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A SECURE ENABLED VIRTUAL QUALITY ROUTING (SEVQ) FOR EFFECTIVE PACKET LOSS MEASUREMENT AND CONGESTION AVOIDANCE

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Abstract

Per-flow traffic measurement, which is to count the number of packets for each active flow during a certain measurement period, has many applications in traffic engineering, classification of routing distribution or network usage pattern, service provision, anomaly detection, and network forensics. In order to keep up with the high throughput of modern routers or switches, the online module for per-flow traffic measurement should use high-bandwidth SEVQ that allows fast memory accesses. Due to limited SEVQ space, exact counting, which requires to keep a counter for each flow, does not scale to large networks consisting of numerous flows. Some recent work takes a different approach to estimate the flow sizes using counter architectures that can fit into tight SEVQ. In this paper, we design a scalable counter architecture called Counter Tree, which leverages a 2-D counter sharing scheme to achieve far better

memory efficiency and in the meantime extend estimation range significantly. Furthermore, we improve the performance of Counter Tree by adding a status bit to each counter.

Keywords

SEVQ Algorithm, Congestion avoidance, Mesh node, Network Controller, Adaptive Congestion avoidance

INTRODUCTION

Per-Flow traffic measurement is one of the fundamental problems in network traffic measurement. It is to count the number of packets (or called flow size) for each active flow during a measurement period. The flows under measurement can be per-source flows, per-destination flows, per-source/destination flows, TCP flows, http flows, or any user-defined logical flows. Each flow is uniquely identified by its flow label. Per-flow traffic measurement has many important applications in traffic engineering, classification of routing distribution or network usage pattern, service provision, anomaly detection and network forensics. SDN networks may decide which flows to be re-routed on which paths based on the flow sizes and the bandwidth availability on those paths; per-flow measurement can also help determine the distribution of traffic transmitted in the networks and the characteristics of traffic sent from a particular source or destined to a particular address; network administrators can perform per-source traffic measurement to identify scanners or estimate the scanning rates of malicious hosts.

We stress that per-flow traffic measurement significantly differs from a related problem called *flow cardinality estimation,* which is to estimate the number of *distinct* elements in each flow.

With high-speed networks routinely carrying large numbers of flows, it is often impossible to keep a counter for each flow in SEVQ. *Exact counting* generally adopts a hybrid SEVQ-DRAM architecture, where small counters in SEVQ are incremented at high speed, and occasionally written back to larger counters in DRAM. However, the hybrid architecture incurs costly SEVQ-to-DRAM updates.

Prior art and limitation: To fit the measurement module in tight SEVQ, some schemes only provide the distribution of flow sizes or measure the sizes of large flows. Other work lessens the space requirement by estimating the sizes of the flows instead of counting their exact sizes. The state-of-the-art estimation approaches include bitmap-based MSCBF, Counter Braids, and randomized counter sharing, which will be briefly reviewed below.

The Multi resolution Space-Code Bloom Filter (MSCBF) employs multiple Bloom filters to encode packets with different sampling probabilities. Filters with high sampling probabilities can keep track of small flows, while filters with low sampling probabilities can track large flows. However, the bitmap nature of MRSCBF determines that it is not memory efficient for counting. Tiny Table is a novel hash table based data structure that represents multi set membership. It improves the query and update efficiency of Bloom filters. However, for per-flow traffic measurement, it still requires a high memory cost, which is tens of bits per flow.

NETWORK TRAFFIC MESERMENT

Network traffic refers to the amount of data moving across a network at a given point of time. Network data is mostly encapsulated in network packets, which provide the load in the network. Network traffic is the main component for network traffic measurement, network traffic control and simulation.

CONGESTION CONTROL

Congestion in a network may occur if the load on the network (the number of packets sent to

the network) is greater than the capacity of the network (the number of packets a network can handle).

- When too many packets are pumped into the system, congestion occur leading into degradation of performance.
- Congestion tends to feed upon itself and backups.
- Congestion shows lack of balance between various networking equipments.
- It is a global issue.

EXISTING SYSTEM

In order to capture the non-deterministic and dynamic effects of the congestion attack, we model the packet error rate at each network node as a random process. At a given time, the randomness in the packet error rate is due to the uncertainty in the congestion parameters, while the time-variability in the packet error rate is due to the congestion dynamics and mobility. The design of ECN requires routers and receivers to explicitly and correctly participate in the congestion control loop, but has no means to check or enforce this cooperation. As noted in the ECN (Early Congestion Notification) specification, this raises the possibility of misbehaviour. Mis-configured or incompatible devices, such as proxies, firewalls, tunnels, and NATs, could exhibit these behaviours. The ECN specification argues that network and receiver misbehaviour is no worse than the problem of aggressive senders. While this is true, receivers and senders often have conflicting incentives with respect to congestion control.

Web servers aim to share bandwidth between all clients, while Web clients aim to improve their download times.

DISADVANTAGES

- ✓ Serial Transmission MAC Protocols (STMP) statistically multiplexes interchange over a single channel and at all time position the channel can convey a packet of only one node. It is as well known as Single Channel MAC protocol.
- ✓ A mobile workstation does not play dangerous role in resource distribution.
- ✓ Wireless information systems at elevated power cost.
- ✓ Highly joined data loss and packet delivery ratio.
- ✓ Poor safety.

PROPOSED SYSTEM

We suggest methods **Secure Enabled Virtual Quality Routing** for the complex nodes to assess and characterize the crash of jamming and for a source node to integrate these estimates into its traffic distribution. In instruct for a source node s to integrate the jamming force in the traffic allocation trouble, the outcome of congestion on transmissions over every link (i, j) must be approximate and relayed to s. Though, to confine the jammer mobility and the dynamic special effects of the jamming attack, the local estimates require to be repeatedly updated.

Jamming may be handled only by the receiver, but since it is recognized to have happened only later than a packet was send, there must be an reverberation of the blocking indication by the recipient to the transmitter.

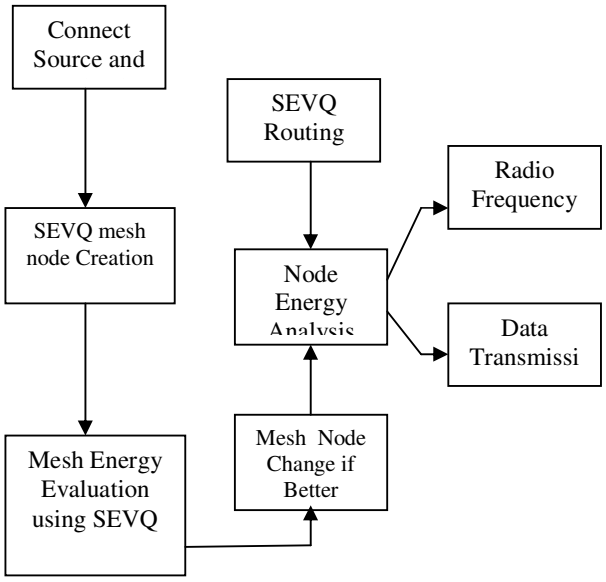
With no SEVQ, jamming suggestion echo is achieved ultimately by the discovery of lost packets. With SEVQ, the jamming is indicated by surroundings the SEVQ field within an IP packet to echo reverse by the receiver to the transmitter by set correct bits in the subtitle of the transport protocol.

ADVANTAGES

WSNs hold up ad hoc networking, and contain the ability of self-forming, self healing, and self-organization.

- ✓ Mesh routers contain minimal mobility and do dedicate routing and configuration, which considerably decrease the fill of mesh clients and another end nodes.
- ✓ Better Performance.
- ✓ Improved reliable Routing which provide better security.
- ✓ Low energy needed to deliver the data by using congestion route avoidance enabled.

SYSTEM FLOW DIAGRAM



CONCLUSION

In this work, we proposed a new algorithm called "SEVQ" is proposed for the specificities and constraints for WSN. Our first objective is to reduce energy consumption at all stages. As a result of this work, to make the most the idea of redundancy to enhance effects which are associated with power conservation.

Mobile nodes are moving randomly without any centralized management in WSN. Due to excessive mobility, the packet loss happens unnecessarily and unlimited retransmission of packets takes place. So the power consumption of communication is going very excessive. The proposed device evolved an Adaptive Congestion Avoidance with quality routing for minimum power intake which attains the greater strength performance and reduced congestion amongst nodes.

The multipath routing is proposed to achieve excessive network lifetime and throughput. Next, energy consumption model is proposed to attain minimum energy consumption of nodes, acknowledgment and information packets.

By using the extensive simulation results, the proposed scheme SEVQ achieves the better packet delivery ratio, better throughput, high network lifetime, low delay and minimum energy consumption.

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