SNMP4SDN Proposal

Name

SNMP4SDN (original name: SAL Plugin for Supporting Generic Commodity Ethernet Switch)

Description

Current SDN technology is usually assumed to be based on network infrastructures using OpenFlow switches. Actually, SDN is not limited to OpenFlow, for example OpenDaylight SAL can support multiple southbound protocols. To fulfill the scope of underlying switches supported in OpenDaylight, Ethernet switches should also be considered. Commodity Ethernet switches have the advantage of low price and is programmable to some extent (i.e. using CLI and SNMP to modify the ACL, MAC table, forwarding table, etc). In an SDN built on commodity Ethernet switches, the upper layer applications could be responsible for making all the forwarding decisions for each switch, and the switches execute data plane forwarding as assigned. Therefore, we believe that commodity Ethernet switch has its advantage and warrants a position in SDN technology development. Off-the-shelf commodity Ethernet switches are commonly allowed to be configured by SNMP, and the Ethernet switch can actively report its status to the administrative computer (i.e. OpenDaylight controller) using SNMP trap. Therefore, we propose an SNMP southbound plugin to control underlying devices supporting SNMP using off-the-shelf commodity Ethernet switch. In addition to SNMP support, this plugin will provide capabilities to manage configurations that can only be accessed via CLI, e. g. ACL, disabling flooding, etc., since such configurations are necessary for using Ethernet switches for SDN. Therefore, there will be three phases in this project, as follows. (1) Creating an SNMP SouthBound Plugin: to configure Ethernet switches via SNMP. (2) The plugin configures Ethernet switches via CLI, for settings that SNMP cannot access. (3) SAL extension: for (1) and (2) we will contribute extensions to the SAL configuration APIs to provide additional API to support SNMP and CLI usage as specified above.

The following figure depicts the described components.

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P.S. Slides of our idea for building an SDN upon Ethernet switches can be found here, and this project focuses on the topic of the southbound plugin and extensions to SAL API.

Scope

1. SNMP SouthBound Plugin. (The main purpose of this plugin is to support Ethernet switches as the data plane devices for an SDN. Configurations not currently supported by SNMP on Ethernet switches will be managed via CLI).

2. Extensions to the SAL configuration APIs.

(A table of API is given here.)

Release Plan

Release Plan 2013

Resources Committed (developers committed to working)

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Initial Committers

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Vendor Neutral

No vendor package names in code

No vendor branding present in code or output of build

No vendor branding present in documentation

Meets Board Policy (including IPR)