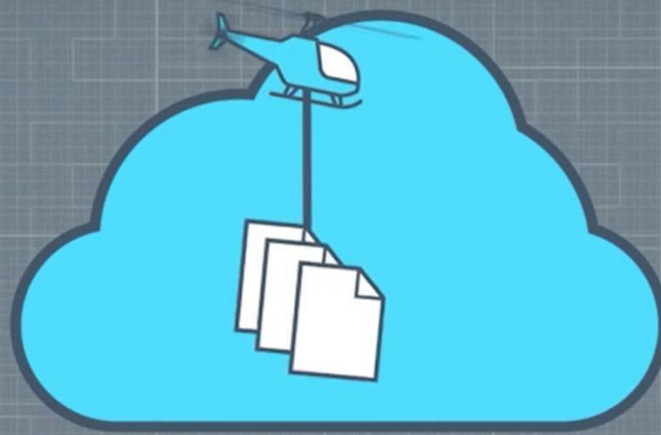


# Azure NetApp Files



Microsoft

+



NetApp

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# Azure NetApp Files

- Overview – Why is this relevant?
- Use cases
- Setup – what's needed? How long?
- Demonstration – Setup
- Use case – CVAD, FSLogix etc.
- Roadmap – a brief point...



# Overview

- Azure NetApp Files – Cloud Storage provided by NetApp ONTAP Storage, but sold, supported, and managed by Microsoft. **100% Azure native**
- Managed in the same way as any Azure service – Portal / PowerShell / Azure CLI. **1<sup>st</sup> Party Service**
- Provisioned and consumed against existing agreements. **No extra Paperwork!**
- Currently requires a request and subscription whitelisting – due to capacity

# Who cares....?

- Traditional challenges – moving shares to the Cloud... *everyone has a nightmare file server migration story*
- The need for NTFS Permissions
- Performance – we need IOPS
- Protocol Support – SMB and NFS
- Compliance/Security – encryption at rest / RBAC / NTFS
- Roadmap - Integrated data replication and backup will be available soon

# Use Cases

- **File Shares** – can be migrated, as is to Azure NetApp Files, maintaining NTFS permissions
- Cloud Sync can stage data and synchronize **between regions**
- **Profile Storage** – UPM / FSLogix / Roaming
- Applications with high IOPS requirements – SAP, Transactional Data etc. **More on performance soon**

# In a nutshell...



You can now provision NetApp ONTAP backed Volumes, directly via the Azure Portal or CLI

NFS and SMB are supported protocols

No additional infrastructure is required in Azure or on-premises









NTFS permissions are supported

It can all be consumed through existing agreements

# Regional Availability


## CANADA

## UNITED STATES

Canada Central	Canada East	Central US	East US	East US 2	North Central US	South Central US	West Central US	West US	West US 2
									

## EUROPE




## UNITED KINGDOM

North Europe	West Europe	UK South	UK West
			

## AFRICA

## ASIA PACIFIC

## AUSTRALIA

South Africa North	South Africa West	East Asia	Southeast Asia	Australia Central	Australia Central 2	Australia East	Australia Southeast
							

<https://azure.microsoft.com/en-us/global-infrastructure/services/?products=netapp>

Note: Correct as of 23/11/2019



# Performance

- A tale of three tiers...

- **Ultra storage**

The Ultra storage tier provides up to 128 MiB/s of throughput per 1 TiB of volume quota assigned.

- **Premium storage**

The Premium storage tier provides up to 64 MiB/s of throughput per 1 TiB of volume quota assigned.

- **Standard storage**

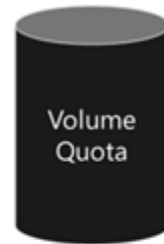
The Standard storage tier provides up to 16 MiB/s of throughput per 1 TiB of volume quota assigned

# Performance

Throughput is based on Service Level x Volume Quota:

Service Level	Throughput
Ultra	128MiB/s per 1TiB quota
Premium	64MiB/s per 1TiB quota
Standard	16MiB/s per 1TiB quota

X



=



E.g. 1      Premium Tier  
(64MiB/s per 1TiB quota)

2TiB  
Volume  
Quota

Up to 128MiB/s gross  
throughput

E.g. 2      Premium Tier  
(64MiB/s per 1TiB quota)

100 GiB  
Volume  
Quota

Up to 6.25MiB/s gross  
throughput

# Pricing

*“Azure NetApp Files (ANF) is charged per hour based on the provisioned ANF capacity. Customers can provision a minimum of 4 TiB of ANF capacity and then add additional provision capacity in the increments of 1 TiB.”*

## UK South:

	Price	4TB Example – Monthly cost	Cost per 1GB per month
Standard Storage	£0.000166/GiB/hour	~ £456	~11p
Premium Storage	£0.000331/GiB/hour	~ £911	~22p
Ultra Storage	£0.000441/GiB/hour	~ £1213	~29p

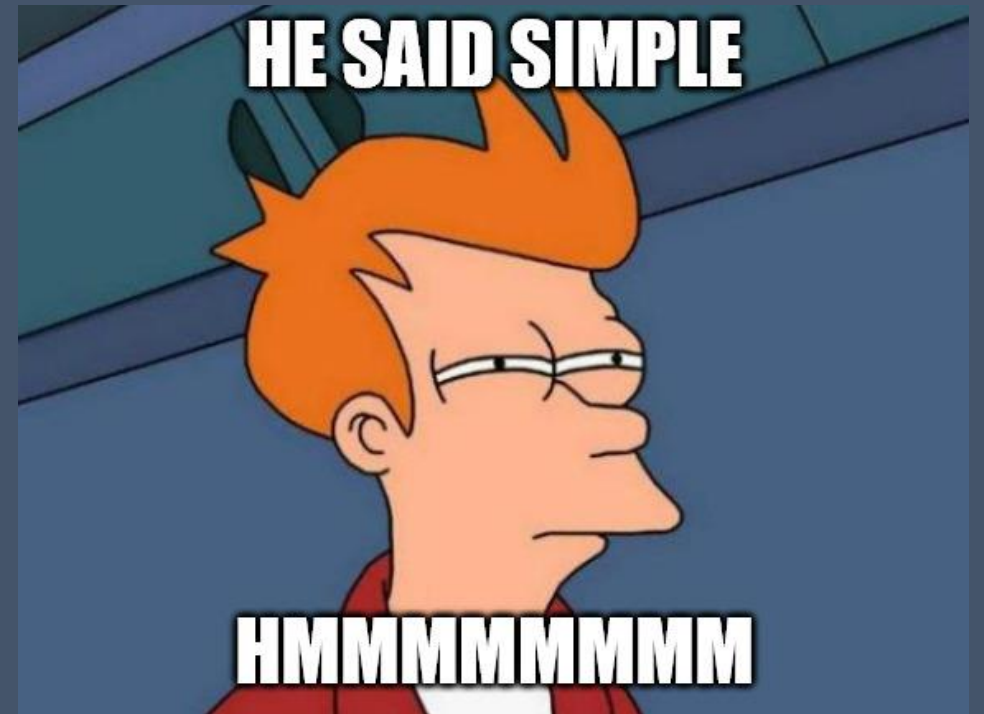
$$4096 \times (24 \times 28) \times [\text{Price per GB per hour}] = \text{monthly cost for 4TB}$$

Challenge – can we setup ANF, and create a Volume in under 5 minutes?

# Yes, we can! 4 simple steps

All done via the Portal or CLI:

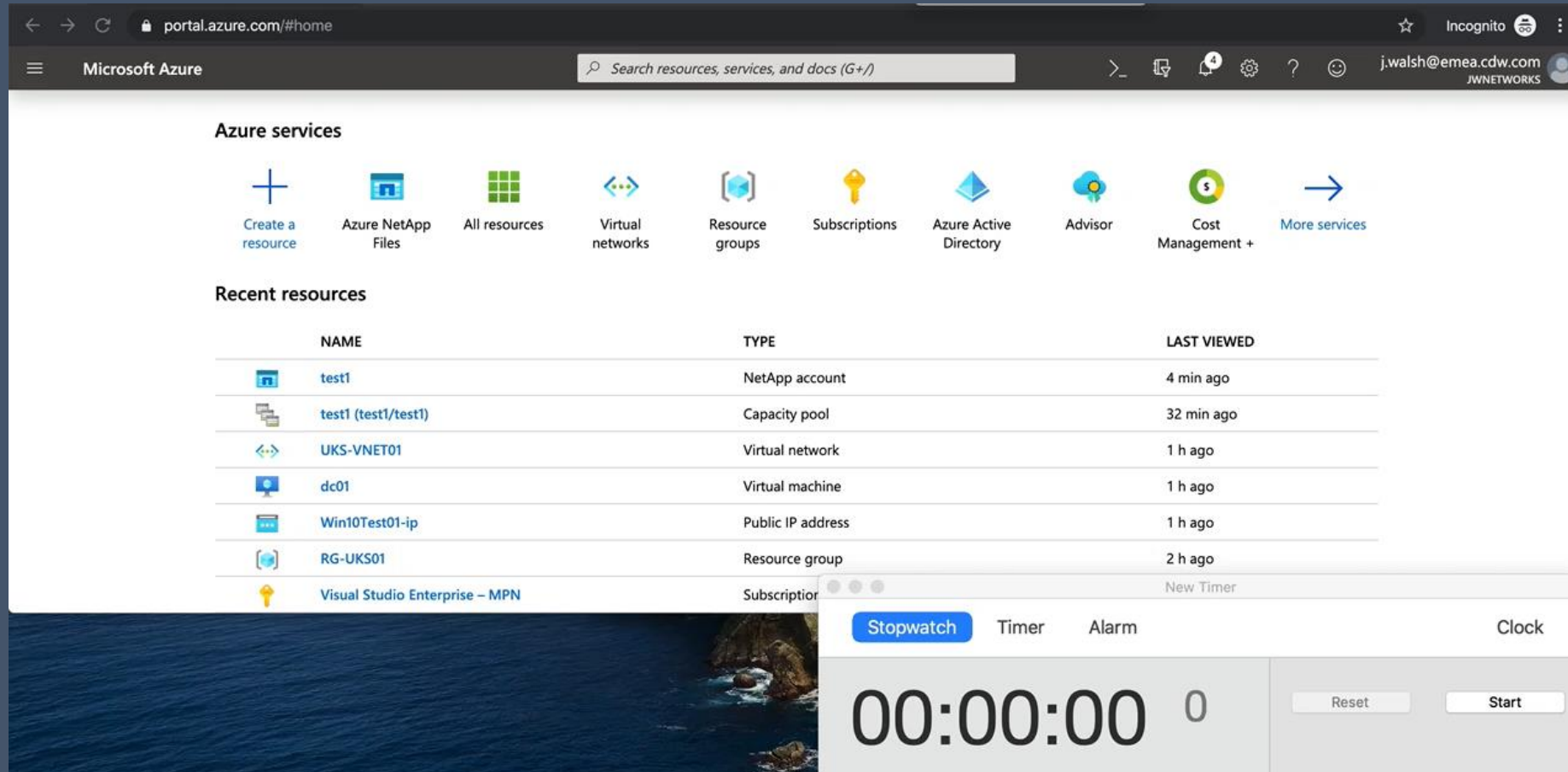
1. Create an ANF Account
2. Create a Capacity Pool
3. Create a Volume
4. Test



# What do we need for this?

1. An Azure Subscription – which is Whitelisted for ANF
2. A VNET, and a Subnet that we can delegate to ANF, or a new Subnet we create
3. A Domain Controller for NTFS permissions to be used
4. A Test machine that can access the above Subnet

# I. Create an ANF Account



```
$resourceGroup = "RG-UKS01"  
$location = "uksouth"  
$anfAccountName = "UKCUGTest"
```

```
New-AzNetAppFilesAccount -ResourceGroupName $resourceGroup -Location $location -Name $anfAccountName
```

# 2. Create a Capacity Pool

The screenshot shows the Azure portal interface for 'Azure NetApp Files'. The breadcrumb navigation is 'Home > Azure NetApp Files'. The page title is 'Azure NetApp Files' with a sub-header 'jwnetworks'. Below the title, there are buttons for '+ Add', 'Edit columns', 'Refresh', and 'Assign tags'. A 'Subscriptions' section indicates 'Visual Studio Enterprise - MPN' and provides a link to 'Open Directory + Subscription settings'. Below this, there are filter dropdowns for 'Filter by name...', 'All resource groups', 'All locations', 'All tags', and 'No grouping'. A table lists '1 items' with columns: Name, Type, Resource group, Location, and Subscription. The table contains one row for 'UKCUG1' (NetApp account) in 'RG-UKS01' (Resource group) in 'UK South' (Location) under 'Visual Studio Enterprise - MPN' (Subscription). At the bottom of the screenshot, a stopwatch timer is visible, showing '00:00:00' and '0' seconds, with 'Reset' and 'Start' buttons.

```
$poolName = "ukcugtest1"
$poolSizeBytes = 4398046511104 # 4TiB
$serviceLevel = "Standard" # Valid values are Standard, Premium and Ultra
```

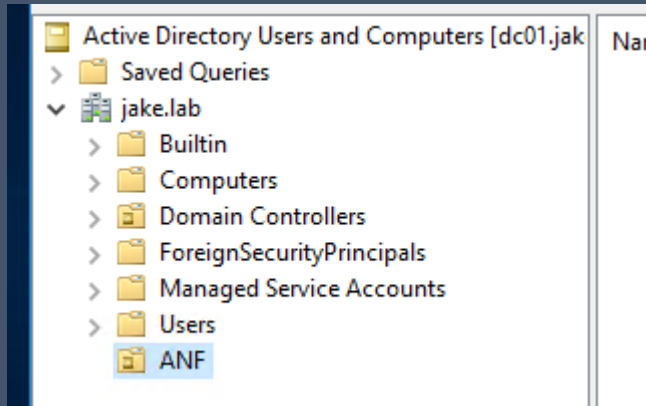
```
New-AzNetAppFilesPool -ResourceGroupName $resourceGroup -Location $location -AccountName $anfAccountName -Name
$poolName -PoolSize $poolSizeBytes -ServiceLevel $serviceLevel
```



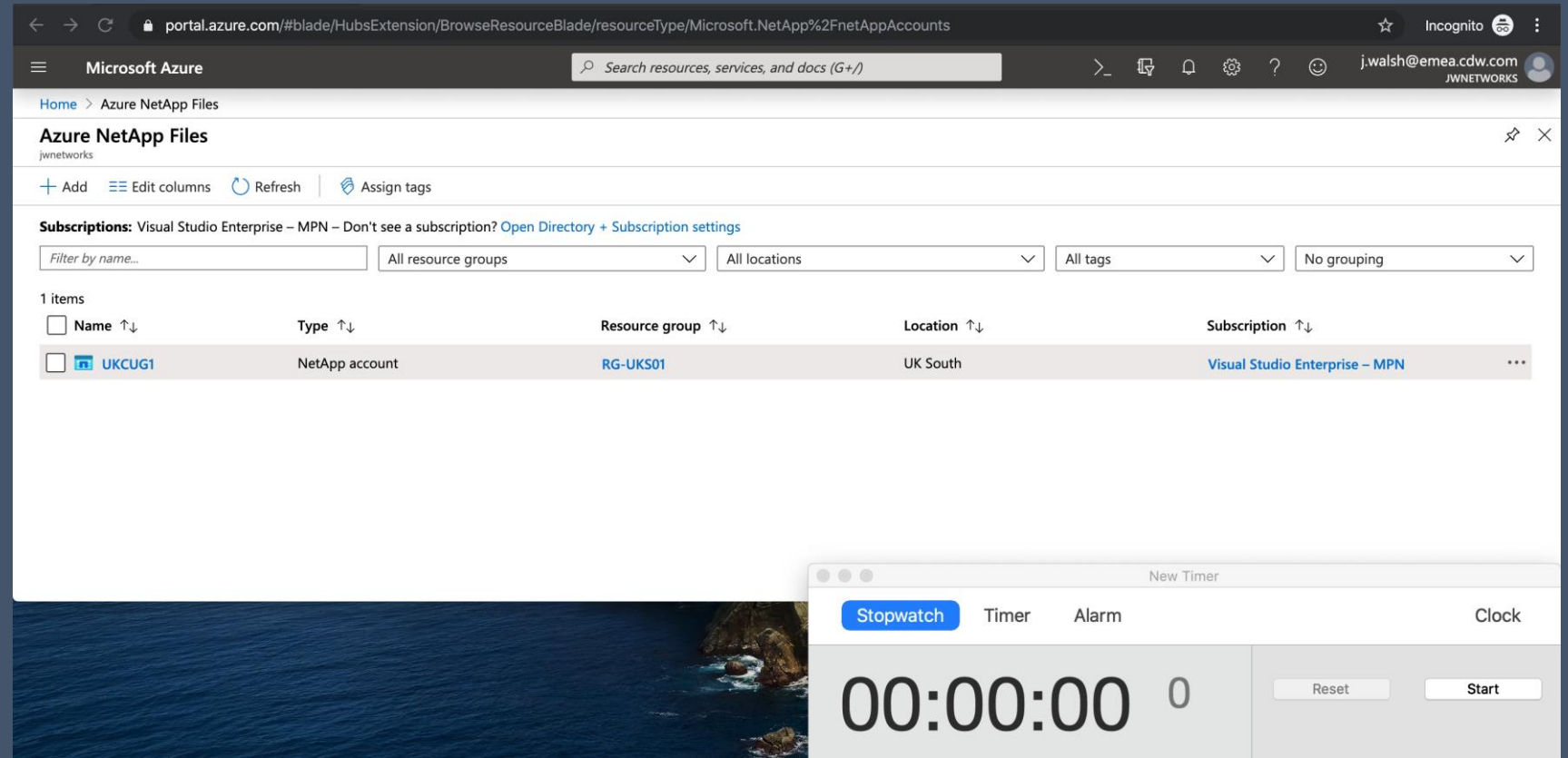
# 3. Create a Volume

## Step I – Setup AD Connection

- This is required to allow ANF to support NTFS authentication for Shares
- Requires a service account with create/delete permissions to an OU for NetApp Computer objects to be stored



OU=ANF,DC=jake,DC=lab



# 3. Create a Volume

Step 2 – Create a Volume, and a delegated Subnet for ANF to utilise

The screenshot shows the Microsoft Azure portal interface. The browser address bar displays the URL: `portal.azure.com/#blade/HubsExtension/BrowseResourceBlade/resourceType/Microsoft.NetApp%2FnetAppAccounts`. The page title is "Azure NetApp Files" under the "jwnetworks" subscription. The interface includes a search bar, navigation icons, and a list of resources. A table lists the resources, showing one item: "UKCUG1", which is a NetApp account located in the UK South region under the "Visual Studio Enterprise – MPN" subscription. A "New Timer" window is overlaid on the bottom right, showing a stopwatch at 00:00:00.

Name	Type	Resource group	Location	Subscription
UKCUG1	NetApp account	RG-UKS01	UK South	Visual Studio Enterprise – MPN

# 3. Create a Volume

```
$anfDelegation = New-AzDelegation -Name ([guid]::NewGuid().Guid) -ServiceName "Microsoft.NetApp/volumes"
$subnet = New-AzVirtualNetworkSubnetConfig -Name "myANFSubnet" -AddressPrefix "10.0.1.0/24" -Delegation
$anfDelegation
$vnnet = New-AzVirtualNetwork -Name "UKS-VNET01" -ResourceGroupName $resourceGroup -Location $location -
AddressPrefix "10.0.1.0/24" -Subnet $subnet
$volumeSizeBytes = 1099511627776 # 100GiB
$subnetId = $vnnet.Subnets[0].Id

New-AzNetAppFilesVolume -ResourceGroupName $resourceGroup `
    -Location $location `
    -AccountName $anfAccountName `
    -PoolName $poolName `
    -Name "ukcug01" `
    -UsageThreshold $volumeSizeBytes `
    -SubnetId $subnetId `
    -CreationToken "myfilepath1" `
    -ServiceLevel $serviceLevel `
    -ProtocolType NFSv3
```

# 4. Test

Active Directory Users and Computers [dc01.jake.lab]	Name	Type	Descrip
> Saved Queries			
▼ jake.lab			
ANF	ANF-8BEA	Computer	
> Built-in			

Connect to virtual machine - Mic x +

portal.azure.com/#@960fe18b-92cc-4256-9fd8-6b7ba62e42c2/resource/subscriptions/e8cc2e33-263a-425a-9db0-6da35dd5df47/resourceGroups/RG-UKS01/providers/Mi... Incognito j.walsh@emea.cdw.com JWNWORKS

Microsoft Azure Search resources, services, and docs (G+/)

Home > Virtual machines > Win10Test01

### Win10Test01

Virtual machine

Search (Cmd+/)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Disks

Size

Security

Extensions

Connect Start Restart Stop Capture Delete Refresh

Advisor (1 of 1): Use availability sets for improved fault tolerance →

Resource group (change) : RG-UKS01 Size

Status : Running Public IP address

Location : UK South Private IP address

Subscription (change) : Visual Studio Enterprise – MPN Virtual network/subne

Subscription ID : e8cc2e33-263a-425a-9db0-6da35dd5df47 DNS name

Computer name : WIN10TEST01 Scale Set

Operating system : Windows (Windows 10 Pro)

Tags (change) : Click here to add tags

Show data for last: 1 hour 6 hours 12 hours 1 day 7 days 30 days

### Connect to virtual machine

Win10Test01

To improve security, enable just-in-time access on this VM. →

RDP SSH BASTION

To connect to your virtual machine via RDP, select an IP address, optionally change the port number, and download the RDP file.

IP address \*

Public IP address (51.140.62.181)


Port number \*

3389

Download RDP File

Having trouble connecting to this VM?

- Diagnose and solve problems
- Troubleshoot connection
- Serial console
- Reset password

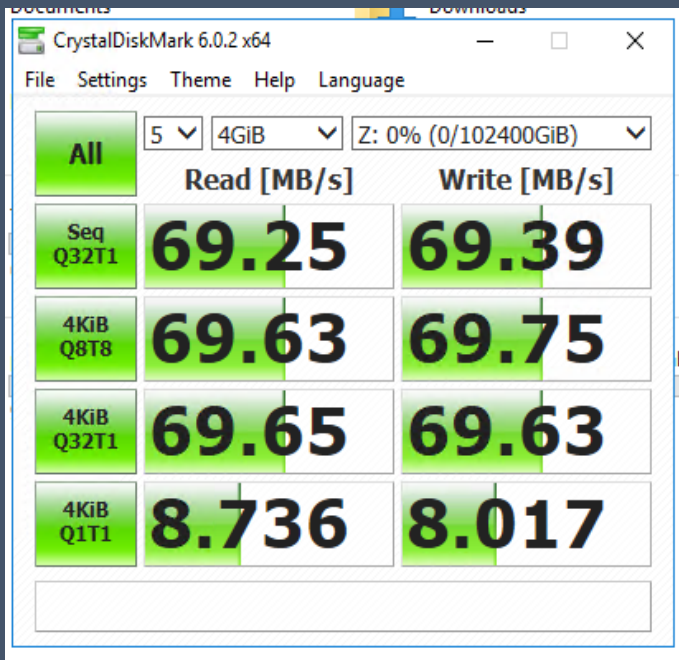


# Challenge – can we setup ANF, and create a Volume in under 5 minutes?

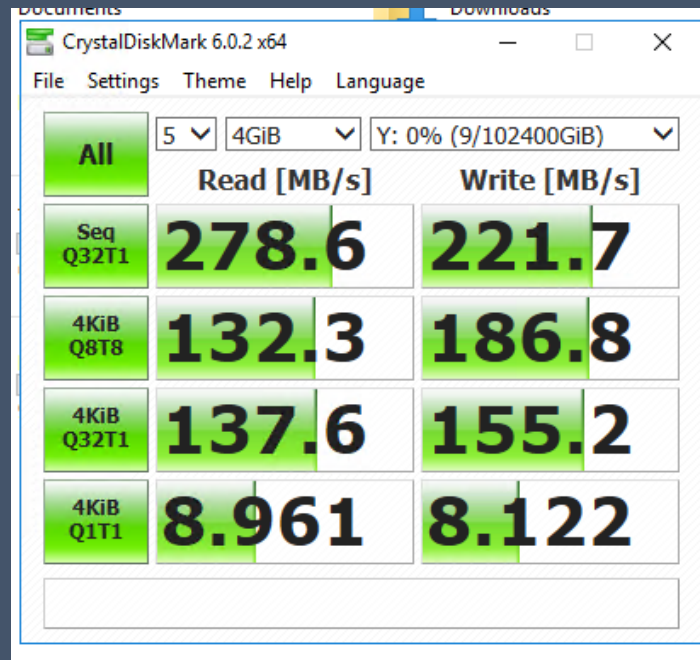
- Rapid Setup – 5 minutes approx. setup time
- Setup can be scripted – so perfect for integration with current toolsets and scripts
- IOPS for demanding use cases
- NTFS Supported – so ideal for file shares, profile storage etc.
- Protocol support for both Linux and Windows systems

# Performance Testing

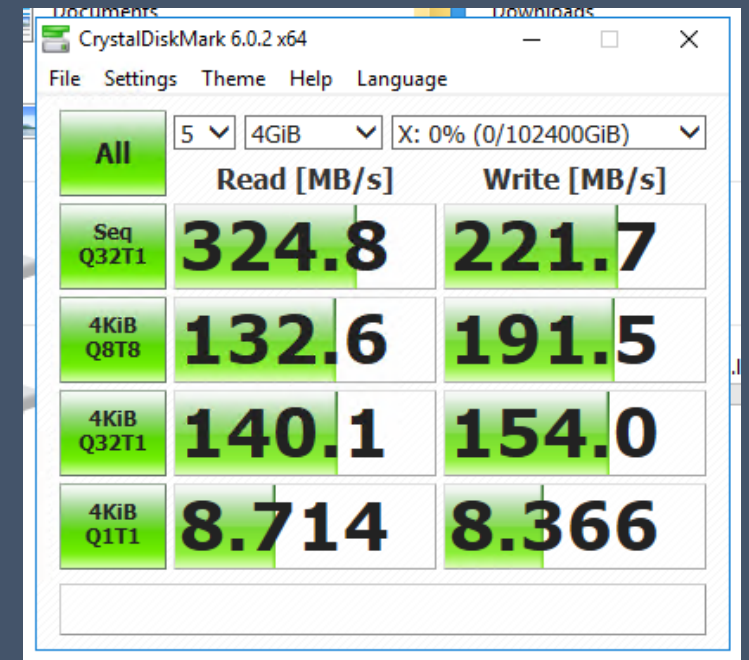
Performance Testing using CrystalDiskMark – accessing as a Windows 10 Client via SMBv3. Tests using a 4TB volume on a 4TB pool – 4GB file test using Standard, Premium, and Ultra:



Standard



Premium



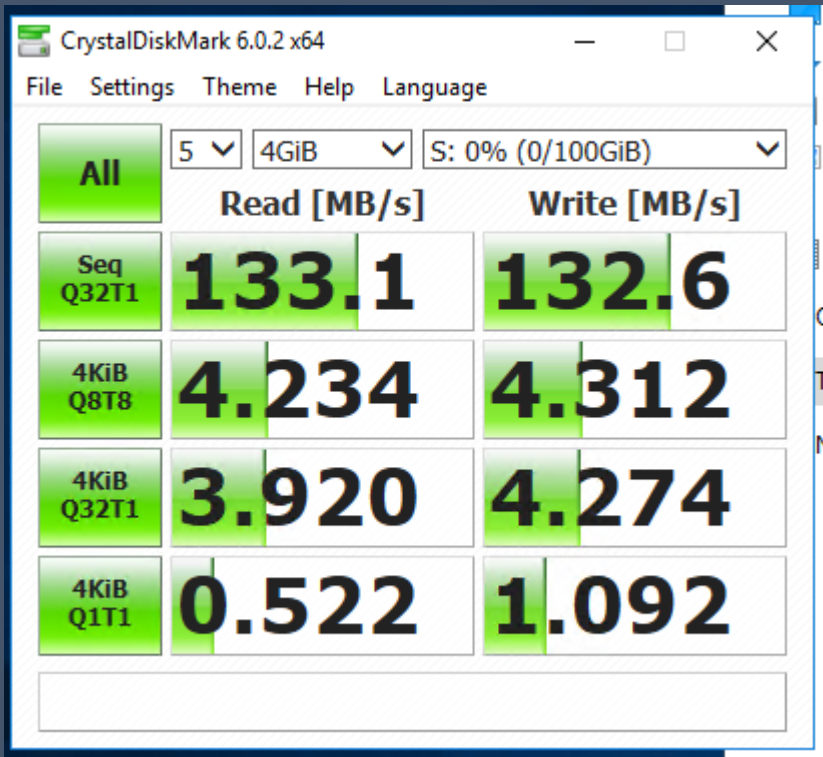
Ultra



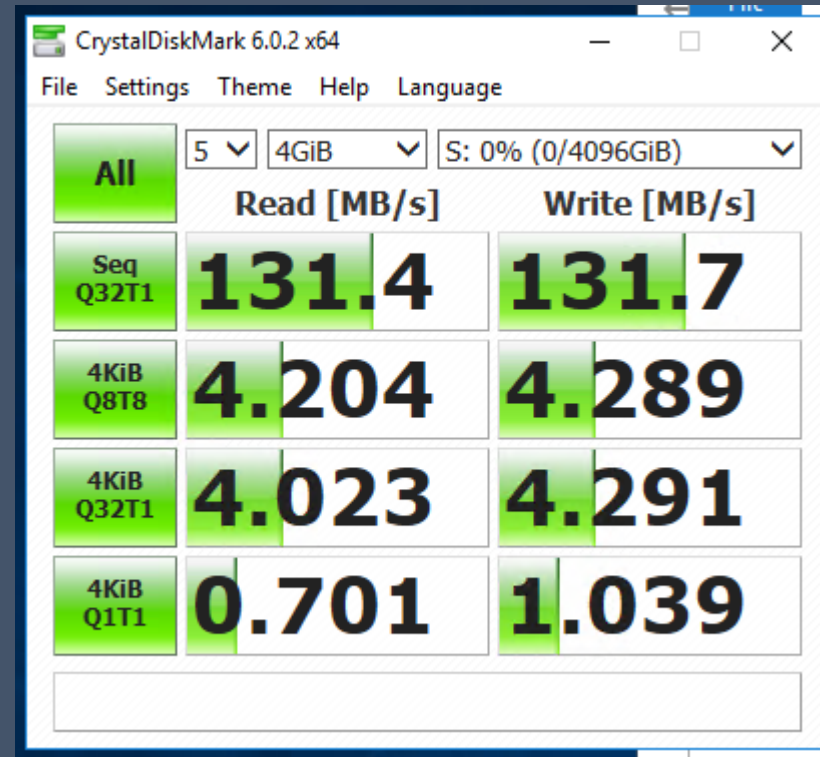
# Performance Testing

Comparison to Azure Files with SMB Share, 4GB test – there is no performance increase with an increased quota:

100GB Quota:



4TB Quota:



# Useful Resources

ANF Geek Out video - <https://www.youtube.com/watch?v=nwCZ4-OL5qg>

Microsoft ANF overview - <https://www.youtube.com/watch?v=km8um8lxqR8>

ANF Availability by Region - <https://azure.microsoft.com/en-gb/global-infrastructure/services/?products=netapp>

ANF Pricing - <https://azure.microsoft.com/en-gb/pricing/details/netapp/>

ANF Whitelisting Request -

[https://forms.office.com/Pages/ResponsePage.aspx?id=v4j5cvGGr0GRqyI80BHbR8cqI7Xv9yVBtRCSlcD\\_gdVUNUpUWEpLNERIMI NOVzA5MzczQ0dQRIZTSS4u](https://forms.office.com/Pages/ResponsePage.aspx?id=v4j5cvGGr0GRqyI80BHbR8cqI7Xv9yVBtRCSlcD_gdVUNUpUWEpLNERIMI NOVzA5MzczQ0dQRIZTSS4u)

ANF Performance Testing recommended settings - <https://docs.microsoft.com/en-us/azure/azure-netapp-files/azure-netapp-files-performance-metrics-volumes>

ANF Performance Benchmarks - <https://docs.microsoft.com/en-us/azure/azure-netapp-files/azure-netapp-files-performance-benchmarks>





# Thank You!

Up next – Coffee Break