Internet service providers face a daunting challenge in provisioning network resources, due to the rapid growth of the Internet and wide fluctuations in the underlying traffic patterns. The ability of dynamic routing to circumvent congested links and improve application performance makes it a valuable traffic engineering tool. However, deployment of load-sensitive routing is hampered by the overheads imposed by link-state update propagation, path selection, and signaling. Under reasonable protocol and computational overheads, traditional approaches to load-sensitive routing of IP traffic are ineffective, and can introduce significant route flapping, since paths are selected based on out-of-date link-state information. Although stability is improved by performing load-sensitive routing at the flow level, flapping still occurs, because most IP flows have a short duration relative to the desired frequency of link-state updates. To address the efficiency and stability challenges of load-sensitive routing, we introduce a new hybrid approach that performs dynamic routing of long-lived flows, while forwarding short-lived flows on static preprovisioned paths. By relating the detection of long-lived flows to the timescale of link-state update messages in the routing protocol, route stability is considerably
improved.

References

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