

Dynamic Resource Allocation and Secure Data forwarding in Large Cloud

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Abstract

Cloud computing is a computing paradigm, where a large pool of systems is connected in networks, to provide dynamically scalable infrastructure for application, data and file storage. Resource management is an important issue in a cloud environment. The data's are transmitted into the single system. A new distributed system can be developed. Using Gossip Protocol resource can be allocated but it is not efficient, so Gossip with throttled load balancing can be used to automatically allocate CPU and memory to multiple VMs. The protocol continuously executes on dynamic. Resource management contains large file means it will decompose into smaller task and it can be shared and forwarded to cloud server. In a cloud environment, security was provided by using proxy re-encryption method. The general encryption scheme will not protect the data confidentiality. Proxy re-encryption techniques can be easily breakable by hackers. So a new encryption scheme called as threshold proxy re-encryption technique with salting is used to strengthen the encrypting data that will prevent the data from external threats.

Keywords: Cloud Computing, Proxy Re-encryption, Resource Management

1. Introduction

Cloud environment can be used for resource allocation and secure data forwarding to another server. Cloud dynamically provide scalable infrastructure for application. Cloud services allow individuals and business to use hardware and software that are managed by third parties at a remote location. Site owners provide services to their respective users via the site that are controlled by service provider.

The main objective of this research work is:

1.1 Adaptability

The cloud will dynamically allocate the resources and adapt the changes.

1.2 Performance

The task can be decomposed into smaller task for encrypt and decrypt the original messages.

In a Data as a service, the resource can be allocated and

data can be forwarded to another server. Gossip protocol is used in an existing system for resource allocation assumes static input means it will produce a single output value. If the input can be changed to dynamic means it will restart the service and Produce the output, so wasting of time to allocate the resources. In this research, use a private cloud to securely protect our data's. The benefit of private cloud that contains personal information may be better protected in the cloud.

The Gossip protocol is used for resource allocation and load balancing process. In distributed system, often uses Gossip protocols to solve problems that might be difficult to solve in other ways. Gossip spreads information in a manner similar to spread of a virus in a biological community. The gossip protocol does not properly allocate all the resources, so introduce a new algorithm Gossip protocol with throttled load balancing.

The Rijindael Encryption algorithm performs encryption on a crypto stream class. It will pass the key for encryption after code can be executed; any data written to the crypto stream object is encrypted. For secure data

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forwarding when user wants to receive the message, he needs to receive the key to encrypt and decrypt data from cloud storage server and use the services. Threshold Proxy Re-encryption with salting process will securely forward the data. Salting process will add the random data to the original message and it can be encrypted and forwarded to another server. After it will re-encrypt and remove the data and decrypt and get the original messages. The main advantage of cloud is to manage and share files. It will increase the storage and reduce the cost.

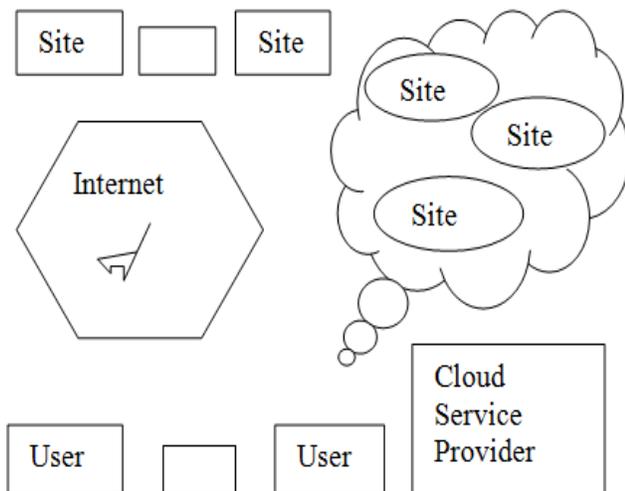


Figure 1. Cloud environment.

2. Related Works

A Gossiping Protocol that indicates whether a global aggregate of static local values is above or below a given threshold. For this protocol, we prove correctness and show that it converges to a state with no overhead. The assumption that the local values do not change¹. The effectiveness of the protocol in achieving its objective increases with increasing memory capacity in the servers. The system is in under load minimizing power consumption through server consolidation and fair resource allocation in case of overload². It is desirable to avoid wasting resources as a result of under-utilization and to avoid lengthy response times as a result of over-utilization. The utility values are then used to calculate a maximum global utility³. Large-scale systems must scale both in the number of cluster nodes and the number of applications the cluster support. Request routing the load on a cluster node is independent of the system size. Application placement is approached in a decentralized manner. Which decide where to run the application?

Direct services are requested to available resource inside the cluster resources⁴. A cloud service provider gives the privacy and integrity of the data; this track the actual usage of the user's data in the cloud by using decentralized data and policies. TPA does not completely solve the problem of protecting data privacy but just reduces the key management⁵. The central role overlay networks play in decentralized application development. The contribution is a gossip protocol called T-Man that can build a wide range of overlay networks from scratch, relying only on minimal assumptions. The protocol¹ is fast, robust, and very simple. It is also highly configurable as the desired topology itself is a parameter in the form of a ranking method that orders nodes according to preference for a base node to select them as neighbors. Extensive empirical analyses of the protocol along with theoretical analysis of certain aspects of its behavior are presented⁶.

3. Proposed Work

3.1 System Architecture

The system architecture describes resource allocation and secure data forwarding in the cloud. Cloud environment includes the physical infrastructure and associated control functionality that enables the provisioning and management of cloud services. Cloud environment contains a large number of servers that are connected by high speed network. Gossip protocols are a middleware component that is implemented between the application layer and the transport layer. The components of the system can be run on all machines. The functionality of the system runs on one or more modules. Figure 2 indicates site manager, user forward the requests to the site manager the site manager processes the request and calculate the memory for resource allocation, workload can be maintained².

The site manager forward all the request to machine manager then the manager compute the resources and calculate the cloud server usage for the allocating the resources. The main purpose of machine manager will take the decision for module execution. The module can be divided into several sub modules and it can be processed one by one. The module manager will execute the module one by one. The resource allocation module, it will allocate the resources dynamically⁵. Data forwarding module it will forward the messages from one server to another using salting technique to forward the data securely.

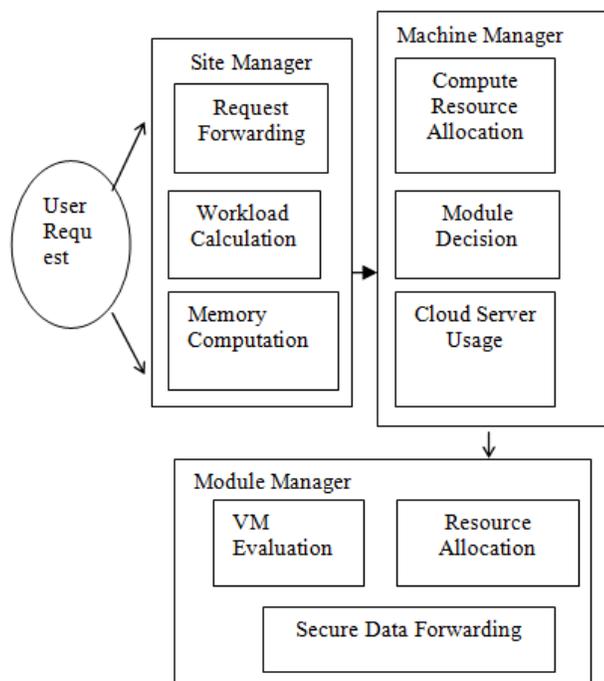


Figure 2. The architecture of resource allocation and secure data forwarding in cloud.

3.2 VM Evaluation

VM Evaluation is the evaluation of VM in the cloud. Evaluation is based on the physical memory usage of the virtual machines in the cloud. Load of each VM in the cloud is computed and sent to the client for further process. The VM which has most free memory will be ready to receive and process the module selected by the client⁶.

3.3 Resource Allocation

In the context of large-scale distributed computing, a key problem in resource management is that of mapping a set of applications onto a system of machines that execute those applications and, for each machine, assigning local resources for those applications that can run on it. The quality of the allocation process is often measured through a utility function, which is an aggregation function computed from local state variables. An optimum allocation will maximize the system utility. The machine resources that are allocated to applications include CPU, memory, storage, network bandwidth, access to special hardware/software⁷, etc. The resource demand of an application can change over time. In response to such changes, the resource allocation process needs to be repeated many times over; in other words, it has to

be dynamic, in order to ensure that the system utility is maximized at all times. Resource allocation refers to the allocation of cloud resources to the process sent by the client. The freest memory in the cloud storage will receive the process. The resource of the virtual machine is allocated to the process. The resources are allocated without memory constraints⁸.

3.4 Proxy Re-encryption

In the secure storage systems, the work of proxy re-encryption scheme is, the messages are first encrypted hash by the Rijindael managed encryption algorithm and then stored in a storage server. When a user wants to share his messages, he sends the request to the server and share encrypted hash to the storage server. The storage server⁹ re-hashes the encrypted messages for the authorized user. The data forwarding technique that contain salting technique to securely forward the messages. Thus, their system has data confidentiality and supports the data forwarding function.

4. Experimental Setup and Results

The Gossip Protocol with throttled load balancing method will satisfy the maximum fairness and demand of users and it will reduce the cost of allocating resources. The utility¹⁰ becomes 1 means it will satisfy the user demand. The number of modules from the site can be incremented by 1 at each site. The cost configuration as the ratio of module instances started to module instances running per machine. Finally evaluate gossip with regards to satisfied demand and cost of reconfiguration. To satisfy the demand, the protocol satisfies more than 95% of all site demands. Data¹¹ can be securely forwarded to another server using proxy re-encryption with salting technique.

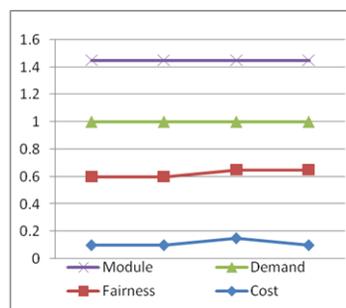


Figure 3. The performance of Gossip Protocol with respect to fairness and scalability.

5. Conclusion and Future Work

Contribution includes engineering a resource management middleware for cloud environments. The key components of such a middleware are a gossip protocol for resource management and it will secure the data. Protocol can be used for fairness and efficient adaptation to load changes. The protocol performs close to an ideal system where the ratio of the total memory capacity to the total memory demand is large.

Future work: 1. Develop a distributed mechanism based on its load after resource allocation. 2. After allocation in cloud, process checks whether the client process is allocated accurately. 3. Develop a new algorithm to secure the data.

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