Deployment of On-demand services in Cloud based on Performance of Servers'

A. Sivakumar [1], M.C.A., (M. Tech)
Scholar
Dept., of Computer Science& Engineering,
Madanapalle Institute of Technology & Science,
Andhra Pradesh, India
e-mail: sivaathigari@gmail.com

Mrs. M. Sreedevi [2], M .Tech., (Ph .D)
Associate Professor
Dept., of Computer Science& Engineering,
Madanapalle Institute of Technology & Science,
Andhra Pradesh, India
e-mail: sreedevim@mits.ac.in

Abstract--- "Cloud computing" is a relatively recent term, defines the paths ahead in computer technology world. Being built on decades of research it utilizes all recent achievements in virtualization, distributed computing, utility computing, grid computing and networking. It implies a service oriented architecture through offering software, platforms and infrastructure as services, reduced information technology overhead for the end-user, great elasticity, mitigate total cost of ownership, services of on-demand and so many other things. Cloud computing provides computation, software, data access and storage services that do not require end-user knowledge of the physical location and configuration of the system that delivers the services. Cloud computing describes a new enhancement, utilization, and delivery model for IT services based on Internet protocols, and it typically involves provisioning of dynamically scalable resources. Cloud computing uses multiple server computers via digital network as though they were one computer. In cloud computing, cloud service providers can offer reservation and on-demand plans to cloud consumers for provisioning of computing resources. With the reservation plan, the price to utilize resources is cheaper than that of the on-demand plan, since cloud consumer has to pay to provider in advance. Due to uncertainty of consumer's future demand and providers resource prices the best advance reservation of resources is difficult to be achieved. The consumer needs to access the on-demand Services due to the fluctuated and capricious demands. In this paper, we are proposing a server analysis process before a user access on-demand services from the cloud server. The server which suits the users need and capable of doing the task in less time is chosen for executing the user's task. As in on-demand services the user pays on basis of pay per uses basis. As Time decreases the cost of the on-demand services decreases.

Keywords--- Cloud Computing, Elasticity, On-Demand, Cloud Servers Performance.

I.INTRODUCTION

Next generation's technology is the Cloud computing. Maybe Cloud technology can save the global; possibly people can have the whole thing they need on the cloud. In the evolution of on-demand information technology services and products the next natural step is Cloud computing. The Cloud is a simile for the Internet, based on how it is illustrated in computer network diagrams, and it obscures an abstraction for the complex infrastructure. It is a technique of computing in which IT-related capabilities are provided "as a service", allowing users to right to use technology-

enabled services from the Internet (i.e., the Cloud) without knowledge of, proficiency with, or control over the technology infrastructure that supports them. Email was most likely the first service on the "cloud". As the computing industry shifts toward given that Platform as a Service (PaaS) and Software as a Service (SaaS) and Infrastructure as a Service (IaaS) for consumers and endeavors to access on demand regardless of time and location, there will be an increase in the number of Cloud platforms obtainable. Cloud computing is a very detailed type of computing that has very precise benefits. But it has detailed negatives as well. Virtualization is a framework for methodology of dividing the resources of a computer into multiple execution environments, by applying one or more concepts or technologies such as hardware and software partitioning, time-sharing, partial or complete machine simulation, emulation, quality of service, and many others. It allows generalization and isolation of lower-level functionalities and underlying hardware. This facilitates portability of higher-level functions and sharing and/or aggregation of the physical resources [8]. By this the end user can entrée what are the resources needed for him.

Cloud computing is a large scale distributing paradigm that focal points on sharing data and computations over a scalable network of nodes. End user computers, data centers, and Web Services are examples of such a network of nodes as a cloud. An application based on such clouds is taken as a cloud application [9]. Basically cloud is a simile for internet and is an abstraction for the complex infrastructure it conceals. The main idea is to use the existing infrastructure in order to bring all viable services to the cloud and make it possible to way in those services regardless of time and location. Whether it's called Cloud Computing or On-demand Computing, Software as a Service, or the Internet as Platform, the common element is a shift in the geography of computation. When you create a spreadsheet with the Google Docs service, major components of the software be inherent in on unseen computers, where about unknown, possibly sprinkled across continents. The advantages of the cloud computing are as follows

- **Mitigated Cost:** Cloud technology is paid augmentation (pay only for what you need), saving organizations money in the diminutive run. Money saved can be used for other significant resources.
- **Enlarged Storage:** Organizations can store more data than on secretive computer systems.
- **Vastly Automated:** IT personnel needed not to keep software up to date as maintenance is the job of the service provider on the cloud.
- **Extremely Mobility:** Employees can access information wherever they are, rather than having to remain at their desks.
- **Allows IT to Shift Focus:** No longer having to worry about constant server updates and other computing issues, government organizations will be free to concentrate on innovations.

But at the same time there are some factors in cloud Computing are must be effect on end User, they are

- **Security/Privacy:** Is there a security standards for data in cloud?
- **Dependence on 3rd Party:** Control over own data is lost in the hands of an "difficult-to-trust" provider
- **Cost of transition :** Is it feasible for me to move from the existing architecture of my data center to the architecture of the cloud?
- **Ambiguity of benefits:** Are there any long term benefits?

In the following section we discuss Cloud Computing paradigms and the performance analysis of on-demand services executed by a cloud consumer.

II. BACKGROUND

A. TYPES OF SERVICES

A cloud is an resilient execution environment of resources involving several stakeholders and providing a metered service at various granularities for a specified level of quality (of service)

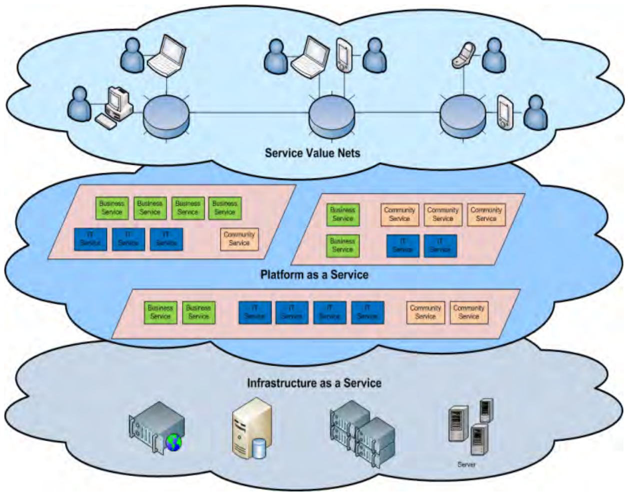


Figure 1: Cloud Services

1. Infrastructure as a Service (IaaS)

IaaS also referred as Resource of Clouds, offer

(managed and scalable) resources as services to the user

in other words, they basically provide improved virtualization capabilities. Accordingly, different resources may be afforded via service interface. Data &Storage Clouds deal with reliable access to data of potentially dynamic size, weighing resource usage with access requirements and /or quality definition.

2. Platform as a Service (PaaS)

They offer computational resources via platform upon which applications and services can be developed and hosted. PaaS typically makes use of contributed APIs to control the performance of a server hosting engine which executes and replicates the execution according to user requests (e.g. access rate).

3. Software as a Service (SaaS)

It is sometimes referred to as Service or Application Clouds that provides implementations of specific business functions and business processes that are provided with specific cloud capabilities ,i.e they provide applications / services using a cloud infrastructure or platform, rather than providing cloud features themselves.

B. DEPLOYMENT TYPES (CLOUD USAGE)

Similar to PaaS / IaaS / SaaS, clouds may be hosted and employed in unlike fashions, depending on the use case, respectively the commerce model of the provider. So far, there has been a tendency of clouds to evolve from private, internal solutions (private clouds) to manage the local infrastructure and the amount of requests e.g. to ensure availability of extremely requested data. This is due to the fact that data centers initiating cloud capabilities made use of these features for internal purposes before considering selling the capabilities publicly (public clouds).

1. Private Clouds– Private Clouds are typically owned by the respective enterprise and/or leased. Functionalities are not directly exposed to the customer, though in some cases services with cloud improved features may be provided–this is similar to (Cloud) Software as a Service from the customer point of view.

2. Public Clouds– Enterprises may use cloud functionality from others, respectively offer their own services to users outside of the company. Providing the user with the actual capability to utilize the cloud features for their own purposes also allows other enterprises to outsource their services to such cloud providers, thus reducing costs and effort to build up their own infrastructure.

3. Hybrid clouds- They consists of a mixed service of private and public cloud infrastructures so as to achieve a maximum of cost reduction through outsourcing even as preserving the desired degree of control over e.g. sensitive data by utilizing local private clouds.

III. PROPOSED STRATEGY

The frontage of the cloud computing system comprises the client's device (or it may be computer network) and some applications are required for right to using the cloud computing system. All the cloud computing systems do not give the identical interface to users. Web services like electronic mail programs control some existing web browsers such as Firefox, Microsoft's internet explorer or Safari. Other type of systems has some unique application which provides the network access to its clients. Front end is a technical term which refers to the interface through which a user can use some kind of services. Backend refers to the some physical peripherals. In cloud computing back end is cloud itself which may encompasses of different computer machines, data storage systems and servers. Group of these clouds make a whole cloud computing system. Theoretically, any cloud computing system can include practically any type of computer machine program that can be predictable by a human being such as from video games to data processing, software development to entertainment. Usually, every application would have its individual dedicated server for services.

In addition, it compute the cost of these cloud and measured as the cost of the infrastructure per time unit, and we also evaluate the performance/cost ratio, showing that some cloud-based configurations reveal similar performance/cost ratio than local clusters. Due to hardware restrictions of our local infrastructure, and the high cost of renting many cloud resources for long periods, the tested cloud server configurations are limited to a mitigated number of computing. They typical applications can involve much more tasks, it will be included have implemented a simulated infrastructure model that includes a larger number of computing resources. More distinctively, the contributions of this work are the following:

1. In the first step we are implementing multi public Cloud servers. This can be accessed by the end user.
2. After the cloud server are deployed, a web service is implemented which keeps track of the cloud servers progress and their performance.
3. When end user request to access the cloud server, the web service will be invoked and they will choose the suitable cloud server for the specific session of the user. The cost will be premeditated as per job basis.

The Performance estimation of the Cloud Server is depending on the factors request response time and other significant performance indicators such as mean number of tasks in the system, blocking probability, and probability.

Implementation of a replicated infrastructure model to test larger sized cloud servers and workloads, proving that results obtained in the real testbed can be extrapolated to large-scale multi cloud infrastructures.

1. Deployment of a multi cloud virtual infrastructure spanning four dissimilar sites.
2. Performance analysis of the cluster testbed for solving loosely coupled MTC applications proving the scalability of the multi cloud solution for this kind of workloads.
3. Cost and cost-performance ratio analysis of the experimental setup, to compare the different cluster configurations and proving the feasibility of the multi cloud solution also from a cost perspective.

Implementation of a simulated infrastructure model to test larger sized clusters and workloads, proving that results obtained in the real test bed can be extrapolated to large-scale multi cloud infrastructures.

A. ANALYSIS OF PERFORMANCE

When a user requests for a task to be assigned to the Cloud Server, the web service will run analysis of the available servers and holds the information of each Cloud Server. When user assigns a task the web service will redirect the user to the highly prioritized cloud server and the job will be completed through that cloud server. The time and the cost of the task is calculated as per the job basis.

It have chosen different server configurations (with different number of worker nodes from the three cloud providers), and different number of jobs (depending on the cluster size).The number preceding the site acronym represents the number of worker nodes. Several problem sizes (in terms of mesh size, iterations, and number of jobs) as classes. As it have proven in a previous work, when executing loosely coupled high-throughput computing applications, the cluster performance (in jobs completed per second) can be easily modeled using

the following equation:

$$r(n) = r_{\infty} / (1 + (n_{1/2}/n))$$

Where n is the number of total completed jobs, r_{∞} is the performance of asymptotic (maximum rate of performance of the cluster in jobs executed per second), and $n_{1/2}$ is the length of half-performance. For more details about this performance is the experimental. In order to provides a good characterization of the clusters in the execution of the workload understudy the performance model.

B. ANALYSIS OF COST

The cost of cloud resources has an significant role on the feasibility of the multi cloud solution besides the analysis of performance. In order to find the maximum optimal configurations it is important to evaluate, not only the total cost of the infrastructure, but also the ratio between performance and cost. The average cost of each instance per Time unit Based on these costs, and using the cost model detailed it can estimate the cost of every experiment. However, this cost is difficult to compare the different server configurations, if it running different number of jobs for every configuration. So, in order to standardize the cost of different configurations, it has computed the cost per job, by dividing the cost of each experiment by the number of jobs in the experiment. Thus the cost of local resources is lower than the cloud resources.

Finally, to decide the optimal configuration from the point of view of performance and cost, it has computed the ratio between cluster performances(r) and cost per job. It can observe that, inspite of the higher cost of cloud resources with respect to the local nodes, there are some hybrid configurations that exhibit better performance - cost ratio than the local setup. This fact shows that the proposed multi cloud implementation of a computing cloud not only from the performance point of view also from a cost perspective.

C. RELATED WORK:

For an efficient management of large-scale Cloud server infrastructures different techniques have been proposed for provisioning of on-demand, dynamic partitioning, or virtualization of Cluster. In the previous method only for the on-demand provision of computational services consist in overlaying accustom software stack on top of an existing middleware layer. The dynamic splitting of the capacity of a computational Cloud server has also been addressed by several projects. The Cluster software enables rapid, automated, on-the-fly partitioning of a physical Cloud into multiple independent virtual Cloud servers.

Similarly, the Server enables to dynamically adjust the capacity of computing resources by sharing resources between peer domains. Several learning has explored the use of virtual machines to provide custom Cloud server environments. In such case, the clusters are usually completely build up of virtualized resources. Some recent works have explored the use of cloud resources to deploy hybrid computing cloud servers, so the cloud server combines physical and the virtualized, and cloud resources. There are many other different experiences on deploying different kind of multi services on cloud infrastructures, such as web servers, database appliances, or web service platform among others.

IV. IMPLEMENTATION

The simulated model consists of the following Model, First

the user will access the web service by login into the system if the user is not a existing member, then he will has to be registered for the access by creating his own account. After once the user is registered his information is stored in the server side.

Figure1: The Login Page

The Figure1 shows the user login page to the web service.

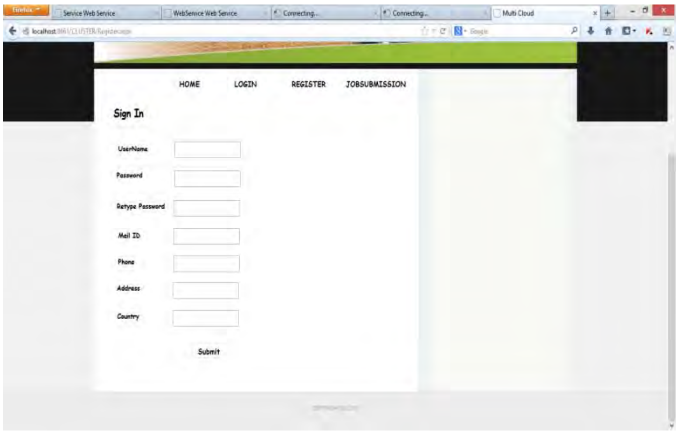


Figure2: The Registration Page

The Figure2 shows the user Registration page to the web service. One of the main issue in cloud computing is security. Protecting the cloud is a very important task for security professionals who are in charge of the cloud. Cloud can be protected by protecting the data, making sure data is available for the customers, delivering high performance for the customers, using Intrusion Detection System on cloud and to monitor any malicious activities. For the safety purpose, the provider's must provide a support system for the client's so that every client must be able to recover their own data loss in the cloud environment. Therefore, the encryption technique must be adopted in cloud by the provider's to their client's for integrity and authentication of data.

When it comes to Security, cloud has lot of difficulties. The provider's must make sure that the client does not face any problem such as data loss or data theft. There is also a possibility where a malicious user can penetrate the cloud by impersonating a legitimate user and there by infecting the entire cloud thus affecting many customers who are sharing the infected cloud.

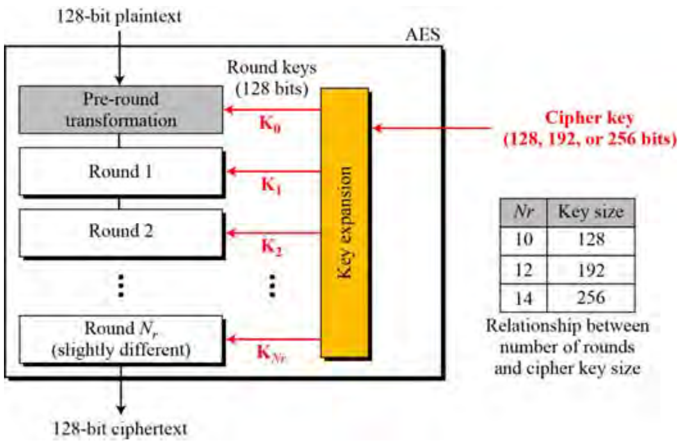
To avoid this problem and to make the user details confidential and to avoid impersonating attacks cryptography is implemented to encrypt the data and to store in the database of the server. The user information like username and password are made invisible by implementing the Advanced Encryption Standard (AES) by implementing web services features into the User Account information. The data will be shared among the cloud server is Encrypted. Hence no one can access it other than the respective user and the data cannot be visible to any middle person or third parties of the cloud server the user works on.

A. ADVANCED ENCRYPTION STANDARD

Figure2: The Web service for encryption

The user details will be inserted in to the database in the form of cipher text. That the no other user or impersonator view the details.

The Advanced Encryption Standard (AES) is a symmetric-key encryption standard approved by NSA for top secret information and is adopted by the U.S. government. AES is based on a design principle known as a substitution permutation network.: AES-128, AES-192 and AES-25 are the standard comprises three block of ciphers. Each of these ciphers has a 128-bit block size, with key sizes of 128, 192 and 256 bits, respectively. The AES ciphers have been analyzed extensively and are now used worldwide; AES was selected due to the level of security it offers and its well documented implementation and optimization techniques. Furthermore, AES is very efficient in terms of both time and memory requirements. The block ciphers have high computation intensity and independent workloads (apply the same steps to different blocks of plain text).



After successfully creating the account the user has access to the web service in which the progress of the servers will be considered. When user clicks on to the job or task submitting the web service will redirect him to high priority Cloud Server for completion of job. After the job Completion the results were shown in the graphical user interfaces. The Screens of the Cloud servers and the Web Service are given below,

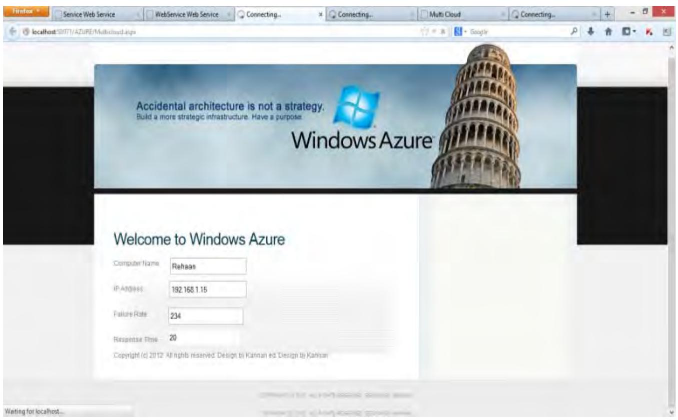


Figure3: The Public Cloud Server 1

The above figure shows the progress of public Cloud Server1

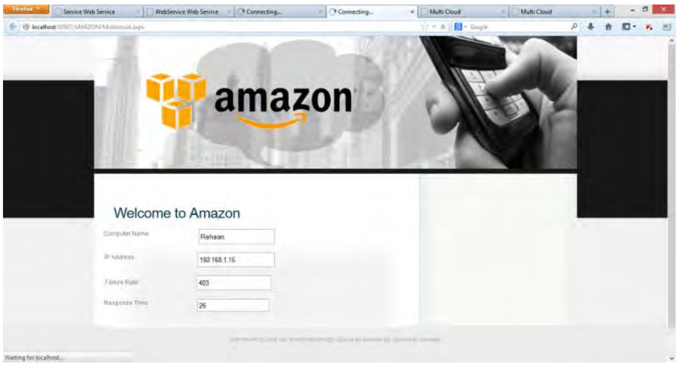


Figure4: The Public Cloud Server 2

The above figure shows the progress of public Cloud Server2

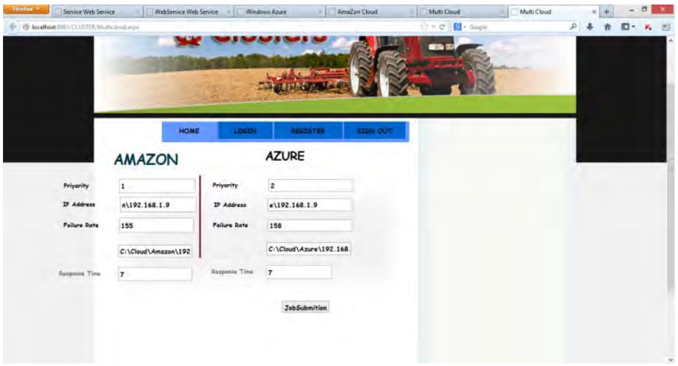


Figure4: The Web Service page

The user will be interacted with the web service by login to the system. The user doesn't keep track of the Cloud Servers. The web service will interconnects the Cloud Servers and assigns the priority to the Servers. The User will be redirected to the highest prioritized Cloud Server. By which the user has access to fast computing Cloud Server and less time Consumption.

V. CONCLUSION

To be well prepared for the future Multi cloud concept we will study advanced clouding and clustering concept that would developed in the near future. Compared with the clustering concept, the proposed multi cloud method is useful to solve the loosely coupled computation problems. It provides the high availability and fault tolerance, Infrastructure cost reduction. The simulation of different cluster configurations shows that performance and cost results can be extrapolated to large-scale problems and Cloud Servers. It is important to point out that, although the results obtained are very promising.

The architectural setup is used for calculating the failure rate for several cloud sites and thus it is infact easy to set priorities for different clouds for completion of jobs. Performance analysis and cost analysis are done, thereby providing the clients their choice of cloud selection. Even though in the future a work has to be taken on the cloud Servers with the combination of web services to provide user with non failing, high performance of cloud servers for fast task completion of large scale computation to save users time and without costing any additional cost.

ACKNOWLEDGMENT

I would like to express my sincere thanks to my guide and authors of the reference papers for their consistence support and valuable suggestions.

REFERENCES

[1] Rafael Moreno-Vozme diano, RubenS. Montero, IgnacioM.Llorente, Multicloud deployment of computing clusters for loosely coupled MTC applications.
[2] R.S. Montero, R.Moreno-Vozmediano, and I.M. Llorente, "An Elasticity Model for High Throughput Computing Clusters," to be published in J.Parallel and Distributed Computing, doi: 10.1016/j.jpdc.2010.05.005,2010.
[3] E. Walker, J. Gardner, V .Litvin,and E. Turner,"Creating Personal Adaptive Clusters for Managing Scientific Jobs in a Distributed Computing Environment," Proc. IEEE Second Int'l Workshop Challenges of Large Applications in Distributed Environments (CLADE '06).
[4] Ioan Raicu,Yong Zhao,Catalin Dumitrescu, IanFoster, MikeWilde. "Falkon:a Fast and Light-weight task execution framework".
[5] BorjaSotomayor,Rub´enS.Montero,IgnacioM.Llorente,andIan Foster."An Open Source Solution for virtual infrastructure management

in Privateand Hybrid clouds".
[6] MichaelA.Murphy,"VirtualOrganizationClusters:Self-Provisioned Clouds",May2010.
[7] G. Juve, E. Deelman, K. Vahi, B. P. Berman,B. Berriman, and P. Maechling, Scientific Workflow Applications on Amazon EC2.Workshop on Cloud-based Services and Applications in Conjunction with 5th IEEE Int.Conferenceon e-Science,2009.
[8] E.Deelman, G.Singh, M.Livny, B.Berriman, and J.Good, The cost Of doing science on the cloud: the Montage example. Proceedings Of the 2008 ACM/IEEE conference on Supercomputing,2008.
[9] X.H.SunandD.T.Rover.Scalability of ParallelAlgorithm-Machine Combinations. IEEE Transactionson Parallel and Distributed Systems, 5(6):599–613,1994.
[10] A.Y. Grama, A. Gupta, andV. Kumar. Iso efficiency: Measuring The Scalability of Parallel Algorithms and Architectures. IEEE Parallel and Distrbuted Technology: Systems and Applications,1(3): 12–21, 1993.

AUTHORS PROFILE

1). Mr A. Sivakumar is pursuing M.Tech in CSE at Madanapalle Institute of Technology &Science, Madanapalli. He received his M.C.A from Annamalai University, TamilNadu, India.

2). Mrs, M. Sreedevi is presently working as Associate Professor in the Dept., of Computer Science& Engineering at Madanapalle Institute of Technology &Science, Madanapalli and having 15 years experience as a teaching faculty. Her research interest lies in the area of Cryptography, Network Security and Cloud computing. Right now, she is finishing her Ph.D in Network Security under Sri Venkateswara University, Tirupati, Andhra Pradesh, India.