

Cloud Computing & Distributed Database

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Abstract

The paper herein delves into recent trends ascribed to cloud computing and distributed database. It explicates the model of cloud computing from a technological viewpoint and goes ahead to elaborate three recent issues on this topic, namely pricing, security, and cross-border taxation. The paper concludes by highlighting the essence of the trends in cloud computing.

Introduction

Cloud computing as a topic is quite challenging to define. It is imperative not be bogged down to finding the exact definition, rather pay attention to its traits. The National Institute of Standards and Technology in the Us Department of Commerce refers to cloud computing as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (for instance networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” (Baun, 2011). As such, cloud computing connotes the delivery of computing as a service to users and not as a product (Crookes, 2012). In this computing service, shared information, software, and resources are availed to computers and other devices. Through cloud computing, software, computation, data storage, and data access services are provided without the need for end-user knowledge on the configuration and location of the system delivering the services (Shih, 2002). With regard to issues of economic development; innovation and effects on the IT industry, numerous proponents of cloud computing seemingly predict the increase in the relevance of local IT, be it through IT contractors or in-house IT. An emerging issue is how cloud computing can be used strategically in such a manner as to take advantage of services and build the capacity of IT at the same time. There are global concerns in light of the

most powerful IT companies dominating the market and whether this dominance can possibly amplify the global inequalities of wealth distribution.

Security, Privacy, and Human Rights Issues

Cloud computing poses some specific challenges to security and privacy. When making use of cloud-based services, an individual entrusts their data storage and security to a third party. Is it possible that individuals can make the assumption that a cloud-based company will work to protect their data (defend it against a security breach, back it up and check for errors in data) if the individual accesses their services at a considerably low cost? The question emerges as to which third parties a cloud-based service shares information with once data is entrusted to them. Cloud-sourcing entails making use of numerous services, and multiple cloud-based services facilitate each other, meaning that products that are cloud-based may have to share the information of its users with third parties in the event that they are involved in the transfer or processing of their information (Friedman, 2010). They may also share the information of individuals with advertisers as many do, in order to help cover the cost. Of course, every cloud based service dictates its own service level agreements or terms and conditions to which users agree (most of the time without reading) and is updated frequently. Issues of security and privacy surrounding cloud computing can also be examined as an awareness and education issue. Individuals need to be privy of the terms and conditions of cloud based service and also be informed about updates (Furht 2010).

The terms and conditions between the company and the user alone are not sufficient enough to protect the security and privacy of the users' information. Infrastructure can be destroyed, security breached, and a firm may end up being bankrupt, and users may end up being

left without recourse. Moreover, service level agreements or terms and conditions may be deemed unfair or illegal in some states but can easily be broken of course. In addition to policy, it is emergent that there is a need for strong adherence to best practices and standards for encrypting, storing and securing data. Some firms have instituted policies about this and in some countries there are regulations regarding organizational protection of private information. What policy, legislative, regulatory and judicial environs are cloud based information subjected to? It is extremely difficult to ascertain this question owing to the internet's global and decentralized structure, in addition to that of cloud computing. Information that cloud services store is subject to policy-based, legal, and regulatory environs of the country from which the cloud service hails, and the country in which the server infrastructure is located (Velte et al, 2010). What complicates this is the ideal that part of the data in transit can also be regulated. With the storage of more and more information in the cloud, security and privacy issues become pertinent, and cloud computing is bound to continue offering challenges to national regulation and policy in addition to the governance of the internet in light of how these issues can be resolved.

Cross-border taxation of cloud service providers

Often, cloud computing is borderless. The requirements for tax compliance and tax regulation are, however, not borderless. This basic conflict can give birth to potentially material and complex or significant issues of tax, majorly for cloud service providers. Up until now, as far as cloud computing has evolved, most jurisdictions see cloud service providers as responsible parties for tax purposes irrespective of any arrangements made between users and cloud service providers. At times, cloud service providers emerge as truly global clouds that provide little or no transparency at all about the location of data processing and storage. However, more often

than not, a group of distinguishable and interrelated data centers within different locations are responsible for the provision of cloud service. It is quite crucial to comprehend this underlying case in point since especially in the latter case, both the cloud user and the cloud service provider may be subject to some or all tax regulations within all the jurisdictions through which the network of cloud passes the information of the user (Jaatung & Rong, 2009).

Generally, under incumbent cloud regulations, critical taxation issues surrounding cloud computing are working to determine the character of cloud service provider revenues and whether the cloud service provider's presence is taxable in all the jurisdictions where the cloud service provider conducts business. Both issues necessitate separate sorting for indirect tax and income tax. Purposes, since different rules may apply to each. For tax compliance, the prime issues are establishing the regulations that apply owing to the location of cloud service providers, in addition to the level of support afforded by the cloud service provider in meeting the compliance requirements. Some critical issues like transfer pricing (decision-making on the risk or attribution value in cloud service provider model) and recent regulations that govern the disclosure of uncertainties about tax, lead to even more ambiguity for the taxpayers, and the necessity for careful evaluation (Hameurlain, 2012).

One major challenge ascribed to the taxation of cloud computing is that there is much more rapid growth of cloud service provider business models than the global jurisdictions charged with taxing can respond to. For instance, the provider of cloud services must establish whether its revenue is categorized as revenue from a software sale or revenue from a service, or lease, or maybe as a bundled package. The categorization can have a big impact on whether withholding taxes or sales might apply, in addition to establishing the source from which revenue is being earned (for instance from domestic or foreign sources, a tenet that is important for the

determination of home country taxation) currently, there is an inconsistent categorization of cloud service around the world, even in regions within the United States. The Organization for Economic Cooperation and Development (OECD) (constituting 34 countries) that gives governments a forum to come up with solutions to common issues has held that cloud service is more of a revenue base than a service. The guidance of the OECD is however non-binding. Every country takes up its own regulations and laws and it is emergent that some categorize cloud service computing as a service, while others see it as a software lease or sale. The distinction has complex and significant ramifications for all cloud service providers in light of a strategy for tax mitigation.

Pricing and Business models

At first glance, business models on cloud computing appear deceptively simple. Rather than purchasing and installing all their applications and IT infrastructure themselves, customers of cloud purchase access to applications and infrastructure they require. Rather than making up-front payments for the whole service, consumers only pay for what they use. A deeper glance into the technology however reveals nuances that multiply and become complicated. First, the fees of cloud service vary from the view that most companies hold on the cost of building their own infrastructure (Rahimi & Haug, 2010). Therefore, at any price, cloud service providers face a difficult task letting their potential customers know how they develop tangible economic value in comparison to existing models of customers. Similarly, difficult is the job of determining the appropriate price points. This task needs to encompass the entire range of costs needed for the sustenance of a cloud service provider's service in the long term (including maintenance, capacity planning, upgrades, and the incorporation of new technology and many more), while

considering values that are less tangible like doing away with the uncertainty of building a firm's IT infrastructure when IT is not its key competency. Furthermore, the consumption patterns of customers need to be incorporated into the considerations of pricing. As is the case in numerous pricing programs like 'peak volume' and 'peak hour' that companies adopt, this consideration enables programs of cloud service pricing to give incentives to customers. It also comes up with appropriate values for the ability of a cloud service provider to avail elastic scalability that is in concordance to the changing needs of the customers.

The key complications of pricing for cloud service providers result from articulating all the value that the price captures, establishing what values clients will associate with purchasing the services rather than constructing the infrastructure themselves, as well as pricing the valleys and peaks of consumption. If, for instance, the top cites of e-commerce all move to the cloud, how will their providers of cloud service charge for the immense seasonal activity soars that goes along with retail sales? Currently, expensing versus capitalization is an issue that could possibly put downward pressure on any cloud computing pricing model. Many firms create annual IT capital expenditure based on based on the traditional costs of infrastructure for IT. Depending on the cloud service pricing model, cloud users and vendors need to comprehend how to evaluate choice expensing against capitalization (Liu, 2012).

Conclusion

Owing to the fact that the vision of information technology facilitated with the same reliability, scalability, and flexibility as service of a public utility takes hold, the implications are huge for consumers and businesses worldwide. In spite of current concerns about privacy, security, compliance, regulatory and legal issues, in addition to the primary need to make

transformations to the existent IT and corporate cultures, cloud computing is emergent as an exigent technological advancement globally. The current shift to cloud computing is bound to enable organizations to finally attain real agility in business in terms of IT, enabling nimbler responses to rapid changes in the market than is possible with in-house IT (Buyy, a 2011). A future shift to business processes that are based on cloud service would function to further enhance that agility, resulting in a more remarkable capacity to transform the productivity of enterprises (Fiore, 2011).

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