Openflow and Clos

1) OpenFlow v1.0 defines a format for flow table entries, shown in figure 2.
   i) Describe how these entries are used to direct traffic in a network with the help of an example.
   ii) Discuss the limitations that this format may pose and suggest how these limitations may be addressed.

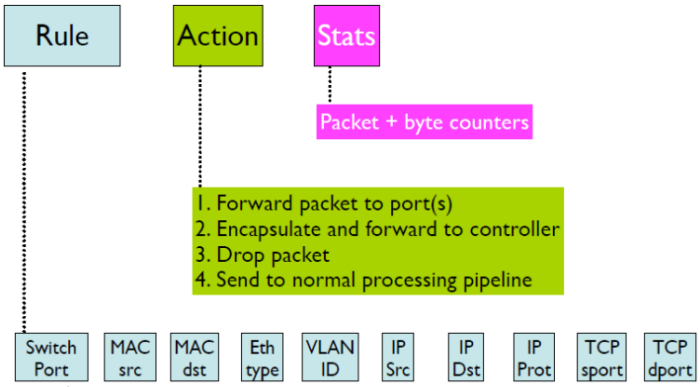

Figure 1: OpenFlow Flow Table Entry

2) Search for the types of OpenFlow messages and describe the exchange of messages between the controller and the routers in assignment 2 if they would be using OpenFlow.

3) Discuss the architecture for Software-Defined Networking (SDN) and how OpenFlow and Nypervisiors fit into this architecture to enable Software-Defined Networking.

4) Explain the advantages and disadvantages of a data centre where the hardware of the data centre may consist of 512 racks using a fat-tree topology in comparison to a traditional 4-post router approach.

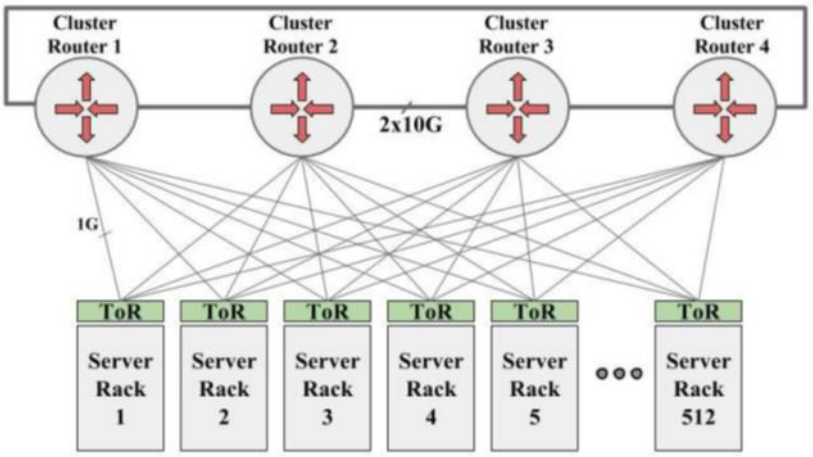

Figure 2: Data centre scenario with 512 racks and 4 routers*

5) Discuss the main difference between the traditional solution used by Google in their infrastructure in 2004 against the solution used in their Jupiter infrastructure.

6) Given the structure for a cluster in Google's Jupiter Architecture, discuss where you could introduce OpenFlow and what results the use of OpenFlow you would expect.

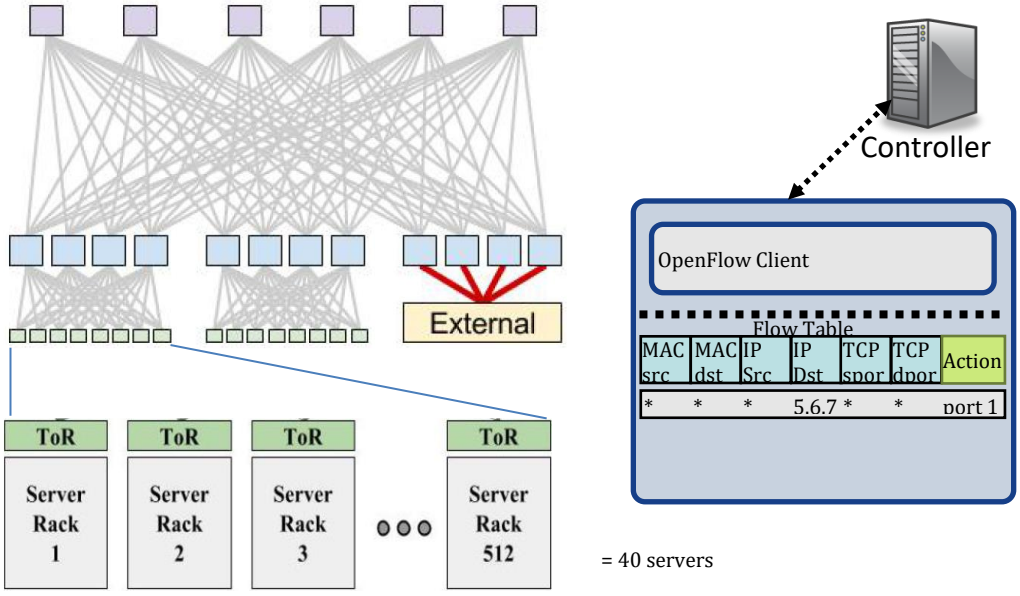

Figure 3: Cluster Architecture