Title: Challenge to realize an Orchestrator-to-Orchestrator Interface using the Control Orchestration Protocol

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Extended Abstracts: The Software Defined Transport Network (SDTN) [1] which applies the Software Defined Networking (SDN) technology to the transport network control method has been emerging as a novel carrier network's architecture in order to manage heterogeneous networks such as different domains, layers, and vendors. In this paper, we propose a scheme that realizes emulated orchestrator-to-orchestrator interface (OOI) using the Control Orchestration Protocol (COP) [2]. The proposed scheme ensures the confidentiality over OOI, in addition to end-to-end paths establishment across multi-carriers.

As a challenging issue towards multi-carrier SDTN, OOI has not been assumed and defined since each orchestrator uses its own interfaces because of security and operation. An orchestrator (referred as A) can recognize another orchestrator (referred B) as one of the SDN controllers, connecting orchestrator A’s SBI to orchestrator B’s NBI. Orchestrator A can transmit the information (e.g. topology, reachability, etc.) to orchestrator B as same as an SDN controller. By connecting one orchestrator’s SBI/NBI to another orchestrator's NBI/SBI mutually, peer-to-peer OOI can be emulated. As for the confidentiality, each orchestrator can output partial information through NBI to share only public information with other orchestrators. According to the unification of orchestrator's SBI/NBI protocols for the connectivity, it is also necessary to unify the SDN controller's NBI protocol, although SDN controller uses own specific protocol. We use COP for OOI and NBI of SDN controllers, since the latest northbound application programming interface (API) of SDN controller is designed towards COP objectives.

The contributions of this paper are the followings; i) Definition of the connection between orchestrators as an emulated peer-to-peer, ii) Implementation of OOI and NBI of SDN Controllers with COP, iii) Conversion of the output information via OOI for the confidentiality. According to the above contributions, we verify the feasibility of the multi-carrier SDTN establishing end-to-end paths across multi-orchestrators.


Figure1. SDTN architecture and communication between orchestrators/orchestrator and SDN controller with COP