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INTERNET OF THINGS INTEGRATES WITH CLOUD COMPUTING

Jadhav Shradha R.
Department Of Comp. Sci. & I.T.
Rajarshi Shahu Mahavidyalaya (AUTONOMOUS), Latur., [Maharashtra]
jshradha162@gmail.com

Jadhav Jayshree M.
Department Of Comp. Sci. & I.T.
Rajarshi Shahu Mahavidyalaya (AUTONOMOUS), Latur., [Maharashtra]
jdjatal@gmail.com

Kulkarni Chandraprbha V.
Department Of Comp. Sci. & I.T.
Rajarshi Shahu Mahavidyalaya (AUTONOMOUS), Latur., [Maharashtra]
cvkulkarni26@gmail.com

Abstract — Cloud computing and Internet of Things (IoT) are two different techniques. It is becoming very difficult for constrained small sensors and other devices which generate the data. Data generated needs to according to its requirements, to create more valuable services. For this purpose, cloud computing integrated with Internet of Things is very important. This paper represents use of cloud computing to

Keywords — Internet of Things; Cloud Computing; Cloud computing services; Generation of data; sensors;

I. INTRODUCTION

Cloud computing is a type of computing that rely on shared computing resources instead of having local servers or personal devices to handle applications. It means Cloud computing is taking services from different cloud services that live outside an organization's database. Cloud computing applications, storage and other services are exist on Web. The services are delivered and used over the Internet and are paid for by the cloud customer generally on pay-per-use business model. The IOT devices generates voluminous amount of data, that's why it needs the Internet Infrastructure.

This leads companies to find solutions to minimize the pressure and solve their problem of transferring all this data.[1], Internet of Things represents a concept for the ability of network devices to sense and collect data the world around us, and then share that data across the Internet. This data can be processed and utilized for interesting purposes.

II.   INTERNET OF THINGS ARCHITECTURE

ure is treated as a system which can be physical, virtual, or a hybrid of the two, consisting of a collec
active physical things, sensors, actuators, cloud services, specific IoT protocols, communication layer
pers, and enterprise layer. Architectures act as an important component of IoT specific infrastructure
ing the systematic approach toward different components resulting solutions to related issues.[2] We
as "a dynamic global network infrastructure with self-configuring capabilities based on standard and
communication protocols where physical and virtual 'Things' have identities, physical attributes, and
nalities and use intelligent interfaces, and are seamlessly integrated into the information network".

IoT Architecture
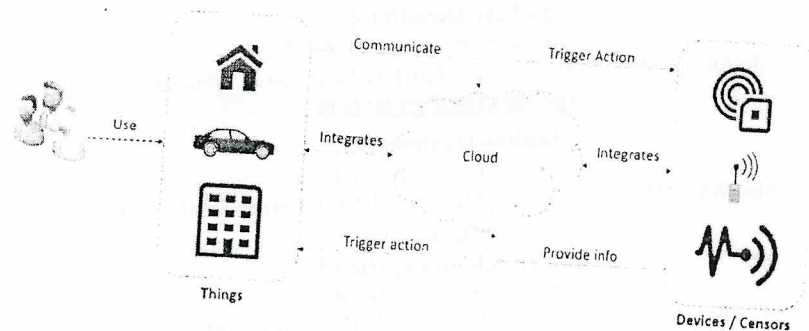
III.   CLOUD COMPUTING SERVICES WITH DIFFERENT IOT

ng provides necessary tools and services to create IoT applications. Cloud helps in achieving
cy, speed in implementing IoT applications. Cloud helps IoT application development but IoT is not
ng.
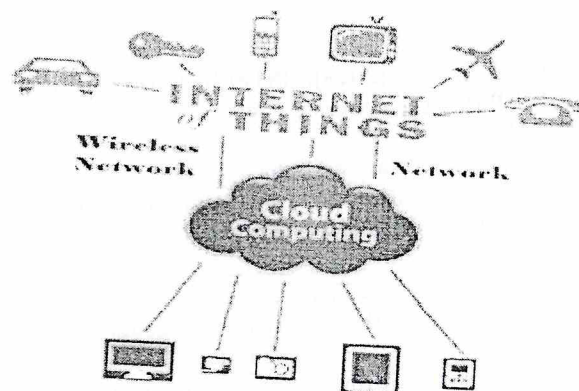
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provides required tools and   services to create IoT applications. It helps in achieving efficiency,
d in implementing IoT applications. IoT & cloud computing works together to increase efficiency
& both have complementary relationship. As IoT generates huge data while cloud computing
r this data to travel. There are many cloud providers who take advantage of it & provide a pay as
Many cloud service providers have identified the needs and started giving IOT related services to
ation of better IOT solutions. Big companies like Microsoft, Amazon, IBM, and SAP has
relat components into their cloud platforms. Following are the different cloud computing

rvi is a secure cloud that only the specified organization can access. The additional security
vate d model is ideal for any organization, including enterprise, that needs to store and
it rry out sensitive tasks.

a private cloud service could be utilised by a financial company that is required by regulation to
e data internally and who will still want to benefit from some of the advantages of cloud computing
usiness infrastructure, such as on demand resource allocation.[4]
Service is like a Private cloud although the main differentiator is that resources used to process
 can be shared with other organisations, and data transferred over a public network such as the
 party providers will deliver cloud services over the internet and are normally charged by CPU
, or bandwidth that they require.
 is a cloud computing environment which uses a mix of on premise, private cloud and third party
ervices.[5] With the hybrid cloud model, IT decision makers have more control over both the
blic components than using a pre-packaged public cloud platform.[8]

Table 1: Internet of Things integrates with Cloud computing

outes	Internet of Things	Cloud computing
	Generates big data	Manage big data
	Very small or almost none	Large, virtually never ending
	Works on hardware components	Works on virtual machines which imitate hardware components
et	Very limited	Wide , far spread
	Source of data convergence	Source of delivering services
pabilities	Limited	Virtually unlimited

ning common so that it is important to integrate it with cloud computing. The data generated by
l resources, different services for storage, utilization and to make it possible to create more
e data generated by IoT's and develop smart applications for the users. Following are some
hows IOT must be integrated with cloud computing.
computing is a platform for assessing large data generated by IOT.
romputing storage is virtual and never ending.
)T collects the data by hardware where as Cloud computing works on virtual machines which
data.
)T is having limited reachability towards commercial end where as cloud computing spreads

: In cloud computing internet is a source of delivering services.
bilities: Cloud computing capability is virtually unlimited.

V. CONCLUSION

computing is a new technological development which has a potential to have great impact on the
Internet is cloud computing which implies that all the efficient activities, making thus an
ork that integrates all types of resources and all types of utility domains. This paper says that the
net Of Things and cloud computing is the indication of the next big leap in the world of Internet.
ications coming from this combination known as IOT Cloud. This combination is the opening a
ss as well as research.

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