

# **ACMC: An Architecture for Consistent Multi-Controller Communication in SDN**

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## **Problem:**

Can we achieve a consistent communication between distributed controllers in SDN with less cost and overhead? In flat SDN network, controllers maintain their own domain of switches. For a consistent communication so that each of the controllers can have the required view of the full network, controllers do talk to each other. Our goal is to have a secure, scalable, consistent and synchronized communication with less overhead, less information passing and surely as fast as possible.

## **Solution:**

We propose ACMC, an Architecture for Consistent Multi-controller Communication, which may achieve a secure, fast, consistent communication between controllers with less information passing and overhead. Our novel idea is that we propose separate channel for incoming and outgoing messages, a new module named 'Virtualization' to have secure communication and lastly we are incorporating a very crucial aspect, concurrency control, for consistent global state updating in distributed system of controllers using Lamport Timestamps. Using our architecture, we can easily picture the whole BGP like communication procedure and the primitives needed. Our architecture are easily scalable to large heterogeneous networks too.

## **Implementation Design:**

We are implementing the architecture using Mininet but yet has not been finished. But we are hoping to have a very good performance for this novel architecture. Our architecture will remove many crucial drawbacks that the current controllers have. For our implementation we are having ONOS controllers to create a distributed environment of controllers. We will evaluate the feasibility of our design by measuring the throughput, time to synchronize and extra overheads.

## **Previous Works:**

Jun Bi et al. proposed EWInterface which proposed a very high level communication interface for controllers. Their idea lacked concurrency control and also channel jamming. Fouad Benamrance et al. proposed another architecture that talked about separate channel for incoming and outgoing messages. But they lacked of concurrency control and virtualization details. H. Yin proposed SDNi that can be used to have this kind of communication but lacked virtualization and lacked details.

## **Importance:**

SDN is now a booming sector of networking as they separate control and data plane. As a result, network elements are easy to configure and control. For this support, more and more networks are being added in this environment. While it is growing bigger and bigger, maintaining consistency in these controllers of distributed network becomes challenging and time consuming. Our architecture can have a fast, secure, scalable, reliable and consistent communication, thus reducing the overhead at a large scale.