ONF Configuration and Management WG

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ONF Overview

Open Networking Foundation

• Standardizing OpenFlow-based SDN
• http://opennetworkingfoundation.org

• Working groups

Extensibility

OpenFlow: wire protocol, extensibility, features, … (OF 1.x)

Config-mgmt

Protocol & schema for configuration of a switch (OF-Config 1.x)

Testing-interop

Interoperability tests, plug-fests; performance benchmarking

Hybrid

OpenFlow in legacy networks; hybrid switches, hybrid networks

Architecture

SDN architecture based on OpenFlow

Forwarding Abstractions

Table Typing, Forwarding plane models
Config & Mgmt. WG: Problem statement

- Bootstrap OpenFlow network
  - Switch connects to controller
  - Controller(s) to connect to must be configured at switches

- Allocate resources within switches
  - Ports
  - Queues
  - ...
Reference Model

- Configuration Point
  - Source of switch configuration
  - OpenFlow Capable Switch
    - Hosts one or more logical switches

- OpenFlow Controller
  - OpenFlow Logical Switch
    - Instance of an OpenFlow Switch

**OF-CONFIG** using IETF Netconf & XML data models

OpenFlow Capable Switch

resources (ports, queues)

OpenFlow Controller

OpenFlow

OF Logical Switch

OpenFlow Controller

OpenFlow

OF Logical Switch
OF-CONFIG scope and releases

- **OF-CONFIG 1.0** (Jan 2012) based on OpenFlow 1.2
  - assigning controllers to logical switches
  - retrieving assignment of resources to logical switches
  - configuring some properties of ports and queues

- **OF-CONFIG 1.1** (Apr 2012) based on OpenFlow 1.3
  - added controller certificates and resource type "table"
  - retrieving logical switch capabilities signaled to controller
  - configuring of tunnel endpoints

- **OF-CONFIG 1.1.1** (Aug 2012) based on OpenFlow 1.3.1
  - consolidation of version 1.1, fixing small inconsistencies

- **OF-CONFIG 1.2** (early 2013) based on OpenFlow 1.3.1
  - features still under discussion, candidates include
    - retrieving capable switch capabilities, configuring logical switch capab.
    - assigning resources to logical switches
    - simple topology detection
    - event notification
Use of Netconf and Yang

• Netconf was chosen as management protocol
  • not necessarily accepted as ideal solution
  • still discussing alternatives

• XML schema was chosen as modeling language
  • Yang is also used, but XML is normative
  • normative XML schema generated from Yang code

• So far, the focus has been on configuration
  • bootstrap of an OpenFlow network is the obvious first thing to do

• New work items will be more on OAM
  • incl. event notifications
Call home issue

- In the OF-CONFIG spec the primary scenario is using Netconf with connections initiated by the configuration point.

- However, several members asked for also supporting call home scenarios with switch initiating Netconf connections:
  - switch configured with DHCP
    - receives own address and configuration point's address
    - no need to manually add switch to configuration point's DB
  - OF-CONFIG document states: use BEEP if you need switch-initiated connections
    - now, BEEP is getting "historic"

- Options:
  - drop call home scenario
  - ask IETF to further support call home