

Delayed Internet Routing Convergence

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1. Summary

This paper focuses on the convergence behavior of BGP and examines the latency in internet path failure. After the failure, the operation of the BGP path selection process on internet backbone routers takes tens of minutes and it causes delays. Due to the period of delayed convergence, end-to-end internet paths experience connection loss, increased packet loss and latency, as a result these problems cause the network performance degradations. The authors provides simulation results which are the addition of the synchronization(using MinRouteAdver) and diffusing update reduce the convergence latency and the number of messages.

2. Pros

This paper is based on the the long term(2 yrs) studies of experiment conducted and the authors point out the unexpected properties of convergence from their experimental results. Moreover, authors examine an upper bound on the convergence time mathematically and provide an example of how BGP convergence works which supports their claims. The authors clearly explain why the convergence delays happen, and they suggest ASPath loop detection to reduce the delays. One of the important contribution of this paper is the changes of the BGP implementation by the vendor could improve the internet convergence latencies.

3. Cons

As the authors point out in the paper, the addition of synchronization, diffusing updates and additional state information make the protocol more complicated and increase router overhead. However, success of the internet is due to the scalability and simplicity of the protocols. Therefore, their suggestion which reduce the convergence delay is not applicable in practice. If the network failure merely occur in practice, the increased complexity of the protocol to reduce the latency is not worthwhile.