PACKET ADVANCING PRIORITIZATION BASED ON USER FUNCTIONALITY

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Abstract : Packet Forwarding Prioritization (PFP) in routers is one of the mechanisms commonly available to network operators. PFP can have a significant impact on the accuracy of network measurements, the performance of applications and the effectiveness of network troubleshooting procedures. Despite its potential impacts, no information on PFP settings is readily available to end-users. Here an end-to-end approach for PFP inference and its associated tool, PAP (Packet Advancing Prioritization). This is the first attempt to infer router packet forwarding priority through end-to-end measurement. PAP enables users to discover such network policies through measurements of packet losses of different packet types.

PAP can be compared with inference mechanisms through other metrics such as packet reordering (called out-of- order (OOO)). OOO is unable to find many priority paths such as those implemented via traffic policing. PAP can also be used to detect the delay differences among packet types such as slow processing path in the router and port-based load sharing.

Introduction : Packet Forwarding Prioritization (PFP) has been available in off-the shelf routers for quite a while, and various models from popular brands, such as Cisco and Juniper Networks offer support. But there is no information on PFP settings are readily available to end-users. Packet Advancing Prioritization (PAP) presents an end-to-end approach for PFP inference. PAP enables users to discover network policies through measurements of packet losses of different packet types. PFP may have a significant impact on the performance of applications. Packet forwarding priority affects: measurements, loss, and delay.

There are a couple of challenges for designing and implementing PAP. The Main advantage of using PAP is to avoid traffic and congestion in networks. PAP is also used to manage traffic in transferring packet between different routers.

Methodology : Methodology is simplified by Measuring the path with different types of packets and then comparing the loss rates of packets. A robust statistical method rank method is designed, for comparing the loss rates of different packet types

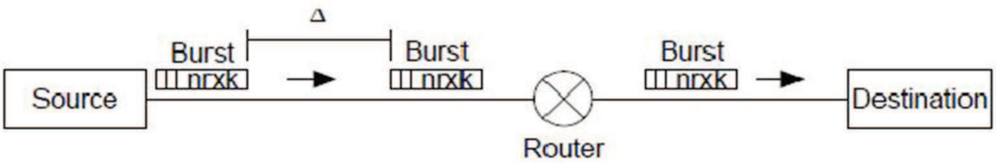

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Fig: Methodology

Existing System :

- As earlier PAP is compared with the inference mechanisms based on other metrics with less overhead such as packet reordering (called out-of-order (OOO)).
- OOO is unable to find many priority paths such as those implemented via traffic policing.
- On the other hand, it can detect existence of the mechanisms, which induce delay differences among packet types such as slow processing path in the router and port-based load sharing.

Proposed System :

- PAP is accurately able to infer router's packet forwarding priority.
- Where OOO (Out-Of-Order) method is unable to find many priority paths such as those implemented via traffic policing.
- The loss based method detected multipriority paths in the Internet; showed low false-positive rate.
- The packet reordering and delay metrics with less probe overhead were not as effective as loss metric

Hence, for packet forwarding priority packet loss metric is better

- Decreasing the probe overhead can be the advantage.

Literature Survey : Robust identification of shared losses using end-to-end unicast probes

Current Internet transport protocols make end-to-end measurements and maintain per-connection state to regulate the use of shared network resources. When two or more such connections share a common endpoint, there is an opportunity to correlate the end-to-end measurements made by these protocols to better diagnose and control the use of shared resources. Packet-probing technique is developed to determine whether a pair of connections experience shared congestion. Correct, efficient diagnoses could enable new techniques for aggregate congestion control, Quality of Service (QoS) admission control, and connection scheduling and mirror site selection. Extensive simulation results demonstrate that the conditional (Bayesian) probing approach that they employ provides superior accuracy, converges faster, and tolerates a wider range of network conditions than recently proposed memory less (Markovian) probing approaches.

Measuring service in multi-class networks : Quality of service mechanisms and differentiated service classes are increasingly available in networks and servers. While network clients can assess their service by measuring basic performance parameters such as packet loss and delay, such measurements do not expose the network's core QoS functionality. A framework and methodology is developed for enabling network clients to assess a system's multi-class mechanisms and parameters. Using hypothesis testing, maximum likelihood estimation, and empirical arrival and service rates measured across multiple time scales, The techniques for clients are (1) determine the most likely service discipline among EDF, WFQ, and SP, (2) estimate the server's parameters with high confidence, and (3) detect and parameterize non-work-conserving elements such as rate limiters. MINTCar: A Tool For Multiple Source Multiple Destination Network Topography

Identifying and inferring performances of a network topology is a well known problem. Achieving this by using only end-to-end measurements at the application level is known as network tomography. When the topology produced reflects capacities of sets of links with respect to a metric, the topology is called a Metric-Induced Network Topology (MINT). Tomography producing MINT has been widely used in order to predict performances of communications between clients and server. Nowadays grids connect up to thousands communicating resources that may interact in a partially or totally coordinated way. Consequently, applications running upon this kind of platform often involve massively concurrent bulk data transfers. This implies that the client/server model is no longer valid. MINTCar is a tool, which is able to discover metric induced network topology using only end-to-end measurements for paths that do not necessarily share neither a common source nor a common destination.

A Wavelet-Based Approach to Detect Shared Congestion : Per-flow congestion control helps endpoints fairly and efficiently share network resources. Better utilization of network resources can be achieved, however, if congestion management algorithms can determine when two different flows share a congested link. Such knowledge can be used to implement cooperative congestion control or improve the overlay topology of a Peer-to-peer system. Congestion technique is used to detect shared congestion either assume a common source or destination node, drop-tail queuing, or a single point of congestion. Congestion is applicable to any pair of paths on the Internet, without such limitations. Wavelet-based technique employs a signal processing method, wavelet denoising, to separate queuing delay caused by network congestion from various other delay variations. Wavelet-based technique is evaluated through both simulations and Internet experiments. When detecting shared congestion of paths with a common endpoint, this technique provides faster convergence and higher accuracy while using fewer packets than previous techniques, and that it also accurately determines when there is no shared congestion. Furthermore, wavelet-based technique is robust and accurate for paths without a common endpoint or synchronized clocks; more specifically, it can tolerate a synchronization offset of up to one second between two packet flows.

End-to-end Inference of Router Packet Forwarding Priority : Packet forwarding prioritization (PFP) in routers is one of the mechanisms commonly available to network administrators. PFP can have a significant impact on the performance of applications, the accuracy of measurement tools' results and the effectiveness of network troubleshooting procedures. Despite their potential impact, no information on PFP settings is readily available to end-users. An end-to-end approach for packet forwarding priority inference and its associated tool, PAP is designed. The PAP is used to infer router packet forwarding priority through end-to-end measurement. PAP tool enables users to discover such network policies through the monitoring and rank classification of loss rates for different packet types. As part of wide-area experiments, PAP is used to analyze 156 random paths across 162 Planet Lab nodes. Where PAP discovered 15 paths flagged with multiple priorities, 13 of which were further validated through hop-by-hop loss rates measurements.

Functional Specification : When the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective. The implementation stage involves careful planning, investigation of the existing system and it's constraints on implementation, designing of methods to achieve changeover and evaluation of changeover methods.

Designing and implementing PAP. First, background traffic fluctuations can severely affect the end-to-end inference accuracy of router properties. Secondly, probe traffic of a relatively large packet bursts are neither independent nor strong correlated. Most existing inference methods have to assume certain independence or strong correlation models for inference (e.g. back-to-back probe packets). However, as for the relatively large packet bursts sent by PAP, a good mathematical model is needed to determine whether the loss rates difference between two packet types is the consequence of a random effect or being treated really differently. Thirdly, for measuring more than two packet types at the same time, simply determining whether they are treated differently.

To overcome these challenges, PAP takes the following three steps to infer packet forwarding priority inference. First, it sends a relatively large amount of traffic to temporarily saturate the bottleneck traffic class capacity, which gives PAP better resistance against background traffic fluctuations. Secondly, a robust non-parametric method is applied on the ranks instead of pure loss rates. Thirdly, a rank assigned to each packet types are used in a hierarchical clustering method to group them when there are more than two packet types and these schemes can be applied in other Internet measurement applications. The Diagram 4.1.Level 0 Represents the flow of Packets from Source to Destination

Module 1: Network Module : After establishing the network connection the node is connected to the neighboring nodes and is independently deployed in the network area having an authorized port number. The source file is browsed for selected data to be converted into fixed size packets that are send from source to destination. Client server computing or networking in distributed applications that partitions task or work loads between service providers and service requesters. Client and server operate on a separate hardware. A server machine is a highly efficient host that runs on one or more server programs. The resources are shared between client and server and the clients establish the communication session with the server.

Module 2: Packet Forwarding Priority : Packet forwarding prioritization (PFP) in routers is one of the mechanisms commonly available to network operators. PFP can have a significant impact on the accuracy of network measurements, performance of applications and effectiveness of the network. The end-to-end approach of packet forwarding priority inference used to measure the loss rate difference of different packet types and its associated tool, PAP. Which is the first to attempt for best knowledge. This tool can be used by the enterprisers or end users to discover whether their traffic are treated differently by the ISPs according to the contract between them and user. For better scalability and accuracy, packet forwarding and prioritization in routers is used to send large amount of traffic to temporarily force packet drop for acquiring measurements and statistical requirements. A Framework is proposed to enable network clients to measure systems multiclass mechanism and parameters. Thus the basic idea of injecting multi class traffic into the system is used by statistical method to infer scheduling types and parameters based on the output..

Module 3: Packet Reordering : PAP is compared with the inference mechanism through other metrics such as packet reordering this is unable to find many priority paths that were implemented via traffic policing. On the other hand PAP can detect the existence of the mechanisms that induced delay difference among packet types. Instead of packet delay, reordering metric is more robust than delay metric although they both reflect the packet delay difference. The delay variation generated by the non-configured device is large; a packet with a shorted delay with configured device can have a large end-to-end delay at the configured device. Hence, the delay differences between different packets types by a configured device are overwhelmed by the large delay variation of the non-configured device exist along the path.

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