Used Of Cloud Computing As An Infrastructure Case Study- Microsoft Azure

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ABSTRACT

In recent years, the cloud has achieved an immense popularity in the world of tech. This has provided new and improved strategies for cost reduction, and for ensuring better utilisation of cloud resources.
Implementation of this model is continuously increasing in numerous businesses , due to the many benefits that the companies are attaining. These cloud resources can belong to either, the infrastructure or platform model.
A vast attention has been directed towards the virtualization technology, because the cloud is largely relied upon it. With the help of virtualization, one can quickly download apps or websites, from the cloud.
In order to yield the full potential of the cloud, companies should migrate all their current applications to the cloud, and in order to do that- only an internet connection is required.
Migration of the existing systems to a scalable cloud solution, can reduce hardware related costs , such as : servers, installation of operating system, database and licence system costs, deployment of database products , and finally employment of professional staff to develop and maintain the system.
This research attempts to study and analyze Microsoft Azure, in particular the virtual machine - as part of its infrastructure. The main priority lies in establishing a secure cloud data storage system.
Key words: Cloud computing, Microsoft Azure, Virtual Machines, Resources, Cost.

INTRODUCTION

The Windows Azure platform is one of the key pillars of Microsoft Cloud, which transforms the traditional data center, helps businesses maintain data anywhere, enables the development of a wide range of modern business applications, while making it possible for IT to support users (who work anywhere, remotely on any device) to manage these devices in a safe and consistent way. With Microsoft Azure, you can access new servers that allow uploading within seconds,
minutes rather than waiting for days or weeks to get new hardware in one's data center. In most cases, many Azure actions are performed automatically without human involvement, nor interaction.
Cloud Computing as a term that does not describe one single thing - but it is a term that incorporates a variety of infrastructure-based services as a service, through platforms as a

development tool, and through software as a service that replaces traditional applications.

1. Types of cloud services

Cloud service models describe how users can use these services. The basic cloud service models include a combination of IaaS (Infrastructure as a Service), PaaS (Platform as a Service),
and SaaS (Software as a Service). These service models may have interaction between each other and may be dependent on each other; for example PaaS is dependent on IaaS because the
application platform requires physical infrastructure.

1.1.SaaS (Software as a service)

SaaS is the software ,whose function is to provide network applications that can usually be accessed by traditional browsers. This is a model of cloud services where users unlike other models have ready-made environments where their projects will be accomplished either for personal or business purposes. SaaS software is usually licensed through a monthly or annual subscription.
Office 365, is a typical model that SaaS offers. Prepaid users, are always equipped with the latest version. All the cost for installment and updating of the software, fall upon the companies that provide these cloud services.
Other SaaS examples are: Microsoft One Drive, Dropbox, Wordpress and Amazon Kindle.

1.2. PaaS (Platform as a Service)

This is a model where different services are provided- such as databases, different operating systems, web servers, etc. Different software developers, as well as individuals or companies use PaaS so that they can utilize the borrowed environment as a service to operate their cloud software without having to invest in their technology and other hardware and software adaptation
activities.
PaaS can be defined as a computer platform that enables the creation of easy-to-access network applications without the complexity of software purchase and maintenance. PaaS is similar to SaaS, except here, rather than being the software presented in network , this is a platform for software creation that appears on the network. Some examples of PaaS include the Google App Engine, Microsoft Azure services and the Force.com platform.

1.3. IaaS (Infrastructure as a Service)

Provides the basic model of cloud computing services on which all services are performed. In this model, users have physical technology such as processors, data storage space,

or network access so that they can be implemented as required. The required physical devices are
linked and configured to the cloud space reserved to create the 'so called' Virtual Machine.
The customer here does not manage or control the basic cloud infrastructure but has control over the operating systems, where data and apps are stored.
What users gain with IaaS is the infrastructure at the top of which they can install any necessary platform. Users are responsible for updating them, if new versions are released.
Examples of companies that offer the IaaS model are: Amazon Web Services (AWS), Cisco Metapod, Microsoft Azure, Google Compute Engine (GCE), Joyent.

2. **Microsoft Azure**

Microsoft Azure (formerly known as Windows Azure) is a public platform created and organized by Microsoft. Microsoft Azure is an open and flexible platform for cloud services that quickly enables building, deploying, and managing applications across the globally managed data center, from Microsoft. As a new Microsoft platform that offers a wide range of different services, Windows Azure can build, deploy, and manage solutions for virtually every imaginable goal. In other words, Windows Azure is a world of unlimited opportunities.

2.1. Windows Azure Services

Cloud-based Windows Azure Services are:
- Computer services
- Network Services
- Data services
- Application Services

2.1.1. Computer Services

Windows Azure Computer Services provide the power needed to process applications that will run on the cloud. Windows Azure currently offers four different services:

Virtual machines - This service provides a general purpose environment that allows to create, deploy, and manage virtual machines in the Windows Azure cloud.

Web sites - This service provides a managed network environment that can be used to create new web pages or to send existing business clouds to your site.

Cloud services - This service enables building and deploying low-cost administration applications using almost any programming language.

Mobile services - This service provides a solution for building and deploying applications and storing data on mobile devices.

3. Virtual machines

Azure's Virtual Machines (VMs) are one of the major functions of Azure's IaaS capabilities along with Virtual Networks. Virtual Machines support the use of a Windows or Linux server in the Microsoft Azure database. There is full control of VM configuration here. Azure Virtual Machines allow the creation and use of virtual machines in the cloud. By providing the what is known as "Infrastructure as a Service (IaaS)" , virtual machine technology can be used in various
ways including:
- Virtual development and testing machines
- Executing cloud applications
- Expanding the cloud data center
- Treatment of critical data in case of disaster in business

Other benefits to be considered for VMs include:
- pay as much as you use - Azure requires a price per hour based on the size and operating system of VM. For partial hours, Azure only requires to pay for the minutes of use. The use of storage server is charged separately.
- elasticity - Azure monitors the physical hardware that holds any VM that is in operation. If a physical VM server fails, Azure notes this, moves VM to a new hardware and reboots VM. This process is sometimes called a 'healing service'.

Like other virtual machines an VM in Azure has an operating system, storage system and network capabilities and can run a variety of applications. If we want to store an image, we can use one provided by Azure or one of our own. Examples include various versions, variances and
configurations of: Linux Servers such as SUSE, Ubuntu and CentOS, Windows Server, SQL Server, BizTalk Server, and SerSharePoint Server.

3.1. Creating a virtual machine

The process of creating a virtual machine passes through several phases where you initially need to open the account on the page and after all the services offered by azure, we choose to access the Virtual machines (classic) option as follows:

Fig 1) creating a virtual machine

we choose the Add button, and then the Windows Server option,
Windows Server 2008 R2 SP1 (or another), the Classic option and the Create button and fill in the text box with the Host name (for example, with name fidan), User name and Password. After its creation, the appearance will appear as follows.

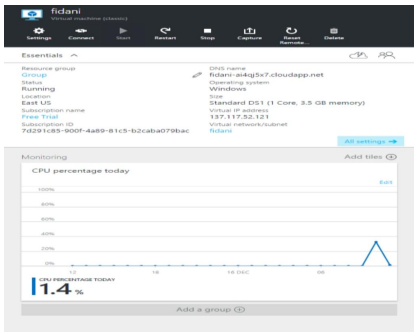

Fig 2) virtual machine created

To connect to this machine from the desktop computer, you must download the remote desktop connection to the desktop and then follow the Connect button to the next figure.

3.2. Virtual machines series

From the options we have, from computing there are the A series of virtual machines that give the highest value. D Series virtual machines provide the best performance type using local SSD, and G series of virtual machines have the largest memory and a faster CPU. Currently, these are the largest virtual machines within the public network.

3.2.1. Virtual Machine Series A

They present the right solution for standard uploads; when we do not need large amounts of CPU and local SSD operation. They offer the possibility of a basic and standard option.
The basic option allows the use of the virtual machine A, and by not using the uploading balance at a time, it reduces the price. This is a general form of loading [5].
In addition, there is a set of virtual machines A: A8 and A9 that bring the highest performance, the lowest latency of the network and which can perform a good uploading performance. Establishing the connection between machines that allow different applications at a
time of less than ten milliseconds, is possible here and is not allowed in a typical hardware.

3.2.2. Virtual Machine Series D

They are approximately 60% faster than series A. Newer CPUs, greater amount of memory, and the use of 112 gigabytes of memory that have local SSD allow a perfect workload. These can be found in all regions of Azure.

3.2.3. Virtual Machine Series D

They present the most optimized way to load data. Up to 32 CPUs and up to half a

terabyte of RAM in the virtual machine can be used. Series G is also the series that enables the attachment of 64 individual disks, thus enabling a total storage capacity of 64 terabytes.
Apart from the type of series, virtual machines can be divided even by level as: basic and standard. VMs at the underlying level are suitable for jobs that do not require upload balancing or auto-ignition capability. VMs at standard level support all configurations and concepts of the Azure Virtual Machines.
Within the basic and standard levels, there are different sizes of VMs. VM Series A belong to the traditional sizes that have been pioneering since the Azure Virtual Machines were introduced for the first time. The D Series of VMs were presented in September 2014 and they feature faster processors and solid state drives (SSD) for temporary physical disks.
When an VM is created, it will be equipped with two disks: an OS disk that is permanently stored in the Azure blob storage and a temporary disk. The temporary drive is a physical disk placed on the server [6]. Virtual machines use virtual hard disks (VHDs) to maintain their operating system (OS) and data. VHDs are also used for images that you can choose to install an OS.
The overall management of VMs is primarily the responsibility of the user. The Microsoft Azure platform will ensure that the VMs is accessible from the outside. Moreover, the user can do whatever they want. Configuring and managing VMs can be done through a standard desktop
remote or through a remote connection using PowerShell. Virtual machines are measured in hours of use, so that we can save money by 'unplugging' the virtual machine when we're not using it. VMs stand on the physical servers located in the Microsoft Azure data center. As with most physical devices there is a chance that there may be some failure. If the physical server fails, the VMs and Azure located on that server will fail. If such a failure occurs, the Azure platform will try to quickly find a secure server in which VMs' reconstruction will take place. This service process can take several minutes. During this, applications placed on that VMs will not be available.
In addition to hardware failures, the VMs may also be affected by periodic updates initiated by the Azure Platform itself. Microsoft will periodically improve the operating system in which VMs are operating. During these updates, the VMs will be restored and therefore will be temporarily unavailable.
To avoid a single failure point, it is recommended to place at least two instances of VMs. In fact, Azure offers a Service Level Agreement (SLA) only when two or more VMs are placed in a set of availability. This is a logical concept that is used to ensure that a set of VMs that are connected between them are not all located at a single point of failure so they do not need to be all upgraded at once . The first two VMs placed in an availability set are divided into two different domains of failure by ensuring that a single point of failure does not affect all at the same time. Similarly, the first five VMs placed in a set of availability are divided into five different update domains, minimizing the impact when the Azure platform carries out any updates to the operating systems.

4. Conclusions

Computing in cloud computing makes it a reality. Organizations can currently only pay for

what they use. This enables a reduction in investment in IT and leads to more efficient use of thedata center. However, the economic benefits of using cloud services are attracting organizations
where their current systems need improvements.
Some cloud providers make it stand out between the existing and cloud data center. While Azure, which easily integrates into the existing IT environment through the broader network of secure private connections, database, warehouse choices, and encryption features, can put things
into place. With the Azure Set you can bring the application development model and placement in the data center. With Azure's choice we will have these advantages: more IT options, less complexity and lower cost. That is why Azure is one of the best cloud service services available.

References

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