Cloud Computing on the Horizon-Security Benefits and its Vulnerability

Neelam Sharma¹ and Nitish Pathak ²

¹Department of Information Technology, Maharaja Agrasen Institute of Technology, Delhi, India
²BVICAM, GGSIPU, Delhi, India
¹sharmaneelam2@gmail.com and ²nitish_pathak2004@yahoo.com

ABSTRACT
“Cloud computing” is increasingly becoming one of those buzz words of the moment, it can be confusing to understand exactly what everything is and how the various technologies differ from one another. The term Cloud Computing encompasses multiple, pre-existing services, but analysis of the phenomenon’s key features shows that it includes some new developments. This also accompanied with the risk, which are largely borne by users and whose impacts could be considerable.

KEYWORDS
IaaS, PaaS, SaaS.
IaaS- Infrastructure as a Service
PaaS- Platform as a Services
SaaS- Software as a Services
QoS- Quality of Service

1. INTRODUCTION
This Specification describes ‘Cloud computing’ is a new supplement, consumption and delivery model for IT services based on Internet, and it typically involves the provision of dynamically scalable and often virtualized resources as a service over the Internet. The author will like to acknowledge the Contribution of Keyword “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document.

2. COMPARISON
Cloud computing can be confused with:
Grid Computing – “a form of distributed computing and parallel computing, whereby a ‘super and virtual computer’ is composed of a cluster of networked, loosely coupled computers acting in concert to perform very large tasks”.
Utility Computing – the “packaging of computing resources, such as computation and storage, as a metered service similar to a traditional public utility, such as electricity.”
Autonomic Computing – “computer systems capable of self management”.

Today, it is hard to understand how effective utility and cloud computing can be offered without using virtualization. However, there are many forms of virtualization used in utility computing, from virtual machines, to virtual storage and network virtualization and these still comprise just a few of many required technologies.

3. TYPES OF SERVICES
Services provided by cloud computing can be split into three major categories:

3.1 INFRASTRUCTURE-AS-A-SERVICE(IaaS)
Infrastructure-as-a-Service(IaaS) like Amazon Web Services provides virtual servers with unique IP addresses and blocks of storage on demand. Customers benefit from an API from which they can control their servers. Because customers can pay for exactly the amount of service they use, like for electricity or water, this service is also called utility computing.

3.2 PLATFORM-AS-A-SERVICE(PaaS)-
Platform-as-a-Service(PaaS) is a set of software and development tools hosted on the provider’s servers. Developers can create applications using the provider’s APIs. Google Apps is one of the most famous Platform-as-a-Service providers. Developers should take notice that there aren’t any interoperability standards (yet), so some providers may not allow you to take your application and put it on another platform.

3.3 SOFTWARE-AS-A-SERVICE (SaaS)-
Software-as-a-Service (SaaS) is the broadest market. In this case the provider allows the customer only to use its applications. The software interacts with the user through a user interface. These applications can be anything from web based email, to applications like Twitter.

4.CHARACTERISTICS
- Agility improves with users’ ability to rapidly and inexpensively re-provision technological infrastructure resources.
- Cost is claimed to be greatly reduced and capital expenditure is converted to operational expenditure. This
ostensibly lowers barriers to entry, as infrastructure is typically provided by a third-party and does not need to be purchased for one-time or infrequent intensive computing tasks. Pricing on a utility computing basis is fine-grained with usage-based options and fewer IT skills are required for implementation.

- Device and location independence enable users to access systems using a web browser regardless of their location or what device they are using (e.g., PC, mobile). As infrastructure is off-site (typically provided by a third-party) and accessed via the Internet, users can connect from anywhere.
- Multi-tenancy enables sharing of resources and costs across a large pool of users thus allowing for:
  - Centralization of infrastructure in locations with lower costs (such as real estate, electricity, etc.) Peak-load capacity increases (users need not engineer for highest possible load-levels)
  - Utilization and efficiency improvements for systems that are often only 10-20% utilized.

Reliability improves through the use of multiple redundant sites, which makes cloud computing suitable for business continuity and disaster recovery. Nonetheless, many major cloud computing services have suffered outages, and IT and business managers can at times do little when they are affected.

- Scalability via dynamic (“on-demand”) provisioning of resources on a fine-grained, self-service basis near real-time, without users having to engineer for peak loads. Performance is monitored, and consistent and loosely-coupled architectures are constructed using web services as the system interface.
- Security could improve due to centralization of data, increased security-focused resources etc., but concerns can persist about loss of control over certain sensitive data, and the lack of security for stored kernels. Security is often as good as or better than under traditional systems, in part because providers are able to devote resources to solving security issues that many customers cannot afford. Providers typically log accesses, but accessing the audit logs themselves can be difficult or impossible. Furthermore, the complexity of security is greatly increased when data is distributed over a wider area and/or number of devices.
- Sustainability comes about through improved resource utilization, more efficient systems, and carbon neutrality. Nonetheless, computers and associated infrastructure are major consumers of energy.
- Maintenance cloud computing applications are easier to maintain, since they don’t have to be installed on each user’s computer. They are easier to support and to improve since the changes reach the clients instantly.

6. VISIBILITY
6.1 PUBLIC CLOUD
Public cloud or external cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned on a fine-grained, self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who shares resources and bills on a fine-grained utility computing basis.

6.2 HYBRID CLOUD
A hybrid cloud environment consisting of multiple internal and/or external providers “will be typical for most enterprises”. A hybrid cloud can describe configuration combining a local device, such as a Plug computer with cloud services. It can also describe configurations combining virtual and physical, collocated assets – for example, a mostly virtualized environment that requires physical servers, routers, or other hardware such as a network appliance acting as a firewall or spam filter.

6.3 PRIVATE CLOUD
Private cloud and internal cloud are neologisms that some vendors have recently sued to describe offerings that emulate cloud computing on private networks. These (typically virtualization automation) products claim to “deliver some benefits of cloud computing without the pitfalls”, capitalizing on data security, corporate governance, and reliability concerns.

They have been criticized on the basis that users “still have to buy, build, and manage them” and as such do not benefit from lower up-front capital costs and less hands-on management, essentially “[lacking] the economic model that makes cloud computing such an intriguing concept”.

6.4 WHAT DOES A SHIFT TOWARDS CLOUD COMPUTING MEAN?
The shift would affect companies a few different sub-industries including software companies, Internet Service Providers and hardware manufactures. Companies in each of these will face significant change if cloud computing is to be the next step for the industry. While it is easy to see how the main software and Internet companies will be affected by such a shift, how companies in the internet and hardware industries will be affected is slightly more difficult. Who Gains?

- Net Customer (NC) ($35 bn approx)
- Google (GOOG)
- Net Suite (N)
- SalesForce.com (CRM)
- Right Now Technologies (RNOW)
- Quest Software (QSFT)
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- Disney
- Who Loses Out?
- Oracle (ORCL)
- SAP AG (SAP)
- Blackbaud (BLKB)
- Lawson Software

7. BENEFITS AVAILABLE FROM CLOUD COMPUTING
Cloud Computing offers upgraded promises against the earlier versions of outsourced services provision have already offered a range of potential benefits to both organizational and individual users.

7.1 POTENTIAL BENEFITS FROM CLOUD COMPUTING
- Access to Services that are otherwise unavailable. In some circumstances, a service-provider may offer a new or exclusive capability – although this is likely to be the case only during a limited period of time, since most services are, at least in principle, compatible.
- Access to Services from multiple desktop devices. Each user, whether within an organization or acting as an individual, is likely to use multiple desktop devices, in various locations, including at home, at work, at client’ sites, in airport lounges, in Internet cafes, etc.
- Access to Services from scaled – down devices. A services may perform the vast majority of the function server-side, enabling the client to be run on a device with very limited capacity. This opens up the possibility for both long-promised but little – used ‘thin clients’, but also various forms of handheld computers, and mobile phones. This depends, however, on the service being designed with this aim in mind.
- Access to services from multiple device-types. Each user, whether within an organization or acting as an individual, is likely to use multiple kinds of devices, including desktop PCs, portable PCs, various forms of handheld computers, and mobile phones. A suitably- designed service may be able to support convenient access to data and applications on any and each of these device – types, through a variety of user – interfaces.

8. OTHER TECHNICAL BENEFITS
Professionalized backup and recover. A service may be designed to provide assured backup of data and software, and assured, simple, efficient recovery. This is because these are core capabilities of a service provider, and that organization is likely to be more professional, attentive and disciplined than many user organizations and particularly individual users. Such services can be provided whether the primary services is delegated to the cloud or run on the user’s own network.

Scalability. Where the transaction and/or data volumes vary significantly over time, a services may offer assured server-
capacity, storage-capacity, and access to the requisite application software. This may apply in a long-term growth curve and in a highly peaked demand, associated with daily, weekly, monthly, annual or even longer cycles, and with events.

Copyright convenience. The service can assume responsibility for all aspects of acquisition, maintenance and licensing of software and of data.

Collaboration Convenience. Collaborate content (including documents and other data which are co-owned and co-maintained) is inherently accessible and amendable multiple authors. There are advantages in hosting services such as a Wiki remotely from each of the participants.

Financial Benefits
Lower Investment/up-front cost. The organization or individual user may be able to avoid investment in hosts, hosting software and application, because the service– provider takes on that responsibility. The service – provider takes on that responsibility. The service– provider’s cost and profit-margin may be offset through economies of scale and/or scope. On the other hand, effort, time and money still need to be invested by users in determining their requirement, evaluating alternative ways of satisfying them, establishing a strategy and plan, and implementing, monitoring and controlling performance against the plan.

-Lower Operational Costs. The organization or individual user may be able to pay – they – go, for what they need, rather than paying on an ongoing basis for excess capacity. Savings may arise, provided that the services – provider has significant advantages such as economy of scale, and passes sufficient of those savings on to their customers.

9. VULNERABILITY
Five questions need definitive answers to satisfy corporate cloud computing buyer concerns.

The first question is Security. What about potential unauthorized access, inappropriate use and loss of control of proprietary corporate information and IT applications? Who is responsible for corporate policy distribution, management and control?

The second question is Performance. Quality of service (QoS) commitments and service-level agreements from cloud computing vendors may not meet corporate availability, legal, budget and insurance requirements. Who is responsible for loss of revenue/profits from a significant cloud computing outage, high network load or insufficient bandwidth access due to denial of service?

The third question is Management. It is exceedingly difficult to manage and administer a corporate virtualized IT environment. It may be impossible or impractical to attempt to manage the cloud. What tools exist for the buyer to monitor and manage multiple cloud computing vendors and their products?
The fourth question is Governance and Regulatory Compliance. Outsourcing of any services brings into question oversight and the cloud computing vendor procedures, processes, internal tools and third-party auditor access. What vendor-supplied software tools exist for the buyer to provide for cloud computing vendor governance and regulatory compliance? The fifth and final question is Financial – the classical issue of a variable vs. fixed-cost management. Corporate CFOs demand budgets to be projected with accuracy, committed to as part of a financial allocation plan and managed with continual diligence and oversight. How do you control IT costs in a services and cloud computing utility billing model, and when should a cloud computing variable cost be converted to an internal IT fixed cost?

10. COUNTER MEASURES
1. We can provide the security on Basis of the demands, if there is small company need small space in the server then there need to pay the small account money and if there is any company need more space they are charged with large amount.
2. We can provide the data security by providing the levels of security on the server if the organization’s data is very critical then it need to be pay more amount so that it is being kept on the safer side of the server or backup is taken automatically after the small interval of time.

11. FUTURE SCOPE
During the past 15 years, a continuing trend towards IT industrialization has grown in popularity as IT services delivered via hardware, software and people are becoming repeatable and usable by a wide range of customers and service providers.”. This is due, in part to the commoditization and standardization of technologies, in part to virtualization and the rise of service-oriented software architectures, and most importantly, to the dramatic growth in popularity of the Internet. These three major trends constitute the basis of a discontinuity that will create a new opportunity to shape the relationship between those who use IT services and those who sell them.

12. CONCLUSION
The analysis reported on this paper puts flesh to those claims. It has provided some clarity about the term’s meaning, and about the benefits that may be available to user organization and individual users. Most crucially, it has clarified the very substantial downsides and risks involved in using cloud computing. It lays a foundation for guidance to user organization in determining the circumstances in which cloud computing is an appropriate approach to adopt.

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