VeRTIGO integration with the OFELIA Control Framework

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Berlin – 29th August, 2013
Presentation outline

• Introduction to VeRTIGO architecture and interfaces

• Integration of VeRTIGO with the OCF. Software modules:
  – The VT-Planner
  – The Expedient Plugin
  – The FOAM driver
VeRTIGO’s main features

VeRTIGO extends FlowVisor by providing the following additional functionalities:

- Virtual links configuration/management
- Extended XMLRPC interface
- Per-port statistics/capabilities database

![FlowVisor’s slice](image1)

![VeRTIGO’s virtual topology](image2)
VeRTIGO Architecture

Key features

• VeRTIGO provide an extended version of the XMLRPC interface that allow the management of virtual links and statistics

• Flows crossing “middle-points” of virtual links are controlled by VeRTIGO
VeRTIGO integration with the OCF
The VT-Planner

• VT-Planner allocates both computational and networking resources in a VeRTIGO-managed island
• VT-Planner is in charge of computing the actual embedding of the virtual network requested by the user onto the substrate network
• VT-Planner embedding algorithm uses free RAM memory of servers and rate of switch ports as metrics
• VT-Planner coordinates the operation of both the FOAM and the VTAM AMs (AM of AMs)
Expedient VT-Planner plugin

- Adds to the OCF GUI the tools to configure VeRTIGO’s virtual topologies
- The experimenter can freely design the virtual topology (including switches, links and virtual machines) without knowing the details of the physical infrastructure
- The plugin sends the request to the VT-Planner which checks the availability of the requested resources and eventually allocates them.
VeRTIGO driver for FOAM

Extends the XMLRPC interface by:

- adding the physical link information in the RSpec returned by the `ListResources` API. This information is used by the VT-Planner to get the physical topology of the network.
- adding the capabilities of switch ports to the RSpec returned by the `ListResources`. Also this information is used by VT-Planner to compute the virtual topology embedding.
- adding the XMLRPC APIs to send the virtual links configurations to VeRTIGO (addLink) and to get port capabilities (getVTPlannerPortInfo)
References

• OFELIA D8.1 - Requirements and specifications for the VeRTIGO modules
• OFELIA D8.4 - Release of software modules: MPLS/QnQ VT slicing, VT planner, VT statistics
• VeRTIGO web site: https://github.com/fp7-ofelia/VeRTIGO