," in *Mobile Computing* (T. Imielinski and H. Korth, eds.), Kluwer Academic Publishers, 1996.



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