Capabilities of Storage Types

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Module Overview

Attributes and capabilities of Standard Performance storage

Billing of Standard storage

Using Premium storage

Hot vs Cold blob storage

Best practices

Standard Storage

- Also referred to as Basic storage
- Based on storage stamps primarily using HDDs
- VHD files are stored in page blobs
- A page blob has a 1 TB maximum size
- 500 *maximum* IOPS per disk for Standard tier VM (300 IOPS for Basic)
- Up to 20,000 IOPS per Standard storage account
- The maximum size of a VHD is 1023 GB

Joke Time!!!!!!!!!

Bigger and Faster Standard Storage

500 IOPS and 1 TB will not always be enough

One option: add multiple disks then combine

The combined volume has the aggregate size and performance

- Combining 8 disks would enable an 8 TB volume with 4000 IOPS

When combining no mirroring or parity is required

Use simple virtual disks with storage spaces or RAID 0/striping

Applications may have their own technologies such as SQL Server

Pricing of Standard Storage

Like all Azure services the storage is billed based on consumption and the type of service

Items That Impact Price

Capacity

Tier

Redundancy

Transactions

Region

Fixed VHD in Azure

Uses fixed size VHDs where the size of the VHD is provisioned at creation time

You pay for what you consume which would typically mean creating the smallest VHD that meets your need

Azure Storage uses sparse storage on the back end and also supports trim type operations

Therefore if your 1 TB VHD only has 50 MB of data stored in it then only 50 MB of Azure Storage is actually used and therefore you pay for the 50 MB only. Not the same for Premium Storage

Sparse Storage and Trim

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Resizing Disks

- Always create disks to the maximum size
- It is possible to resize via REST, PowerShell and the portal
- Works for OS and data disks
- If used by a VM the VM must be deallocated from the fabric
- Once increased in size extend the volume inside the OS

Resizing Disks

```
Get-AzureDisk | ft Label, AttachedTo, DiskName –AutoSize

Update-AzureDisk -DiskName <diskname> –ResizedSizeInGB 1023
–label <label>


$vm.StorageProfile.OSDisk.DiskSizeGB = 1023

Update-AzureRmVM -ResourceGroupName $rgName -VM $vm
```

Premium Storage

Standard Storage

Provides a maximum number of IOPS per disk

Premium Storage

A separate set of storage stamps based on SSD primarily with additional network connectivity

Premium Storage

Provides:

Higher IOPS per disk

Predictable IOPS rather than simply a possible maximum

Currently available as LRS *availability only*

For Azure VM disks *only*

Types of Premium Storage

- Not sparse storage
- Cost based on the disk size not data written

Premium Storage Disk Type	P10	P20	P30
Disk size	128 GiB	512 GiB	1024 GiB (1 TB)
IOPS per disk	500	2300	5000
Throughput per disk	100 MB per second	150 MB per second	200 MB per second

Using Premium Storage

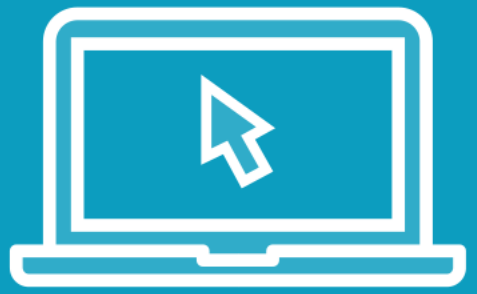
Premium storage can only be used by specific VM series: DS, DSv2 and GS

- Separate compute stamps with specific network connectivity
- Less temporary storage as its used for caching purposes

Up to 80,000 IOPS and 2000 MB per second disk throughput per VM

VM can use a mix of standard and premium storage

Demo



Viewing Storage Account content

Monitor Storage Account usage

Azure Storage Best Practices

Keep track of disks per storage account

Use consistent naming schemes for accounts and disks

For disks ensure its easy to relate which VM is using the disk

Storage and compute must be in the same region

Use multiple disks to increase IOPS without increasing cost for standard storage

Summary

- Attributes and capabilities of Standard Performance storage
- Billing of Standard storage
- Using Premium storage and billing differences
- Best practices

Next Up:
Azure IaaS VM Types of Storage