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A Security parameter based Evaluation for Effective Service Allocation in Distributed Cloud Environment

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ABSTRACT

The cloud environment provides the distribution of available services and resources to public and private users. This increased load and security environments increases the security leaks that can affects the distribution reliability. In this research work, a prior computation method is provided to compute the security capability of cloud system before allocating the services to the user. The proposed model is defined as the intermediate layer between the users and the servers to achieve higher degree of reliability. In this model, the evaluation is performed between the security features under availability and requirement constraints. As the effective services are allocated to the user the reliability of the service execution in cloud environment is improved. The paper has presented the middle layer architecture to satisfy the users based on the security requirements and to reduce the security lapses exist in the distributed environment.

Keywords: Availability, Distributed Cloud Environment, Requirement Analysis, Service Allocation, Security Lapses.

I.INTRODUCTION

Cloud computing connects the distributed cloud servers in single environment to available the services to large number of users. The cloud system able to distribute the services, resources as well as hardware to public and private users. The user requests are processed by the cloud computing technologies and provide the service access and storage through various applications. The infrastructure of middle layer architecture is defined as an application or environment to provide the interaction between the cloud servers and users. The application or architecture identifies the most effective, reliable service provider that can satisfy the user request more effectively. But, as the number of users generates the same kind of request, the application can allocate them to same cloud server. In this way, the load on particular cloud server can be increased. This kind of unequalized distribution of user request in cloud environment can affect the performance and reliability of distributed cloud environment. The situation occur because of such unmanaged service distribution is shown in figure 1.

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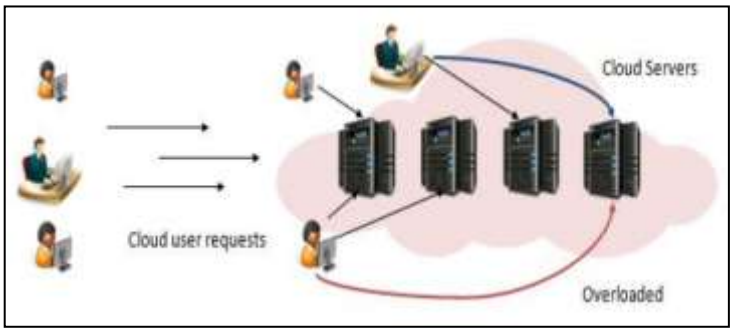

Figure 1 : Service Allocation in Unmanaged Environment

Figure 1 showing the unmanaged allocation of the services to users in distributed cloud environment. The figure shows that the multiple users generate the request in the environment. As the request is allocated to best service provider, it can be overloaded and the performance of that server can be decreased. There is the requirement of some specific load balancing and service distribution algorithm to achieve the balanced service allocation.

The load balancing in cloud server not also improves the service distribution but provide the low cost and faster execution. The application scaling, minimizing the traffic, load balancing and routing of the traffic. Various scenarios and algorithms are provided at cloud servers and middle layer architecture to distribute the requests in cloud environment in equalized form. In this paper, an effective cloud service allocation algorithm is provided under the consideration of security and load aspects.

In this paper, the securities lapses exist in the cloud environment are handled at the time of cloud service allocation. The proposed system is defined as the intermediate layer that analyzes the security requirements of users and observes the security features of cloud server. Based on the evaluation, the cloud service is allocated to the user. The load, availability and security features are analyzed while allocating the cloud. In this section, the cloud system is described respective to unequalized load situation. In section II, the work provided by the earlier researchers is discussed for cloud service allocation. In section III , the description of proposed model is provided. In section IV, the conclusion of this work is provided.

II.RELATED WORK

The cloud system is having the issues of secure service allocation and to improve the reliability and effectiveness of service distribution. The researchers have provided the work to explore the characteristics, functioning and behaviour of cloud environment and service allocation. In this section, the work provided by the earlier researchers is discussed. Navimipour et al.[1] has identified the capabilities and challenges of cloud system. The process algebra, model check and the system level verification methods defined with cloud system are discussed by the author. The parameter considered by the researchers to reduce the effectiveness of service distribution is also identified by the author. The behaviour and the verification methods identified by the researchers are discussed in this section. Author[2] has defined an infrastructure based analysis on the network configuration, constraint and behaviour. The evaluation was considered for multi-cloud, heterogeneous cloud

and micro cloud environment. The relationship between the users and service providers was characterized by the author. The design and distribution behaviour was explored by the author with quality feature specification. Author[3] has defined a work on energy based distributed environment and data center. The design of grid and cloud based environments was discussed by the author with resource distribution and scalability vector. The performance impact was observed with service deployment in robust cloud environment. The metrics and the architectural strength of service distribution was discussed b y the author. Ye et al.[4] has defined a work to reduce the execution time by defining the workflow analysis based cloud scheduling. The model was addressed under multi-objective specifications, concerns and methods. The weight specific decisions were addressed by the author to analyze the specific criteria and constraints. The parameter based evaluation was discussed by the author to improve the service distribution in cloud environment. Author[5] has improved the resource utilization by characterizing the process of architecture level service distribution. The group specific neighbor and weight evaluation was provided by the author for request distribution. The usage specific evaluation was defined by the author to generate the pattern weight and to improve the resource utilization. Author[6] has defined the provisioning method to reduce the computation cost for process execution within deadline. The resource allocation method was defined by the author using task prioritization. The service provisioning method was defined to achieve multi-task adaptation in the robust cloud environment.

Zeng et al.[7] defined a greedy approach with cost constraint method to improve the service level agreement in distributed cloud environment. The deadline and budget constraint based evaluation was defined with heuristic method to assign the priorties on the user requests. The parameter specific evaluation was defined to improve the service allocation in distributed job model. The budget control based configuration method was defined to improve the architectural behaviour. Author[8] has considered the energy and delay as effective decision parameter for improving the resource allocation in distributed cloud environment. The profit evaluation and the resource utilization methods and behaviours were discussed by the author. The constraint specific evaluation was defined to reduce the failure rate and to improve the service allocation. Author[9] has provided the analytical review on various aspects of service distribution and scheduling in cloud environment. The criteria, method and challenges faced by the users were discussed by the author. The task characterization and the cost driven evaluation was provided by the author to improve the resource usage in robust configuration environment. The scheduling method with multi-criteria evaluation was defined to achieve better parameter adaptation. Author[10] has provided a work to improve the utilization and sharing in deadline control. The task based evaluation was provided to evaluate computation capability of cloud system and virtual machine. The delay and latency based algorithmic process was defined to estimate the subtask execution of user tasks. The inter-relationship evaluation was provided for performance evaluation in simulation environment. Author[11] has defined a work on task scheduling in market cloud with sub-task processing. The winner coalition formulation method was defined for payment mechanism. The resource constraint evaluation method was defined by the author for better resource utilization. The parameter and budget balanced cloud system was defined to reduce the computation and to achieve better distribution of the cloud system in hybrid cloud environment.

Author [12] has used the rule specific evaluation on moving average formulation applied on memory, bandwidth and processing capabilities. The quantization method was defined to reduce the wait time and to improve the capabilities of resource distribution in cloud environment. The rule adaptive dynamic evaluation was analyzed by the author to improve the resource sharing. Author[13] has provided a constraint, parameter based optimization method for effective resource allocation. The cost, delay and deadline consideration was taken by the author to achieve better utilization of available resources. The energy and cost effective evaluation was provided by the author to improve the effectiveness of resource distribution in hybrid cloud environment. Author[14] used the game theory based scheduling method to achieve better and energy effective distribution of services in cloud environment. The task distribution and energy specific mathematical formulation was defined to improve the measures of service allocation. The configuration level adaptation and architectural improvement was also achieved by the author. Author[15] has observed the computational cost with resource specific parameter to achieve the effective gain in distributed cloud environment. The limited time and cost evaluation was considered as key parameter for service allocation in cloud environment. Author[15] has defined the Min-Min algorithm with clustering behaviour to improve the heuristic behaviour of resource execution in distributed cloud environment. The performance criteria based evaluation was provided by the author. The power efficiency evaluation was defined to improve the service allocation and effective execution in cloud environment. Author [16] has defined a multi-objective scheduling method to reduce the time and cost in service execution in cloud environment. The VM provisioning based data dependency and cloud system realization was achieved by the author. Author[17] has defined a directed acyclic graph (DAG) method for multi-feature evaluation in distributed cloud environment. The budget controlled modeling and service allocation process was defined by the author.

III.RESEARCH METHODOLOGY

In this paper, a security lapses covered effective method is provided for effective service allocation in cloud environment. The parameter effective analysis is performed by the middle layer to map the user security requirements to the security features within available cloud services. This evaluation is done under the security, availability and reliability features. The parameters considered at this stage with their role to handle the security lapses are shown in figure 2.

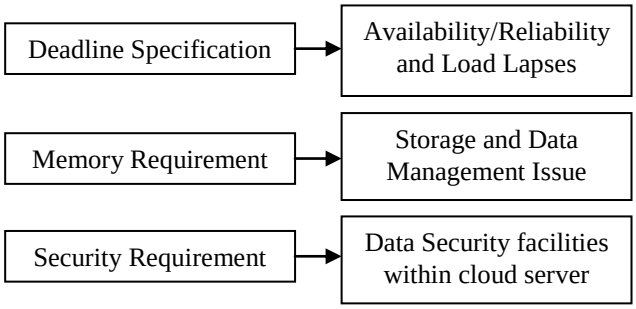

Figure 2: Parameters for handle Security Lapses

Figure 2 shows the user side requirements and its map to the characteristics of the cloud server. The deadline consideration is defined at the user end to identify the need of the user to execute the service. If the cloud server is having some failure issue or some chances of non-availability, then it cannot be allocated to the cloud server which is having a hard deadline. If the user request is having a soft deadline or no-deadline situation, then it can be allocated to server which can delay the user requests. This kind of mapping increases the reliability while executing the user task at the server end. The memory requirement is another parameter considered when loading the tasks at server side. The servers are defined with storage capabilities. The number of parallel tasks that can be loaded to the memory decides the acceptability of the cloud server. If the user request is having high memory requirement, then it will be loaded to the cloud server with maximum available memory. Whereas, the smaller tasks can be kept in the queue and can be executed by any server as any of the executing task finish. The security requirements are the major factor defined by the client as the request performed. The type of request itself can define the security requirement. Such as the account information, money transactions or the bank related services requires more security, whereas the game, news specific services does not require the security. In such case, while allocating the cloud server, the security requirements are checked and the server with data and communication security will be allocated to the request that demands for it. By these observed mapping, the security lapses can be resolved at the earlier end and the overall cloud system security can be improved. The work flow of cloud service allocation with security lapses consideration is provided in figure 3.

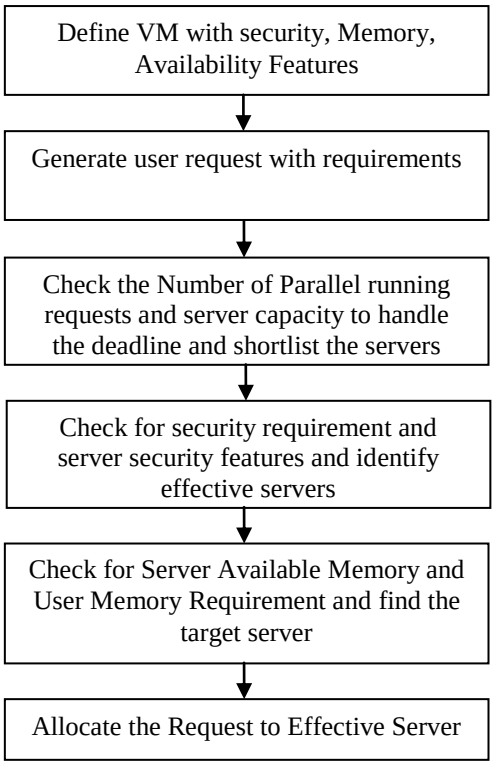

Figure 3 : Flow of Security Effective Service Allocation

Figure 3 has provided the work flow of task considered for effective service allocation in the cloud environment. All the requirement features are prioritized and compared to the available servers respective to their

requirements. With each requirement map, the VMs are shortlisted and after applying the feature map, the effective server is identified. The figure shows that the model is applied on a configured cloud environment. At the first level, the server side analysis is performed for the number of executing requests and the capacity. This load vector consideration is effective to identify the reliability strength of the cloud server. If server is capable to handle another request under availability and deadline consideration, then the VM will be shortlisted as the effective service provider. In second phase, the security requirements of users are checked on the security features of the service provider. At this phase, the request level services can be identified the server itself or by the middle layer architecture to perform effective mapping of user requests on the cloud server. After obtaining the security requirements, the comparison on the security features of all the VMs is done to perform effective mapping. In the final stage, the memory specific check is performed to identify the servers that can hold the user request. The memory requirement of user request is analyzed at this stage for loading the request to effective virtual machine. After applying these three checks, the security and reliability effective VMs are shortlisted, now the request can be loaded to any of such virtual machine.

The method and parameters defined in this section identified that the model is able to handle the security lapses at the earlier stage and able to provide effective cloud service execution.

IV.CONCLUSION/FUTURE WORK

In this paper, an effective cloud service allocation environment is defined to handle the security lapses exist in the distributed environment. The cloud system is defined with M cloud servers with integrated security capabilities and load capacity. As the requests are accepted, the user requests are analyzed based on security requirements. The proposed middle layer architecture, allocated the cloud servers to the user requests based on the security requirements. This kind of security driven mapping reduces the security lapses in the cloud system and improves the cloud system reliability.

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