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IMPROVING THE PERFORMANCE OF FOG COMPUTING BY USING FOG TERMINAL NODES

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ABSTRACT

Cloud Computing is a variety of services provider through the Internet. The resources include tools and applications such as servers, data storage, database, and networking. With the high-speed increment in the quantity of web associated gadgets, the increasing request of real time and low latency systems is challenging to be normal cloud computing structure. As such, cloud computing demands on our irreplaceable dependency on cloud data centers (DCs) are always running with tons of energy and exhaust huge amounts of carbon dioxide gas (CO_2).In this model, we evaluate the relevance of proposed model Fog Computing to the request of latency-sensitive demands in the surroundings of Internet of things. The proposed model is statistical characterized by the Fog Computing System with regard to service latency, emission of CO2, cost, and power-consumption.

***Keywords:* Cloud Computing, CO_2-emission, Fog computing, Internet of Things (IoT), Power Consumption, Service Latency.**

1. INTRODUCTION

Cloud Computing have obtained common attention required its versatility across a wide range of area. Cloud computing structures depend heavily on Data Centric Networks (DCNs), considered to be single, computational and storing monopolies. For latest cloud related structures, all resources service requests are analyzed and processed in DCs. IoT technology relies on Cloud Computing. Information from Internet-attached gadgets is massive and demanding to process in cloud data centers. Many of the IoT Infrastructures, such as smart driving and grids, car parking order, Smart vehicle traffic management systems, offer real-time, low latency services. Traditional cloud computing only enables greater storage, computation and data processing on data centers, the heavy information traffic from IoT gadgets is a massive grid bottle neck, and incurs high latency. In addition, DCs must walk around the clock to proceed, deliver huge amount of request, resulting in enormous power consumption, huge emission of CO_2.In this effort, we examine the relevance of old computing model - Fog Computing to reach the demands of real time, service latency application in Internet of things. Fog Computing, a term stamped by Cisco in the year 2012, is the distributed Computing model that authorize the Network instruments with variant hierarchies of different computing, storage capabilities. The idea is to meet the demands of real time, low latency-services (ex., smart parking, live recording, traffic monitoring etc.) through Fog Computing equipment, attached workstations and small scale storage units.

2. RELATED WORK

2.1 IoT

Researchers has initiated the idea of Internet of things which connect millions of devices over the internet and allow machines to machines communications on the devices. Therefore, the IoT structure is dynamical platform for computing, storage and management. IoT performance relies heavily on platforms of Cloud to deliver millions of tools and its services in the real world.

2.2 Cloud Computing

This entire virtualization process of Cloud service involves severe cloud disease spread across multiple specialized graphical places. The cloud systems are Data Centric and service that provides one or more DCNs, for each user-request. In Solving the model and optimal placing problem for DCs in terms of QoS, latency of services and efficiency of cost. The process is extremely affected by capacity of DC Networks. It also depends, as the number of latency-sensitive apps increases, delivery of service capacity decreases significantly.

2.3 Fog Computing

The latest trend in data space, speed, diversity and draw backs of Cloud Computing makes easy to develop new methods of storage management and governance. In this paper, Cisco has developed a revolt concept of Fog Computing. It can be described as distributed computing structure, can operate millions of devices which are connected to Internet. Edge computing is the main principle of this technology, in which services hosted on edge devices, including routers, access points and gateways. The author defines the characteristics in terms of mobility, perception of places, geographical distribution, latency, versatility, and predominantly accessing wireless devices. However, most of works are centered through the theme associated with Fog computing. According to author the programming model was developed to support mobile Fog Computing through large scale IoT connections. This model support delivery of services for geographically dispersed, latency sensitive applies.

3. EXISTING SYSTEM

As now a days the raid increase in the number of internet connected devices, so it proves to be traditional Cloud Computing framework with the need for the real time, low latency services. Also, Cloud Computing demands are always running on our irreparable dependency on cloud DCs, which exhaust massive amounts of CO_2 gas and tons of energy. This is a great time to access the cloud. Both time and energy increase through this system.

4. PROPOSED SYSTEM

The proposed model Fog computing is to reach user demands like latency-sensitive application in internet of things. The development of the model is carried out by statistically characterizing Fog Computing network by assessing its performance in a climate demanding CO_2 emissions, cost, service latency, power consumption and the real-time service of a large number of Internet-connected devices. Not only does this model reduce both time and cost, we can also reduce emissions of large amounts of CO_2 gas. Users can access files and provides services at the Edge.

4.1 FOG COMPUTING ARCHITECTURE

Fog Computing is a supporting platform for IoT. Architecture of Fog Computing describes how to reduce cost of fog computing. Services provided with low power consumption and low latency. It also reduces CO_2 gas emissions.

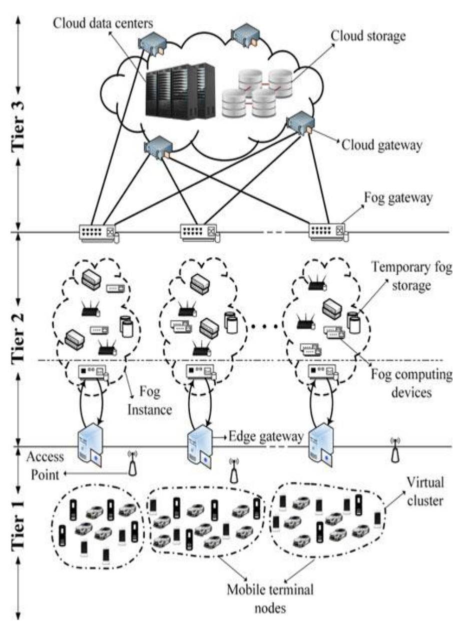

Fig.1. Fog computing architecture

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4.2 SYSTEM OUTLINE

This subsection describes the general fog computing architecture of different levels. Fig.1 shows 3-tiered structure of fog Computing discussed below.

(a) Level 1. This is the structure of the bottom-most range. There are many Terminal Nodes consisting with smart and wireless sensor nodes, absorbs different real parameters and transfer to the next level.

(b) Level 2 is known as fog computing layer. Basic elements i.e., gateways, switches, access points and routers capable of computing, routing, packet forwarding and data storage.

(c) Level 3. The top is usually called a cloud computing level. Many high-end servers and DCs are compressed.

4.3 SYSTEM DESIGN

Edge Computing is the working principle of fog computing. As mentioned above, the IoT is one of the bottom-up hierarchical components with smart Internet-connected TNs. TN's form location-based logical groups, called Virtual Clusters (VCs), form an edge virtual private network which transfers information to different fog instances. The mobility of the Terminal Nodes makes the mapping of TN's flexible and stable for the Fog Instances. Intermediate fog devices are used to transfer the data to upper levels. Fog devices have a variety of networking elements like switches, routers, access points, gateways.

The model is divided into two parts,

1. Fog Abstraction Layer (FAL)

2. Fog Orchestration Layer (FOL)

While the fog sources managed by formers, it enables virtualization and protects tenant privacy, while latter looks at specific fog features. The FOL acts as software agent, and it responsibility for routing of distributed database and applies request for fog, scalability and fault tolerance, monitoring the state of the device.

5 RESULTS

Fig 1: cloud server started

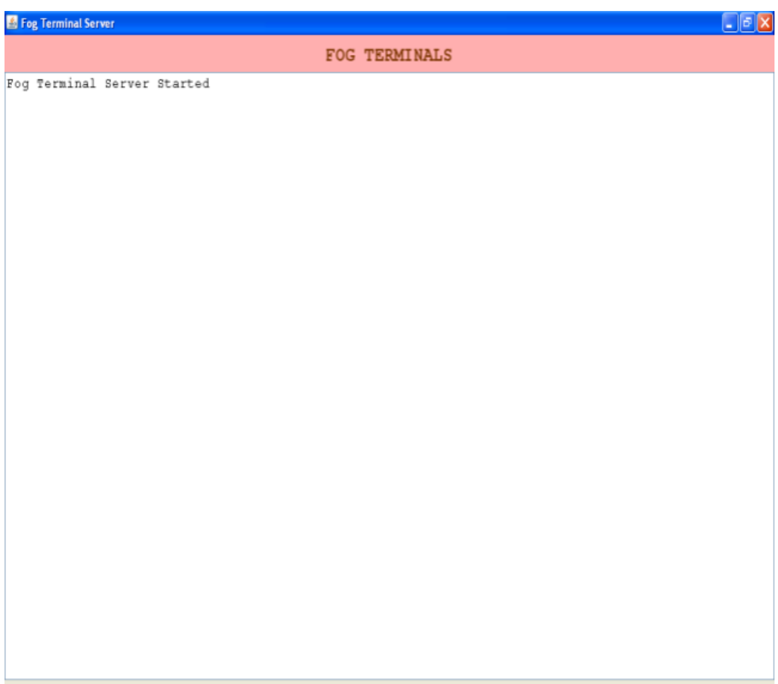

Fig 2 : Fog Terminal server started

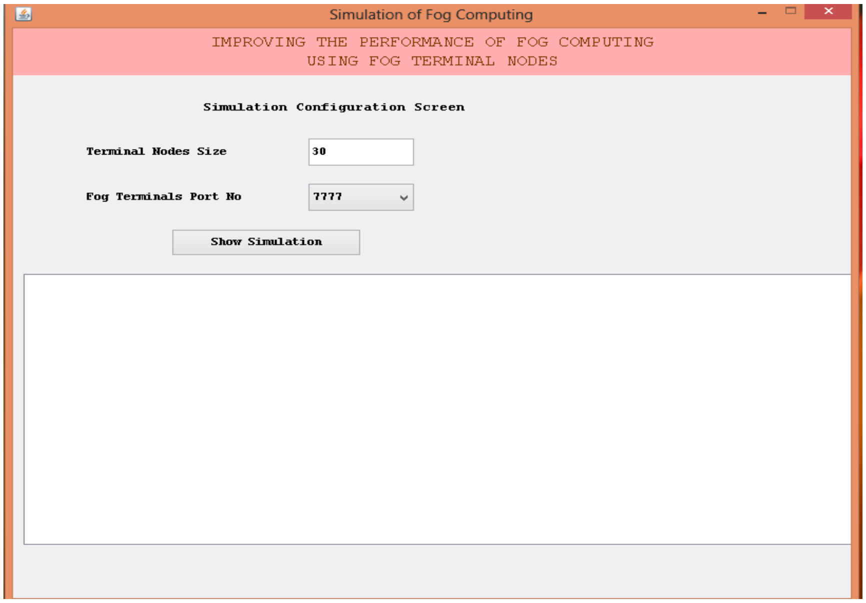

Fig 3 : Simulation Configuration screen

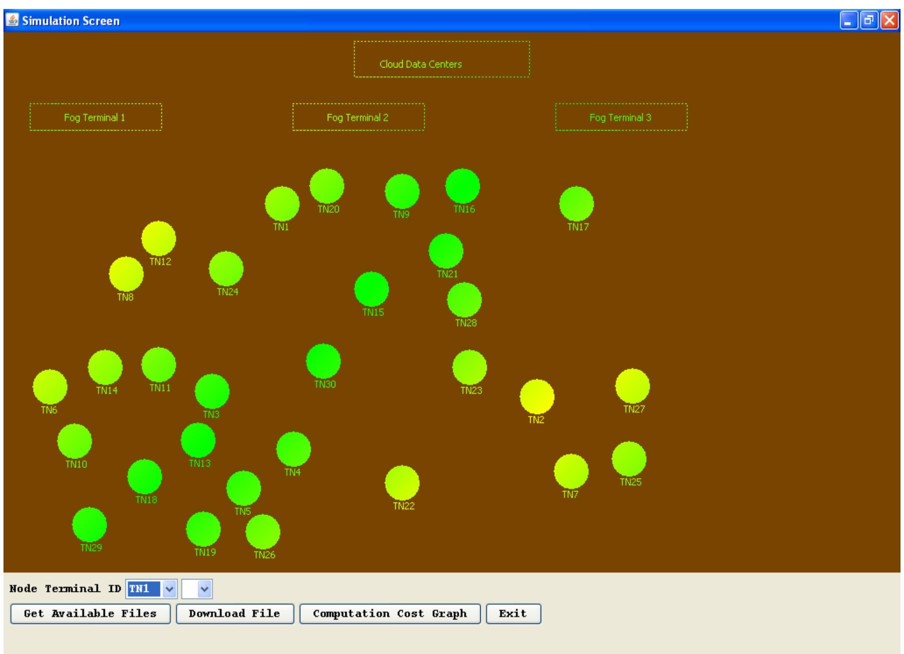

Fig 4 : Get Available files

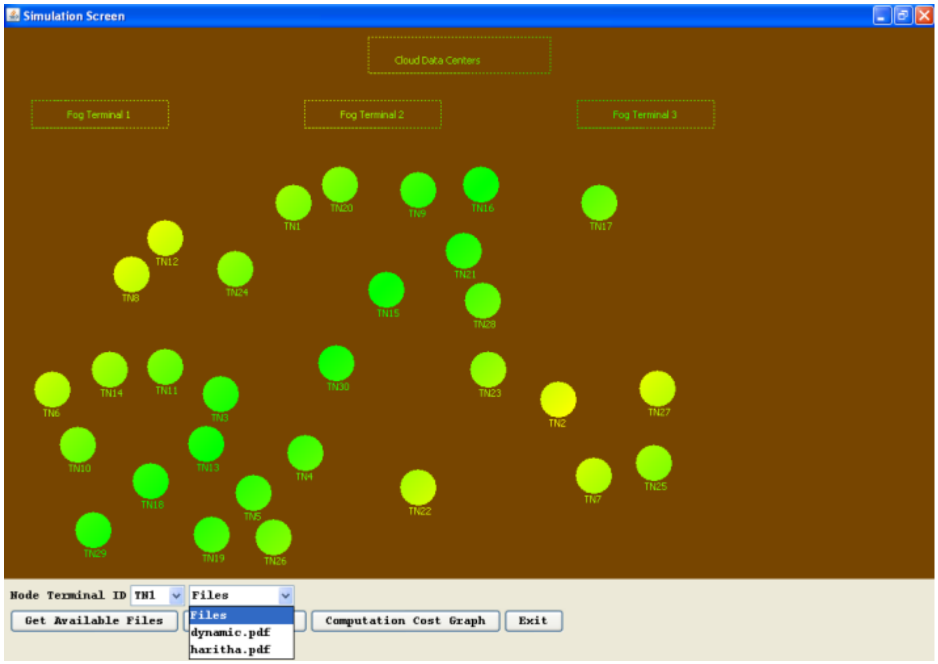

Fig 5 : Select any file

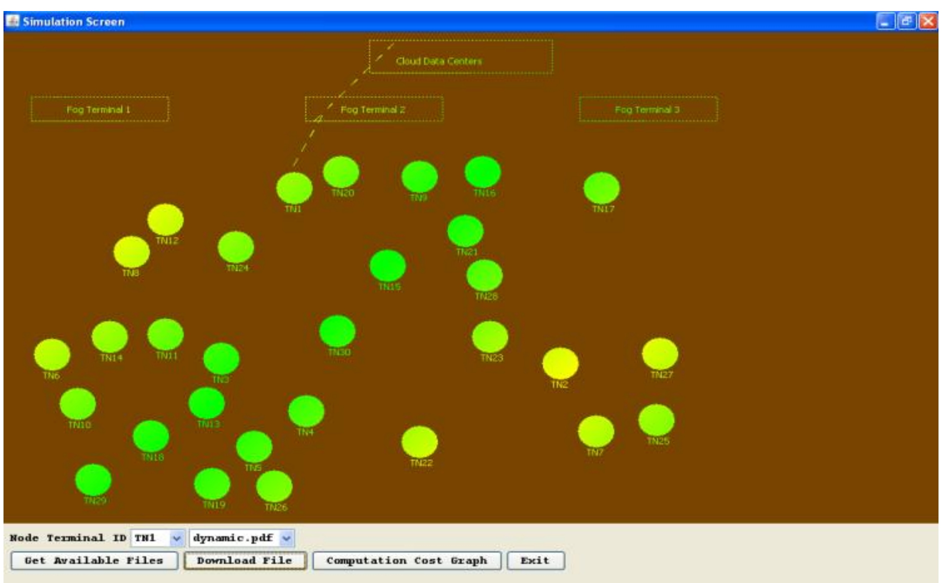

Fig 6: Getting file from Cloud Server

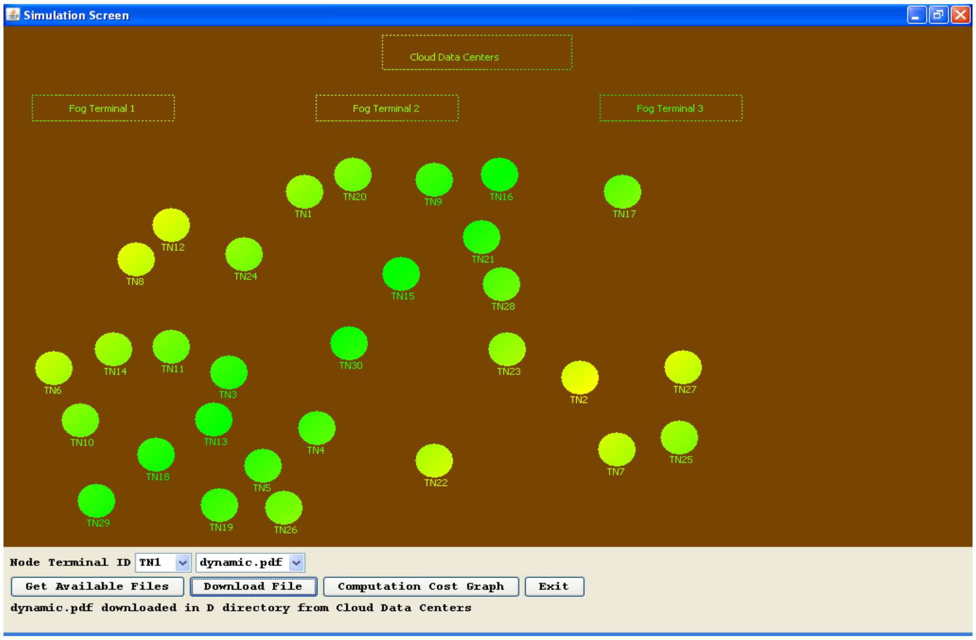

Fig 7: File Downloaded from Cloud Server

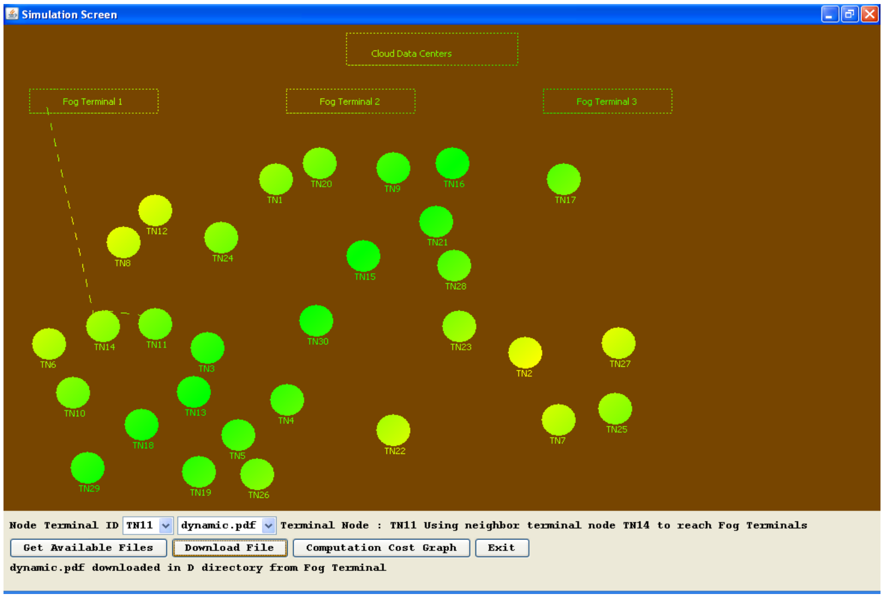

Fig 8 : File Downloaded from Fog Terminal without Interfere from Cloud Server

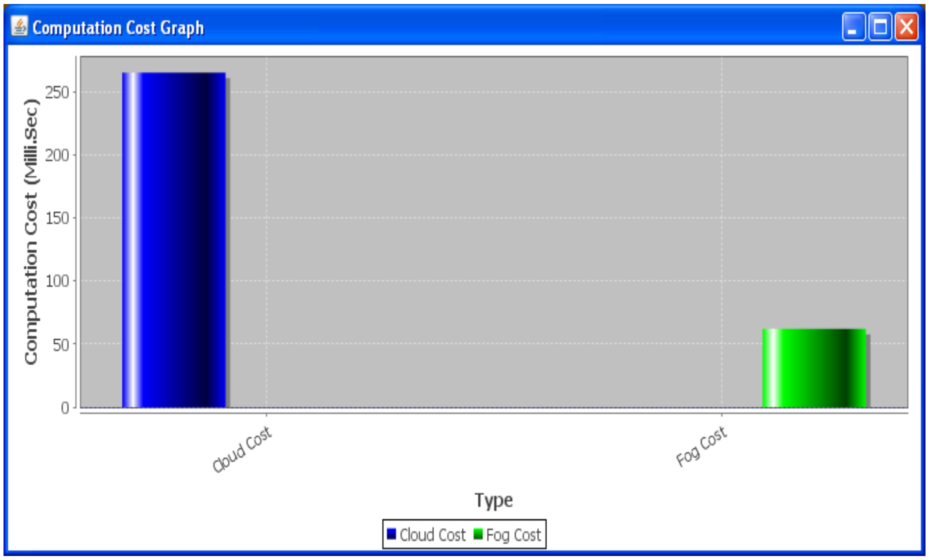

Fig 9: Computation Graph From Cloud and Fog

6. CONCLUSION

The main focus of the model is to examining the relevance of Fog Computing within the framework of IoT. In this propose system we develop a statistical prototype for fog computing, to evaluate performance of IoT applications, where it meets the critical requirements of implements sensitive applications with latency. It demonstrates the performance and evaluates real time services. The experiment shows better performance over QoS and eco-friendliness. We can finally justify the fog model as a better computing platform and it supports IoT. As a Future work, develop Fog Computing prototype that works on real-time implementations.

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