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A REVIEW OF CLOUD COMPUTING ON AZURE

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A B S T R A C T

Cloud computing is becoming an increasingly popular business model that makes computing resources available to users as needed. Cloud Computing uses web technology to provide ITE-enabled functionality "as a service" to all users who need it. This means that through cloud computing, you can access what you need from anywhere on any computer, without worrying about storage or costs, and without management. Here, we will describe "Microsoft Azure", one of the simplest cloud service providers in the world. Cloud computing offers everything like one with infrastructure A scalable and active application platform Efficient in terms of cost to customers. Cloud service Very abstract without a well-defined one Depending on the property and user requirements There are several solutions on the market of Cloud computing.

Keywords*: Cloud, Virtual Machine, Distributed Server Windows Azure, Types of cloud, network, devops, Virtual machine*

1. INTRODUCTION

What is cloud computing?

Cloud computing is renting resources, like storage space or CPU cycles, on another company's computers. You only pay for what you use. The computing services offered tend to vary by cloud provider. The cloud is an abstract virtual environment. The program and data are saved. Cloud computing Power is supplied through the data centre. With a system for data storage Ability to manage almost all software, and Customers pay flexibly according to resources It is used based on a monthly fee. Even in the cloud Computing users do not need to purchase software. Maintain expensive servers and equipment for your data Storage, which leads to significant savings IT spending, office space, in-house staff Data security support and enhancement. Cloud computing based on main component are as follows:

1. **Client** defined by terminal or common Computer, its advantage is small hardware Cost, low IT cost, security, low power consumption, simple repair and replacement, etc.

2. **The data centre** consists of a collection of servers Where the subscription application is hosted. They are You can fall back to the same building or one big hall with space from servers outside your organization Contains a virtualization server for which the software is targeted Can be installed and allows multiple instances Available virtual servers. many Virtual servers can run on physical servers (Multiple clients).

3. **Distributed server** that should not be localized All in the same place, but in different places Geographical location. Something really, it happens at some point. For example, a power outage. You can access this service from another website.

Users need something that is efficient and adaptable Infrastructure for business purposes. this Includes uninterrupted services available at in the world. Data centres can do even more Targets such as: Transaction Processing Centre. Multimedia Content Distribution Centre Data A centre for performing complex simulations. data Business type processing operation. Data centre for normal business.

Azure Architecture

Microsoft Azure is Microsoft's IaaS and PaaS solution, first announced in 2008 and enhanced with additional features since then. It relies on a global network of data centers managed by Microsoft to provide a collection of services that facilitate the development, deployment, and management of scalable cloud-based applications and services. Currently, Microsoft maintains data centres in four regions in North America, two regions in Europe, and two regions in Asia, and has plans to expand into additional sub-regions in the future.

The architecture of a cloud service resembles that of an on-premises solution, except that the responsibility for managing individual components of the architecture differs for a cloud service. There are three models used most commonly for cloud services:

1. Infrastructure as a Service (IaaS). The cloud service provider maintains the physical or virtual machines, storage, and a networking layer, whereas you build and maintain one or more virtual machines that you load with an operating system, applications, and data. This model is stateful, which means that even when you shut down your virtual machines, their contents are saved to disk when you shut them down and are available again when you restart the machines.

2. Platform as a Service (PaaS). With this model, the cloud service provider manages everything for you to support an application that you build. This model is considered best practice due to its statelessness. Application components do not persist a current state on the current node, but rely on external persistent storage so that no data is lost if hardware fails.

3. Software as a Service (SaaS). The cloud service provider provides everything from the hardware to the applications running on the server in this model, leaving you simply to use the application.

2. TYPES OF CLOUD

Public cloud is defined as a computing service provided by a third-party provider over the public Internet and made available to anyone who wants to use or purchase them. These can be sold for free or on demand, so customers pay only for one use for the CPU cycle, storage space, or bandwidth they use.

Private cloud is defined as a computer service that is provided either over the Internet or a private internal network and is provided solely for the selection of users, not the general public. Private cloud computing, also known as the internal cloud or enterprise cloud, is a public cloud with additional controls and customizations available from dedicated resources on locally hosted computing infrastructure, such as self-service, scalability, and resiliency. It provides many benefits to the organization.

Hybrid cloud, sometimes referred to as a cloud hybrid, is a computing environment that combines an on-premises data centre (also known as a private cloud) with a public cloud to allow data and applications to be shared between them. Some people define a hybrid cloud as a "multi-cloud" configuration. In this configuration, your organization uses multiple public clouds in addition to your on-premises data centre.

Another big advantage of cloud technology is Related to the mobility of access to data You need quick access to important data.

In the cloud, you only need an internet connection Access stored information from anywhere Place and post / send at any time Information is probably social platforms, shops, Process big dates with optimal reaction time. The Due to the large size of the database used by SN The conclusion that those processes need to be performed Efficient computer system with powerful virtual with minimal processing Reaction time. For example, in a disaster situation Will need to use important information based on See social networks, Twitter, collecting systems Interpret contributions and process them based on them Emotional analysis is strong, Efficient and secure data centre. There is Numerous providers of cloud technology.

Benefits of Microsoft Azure

Microsoft Azure is a leading provider of Cloud Infrastructure as a Service solutions sold under the umbrella of Azure. Azure makes it faster and easier to build, deploy, and manage your apps without having to buy or maintain the underlying infrastructure. Azure integrated cloud resources meet all your security and compliance needs while being easily customized to your organization's unique needs.

Azure has the added benefit of being fully integrated with all Microsoft products. If you're using your existing Microsoft infrastructure, Azure is a perfect complement to your existing software and applications. Flexible, cost-effective and state-of-the-art, Azure is the perfect solution for companies that want to grow and stay ahead of the competition.

1. Perfect for small businesses and established businesses Azure is designed for businesses of all sizes, from local bakeries to multinationals. It can be easily scaled to meet your IT needs and works with a pay-as-you-go pricing model for any budget. Enterprises can launch and store internal and external applications in the cloud, saving on internal IT costs such as hard.

2. Organizations can synchronize identification data at the headquarters with Active Directory Enable Windows Azure and single authentication Simplify user access to the cloud base application.

3. Security reports are always accessible Monitor data access and contribute to risk management.

4. Authentication can be performed using multiple methods. This also helps prevent unauthorized access. Providing an authentication mechanism in Add to password.

5. Customers can implement approval schemes Control user access to task resources Role, approval level, and Approved authority.

If you want to keep a large number of local applications Move another server to the cloud with your local server If you use the "hybrid" approach, you can have it the flexibility you need to run your applications and data Stored locally in the cloud or a mixture of both versions. Microsoft offers Office-like solutions 365. Microsoft Azure and Windows Server. To Example of hosting an application with the cloud provides access to Office 365 from anywhere Traditional usage on desktop and mobile devices. In addition, Microsoft Azure is complete Managed cloud infrastructure to host your business Has the ability to quickly install applications and new ones Move applications or them from your on-premises server Cloud whenever you want.

Main Services Given by Azure cloud

A) For computer

- Azure virtual machines that can be installed A Windows Server or Linux image in the cloud. She You can select a photo from the gallery or bring your own photo Originally customized operational image system.
- Azure Cloud Service You Don't Have Stop Managing the Infrastructure. When You Can Switch Between Web and Worker Roles Development, Deployment, And Manage Modern Applications.
- The Azure website helps you to install the web quickly Scalable and reliable cloud application Construction. You can also scale your resources quickly Number of nodes; or set autoscaling as follows Load application requirements.

B) Network Services

- You can create something private using Azure ExpressRoute with Azure data centre On-site or on-site infrastructure Collocation environment.
- Azure Virtual Network helps you create a VPN virtual private network in Azure and connect securely These VPNs with IT infrastructure.
- Load balancing is done by Azure Traffic Manager for traffic going to additional Azure-hosted services.

C) Devops Services

- DevOps (development and operations) integrates people, processes, and technologies to automate software delivery, delivering continuous value to users. Azure DevOps Services allows you to create build and release pipelines that enable continuous integration, deployment, and deployment of your application.
- You can quickly create on-demand Windows and Linux environments you can use to test or demo your applications directly from your deployment pipelines.

D) Data centre

- Azure Storage provides storage space for non-relational data structures such as objects and binaries A file, a simple table, a queue, or a virtual drive.
- Azure SQL Database is a relational database service that you can quickly create. An application that extends or extends in the cloud.
- Azure Active Directory provides management ID and access control function Cloud application.
- Azure Multifactor Authentication helps prevent unauthorized access to cloud appli The Azure Content Delivery Network delivers low latency, high availability, and broadband content to customers around the world through a robust global network of data centres. cations or on-premises: add another layer of authentication.
- Azure Automation allows you to automate resource creation, provisioning, monitoring, and maintenance with a scalable and reliable engine for running workflows.
- Azure Service Bus is a messaging infrastructure placed between applications that allows applications to do this. Message exchange to improve scalability and resilience.

3. VIRTUALIZATION IN WINDOWS AZURE

Virtualization is the field of IT technology. Current trends Virtualization domains are more virtual to install Machines on up to one physical machine with processor resource usage Memory for the life of the physical machine.

Virtualization creates a virtual or simulated computing environment instead of a physical environment. You can use virtualization to create versions of operating systems, hardware, storage devices, and more. These virtual components allow an organization to divide a single physical server or computer into multiple virtual machines. Each of these virtual machines can interact independently and run different applications or operating systems while sharing the resources of a single host machine at the same time.

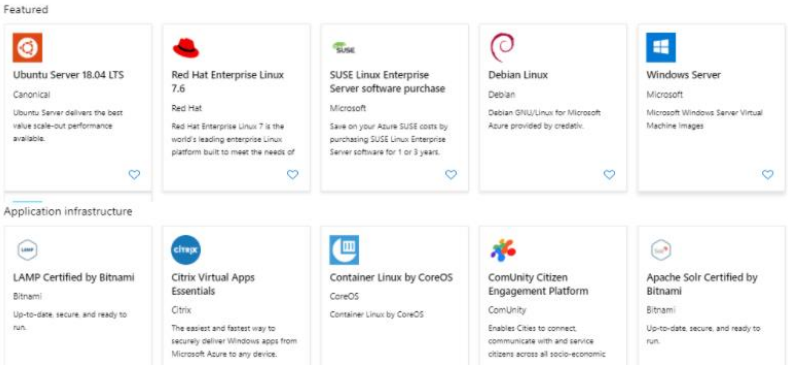

Figure 1 Contained Operating System

In Windows Azure, you can create virtual A machine that provides IaaS (Infrastructure as a Service). IT professionals can create and use virtual stuff Machines in the cloud.

Virtual machines developed for Windows Azure offer users the possibility to use R2 images. Ability to run Linux from Windows Server 2012 systems and virtual machines. These servers are either Windows or Linux Access via Remote Desktop.

System Centre 2012 R2 integrated:

Cloud management and system management Microsoft Azure platform with the following features: Skill: Providing infrastructure. Deployment Infrastructure; Monitoring infrastructure; on request Services and automation; Performance monitoring; Service management. System Centre 2012 Manage a large number of Windows Server 2012 Physical machine.

There is one in the virtual machine Private IP and how to access it Intermediate machine (load balancer) Always provide public IP (VIP) Occupancy and occupancy are known and monitored Virtual machine used.

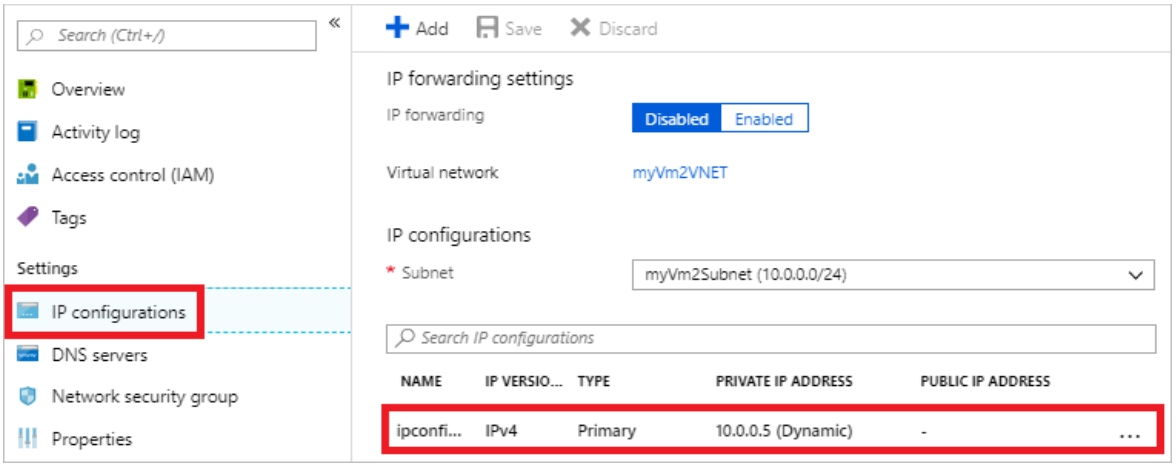

Figure 2. Identify the IP of the virtual machine

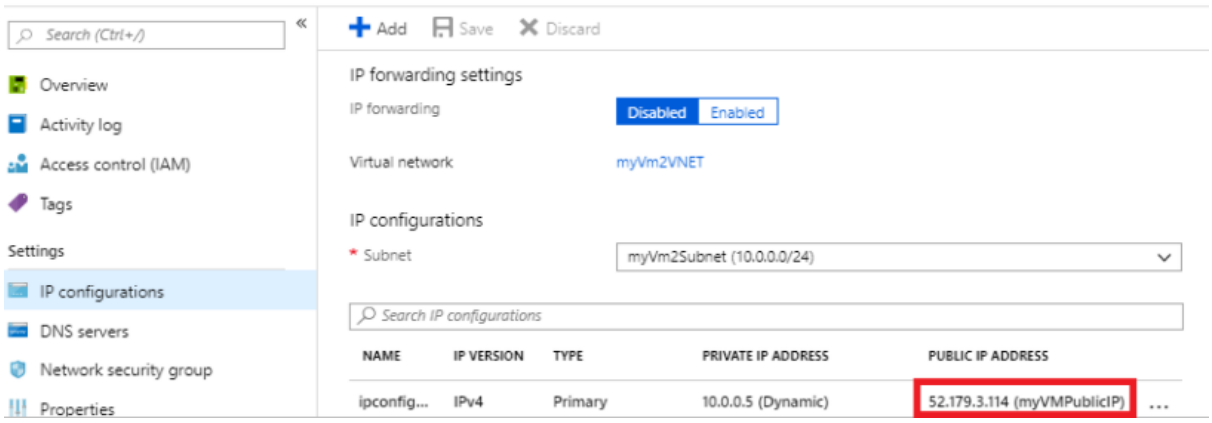

Figure 3. Virtual machine Properties

The connection to the created virtual machine is It is performed based on the authentication shown in Figure 5. It is very important that you can access your Azure virtual server from anywhere. For Windows Azure, you can do this with a “preview feature" called a VHD role Realize virtual machines like Amazon and others other hosting virtual machines, Predefined template or WHD custom Then it will be uploaded to the cloud.

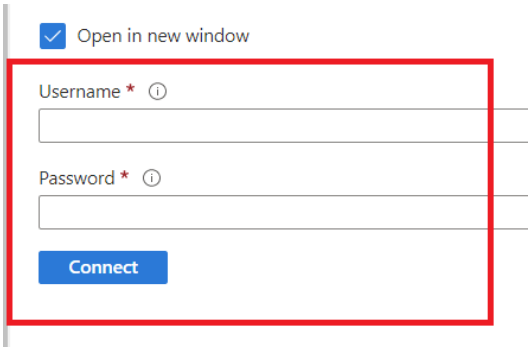

Figure 4. Connecting to Virtual machine

- These servers can be accessed via Remote Desktop on either Windows or Linux. In the best the benefits offered by virtualization technology are of utmost importance. Applications and operating systems can run on a single physical system. Servers can be centralized in virtual machines. The available natural resources are treated as an intersection and are controlled within the virtual machine.

4. CONCLUSIONS

Successful implementation of an IT structure depends heavily on the choice and planning of the IT structure. An architecture that efficiently meets the needs of the computer system you want to develop. maintenance High levels of availability, security, and performance in a well-developed regulatory environment Frameworks remain the most important guidelines for professional IT services. To achieve that Cloud users, need to be very careful when choosing a provider. Many of them are often Responsible for managing information, but unable to achieve a certain level of service Quality can have a significant impact on data confidentiality and operations.

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