SDN Problem Statement and Use Cases for Data Center Applications

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Problem

• In data center environment, the operation at application-level does not have the knowledge of the underlying network condition:
  – Make network provisioning complex
  – Difficult to expand intra/inter-data-center services

• Many are developing proprietary solutions
  – This area involves the interoperability between applications, storage servers and networking routers/switches
  – Need to have a standardized protocol
Physical Network Virtualization, Programmability and Monitoring

Logical Networks (VM’s, Applications)

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Physical Networks

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User Case #1: VM Migration: traditional model (Dedicated network devices, and manual configuration)
User Case #1 (cont.): Manage via network virtualization
(A software solution by constructing L2 over L3, but no awareness on the underlying network links)
User Case #1 (cont.): Manage via SDN Controller
(Support network virtualization by interfacing with the underlying physical network, and leveraging existing techniques to provide provisioning, VPN and SLA support)
User Case #2 (cont.): Application-to-Network VPN Mapping

Application VPN (with various connectivity and SLA requirements)

Network VPN infrastructure (TE, SPB, PBB, EVPN, OpenFlow...)

Mapping of application connectivity to network VPN

VPN

MPLS Network

SDN Controller

VM

App1

App2

Data Centers

VLAN

Switch