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Multi File Process Conformation in Network Overlays

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Abstract: The multi file process of delivering delay-sensitive data to a group of receivers with minimum latency. This latency consists of the time that the data spends in overlay links as well as the delay incurred at each overlay node, which has to send out a piece of data several times over a finite-capacity network connection. The latter part is a significant portion of the total delay, yet it is often ignored or only partially addressed by previous multicast algorithms. The analyze the actual delay in multicast trees and consider building trees with minimum-average and minimum-maximum delay. The NP-hardness of these problems and prove that they cannot be approximated in polynomial time to within any reasonable approximation ratio. The present a set of algorithms to build minimum-delay multicast trees that cover a wide range of application requirements min-average and min-max delay, for different scales, real-time requirements and session characteristics. The conduct comprehensive experiments on different real-world datasets, using various overlay network models. The results confirm that our algorithms can achieve much lower delays and up to orders-of-magnitude faster running times than previous related approaches.

Key words: Multicast trees · Minimum latency · Overlay networks

NTRODUCTION

Overlay networks have been the subject of significant research and practical interest recently. The initial motivation for overlay networks was mainly due to the following three shortcomings of the IP routing transportation. First, to deal with the slow fault recovery and of BGP, overlay networks can bypass broken paths by rerouting traffic through mediator overlay nodes. The detection of broken paths by overlay nodes can be quickly performed through active probing. Second, the IP routing model is basically a “one-size-fits-all”service, providing the same route independent of performance requirements. Instead, overlay networks can offer different routes to the same destination, depending on the performance metric. Third, the fact that interdomain IP routing is largely resolute by ISP commercial policies often results in suboptimal paths [1].

Overlay networks can provide better end-to-end performance by routing through intermediate overlay nodes, essentially forcing the flow of traffic in end-to-end paths that would otherwise not be allowed by ISP policies. Over the last few years much has been learnt about overlay networks. To name some major steps, the Resilient Overlay Network (RON) was the first wide-scale overlay implementation and testbed, over which several measurement studies have been completed. Those studies showed the fault recovery and performance benefits of overlay routing. Another research thread focused on enhanced services that can be provided by overlay networks, such as multicasting, end-to-end QoS, secure overlay services and content delivery. Overlay path selection algorithms, focused on QoS-aware routing, have been studied in. The impact of the overlay topology on the resulting routing performance was studied in, suggesting that knowledge of the native network topology can significantly benefit the overlay construction.

Overlay Routing: Overlay networks rely heavily on active probing, raising questions about their scalability and long term viability. The high cost of overlay network probing was the motivation for the tomography-based monitoring scheme reported. More recently, a comparison between overlay networks and multi homing has been reported in suggesting that multi homing may be capable to offer

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almost the same performance benefits with overlay networks, but in a much simpler and more cost-effective way. Furthermore, an ongoing debate focuses on the “selfishness” of overlay routing and on the potential performance inefficiency and instability that it can cause. It is clear that there is still much to be learnt about overlay networks and that the key debates on the scalability, efficiency and stability of overlay networks have to be addressed before their wider-scale deployment [2].

Overlay networks that has been largely unexplored previously, namely, the use of available bandwidth measurements in the path collection process. Previous work on overlay routing assumed that the only information that can be measured or inferred about the underlying local network is related to delays, loss rate and sometimes TCP throughput. The problem with these metrics is that they are not direct indicators of the traffic load in a path: delays can be dominated by propagation latencies, losses occur after congestion has already taken place, while measurements of TCP throughput can be highly intrusive and they can be affected by a number of factors.

Hybrid Routing: First focus on two algorithms that represent two different and general approaches: proactive and reactive routing. The former attempts to always route a flow in the path that provides the maximum available, so that the flow can avoid transient congestion due to cross traffic (and overlay traffic) fluctuations. The latter reroutes a flow only when the flow cannot meet its throughput requirement in the current path and there is another path that can provide higher available. The routing algorithms are compared in terms of efficiency, stability and safety margin. The reactive routing has significant benefits in terms of throughput and stability, while proactive routing is better in providing flows with a wider safety margin. Hybrid routing scheme that combines the best features of the previous two algorithms. The effect of several factors, including network load, traffic variability, link-state staleness, number of overlay hops, measurement errors and native sharing effects. Some of our results are rather surprising. For example, we show that a significant measurement error, even up to 100% of the actual available value, has a negligible impact on the efficiency of overlay routing. Also, that a naive overlay routing algorithm that ignores native sharing between overlay paths performs equally well with an algorithm that has a complete view of the native topology and of the available in each native link. The main contribution of is not a novel routing algorithm or a new available measurement technique, but an investigation of the applicability of available estimation in dynamic ovelay.

Reduce Delay in Overlays: Minimum delay delivery of data in overlay networks is a problem for several distributed applications. Consider a delay-sensitive event notification system in which an event generated at a node needs to be signaled to a large group of monitoring nodes with minimum latency. Two problems of minimizing the average and the maximum delay in multicast trees and we prove their NP-hardness as well as their inapproximability to within any reasonable ratio. That is, no polynomial-time approximation algorithm [3].

NP-complete to find various forms of degree-bounded trees, such as one with minimum total distance or one with minimum distance to the farthest receiver. NP-hardness of these problems and prove that they cannot be approximated in polynomial time to within any reasonable approximation ratio. The present a set of algorithms to build minimum-delay multicast trees that cover a wide range of application requirements min-average and min-max delay.

This is incredibly useful for companies that may have files that require access by multiple employees daily. By utilizing networking, those same files could be made available to several employees on separate computers simultaneously, improving efficiency [4].

The group of receivers corresponding to a source node in these systems may not be constant over time, such as a dynamic agent in a virtual environment moving across the area of interest of other entities. Therefore, forming overlay multicast groups in such dynamic systems and maintaining the corresponding state information in the intermediate overlay nodes, as in several classic multicast techniques is not an efficient solution. A naive alternative approach is to send each message directly from the source to each receiver. Solution is not scalable since it requires each node to have a connection to every other node in the network.

Solution is not scalable since it requires each node to have a connection to every other node in the network. Moreover, this approach can incur long delays because a node has a finite-bandwidth connection to the network, over which several copies of the same data should be sent. To avoid these problems, nodes can be connected through a mesh overlay [5].

Mesh Topology Building: In a mesh network topology, each of the network node, computer and other devices, are interconnected with one another. Every node not only sends its own signals but also relays data from other nodes. In fact a true mesh topology is the one where every node is connected to every other node in the network. This type of topology is very expensive as there are many redundant connections, thus it is not mostly used in computer networks. It is commonly used in wireless networks. Flooding or routing technique is used in mesh topology.

Multi File Process Conformation: Data can be transmitted from different devices simultaneously. This topology can withstand high traffic. Even if one of the components fails there is always an alternative present. So data transfer doesn't get affected. Expansion and modification in topology can be done without disrupting other nodes.

Overlay Frame Transfer: An overlay network is a computer network that is built on top of another network. Nodes in the overlay network can be thought of as being connected by virtual or logical links, each of which corresponds to a path, perhaps through many physical links, in the underlying network. An overlay network is a computer network that is built on top of another network. Nodes in the overlay network can be thought of as being connected by virtual or logical links, each of which corresponds to a path, perhaps through many physical links, in the underlying network. The Internet was originally built as an overlay upon the telephone network, while today (through the advent of VoIP), the telephone network is increasingly turning into an overlay network built on top of the Internet.

Parallel Path Building: An important factor for determining the scalability of a multicast scheme is the underlying routing protocol. The common approach used in and several other works is link-state-based routing, which allows all nodes to know the full topology of the network while suffering from high overhead and limited scalability. Our multicast scheme, on the other hand, is based on a variant of distance-vector routing and can be up to orders of magnitude more scalable. An earlier version of this work in complete the work in by presenting a new algorithm for updating multicast trees, rather than having to rebuild them every time from scratch, which reduces the calculation time for multicast trees to nearly 0 while producing trees with high delay efficiency. It is also demonstrate how to best employ our multiple algorithms together to always yield the best running time and tree efficiency.

Overlay Routing Algorithm : The overlay topology as a directed graph G = (V, L) whose vertices and links represent the set of overlay nodes and overlay links, respectively. The available of each overlay link l = (u, v) 2. L is denoted by b(l). An overlay path p is a sequence of one or more overlay links and its available b(p) is defined as b(p) = minl2p b(l). The overlay flow as the basic traffic unit for overlay routing, meaning that all packets of a flow are sent via the same path determined for that flow [6]. Each overlay flow is modelled by four parameters f = (vi, ve, d, r); vi, ve 2 V are the ingress and egress overlay nodes of the flow and d is the flow duration. The last parameter r is the flow's maximum throughput limit (max-rate limit) and it represents the maximum throughput that the flow can achieve. For instance, the throughput of a flow may be limited by its ingress or egress access capacity, the throughput of a streaming flow may be limited by the rate of the best-quality encoder and the throughput of a TCP flow may be limited by the size of end-host socket buffers. Due to limited network resources, a flow's actual throughput can be lower than its maxrate limit r. The symbol a to represent the current value of the achieved throughput of a flow.

Types of Overlay Routing: First consider two overlay path selection schemes: proactive overlay routing and reactive overlay routing. In both schemes, a flow will be initially routed on the path that provides the maximum headroom. With the proactive algorithm, the flow is switched to the path that appears to have the maximum headroom at the end of each path update period. Note that due to potential staleness in the link-state information, that path may not actually be the best choice [7]. With the reactive algorithm, on the other hand, the flow stays at its current path if it has achieved its max-rate limit. Otherwise, the flow is "unsatisfied" and it is routed on the path with the maximum headroom; that path may be the same with the previously used path. The intuition behind proactive routing is that the maximum headroom path can provide a flow with a wider safety margin to avoid transient congestion due to traffic load variations, measurement errors and stale link-state. The intuition behind reactive routing is that a flow should stay at its current path if it is already satisfied, leading to fewer path changes and more stable overlay routing [8].

Heuristic Routing Algorithm: The design of algorithm is based on heuristics, which is a technique that improves the efficiency of a search process, possibly by sacrificing claims of completeness [9]. The method developed in this study defines a search algorithm to check for the optimum solution in the domain of valid VP assignments. The algorithm consists of two basic phases, which are initialization and optimization. In the former, a starting point is found which is a valid solution, i.e., a valid VP network that satisfies the constraints. In the latter, incremental changes are made in the VP network that achieve a lower value for the objective function and satisfy the constraints, until no more improvement can be found.

Pseudo-Code for the Heuristic Algorithm Design:

```
Start:Initialization
#Read traffic requirements and convert them to equivalent bandwidth
while create an initial set of VPs for node pairs having a traffic demand and a direct link
if try to route all connection request over these initial VPs Optimization
else repeat sort VCs not assigned yet in descending order according to their capacity requirements.
endif
# find the minimum link
return
endwhile
reduce the data delivering delay
```

Reduce Data Sending Delay: Multicasting technology uses the minimum network resources to serve multiple clients by duplicating the data packets at the closest possible point to the clients. This way at most only one data packets travels down a network link at any one time irrespective of how many clients receive this packet. Traditionally multicasting has been implemented over a specialized network built using multicast routers. This kind of network has the drawback of requiring the deployment of special routers that are more expensive than ordinary routers [10].

Using overlay networks for multicasting presents a new challenge as the end nodes are required to play a dual role of clients as well as forwarding agents to other client nodes downstream. Node dynamics will have different effects on the end user applications depending on the type of application. Real time applications will be more affected by node dynamics than non-real time applications due to the disruptions resulting from such dynamics

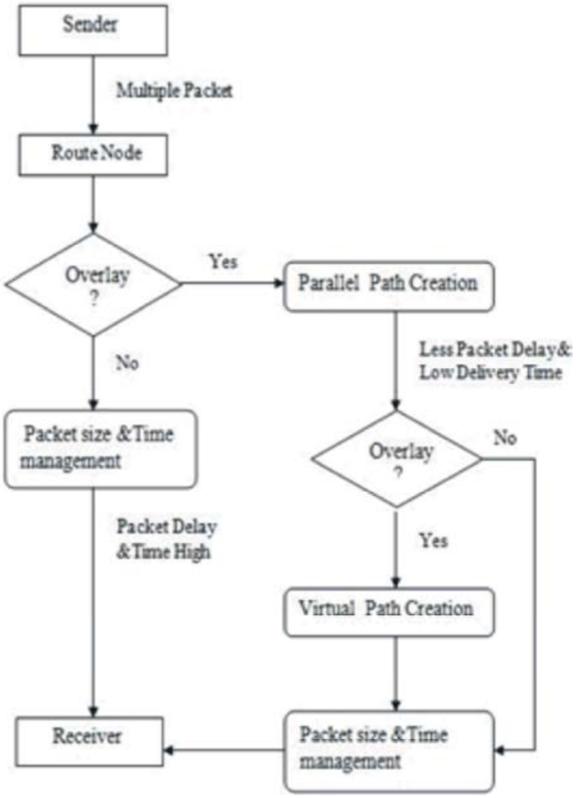

Fig. 1: Process Flow of Reduced Delay

CONCLUSION

Dlivering data to a group of receivers with minimum delay in an overlay network. We show that multicast routing algorithms that simply find a shortest-path tree can result in large delays as they only minimize the link-bylink cost, ignoring the important delay incurred at high-degree nodes in the tree. The problems of minimizing the average and the maximum delay in a multicast tree. The set of algorithms that heuristically create multicast trees with minimum delays: For each of the two min-sum and min-max delay cases, we design a delay-efficient algorithm and a tree adaptation algorithm to update a previous tree in nearly zero time, instead of rebuilding a new one from scratch.

The group of these algorithms supports a wide range of application requirements: overlays from tens to a few thousand nodes as well as different real-time requirements and session characteristics. Two different real-world datasets on overlays created. Our results confirm that our algorithms can achieve significantly lower delays and smaller running times than previous minimum-delay multicast algorithms.

In the future work, The sender transmit the data to the receiver at the same time copy of the data also transmit to the all the other nodes in mesh topology. if any problem occurs in receiver side or current transaction path means, the system only send the ACK to the sender and no data resending process. But the data automatically transmitted by the neighbor node of the receiver.

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REFERENCES

1. Amir, Y., C. Danilov, S. Goose, D. Hedqvist and A. Terzis, 2006. An overlay architecture for high-quality VoIP streams, IEEE Trans. Multimedia, 8(6): 1250–1262.
2. Aron Walters, David Zage and Cristina Nita-Rotaru, 2006. Mitigating Attacks Against Measurement-Based Adaptation Mechanisms in Unstructured Multicast Overlay Networks, in 14th IEEE International Conference on Network Protocols (ICNP'06), Santa Barbara, CA, USA, pp: 65 -74.
3. Brosh, E., A. Levin and Y. Shavit, 2007. Approximation and heuristic algorithms for minimum-delay application-layer multicast trees, IEEE/ACM Trans. Netw., 15(2): 473-484.
4. Mokhtarian, K. and H.A. Jacobsen, 2013. Minimum-delay overlay multicast, in Proc. IEEE INFOCOM, Turin, Italy, pp: 1771.
5. Dario Pompili, Caterina Scoglio and Luca Lopez, 2008. Multicast algorithms in service overlay networks, Journal of Computer Communications, 31: 489-505, 31(3): 489-505.
6. Firdhous. M.F.M. and Moratuwa, 2011. Multicasting over Overlay Networks – A Critical Review, in (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 2, No. 3.
7. Jun Guo and Sanjay Jha, 2008. Host-aware routing in multicast overlay backbone, in IEEE Network Operations and Management Symposium (NOMS 2008), Salvador, Bahia, Brazil, pp: 915-918.
8. Shi, S. and J. Turner, 2002. Routing in overlay multicast networks, in Proc. IEEE INFOCOM, New York, NY, USA, 3: 1200-1208.
9. Han Gao, Michael E Papka and Rick L Stevens, 2006. Extending Multicast Communications by Hybrid Overlay Network, in IEEE International Conference on Communications (ICC '06), Istanbul, Turkey, pp: 820-828.
10. Rodolakis, G., A. Laouiti, P. Jacquet and A. Naimi, 2008. Multicast overlay spanning trees in ad hoc networks: Capacity bounds, protocol design and performance evaluation, Comput. Commun., 31(7): 1400–1412.