
The Azure Dictionary of Pain
a straightforward guide to thorny cloud terms
A Cloud Guru

The Azure Dictionary of Pain

This idea of helping a team reach a "baseline cloud fluency" is a phrase we hear a lot at A Cloud Guru. You can have two engineers that excel at one kind of cloud operation, but if the rest of the team can't speak their language, nothing gets done. Things slow down—or stop—when people can't communicate.

At A Cloud Guru, our goal is to teach the world to cloud. So we turned to our data to help us understand how we can help bring organizations up to that baseline cloud fluency—or at least in the ballpark. Our goal with this guide is to make sure the next time someone mentions a major issue with the Azure Functions (the product, not the noun), you won't be left scratching your head.

We analyzed 2.7 million responses to hundreds of questions across multiple areas of cloud expertise. We specifically looked at tough questions, where the correct response rate fell below what you'd probably call a C average (or 60%). From these questions we identified key products, technologies, and topics that were often represented in those questions—and are here to help you get a handle on them.

In this guide, we'll cover some core concepts (like load balancing and availability zones) as well as some of the most common—though clearly challenging!—Azure tools you'll find in a modern cloud stack.

You'll still probably want to do a lot better than just a C average. But while you won't need everyone to be an expert at everything, they still need to speak the same language. Or, at least, understand when someone's telling a cloud-related joke that isn't meant to be taken literally.

Here are the trip-up topics that stump cloud teams the world over: the Azure Dictionary of Pain.

Pain Forecast: Partly Cloudy

Auto-Scaling (Azure Autoscale/ Monitor)

[ôdō, skāliNG]

***AWS** Auto Scaling | **Google** Auto-scaling!*

WHAT IS IT? Autoscaling is a feature of Azure that you can configure to monitor your resources' performance and then add or remove resources based on the demand of those applications. You can use these to make your applications able to adapt to changes in requests from users. You can increase and decrease resources based on demand—so you aren't paying for resources you aren't using.

You can, of course, scale your resources manually—if you're glued to a screen all day. But you'll want to implement auto-scaling in general, which with Azure is called Azure Monitor. You can look at metrics, such as CPU percentage, queue length, or rate of data input and output within resources. You can configure Azure Monitor to, well, monitor these things and scale when they change based on thresholds you set.

When you're configuring an auto-scaling group, you'll want to think of four parameters: how many servers do you want to maintain uptime, do you want to adjust your server count manually, do you want to schedule when to scale up or down, or would you like it to be based on conditions with your product performance.

WHY IS IT HARD? There are two types of scaling you can implement: **1 :** Vertical scaling: you scale up or down by changing the capacity of a resource. You might increase the processor size of a VM to handle more requests at the same amount of time.

This type of scaling is sometimes referred to as "scaling up." **2:** Horizontal scaling: as demand increases, you add more resources to handle requests. This is sometimes called "scaling out."

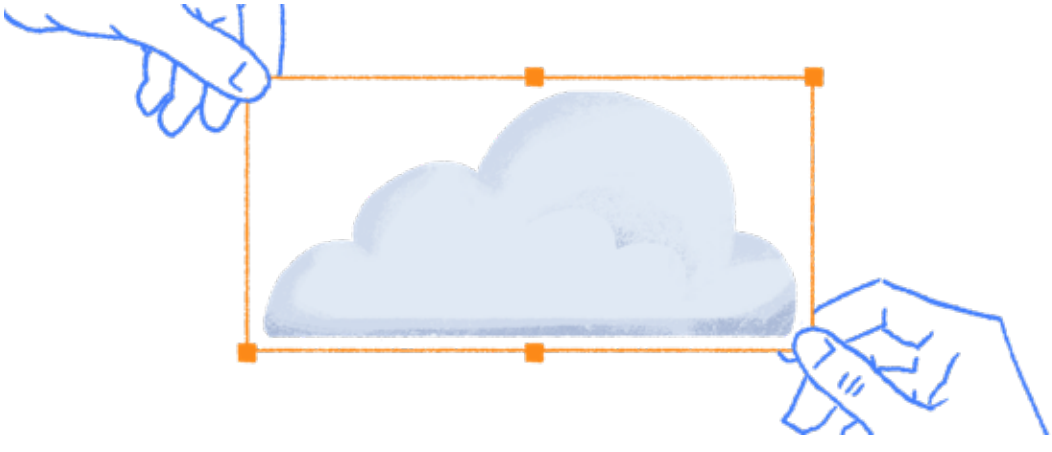
Each kind of scaling introduces its own set of challenges. If you're scaling vertically, your specific resource may become unavailable, which won't work if you are in the middle of a process. Horizontal scaling introduces load-balancing and partitioning.

You also have to decide how you're going to set your auto-scaling thresholds. You can set a limit to instances, but that might still not be enough. Each rule you add will make your auto-scaling processes more complicated—and introduces more room for error.

A Cloud Guru learners missed tough questions related to auto-scaling 52.6% of the time. Here are a few sample questions.

> An application server running in an autoscaling group is terminating and relaunching every few minutes. What is the most likely cause? (25.8% correct)

> Your newly deployed model gets heavy usage on Monday, then no usage the rest of the week. To accommodate this heavy usage you make use of auto-scaling to adjust to the inbound request load. After several weeks in production you notice a large number of scaled resources going unused and thus consuming money for no good reason. What might you do to resolve this? (44% correct)



Pain Forecast: Thunderstorms

Azure Cosmos DB

[aZHər, käzməs, dē,bē]

***AWS** DynamoDB | **Google** Cloud Datastore*

WHAT IS IT? Cosmos DB is a system that tries to synchronize data all across the globe instead of for specific regions. This kind of global synchronization is super essential for global applications that need to be highly responsive, have a lot of continuously changing data, and are always available to users. Facebook is a good example—people use it worldwide and are constantly changing the data.

Applications will essentially think CosmosDB is in their region, while Cosmos DB is handling replication across all regions to ensure it's a continuous global database. Cosmos DB automatically partitions data to optimize performance and storage capacity.

CosmosDB is also accessible through multiple APIs, such as Document DB (for SQL), MongoDB (for NoSQL), Graph API (for Gremlin), and Tables API (for key/value pairs).

WHY IS IT HARD? With all that replication happening across regions, there's bound to be some variations in quality. You're choosing between performance and consistency when picking a consistency level. Cosmos DB calls these consistency levels, which come in five categories:

STRONG : A guaranteed write operation committed and visible on a primary Cosmos DB after being committed and confirmed on all replicas. Strong consistency is the most predictable and intuitive.

BOUNDED STALENESS : The most frequently chosen, Bounded Staleness, allows you to figure how stale docs can be used. It decides how far behind a document can be before it needs to be updated.

SESSION : Ensures all read/write operations are consistent within a current user session. In a user session, for example, Facebook will have data particular to that user.

CONSISTENT PREFIX : This ensures changes are read in the sequence of the corresponding writes.

EVENTUAL : The loosest consistency, commits and writes against a primary immediately, and replicant transactions are synchronously handled and eventually get to replicas.

A Cloud Guru learners missed tough questions related to NoSQL and Cosmos DB 47% of the time. Here are a few sample questions.

> You are developing a solution using Cosmos DB NoSQL database. When you return data, it must be guaranteed that reads never see out-of-order writes. Which consistency level should you implement? (49.5% correct)

> Which component of CosmosDB security provides access to administrative resources such as accounts and users? (50 correct)

Pain Forecast: Severe Thunderstorms

Azure DNS & Traffic Manager

[aZHər, dē,in,es, and, 'trafik, manijər]

***AWS** Route 53 | **Google** Cloud DNS*

WHAT IS IT? The domain name system is the internet's phone book, converting a name (like acloud.guru) to an IP address. Azure contains a DNS zone for a domain name, which hosts the IPs for that domain name. You'll build a DNS zone from a unique resource group that gives you a domain. You can also create a private DNS zone, though you have to set one up through the command line. All the records for a domain are in a DNS zone.

Traffic manager, meanwhile, figures out how to intelligently route someone to your application. Traffic Manager ensures high availability across different geographic regions. If a region within your solution goes offline, Traffic Manager can route to online regions.

> Here's what it looks like: **1 :** The user loads the solution (and does a DNS lookup) **2 :** Traffic Manager responds with an IP address based on your configuration of the Traffic Manager service **3 :** The user then navigates to the appropriate solution.

WHY IS IT HARD? Both Traffic Manager and Azure DNS work closely together to make sure your users are able to access your app and have a good experience. DNS is the phone book that contains IP addresses from the domain name, while Traffic Manager will pick the right IP from that list of IP addresses.

In classic cloud fashion, there are a ton of routing methods that come with Traffic Man-

ager. These are multiple types you'll put into your Traffic Manager profile:

PRIORITY : prioritizes primary and backup endpoints.

WEIGHTED : distributes traffic according to weight value, such as if you'd like 20% to go to one region and 20% to another.

PERFORMANCE : sends traffic to the "closest" endpoint, which is excellent for solutions global in design.

GEOGRAPHIC : route traffic based on the geographic location of the client.

MULTIVALUE : returns multiple endpoints, and up to the client to determine which endpoint to use.

SUBNET : route based on the requester's IP address.

You have to actually own the domain name. Once you've added your custom domain, you'll have to complete your custom domain's validation. You have to add a text record from whoever manages your domain name and upload it to validate that you own it.

You can also configure a Vnet to enable auto-registration, pointing to a private internal DNS zone. You can use a private DNS for VMs to connect with named domains, such as somethingsomething.internal.

A Cloud Guru learners missed tough questions related to DNS 49.7% of the time. Here are a few sample questions.

> What two DNS record types are used to verify a custom domain name in Azure Active Directory? (52.9% correct)

> You have two Azure virtual machines named VM1 and VM2. VM1 is using the Red Hat Enterprise Linux 8.1 (LVM) operating system and is located in VNet1, within subnet1. VM2 is using the Windows Server 2019 operating system, and is located in VNet1, within subnet2. VNet1 has custom DNS configured, pointing to a DNS server with the IP address 172.168.0.6. VM2 has 10.0.1.15 configured as the DNS server on its network interface. Which DNS server will VM2 use for DNS queries? (69% correct)

Pain Forecast: Thunderstorms

Azure Functions

[aZHər, fəNG(k)SH(ə)n]

***AWS** Lambda | **Google** Cloud Run, Cloud Functions*

WHAT IS IT? Azure Functions are Microsoft Azure's serverless computing product, abstracting out all the reliance on infrastructure. It's the most flexible type of scaling based on workload volumes. The serverless programming model is based on triggers and bindings—focusing on writing code that responds to specific events and returns data the function needs to return. Functions also have a rich end-to-end development experience.

Ultimately there's a server in Azure running your function—you don't know anything about it whatsoever. You write some code to respond to an event, and never see anything that's happening with the server on Microsoft's end.

Functions offer the ability to run single code pieces in response to events and are billable for that execution time rather than in any other billing method. As a result, you can save an enormous amount of money on servers that are up and running but not doing anything.

WHY IS IT HARD? Serverless can feel somewhat orthogonal to traditional cloud computing. Though the benefits are enormous (especially from a cost perspective), companies accustomed to managing VMs to handle their applications will have to change the way they think about their structure.

That includes at an architectural level, as well. Here are some architectural considerations that are essential to understanding functions:

EVENT-DRIVEN : Code is executed in response to events on an as-needed basis. Servers aren't sitting around waiting for things to happen.

REACTIVE : Code is applied to particular events that happen when needed. It's responsive, resilient (events will be re-processed if failed), elastic (as events go up, it scales up), and message-driven.

MULTI-FACTOR : Declarative and automated deployment (the function can be deployed via code), configuration is in the environment (not configuration files), concurrency is via the process.

There are also many ways to execute a function: on time intervals, HTTP requests, whenever something is uploaded in Blob storage, a message from an Azure Storage queue, a Cosmos DB document change, or an event hub receiving a new event.

A Cloud Guru learners missed tough questions related to serverless operations 48% of the time. Here are a few sample questions.

> You are developing a solution using Azure Functions. You have another app located on-premises that will call the new Azure Function. Which feature of Azure Functions will you need to enable so that only the on-premises app can call the Function? (50.6% correct)

> Which hosting plans for Azure Functions will allow for the Azure function app to invoke functions in parallel, when needed to scale? (50% correct)

Pain Forecast: Scattered Showers

Azure Identity Management & Access

[aZHər, ī'den(t)ədē, manijmənt, akˌses]

WHAT IS IT? Let's say you've built a team that manages an application built on Azure. You govern the access that the team has to the services associated with their application—but not others that might contain sensitive information. This can help ensure it's easier to manage access all the way up to the alarmingly-complex information siloing that you might find at Apple.

IAM allows you to do that through Azure to manage services, resources, and applications. IAM is core to any cloud usage, from giving developers access to resources to push updates to production or giving auditors access to inspect your work. All cloud providers have some form of IAM. It's the foundation for providing security in the cloud. And you can set up IAM to include a variety of ways to log in, including a Windows account through Active Directory.

You enable access to your applications at a granular level through IAM. Each user that gets access to your accounts is a unique username and password combination, and often additional security measures on top of that. You might also have Access Keys and Secret Keys for developers. It's generally good practice to include multi-factor authentication as well, or MFA. (Seriously, if it's not on, go turn it on right now.)

WHY IS IT HARD? This is referred to as Azure role-based access control, or RBAC. There are both Azure Roles and Azure AD (Active Directory) roles. AD roles are used in cases like creating or editing users, assigning admin roles, resetting passwords, managing user licenses, and managing domains. Azure roles offer fine-grained access management to Azure resources, including:

OWNERS, with full access to all resources (and the ability to delegate access to others.)

CONTRIBUTORS, which can create and manage all types of Azure resources and create new tenants in Azure AD, but cannot grant access to others.

READERS, which can view resources.

USER ACCESS MANAGERS, which can, well, manage access to Azure resources.

There are a lot of things that can go wrong when implementing IAM. Your life will probably be pretty easy if you have incredibly robust and clean IAM implemented and the right policies to keep it clean. If it's crept out of control and held together by duct tape and a thousand Confluence pages, you'll run into problems.

Your developers might lose their access keys or secret keys—or someone else can get a hold of those. You should always set up MFA on root accounts and customize password rotations. But if you're a little too cavalier when using identity federation, a breached account somewhere else could end up leading to a breach to your Azure console entirely. You can also provide temporary access—but if you forget to disable that quick access, you could end up once again, increasing your surface area for breaches!

A Cloud Guru learners missed tough questions related to identity and access management 50.5% of the time. Here's an example:

> We want to enable users in a specific Azure Active Directory group to have the ability to manage keys (not just list them) for our Cognitive Services. Which RBAC role would we assign? (66% correct)

Pain Forecast: ☼ Mostly Sunny

Azure SQL Family

[aZHər, es,kyo͞o,el, fam(ə)lē]

***AWS** RDS | **Google** CloudSQL*

WHAT IS IT? A managed database that, well, manages everything. A relational database service (or RDS) abstracts out the whole process of running and maintaining a database, so you are only engaging it when you need to read or write data. CPU, memory, storage, and IOPS are split apart. You can scale them independently—bringing each one up or down. All of Microsoft's Azure SQL databases are relational databases outside of CosmosDB (which is NoSQL).

Azure offers three options in its SQL family: Azure SQL Database, SQL Server on Azure VMs, and Azure SQL managed instance. (There's a long list of specific SQL environments you can spin up beyond that, but that's a good overhead view.)

AZURE SQL DATABASE : If you're starting in the cloud—especially if you implement any serverless operations—this is a core product that covers most bases and includes serverless compute.

AZURE SQL MANAGED INSTANCE : Represents a fully-managed SQL server instance but is hosted in the Azure cloud. Traditionally service instances are infrastructure as an instance, but Microsoft uses this for a platform as a service. This is really based on the programming model of an on-prem SQL server, but it uses Microsoft support.

It has high availability built-in and allows you to back up and restore to Azure blob storage quickly.

SQL SERVER IN VMS : You can use this to migrate your workloads to Azure while maintaining SQL server compatibility and operating system-level access. This can be helpful if you're in the middle of migration but still need to access it as if it were on-prem.

Microsoft also offers a service called Hyperscale, which can autoscale up to 100 TB of storage. This generally works well for companies that want to migrate to the cloud, or are limited by the max database size restrictions. Companies with smaller databases that require high performance and scaling options might also find it useful.

RDS tools try to lower the overall cost of ownership and strip away routine tasks. That can include provisioning, backup, recovery, and many other core requirements for any system. So, as a result, you can focus on everything else that pertains to your business.

WHY IS IT HARD? Microsoft's SQL family choices can represent a step function for companies looking to migrate to the cloud. Cloud-first companies might jump straight to a managed instance. Companies with traditional on-prem databases may already be using Microsoft SQL, but are starting their transition. As an example, one might look a bit like this:

On-prem Microsoft SQL → Microsoft SQL in private clouds → SQL server in Azure VMs → Azure SQL database managed instances.

You can also pick from many options for the Azure SQL database, including MariaDB, MySQL, PostgreSQL, and of course, a NoSQL product called CosmoDB.

RDS tools, in general, are not a magic bullet to getting everything else off your plate. You'll still have a lot of things to consider, such as: **1 :** What database engine are you using? **2 :** How are you handling backups? **3 :** How are you managing monitoring?

And when there's a lot to configure, especially when you're planning for a set-it-and-forget-it tool, there's a lot that can go wrong—especially as you scale up.

A Cloud Guru learners missed tough questions related to Azure SQL family and relational databases 49.7% of the time. Here are a few sample questions.

> You are auditing your RDS estate and you discover an RDS production database that is not encrypted at rest. This violates company policy and you need to rectify this immediately. What should you do to encrypt the database as quickly and as easy as possible? (29.2%)

> A company disaster recovery policy requires that all RDS backups are retained in a secondary region. What is the optimal solution to meet this requirement? (29.9%)

Pain Forecast: Scattered Thunderstorms

Azure Storage (Disk, Blobs, & Files)

[aZHər, stôrij]

***AWS** Amazon S3 | **Google** Google Cloud Storage*

WHAT IS IT? Blobs, aside from being a fantastic name, are just files within a container. A blob can be a video file or an image file that fits into a container you've created within Azure Storage. Each Blob has a unique address, making it easy to retrieve items from containers. So you could have a browser fetch images from a container, stream video or audio, or store any other kind of data.

Blob actually has a technical term: binary large object. Blob storage uses Azure AD for authentication and role-based access control for authorization. Blob storage is suitable for producing static websites.

You can also create a managed disk from a storage blob, which is what you might consider doing if you're migrating from an on-prem solution. Azure storage supports three types of Blobs:

> **BLOCK BLOBS :** blocks of data **APPEND BLOBS :** data like block blobs, but are optimized for append operations. **PAGE BLOBS :** store random access files up to 8TB. These page blobs could store a virtual hard drive and serve as a disk for a VM on Azure.

You also have disk storage. Azure will look after the physical managed disk attached to your VMs and guarantees uptime and backup. You can also easily upgrade the disk size or type. There are multiple disk types, each with varying costs.

HDD : Old-school hard drives that are cheaper but slower than SSDs. **STANDARD SSDS :** solid-state drives that have lower latency than an old-school drive. **PREMIUM SSDS :** High-performance storage for critical workloads. **ULTRA-DISK :** The fastest for most-demanding data workloads.

And finally, there are Files for managing file shares in Azure Storage. If you're used to an on-prem file shares configuration, you can extend that into Azure VMs with Files.

WHY IS IT HARD? The Azure Storage problem is an optimization problem. Microsoft offers so many options that you can probably figure out a custom configuration, based on how much storage you need and how often you need to access it, instead of going for a one-size-fits-all approach.

You'll be able to save some money if you know your exact storage needs and how often you'll be using your files.

Blob storage offers three tiers depending on how often you need to access your data, each with a different cost structure: **HOT TIER :** For your frequently-accessed data **COOL TIER :** For lower storage costs and higher access times—meant for data that remains in the cool tier for at least 30 days. **ARCHIVE TIER :** The lowest cost and highest access time.

And, of course, your disk storage also has varying pricing tiers.

A Cloud Guru learners missed tough questions related to Azure Storage 49.2% of the time. Here are a few sample questions.

> We are designing an application where we need to accept a steady stream of large binary objects up to 1GB each. We want our architecture to allow for scaling out. What would you select as the best option for intake of the blobs? (47.7% correct)

> An application that performs statistical analysis on weather data receives files once a week. It assimilates the data in these files with previously collected data via its algorithms and publishes a report at the end of each month. At unspecified times during the week, interim results need to be made available to meteorologists within minutes. Which architecture will meet the data availability requirements for the solution at the least cost and with the simplest application code? (52.4% correct)

Pain Forecast: Scattered Showers

Azure Virtual Machine(VMs)

[aZHər, vərCH(o͞o)əl, məˈSHēn]

***AWS** EC2 Instances | **Google** Google Compute Engine*

WHAT IS IT? VMs are simulations of physical computers—they're servers, but behave like computers for you, abstracting the need to manage the hardware. They're the workhorses for Azure, containing disk storage, processors, operating systems, and so forth. And, of course, they're the most expensive part of Azure deployment. The operating systems in Azure are Linux or Windows.

Azure VMs are the resources that are doing the actual work, like going through a process or serving a website for someone. It'll be where you store your data in memory when you're operating on it. Again, this is basically a computer, just abstracted out.

WHY IS IT HARD? Because they're behaving like an actual computer, you have to treat it as a real computer—except it's one you can't see. You have to secure and maintain your instances, you have to manage the correct configurations, and you have to build a set of VMs that can achieve what you need to do at as little cost as possible.

Given that you can scale up the number of VMs you need with various configurations, you're going to have to understand how each piece of it works. And you can quickly lose track of how many VMs you have up and running. Some VMs will be running at a constant pace, some you'll need only in certain situations.

VMs sit within availability zones within regions, so you'll also want to determine where you want to drop your servers because your users' physical distance actually matters. Data exchange between regions within a billing zone is free, but it'll cost more when going between different billing zones.

There are subscriptions based on credits for services. There's also a pay-as-you-go model that can be one of the most expensive options because you're paying a premium for the right to be more flexible. Azure also has reserved instances, which can help you save money if you have a predictable set of needs.

A Cloud Guru learners missed tough questions related to VMs 50.3% of the time. Here are a few sample questions.

> You have just started in a new role supporting the MS Azure environment and have been asked to group resources based on the new organizational structure. All resources are currently in one Resource Group and will now be spread across 5 different Resource Groups. Many VMs will need to be moved into the new groups. What concerns (if any) do you raise with your manager about the migration of resources to other Resource Groups? (38.8% correct).

> The Consilium Company has just deployed a number of Azure VMs into a specific subnet in an Azure virtual network. They have also implemented a network security plan which includes the use of Azure Firewall. From those newly deployed VMs, the company wants to deny access to the website https://www.microsoft.com. How can you achieve this using their current Azure resources? (48.7% correct)

Pain Forecast: Scattered Thunderstorms

Load Balancing

[lōd, məˈSHēn]

***AWS** Load Balancers | **Google** Load Balancers*

WHAT IS IT? Exactly what it sounds like: balancing the load of traffic across multiple different resources. It lets you scale up your infrastructure and services by balancing inbound and outbound traffic. When you want to achieve high availability, you want duplicate resources that serve the same purpose—and a load balancer helps you distribute load across those duplicated resources.

TCP and UDP traffic comes into a load balancer (layer 4) without knowing what's in that traffic.

Load balancers instantly reconfigure themself when you scale your resources up and down. Health probes ensure the back-end pool of VMs is healthy and can receive traffic. If a health probe validates a server in your Vnet, your load balancer can route traffic to that VM.

WHY IS IT HARD? Microsoft Azure has two additional types of load balancers that you'll have to choose from: internal and external load balancers, and basic or standard SKUs within those types.

The standard SKU can support up to 1,000 instances, while the basic SKU supports up to 100 instances in the back-end pool. Standard SKUs can also use a mixture of VMs, VM Scale sets, and availability sets. You can also use HTTPS for health probes, while basic SKUs can only use HTTP and TCP. You can also choose the availability zone when using a standard SKU in some regions.

Internal load balancers direct traffic only to resources in a Vnet or use a VPN to access Azure infrastructure. You might use an internal load balancer to balance traffic across VMs in the same Vnet, or from on-prem hardware to VMs on the same Vnet.

A Cloud Guru learners missed tough questions related to load balancers 53% of the time. Here are a few sample questions.

> You have an Azure subscription that contains the following unused resources: Network Interface (nic0), Static Public IP (pip1), Standard Load Balancer (lb1) with 5 rules configured, Virtual Network (VNet2) = 10.1.0.0/16, and a Stopped (Deallocated) Virtual Machine (VM3). Which of these unused resources should you remove to lower cost? (56.7% correct)

> You have a Microsoft SQL Server Always On availability group on two Azure virtual machines. You need to configure an Azure internal load balancer as a listener for the availability group. What should you configure? (49.9% correct)

Pain Forecast: Thunderstorms

Snapshots

[snap,SHät]

WHAT IS IT? Snapshots are a point-in-time copy of a managed disk. You'll choose the account type (such as choosing between an HDD and SSD) for the snapshot for whatever managed disk you're looking to save with a snapshot. They're effectively backups for your managed disks.

You can also create a new managed disk based on your snapshot of another managed disk. You might use that snapshot for troubleshooting or as a master snapshot for creating new VMs.

WHY IS IT HARD? There are two kinds of snapshots: full snapshots and incremental snapshots. The former is exactly what it sounds like, a full point-in-time backup of your disk. But if you continued to use full snapshots, you'd start to rack up your storage very quickly.

Incremental snapshots may be backups, but they technically aren't a full backup. Each snapshot isn't necessarily a complete backup of your storage or disk. Instead, it stores the incremental changes from your last snapshot, and the previous snapshot captures the changes from the snapshot before it.

When you're taking a new snapshot, you're able to save money because you're backing up the incremental changes rather than a full backup.

A Cloud Guru learners missed tough questions related to Azure Disk Storage and snapshots 50% of the time. Here are a few sample questions.

> You have an Azure subscription with a virtual machine named VM1. You are using Recovery Services Vault (RSV) to backup VM1 with soft delete enabled. The backup policy is set to backup daily at 11 PM UTC, retain an instant recovery snapshot for 2 days, and retain the daily backup point for 14 days. After the initial backup of VM1, you are instructed to delete the vault and all of the backup data. What should you do? (51% correct)

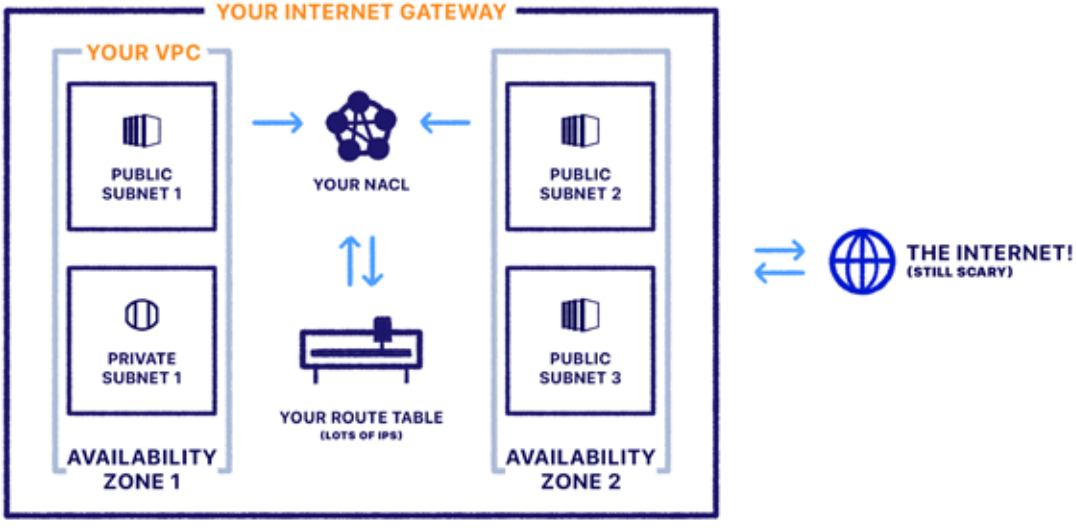
> You have an Azure subscription named Subscription1. In Subscription1 you have two Azure VMs named VM1 and VM2, both running Windows Server 2016. VM1 is backed up using Recovery Services Vault, with a backup policy of producing a daily backup and keeping that daily backup for seven days. Also, a snapshot is kept for 2 days. VM1 is compromised by a virus that infects the entire system, including the files. You need to restore the files from yesterday's backup of VM1. Where can you restore the files to in the quickest manner? (75.1% correct)

Pain Forecast: Thunderstorms

Virtual Private Network & Subnets

[vərCH(o͞o)əl, prīvit, net ̩wərk, and, səb'net]

WHAT IS IT? Often called a Vnet, virtual private networks enable Azure VMs to communicate with each other, on-premise networks, and on the Internet. Just like a VM, it's yours to use, but the physical hardware is abstracted out. You can define multiple subnets within each VNet, which segregate your network, allocating an IP space for resources such as SQL databases or VMs



Each Vnet comes with an address space that you can divvy up across multiple subnets. Perhaps more importantly, you can isolate subnets from the Internet within your Vnets.

Vnets, and the Azure VMs within them, behave just like the Azure VMs within Microsoft's Azure cloud. You can scale Vnets or add Vnets as you need them and isolate resources within them through subnets. You can also peer Vnets to allow routing between the two of them, while the Azure public cloud itself provides high availability.

The upside is companies starting their migration into the cloud have an option to keep some of their resources walled off from the Internet. While they might not actually need a Vnet during their migration, it can help when trying to herd the cats internally (namely your compliance team). And Vnets allow you to isolate information that needs to be separated from the Internet, such as regulated data.

WHY IS IT HARD? Count the arrows on that flow chart! A whole lot is going on and a lot of points of failure, especially if you're trying to keep data isolated from the Internet. The last thing you want to do is unintentionally increase your surface area for Bad Things To Happen. If you're starting your cloud migration, you'll want to make sure you have an expert in networks on hand to make sure everything is spun up smoothly.

In addition, subnets within your Vnet are restricted to one availability zone rather than spanning multiple availability zones. As such, you'll have to configure your systems in such a way to ensure you don't run into a scenario where one subnet needs to be talking to another in a different availability zone.

A Cloud Guru learners missed tough questions related to Vnets and subnets 49.8% of the time. Here are a few sample questions.

> You are in a client meeting with a customer and learn that the customer would like to run their website from their own vNET and subnets, but due to staff constraints they would like the least amount of overhead on the team as possible. Which Azure service would you recommend to the client? (20.4% correct).

> A virtual machine has been built using default settings for VNet, subnet and network security groups. Which Azure services would you configure so that the only external connection permitted is for Microsoft updates? (40.7% correct)

A CLOUD GURU

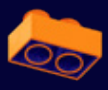
Cloud Smarter. Cloud Better. Learn with A Cloud Guru.

Since 2015, we've helped more than two million engineers learn to cloud with approachable courses taught by industry experts. Scale your teams, get them certified, generate value, and learn a ton of cool stuff along the way.

Accelerate Adoption
Learn the critical skills you need to supercharge your products with top cloud tools and technology.

Speak Cloud
Our scalable, sprint-based program lifts everyone to a common base of knowledge quickly and effectively.

Stay Informed
See the latest trends in the way learners build their cloud knowledge based on our research.



Learn By Doing
Give your team valuable hands-on experience—and let them break everything—without exposing your production environments.

Keep Growing
Provide ongoing, guided learning that takes your employees from novice to guru in specialized cloud career tracks.

Ready to take off? We'd love to help you reach the sky.

Request A Demo