

A proposal of SDN-based virtual network routing for virtual cluster deployment considering network throughput



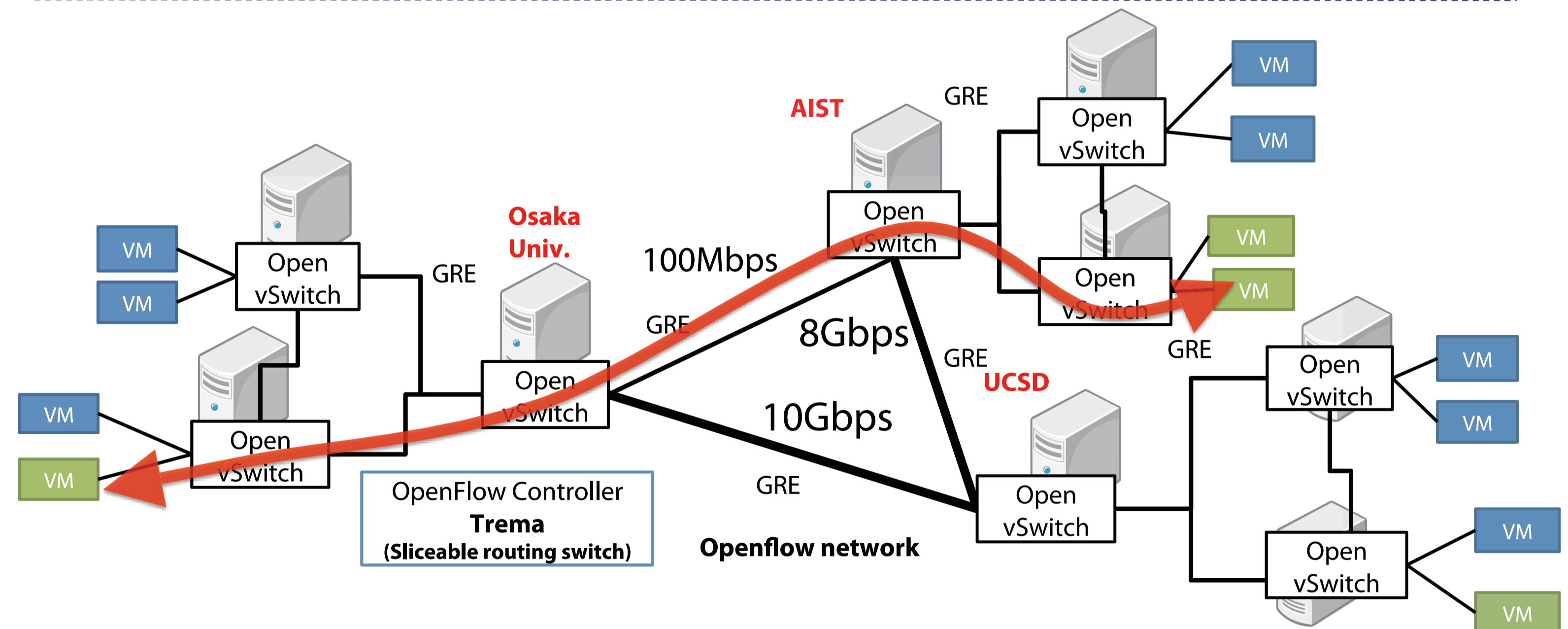
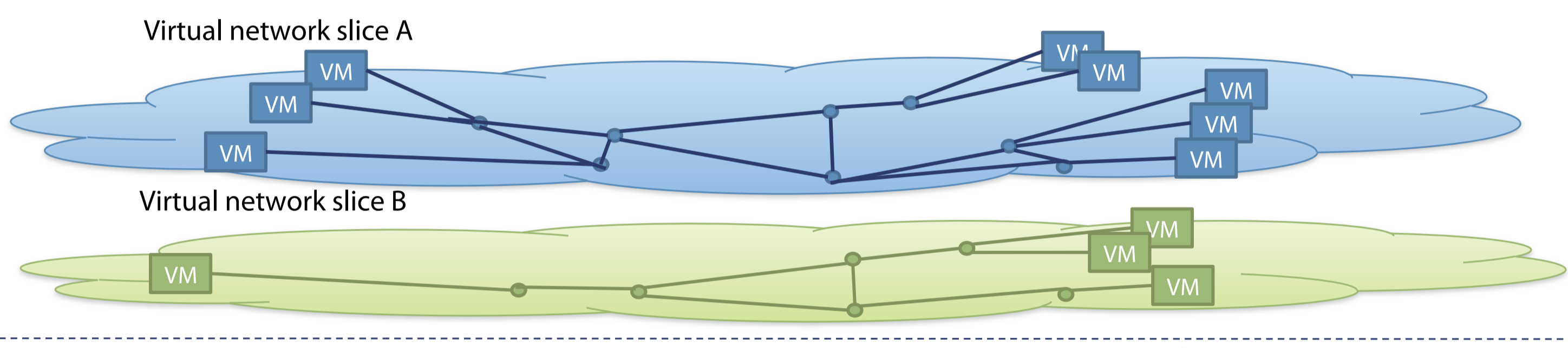
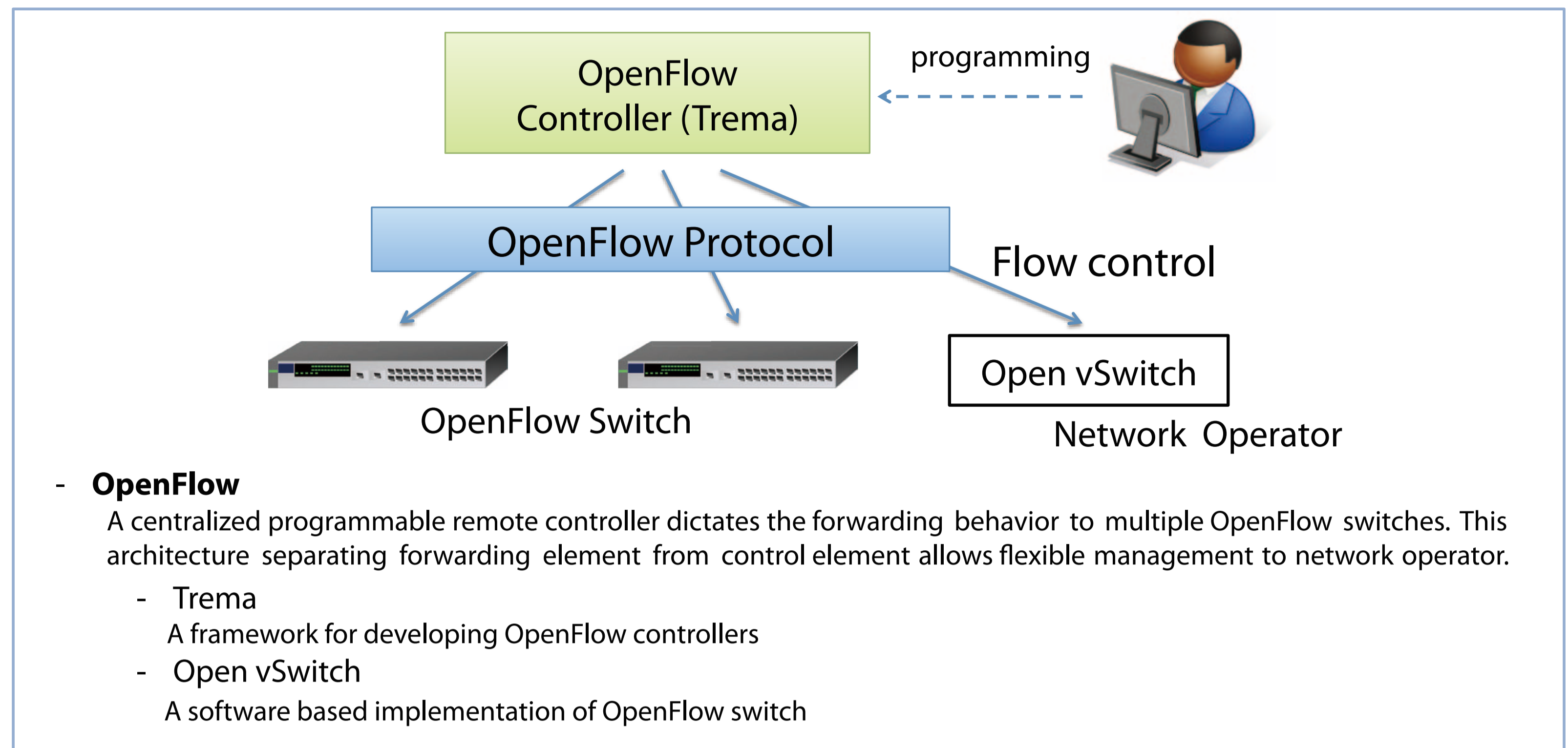
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Background

The recent development of virtualization technology enables us to easily build virtualized computational cluster aggregating computational resources from multiple sites. Network virtualization hiding heterogeneities of physical network resources is a key technology to realizing such a virtual cluster, because each site has its own management policy and network barrier like NAT and Firewall. Several approaches have therefore been proposed previously for network virtualization, such as using VPN and overlay network technologies. We have proved that we can provide multiple virtual network slices for each virtual cluster project through SDN-based virtual network in PRAGMA 22. In addition, we have found that the proposed SDN-based virtual network showed better network throughput than the existing virtual network solutions.

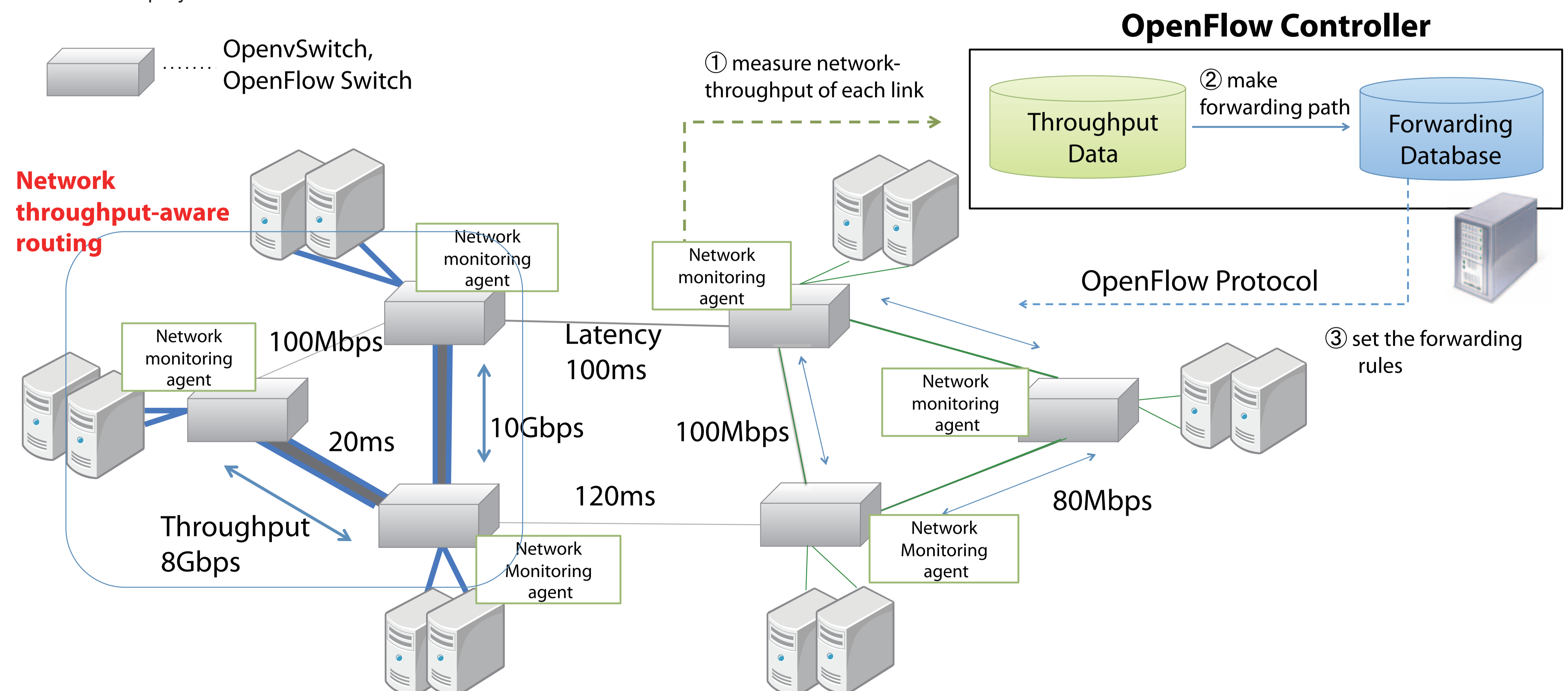
Problem

Although the SDN-based virtual network provide better performance than existing overlay network technologies, our proposed approach is not optimal in terms of wide-area network routing. The prototype method simply makes shortest path routing adapt to the communication among virtual machines in a virtual cluster. However, it does not consider the difference of the network performance of each link, although each network link shows a variety of different throughput and latency in the widely distributed network.



Network throughput-aware routing for virtual clusters

We propose a network throughput-aware routing method on SDN-based virtual network. The basic idea of the method is keeping track of physical network topology and dynamic network parameters, and then allocating appropriate network resources based on the demand of user's application. A virtual cluster for the user is then deployed over the allocated network resources.



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