

What Does Cloud Computing Mean for the Indian Army?

SANJAY SETHI

A YouTube video¹ buzzing on the Internet, and received by me from one of my Higher Defence Management Course mates motivated me to pen this article. The video in question comically parodies vivid details of the hazards of cloud computing. The claimant in the video, in all seriousness, challenges exploitation of cloud computing in the light of the threat posed by rains and thunderstorms. There is also suspicion in his mind about the efficacy of the idea, particularly in conditions when the weather is fine while uploading of data, but deteriorates when the need arises for downloading of the same data. On a serious note, there is a definite need to understand the concept and strategise a path to its exploitation.

So **what is cloud computing?** Clouds are a large pool of easily usable and accessible virtualised resources (such as hardware, development platforms and/or services). These resources can be dynamically reconfigured to adjust to a variable load (scale), allowing also for an optimum resource utilisation. This pool of resources is typically exploited by a pay-per-use model in which guarantees are offered by the infrastructure provider by means of customised service level agreements². Understanding of this definition is vital to understanding of the concept. But before we go on, it is essential to understand the three actors involved in cloud computing. The first being the “service providers”, who make services accessible to the “service

users” through Internet-based interfaces. Clouds provide the computing infrastructure as a service amongst other things. The infrastructure is owned and made available by the “infrastructure providers” and, of course, the third actor is the user of the services.

Clouds can provide three types of services and the same are detailed below:

- **Infrastructure as a Service, or IaaS:** The infrastructure providers manage a large set of computing resources, such as storing and processing capacity. Through virtualisation, they are able to split, assign and dynamically resize these resources to build ad-hoc systems as demanded by customers. Dropbox and Google Drive do similar things by making storage space available. Today, one can buy 100GB of storage space for a period of one year at \$99 a year or Rs 6,100, whereas in the same amount, one could buy a physical hard disk for just 1GB or one hundredth of the capacity available on the cloud.
- **Platform as a Service, or PaaS:** With this service, you can develop new applications or services in the cloud that do not depend on a specific platform to run, and you can make them widely available to users through the Internet. PaaS delivers cloud-based application development tools, in addition to services for testing, deploying, collaborating on, hosting, and maintaining applications³. A well-known example is the Google Apps Engine. The City of Edmonton, Alberta, Canada, made access to public data easy for citizens and developers with its Open Data Catalogue. Created in a cloud-based software development environment, it makes data accessible in industry-standard protocols and Application Programming Interfaces (APIs). Similarly, the US Department of Defence (DoD) emulates field conditions for application testing using a cloud platform that the department leases only on requirement basis⁴.
- **Software as a Service, or SaaS:** Finally, there are services of potential interest to a wide variety of users hosted in cloud systems. This is an alternative to locally run applications. Using Google Docs instead of Microsoft Office is a good example of the utilisation of SaaS. Private enterprises take advantage of SaaS affordability to deploy business systems quickly and with greater security than they could provide themselves. Even in a downward economy, spending on SaaS in the private sector rose 18 percent in 2009, according to a Gartner report that cited office suites and digital content creation as the most popular type of application, followed by Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP)⁵. SaaS offerings have become widespread and government agencies too are finding ways to benefits from SaaS investments⁶.

The National Institute of Standards and Technology (NIST) is a US non-regulatory federal agency within the US Department of Commerce, and its mission is to promote innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. As per the NIST, the key features of cloud computing are:

- **On-demand Service:** You can get what you need and when you need it.
- **Broad Network Access:** The cloud brings network-based access to, and management of, software and services—meaning access is anywhere, anytime without any investment in infrastructure.
- **Resource Pooling:** A large pool of users shares location-independent resources and costs in an environmentally sustainable way.
- **Flexible Resource Allocation:** As demands fluctuate, cloud services can scale rapidly. You don't have to worry about bringing new servers online or reallocating resources.
- **Measured Service:** Usage is metered—often per user or per hour. This means you pay only for what you use. Service levels are contractually defined.

A Harvard Business Review Analytic Services Report says clouds comprise a game changer and the reasons are *speed, flexibility, collaboration, and insight*. In a survey on the benefits of cloud computing, respondents rated increased business agility as the most valued benefit of cloud computing, with 44 percent scoring it five out of five and an additional 34 percent scoring it four out of five. The benefits, in order of importance as determined by the survey, are summarised below:

- Increased business agility - 44%
- Flexible capacity - 41%
- Faster adoption of new technology - 36%
- Lower fixed costs (shift from capex to opex) - 33%
- Lower up-front costs to develop/deploy
- Information Technology (IT) systems - 31%
- Always on newest versions of software without IT updates - 26%

In the survey of nearly 1,500 business and technology leaders conducted by Harvard Business Review Analytic Services, the majority—85 percent—said their organisations will be using cloud tools moderately to extensively over the next three years. They cited the cloud's ability to increase business speed and agility,

lower costs, and enable new means of growth, innovation, and collaboration as the drivers for this fairly aggressive rate of adoption.

A Microsoft study summarises the benefits of cloud computing as under:

- **It's Cheaper:** The truth is that you need to balance the upfront savings with ongoing subscription costs to determine actual savings. The pay-as-you-go approach lets you balance your IT budget with operational expense spending instead of capital expenses. So you can expect to reduce costs associated with server hardware, support and deployment, and power consumption.
- **It's Faster:** Data-intensive computing in a cloud can be six times faster than in isolated data centres. Applications are quicker, compared to traditional means. And it's certainly fast to procure on-demand services.
- **It's Greener:** In 2006, the US Department of Energy estimated that US data centres consumed about 1.5 percent of all US electricity use, and current projections show worldwide carbon emissions from data centres will quadruple by 2020. Consolidating and sharing resources can help curb the waste of data centre sprawl and reduce greenhouse gas emissions. The cloud has a green lining!

Having seen the corporate scenario, it is only prudent to look at the military one. The goal of the US Department of Defence (DoD) with respect to cloud computing, is: to *“implement cloud computing as the means to deliver the most innovative, efficient and secure information and IT services in support of Departments mission anywhere, any time on any authorised device”*⁸. What is important to note is that the US DoD values cloud, as it is secure, cost-effective and permits ease of access across the globe. The spirit behind the DoD's pursuance of cloud computing is “efficiency, agility, and innovation”. The basic idea is reduced costs/increased operational efficiencies, increased mission effectiveness and cyber security.

So what does it mean for the Indian Army? The army certainly needs to re-crystallise its future IT landscape, such that in coming years it is able to provide wide-ranging and ever increasing capabilities with minimal resources. It is apparent from the recent experiences of modern defence forces, as well as that of other large public/private sector organisations, that the fast paced piecemeal automation eventually leads to setting up of information silos which duplicate applications as well as data. Information silos cause communication barriers on account of constraints of accessibility, seriously impair productivity and are

the major reason for failure to present a cohesive and exhaustive snapshot of the entire enterprise. The Indian army needs to learn from these realities and evolve a strategy for creation of a cost effective, and resilient cloud environment of its own which can take on the future requirements of the entire organisation. An army's own cloud, which provides users spread across geographies, a secure and cost effective service environment for deployment and exploitation of applications as well as hardware resources, will go a long way in creation of a best in class IT landscape.

Col **Sanjay Sethi** is a Senior Fellow at CLAWS.

N.B. The views expressed in this article are those of the author in his personal capacity and do not carry any official endorsement.

Notes

1. <http://www.youtube.com/watch?v=ApQIMm39xr0>
2. Luis M. Vaquero¹, Luis Rodero-Merino¹, Juan Caceres¹, Maik Lindner, "A Break in the Clouds: Towards a Cloud Definition", *Computer Communication Review*, Vol 39, No. 1, January 2009.
3. http://www.microsoft.com/industry/government/guides/cloud_computing/5-PaaS.aspx
4. Ibid.
5. Gartner, "Gartner Says Worldwide SaaS Revenue to Grow 18 Percent in 2009." Gartner press release, November 09, 2009. <http://www.gartner.com/it/page.jsp?id=1223818>
6. "Forecast: Improved Economy in the Cloud: An Introduction to Cloud Computing in Government", A Microsoft US government White Paper, March 2010.
7. "How the Cloud Looks from the Top: Achieving Competitive Advantage in the Age of Cloud Computing", a report by Harvard Business Review Analytic Services.
8. "Cloud Computing Strategy", US DoD, July 2012.