Recent Research Trends in Cloud computing

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***Abstract*— In cloud computing, cloud providers can offer cloud consumers two provisioning plans for computing resources, namely reservation and on-demand plans. In general, cost of utilizing computing resources provisioned by reservation plan is cheaper than that provisioned by on-demand plan, since cloud consumer has to pay to provider in advance. With the reservation plan, the consumer can reduce the total resource provisioning cost.**

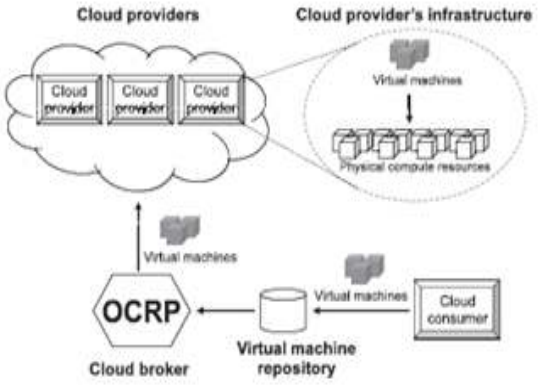
Introduction

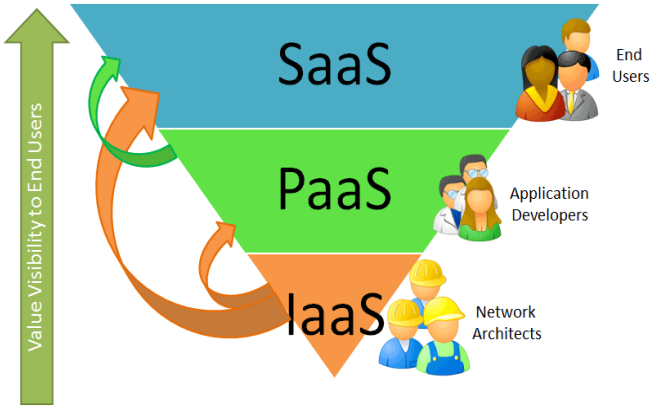
CLOUD Computing is a novel paradigm for the provision of computing infrastructure, which aims to shift the location of the computing infrastructure to the network in order to reduce the costs of management and maintenance
of hardware and software resources [1]. Cloud computing has a service-oriented architecture in which services are broadly divided into three categories: Infrastructure-as-a-Service (IaaS), which includes equipment such as hardware, storage, servers, and networking components are made accessible over the Internet; Platform-as-a-Service (PaaS), which includes hardware and software computing platforms such as virtualized servers, operating systems.

Literature review

1960 - John McCarthy opined that "computation may someday be organized as a public utility"
Early 1990s – The term “cloud” comes into commercial use referring to large networks and the advancement of the Internet.
1999 – Salesforce.com is established, providing an “on demand” SaaS (Software as a Service).
2001 – IBM details the SaaS concept in their “Autonomic Computing Manifesto”
2005 – Amazon provides access to their excess capacity on a utility computing and storage basis
2007 – Google, IBM, various Universities embark on a large scale cloud computing research project
2008 – Gartner says cloud computing will “shape the relationship among consumers of IT services, those who use IT services and those who sell them”

3. Architecture:-





Layers of Cloud Computing:

Cloud Computing = Software as a Service
+ Platform as a Service
+ Infrastructure as a Service
+ Data as a Service

- Software as a Service (SaaS)
  - From end user’s point of view
  - Apps are located in the cloud

- Software experiences are delivered through the Internet

➢ Platform as a Service (PaaS):

- From developer's point of view (i.e. cloud users)
- Cloud providers offer an Internet-based platform to developers who want to create services but don't want to build their own cloud

➢ Infrastructure as a Service (IaaS)

- Cloud providers build datacenters
  - Power, scale, hardware, networking, storage, distributed systems, etc
- Datacenter as a service
- Cloud users rent storage, computation, and maintenance from cloud providers (pay-as-you-go; like utility)

Data ➔ Information ➔ Knowledge ➔ Intelligence

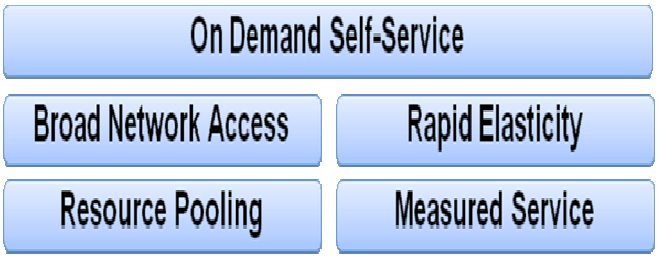
- Infrastructure for Web-scale data mining and knowledge discovery
- Empower people with knowledge
- Empower applications and services with intelligence

Some Commercial offerings:

4. Characteristics Advantages Disadvantages:-

➢ Common Characteristics:

➢ Essential Characteristics:



Advantages:

➢ Improved performance:
- With few large programs hogging your computer's memory, you will see better performance from your PC.
- Computers in a cloud computing system boot and run faster because they have fewer programs and processes loaded into memory.

➢ Reduced software costs:
- Instead of purchasing expensive software applications, you can get most of what you need for free.
  - Most cloud computing applications today, such as the Google Docs suite.
- better than paying for similar commercial software
  - Which alone may be justification for switching to cloud applications

➢ Unlimited storage capacity:
- Cloud computing offers virtually limitless storage.
- Your computer's current 1 TB hard drive is small compared to the hundreds of Pbytes available in the cloud.

- Increased data reliability:
  - Unlike desktop computing, in which if a hard disk crashes and destroy all your valuable data, a computer crashing in the cloud should not affect the storage of your data.
    - if your personal computer crashes, all your data is still out there in the cloud, still accessible

Disadvantages:

- Requires a constant Internet connection:
  - Cloud computing is impossible if you cannot connect to the Internet.
  - Since you use the Internet to connect to both your applications and documents, if you do not have an Internet connection you cannot access anything's, even your own documents.
  - A dead Internet connection means no work and in areas where Internet connections are few or inherently unreliable, this could be a deal-breaker.
- Stored data might not be secure:
  - With cloud computing, all your data is stored on the cloud.
  - The questions is How secure is the cloud?
  - Can unauthorized users gain access to your confidential data?
- Stored data can be lost:
  - Theoretically, data stored in the cloud is safe, replicated across multiple machines.
  - But on the off chance that your data goes missing, you have no physical or local backup.

Put simply, relying on the cloud puts you at risk if the cloud lets you down.

Limitations:

- Security is a significant concern in public clouds.
- IT teams in the organization may have to invest in buying, building and managing the clouds independently Journal of Theoretical and Applied Information Technology .

Current research:-

Trends – What Might Get Better Over Time

Cloud technologies are clearly still evolving, and it is important to avoid setting policies today in reaction to an immature market. Based on observations from diffusion and maturation of other technologies, we might anticipate some threats diminishing naturally over time. Both market evolution and a growth of experience will settle some of the issues discussed above.

Economics drives much of our reaction to security and privacy threats (Anderson and Moore, 2006). If demand grows, firms will at least pay more attention to customer concerns about security. Many security mechanisms, such as encryption, network auditing tools, isolation architectures and even hired expertise have a high fixed cost, but add little marginal cost to each client. Once investment has been made, costs can be recouped across all clients without one bearing the complete cost, even if the features were initially demanded by only a subset of the client base.

Conclusion:-

Clouds are essentially Data Centers hosting application services offered on a subscription basis. However, they consume high energy to maintain their operations. high operational cost + environmental impact Proposed heuristics for energy-efficient dynamic VM consolidation that significantly reduce energy consumption, while providing a low level of SLA violations. Presented a Carbon Aware Green Cloud Framework to improve the carbon footprint of Cloud computing.

REFERENCES

[1] L.M. Vaquero, L. Rodero-Merino, J. Caceres, and M. Lindner, "A Break in the Clouds: Towards a Cloud Definition," ACM SIGCOMM Computer Comm. Rev., vol. 39, pp. 50-55, Dec. 2008. 942 IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 23, NO. 5, MAY 2012 TABLE 1 Moments of Response Time Distribution, CoV ¼ 0:5 TABLE 2 Moments of Response Time Distribution, CoV ¼ 1:4

[2] B. Furht, "Cloud Computing Fundamentals," Handbook of Cloud Computing, pp. 3-19, Springer, 2010.

[3] H. Khazaei, J. Mi_si_c, and V.B. Mi_si_c, "Performance Analysis of Cloud Computing Centers," Proc. Seventh Int'l ICST Conf. Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine), Nov. 2010.

[4] L. Wang, G. von Laszewski, A. Younge, X. He, M. Kunze, J. Tao, and C. Fu, "Cloud Computing: A Perspective Study," New Generation Computing, vol. 28, pp. 137-146, 2010.

[5] L. Kleinrock, Queueing Systems: Theory, vol. 1, Wiley-Interscience, 1975.

[6]Amazon AWS: http://aws.amazon.com/free/AWS Cost Calculator: http://calculator.s3.amazonaws.com/calc5.html Windows Azure: http://www.azurepilot.com/ Google App Engine (GAE): appengine/docs/whatisgoogleappengine.html Graph Analytics: http://www.umiacs.umd.edu/ ~ jimmylin/Cloud9/docs/content/LiL_Schatz_MLG2010.pdf For miscellaneous information: http://www.cse.buffalo.edu/~bina