



# TRINITY INSTITUTE OF PROFESSIONAL STUDIES

Dwarka, Sector-9, New Delhi

## TRINITY TECH REVIEW

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Dr. R.K. Tandon

# Review of VMWare's Distributed Resource Scheduler for Automated Anomaly Detection and Optimization in Cloud Computing

**Akhil Kumar**

## **Introduction**

There is an evolution happening in how organizations of all shapes and sizes consume business services. More and more, business services are being consumed from either public or private “clouds”. Experts Define Cloud Computing [1]: *“The ‘cloud’ model initially has focused on making the hardware layer consumable as on-demand compute and storage capacity. This is an important first step, but for companies to harness the power of the cloud, complete application infrastructure needs to be easily configured, deployed, dynamically-scaled and managed in these virtualized hardware environments.”*

In other words, there is a big difference between an application that runs on a cloud and an application that is actually “cloud aware” and can take advantage of the dynamic environment in which it exists. The challenge is that to be “cloud aware” an application must be able to scale well not just vertically but horizontally. This adds a whole new level of complexity because the

application now has to take into account cloud computing infrastructure elements,

such as cache, storage, network, bus, management, cost, etc.

Automated horizontal scaling of applications in a cloud computing environment is a complex problem. One fundamental road block is the inability of current monitoring/management systems to adequately capture the current state and predict the future state of an application and the cloud computing infrastructure in which it is running. Both are fundamental to automating the horizontal scaling of applications in the cloud. Today's monitoring/management tools generally rely on experts to configure thresholds manually on single data streams and then trigger an alert or workflow if the threshold is exceeded. This approach is woefully inadequate for managing large, dynamic systems, such as cloud computing applications and infrastructures. This has been widely recognized and the source of

numerous academic efforts, including IBM Research's autonomic computing initiative.

Attempts to overcome this roadblock and create an adequate picture of the current and likely future state of a cloud and thereby allow intelligent self-management have focused on advanced anomaly and machine learning techniques. Both techniques are important fields of research and have been treated within diverse areas. A lot of theoretical work has been done and there are many available components such as high performance message buses, real time data correlation engines, and efficient machine learning algorithms which can be leveraged to create functional solutions. Commercially, these components have already found themselves applied to advanced financial and medical analysis solutions.

One commercial product that stands out in the market as potential solution for automating the horizontal scaling of cloud applications is VMWare's vSphere Distributed Resource Scheduler (DRS) [2]. VMWare claims that DRS can, on a continuous basis, "intelligently allocate available (cloud) resources among virtual machines according to business needs." It does this by pre-defined resource allocation rules, predictive usage algorithms, continuous monitoring of physical and

virtual machine resource usage, and the triggering of automated administrative workflows. Although DRS is arguably the most sophisticated cloud optimization solution on the market today, its scope is very limited:

1) DRS is a VMware-only tool; 2) its purpose is to optimize the placement of VMs on a cluster and not optimize application performance; 3) it is not Service Level Objective (SLO) aware; 4) its workload optimization logic considers only CPU and RAM utilization metrics and not I/O or network latency which are critical to application-level performance. Each of these limitations rule out DRS as a tool for creating truly "cloud aware" applications capable of intelligently scaling horizontally and, thereby, of taking advantage of the one of the key benefits of cloud computing.

To begin to apply anomaly detection and machine learning techniques and systems in the context of creating "cloud aware" applications, we suggest the following basic design principles/requirements:

### **The Solution**

- Must automate the optimal horizontal scaling of stateless and stateful cloud applications in reference to pre-defined SLOs and other standard affinity, availability, and costing rules

- Must be able to detect, log and alert on anomalous patterns across multiple, real time, multivariate data streams.
- Must be (as much as possible) application and cloud agnostic.
- Must be able to respond quickly to workload spikes and scale back more slowly.
- Should use a modular control framework based on Model-Predict-Control (MPC) [3] principles that uses a model of the system and its current state to compute the (near) optimal sequence of actions of the system that maintain the desired constraints using short timelines and an iterative methodology.
- Reference signals to the control framework should be based on multi-dimensional workload calculations, including: CPU utilization, RAM utilization, I/O latency, and network latency. Should be able to add additional factors.
- The control framework should use Machine Learning (ML) [4] algorithms to automate system modeling to a) predict probability of an action will achieve desired SLOs and identify complex patterns.
- The control framework should have a loose-coupled event-driven architecture where all main modules are publishers or subscribers to a high performance message bus/event broker.
- The control framework should use a high performance Complex Event Processing (CEP) engine to aggregate and normalize multiple, real-time data streams.

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## Social Media Engagement and Addiction

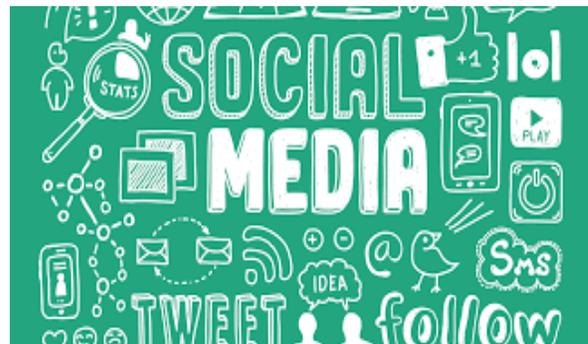
Chetan Rawat



Use of social media has evolved into a full-fledged and influential media channel that if used wisely can reap great rewards. For many people social media is the main use of the web. In the context of the average hour of internet use today, social accounts for 13 minutes whilst news is three minutes and email only two. Social media has also become an addiction. Often social media engagement and success is judged on superficial terms, celebrating so called ‘**Vanity Metrics**’ such as how many followers you have on Twitter. It is important to spend time generating original and thought provoking content and sharing expertise.

We treat teenagers with social anxiety and they use the social media sites to find validation and companionship missing in their real life or the physical world. With anxiety and depression, a teen with high stress may turn to social media to

decompress and then develop a pattern that becomes addictive. Also a teen with a limited social life is more at risk. It may seem counter intuitive, but people with poor social skills are more likely to jump online to socialize and meet friends only to feel more comfortable opening up online to become an unhealthy habit. Teens often use addictions as a psychological escape and social media becomes another way of achieving that goal.



**Facebook** is a free social networking website that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues. **Twitter** is a free microblogging service that allows registered members to broadcast short posts called tweets. Twitter members can broadcast tweets and follow other users. **Google+** is Google's social networking project,

designed to replicate the way people interact offline more closely than is the case in other social networking services. **LinkedIn** is a social networking site designed specifically for the business community. The goal of the site is to allow registered members to establish networks with people they know and trust professionally. **Reddit** is a social news website and forum where stories are socially curated and promoted by site members. **Pinterest** is a social curation website for sharing and categorizing images found online. It requires brief descriptions but the main focus of the site is visual.

Some signs which shows whether a person is addicted to social media or not :-

**Sign #1:** You check your mobile phone every few minutes for any notification on Facebook, Twitter mentions and such.

**Sign #2:** You think your world is over when you have no internet access or when Twitter, Facebook or other social media is down.

**Sign #3:** You assume other people can understand what you mean by your cool terms such as BRB ('Be right back'), CMI ('cannot make it'), LOL ('laugh out loud') and so on.

**Sign #4:** You have to check in at every new location to let everyone know where you are.

**Sign #5:** You literally announce to everyone on social media what you are doing every day, every hour. Things like having a lunch, found a penny, went shopping today and blah, blah, blah.

**Sign #6:** You tag your friends on pictures that do not involve them, in order to make sure they see the pictures on their Facebook timeline.

**Sign #7:** You start to #hashtag #about #everything #under #the sun.



**Sign #8:** You have made urgent requests on Facebook for your family and friends to send you 'lives' on Candy Crush. (As if your life depends on it.)

**Sign #9:** You believe life is more happening on social media than in reality.

**Sign #10:** You freak out if your pictures are not able to be uploaded onto Instagram or Facebook.

**Sign #11:** Words like 'Tweet', 'Insta', 'Pinned', 'Updates', 'Hashtags' suddenly has become part of your lingo.

**Sign #12:** You cannot live a day without social media; you need to travel with it, eat with it, sleep with it, or even using it while taking a dump.

**Sign #13:** You feel stressed for the entire day, if your ex-schoolmate, does not respond to your friend request.

**Sign #14:** You feel angry and mad when people in real life do not understand what you mean in 140 characters.

**Sign #15:** You feel proud when that cute picture of yours get a hundred likes on Facebook.

**Sign #16:** You secretly spend some of your work hours on social media.

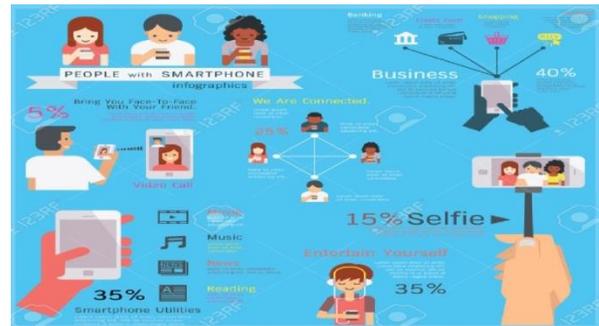
**Sign #17:** You feel upset when nobody comments on your updates in Facebook.

**Sign #18:** Social media has become part of your daily ritual; like sleeping and eating.

**Sign #19:** You would wake up in the middle of the night to check your social media for updates.

More importantly, all of the media related technologies associated with increase in multi-tasking is now commonly accessed with a single Internet-enabled mobile phone. As their name indicates, mobile phones are portable allowing trouble-free access to the Internet irrespective of time and place. Portability makes them the perfect medium for Internet addicts. social media present a large number of experiences from a psychological perspective, each with

potential that can result in problematic behavioral patterns. Others, with a narcissistic inclination, may find Instagram to be an addictive arena for them to present themselves to others with “selfies”. Another fuel for social media addiction may be social anxiety. The fear of missing out (FoMO) offers an explanation for frequent social media any time of day at the expense of other activities.



Social networks are massively addictive. Most people I know check and interact on social sites constantly throughout the day. And they have no idea how much actual time they spend on social media, there's a reason for that, Most of the major social network companies, as well as social content creators, are working hard every day to make their networks so addictive that you can't resist them. Social media is also often used for crowdsourcing.

# Impact of Internet Addiction on Academic Performance: A Study of Under Graduate Students

**Dr. Ritu Gandhi Arora**

Internet had brought revolutionary change worldwide. Every information is available on a single click of a button. Internet has delimited the world and made a man able to access every information anytime, anywhere. It is a well known fact that excess of everything is bad, same way excess use of internet has also become a problem, especially among the teenagers. The researcher in the present study has tried to establish the relationship between internet usage and academic performance among the undergraduate students of professional institutions. The under graduate students studying in different professional institutions of Faridabad city (Industrial Hub of Haryana and growing education city) has selected as population for study. The research was conducted on 150 students including girls and boys both. Results of the study clearly indicated that internet usage among the students has been rising very fast also have negative impact on their studies if using uncontrollably. The study also shows that internet usage pattern of boys are quite high in comparison to girls. It was found that average to high use of internet positively influenced the academic achievement while no use and extremely high usage had a negative impact on academic performance of the students.

## **Introduction**

The Internet is a system of interrelated computer networks that use the Standard Internet Protocol suit to serve billions of users worldwide, which consist of public, private, academic institutions-schools, colleges and business units. The main target of internet has always been the creation of connect and communication and no doubt internet has excelled beyond the expectations of the users. Any kind of information on any subject is available on the internet with a single click of a button. As per the available literature Students Vol 1 Issue 1 (Jan – March, 2015) Page 18 (irrespective of age group) are among the top users who surf internet for making notes, assignments, research and entertainment. The internet increasingly becomes part of our day to day lives resultant most of the students are becoming internet addicted and suffering with internet addiction disorder. This disorder has received much attention over a period of time. Internet addicted person withdraw itself from society and family. Their social relationships, academic or occupational functioning may go down.

Psychologists have identified several withdrawal Symptoms like depression, anxiety, confrontation, and belligerence along with various other addiction

syndromes. Researches mentioned that more than 60% of people seeking treatment for Internet Addiction Disorder (IAD) claimed their involvement with sexual activities online. More than half are also addicted to alcohol, drugs; tobacco etc. people who develop problems with their internet use may start using internet on casual basis. Many of the institutes have also started restricting use of internet in hostels during night hours. Rationale of the Study: Now days, students find that the internet and computers are necessities. They need internet and computers to do their projects as part of their assignments. They feel that If they don't have computer they will get behind in this information age, even children in lower grades need computer with an internet connection to search their assignments. After all, today's teens have literally grown up with the internet and what may be considered "too much time online." Internet addiction disorder is a general term used to describe and obsession with the online world in which a user spends an excessive amount of time engaged in computer related activities. These activities may include chatting with friends, web surfing, social networking via Facebook or Linked In, online shopping, and playing video games. Internet addiction disorder (IAD) is a condition where an individual compulsively and almost always on productivity uses the internet and finds any attempt to limit its use distressing.

No age group is unaffected to this addiction from teenage students to adults, can develop video game addictions. But it is more dangerous for teenagers, as they are not mature to understand the right and wrong of

it. It is much obvious that when the children will spend much time on internet and busy in uncreative activities, their academic achievement may be adversely affected. The investigator wants to determine the degree or extent to which internet addiction is common among college graduates so that it can be controlled to ensure their good academic performance. Secondly, the research on internet addiction in college students has remained mostly limited to developed countries but in developing countries particularly in India studies on internet addiction is not showing healthy sign.

### **Objective of the Study**

The researcher in the present study determine the impact of internet addiction on academic achievement of the college under graduate students. Research Methodology: The research methodology adopted for this study was descriptive and statistical in nature. The under graduate students of various professional colleges of Faridabad was taken as sample for conducting this study. A stratified random sampling design was applied to target population. The investigation was conducted on 150 boys and girls students from different colleges of Faridabad. To access the level of internet usage among students, The Young's Vol 1 Issue 1 (Jan – March, 2015) Page 19 Internet Addiction Test (YIAT), an instrument developed by Dr. Kimberly Young in 1998 was applied. The split half reliability of this tool is 0.859 and Cronbach's Alpha is 0.902. In order to determine the impact of internet on academic achievement of the students a self

administered questionnaire was used. To analyze data SPSS 17.0 version was used. The mean, standard deviation and T test were the required statistics to determine and to test the hypothesis.

### Analysis and Findings

The present study makes extensive use of primary data gathered through 150 undergraduate students (both boys and girls), studying in six professional colleges of Faridabad. The respondents were between 18- 21 years of age. Out of the total sample the respondents were found to be in the ratio of 43: 32 percent on gender basis i.e. the majority of the respondents were male.

The mean score of the internet usage pattern of male students is 46.54 and that of female is 26.99. Table 3: Comparison of Usage Pattern among on the basis of Gender

Gender	Number	Mean	S.D	t value	Sig. value
Male	86	46.54	27.08	5.967	0.01
Female	54	26.99	29.13		

The Standard Deviation score of boys is 27.08 which is more than the S.D of girls i.e. 29.13. t values is 5.967 which is significant at 0.05 and 0.01 level. As per the results internet usage pattern of boys is quite higher than girl students. Results clearly show that boys are more addicted to internet than girls or the boys may have more access to internet facility. Impact of Internet on Academic Achievement of Students: It is noted that percentage marks obtained by students with average use i.e. 48 students (32%) were between 65-70% and that of the students with internet addiction (10%) was between 45- 57% thus showing that average to high use of internet, positively influenced the

academic achievement while no addiction and high usage had a negative impact on academic achievement. Statistically, this association was significant. It also verifies the fact that extreme usage of internet affects the academic performance of the students. Conclusion: For youth, the Internet poses a number of risks along with a massive amount of opportunities. The research explored that some of the internet risks facing youth are addiction, exposure to inappropriate material, cyber bullying and sexual solicitation. Despite these risks, the research also suggests that the Internet can be beneficial for college goers. It provides a vehicle to promote cognitive, social, and physical development. Although there are limits to which the Internet can be used as a means of learning, health promotion, and intervention delivery, nonetheless the Internet can be used to match more traditional methods of delivering information. Overall, research suggests that specific efforts are needed to counter online risks in order for youth to benefit from the many opportunities offered by the Internet. The research study found that out of 150 undergraduate students, internet usage pattern of 40 students is extremely high. Only 10 percent students are addicted to internet, though this is a small figure, but has a growing tendency. Results of t-test reveal that male and female students significantly differ in their internet usage pattern. Male students are more addicted to internet usage. This further mentioned that male students have more access to internet than the female students. In reality, virtual world is dominated by teenagers who log in early and forget to log out of the World

Wide Web. They have Easy accessibility of internet even on their phones. Literature also mentions that 90% of the children in the age group of 14-20 are internet addicts and suffer from Compulsive Internet Usage (CIU). The usual behavior issues are lack of

attention in studies and misbehaving with teachers as well as parents. It was observed that they are suffering from cyber addiction, which makes a child irritable and affects his academics and social relations.

## **Intelligent cloud computing architecture: an innovative step for e-governance**

**Kushagra Bhatia Vishwajeet Mishra**

### **Abstract**

The development of high speed Internet access, Web applications and Virtualization techniques have made Cloud computing a leading edge technology. A user in `Cloud' runs web based application over Internet via browser with a look and feel of desktop program. Data center works as backbone in Cloud computing where a large number of servers are networked to host computing & storage needs of the users. Many data intensive applications produce huge amount of data which travel on cloud network. In this paper, an intelligent & energy efficient Cloud computing architecture is proposed based on distributed data-centers to support application and data access from local data-center with low latencies. This proposed architecture is suitable to apply for E-Governance and provides a green ecofriendly environment for Cloud computing.

### **Introduction**

Computer scientists have always been attempting and innovating a new technology that efficiently & effectively utilizes the contemporary underlying hardware resources for the benefit of the science and business community. Starting from mainframes to recent

virtual machines on “Clouds”, computational history experienced a trend of alternatively convergent and divergent patterns for the use of computing resources. Main objective of this paper is to discuss how to utilize the Cloud Computing (CC) applications for effective functioning of E-Governance activities. So, far technocrats as been utilizing various conventional based logical software applications for functioning of E-Governance.

This paper describes the role of cloud computing standards and architectures in framing a good E-Governance strategy. E-services are delivering cost effective services, which can drive the growth of the economy and government productivity. Cloud computing provides a new service consumption and delivery model inspired by Consumer Internet Services. Cloud computing accelerates cost reduction benefit.

The paper elucidates the benefits of cloud in rolling out E-Governance services. Proper planning, execution, training and good management could reduce overall costs to a great extent and help in more efficient utilizations of tax payer’s money. Cloud Computing for E-governance can:

- Reduce IT labor cost by 50%

- Improve capital utilization by 75%, significantly reducing license costs
- Provides much needed scalability

### **E-governance**

E-Government is a digital interaction between a government and citizens, government and businesses, government and employees and also between government and governments/agencies. Through EGovernment, the internet and the world-wide web are used for delivering government information and services to the citizens. The ultimate goal of the E-Government is to increased public services in an efficient and cost effective manner. E-government helps simplify processes and makes access to government information more easily accessible for public sector agencies and citizens. In addition to its simplicity, e-democracy services can reduce costs.

E-Government allows government transparency because it allows the public to be informed about what the government is working on as well as the policies they are trying to implement. E-government increases voter awareness, which could lead to an increase in citizen participation in elections. E-governance refers to governance processes in which information and communications technology (ICT) play an active and significant role for efficient and effective governance, and for making government more accessible and accountable to the citizens.

E-Governance has become an integral part of public sector transformation as Information and Communication technology (ICT) have helped to deliver more modern services for citizens and businesses. It stimulates the emergence of Information Society. Also drive public sector transformation and help governments prepare for future models of public administrations. ICT helps in providing new governance services and

products for government. It increases participation of people. It also helps in better information dissemination. As ICT has already become an integral part of everyday life. The challenge for the next generation of e-governance applications is to continue to improve public sector performance.

The partnership with the various stakeholders for E-Government initiatives can be in many areas such as: Financial Investment, Infrastructure Setup, Solution Architecture and Selection of Technology, Content Development and Management, roll-out of e-government project, software development, project management and assessment, capacity building etc. It describes the use of technologies to facilitate the operation of government and the disbursement of government information and services. E-government uses electronics in government as large-scale as the use of telephones and fax machines, as well as surveillance systems, tracking systems such as RFID tags, and even the use of television and radios to provide government-related information and services to the citizens.

### **Types of E-Governance**

On the basis of their relations between government and participants, the E-governance are divided into various categories:-

1) Government to Government (G2G): It includes the various functions of the government which necessitate the fulfillment of government. It is across the departments and it is between one government to another state government. For e.g. Toll Tax.

2) Government to Employee (G2E): It includes the technology which is used to enhance the government services to provide advantage to its citizen, business partners and employees.

3) Government to Business (G2B): It means government is providing benefits in business in terms of enforcement, tax collection etc.

4) Government to Citizens (G2C): It includes the strategy used for Customer Relationship Management(CRM) with business concept. It also provides the goods and services to accomplish the need of its citizens. E.g. UID, E-taxation, E-passport, E-procurement etc. B. E-Governance Applications The Government is the primary provider of all applications, giving its citizens, employees, state owned enterprises and others. E-Governance provide reliable services to all stakeholders, round-the-clock, with acceptable levels of performance. Some of the common E-Governance applications are listed here:

1) E-Procurement: Automation of purchase and sale of supplies and services over the internet for the Government and various governmental bodies.

2) HRMS: Government can configure payroll and benefit systems, create and management training systems and even track performance reviews. RMS can eliminate paper work, and helping the government in its go green initiatives.

3) E-Police: Providing easy access to information by making queries across databases of police stations across zones and states, for efficient policy. This increases safety mechanisms and helps provide better services too.

4) E-Court: E-Court facilitates integration of different courts, improves scheduling of cases and effective exchange of information between stake holders.

### **Objective of E-Governance:**

The main objectives are:

1) To build an informed society: An informed society is an empowered society. Informed people can make a Government responsible. Therefore, providing access to all to every part of information of the Government and of public importance is one of the basic objective of E-Governance.

2) To increase Government and Citizen Interaction: Physically, the Government and Citizens hardly interact. The feedback amount from and to the citizens is very negligible. E-Governance wants at build a feedback framework, to get feedback from the people and to make the Government aware of people's problems.

3) To encourage citizen participation: True democracy requires participation of each individual people. Increased population has led to representative democracy, which is not democracy in true sense. E-governance wants to restore democracy to its true meaning by improving citizen involvement in the process of governing, by improving the feedback, access to information and overall participation of the citizens in the decision making.

4) To make the Government accountable: Government is responsible and answerable for every act decision taken by the Government. EGovernance will help make the Government more accountable than now by bringing transparency's and making the citizens more informed.

5) To reduce the cost of Governance: EGovernance also wants to reduce cost of governance by cutting down on expenditure on physical delivery of information and services. It does away with the physical communication thereby reducing the time required for communication while reducing cost.

6) To reduce the reaction time of the Government: Normally due to red-tapism and other reasons, the Government takes long time to reply to people's queries and problems. E-Governance aims to reduce the reaction time of the Government to the people's queries and problems, because problems are basically Government's problems as Government is for the people.

D. Traditional Architecture With traditional infrastructure, we need to ensure secure, application life, from development retirement. For making the application highly available, the part of development activity which could be resources across various government organizations support: It is another major concern as for each but for distributed data centres only one license for the application cannot scale and scalability demands change over time. Thereby making some of the hardware and central authority and traditional infrastructure incurs more costs when modification is required.

### **Cloud computing**

Cloud computing encompasses a whole range of services and can be hosted in a variety of manners which are depend on the nature of the service involved and the data/security needs of the contracting organization .Cloud computing is fast creating a revolution in the way information technology is used and procured by organizations and by individuals. According to the IEEE Computer Society Cloud Computing is: "A paradigm in which information is permanently stored in servers on the Internet and cached temporarily on clients that include desktops, entertainment centres, table computers, notebooks, wall computers, handhelds, etc". Cloud computing is the collection of scalable, virtualized resources, which is capable of hosting application and

providing required services to the users and can charge as per the uses like utility.

The main goal of cloud computing is to provide ICT services with shared infrastructure and the collection of many systems. Cloud computing provides infrastructure as a service, software as a service, platform as a service, network as a service, and storage of data as a service. The main philosophy of cloud computing is to provide every required things as a service. In order to be clearer, the services in the cloud can be thought in layer architecture where various resources are available in different layers. Cloud services are available over the Internet in the whole world where the cloud acts as the single point of access for serving all customers. Cloud computing architecture addresses difficulties of large scale data processing.

### **Types of Cloud**

Cloud can be of three types

1) Private Cloud: This type of cloud is maintained within an organization and used solely for their internal purpose. Many companies are moving towards this setting and experts consider this is the first step for an organization to move into cloud. Security and network bandwidth are not critical issues for private cloud.

2) Public Cloud: In this, an organization rents cloud services from cloud provider on-demand basis. Services provided to users using utility computing model.

3) Hybrid Cloud: This type of cloud is composed of multiple internal or external cloud. This is scenario when an organization moves to public cloud computing domain from its internal private cloud.

C. Cloud Architecture The cloud providers actually have the physical data centres to provide virtualized services to their users through Internet. The cloud providers provide separation between application and data. The underlying physical machines are generally organized in grids and they are usually geographically distributed. In the cloud scenario, virtualization plays an important role. The data centre hosts provide the physical hardware on which virtual machines resides. User potentially can use any OS supported by the virtual machines used. Operating systems are designed for specific hardware and software. It results in the lack of portability of operating system and software from one machine to another machine which uses different instruction set architecture. The concept of virtual machine solves this problem by acting as an interface between the hardware and the operating system called as system VMs [13]. Another category of virtual machine is called process virtual machine which acts as an abstract layer between the operating system and applications.

According to the concept of cloud computing, instead of purchasing hardware or software, a user purchases remote access to them via the Internet. There are three levels of cloud computing as shown in

D. Types of utility cloud services Utility computing services provided by the cloud provider can be classified by the type of the services. These services are represented as XaaS where we can replace X by Infrastructure or Platform or Hardware or Software or Desktop or Data etc. There are three main types of services most widely accepted – Software as a Service, Platform as a Service and Infrastructure as a Service. These services provide different levels of abstraction and flexibility to the cloud users. Now, we discuss some salient features of some of these models:

1) SaaS (Software as a service):

Delivers a single application through the web browser to thousands of customers using a multitenant architecture. On the side of customer, it means no upfront investment in servers or software licensing; on the provider side, with just single application to maintain, cost is less compared to conventional hosting. Under SaaS, the software publisher (seller) runs and maintains all necessary hardware and software. The SaaS customer accesses the applications through Internet. Google docs is a very nice example of SaaS where the users can create, edit, delete and share their documents and Google have the responsibility to maintain the software and hardware. E.g. - Google Apps, Zoho O\_ce.

2) PaaS (Platform as a service):

Delivers development environment as a service. Everyone can build his/her own applications that run on the provider's infrastructure that support transactions, uniform authentication and availability. The applications built using PaaS are offered as SaaS and consumed directly from the end users web browser which gives the ability to integrate or consume third party web services from other service platforms. E.g. - Google App Engine

3) IaaS (Infrastructure as a Service):

IaaS service provides the users of the cloud higher flexibility to lower level than other services which gives even CPU clocks with OS level control to the developers. E.g. - Amazon EC2 and S3.

### **Cloud computing for e-governance**

In today's world it is very much necessary to make the proper use of an effective and advanced cloud computing in the way for an

effective e-governance. Cloud Computing have technological, advanced, smart and feasible features to make its proper use in an e-governance. As Gartner predicted that 20% government offices use Cloud computing for its effective working. The governments of various countries due to its features like scalability, fast flexibility, compensate as per on demand and usage to software, storage, network and other stand of services makes it more widely used in e-governance. An effective E-government system should be reliable, cost effective, ease to maintenance, satisfying other nonfunctional. Presently two main trends in the area of information technology influence e-government.

The first is constant development of computer infrastructure which becomes more powerful with the less expense. The second trend is constant increase of user skills and knowledge of operating computers and the Internet. These trends enhance possibilities of providing electronic services both in the public and private sector. The private sector noticed that chance – development of e-economy and e-business, both B2B and B2C, accelerated. Governments can leverage the Cloud to bridge the communication divide, especially with those people that belong to the remote parts of the country. It could also be used to increase interoperability between various government agencies, reduce redundancy, and monitor the effectiveness of government schemes. Transparency in Government can be achieved at a faster pace by adoption of Cloud. The Cloud has the potential of transforming this sector, to benefit not only the Government itself, but also millions of people. E-Governance with cloud computing offers integration management with automated problem resolution and manages security end to end.

Globally, Cloud architectures can benefit government to reduce duplicate efforts and

increase effective utilization of resources. This helps the government going green and effective waste management. Enterprises and businesses are already reaping the benefits of cloud by using the pay-as-you-use service model, its large scalability and ready availability. Since government requires a large infrastructure it is important for government to use cloud computing on long term basis.

### **Proposed Cloud Architecture**

Due to world-wide hype and rapid growth in associated technologies, cloud computing clients are continuously increasing. The large number of service requests to full fill the demands of millions of users will broaden the latency problem. Cloud service provider may be far away from the customer physically, compelling data to travel from several mediums and network equipments, thereby imposing a time delay in getting Cloud services. Cloud providers use centralized data-center to host computing & storage needs of the clients. In this, an intelligent & energy efficient Cloud computing architecture is proposed based on distributed data-centers which form a client's instance in nearest neighbourhood and fulfill client's request in optimized latency.

1) Cloud Computing Model: In the proposed Cloud architecture data-centres work in masterslave paradigm. Nearest data-centres form a computing zone and users may opt for creating their instances in multiple zones. The main entities involved in proposed architecture are:

a) Master/Slave Data-Centre: Master data center is located at Cloud provider's administrative premises. In this, user's accounting on pay-as-you-go basis is completed. Slave data-center are geographically scattered to serve user's requests in minimum physical distance.

b) Users/Brokers: Users directly communicate or via brokers submit requests which automatically reach at master data-center. Master data-center creates user instance at appropriate slave data-center considering minimum latency.

c) Service Level Agreements (SLAs): Quality of Service (QoS) and pricing negotiations are settled through SLAs. Master data-center scans SLA each time to host needs of the users.

### Advantages of Cloud Architecture

In traditional architecture, the services offered are bound to a physical machine. This model increases the cost of deployment and becomes expensive to maintain with the number of services increase.

Cloud computing provides:

- On-demand self sufficient services
- Ubiquitous network access
- Location independent resource
- Rapid elasticity Cloud has following advantages:
  - Can reduce IT labor cost by 50% in configuration, operations, management and monitoring.
  - Can improve capital utilization by 75%, significantly reducing license costs.
  - Decreases provisioning cycle times from weeks to minutes.
  - Can reduce end user IT support costs by up to 40% up. In a traditional infrastructure there will

be one instance of application per physical server and has an average utilization of 10%. Cloud not only automates the maintenance and manual operations, but also raises the utilization rate by 50% and offers full virtualization.

### Conclusion

Cloud computing is an emerging technology in which every services are available in the cloud. Cloud is the collection of distributed computing devices. Cloud provides service through public and private clouds with the help of required technology such as, system approach, distributed system, service oriented architecture, grid computing and virtualization.

The domain of cloud application is very big. E-Government system requires entities like, software, hardware, service, management, network, business, policy and security to survive and function properly. Cloud computing which treats all these entities as a service can be used in e-government system.

Cloud computing can handle the above mentioned challenges and finally address global challenges of e-government system. Cloud helps enabling E-Governing services faster and cheaper thereby accelerating the adoption and use of Information Technology for e-services. The Cloud provides a solid foundation for the introduction of widespread provision of services to various stakeholders.

Applications deployed in Cloud architectures will help the government to reduce operating costs and increase end user satisfaction levels. The Cloud will help to provide E-governance services faster and cheaper thereby accelerating the adoption and use of IT for e-services.

# JEEVAN- Traffic Control and Collision Avoidance through Vehicular Ad-hoc Network

Niti Aggarwal

## Introduction

VANETs (vehicular ad hoc networks) are emerging as a new network environment for intelligent transportation systems. Many of the applications built for VANETs will depend on the data push communication model, where Information is disseminated to a group of vehicles. [2] Vehicles Transformed into “Computers on the Wheels” or “Networks on the Wheel”. With the wireless technology becoming pervasive and cheap, several innovative vehicular applications are being discussed. We classify these applications into two categories –

- Internet Related: Accessing emails, web browsing, audio and video streaming are applications where the emphasis is on the availability of high bandwidth stable internet connectivity.
- Safety Related: Applications like collision alert, deceleration warning are applications where the main emphasis is on timely dissemination of safety critical alerts to nearby vehicles. It is important to understand that the V2I communication model in VANETs assume the presence of limited or intermittent internet connectivity based approach in comparison to a pure V2V or a pure V2I based solutions and take a position that a tight integration of the V2V and V2I functionalities would become the most successful model for the future vehicular applications. We believe that the latency concerns related to the safety applications would be served by the high bandwidth, low latency

V2V infrastructure and the delay tolerant internet connectivity based applications and the

security concerns would be addressed through the V2I infrastructure. The main factors that would influence the adoption of VANET architecture for future vehicular applications would be – 1) Low latency requirements for safety applications.

2) Extensive growth of interactive and multimedia applications.

3) Increasing concerns about privacy and security.

## System description

Vehicular Communication Systems are an emerging type of networks in which vehicles and roadside units are the communicating nodes, providing each other with information, such as safety warnings and traffic information. As a cooperative approach, vehicular communication systems can be more effective in avoiding accidents and traffic congestions than if each vehicle tries to solve these problems individually. Fig.1 How to control collision via vanet In figure1 Points are defined as:-

1. Detection of vehicle crash: emergency message broadcast to vehicle in zone of danger.
2. Drive through Internet: videoconferencing with overseas business partners.

3. “I am in your blind spot” messages erupted due to deep fade.

4. Vehicle cooperation triggered.

5. Vehicle platooning.

6. Look out! I am going to merge onto the highway.

7. Advertisement: service centre ahead. Vehicle-to-Vehicle (V2V Communications) for Safety is the dynamic wireless exchange of data between nearby vehicles that offers the opportunity for significant safety improvements. By exchanging anonymous, vehicle-based data regarding position, speed, and location (at a minimum), V2V communications enables a vehicle to sense threats and hazards with a 360 degree awareness of the position of other vehicles and the threat or hazard they present calculate risk issue driver advisories or warnings or take preemptive actions to avoid and mitigate crashes.

Vehicle-to-infrastructure (V2I) Communications for safety is the wireless exchange of critical safety and operational data between vehicles and highway infrastructure, intended primarily to avoid or mitigate motor vehicle crashes but also to enable a wide range of other safety, mobility, and environmental benefits. V2I communications apply to all vehicle types and all roads, and transform infrastructure equipment into “smart infrastructure” through the incorporation of algorithms that use data exchanged between vehicles and infrastructure elements to perform calculations that recognize high-risk situations in advance, resulting in driver alerts and warnings through specific counter measures.

Vehicle to Infrastructure Communication  
VANET Research Challenges-

1. Routing Large end-to-end delays and decreased packet delivery ratio.

2. Security Frameworks

- Need lightweight, scalable authentication frameworks.

- Need reliable and secureness.

- Need fast and low-cost message exchange facility.

3. Connectivity issues

- Need Highly Connected Network with less Traffic.

### Current works in Vanet

- Dash Navigation, Inc. a start-up in Sunny Valley, CA started offering a service in 2009 called The Dash Driver Network that allows drivers to broadcast their location and speed in exchange for receiving updated traffic information compiled from other vehicles in the network. This system is centralized and relies on wireless internet connectivity which is not widely available on roads and highways around the globe. Because the collecting entity is a central, trusted location, privacy concerns are mitigated.

- The CAR 2 CAR COMMUNICATION CONSORTIUM, a non-profit organization initiated by European vehicle manufacturers with the objective of improving road traffic safety and efficiency published in 2007 a manifesto in which it proposes standards for V2V and V2I communications among other things.

- In 2008, The European Union deployed systems relying on V2V and V2I communications by reserving a radio frequency

across the EU for vehicle applications aiming at enabling co-operative systems between carmakers.

- The Google Driverless Car is a project by Google that involves developing technology for driverless cars. The system combines information gathered from Google Street View with artificial intelligence software that combines input from video cameras inside the car, a LIDAR sensor on top of the vehicle, radar sensors on the front of the vehicle and a GPS position sensor attached to one of the rear wheels that helps locate the car's position on the map. Google anticipates that the increased accuracy of its automated driving system could help reduce the number of traffic-related injuries and deaths, while using energy and space on roadways more efficiently.

### **Routing methodologies**

1. In V2V communication, the collision warning messages are broadcast from vehicle to vehicle across multiple hops without the involvement of a roadside unit.
2. In case of V2R the warning messages are first sent to a roadside unit, and then broadcast by the roadside unit to all vehicles in range.
3. In V2R/V2V Hybrid Model, Vehicles which receive a warning message via V2V communication will send it to a roadside unit if they did not receive a warning message with the same event ID from roadside units.

### **Proposed work**

I am introducing a module "JEEVAN" in which some vehicles like Ambulance can registered in VANET and can communicate with operator to inform its position in traffic in emergency . So, that operator can passes this information to traffic controller through some

signals or other techniques which enables the lane in which Ambulance exists to move out earlier at that emergency time. This module can also be used to control traffic on roads. This module can also be used in major accidental cases in which any vehicle registered with VANET can inform operator regarding accident so that operator can inform registered ambulances to reach at accident spot and can also control traffic in that area.

### **Proposed module**

Ambulance Operator can search for nearest hospital in emergency case and can register patient details to save time prior to get admit in Emergency Ward. I have Develop modules in JAVA for operator to send Patient Details to Nearest Hospital like registration, patient detail, Nearest hospital finder etc and for hospital to Register Patient to bring needed Blood group bottles before his arriving at hospital Like Doctor Availability, Doctor Appoitment, Blood Bank Services and billing system in Installments etc. Front End :Java

Back End:My SQL

### **Merits**

1. It will improve the safety of vehicle.
2. It will solve traffic problems which saves time and lives of people.

### **Conclusion and future scope**

1. The implementation of the project will help in saving humanity.
2. Moreover this can be extended to large scale project from one city to nation as a whole.
3. It will save life in accidental and emergency cases.

4. Hospitals can register with VANET to improve their services.

### **Limitations**

Wireless connectivity issues because of presence of disturbing elements. This limitation can be resolved by using mobile networks. As this face less connectivity issues.

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