An Adaptive Model- A2Pattern for Load Balancing to Ensure Disaster Data in Cloud Infrastructure

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Abstract

"The cloud" is inherently a shared infrastructure. This shared nature makes cloud an ideal model for disaster recovery. Due to global warming our earth may face many types of disasters like earthquake, tsunami, storm, flood and etc., The sensing of an environment conditions and disaster is the preventive methods to make an alert to protect data, it can lead us to a business recovery. To find the disaster and to monitor more number of objects placed in the remote areas, the function is not processed properly in the Remote Monitoring Systems. The proposed method is cloud computing infrastructure to monitor all the remote objects in the world wide and to make the fast identification of a disaster, and it also guarantees the response time by using FTR-HTTPs method. For better management of resource availability good load balancing techniques is needed. So, load balancing in cloud becoming more interested area of research. In existing load balancing technique allocation of resources is based on the demand or the request of the client. But here the appropriate resource allocation is not properly done. In this paper Activity based access pattern for load balancing in cloud based systems is proposed. In the proposed system the Virtual Machines with resources can be allocated based on its activity with the help of the BPN classifier technique. Earthquake magnitude is high then it make an alert mail to admin.

Keywords -*Load balancing, Remote Monitoring, Virtual Machine, A2pattern technique, Disaster.*

I. INTRODUCTION

Cloud computing is a phrase used to describe a variety of computing concepts that involve a large number of computers connected through a real-time communication network such as the Internet. The ability to run a program or application on many connected computers at the same time. Load balancing has a goal to optimize resource use, maximizing the throughput, Minimizing the response time and to avoid overload of any one of the resources [2]. Load balancing is a core networking solution responsible for distributing incoming traffic among servers hosting the same application contented. To balance a resource request it's important to recognize a major goal of Load Balancing algorithms: Cost Effectiveness, Scalability and Flexibility, and Priority. As demand of the application increases, new servers can be easily attach to the resource pool, and the load balancer will immediately starts by sending traffic to the new server. In the existing system the data can be retrieved in the place of a disaster monitoring areas. After that the data can be stored in a VM based on the demand [1]. Performance cannot be improved by using the heuristic algorithm. So here the activity based pattern method can be proposed to maximize the performance and minimizing the response time and the time complexity. Spatial data outlines it the location and shapes of event. The environment, by taking the concept of this the client location can be identified in a particular time period the pattern can be generated and mapped based on its request from the client's location. All the client location can be mapped and form a pattern as per the request from the client.

Client tagging method is nothing but a identity that provided to our clients based on its location. A Control message which contains the information about the location and id will be provided by a client Tagging method. For example, in an institution a identity can be provided to all the members who are all belonging to particular institution for an authenticity purpose. Based on the id and location the spatial mapping can form the pattern as per the client request the server. Here pattern can be generated based on the types of an accessing/activity pattern from the client. In the cloud, the data can be allocated to Virtual Machine. Based on their classification of activity or access pattern it can be stored in a server.

II. PROPOSED ARCHITECTURE

In the Fig.1, Cloud infrastructure, there are many virtual Machines available and they are act as a listener service and an application service. There are Many RTUs presented in the various areas to be combined together and storing the disaster sensed information it can be read and process by virtual machines and allocate it in a cloud storage areas. By the help of an application service client can also easy

to view the disaster data. Here in the cloud storage area all the data to be stored by comparing the magnitude value of an earthquake it can check with the previously updated disaster. If the high level data found then it can provide a disaster warning about the disaster.

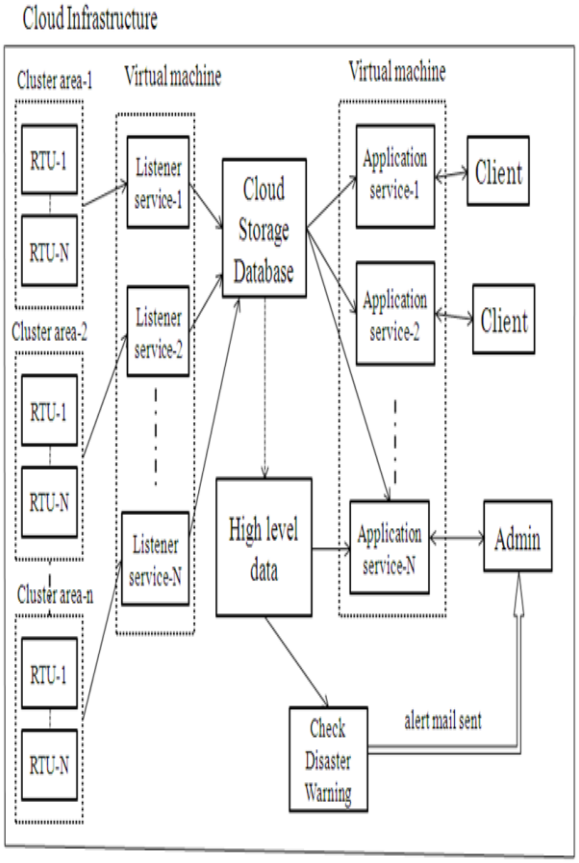

Fig.1, Architecture in Cloud Computing perspective

In the Fig.2, the architecture diagram is described. To perform the efficient load balancing on the server, the client request can be identified as a pattern based on its user accessing rate. The classifier [12] only identifies the client activity pattern. The pattern can be generated by the spatial mapping with the help of a client tagging. Based on the labelling, the server can allocate a particular pattern to its allocated Virtual machines. Backward Propagation Neural Network Classifier used for learning process, it can able to classify and analyse the pattern and its types. Here the server can already maintains a list of all VM and their ranking position based on its priority and capacity in the form of labels. The server only maintains the all virtual machines; BPN Classifier classifies the client request as a Pattern. The accessing pattern mechanism are explained simply are as follows

1. Frequent Access Pattern- To check whether the client request can be accessed frequently in the server.
2. Seasonal Access Pattern- Pattern can be formed based on which client can be accessing in a regular time interval.
3. Time Bound Access Pattern- Pattern can be formed based on which client can be accessing in a certain time period.
4. Tentative Access Pattern- Pattern can be formed based on which client can be accessed as a rare event or occasionally.

Based on the Control message by the client tagging, the spatial mapping helps to map the client location based on the client accessing rate.

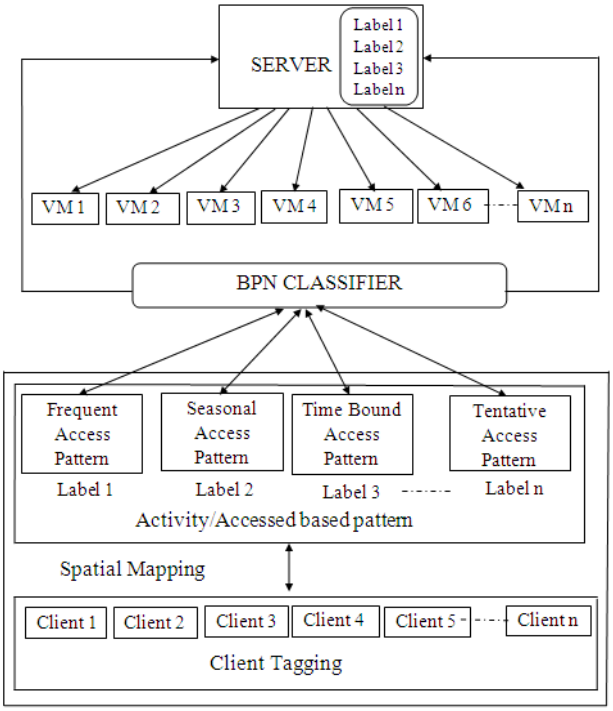

Fig. 2. Architecture Diagram for A2Pattern

III. PROPOSED METHOD

In the cloud, the data can be allocated to Virtual Machine based on their classified activity or accessing pattern of the user by its different pattern analysing technique .The data can be stored in a Virtual machine with the help of a server list. The proposed techniques are as follows.

A. BPN Classifier

BPN- Back Propagation Neural Network Classifier. Dataset is here required of the desired output for more inputs, modelling the training set. It is most useful for feed-forward networks (networks there is no feedback and no loop connections). Back propagation is a classifier it classifies the client request in to four pattern based on the user request activity [3]. Fig.2, describes the BPN Classifier Technique.

Here the input layer is the client, and the hidden layer is the Particular type of a accessing pattern, and the output layer is to store the particular client based on its particular accessing activity pattern. In the fig.3, client 1 is requesting the server due to its frequent activity it can be analysed as a frequent access pattern and stored it in to a server. But when it's not true or the remaining nodes are to be considered as an error.

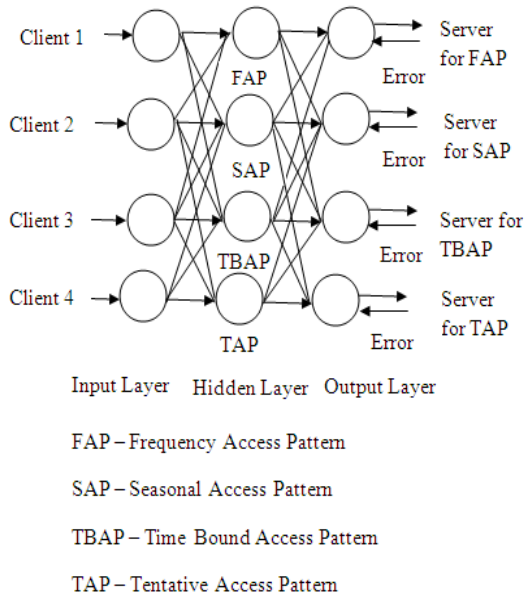

Fig. 3. BPN Classifier

B. Client Tagging

Client Tagging is a method that provides a control message in the form of a location of the client and its IP address. Based on the control message it is very useful to identify the client as a trusted Party. With the help of a client tagging method, the spatial mapping is used to map the client based on its region.

1) Labelling

Labelling is a method of naming the mapping pattern that is generated. To identify the pattern the labelling technique is used to analyse the full pattern and store it in to the server. It is also used to classify the request from the client which makes the grouping of clients much easier. It is also very useful for identifying the client in the cloud environment.

C. Spatial Mapping

Spatial Mapping refers to Mapping based on the geographical information of where an event (client request) occurs. The frequency rate (accessing or request) of a client activity is analysed then it can be mapped together to form a pattern. This pattern can be stored according to the priority given to the client and it is allocated to a particular Virtual Machine. Along with a spatial data is very efficient to generate the pattern by its location [18].

D. Activity Based Access Pattern For Load Balancing

The types of an Activity based access pattern for load balancing can be follows and explained [15].

1) Frequently Access Pattern

Frequently access pattern can be formed by mapping of aclient based on its request. The classifier analyzes from where the request from the client frequently accessed the server. Based on the time period of a client activity, it can analyze that whether the client is active and it can receive the information frequently from the server [14]. The procedure to find a frequent access pattern, that is to find the client requests to the server frequently. The input is getting the request from any client, and the output is to obtain only a frequently access pattern.

a) Analyzing Pattern

After the generation of a pattern it can be labelledaccording to the activity of the client. The pattern is analysed and stored along with certain pattern information.The pattern is analysed based on the request from the client. Here the generated pattern is checked for pattern matching [13] with the same pattern of previously generated frequent access pattern if its match then automatically decide it belongs a Particular pattern group and stored it in an allotted VM. In these pattern 16 nodes is assumed to be mapped to form a pattern.

b) Procedure to Find a Frequent Pattern

Input: Request from any Client
Output: Frequent Access Pattern
TC: Tagged Client
Th: Threshold
CR: Client Request
n: number of tagged client
var i=TC1……TCn;
for each client request
CR1……CRn
mark Tag;
return TC1…….TCn
For each Tag generate pattern
while (n(TCi)>Th)
{
find n(TCi);
return
f=n(TCi)
}

2) Seasonal Access Pattern

Seasonal access pattern is a pattern, [20] the classifier can be analyzed to find where the requestfrom client can access the server in a seasonal. Based on the threshold value it can be analyzed that whether the server receives the request in a regular time interval. The procedure to find a seasonal access

pattern is to find the client requests to the server in a regular time interval or seasonally.

a) ***Analyzing Pattern***

Here the generated pattern has 8 nodes. In the frequent access pattern there is a 16 nodes can be mapped to form a pattern, by comparing the node size it will be reduced half the nodes by this way also its very efficient to identify pattern. Hence it assumes that these clients can occur seasonally.

b) ***Procedure to find a Seasonal Pattern***

Input: Request from any client
Output:Seasonal Access Pattern
time=seq(regular interval of access time);
x<- Tc(data,time)
Generate pattern for each tag
If(Th=regular Interval) then
{
Seasonal<-set pattern(x);
else
return
}

3) ***Time Bound Access pattern***

Time bound access pattern is a pattern that can classify and analyse the request from the client that is received during certain time period in a routine fashion [17]. The procedure to find a Time Bound access pattern is to find the client requests to the server in a certain time period. In a given time,sequence of requests from the clients based on fixed time interval is found.

a) ***Analyze Pattern***

The pattern is a time bound analyzed by the classifier based on spatial mapping method. Here the generated pattern is checked whether the pattern matches with the previously generated time bound pattern if it match, then it is automatically decide that it is a time bound pattern.

b) ***Procedure to find a Time Bound Pattern***

Input: Request from any client
Output:Time Bound Access Pattern
time=seq(start=Tc1, end<Th);
x<- Tc(data,time)
Generate pattern for each tag
if(Th<tolerant) then
{
timebound<-set pattern(x);
else
return
}

4) ***Tentative Access pattern***

Tentative access pattern is a pattern; the classifier analyses the request from the client that is received occasionally or as a rare event. Based on the threshold value it can be analysed that whether the client can be received a request in a totally different time period. It can may or may not be happened it's a rare event. The generated pattern can be continuously used for analysing a Tentative Access pattern of a client based on the Access pattern the data can be stored in a particular Virtual Machine. The Tentative pattern is simple means where client request can occur as a rare event.

a) ***Analyze Pattern***

The pattern is a tentative access pattern only 5 nodes is assumed to form a pattern. It analyzes the node is much lesser to be mapped when compared to all pattern. The event that will occur rarely then the request of a client can be assumed as a rare event then it commonly moves to a tentative pattern.

b) ***Procedure to find a Tentative Pattern***

Input: Request from any Client
Output:Tentative Pattern
start:
time=seq(Irregular access time)
consider as a rare event
x<-Tc(data,time)
tentative<-set pattern(x);
end:

IV. RESULT AND DISCUSSION

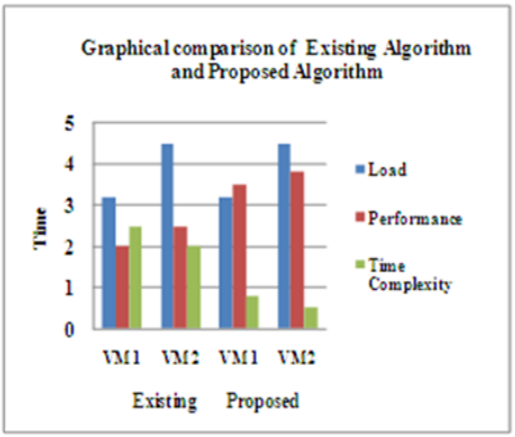

Fig.4, Graphical Comparison of Existing and Proposed System

The proposed approach yields less response time compared to the existing approach. The graph strongly shows the activity based access model will balance a load equally to provide higher performance and it also reduces the time complexity [16]. By the activity based client accesses it reduces the load of the server when compared with the existing system, here the all the client's activity can be maintained in a

single state hence there is a necessary to maintain client information.

V. CONCLUSION AND FUTURE WORK

By using a cloud here the disaster can be identified in a worldwide. And it helps to identify the disaster early detection. Here the better load balancing technique, the Activity based access pattern method; here the pattern can be generated based on a client request to the server. The load can be balanced based on the allocation of a load according to a pattern it helps to improve the efficiency based on the pattern it helps to easily allocate to a various virtual machine. It also improves the performance and it reduces the time complexity. The information can be classified and stored according to the pattern this made the data retrieval easy. By this the server load can be maintained according to the user's activity. This work can also be extended for multi – server application cloud environments.

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