International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878 (Online), Volume-7, Issue-6, March 2019

A Study of Hybrid Cloud in Big Data using Fog Computing

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Abstract: ***The hybrid cloud getting emerged in recent times because of efficiency and cost-effective measures. Private and Public clouds are connected with good resilience architecture to increase productivity and secondary sales in the according to the market demands. API's place an inevitable role, and it makes the hybrid clouds without any fragile in the connections. Nowadays the Hybrid clouds have some technologies are, Fog computing, Mist computing and Edge computing sitting in the client region and to make the aggregation towards the receiving data from the client and the same is sent back to the cloud to have high performance with a great result without any starvation. The objective of the work is to analyze the performance and cost-effective features of the hybrid. The methodologies applied here are Datafication and Data Philanthropy. The result of the work brings the pierce of work going for performance and cost factors are calculated through techniques, models, architectures, and over a period of years. Safety and security measures are needed all the way to ensures stronghold between the clouds of hybrid. The big data can be safeguarded through the private cloud and the operations are easy via the public cloud is the total study throughout the analyses of the work.***

Index Terms: Hybrid Cloud, Fog Computing, Edge Computing, Data Philanthropy, Datafication, Big data

I. INTRODUCTION

Cloud Computing is an archetype to makes computer system resources, peculiarly storage and computing power is available on-demand services to manage the users. It can provide immediate access to hardware resources. The cloud storage can store the file on the web and the file is distributed across remote servers and it can access through the internet. Hybrid cloud environments literally using big data to enables an enterprise to deploy on-demand services with their premises an private cloud to host critical workloads. For an less critical resources can host their resources by using a third- party public cloud provider. In an service management it can monitor cloud based services to help with workload deployment , capacity planning and ensure their availability and performance requirements. Hybrid cloud can provide on-premise infrastructure to the public cloud to handle any overflow without giving the access of third-party data centre.Fog computing literally reduces the job of cloud and increases the performance of cloud storage. In the area of fog computing, data mining techniques are implemented to get the aggregation of data or the summary of data. Every time sending enormous data to the cloud find it is difficult to do work and the response time will increase and ultimately the starvation of the client will increase more. To avoid such a type of situation, nowadays the fog computing playing as an interface role and reduces the work of cloud. The aggregation of data will be very precise in nature and giving low intensity for the cloud to work very faster manner. Here the performance of the cloud will increase and at the same time, the starvation for the client will be reduced.In Big data they have used some categories to provide privacy for the data preservation. They are said to be as an Data philanthropy and Datafication. Big data storage is designed specially to store,manage and retrieve massive amounts of data. In the application of cloud platform network mapping methodology was implemented and saves the operational cost [1].Data Philanthropy is a form of collaboration in which public sector can spark innovation with new lines of research and it can help to solve the problem and it cannot address by data existing sources. For generating the data the data provider can shares the data with public serving analyst including anonymization andFor key considerations they can process large amount of data and it is related to scalability and distribution of data etc.., Internet of things provide a hybrid selective -any fit genetic algorithm and subset sum heuristic for mutation to optimize usage cost for cloud resource [9].In the application of cloud platform, the cloud merging method was implemented and reporting the rotated point clouds to the other point [10].For the application of cloud data centres the NEPHELE method was implemented and develop scalable optimal network [11]. The communication of multi cell or multiple channels the C-RAN method has been used to increase total capacity of the system [12]. The application of electrical system the source server selection and destination server algorithm can be used to save electric power in cloud data centre [13]. In virtualization data centre the Maintenance and Electricity Cost Data Centre(MECDC) to target load balancing [14]. The application of community networks the IaaS, PaaS, CPR (Common Pool Resources) to sustain community clouds in open standard [15].In the following sessions we discuss about relative works, survey analysis, result and discussions, conclusion and references.

II. RELATIVE WORKS

The application of mobile networks the SDM (Smart Deduplication for Mobile) methodology was implemented, a higher deduplication accuracy and power consumption [16]. In cloud environment the novel model driven approach to secure cloud platform [17]. By using a Storage Synchronization, the SWAN methodology used for a benefits of synchronized storage and sharing capabilities [18]. For an autonomic computing the Hybrid Resource Provisioning Approach-RL(Reinforcement Learning) was implemented and reduce total cost and increase virtualization [19].

Revised Manuscript Received on 30 March 2019.
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The application of mobile cloud computing the HMAC method was implemented to achieve feasible solution [20]. In an Homomorphic Encryption Technique the SHAMC (Secure and Highly available database system in multi-cloud environment) can be used to avoid service interruption in multi clouds [21].In an cloud infrastructure the ReCAP(Reproduce scientific workflow execution using Cloud-Aware Provenance)method can be used to re-provisioning of resources in cloud [22].The application of cloud computing environment the DTRM (Data Trustworthiness to enhance Reputation Mechanism) to enhance data trustworthiness[23].For an cloud computing. environment the DPRS(Dynamic Popularity aware Replication Strategy) method can be enhanced to aware replication strategy [24].In an Cryptography cloud trends the ABE(Attribute Based Encryption Technique)and HE(Homomorphic Encryption) techniques can be used to secure and preserve the data in cloud [25].The application of media clouds the HEVC(High Efficiency Video Coding) was implemented, to secure data in real time cloud environments [26].In an cloud environment the stochastic model was implemented to estimate energy consumption [27].By using an cloud environment the DIPOR(IDA based Dynamic Proof of Retrievability) method was utilized to retrieve original data from corrupted blocks [28].The application of cloud computing platform the VPH(Virtual Physiological Human) methodology was implemented ,to increase the utilization of computing and successful deployment [29].In an cloud storage platform the PDP(Provable Data Possession)and PoR(Proof of Retrievabilty) methodologies can be used to gain trustworthiness from clients [30].

III. SURVEY ANALYSIS

In Big data analytics can enables an organization to handle plentiful information that can affect the business process. The main objective of data analysis is to predict future observations for developing their effective methods of data mining to understand their relationships. For generating a large amount of data in various devices to increase the time because the speed of access raises in both structured and unstructured data. Several traditional techniques are involved in big data are processed within their data mining algorithms are related to statistics and computer science including some areas are Naïve Bayes, SVM,A-priori,cart and EM.In an real time instance they can generate their high speed of data with constraint their algorithms in spatial data and temporarily managed init.For an data philanthropy can collect the private dataset can be scattered across various internal nodes with limited number of documents and the data are aggregated inti new dataset can released their metadata. By comparing their data to trusted public sources can validate against the own surveys or comparing the data by using similar data. The data providers should recognize their data assets with public good.For an Datafication it can increase their availability of data within their analytical process. It can have categorized by 3V's.They are, Volume, Velocity and Variety. Ina volume the key considerations are related to distribution, ability of process and scalability etc.., Ina Velocity the key considerations include coarse of data and they discard their relations of data. Ina Variety has some different forms for both structured and unstructured data is inconsistent in nature and veracity can represented in an key considerations.

Table 1:Comparitive Analysis

S. No	Year	References	Application	Methods	Outcome
1	2016	[1]	Optimal target cloud platform with network affinity	Network Mapping Algorithm	Resource savings in turn savings for operational Expenses
2	2016	[2]	Electrical and electronics system	experimentally-attested transmission line model	Differences in current time derivatives on surface
3	2017	[3]	mobile communication system	C-RAN	achieve cost effectiveness and flexibility
4	2017	[4]	multiple wireless operators	C-RAN and Wireless Network Virtualization	achieve feasible solution for original problem
5	2018	[5]	intrusion detection system	Game Theoretic Approach-Cooperative defense algorithm	Increses security of data in sensor clouds

6	2017	[6]	integration function in cloud environments	Hybrid CSB(cloud service broker)	To construct User centric Hybrid cloud
7	2017	[7]	wireless area network	parallel transfer cloud to cloud	provide maximum throughput
8	2017	[8]	virtualization network	Dynamic Virtualized Bandwidth Allocation (DVBA)	easy tuning network resource for manymore users under cloud platform
9	2017	[9]	Internet of things	A HYBRID SELECTIVE -ANYFIT GENETIC ALGORITHM,Subset Sum Heuristic for mutation	optimize usage cost for cloud resource
10	2017	[10]	cloud merging method	Merging point clouds	re-plotting the rotated point clouds to the other point
11	2018	[11]	application for cloud data centers	NEPHELE	develop scalable optimal network
12	2018	[12]	communication in multi cell or multiple channels	C-RAN	Increase total capacity of the system
13	2018	[13]	electrical system	Source Server Selection,Destination Server Selection algm	Save electrical power in cloud data center
14	2018	[14]	maintenance of virtualization in cloud data centres	Maintenance and Electricity Costs Data Center (MECDC)	target load balancing
15	2017	[15]	community networks	IaaS,PaaS,CPR(common pool resources)	To sustain community clouds in open standard
16	2017	[16]	mobile networks	SDM(smart deduplication for mobile)	Higher deduplication accuracy,power consumption
17	2017	[17]	security in cloud environment	novel model driven approach	secure cloud platform
18	2016	[18]	file sharing in storage synchronization	SWAN	benefits of synchronized storage and sharing capabilities
19	2017	[19]	autonomic computing or reinforcement learning	hybrid resource provisioning approach-RL(reinforcement learning)	Reduce total cost and increase resource virtualization
20	2018	[20]	mobile cloud computing	HMAC	to achieve feasible solution

21	2017	[21]	homomorphic encryption or database security	SHAMC	To avoid sevice interruption in multiple clouds
22	2017	[22]	cloud infrastructure	Reproduce Scientific Workflow Execution using Cloud-Aware Provenance (ReCAP)	re -provisioning of resources in cloud
23	2018	[23]	data veracity in cloud computing	Data Trustworthiness enhanced Reputation Mechanism (DTRM)	enhance data trustworthiness
24	2017	[24]	simulation,data replication in cloud computing	Dynamic Popularity aware Replication Strategy (DPRS),	aware replication strategy
25	2017	[25]	cryptographic cloud trends	ABE(attribute based encryption),HE(Homomorphic encryption)	data preservation and security
26	2016	[26]	media clouds or AES	High Efficiency Video Coding (HEVC)	Secure data in real time cloud environments
27	2017	[27]	Hybrid storage in cloud	Stochastic models	estimate energy consumption
28	2018	[28]	disaster recovery in cloud storage	DIPOR	to retrieve original data from corrupted blocks
29	2017	[29]	cloud computing platform	VPH(Virtual Physiological Human)	successful deployment and utilization of computing
30	2017	[30]	cloud storage platform	Provable Data Possession (PDP), Proof of Retrievability (PoR).	to gain trustworthiness from clients

IV. RESULTS AND DISCUSSIONS

Big data is a tool focussed on the investigation of innovative business methodology can transform their various data to different industries such as healthcare system, e-government, e-commerce and its security in an long term analysis they can accessed within their data of an intrusion detection system to prevent their data in an public cloud. Hybrid cloud can access both public and private cloud with on-premises resources to gain the agility of an data. The important data can be stored and accessed with their cloud services. In an productive growth it can enables the organization in business logic the networking of an data is ubiquitous of an data process. For an business model they can support their data-driven decision making process and communicate with stakeholders. Table 2, Table 3, Table 4 and Table 5 exhibits the different analysis factors to enrich the quality of the survey to the core ideology . Fig 1. Express the Application and the Methodology, Fig 2. Represents the Percentage Analysis, Fig 3. Provides the Performance of the Hybrid cloud using Big data, Fig 4. Tells about the Business analysis of Cloud using Big data.

Sl.No	Year	Application	Method
1.	2016	4	5
2.	2017	18	14
3.	2018	8	12

Table 3: Application Wise And Result Wise Percentage

Sl. No	Year	Application	In %	Method	In %
1.	2016	4	13	5	16.1
2.	2017	18	60	14	45.1
3.	2018	8	26.6	12	38.7

Table 4. Data Model And Analysis

1	IEEE Transactions	5
2	IEEE Access	4
3	IEEE International Conferences	4
4	Future Generation and Computer System	9
5	Simulation Modelling Practice and Theory	1
6	Computer Communications	3
7	Information Science	2
8	Journal of System and Software	2

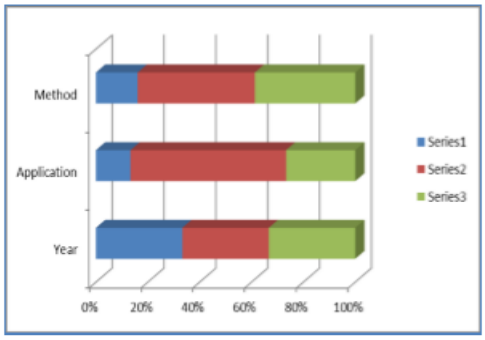

Fig 1:About Application ,Year ,Method

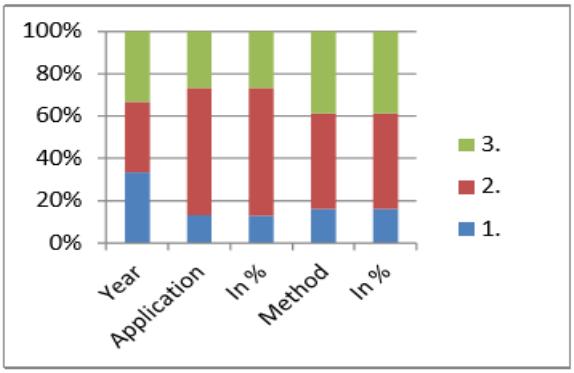

Fig 2. Percentage Analysis

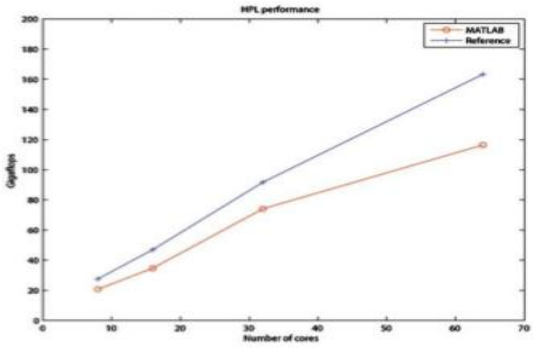

Fig 3. Performance of the Hybrid cloud using Big data

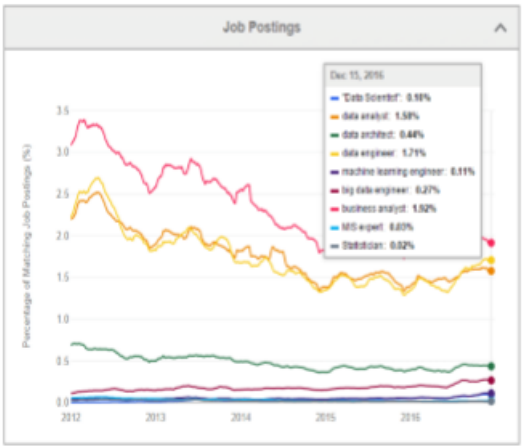

Fig 4. Business analysis of Cloud using Big data

V. CONCLUSION

The Hybrid cloud has high security features with fast connection of network and easy-to –access with the features of their cloud. The valuable data can be extracted from large set of information in an critical issue of big data. The new approaches are developed with qualify and validate their items in big data are impractical. It can capitalize their low-cost approach and offers scalability to handle the fluctuation of computing demands. For an enterprise cloud demands the user can control to connect, secure and discover their services in the cloud. The distribution data has multiple servers to improve their processing speed by using an front end user applications. In an fog environment they can accessed with local area network and transmit their data into one form to another forms within the computing area. The additional research of this paper is to improve their efficiency and integrity of data can display and analysis with their data storage.

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