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Research Article

Security for Multi Cloud Using Server less Registering Approach

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Abstract: These days, in any application development, security for specific area has become crucial job in the service access environment. Since clients needs to utilize the unique services and resources in distributed computing environment. Here the security administrations and cloud portal frameworks have been highly advanced based on the client necessities. However cloud offers a lot of resources through the global service vendors and Multicloud technologies are rapidly in use, but still the cloud requires security enhancement. Applications become complex and have attacks when deployed on multiclouds .So it is very important factor to protect the data and resources from the hackers. In multiple cloud environments it is possible to control all the applications, user resources, secret information and other confidential user process level with the help of server less approach. The server less computing approach is a sort of Distributed computing execution model through which Cloud Service provider will allocate the resource to the client in a dynamic manner .This paper represents what is Multi cloud, advantages of Multicloud, Why Security issue with Multi cloud, How server less is different from monolith services and Security Approaches to multi cloud with server less computing.

Index Terms: cloud services, multicloud, server less computing

1. Introduction

As we know Cloud delivers computing power (CPU, RAM, Network Speeds, Storage OS software) a service over a network called Internet. But if all the resources and services of the website are on one cloud, a DDoS (Distributed Denial of Service) attack can take the website down, sometimes the single cloud service provider cannot fit all requirements to the tee. Hence many organizations are making use of multiple cloud environments. Multicloud is an approach which contains more than one cloud, mix of public and

private cloud components where service provided by different vendors.Fig:1 represents overview of multi cloud environment. Organizations/IT sectors normally deploy Multicloud environments to meet various IT-related goals like improved flexibility, reduced costs for IT services, avoiding vendor lock-in (restructure of the functions will be easy), and tapping into regional cloud providers (especially some companies operate globally, where a single provider may not be available in certain locations, or where they offer specific cloud features might be unavailable).

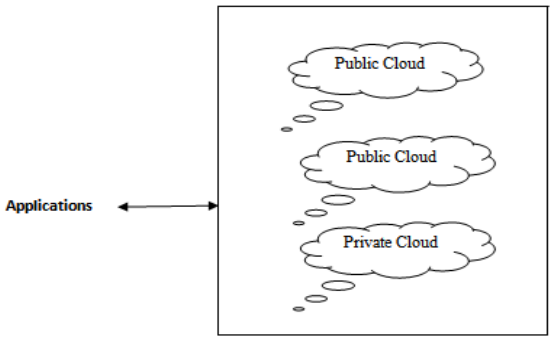

Fig1: Multi Cloud Representation

Public cloud platforms are available from third party vendors like Amazon Web Services, Microsoft Azure, Google Cloud Platform, Alibaba Cloud, the IBM Cloud, and others. Private cloud means delivering cloud services

through internet or private internal network to a company or organization, here data centre's are controlled to make cloud computing resources available across an entire organization, irrespective of any location.

Advantages of Multicloud

Reliability:If all the resources are in single cloud, Single Point Of Failure can affect the performance, as multi cloud uses more than one cloud, if one cloud services are not working rest of the resources and services will not be effected.

Flexible:As the business/organization grows year by year, the infrastructure and data storage need to be changed frequently, when there is no need of certain elements to be in the cloud, the elements can be scaled to the local server and the developer can match the needs to the solutions that fit the best and alter them as the requirement.

Cost optimization: There are plenty of cloud vendors in the market, finding the right combination of cloud providers to match the business will help the company to boost the efficiency and reducing the cost.

Data Management:All data is not created equally, some of the data need to be stored in data base for life time, others might be part of computations like 6 times a day for seven months .rather than dumping all the data into a single cloud, we can take the advantage of multi cloud and can choose the right service because when the data need to be uploaded, analyzed and downloaded back to the local intranet, speed and processing power will be managed by the cloud providers which is greater than the IT's security system.

Less Manpower:CSP is responsible for delivering the additional functionality to the customers without need to hire the extra man power or spend time to managing it

Why Security issue with Multi cloud: The major need which has to be managed effectively in Multicloud is security because by using various public cloud services the support against attack will be more compared to the single provider. Hence it is essential to secure the network. Security levels can be increased by using server less approach.

How Server less Is Different from Monolith services.

Server less computing is a process of providing the backend services to the user on as-Used basis. The programmers can develop the application without having to worry about servers at all. Here Servers are allocated by the cloud service providers to run the code, data storage process and infrastructure concern is managed by the vendors. Programmer need not to be aware of them. The name server less indicates/appended that programmers spend less time on backend development and more time writing application code. An Organization/Sector that gets backend services from a server less vendor need not to reserve prior ,charges are based on the computation and pay for a fixed amount of bandwidth or number of servers, as the service is auto-scaling(automatically adds or removes resources). Coming to the normal three tier architecture, follows monolith pattern which means, Application code is maintained in a single container. The call from user interface to database makes to execute all the code within the container. Fig: 2 represents, how the client interacts with the Monolith service (which is pre-provisioned with all the functions) as per the requirement. The application is bind with different services like (update user, Get_User, Create_User, delete_user) and is scaled only if overall load exceeds across the service. Here the server should be ready to process the request all the time, irrespective of CPU time and memory that are actually used. Example: it's like leaving Electrical Chimney on all year long, regardless of usage and paying unnecessary electricity bill

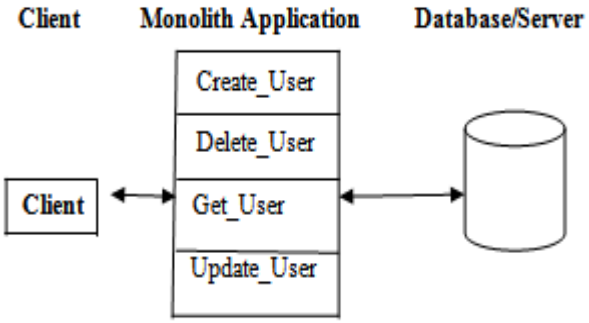

Fig: 2: Client Accessing Monolith Application From Database

Coming to server less approach, programmer can choose different tools like node.js, python, C#, etc to write the code and upload the file which will automatically deployed by the system. Another name for server less computing is Function-as-a-Service (FaaS), because the programmers assemble code into different blocks called functions. As the function load grows, the infrastructure will create different copies of the function which can be scaled, updated separately and parallel to meet the demands. Server less is stateless (it only executes a task and does not store or re-use the requests), It works like a motion sensor, only when a particular pre-program event is triggered. As shown in Fig: 3 API gateways is an HTTP server where all the routes and endpoints are initially defined in configuration and each route is associated with the resource with the help of FaaS Functions. When Client request for the resource, API gateway receives the request and matches the routing configuration and passes as input to the FaaS Function, which in turn executes the function and response back to the API.

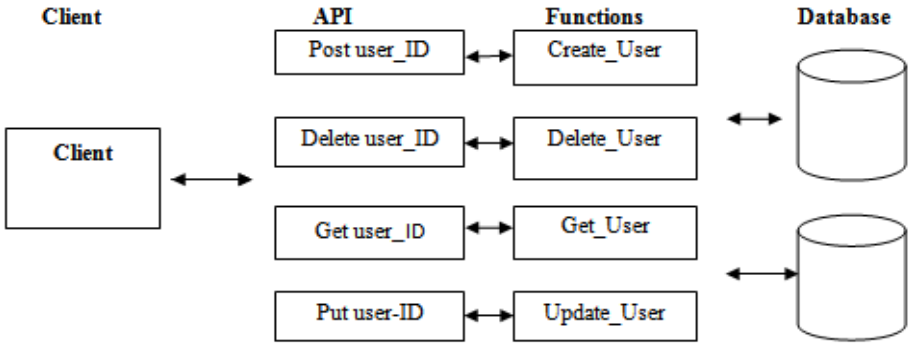

Fig 3: Server less Computing Architecture

Where API will transfer the result into HTTP response and sends back to the client or browser. No cost is charged when the APIs are not called.

2. Security Approaches to multi cloud with server less computing:

Time out Invocation: As all the programs are assembled through small functions, the programmer can set real time outs and make the functions run as quick as possible, which allows the administration to stop malicious behavior .

Authentication through APIs: All the requests need to be passed through API Gateways, creating only few users who have the ability to access the API gateway, helps to identify any misconfigurations.

Log Activity: Server less functions are event driven and stateless, maintaining and monitoring log activity will help to identify the intruder or any malicious attacks.

Monitor Function Layers:Functions will have multiple layers, where each function can be called with different code and also with third party libraries, Layer monitoring will help the to identify the attempt of malicious activity

Third party security tools:There are many third party security tools like Aqua Security, Nuweba, Puresec, Protego labs in which the server less can be easily implemented and enhance the security.

3. Conclusion

Server less is a perfect approach for many multi cloud applications, which won't run continuously but have quite high traffic. The sectors who seek to scale painlessly with lower cost can approach the server less computing. As server less is having real-time response nature, which can be implemented in IOT, weather forecasting, temperature, regular health check-up apps etc.

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