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A Plan of an NICT P4 Testbed

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NICT provides testbed facilities such as JGN, JOSE, RISE, and StarBED to promote research and development of information and communications technology. Recently, a trend to open networking has been accelerating, and many projects have been proposing innovative networking mechanisms utilizing programmable networking capabilities. Especially, data-plane programming with the P4 programing language attracts much attention of researchers and developers because it enables more flexible and stateful packet processing. Thus, we are considering supporting network programmability with P4 in our testbed environments and providing a P4 testbed in the future.

To realize the P4 testbed, we have a stepwise plan. As the first step, we are considering using the P4 behavioral model (bmv2) that works as P4 software switches. Among the NICT testbeds, RISE is an SDN/OpenFlow testbed and it already provides network environments with software switches as well as those with hardware switches. Therefore, we will use this software-based RISE environment and replace the software switches with bmv2 instances to create a P4 testbed environment.

As the second step, we will introduce hardware P4-enabled switches. The challenges we face here is how to achieve multi-tenancy. RISE provides multi-tenancy with hardware switches by using the virtualization (slicing) mechanism implemented in those switches. However, at the time of writing, we have not yet found such equipment that supports both P4 programmability and virtualization.

In the workshop, I will talk about our plan of our P4 testbed, discuss use cases of P4, and look for opportunity for collaboration on the P4 testbed development.

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