A STUDY ON ENERGY EFFICIENT INTEGRATED CLOUD AND WSN ARCHITECTURE USING LOAD BALANCING MECHANISM

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Abstract – Emerging Wireless Sensor Networks-Cloud Computing based networks will offer substantive choice in delivery and opportunities for building better system. Wireless sensor network is the domain of embedded system that can sense the objects, capture the detail and forward to the next hop. Cloud computing is another technology that gives seamless service to the operator and customers. It is application oriented network and designed for small scale to Enterprise networks.

This research based proposal is intent to collaborate the inter-domain non-diversity networks that guides planned actions. The objective of the research work is to reduce the power consumption from the desired path as a function of Load Balancing. It is observed in many cases, change of multi-domain would impact the connectivity; Load balancing algorithm is the solution to a problem and sending the updated path to the parental node in the network. The proposed algorithm has supported capabilities to offload traffic to the cloud systems. In this heterogeneous system taken together related to business corporations and Load Balancing Algorithm is applied for managing this system which are separated from preconception like interference, power consumption and high latency in the system. This system resolve problem and decomposing the sensor networks into cloud based environment. This proposed system can not only making the sensor networks more friendly but also improve power consumption and is used in mission critical applications.

Keywords- wireless sensor network, load balancing

INTRODUCTION

Instead of all the computer hardware and software you're using sitting on your desktop, or somewhere inside your company's network, it's provided for you as a service by another company and accessed over the Internet, usually in a completely seamless way. Exactly where the hardware and software is located and how it all works doesn't matter to you, the user—it's just somewhere up in the nebulous "cloud" that the Internet represents.

Cloud computing is a buzzword that means different things to different people. For some, it's just another way of describing IT (information technology) "outsourcing"; others use it to mean any computing service provided over the Internet or a similar network; and some define it as any bought-in computer service you use that sits outside your firewall. However we define cloud computing, there's no doubt it makes most sense when we stop talking about abstract definitions and look at some simple, real examples—so let's do just that.

What makes cloud computing different?

It's Managed- In this the service is provided by someone else and can be managed by someone else.

- It's ON Demand- Cloud services are available on-demand and often bought on a "pay-as-you go" or subscription basis. So you typically buy cloud computing the same way you'd buy electricity, telephone services, or Internet access from a utility company. Sometimes cloud computing is free or paid-for in other ways

Types of cloud computing

IT people talk about three different kinds of cloud computing, where different services are being provided for you. Note that there's a certain amount of vagueness about how these things are defined and some overlap between them.

- Infrastructure as a Service (IaaS) means you're buying access to raw computing hardware over the Net, such as servers or storage. Since you buy what you need and pay-as-you-go, this is often referred to as utility computing. Ordinary web hosting is a simple example of IaaS: you pay a monthly subscription or a per-megabyte/gigabyte fee to have a hosting company serve up files for your website from their servers.
- Software as a Service (SaaS) means you use a complete application running on someone else's system. Web-based email and Google Documents are perhaps the best-known examples. Zoho is another well-known SaaS provider offering a variety of office applications online.
- Platform as a Service (PaaS) means you develop applications using Web-based tools so they run on systems software and hardware provided by another company. So, for example, you might develop your own ecommerce website but have the whole thing, including the shopping cart, checkout, and payment mechanism running on a merchant's server. App Cloud (from salesforce.com) and the Google App Engine are examples of PaaS

WIRELESS SENSOR NETWORKS

Wireless Sensor Networks (WSNs) enjoy great benefits due to their low-cost, small-scale factor, smart sensor nodes. Not only can they be employed in cumbersome and dangerous areas of interest, for monitoring or controlling the region, but they can also be deployed to automate mundane tasks. Early sensory units were expensive and lacked the computational and communicational capabilities of current smart sensor nodes, which can now sense, process, store, and forward data, all being powered by a battery.

LITERATURE REVIEW

Oana Chenaru, Grigore Stamatescu, Iulia Stamatescu, Dan Popescu [3], has proposed cloud integration solution implements restful services at a coordinator node level of the WSN, allowing the implementation of a scalable and more performing communication infrastructure. The overall system allows functionality for visualization, data storage and processing and distributed algorithms that can run across heterogeneous multi-level monitoring and control systems.

Bhale Pradeepkumar Gajendra, Vinay Kumar Singh, More Sujeet[6] Cloud computing offers many cloud services for individual users and many small and large companies. Users use cloud services in many forms such as form of software, platform and form of infrastructure. The important issue of cloud computing is security of data in cloud storage. The public key is implemented in the paper as private key known only the owner of data. Encryption is done by cloud provider using public key and the decryption process is done by cloud user using private key.

Peng Zhang, Zheng Yan, Hanlin Sun[2] , proposes a novel architecture based on cloud computing for wireless sensor network, which can improve the performance of WSN. Based on this architecture, a cloud acts as a virtual sink with many sink points that collect sensing data from sensors. Each sink point is responsible for collecting data from the sensors within a zone. Sensing data are stored and processed in distributed manner in cloud. All WSNs in zones are integrated together by the cloud. Sensing data in cloud are stored and processed in distributed manner.

Dzmitry Kliazovich et al. [7] presented a simulation environment for energy-aware cloud computing data centers. Authors have implemented the data centres on Green Cloud simulator. Green Cloud is designed to capture details of the energy consumed by data center components as well as packet-level communication patterns between them. The simulation results obtained for two-tier, three-tier, and three-tier high-speed

ArchanaThange, et. al. [10] has discussed the issues of Radio frequency identification (RFID)that maintains the security and privacy of system. the authors proposed approach moved to cloud, preserves the privacy of tag and reader holders. It makes the database more secure. cloud based RFID authentication scheme readers anonymously access the cloud through wireless or wired connections. An encrypted hash table stores the client's secrets in encrypted form so that secrets should not be easily revealed to the cloud. It prevents private user data from leaking to malicious cloud provider.

Akanksha Aggrawal et al. [1] had gathered the data of WSN but has limitations in terms of storage and processing power. On the other hand cloud computing does not have any restriction in terms of storage and processing power. So if the advantages of both the technologies are considered, then the WSN-CC integration can figure out many problems. One such issue was that the type of WSN considered in Data filtering in WSN using neural networks was homogeneous whereas the heterogeneous networks can also be considered for monitoring different type of applications. Further the encryption details presented in this paper was limited to only some sensitive data thus makes it an open area for exploration. For task mapping and scheduling authors have applied the ECO Maps algorithm for only one hop clustered homogeneous WSN however, its applicability over multi hop heterogeneous.

Table 1: Brief overview of this literature survey

Sno.	Authors	Research gaps

1.	Oana Chenaru, Grigore Stamatescu, Iulia Stamatescu, Dan Popescu	Existing system work upon the distributed system but control information not being utilized by the coordinator.
2.	Bhale Pradeepkumar Gajendra, Vinay Kumar Singh, More Sujeet	Previous approach provide the authentication mechanism and issues related to routing overhead decreases but delay metric is highest in the paper.
3.	Akanksha Agrawal, Sakshi Kaushal	Improved storage and processing power in existing system but fail to apply heterogeneous approach
4.	Peng Zhang, Zheng Yan, Hanlin Sun	Introduced novel architecture that has improved the performance of wireless sensor networks. Sink node send data directly to cloud but unfortunately the processing power of the system increases.

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