Bachelor / Master Thesis –
Monitoring Control System managed with SDN

Short description
Investigate and prototype a control system for IP traffic monitoring of System Under Test (SUT) in a telecom test environment. Today in some test situations, the IP traffic connections between telecom nodes are monitored (tap of traffic, or TAP). The monitored traffic is routed to protocol analyzers. The Monitoring Control System shall be able to remotely control connection points (TAP), mirroring ports in infrastructure switches, traffic aggregators and dedicated switches for monitoring traffic. Preferably SDN technology should be used (Software Defined Network).

Background
There is need for a common and easy way to set up and control SUT (System Under Test) traffic monitoring connections between TAPs (to tap of traffic) and protocol analyzers. The Monitoring Control System shall be used to route the IP traffic via mirroring ports in infrastructure switches, dedicated switches and traffic aggregators for monitoring traffic. It should also be possible to configure and control filtering functionality like filtering on VPN, IP address or bit slicing etc. The system shall be remote controllable and easy to use for a tester that want to set up monitoring of SUT traffic.

Thesis Description
The activity can be divided in several steps.

Step 1 Investigation
- Investigate and evaluate different methods to control the components in an IP Traffic Monitoring System using OpenDaylight
- Identify which network infrastructure components that can/should be part of the Traffic Monitoring System. E.g. infrastructure switches, traffic aggregators, dedicated switches and routers for monitoring traffic etc.
- Investigate and evaluate which network infrastructure components (and brands) that have suitable APIs and protocols for configuration and control.
- Investigate if there are existing solutions that can be of value.

Step 2 Prototype (Can be a separate work item)
- Investigate what is possible to do with existing infrastructure SSR 8000 (Smart Service Router) and Extreme switches, and how it should be configured to be a part of a monitoring network.
- Design and implement a prototype that can set up connection and filter parameters and connect the traffic to a protocol analyzer. The prototype should also provide a suitable and easily maintainable abstraction of the network.
- Test and demonstrate the prototype in a test environment

The work can be extended with more detailed steps depending on interest and time.
Qualifications
This project aims at Master of Science (civilingenjör) students in electrical engineering, computer science, computer engineering or equivalent academic program. Typically skills required:
- Passion for and skill in software development
- Good communications skills in English

The candidate should also have skills on following areas:
- TCP/IP Network knowledge
- Network management: SNMP, XMPP, Netconf, Open Flow, Open Stack etc.
- Software Defined Network (SDN)
- Network switching
- Protocol analyze

Extent
We are looking for one or two students to do a Master Thesis.
Probable scoop is 3 – 6 months
Preferred starting date: Q3-14

Keywords: SDN, Open Flow, OpenDaylight, IP traffic monitoring, Protocol

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