Lightning Talk

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Motivation

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- Nobody can conjectured the natural disaster. Whether it be earthquake, Flood, Tsunami, Hurricane, or other disasters.
- In these disaster situations, availability of network bandwidth to access important data, transmit crucial information as needed is very necessary.

Infrastructure

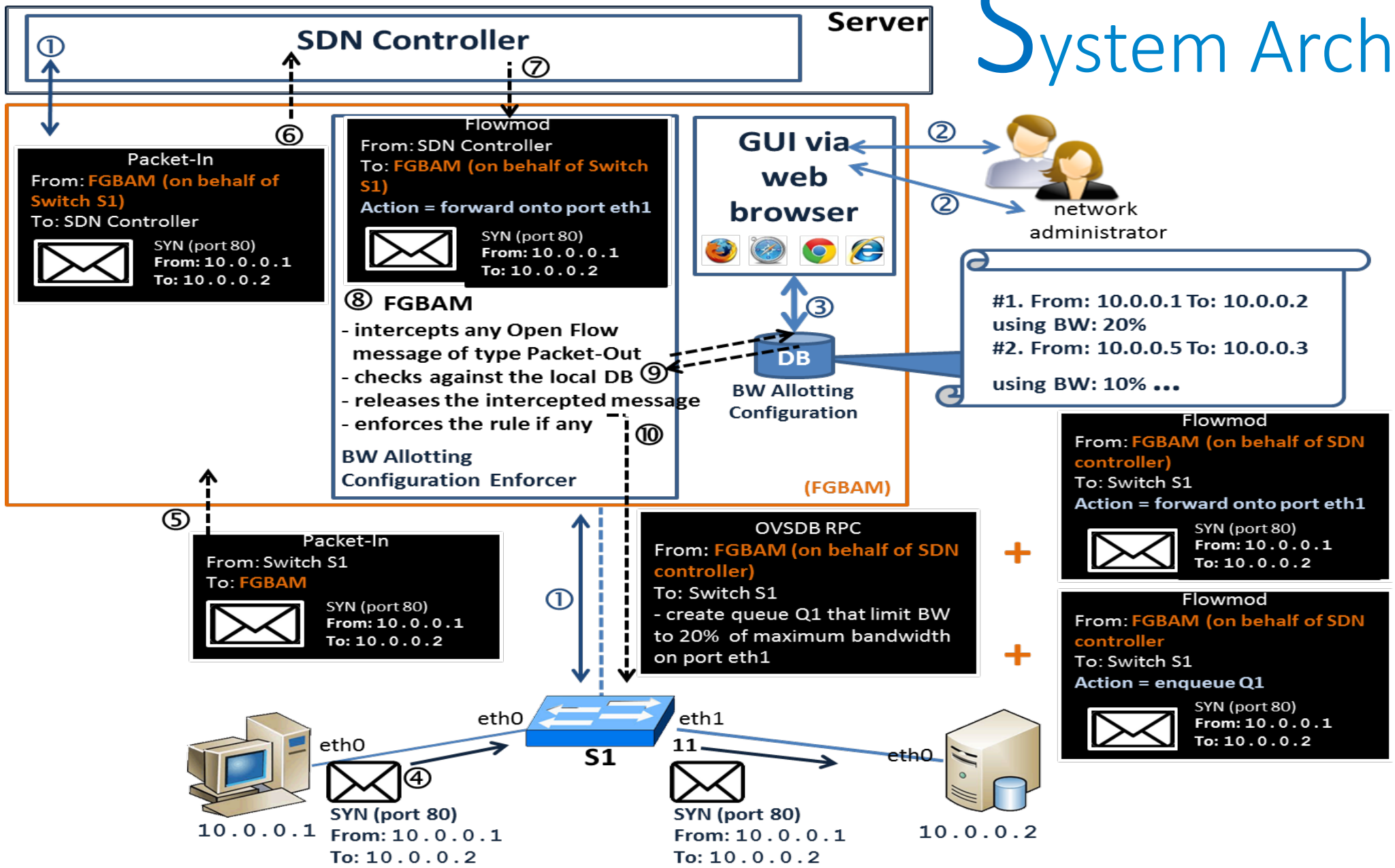
nfrastructure

- Software- defined networks (SDN) are known as a novel infrastructure for controlling and managing network resources from a programmable centralized controller.
- OpenFlow protocol: the communication protocol between switches and SDN controller.

The prototype of Fine-Grained Bandwidth-Allocating Middleware in software-defined networks

"FGBAM"

System Architecture



Advantages

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- Fine-grained bandwidth allocation: FGBAM can divide communication bandwidth of a single port among many data flows.
- Transparent : no changes in implementation of SDN controllers and configuration of network devices are required.
- Universal : Can work with SDN controllers of many kinds and any network topology.

Current Results

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We have tested FGBAM in simulated environments.

- Our results showed that we can actually do fine-grained communication bandwidth allocation in SDN.

Current results : Topology

- Simulated environments using Mininet and virtual machines

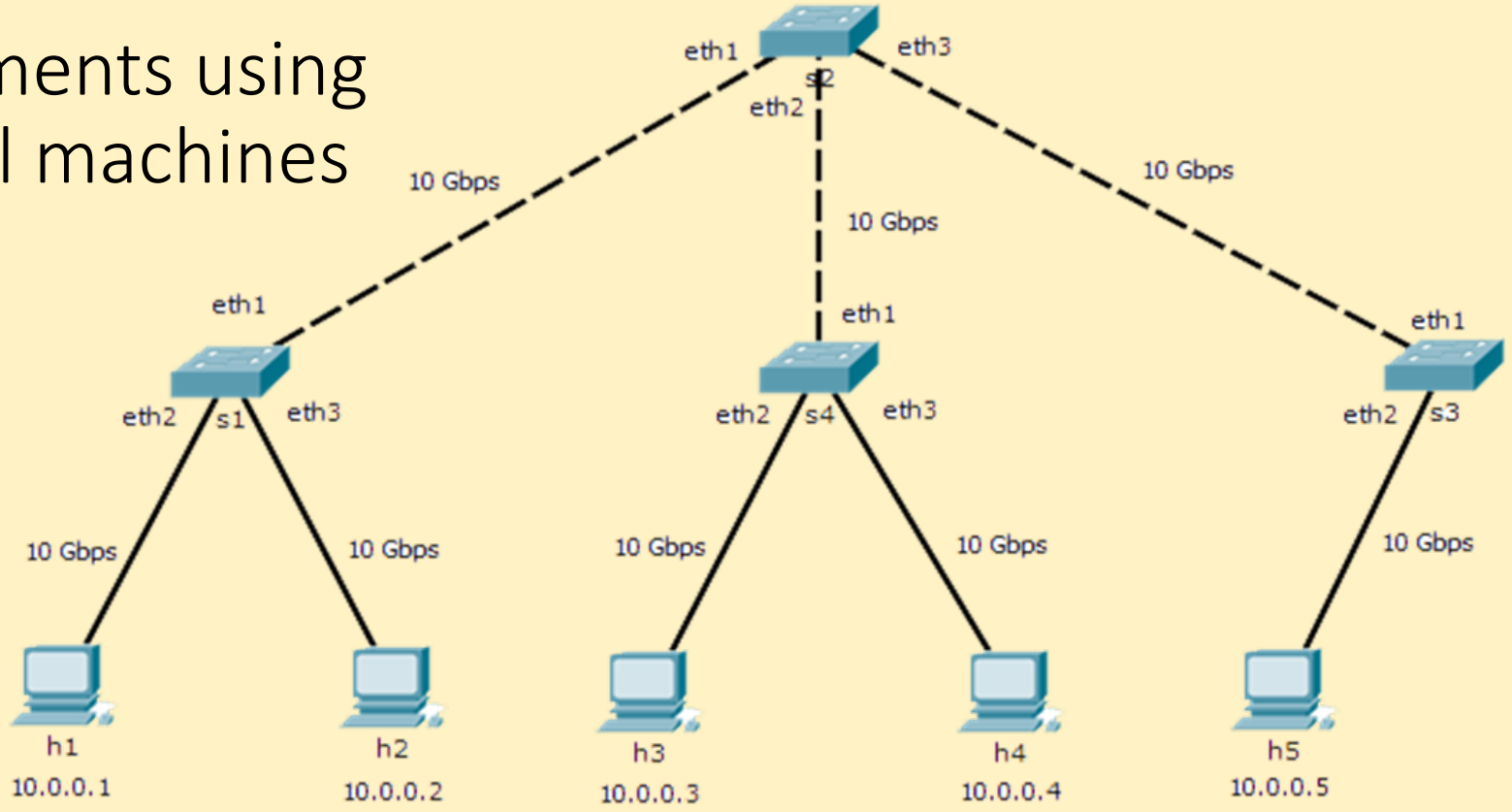

Fig.1 SDN Topology 1 consists of 4 switches and 5 hosts connected together.

Current results

Controller	Source IP	Destination IP	Transport Protocol (TCP/UDP)	Source Port	Destination Port	Bandwidth Allocation Policy		Result
						Port Affected	Limited BW	
POX	10.0.0.1	10.0.0.2	6(TCP)	any	5001	s1-eth3	2 Mbits/sec	1.91 Mbits/sec
	10.0.0.2	10.0.0.1	6(TCP)	any	667	s1-eth2	5 Mbits/sec	4.76 Mbits/sec
	10.0.0.2	10.0.0.3	any	any	any	s1-eth1 ,s2-eth2, s4-eth2	4 Mbits/sec	3.82 Mbits/sec
	10.0.0.2	10.0.0.5	17(UDP)	any	157	s1-eth1 ,s2-eth3, s3-eth2	3 Mbits/sec	2.91 Mbits/sec
	10.0.0.5	10.0.0.4	17(UDP)	any	157	s3-eth1, s2-eth2, s4-eth3	8 Mbits/sec	7.33 Mbits/sec
Beacon	10.0.0.1	10.0.0.2	6(TCP)	any	5001	s1-eth3	2 Mbits/sec	1.91 Mbits/sec
	10.0.0.2	10.0.0.1	6(TCP)	any	667	s1-eth2	5 Mbits/sec	4.75 Mbits/sec
	10.0.0.2	10.0.0.3	any	any	any	s1-eth1 ,s2-eth2, s4-eth2	4 Mbits/sec	3.81 Mbits/sec
	10.0.0.2	10.0.0.5	17(UDP)	any	157	s1-eth1 ,s2-eth3, s3-eth2	3 Mbits/sec	2.91 Mbits/sec
	10.0.0.5	10.0.0.4	17(UDP)	any	157	s3-eth1, s2-eth2, s4-eth3	8 Mbits/sec	7.28 Mbits/sec

Fig.3 The performance of FGBAM when managing communication bandwidth in Topology 1.

“Thank you”