Review of Cloud Computing and Its Application

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ABSTRACT

Cloud computing is a technology that uses the internet and central remote servers to maintain data and applications. The practical application of Virtualization through various Cloud Computing Services is growing. From Medical Research to Agriculture, various approaches through Cloud Computing Services have been made by different companies.

In this paper we focus on various application of cloud computing in various fields such as health care system, agriculture field, Research field, health care system, Human resource management system. The paper also focuses on the intelligent manipulation of activities using the Context-aware Activity Manipulation Engine (CAME), core of the Human Activity Recognition Engine (HARE). The activities are recognized using video-based, wearable sensor-based and location-based activity recognition engine.

1. Introduction

The cloud can be described as on-demand computing, for anyone with a network connection. Access to applications and data anywhere, anytime, from any device is the potential outcome. The consumer-level cloud is a good starting point for this - sites like Facebook act as digital repositories for data and we can access this data from any internet-enabled device, from our iPhones to our desktop computers. [1]

Cloud Computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand, like the electricity grid.[2] Cloud computing is a paradigm shift following the shift from mainframe to client-server in the early 1980s.In this paper we are going to monitor various application of cloud computing. There are many types of application of the cloud computing according to their types. There are different types of cloud computing [2]

- Infrastructure as a service (IaaS),
- Platform as a service (PaaS),
- Software as a service (SaaS)
- Storage as a service (STaaS)
- Security as a service (SECaaS)
- Data as a service (DaaS)
- Business process as a service (BPaaS)
- Test environment as a service (TEaaS)
- Desktop as a service (DaaS)
- API as a service (APIaaS)

Cloud applications are on-demand software solutions that are designed for enterprises, SMBs, and consumers. They are typically called Software-as-a-Service (SaaS) and include many of the same applications found in the traditional software market but are designed for muti-tenant use and run on an infrastructure cloud environment.[6]Unlike many traditional software products,

clouds applications are subscription based and are updated and maintained.[6]Additional cloud based applications for developers are located under Platforms and software for Infrastructure Operations & Security is located under Compute & Storage.

Health monitoring system using cloud computing monitor human health and provide life care services. [7]WSNs are deployed in home environments for monitoring and collecting raw data. The software architecture is built to gain data efficiently and precisely. Sensed data is uploaded to Clouds using a fast and scalable sensor data dissemination mechanism.

In the HR workplace today there are many benefits to using cloud computing applications.[8]The average corporation uses a ratio of one human resource professional to every one hundred employees and considering that many corporations are either international or perhaps dispersed across a large country, HR teams are often not all based in the same place. Additionally many people now work remotely, a perk often given by companies to appeal to those wishing to avoid a long commute, or who don't want to place young children in daycare.

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2. RELATED WORK

Cloud computing [1] is a general term for anything that involves delivering hosted services over the Internet. These services are broadly divided into three categories Infrastructure-as-a- Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). The name cloud computing was inspired by the cloud symbol that's often used to represent the Internet in flow charts and diagrams.

Commercially available software Activities that are managed from central locations rather than at each customer's site, enabling customers to access applications remotely via the Web Application delivery that typically is closer to a one-to-many model (single instance, multi-tenant architecture) than to a one-to-one model, including architecture, pricing, partnering, and management characteristics Centralized feature updating, which obviates the need for downloadable patches and upgrades. [9]

In Cloud computing, customers do not own the infrastructure they are using; they basically rent it, or pay as they use it. One of the major selling points of cloud computing is lower costs. [9]Companies will have lower technology-based capital expenditures, which should enable companies to focus their money on delivering the goods and services that they specialize in. [9] There will be more devices and location independence, enabling users to access systems no matter where they are located or what kind of device they are using. The sharing of costs and resources amongst so many users will also allow for efficiencies and cost savings around things like performance, load balancing, and even locations.

Cloud Computing has become a scalable services consumption and delivery platform in the field of Services Computing. The technical foundations of Cloud Computing include Service-Oriented Architecture (SOA) and Virtualizations of hardware and software.[6]The goal of Cloud Computing is to share resources among the cloud service consumers, cloud partners, and cloud vendors in the cloud value chain. The resource sharing at various levels results in various cloud offerings such as infrastructure cloud (e.g. hardware, IT infrastructure management), software cloud (e.g. SaaS focusing on middleware as a service, or traditional CRM as a service), application cloud (e.g. Application as a Service, UML modeling tools as a service, social network as a service), and business cloud (e.g. business process as a service. [6]

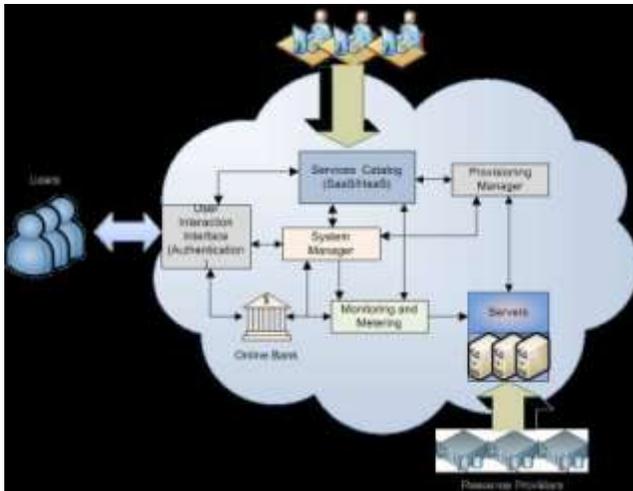The general architecture of Cloud computing is shown in Figure

Figure 3 General Architecture of Cloud Computing [2]

Cloud computing is broken down into three segments:

i.   Applications

ii. Platforms

iii. Infrastructure

Each segment serves a different purpose and offers different products for businesses and individuals around the world. [3]

3. Application of Cloud Computing

In the cloud computing definitions that are evolving, the services in the cloud are being provided by enterprises and accessed by others via the internet. The resources are accessed in this manner as a service - often on a subscription basis. The users of the services being offered often have very little knowledge of the technology being used. The users also have no control over the infrastructure that supports the technology they are using. [3]

Cloud computing fundamentally allows for a functional separation between the resources used and the user's computer. The computing resources may or may not reside outside the local network, for example in an internet connected datacenter. What is important to the individual user is that they 'simply work'. This

separation between the resources used and the user's computer also has allowed for the development of new business models.

All of the development and maintenance tasks involved in provisioning the application are performed by the service provider. [3] The user's computer may contain very little software or data (perhaps a minimal operating system and web browser only), serving as little more than a display terminal for processes occurring on a network of computers far away.

Backup and Cloud Computing: By paying a fixed monthly fee customers will can receive storage and bandwidth for backup and recovery. This is helpful for backing up any website or important data. [4]

Cloud Computing in Office: Cloud applications are becoming more common for usage in the office like DaaS (Desktop as a Service) or SaaS. Cloud Computing has opened the opportunity in reduction of licensing costs. [4]

E-Governance : Not all Government sectors are yet ready to deploy Cloud Computing, but several field trials and pilot projects are running to communicate a geographically difficult to reach area of a country with the capital.[4]

Cloud computing in agriculture: In agriculture, cloud services are increasingly being used on a highly available, virtual server system from external providers. Access is via a secure Internet connection via VPN client. [4]

Health care system

To provide robust healthcare services, recognition of patient daily life activities is required. Context information with real-time daily life activities can help in better services, service suggestions, and change in system behavior for better healthcare. Human health, profile, as well as activities are monitored and processed intelligently for better care with low cost.

In this paper, we focus on intelligent manipulation of activities using Context-aware Activity Manipulation Engine (CAME) core of Human Activity Recognition Engine (HARE), recognized using video-based, wearable sensor-based and location-based activity recognition engines for context analysis of the activities performed. The objective of CAME is to receive real-time low level activity information from Activity Recognition Engines and infer higher level activities, make situation analysis, and after intelligent processing of activities with their corresponding information take appropriate decisions.

To achieve this objective, two phase filtering technique for intelligent processing of information (represented in ontology) is used and appropriate decisions based on description logic rules (incorporating expert knowledge). The experimental results for intelligent processing of activity information showed relatively good accuracy.

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To access data on the Cloud, the user must authenticate and granted access permissions. In sensor-based approach, a gyroscope and accelerometer supported sensor is attached to human body. By using gyroscope and accelerometer data, an activity is predicted based on Semi Markov Conditional Random Fields. Detected activities could be simple (e.g. sitting, standing, and falling down) or more complicated (e.g. eating, reading, teeth brushing, and exercising). [7]

Health Monitoring system using cloud computing has the following advantages compared to the existing system, such as the use of voice over IP Service (*VOIP*) through which the patients can communicate with the doctor in case of emergency, this helps the doctor to better diagnose the health condition of the patients.[7]

A temperature sensor is fixed in patient living room to monitor the room temperature of the room and an alarm is raised when the temperature exceeds or drops low than the normal room temperature. [7]The use of Eye OS cloud environment enables efficient access to the cloud and managing the patient health data is effective compared to the existing system, this provides easy access to the cloud from anywhere in the globe. Proposed system uses 16F877A KIT through which various sensor devices are connected; this reduces the complexity for the patient to go to the hospital to check their heart beat rate and health condition. [7]

Research Field

From backing up the working data to collaboration, anything has been much easier than before. Even few years ago, 5 years hard worked data loss was common due to physical damage or hard disk failure. Storage and Backup application provided by Cloud Computing automatically back up the data without manual intervention. [3]

Thus Cloud Computing has lot of usages and can be extended too. Still, several issues has not been solved (like privacy, security), that might need time to be solved. With more usage, the cost of Cloud Computing Services will be reduced as well. [5]

Modern HR Workplace

In the HR workplace today there are many benefits to using cloud computing applications. The average corporation uses a ratio of one human resource professional to every one hundred employees and considering that many corporations are either international or perhaps dispersed across a large country, HR teams are often not all based in the same place. [8]

Additionally many people now work remotely, a perk often given by companies to appeal to those wishing to avoid a long commute, or who don't want to place young children in daycare. Having employees work from home is also environmentally friendly, since it reduces the number of cars on the road; however, it can be very costly for businesses to set these employees up with their own hardware and software licenses and it can also be logistically difficult to service both hardware and software when an employee is not situated in an office, with an in-house IT support team available. [8]This, of course, leads to one of the main benefits of using cloud computing applications.

They negate the need for costly hardware that can host a large software application an IT support team software licenses, and software installation, period; the cloud can be accessed from anywhere, anytime.

Furthermore, the HR department typically deals with sensitive information; having this information securely stored on a remote server reduces concerns about loss of information, should the company experience a breach of security or damage from fire, water or a natural disaster. Cloud computing application providers also back up information, just in case anything should happen to it on their end, and take care of upgrades.

However, the primary concern expressed about cloud applications is the security of information. All internal and external entry points are protected with reinforced steel doors and door frames, safety glass and walls. Video recording of all entry points is archived for a year. There are also glass-breakage sensors, visual alarms and audible alarms to alert staff in the event of a break-in attempt. The multiple benefits of cloud computing applications have proven that they are the way of the future for company's technical needs. In dealing with the modern business world, there is no more effective way of sharing information in a secure, technological and cost-effective manner.

Conclusion

Cloud computing is the latest technology which is becoming so popular due to its uses. Cloud computing is an upgrading technology due to its application in various fields like human manipulation, research field, modern HR workplace, agriculture field & many other application. Cloud computing is the upgrading technology& in the future it is becoming so popular. cloud systems are virtualized there are a number of natural advantages such as backups are much easier to create and the risk associated with hardware failure is minimized. Health monitoring system using cloud computing monitor human health and shares this information among doctors, from the Cloud to provide low- cost and high-quality care to users. Cloud computing is popular because of its security .many customer believes that cloud storage is completely safe.

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