Manage the availability of your Azure VMs

10 minutes

Often, the success of a services company is directly related to the service level agreements (SLA) the company has with its customers. Your customers expect the services you provide always to be available and their data kept safe. This is something that Microsoft takes very seriously. Azure provides tools you can use to manage availability, data security, and monitoring, so you know your services are always available for your customers.

Administration of an Azure VM isn't limited to managing the operating system or software that runs on the VM. It helps to know which services Azure provides that ensure service availability and support automation. These services help you to plan your organization's business continuity and disaster recovery strategy.

Here, we'll cover an Azure service that helps you improve VM availability, streamlines VM management tasks, and keeps your VM data backed up and safe. Let's start by defining availability.

What is availability?

Availability is the percentage of time a service is available for use.

Let's assume you have a website and you want your customers to be able to access information at all times. Your expectation is 100% availability concerning website access.

Why do I need to think about availability when using Azure?

Azure VMs run on physical servers hosted within the Azure Datacenter. As with most physical devices, there's a chance that there could be a failure. If the physical server fails, the virtual machines hosted on that server will also fail. If this happens, Azure will move the VM to a healthy host server automatically. However, this self-healing migration could take several minutes, during which, the application(s) hosted on that VM will not be available.

The VMs could also be affected by periodic updates initiated by Azure itself. These maintenance events range from software updates to hardware upgrades and are required to improve platform reliability and performance. These events usually are performed without

impacting any guest VMs, but sometimes the virtual machines will be rebooted to complete an update or upgrade.

> **Note**
>
> Microsoft does not automatically update your VM's OS or software. You have complete control and responsibility for that. However, the underlying software host and hardware are periodically patched to ensure reliability and high performance at all times.

To ensure your services aren't interrupted and avoid a single point of failure, it's recommended to deploy at least two instances of each VM. This feature is called an *availability set*.

What is an availability set?

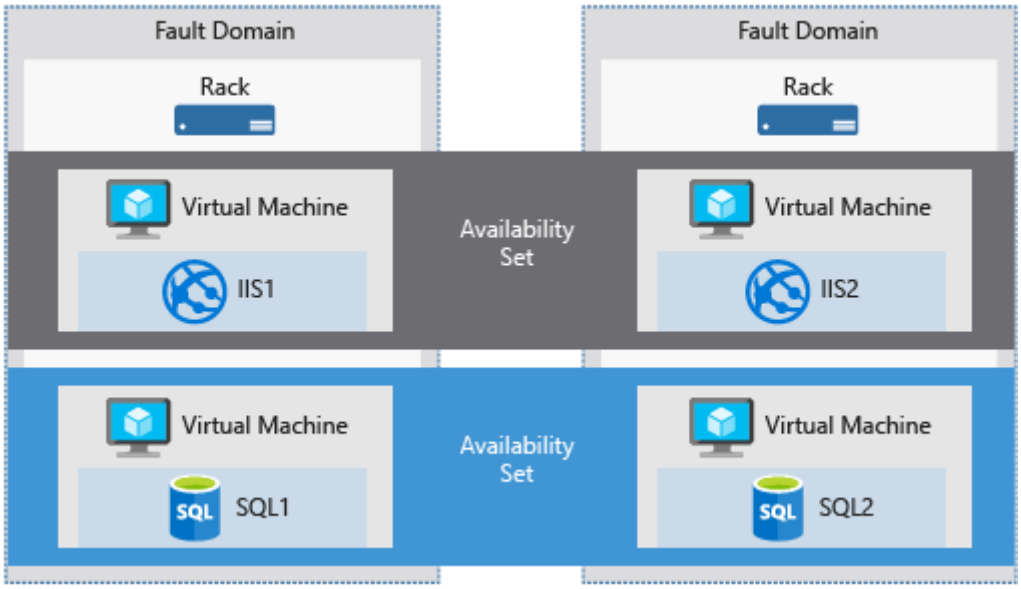
An **availability set** is a logical feature used to ensure that a group of related VMs are deployed so that they aren't all subject to a single point of failure and not all upgraded at the same time during a host operating system upgrade in the datacenter. VMs placed in an availability set should perform an identical set of functionalities and have the same software installed.

> **Tip**
>
> Microsoft offers a 99.95% external connectivity service level agreement (SLA) for multiple-instance VMs deployed in an availability set. That means that for the SLA to apply, there must be at least two instances of the VM deployed within an availability set.

You can create availability sets through the Azure portal in the disaster recovery section. Also, you can build them using Resource Manager templates, or any of the scripting or API tools. When you place VMs into an availability set, Azure guarantees to spread them across **Fault Domains** and **Update Domains**.

What is a fault domain?

A fault domain is a logical group of hardware in Azure that shares a common power source and network switch. You can think of it as a rack within an on-premises datacenter. The first two VMs in an availability set will be provisioned into two different racks so that if the network or the power failed in a rack, only one VM would be affected. Fault domains are also defined for managed disks attached to VMs.



What is an update domain?

An update domain is a logical group of hardware that can undergo maintenance or be rebooted at the same time. Azure will automatically place availability sets into update domains to minimize the impact when the Azure platform introduces host operating system changes. Azure then processes each update domain one at a time.

Availability sets are a powerful feature to ensure the services running in your VMs are always available to your customers. However, they aren't foolproof. What if something happens to the data or the software running on the VM itself? For that, we'll need to look at other disaster recovery and backup techniques.

Failover across locations

You can also replicate your infrastructure across sites to handle regional failover. **Azure Site Recovery** replicates workloads from a primary site to a secondary location. If an outage happens at your primary site, you can fail over to a secondary location. This failover allows users to continue to access your applications without interruption. You can then fail back to the primary location once it's up and running again. Azure Site Recovery is about replication of virtual or physical machines; it keeps your workloads available in an outage.

While there are many attractive technical features to Site Recovery, there are at least two significant business advantages:

1. Site Recovery enables the use of Azure as a destination for recovery, thus eliminating the cost and complexity of maintaining a secondary physical datacenter.

2. Site Recovery makes it incredibly simple to test failovers for recovery drills without impacting production environments. This makes it easy to test your planned or

unplanned failovers. After all, you don't have a good disaster recovery plan if you've never tried to failover.

The recovery plans you create with Site Recovery can be as simple or as complex as your scenario requires. They can include custom PowerShell scripts, Azure Automation runbooks, or manual intervention steps. You can leverage the recovery plans to replicate workloads to Azure, easily enabling new opportunities for migration, temporary bursts during surge periods, or development and testing of new applications.

Azure Site Recovery works with Azure resources, or Hyper-V, VMware, and physical servers in your on-premises infrastructure and can be a key part of your organization's business continuity and disaster recovery (BCDR) strategy by orchestrating the replication, failover, and recovery of workloads and applications if the primary location fails.

Next unit: Back up your virtual machines

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