A Proposed Architecture for Placement of Cloud Data Centre in Software Defined Network Environment

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Abstract: Emerging technologies like IoT (Internet of Things) and wearable devices like Smart Glass, Smart watch, Smart Bracelet and Smart Plaster produce delay sensitive traffic. Cloud computing services are emerging as supportive technologies by providing resources. Most services like IoT require minimum delay which is still an area of research. This paper is an effort towards the minimization of delay in delivering cloud traffic, by geographically localizing the cloud traffic through establishment of Cloud mini data centers. The anticipated architecture suggests a software defined network supported mini data centers connected together. The paper also suggests the use of segment routing for stitching the transport paths between data centers through Software defined Network Controllers.

Keywords: Cloud Computing, Software Defined Network, Traffic Engineering, Segment Routing, Latency, Data Center, Traffic Optimization, Mini Data centers.

I. INTRODUCTION

A. Cloud Computing

Today, cloud computing has achieved its maturity. Cloud Computing is a service model that provide services to various types of customers, through network, independent of geographical locations of Cloud Service providers and cloud users. Cloud computing provides on demand services with shared pool of resources. Through Cloud Computing the vendors are providing services related to software, infrastructure and platform. The trend in the market shows a major shift towards cloud computing adoption as it cut down the cost of owing resources. The enterprises need not to worry about the maintenance. Besides this cloud computing carries many other advantages such as dynamic resource allocation, elasticity, scalability and pay per use. Cloud Computing is available in various modes like public Cloud, Private Cloud and Hybrid Cloud. Public Cloud provides services through public internet.

The services are either free or pay per usage. Examples of Public Cloud are Amazon Elastic Compute Cloud (EC2), Google App Engine. The private Cloud provides proprietary hosted services. The services of Private Cloud are limited to single organization's need. Examples include Amazon wen Services, Sales force Services. The third category i.e. hybrid cloud carry advantages of public as well as private cloud. It delivers the private cloud's high-security features, along with the fast connection and easy-to-access features of the public cloud.

B. Data Center Networking

Enormous scope Data Centers structure the center foundation support for the always growing cloud based Services. In this manner the exhibition and reliability attributes of Data Centers will fundamentally affect the versatility of these Services. Specifically, the Data Center network should be deft and reconfigurable to react rapidly to truly changing application requests and Service necessities. An examination of Data center topologies has been performed and these topologies were compared on the criteria. Data centers have Top of Rack (ToR) switches and these switches are interconnected to End of rack(EoR) switches which are associated by means of core switches. This methodology prompts critical transmission capacity oversubscription on the connections in the organization center, and incited a few scientists to propose substitute methodologies for flexible savvy network models. Cloud Data Centers today pack a great deal of computational force. For example, Amazon Data Center houses somewhere in the range of 50,000 and 80,000 servers with force utilization that is around 30-25 megawatts. These Data Centers consume space which is generally similar to a football field on the off chance that we mull over the all-out space involved by the computational assets themselves, the cooling region, and these sorts of things. Data Centers are accordingly giving scalable computing resources, for huge web scale Services. These Data Centers will in general be situated in topographically scattered regions. Frequently, they might be in distant regions for advancing on conditions like energy utilization and ensuring that we get monetary force. Those are a portion of the issues in the area of Data Centers. In the event that we look inside a Data Center, the network is one of the fundamental parts of the Data Center and these network fabrics associates the entirety of the servers that are inside a Data Center, and it additionally gives availability to the customers that are over here through the web.