Paper Evaluation, Central Control Over Distributed Routing

Jiani Jiang <jianij@kth.se>

1. Paper summary

This paper focuses on problems of centralizing routing and takes the flash crowd traffic into consideration. If we use TE to deal with it, it will introduce a large number of tunnels. Using SDN, the comparable cost, scalability, reliability and development problems are challenging. Therefore, this paper introduce Fibbing, a technique that offers direct control over the routers' forwarding information base (FIB) by using fake nodes and links into a distributed link-state routing protocol. To be more specific, Fibbing proceeds in four consecutive stages based on desired forwarding graphs and the IGP topology. It uses the Compilation stage to compile requirements into concrete forwarding DAGs and the Topology Augmentation stage to compute an augmented topology based on these DAGs. Then, the job of next Topology Optimization stage is to optimize the topology and turns the fake information into the networks by the Injection & Monitoring stage.

2. Top 3 contributions

1. The first paper to give a idea that rely on routing protocols to program routers so that Fibbing can adapt the forwarding behavior of may routers at once and allow them to compute forwarding table entries and converge on their own.

2. Make it possible to readily support advanced forwarding applications including traffic engineering and load balancing, traffic steering and fast failover.

3. It can works on existing routers which means it is cost-saving and can utilize the merits of the routers like greater scale and faster convergence.

3. Problems

1. Since Fibbing will use the forwarding DAGs to compute the augmented topology and it only uses the paths information, it can't support finer-grained routing and forwarding policies such as matching on the port numbers.

2. Fibbing use the controller to computes the routing input centrally and the routing output is still computed in a distributed fashion. So it requires the routers computing power as well. And it must be very fast in computing augmented topologies to avoid loops and blackholes upon network failures.