Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Spring Term 2017

ADVANCED COMPUTER NETWORKS
Assignment 4: Datacenter routing

Assigned on: **16 March 2017**
Due by: **23 March 2017**

Question 1:

Why does just connecting tens of thousands of servers in a data center with a traditional Ethernet domain (MAC addressing, spanning tree, ARP) not work?

Question 2:

Explain what TRILL is, and what problem it solves.

Question 3:

a) What is a VLAN? What problem does it solve?

b) What problems does having a large number of VLANs in a data center cause?

Question 4:

a) In a VL2 data center, explain the steps involved in one machine sending traffic to another.

b) What is the concept of IP anycast, and how does VL2 use it for load balancing? (Read through section 4.2.2 in the VL2 paper: http://ccr.sigcomm.org/online/files/p51.pdf)

Question 5:

a) What is ECMP? What problem does it solve?

b) Why does ECMP not do packet-level randomization?

Question 6:

Consider two flows with the below characteristics:

- Flow A: source address S, destination address D, source port s, destination port d_1, protocol TCP
- Flow B: source address S, destination address D, source port s, destination port d_2 ($d_2 \neq d_1$), protocol TCP

With ECMP, do they take the same path through the network or different paths?