NS3 Project Proposal

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Relevant Paper

The Peak-Hopper: A New End-to-End Retransmission Timer for Reliable Unicast Transport.Find it here

Published in: IEEE INFOCOM 2004

High Level Overview

- RTO should be responsive to upward-going trends in the RTT and less responsive to downward-going trends
- It essentially runs two RTO algorithms in parallel.One algorithm (Short-Term History RTO) monitors the present and short-term history in order to respond to RTT increases. The other algorithm(Long-Term History RTO) simply decays the current value of RTO, and can therefore be said to represent the long-term history

Calculating RTO

$$\delta = \frac{RTT_{sample} - RTT_{previous}}{RTT_{previous}} \quad \text{(Step 1)}$$

$$D = 1 - \frac{1}{F * S} \quad \text{(Step 2)}$$

$$B \leftarrow \max(\delta, D * B) \quad \text{(Step 3)}$$

$$RTT_{\max} = \max(RTT_{sample}, RTT_{previous}) \quad \text{(Step 4)}$$

$$RTO \leftarrow \max(D * RTO, (1 + B) * RTT_{\max}) \quad \text{(Step 5)}$$

$$RTO \leftarrow \max(RTO, RTO_{\min}) \quad \text{(Step 6)}$$

Explanation

1. Having collected a new RTT sample, RTTsample, we compare this value to the previous RTT sample collected, RTTprevious, as shown in Step 1. We call the normalized change between these two samples δ. This is the measure of the short-term changes in RTT.

2. In Step 2, we further define a decay factor, D. D determines how rapidly the RTO is decayed. We also introduce a fader variable, F, which controls the speed of this decay (a high F gives a slow decay and vice versa).

3. In Step 3, we calculate a booster variable B. The booster variable determines how high the RTO should hop when a large RTT increase has been detected.

4. In Step 4, we set RTTmax to the maximum of the new RTT sample, RTTsample, and the previous RTT sample, RTTprevious. RTTmax is used to represent the short-term history of the RTT.

5. In step 5, We set RTO to the maximum of a long-term history (represented by the term D*RTO) and the short-term history (represented by the term ((1+B)*RTTmax).

6. In final step (Step 6), we ensure that the RTO does not fall below the minimum allowed RTO.

Expected Output

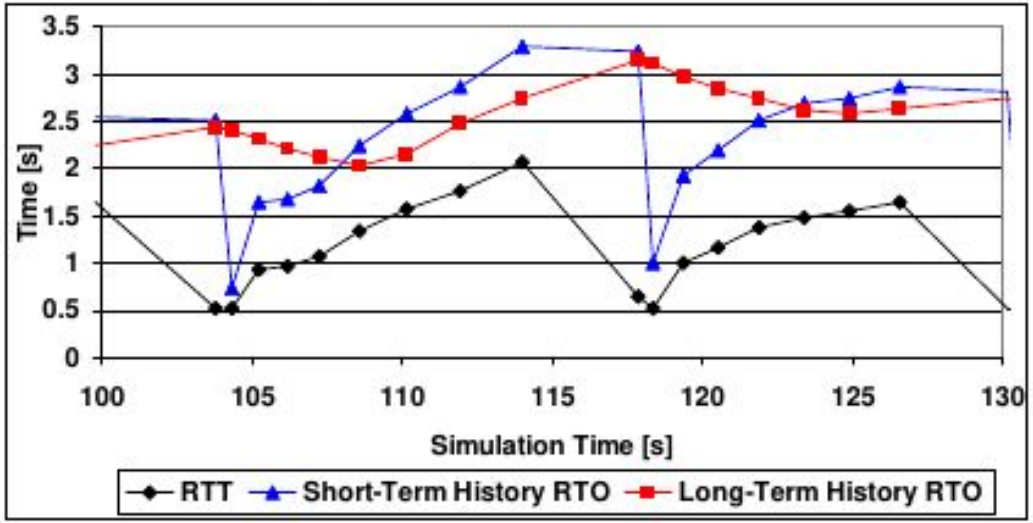

Figure 4. The PH-RTO is calculated as the envelope of the Short- and Long-Term History RTO curves

Thank You