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A PATH FOR HORIZING YOUR INNOVATIVE WORK

CLOUD COMPUTING FOR AGENT-BASED URBAN TRANSPORTATION SYSTEMS

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Abstract: With the help of new technology and methology it has become possible to manage very large amount of sensing data and apply new integrated computing models to acquire information intelligence This paper elaborates how the Internet Consumer industry has innovated at rapid pace, explores how this .This paper offers a user oriented approach to the specification of requirement for the effective management of urban areas. This paper also explores how such an enterprise transformation has fundamentally changed the business scenario in the telecom industry.

Keywords: Real time Services; Data Center; Traffic Management; Core network.

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INTRODUCTION

This paper introduces internet based cloud computing services model, exploring the properties & deployment model in use today, as well as the challenges associated with cloud computing. In this paper we discussed the communication services in cloud (including way to access the cloud such as media control & API's) & the important of flexibility & scalability in a cloud based environments.

The cloud computing service model involves the Provision, by a service provider, of large pools of high performance computing resources and high-capacity storage devices that are shared among ends users as required. The service provider's offering may also requires a high speed network to provide structure.

The cloud computing service model involves the provision, by a service provider of large pools of high performance computing resources a high–capacity storage devices that are shared among end users as required [4]. There are many cloud service models, but generally, end users subscribing to the service have their data hosted by the service, and have computing resources allocated on demand from the pool. The service provider offering may also extend to the software applications required by the end user. To be successful, the cloud service model also requires a high-speed network to provide connection between the end user and the service provider's infrastructure.

There are many definitions of cloud computing, and discussion within the IT industry continues over the possible services that will be offered in the future,[2]. The broad scope of cloud computing is succinctly summarized in [5]:

In this paper, we present an overview of energy consumption in cloud computing and compare Internet. However, at any time, only a fixed number of instances of the software are permitted to be running per user. One example of software as a service is Google Docs [2]. When a user exclusively uses network- or internet based software services, the concept is similar to a B thin client [model, where each user's client computer functions primarily as a network terminal, performing input, output, and display tasks, while data are stored and processed on a central server. Thin clients were popular in office environments prior to the widespread use of PCs.

B. Storage as a Service

Through storage as a service, users can outsource their data storage requirements to the cloud [3]–[6].

All processing is performed on the user's PC, which may have only a solid state drive (e.g., flash-based solid-state storage), and the user's primary data storage is in the cloud. Data files may include documents, photographs, or videos.Files stored in the cloud can be accessed from any computer with an Internet connection at any time [5]. However, to make a modification to a file, it must first be downloaded, edited using the user's PC and then the modified file uploaded back to the cloud.

The cloud service provider ensures there is sufficient free space in the cloud and also manages the backup of data [5]. In addition, after a user uploads a file to the user can grant read and modification privileges to other users. One example of storage as a service is the Amazon Simple Storage service [3].

C. Processing as a Service

Processing as a service provides users with the resources of a powerful server for specific large computational tasks [2]–[6]. The majority of tasks which are not computationally demanding, are carried out on the user's PC. More demanding computing tasks are uploaded to the cloud, processed the results are returned to the user [6]. Similar to the storage service, the processing service can be accessed from any computer connected to computer connected to the Internet. One example of processing as a service is the Amazon Elastic Compute Cloud service [3].

Deployment Models

Deploying cloud computing can differ depending on requirements, and the following four deployment models have been identified, each with specific characteristic that support the needs of the services and users of the clouds in particular ways .

Private Cloud—The cloud infrastructure has been deployed, and is maintained and operated for a specific organization. The operation may be in-house or with a third party on the premises.

Community Cloud — The cloud infrastructure is shared among a number of organizations with similar interests and requirements.

This may help limit the capital expenditure costs for its establishment as the costs are shared among the organizations. The operation may be in-house or with a third party on the premises.

Public Cloud — The cloud infrastructure is available to the public on a commercial basis by a cloud service provider. This enables a consumer to develop and deploy a service in the cloud with very little financial outlay compared to the capital expenditure requirements normally associated with other deployment options.

Hybrid Cloud — The cloud infrastructure consists of a number of clouds of any type, but the clouds have the ability through their interfaces to allow data and/or applications to be moved from one cloud to another. This can be a combination of private

An example: user perspective for an urban environment

Urban management aims to respond effectively to the key political concerns of European cities today including the socio-economic and environmental impacts of climate change, deteriorating public health and biodiversity loss etc.

All of these urban impacts are associated with a dysfunctional urban model in which urban transportation systems, in the context of urban sprawl, generate excess greenhouse gas (GHG) emissions promoting climate change. Furthermore, motorized transportation as the prime generator of GHG emissions also degrades the environment in respect of noise and air quality, impacting adversely on human health. These political concerns arising from the direct socio-economic and environmental impacts of the drivers of change are fundamentally related at the urban level in the land-use-transport-environment nexus, in which the degree of compactness of the city determines the potential for public transportation solutions which in general offer multiple socio-economic and environmental benefits. Given the interrelated, interconnected and complex nature of drivers and impacts in the urban environment, policy integration and integrated urban governance are viewed as the "sine quanon" of effective responses. Urban governance is thereby promoted via integrated approaches to territorial impact assessment, policy formulation and policy implementation.

Despite these aspirations for the development of integrated approaches, the reality approaches, the reality remains that urban intelligence at the local level is generally poorly developed in the critical areas of territorial impact assessment and urban planning. Agencies addressing the management of urban regions have a critical need to integrate large sets of data across the sectoral domains of land-use, transport, health, etc. in order to respond to the political demands for sustainable cities, but this is rarely achieved effectively. Furthermore, the complexities surrounding data integration to secure reliable intelligence increase further when the typical framework conditions for interagency collaboration on territorial planning issues requires intercity or intra-regional comparisons and assessments. Failure to secure policy integration can be attributed to a variety of factors including notably organizational and procedural barriers associated with the sectoral responsibilities for land-use, transport and environment, primarily in a horizontal perspective at the local level, and in a vertical perspective between government agencies responsible for policy development from local, to regional, national and EU levels.

III .BENIFITS AND CHALLENGES

BENEFITS

The following are some of the possible benefits for those who offer cloud computing-based services and applications:

Cost Savings — Companies can reduce their capital expenditures and use operational expenditures for increasing their computing capabilities. This is a lower barrier to entry and also requires fewer in-house IT resources to provide system support.

Scalability/Flexibility — Companies can start with a small deployment and grow to a large deployment fairly rapidly, and then scale back if necessary. Also the flexibility of cloud computing allows companies to use extra resources at peak times, enabling them to satisfy consumer demands.

Reliability — Services using multiple redundant sites can support business continuity and disaster recovery. Maintenance — Cloud service providers do the system maintenance, and access is through APIs that do not require application installations onto PCs, thus further reducing maintenance requirements.

Mobile Accessible — Mobile workers have increased productivity due to systems accessible in an infrastructure available from anywhere

CHALLENGES

The following are some of the notable challenges associated with cloud computing, and although some of these may cause a slowdown when delivering more services in the cloud, most also can provide opportunities, if resolved with due care and attention in the planning stages.

Security and Privacy— Perhaps two of the more “hot button” issues surrounding cloud computing relate to storing and securing data, and monitoring the use of the cloud by the service providers. These issues are generally attributed to slowing the deployment of cloud services. These challenges can be addressed, for example, by storing the information internal to the organization, but allowing it to be used in the cloud. For this to occur, though, the security mechanisms between organization and the cloud need to be robust and a Hybrid cloud could support such a deployment.

Lack of Standards — Clouds have documented interfaces; however, no standards are associated with these, and thus it is unlikely that most clouds will be interoperable. The Open Grid Forum is developing an Open Cloud Computing Interface to resolve this issue and the Open Cloud Consortium is working on cloud computing standards and practices. The findings of these groups will need to mature, but it is not known whether they will address the needs of the people deploying the services and the specific interfaces these services need. However, keeping up to date on the latest standards as they evolve will allow them to be leveraged, if applicable.

Continuously Evolving — User requirements are continuously evolving, as are the requirements for interfaces, networking, and storage. This means that a "cloud," especially a public one, does not remain static and is also continuously evolving.

Compliance Concerns — The Sarbanes- Oxley Act (SOX) in the US and Data Protection directives in the EU are just two among many compliance issues affecting cloud computing, based on the type of data and application for which the cloud is being is being used. The EU has a legislative backing for data protection across all member states, but in the US data protection is different and can vary from state to state. As with security and privacy mentioned previously, these typically result in Hybrid cloud deployment with one cloud storing the data internal to the organization

IV. THE FUTURE OF CLOUD COMPUTING

The analysis in previous sections was based on state-of the-art technology in 2010. In recent years, there have been continuous improvements in the energy efficiency of equipment as new generations of technology come on line. This has led to exponential improvements over time in the energy efficiency of servers, storage equipment as well as routers and switches. It is reasonable to expect that future generations of transport and computing equipment will continue to achieve improvements in terms of energy efficiency, largely due to improvements in complementary metal–oxide–semiconductor (CMOS) integrated circuit technology. In this section, we utilize estimates of efficiency gains in technology over time to forecast energy consumption of cloud computing in the future. We also discuss future directions for cloud computing and provide guidelines for how cloud computing can be made as energy efficient as possible.

A. Forecasts of Equipment Energy Consumption

In a commercial environment, especially a data center, many factors dictate the technology in use. Prime objectives are to maximize the delivery of services and hence revenue, at the same time minimizing the costs of support and maintenance, rack space, head load, and power consumption. It is common practice to periodically replace lower performing or high maintenance equipment with state-of-the-art equipment. User equipment in contrast tends to be retained for longer periods and its evolution in the medium-term future is difficult to predict. Our forecasts focus on the energy consumption of the network, servers, and storage and do not consider future generations of user equipment.

B. Storage as a Service

We now forecast the per-user energy consumption of storage as a service. The cloud storage service stores on average 20 active files per user with an unchanging average file size of 1.25 MB. The per-user per-file download rate is one download per hour. The total per-user power consumption trend for such a public or private cloud storage service over the years 2009–2020. For reference, included in the power consumption of a modern laptop HDD (2:500 HDD) in 2009. At one download per hour 2 for the public cloud service and the private cloud service that the energy consumption of transport dominates total power consumption. Improvements in technology should lead to a factor of 10 improvements over time for both types of services.

However, as previously noted, the absolute energy savings from the service are small and there are better opportunities for large energy savings elsewhere.

C. Software as a Service

Our power consumption forecast of software as a service considers public and private cloud software services with 20 and 200 users per server. The power consumption of the software services includes the power consumed by servers, storage, transport, and the user terminal. The user terminal is built using 2009 technology and its estimated power consumption is also included. Although it is reasonable to expect user terminals to become more energy efficient in the future, in this analysis, we focus on net gains that will be achieved through improvements in server and transport equipment.

D. Processing as a Service

To service, we again consider a processing service used for computationally intensive tasks; in this case, the encoding of 2.5 h of video material 0.55 times per week. The total per-user per-week energy consumption trends of such public and private cloud processing services for the years 2009–2020. The total energy consumption includes the energy required to perform common office tasks on a low-end laptop dating from 2009. As with software as a service, we keep the power consumption of the user equipment constant because, in this analysis, we focus on net gains that will be achieved through improvements in cloud computing equipment (servers and transport).The per-week energy consumption of a modern low-end laptop used 40 h/week and periods of high demand. However, energy-efficient transport between these data centers is necessary to ensure that cloud computing is energy efficient In our analysis, public clouds consumed more energy than private clouds because users connected to the public cloud through the public Internet. Specifically, the large number of router hops required to traverse the public Internet greatly increases the energy consumption in transport. Optical bypass can be used to reduce the number of router hops through the network and thus the energy consumption in transport. To minimize the energy consumption in transport, cloud computing data centers should be connected through dedicated point-to-point links incorporating optical bypass where possible. Indeed, reducing the number hops and transmission links would yield benefits to all services.

V. **CONCLUSIONS**

In this paper, we have argued that the integration of fragmented environmental information can result in better environmental monitoring in order to mitigate various environmental challenges such as issues related to climate change. Furthermore, we argued that cloud computing can play a major role in achieving environmental information integration by providing on-demand processing and storage capabilities. Our urban management based example assists in identifying a generic set of technical capabilities for information intelligence and proposes a layered architecture for IEMS using different cloud based implementation scenarios. However, based on our preliminary assessment we argue that it is not a simple matter to develop integrated intelligence to its full potential as a result of certain technological challenges. These challenges require rigorous investigation in future research in realizing the true potential of the proposed cloud based architecture for integrated information intelligence and decision making in environmental domain.

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