

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015

An Envoy Based Scheme for Metropolitan Portage on Cloud

B. Deepthi Reddy¹, R. Navya Sree², S. Divya³

Assistant Professor, Department of Information Technology, JBIET, Hyderabad, Telangana, India¹

Assistant Professor, Department of Information Technology, JBIET, Hyderabad, Telangana, India²

Assistant Professor, Department of Information Technology, JBIET, Hyderabad, Telangana, India³

ABSTRACT: Envoy-based traffic management systems can use the self rule, portability, and competency of mobile agents to deal with dynamic traffic environments. Cloud computing can help such systems cope with the large amounts of storage and computing resources required to effectively use of traffic strategy envoys and huge portage data. With the help of new technology and methodology it has become possible to manage very large amount of sensing data and apply new integrated computing models to acquire information intelligence. An intelligent traffic cloud could provide services such as decision support, a standard development environment for traffic management strategy, and so on. Moreover, the cloud can generate, store, manage, test, optimize, and use mobile traffic strategy envoys to maximize advantages of cloud computing and envoy technology effectively control and manage metropolitan traffic systems.

KEYWORDS: Intelligent traffic cloud, mobile agent technology, cloud computing, metropolitan transportation system.

I. INTRODUCTION

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 provides structure. This paper announces internet based cloud computing services model, exploring the properties & deployment model in Use today, aswellas the challenges associated with cloud computing. In this paper we discussed the communication services in cloud & the important of portability & scalability in a cloud based environments.

With mobile agent technology, an metropolitan-traffic management system based on Envoy-Based Distributed and Adaptive Platforms for Transportation Systems (Adapts) is both feasible and effective. However, the large-scale use of mobile agents will lead to the emergence of a complex, powerful organization layer that requires enormous computing and power resources. To deal with this problem, we propose a prototype metropolitan-traffic management system using intelligent traffic clouds. Intelligent transportation clouds could provide services such as decision support , a standard development environment for traffic management Strategies.

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.

In the traffic environment there are many states, an urban traffic management system must provide an appropriate traffic strategy agents. The requirements for the complete traffic management system are guidance, monitoring, emergency subsystems and traffic control. Hence to handle all this, new performance improvement traffic strategy environment, and addition of new subsystem, new traffic strategies is introduced continuously. Recent technology used by the urban traffic management systems to communicate with the traffic managers is decision support system and also uses large number of mobile agents to generate, store, manage, test, optimize. An inevitable trend in the development

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015

of urban traffic management system with a friendly human –computer interface is the powerful decision support system. Thus, future systems must have the following capabilities.

1. Storage
2. Computing Power
3. Network Bandwidth

Using Cloud computing technologies for addressing the challenges in agent based urban traffic management is cost efficient and effective method. But managing the resources in cloud for the specific requirements of metropolitan traffic management is not addressed in previous work

II. ARCHITECTURE

An intelligent traffic clouds have four architecture layers:

1. Application Layer
2. Platform Layer
3. Unified source Layer
4. Fabric Layer

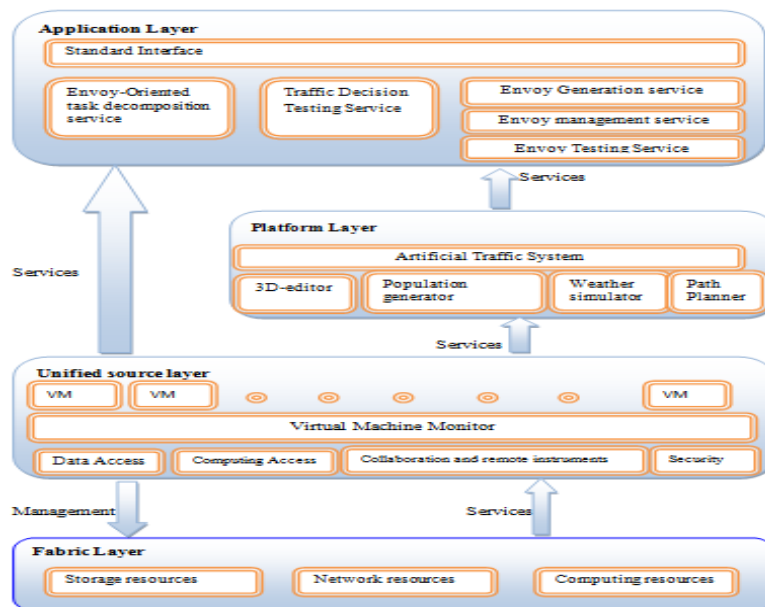


Fig.1: Architecture

Figure 1. specifies the relationship between the layers and the functionality of each layer

Application Layer: It contains all applications that run in clouds. It supports application such as envoy generation, envoy management, envoy testing, envoy orientation task decomposition and traffic decomposition support. The cloud provides all services to customers through standard interface.

Platform Layer: It is made up of envoy testing service, which provides platform as a service. This layer contains population generator, weather simulator, path planner, 3D-editor to provide services to upper traffic applications and envoy development.

Unified Source Layer: It controls the hardware level resources in the fabric layer to provide infrastructure as a service, it uses virtual machines to hide the physical characteristics of resources to ensure the safety of data and appliances.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015

Fabric Layer: It contains hardware resources such as storage, computing and network. The intelligent traffic clouds use these distributed resources to serve the peak demand of metropolitan traffic management systems, supports the running of envoy's and envoy testing services, and efficiently stores the traffic strategy and the performance.

III. RELATED WORK

A number of envoy-based applications have already been reported in the literature. These applications propose and investigate different envoy-based approaches in various traffic and transportation related areas.

The research results clearly demonstrate the potential of using agent technology to improve the performance of traffic and transportation systems. Most agent based applications, however, focus on modeling and simulation.

Few real-world applications are implemented and deployed. In general, the design, implementation, and application of agent based approaches in the area of traffic and transportation are still immature and need to be further studied. The integration of new technologies, such as mobile agent technology, should be considered to enhance the flexibility of systems and the ability to deal with uncertainty in dynamic environments.

Monitoring:

Virtualization brings to Clouds is the potential difficulty in fine-control over the monitoring of resources. Although many Grids (such as Tera Grid) also enforce restrictions on what kind of sensors or long-running services a user can launch, Cloud monitoring is not as straightforward as in Grids, because Grids in general have a different trust model in which users via their identity delegation can access and browse resources at different Grid sites, and Grid resources are not highly abstracted and virtualized as in Clouds.

Provenance:

Provenance refers to the derivation history of a data product, including all the data sources, intermediate data products, and the procedures that were applied to produce the data product. Provenance information is vital in understanding, discovering, validating, and sharing a certain data product as well as the applications and programs used to derive it.

Security Model:

Clouds mostly comprise dedicated data centers belonging to the same organization, and within each data centre, hardware and software configurations, and supporting platforms are in general more homogeneous as compared with those in Grid environments. Interoperability can become a serious issue for cross-data centre, cross-administration domain interactions, imagine running your accounting service in Amazon EC2 while your other business operations on Google infrastructure. Grids however build on the assumption that resources are heterogeneous and dynamic, and each Grid site may have its own administration domain and operation autonomy. Cloud infrastructure typically rely on Web forms (over SSL) to create and manage account information for end-users, and allows users to reset their passwords and receive new passwords via Emails in an unsafe and unencrypted communication. Note that new users could use Clouds relatively easily and almost instantly, with a credit card and/or email address.

IV. PROPOSED SYSTEM

Proposed solution for envoy resource management for cloud computing is based on distributed cloud service. Our solution consist of following components

1. Sensor Data Routing Engine
2. Envoy scheduler
3. Multiple cloud interfaces
4. Physical traffic sensors.

Physical traffic sensors capture traffic data using their functional components and send data to the data routing engine on the wireless link interfaces, which is essentially a proxy forwarding the sensor feed to the cloud VM for processing by the traffic agents and to Sensor Data routing engine is a lightweight component send the sensor feed statistics to the Envoy scheduler which runs in cloud to decide on agent scheduling and routing of sensor feed. Envoy Scheduler is the

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015

important component in our architecture which takes care of scheduling the agents in terms of number of agents and agent location depending on the QOS feedback collected from the cloud brokers and the sensor feed stats. Envoy Scheduler will decide the scheduling logic based on the demand supply collected from sensor feed stats and the QOS feedback.

Two ways of load balancing will be implemented in our solution short term and long term. Based on the response time of the agents, short term load balancing will be done to increase the agents to handle the traffic data from a particular region. Long term load balancing is based on prediction of traffic data load from the sensors,. By using this proposed scheduling method the response time is always under control and the resource is consumed according to demand without causing wastage. Wastage is also an important factor because many cloud providers charge the users in terms of number of VM used and by reducing the wastage, cost saving is achieved.

V. CLOUD BALANCING

The shifting of load is automated to enable organizations to configure clouds and cloud balancing and then turn their attention to other issues, trusting that the infrastructure will perform as designed.

The Global Server Load Balancing (GSLB) and global DNS functionality have been in place for a very long time is given the correct architecture, also valid in cloud balancing. The point of both is to present a unified DNS for a variety of locations and determine the best place from which to serve an application when a customer connects.

Configuring GSLB and global DNS to direct traffic to available installations based upon the organization's criteria and the state of the application permits routing to the geographically closest data centre or, if it is down, to an alternate data centre, all from the same URL.

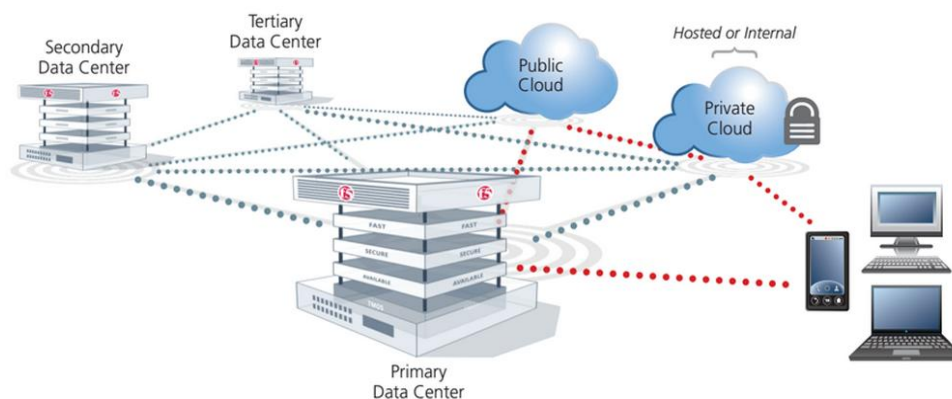


Fig.2: Cloud Balancing

Cloud balancing uses a global application delivery solution to determine, on a per user or customer basis, the best location from which to deliver an application. The decision-making process should include traditional GSLB parameters such as:

- Application response time.
- User location.
- Availability of the application at a given implementation location.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015

- Time of day.
- Current and total capacity of the data center or cloud computing environment in which the application is deployed.

VI. SERVICES

With regard to services, at the present time, the concept of cloud computing involves the provision of the following types of services to its users.

Everything As A Service:

This type of service is provided to all users of the software and hardware to control the business processes, including the interaction between users, the user only needs to have access to the Internet.

Software As A Service:

It is far and away the most common model of cloud service: Companies buy access to an application but have no responsibility for (and no control over) its implementation. More than 60% of companies that Numerates works with already use at least one application that they get via SaaS, ranging from horizontally useful tools such as customer relationship management to more vertically specific tools for such tasks as insurance claims adjustment, classroom scheduling and medical billing management.

Platform As A Service:

It involves providing a platform on which a customer can run its own applications. For example small company might have a Java application to which it has trouble providing enough resources during holiday peak loads. The company might go to a platform provider, such as Akamai, to run the system on its Java application server framework. Microsoft, Force.com and Google also provide platforms on which customers can run applications.

Infrastructure As A Service:

It is a type of cloud computing platform wherein the customer organization outsources its IT infrastructure including storage, processing, networking, and other resources. Customers access these resources over the internet i.e. cloud computing platform, on a pay-per-use model.

Security As A Service:

This type of service enables users to quickly deploy, allowing products to ensure the safe use of Web technologies security of electronic communications, as well as the safety of the local system, which allows users of the service to save on deploying and maintaining their own security system.

VII. SIMULATION

The figure3 shows traffic in the cloud. Suppose there are multiple systems running on same cloud for ex: say T_1, T_2, T_3, T_4, T_5 are no. of systems and when T_1, T_2, T_3 are requesting the service to the cloud at the same time, then collision may occur as a result there will be a delay in response time.

In order to overcome the collision and delay in the response we model figure4 intelligent traffic clouds. Metropolitan traffic management systems based on cloud computing have two roles: service provider and customer. All the service providers such as the test bed of typical traffic scenes, Envoy Testing Service, traffic strategy database, and traffic strategy envoy database are all implied in the systems core: intelligent traffic clouds.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015



Fig3. Cloud Traffic

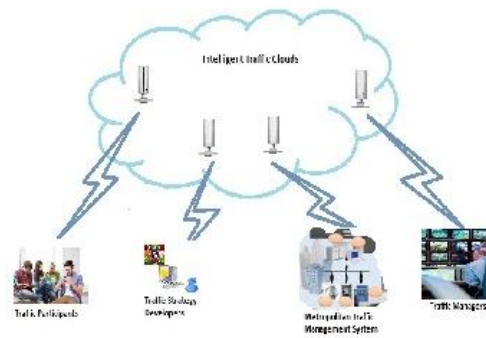


Fig4. Intelligent Traffic Clouds.

VIII. CONCLUSION

Metropolitan traffic management systems based on cloud computing. The intelligent traffic clouds could provide traffic strategy envoys and agent-distribution maps to the traffic management systems, traffic-strategy performance to the traffic-strategy developer, and the state of metropolitan traffic transportation and the effect of traffic decisions to the traffic managers. It could also deal with different customer's requests for services such as storage service for traffic data and strategies, mobile traffic-strategy agents, and so on. With the development of intelligent traffic clouds, numerous traffic management systems could connect and share the clouds infinite capability, thus saving resources, time and costs.

REFERENCES

- [1]. Heena Kousar, Dr. B. R. Prasad Babu "Resource Allocation Algorithms in Cloud Computing for Agent Based Traffic Management", in International Journal of Advanced Research in Computer Science and Software Engineering, Volume 5, Issue 1, ISSN: 2277 128X, January 2015.
- [2]. Ramlalit et al, Pankaj Kumar Singh, Ashutosh kumar "Cloud Computing for Agent-Based Urban Transportation Systems " in International Journal of Computer Science and Information Technologies, Vol. 3, Issue 6, 5508-5511, 2012.
- [3]. Saleha Ansari, Lovina Hajirawala, Krishnali Pawar, Rajesh Kolte "Android Application For Agent Based Urban Transportation System Using Cloud Computing" in Proceedings of 4th IRF International Cochin, India, ISBN: 978-93-82702-98-6, 19th April 2015.
- [4]. Zhenjiang Li and Cheng Chen "Cloud Computing for Agent-Based Urban Transportation Systems" IEEE Feb 2011.
- [5]. Mayanka Katyal, Atul Mishra, "A Comparative Study of Load Balancing Algorithms in Cloud Computing Environment" an Article accessed online.
- [6]. Sotomayor. B., Montero, R. S. Llorente, I. M. & Foster, "Virtual infrastructure management in private and hybrid clouds", IEEE Internet Computing, 13(5), 14-22, 2009.
- [7]. Radojevic. B. & Zagar. M "Analysis of issues with load balancing algorithms in hosted (cloud) environments" In proceedings of 34th International Convention on MIPRO, IEEE, . 2011.
- [8]. D.D.D. Suri Babul, M. Chinna Rao² and K. Ravi Kumar, "Agent-Based Urban Transportation System Using Clouds", IJART, Vol.3, Issue 1, pp-35-42, August 2012.
- [9]. F.-Y. Wang and S. Tang, "Artificial Societies for Integrated and Sustainable Development of Metropolitan Systems," IEEE Intelligent Systems, vol. 19, no. 4, pp. 82-87, 2004.
- [10]. Manoj A Patil, Khyamling A. Parane, D. Rajesh, "Cloud Computing for Agent-based Traffic Management Systems," International Conference in Recent Trends in Information Technology and Computer Science (ICRTTCS – 2012).
- [11]. A. Weiss, "Computing in the clouds", net Worker, vol. 11, no. 4, pp. 16–25, 2007.
- [12]. F.-Y. Wang, "Toward a Revolution in Transportation Operations: AI for Complex Systems," IEEE Intelligent Systems, vol. 23, no. 6, 2008.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2015

BIOGRAPHY



B.Depthi Reddy, Assistant Professor, Department of Information Technology, J.B. Institute of Engineering and Technology, Moinabad, Telangana.



R.Navya Sree, Assistant Professor, Department of Information Technology, J.B. Institute of Engineering and Technology, Moinabad, Telangana.



S.Divya, Assistant Professor, Department of Information Technology, J.B. Institute of Engineering and Technology, Moinabad, Telangana.