IMPROVING THROUGHPUT OPTIMALITY FOR MULTIPATH ROUTING IN HETEROGENEOUS NETWORKS

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Abstract : Heterogeneous networks are cooperatively allows multipath routing for packet transmission which allows to study optimal routing for different networks where a group of subset nodes can forward packets using single path routing policies. In existing work pre specified backpressure policy is available for throughput optimality for multipath routing in heterogeneous networks. Where we notified limitation for this workless throughput optimality in heterogeneous network and low cost performance, so we need to propose a new algorithm to improve throughput optimality and improve performance. Existing work limitations is as follows: (i) Techniques all require centralized control, adoption both by all network nodes, or both; thus none of these techniques could provide incremental deployment of throughput optimal routing to wireless networks. (ii) Moreover, these techniques cannot be used in conjunction with throughput optimal dynamic control schemes, such as backpressure. In proposed work, to improve throughput optimality we commodity all the networks regions in small nodes and a "new node replacement algorithm with Optimal Backpressure policy". This new algorithm allows us to improve performance in terms of throughput and end-to end delay.

IndexTerms – Introduction, throughput optimality, multipath routing, heterogeneous networks

I. INTRODUCTION

We study optimal routing in networks where some legacy nodes are replaced with overlay nodes. While the legacy nodes perform only forwarding on pre-specified paths, the overlay nodes are able to dynamically route packets. Dynamic backpressure is known to be an optimal routing policy, but it typically requires a homogeneous network, where all nodes participate in control decisions. Instead, we assume that only a subset of the nodes is controllable; these nodes form a network overlay within the legacy network. The choice of the overlay nodes is shown to determine the throughput region of the network. A first finding is that ring networks require exactly controllable (overlay) nodes to enable the same throughput region as when all nodes are controllable, independent of the total number of nodes in the network. Motivated by this, we develop an algorithm for choosing the minimum number of controllable nodes required to enable the full throughput region. We evaluate our algorithm on several classes of regular and random graphs. In the case of random networks with a power-law degree distribution, which is a common model for the Internet, we find that fewer than 80 out of 1000 nodes are required to be controllable to enable the full throughput region. Since standard backpressure routing cannot be directly applied to the overlay setting, we develop a heuristic extension to backpressure routing that determines how to route packets between overlay nodes. Simulation results confirm that maximum throughput can be attained with our policy in several scenarios, when only a fraction of legacy nodes are replaced by controllable nodes. Moreover, we observe reduced delay relative to the case where all nodes are controllable and operate under backpressure routing.

Purpose

This application purpose is providing overlay architecture for optimal multipath routing. Dynamic backpressure is known to be an optimal routing policy, but it typically requires a homogeneous network, where all nodes participate in control decisions. Instead, we assume that only a subset of the nodes are controllable; these nodes form a network overlay within the legacy network.

Scope

The scope of the application is providing secure overlay architecture for optimal multipath Routing. It is providing dynamically control traffic bifurcations at overlay nodes.

II Existing Work

In Existing work pre specified Backpressure policy is available for Throughput optimality for multipath Routing in heterogeneous networks. Where we notified limitation for this workless Throughput optimality in heterogeneous network and low cost performance, so we need to propose a new algorithm to improve Throughput optimality and improve performance.

Limitations

1. Existing techniques all require centralized control, adoption both by all network nodes, or both; thus none of these techniques could provide incremental deployment of throughput optimal routing to wireless networks.
2. Moreover, these techniques cannot be used in conjunction with throughput optimal dynamic control schemes, such as backpressure.

III Proposed Work

In proposed work, To Improve Throughput Optimality we commodiate all the networks regions in small nodes and "a new node replacement algorithm with Optimal Backpressure policy ".This new algorithm allows us to improve performance in terms of throughput and end-to end delay.

Contribution Work

- The proposed algorithms for applying backpressure in overlay networks. This algorithm to several scenarios of interest including regular and random graphs.

- A threshold-based control policy_ BP_T as a medication of BP for use at overlay nodes. Source
- Router
- Cluster
- Destination(End user)
- Attacker
- Destination

Source

In this module, the Source will browse the data file and then upload to the particular Destinations. Source will send their data file to router and router will send to particular Destination (A, B, C…). And if any attacker will change the energy of the particular node, then Source will reassign the energy for node.

Router

The Router manages a multiple clusters (cluster1, cluster2, cluster3, and cluster4) to provide data storage service. In cluster n-number of nodes (n1, n2, n3, n4…) are present, and in a cluster the node which have more energy will communicate first and consider as cluster head and other nodes based on the distance will be selected to send data from the cluster head. In a router Source can view the node details, view routing path, view time delay, view correlation and view attackers. Router will accept the file from the Source and then it will connect to cluster; the all clusters are communicates and then send to particular Destination. In a router we can view time delay and also routing path.

Cluster

In cluster n-number nodes are present and the clusters are communicates with every clusters (cluster1, cluster2, cluster3 and cluster4).In a cluster the node which have more energy will communicate first. The Source will assign the energy for each upload the data file to the router; in a router clusters are activated and the cluster-based networks, to select the representative nodes, and send to particular Destinations.

Destination (End User)

In this module, the Destination can receive the data file from the Source via router. The Destinations receive the file by without changing the File Contents. Users may receive particular data files within the network only.

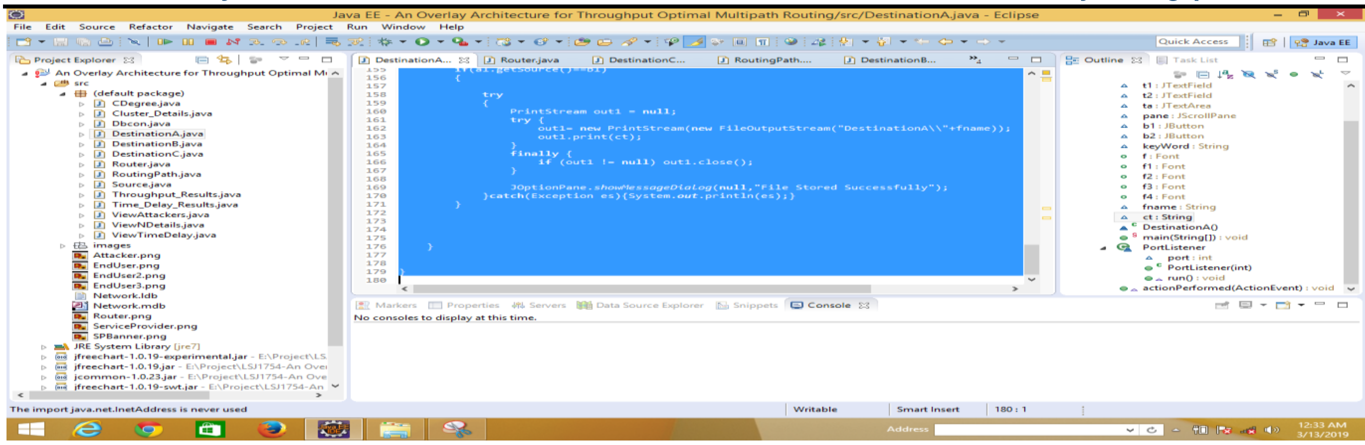
Attacker

Attacker is one who is injecting the fake energy to the corresponding nodes. The attacker decries the energy to the particular node. After attacking the nodes, energy will be changed in a router.

IV IMPLEMENTATION

Implementation is the process of assuring the information system which is operational and then allowing user take its operation for its operations for use and evaluation. Implementation includes the following activities.

- Obtaining and installing the system hardware.
- Installing the system and making it run on its intended hardware.
- Providing users access to the system.
- Creating and updating the database.
- Train the users on the new system.
- Documenting the system for its users and for those who will be responsible for maintaining it in future.
- Making arrangements to support the user as the system is used.
- Transferring on going responsibilities for system from its developer to the operations or maintenance.

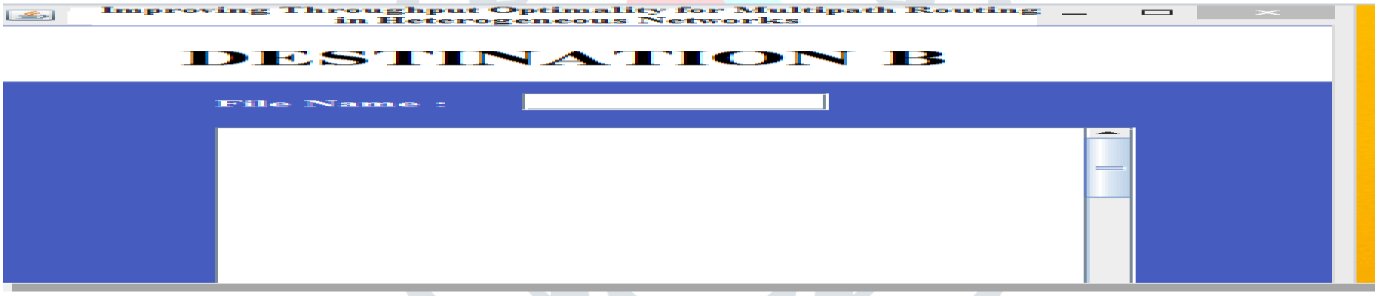


Screen 1 : Home page

Description: The above home page is Improving Throughput Optimality For Multipath Routing in Heterogeneous Networks.

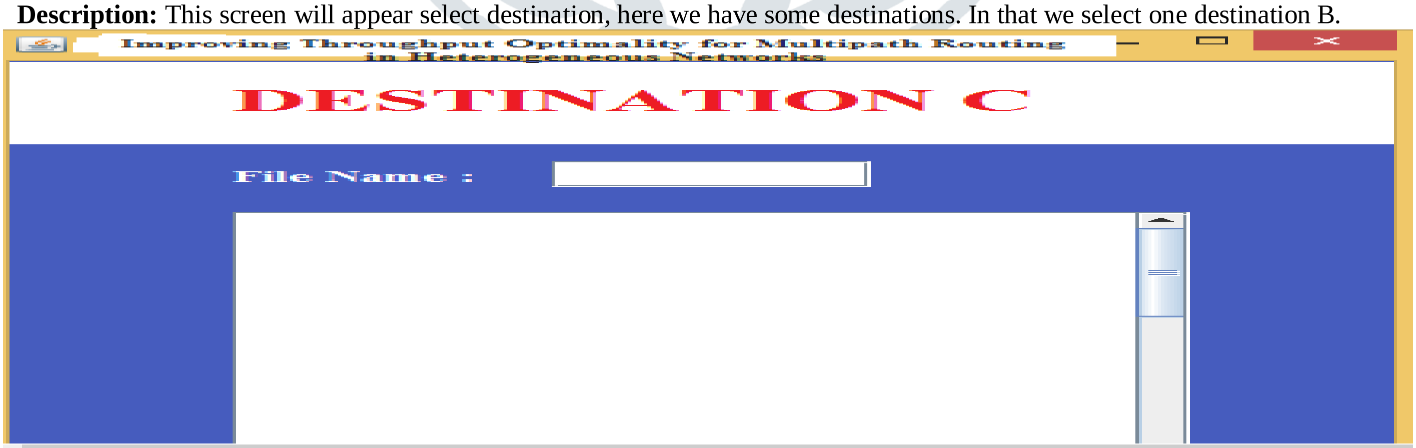
Screen 2 Destination A Code Form

Description: This screen will be appear Destination A, execution code form.



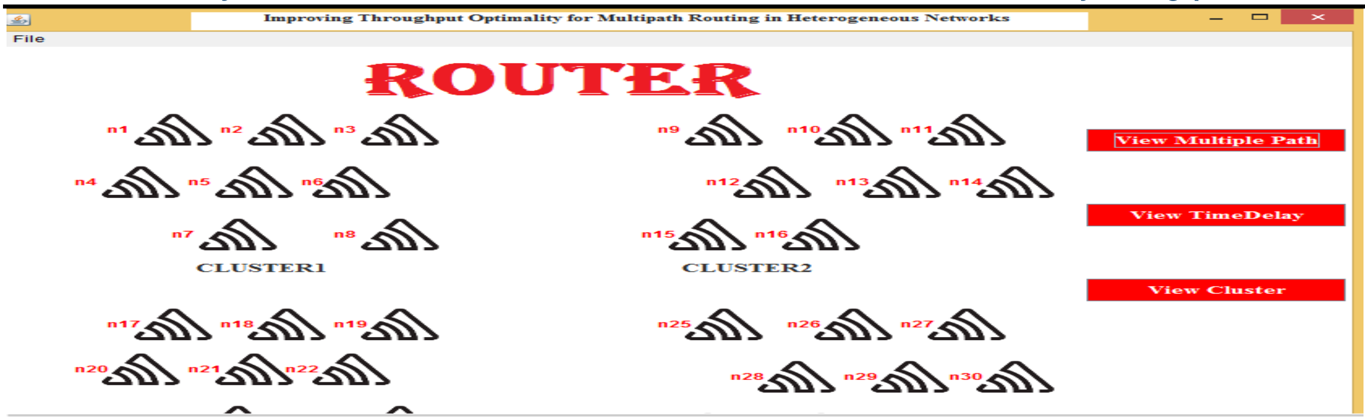
Screen 3: Destination B code Form

Description: This screen will appear select destination, here we have some destinations. In that we select one destination B.



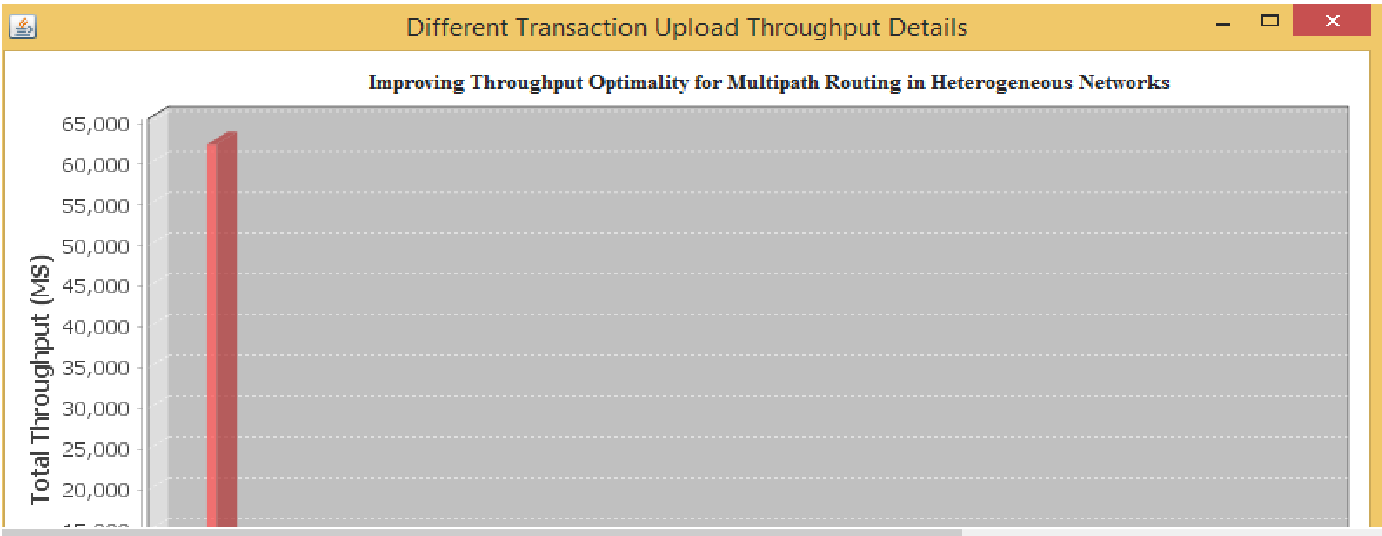
Screen 4: Destination C code Form

Description: This screen will appear select destination, here we have some destinations .In that we select one destination C.



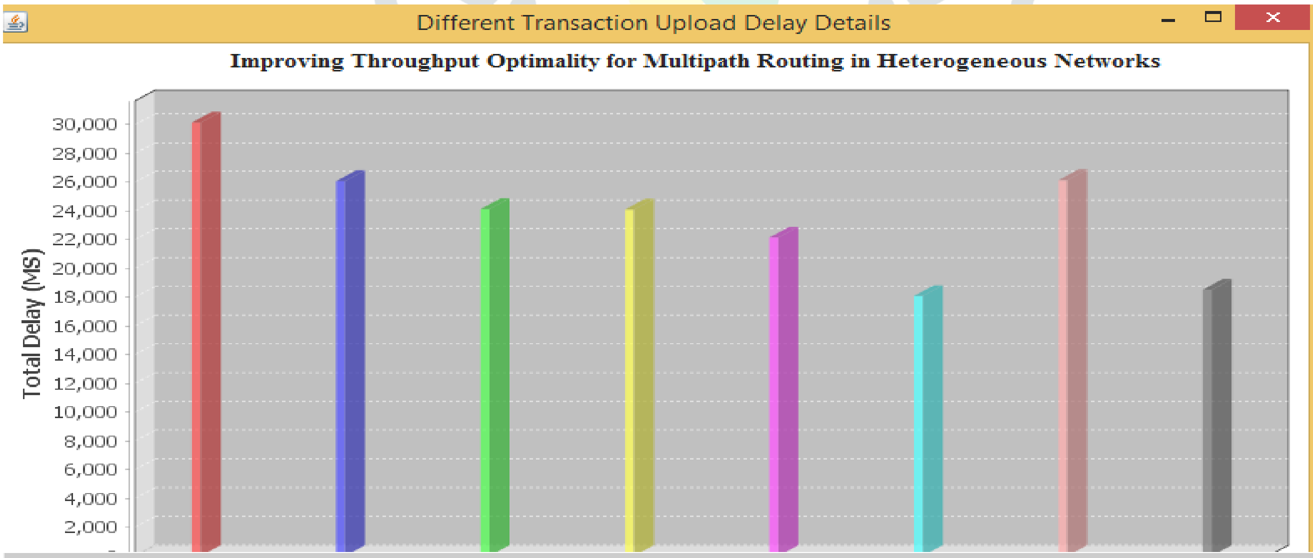
Screen: 5 Router

Description: After selected destination it displays input screen enter router.



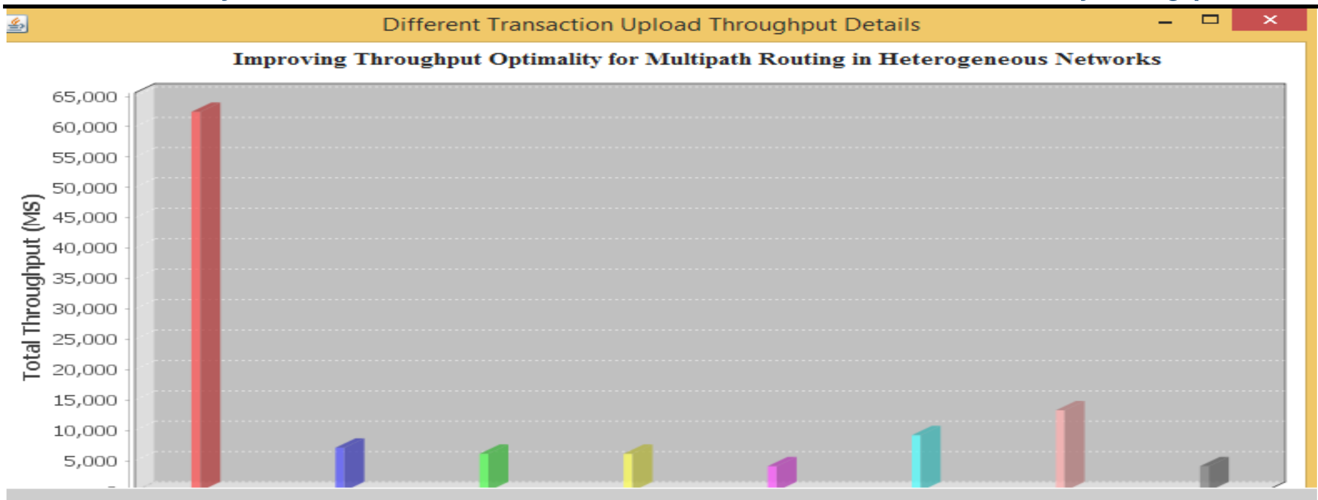
Screen 6: Different Transaction Upload Throughput Details

Description: In this screen we have Total time delay and Time delay, shown average percentage of time delay in screen destinations.



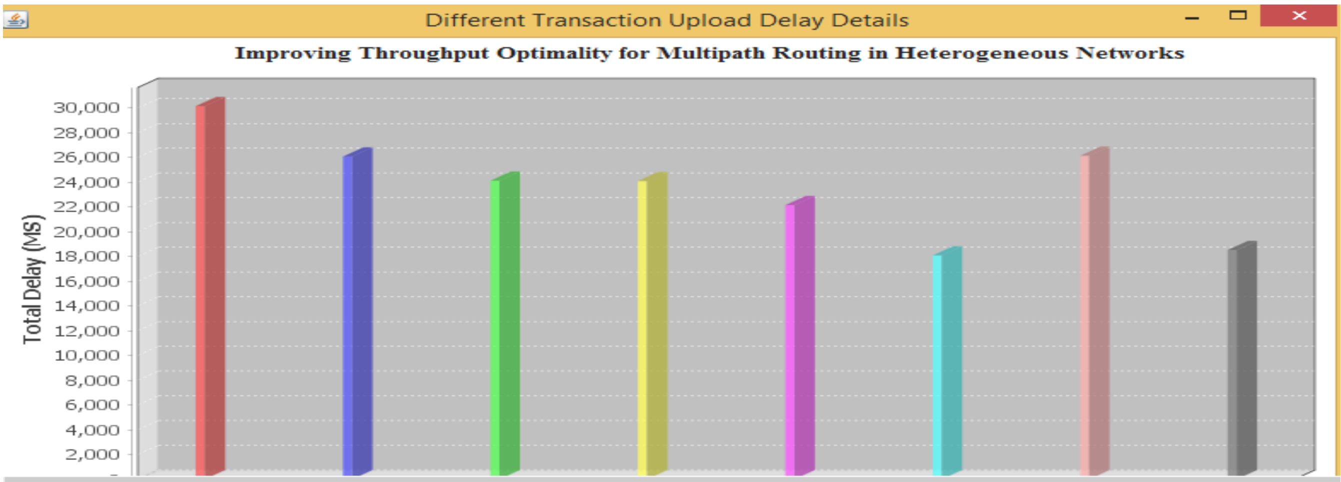
Screen 7: Different Transaction Upload Throughput Details

Description: This screen will appears the Improving Throughput Optimality For Multipath Routing in Heterogeneous Networks.



Screen 8: Different Transaction Upload Throughput Details

Description: This screen will be the Improving Throughput Optimality For Multipath Routing in Heterogeneous Networks.



Screen 9: Different Transaction Upload Delay Details

Description: In this screen we have total time delay and Time delay, shown how much of percentage of time delay in screen destinations.

CONCLUSIONS

The study optimal routing in legacy networks where only a subset of nodes can make dynamic routing decisions, while the legacy nodes can forward packets only on pre-specified shortest-paths. This model captures evolving heterogeneous networks where intelligence is introduced at a fraction of nodes. The propose a necessary and sufficient condition for the overlay node placement to enable the full multi commoddity throughput region. Based on this condition, The project devise an algorithm for optimal controllable node placement. This project run the algorithm on large random graphs to show that very often a small number of intelligent nodes suffices for full throughput.

Future Work

Finally, proposed a dynamic routing policy to be implemented in a network overlay, that demonstrates superior performance in terms of both throughput and delay. This project may extended with upgrade applications.

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