

Challenges on cloud computing perspective

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Cloud computing faces a number of challenges clearly identified by our research. These include valid and regulatory compliance considerations, security and privacy issues, dealing with the contractual relationship between client and cloud provider, including lock-in and reliance, as well as managing the very flexibility that cloud provides. Nevertheless, many of these types of challenge have been faced previously and effective solutions have evolved.

For example, safe harbor provisions address legal and regulatory issues about transferring data abroad and over 25 years of IT outsourcing have resulted in a skill base that is capable of managing contractual relationships with key partners. End-user computing, whether in the form of desktop computers or, increasingly, smartphones, has become effectively integrated within the IT infrastructure of most organizations. Cloud computing can, and should, learn from these experiences if it is to achieve its full potential.

Security

Well-known security issues such as data loss, phishing, botnet (running remotely on a collection of machines) pose serious threats to an organization's data and software. The multi-tenancy model and the pooled computing resources on cloud computing has introduced new security challenges such as shared resources (hard disk, data, VM) on the same physical machine invites unexpected side channels between a malicious resource and a regular resource. And, the issue of "reputation fate-sharing" will severely damage the reputation of many good Cloud "citizens" who happen to, unfortunately, share the computing resources with their fellow tenant – a notorious user with a criminal mind. Since they may share the

same network address, any bad conduct will be attributed to all the users without differentiating real subverters from normal users.

Costing Model

Cloud consumers must think about the tradeoffs amongst calculation, communication, and integration. While migrating to the Cloud can substantially reduce the infrastructure cost, it raises the cost of data communication.

Charging Model

From a cloud provider's perspective, the elastic asset pool (through either virtualization or multi-occupancy) has made the cost examination significantly more complicated than regular data centers, which often calculates their cost based on utilizations on static computing.

Service Level Agreement

It is vital for consumers to acquire ensures from providers on service delivery. Regularly, these are provided through Service Level Agreements (SLAs) consulted between the providers and consumers.

High performance computing

The scientific and high-performance computing (HPC) community has recently become more interested in cloud computing. Contrasted with SaaS workloads, which rely on request-level parallelism, HPC workloads typically rely on thread- or task-level parallelism, making them more communication-intensive and more sensitive to communication latency. These properties make HPC workloads especially vulnerable to “ performance noise” artifacts introduced by the pervasive utilization of virtualization in cloud

environments. Legacy scientific codes often rely on resource-scheduling approaches, such as gang scheduling and make presumptions about the network topology that connects the servers. Such design decisions make sense in a statically provisioned environment but not for cloud computing. Thus, not surprisingly, early benchmarks of existing HPC applications on public clouds were not empowering.