

## **Deployment of Data Base as a Service and connecting it with the local server**

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### **Abstract**

Cloud Computing, is the on-demand delivery of computing resources-everything from applications to traditional IT infrastructure(Data centers)-over the internet on the pay-for-use basis. Cloud Computing is the current need of the IT industry. Cloud Computing offers on demand internet based IT services like IaaS(Infrastructure as a Service), PaaS(Platform as a Service), DBaaS(DataBase as a Service), etc. With the exponential increase of the IT industry it is very difficult to maintain all the resources physically and hence the Cloud computing comes into the picture. Every IT industry requires data to be maintained and updated constantly and datacenters in the traditional IT has proved to be inefficient. Datacenters have huge unused resource which too requires capital. With the increase of data, it becomes very difficult to manage the data in the physical resources and hence companies use DBaaS (DataBase as a Service), where the data is saved on the servers which are not physically present at that location. Pre-configured and pre-defined structure of the database is present and hence deploying and maintaining the database becomes easy. With the deployment of DBaaS, analyzing the performance and optimization of the database is much better than doing the same in physical database.

**Keyword:** Datacenters; DBaaS; Cloud computing; Traditional IT infrastructure;

### **Introduction:**

With the increase in number of the IT firms, the need of resources has also gone up. Traditional IT infrastructure uses Datacenters to maintain the database and also other resources. Datacenters maintains all the resources for the firm and provides solution when queries are being generated. But with the increase of the data it becomes very difficult to maintain the database and hence to maintain a large chunk of the data huge physical resources are

required. In traditional IT infrastructure the complexity involved in the security, manageability, software up gradation has gone up as well.

Problems with the traditional IT infrastructure leads to the development in the Cloud Computing. Industries are switching themselves from traditional IT infrastructure to the Cloud computing. Scalability, Performance, Availability, Least cost and robustness are some of the basic reason companies switching themselves from datacenters

to cloud computing. Traditional IT infrastructure meets the certain requirements of the industry whereas Cloud computing is the integrated form of all the services and resources provided by the traditional IT infrastructure.

In the current scenario data is the most important thing for any industry. They need to maintain data, update the data, secure data and analyze it. By analyzing the data they are able to take right decision. To meet the requirements to the industry the cloud vendors provides DataBase as a Service (DBaaS). DBaaS stores the database of the industry in the cloud, so the company doesn't have to maintain the datacenters with large number of resources. It automatically stores the data entered by the user on the cloud, on the specific location. Cloud provides the scalability and promises efficient resources utilization. Data in the database of the cloud can be accessed from any geographic location. It provides the better infrastructure to the database than the datacenters used in the traditional IT industry. The need of professionals has been eliminated to maintain the data in the datacenters. The basic advantage of using the database on the cloud is the load balancing. The user gets the independency of choosing the location of the servers, according to the location provided by the vendor. The load is being distributed across multiple servers so that performance cannot be degraded and accessing of the data should be much easier.

Most of the database offers web based console in which the user can configure the instance of the database. Most of the vendors provide both type of data models i.e. SQL database and NoSQL databases. Queries can run directly on the database service. The result of the query can be analyzed through various means. Data is also safeguarded in the cloud storage by storing the data across multiple servers. Data are being replicated and stored in the

multiple servers so that the user do not lost any data.

The user using the DBaaS service is also independent to choose the storage location, the amount of space needed, number of processors required and other details which is not possible in the traditional datacenters. User only has to pay for the resource which he is using. Cloud computing is not limited to the provide the service to the application with user end. They are also helpful in the industries where a bunch of people work on the same data every day. Everyday developers work on the same data and store that data on the local server and the local server in being authorized to be synced with the cloud storage. Data from the local servers are automatically being uploaded to the cloud storage, thus keeping the data safe. Unlike datacenters, DBaaS do not require DataBase Administrator (DBA) to handle the database. User can directly call the database service that would maintain, upgrade, back-up and handle server failure of the database and every other expect without considering the developers. The operational cost is reduced, at the same time the performance has been increased simultaneously.

DBaaS can be deployed on any form of cloud like on public cloud, private cloud or enterprise cloud, which is chosen according to the use. Not only the time or cost but also the operational quality has been reduced to much extent. Database analysis become easy to carry out and generation of automatic report has also become possible through automation.

#### **Problem Statement:**

The distributed database that implements a DBaaS system have two major problems that has to be considered. First one is elasticity and second is scalability of the database. Initially the firm don't know the amount of the storage needed or the amount of the data they will be receiving. The

scalability is the major issue in DataBase provided by the DBaaS. The firms initially take certain amount of the storage space on the server. Sometimes the data used by the firm crosses the limitation of the taken resources. In this situation either the firm has to buy some new resource of remove the initial data. In both the situations the firm has to lost some data or has to deal with the irregularity of the database.

Another problem that arises is Elasticity in case of DBaaS in cloud. This problem mainly arises when the firm has to add some new entity on their complete database. Complete DataBase structure has to be changed in this case.

Few other problem that arises in DBaaS system are the workload level and the complexity of the Database infrastructure. In the distributed database system the evaluation of the scalability and elasticity is required in the cloud.

### Literature Review

Database is the essential part of the IT industry and database became an integral part of the industry in last four decades. During the age of the datacenters there were very few key people directly interact with the database to get the relevant information. Sometimes without knowing the user interact with the database indirectly. Like searching a phone number in the contact list is accessing the database. In late 1990's the interaction revolution started and there is sharp increase in the the direct accessing of database by the user.

Earlier each firm used to have datacenters to store data. These datacenters used to store data of the firm. There are some key people who handle these data and industries need 24x7 standing team to handle the data. Huge amount of resources are also required to maintain the datacenters. Much of the resources remain unused and even than firm has to pay a large amount of money to maintain those resources. In the datacenters much of the resources

remained unused. After managing all the resources data security and handling of the data still remains an issue in the datacenters. Data is maintained for the analysis purpose and later the data is analyzed and relevant information is depicted from the analysis. The result of the analysis is used to take important decisions. To carry out the analysis in the datacenters was a very typical process. The data from all the resources are abstracted. After abstraction the relevant data is separated and than the analysis process is carried out. The analysis is done manually and it takes a lot of time. The result of the analysis is also made manually and the possibility of the manual error is very high in this process.

The data security in the datacenters is always an issue. Data can be lost due to human error or the breach in the security. Datacenters were unable to provide reliability. The security of the data is very low and hence it is easy to breach the security wall.

Seeing all this issues, development of the Database-as-a-service (DBaaS) in cloud was started by the firms. The key issues to be solved during the development were reliability, availability, security and analysis of the data. The cloud service providers were already offering the services like Software-as-a-service (SaaS), Platform-as-a-Service(PaaS), Web hosting, etc. They came up with the new service termed as DataBase-as-a-Service(DBaaS). Cloud service providers like Amazon Web Services (AWS), Microsoft Azure and other service providers started offering DataBase-as-a-Service. The user need not to have any physical resource, the resources were provided by the service providers. The user accordingly chooses the amount of memory they need on the server, size of the RAM, processor, and other hardware requirements. The user only has to pay for the resources that he is using. At this point of time the firms started switching from traditional IT infrastructure to the cloud. They don't have to

maintain the datacenters with huge amount of unused resource. Switching from traditional IT infrastructure to the cloud services not only provide basic infrastructure but also with security, reliability, economic and availability. The cloud providers not only provide the database service but also provide platform to analyze the data and provide the analysis result automatically.

The resources used by the user are not physically present but the service provider provide some space on the physical server that can be used by the user.

The space in the server is the private storage space for the user. It will act as a private cloud for the user and all the data will be stored in that space. The security of the space is provided by the cloud service provider. The resources are reliable and most of the providers promises 99% of the reliability. Current development of the in the database on cloud is on the elasticity and the scalability of the database.

Currently most of the IT firms use the combination of the Traditional IT infrastructure and Cloud services which can be called as Hybrid infrastructure. It is blend of both the infrastructures. To enhance the performance of the firm this combination is used. In this hybrid infrastructure cloud service is used to secure the data from being lost, creating multiple instances of the data, enabling multiple people to work on the same data, availability and accessing of the data from any geographic location. In the same way traditional IT infrastructure is used to keep the data safe from outside world and to increase the reliability at any specific location. In this hybrid combination the problems related to the distributed database in cloud like scalability and elasticity is tackled.

### Objectives:

Deploying the DataBase as a Service (DBaaS) for the user and storing the database in cloud and creating the local database of the same.

### PREREQUISITES

The user must know the following things before going through the Methodology.

1. One must know to deploy the code on Github.
2. The user has to understand the services provided by the vendor.
3. Reader must be able to build their own application.
4. One should be able interconnections between different databases.

### Methodology:

Following methodology should be followed to deploy the database service and connecting the same with the local server.

- 1) We have to write the code for the web application or any other application.
- 2) I have used PHP, Mysql(to create the local database) and HTML to create the application.
- 3) The application should take the input from the end user to store in the cloud database and local database as well.
- 4) Store all the information of the user on the local server i.e. Mysql database using PHP. The same database can directly store in the cloud database or in the local database. The data can be synced automatically with each other and stored in both. The replica of the database is stored in local server as well as on cloud server.
- 5) Create an account on Microsoft Azure or you can use any vendor and deploy Web app+Mysql service in Microsoft Azure and DBaaS service will be deployed for the web application.
- 6) Set up the server location and the resource group in the web app+Mysql which will be used to set the application in use for the end user.
- 7) Create the repository on the github according to your project and deploy the code of your application of the repository

- 8) Authorize your github account with the vendor deploy the code on the github.
- 9) Once authorized the URL of the web application will be generated and through the URL the user will be able to access the application and data entered by the user will be stored in the database of the cloud and local server as well.

### Conclusion:

Database is the important part on the industry and is stored for the analysis purpose. The result of the analysis later through these result important decisions are made. Currently, IT firms have taken one step forward and use the combination of traditional IT infrastructure and cloud computing services. This blend of infrastructure has enhanced the performance of the industry. DBaaS is the one of the most widely used service provided by the cloud vendors. It is reliable and availability is quite high.

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