DCN Project 4 Proposal

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Introduction

The purpose of this project is to implement multi-tenancy in data center network architecture.
A tenant is a group of users who share a common access with specific privileges to the software instance. With a multitenant architecture, a software application is designed to provide every tenant a dedicated share of the instance.

Design

When a switch doesn't know how to deal with a packet, it will trigger a packet-in event, and the packet will be pass to the controller. The controller will analyze the packet source and destination address, learn the mac-to-port table, and add a flow for the source and destination pair. Next time when a packet with the same source and destination pair comes in, the switch can directly forward the packet to the right port without bothering the controller.
In multi-tenancy architecture, communication between hosts which are in different tenants should be blocked. In order to do so, I decide to add an analyzer in the controller. When receiving a packet, the analyzer will check the source and destination address of the packet if they are in the same tenant. If so, the packet will be properly handled with the process mentioned above. Otherwise, the packet will be dropped and the flow won't be added into the flow table, hence, the two hosts in different tenants won't be able to communicate to each other.

Benefits of Multi-tenancy in Data Center (MTDC)

1. Flexibility – Using MTDC infrastructure enables small and medium-sized businesses to take advantage of advanced technologies.
2. Reliability – MTDCs typically provide their own technicians to maintain the infrastructure and ensure that hosted functions always operate at peak efficiency.
3. Savings – MTDC tenants can secure significant OpEx and CapEx savings by choosing to outsource data center services.
4. Reduced Latency – With an MTDC, Enterprise organizations can significantly reduce latency.

5. Security – Regarding security, MTDCs offer multiple levels of protection against external threats, and can provide faster, more thorough recovery from disaster situations.