


# UK Windows Virtual Desktop User Group

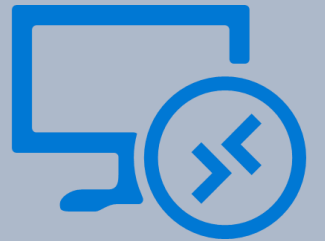


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## Azure NetApp Files Cross Region Replication



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Website: [jakewalsh.co.uk](http://jakewalsh.co.uk)

Please note: the views and opinions in this presentation are entirely my own!

# Overview

- **What is Cross Region Replication?**
- **Setup Demo**
- **Operation**
- **WVD Use Cases**
- **Resources**



# What is Cross Region Replication?

- Provides Data Protection by replicating Azure NetApp Files **Volumes** from a Source Region to a Destination
- Permits failover of the ANF Volume manually
- Supported between various Azure Regional Pairs and non-pairs
- Currently in Public Preview - waitlist submission required



**Note: this is a preview service – things will change!**

# Supported Replication Pairs

## Azure regional pairs

- East US and West US
- East US 2 and Central US
- Australia East and Australia Southeast
- Canada Central and Canada East
- South India and Central India
- Germany West Central and Germany North
- Japan East and Japan West
- North Europe and West Europe
- UK South and UK West

## Azure regional non-pairs

- West US 2 and East US
- South Central US and Central US
- South Central US and East US
- South Central US and East US 2
- East US and East US 2
- East US 2 and West US 2
- Australia East and Southeast Asia
- Germany West Central and UK South

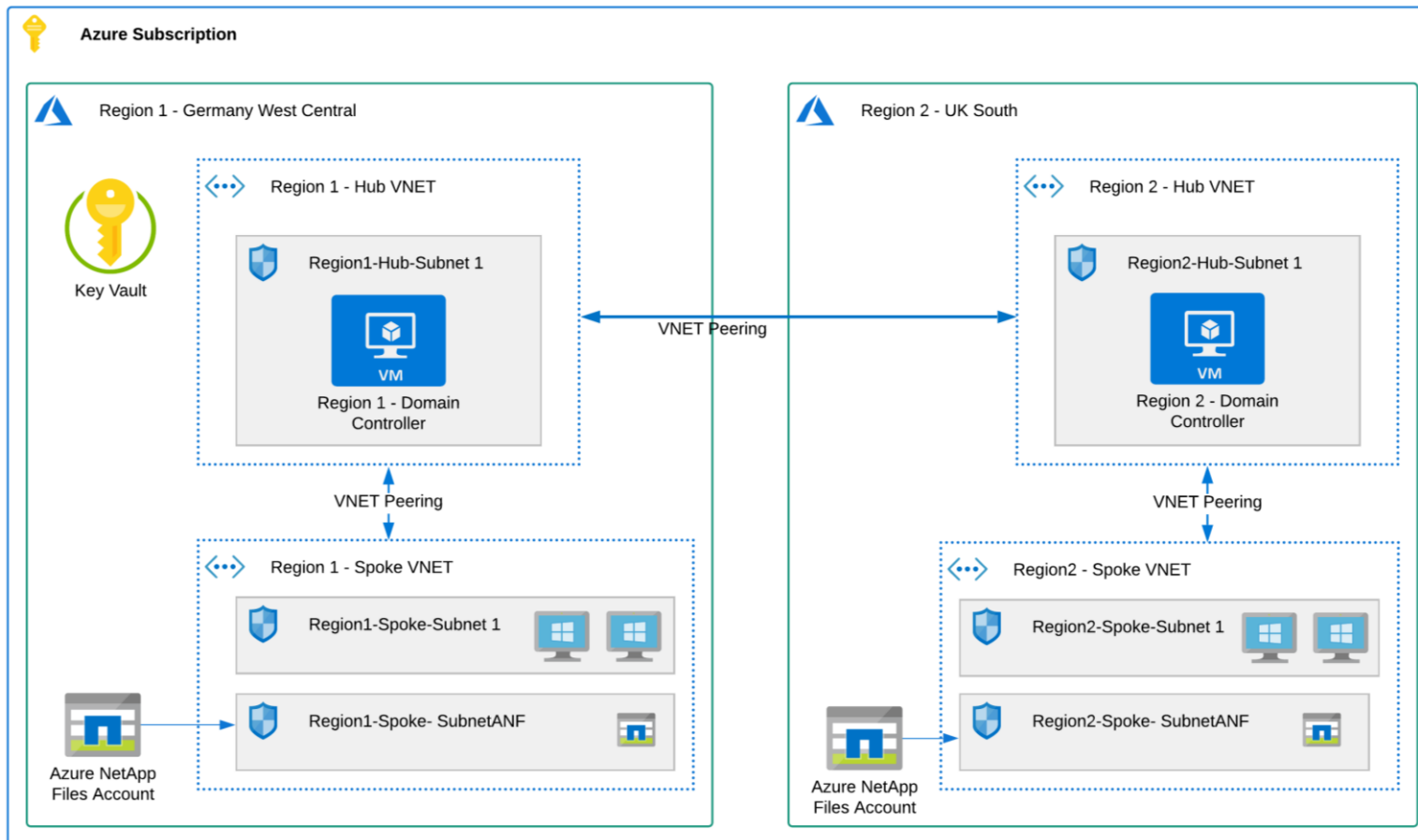
# Requirements / Considerations

- SMB and NFS are supported – SMB requires AD connection in the Source **and** Destination ANF Account
- Replication Volume is **read only** until it is failed over
- Currently must all be inside a single Subscription
- Currently 5 replicated volumes per Subscription per Region are supported. Support Ticket required to increase this.

# Demo & Operation



# Demo – Setup and Operation



Single Subscription (After waitlist signup)

ANF Accounts in Supported Regions

Active Directory available in both Regions

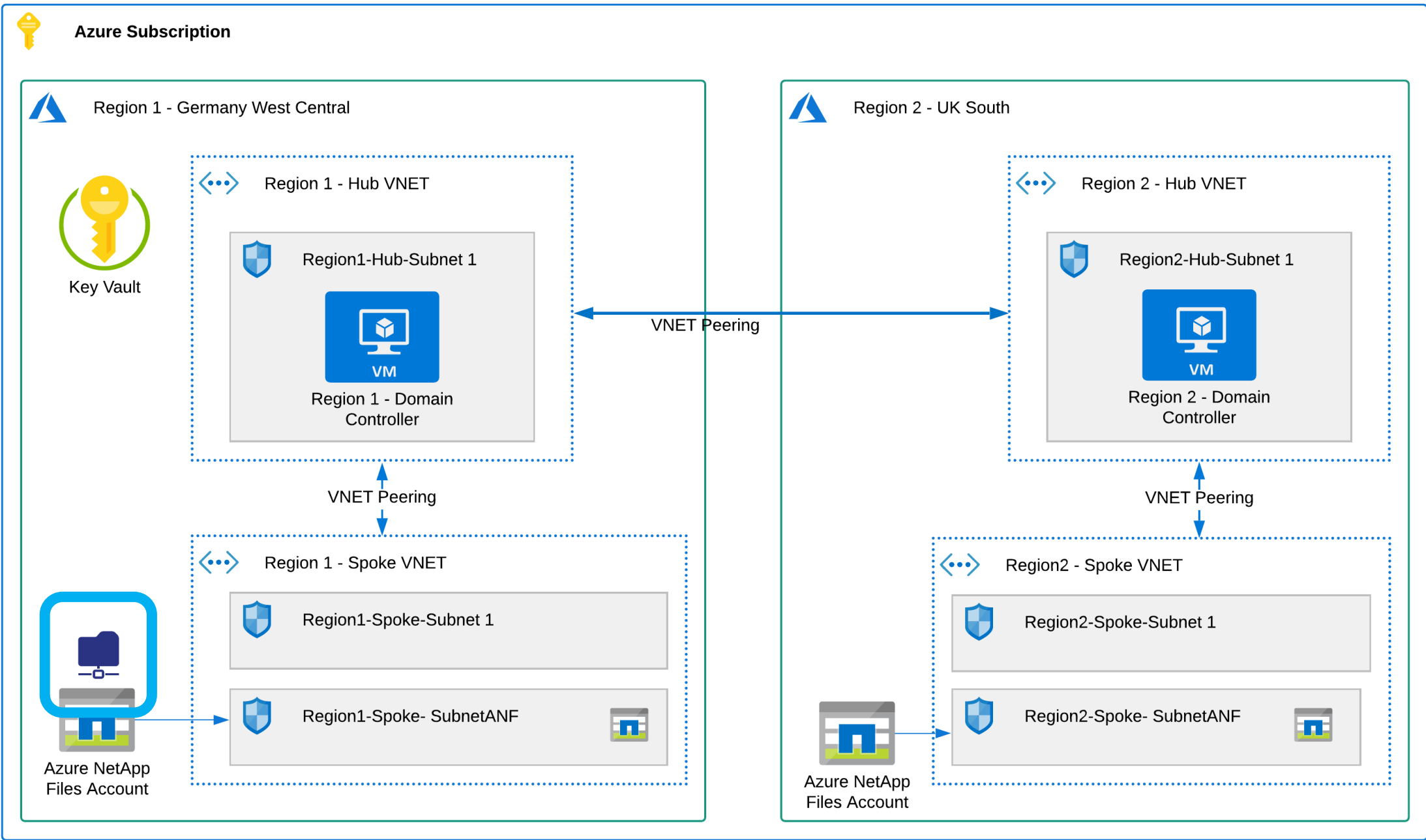
ANF Volume & AD Connection created in both Regions

Lab Terraform available in my GitHub Account: [github.com/jakewalsh90](https://github.com/jakewalsh90)

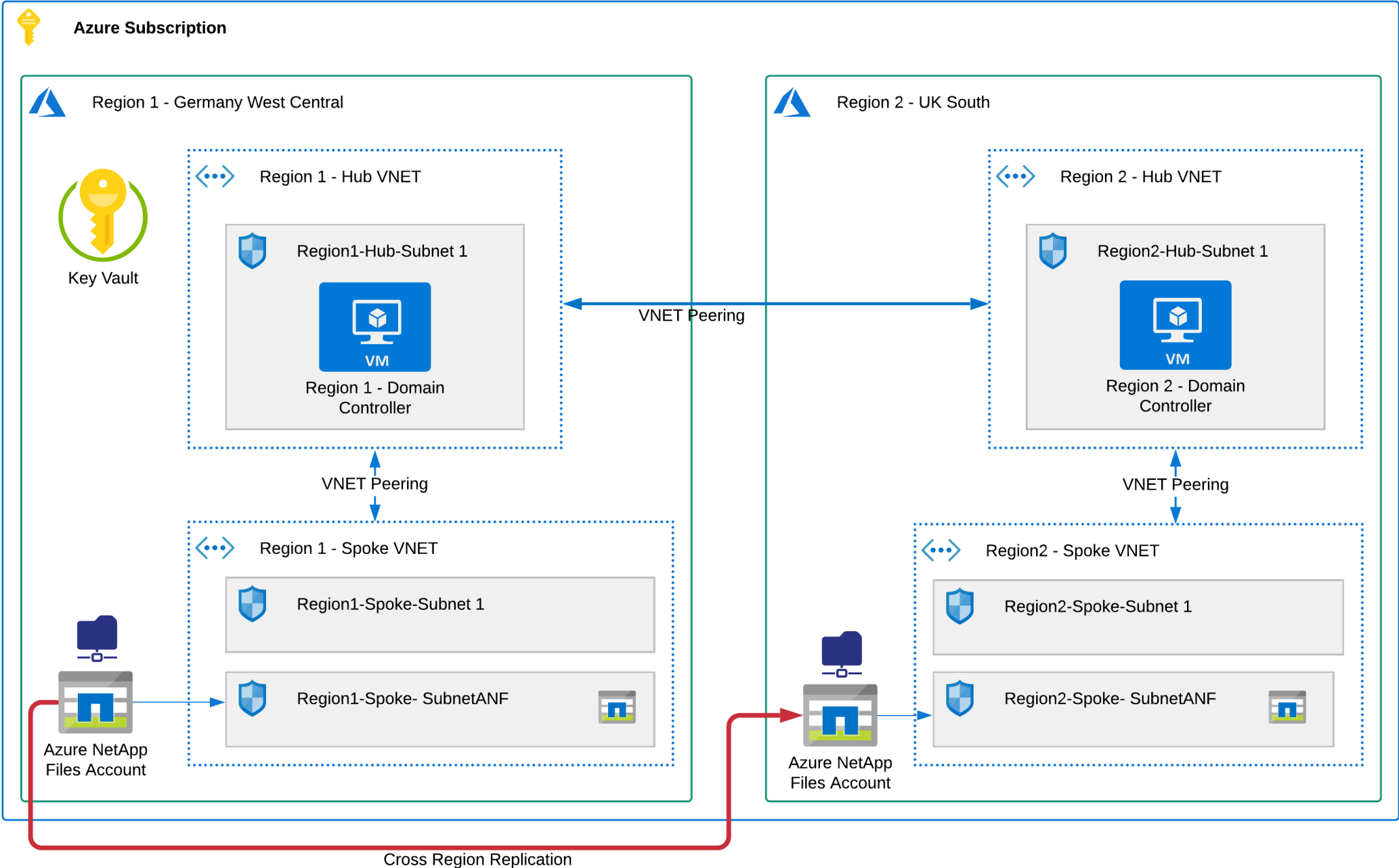




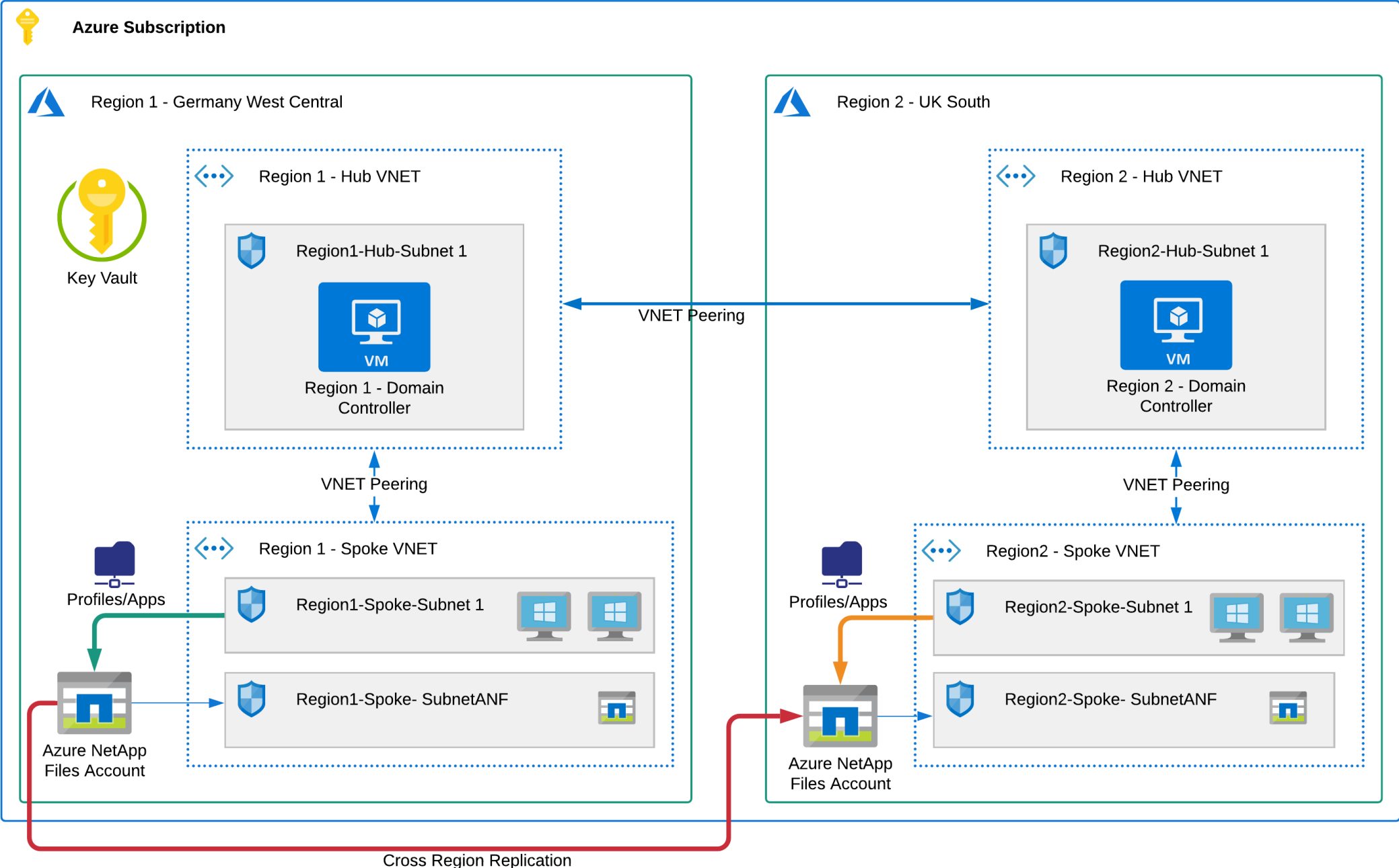
# Initial Lab Environment



# ANF Share and Replication – Creating a Replica Volume



# Access from Session Hosts – Looking at WVD benefits and use cases



# ANF Overview of Base Lab Environment

[Home](#) >

## Azure NetApp Files

lab.jakewalsh.co.uk

+ New

⚙ Manage view

↺ Refresh

⬇ Export to CSV

🔗 Open query

💙 Feedback

🏷 Assign tags

Filter for any field...

Subscription == all

Resource group == all

Location == all

+ Add filter

Showing 1 to 2 of 2 records.

No grouping

List view

<input type="checkbox"/> Name ↑↓	Type ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓	
<input type="checkbox"/>  region1-anf	NetApp account	<a href="#">baselabv2-region1infra</a>	Germany West Central	<a href="#">lab.jakewalsh.co.uk - CDW MSDN</a>	...
<input type="checkbox"/>  region2-anf	NetApp account	<a href="#">baselabv2-region2infra</a>	UK South	<a href="#">lab.jakewalsh.co.uk - CDW MSDN</a>	...

# Volume Creation – Region 1

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New

⚙

Manage view

↺

Refresh

↓

Export to CSV

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<input type="checkbox"/>  region2-anf	NetApp account	<a href="#">baselabv2-region2infra</a>	UK South	<a href="#">lab.jakewalsh.co.uk - CDW MSDN</a>	...

< Previous

Page 1

of 1

Next >

# Volume Creation – Region 1

Home > Azure NetApp Files lab.jakewalsh.co.uk

+ New ⚙️ Manage view ▾ ↻ Refresh ⬇️ Export to CSV 🔗 Open query ❤️ Feedback | 🏷️ Assign tags

Filter for any field... Subscription == all Resource group == all Location == all Add filter

Showing 1 to 2 of 2 records.

<input type="checkbox"/> Name ↑↓	Type ↑↓	Resource group ↑↓	Location ↑↓
<input type="checkbox"/> region1-anf	NetApp account	baselabv2-region1infra	Germany West Cent
<input type="checkbox"/> region2-anf	NetApp account	baselabv2-region2infra	UK South

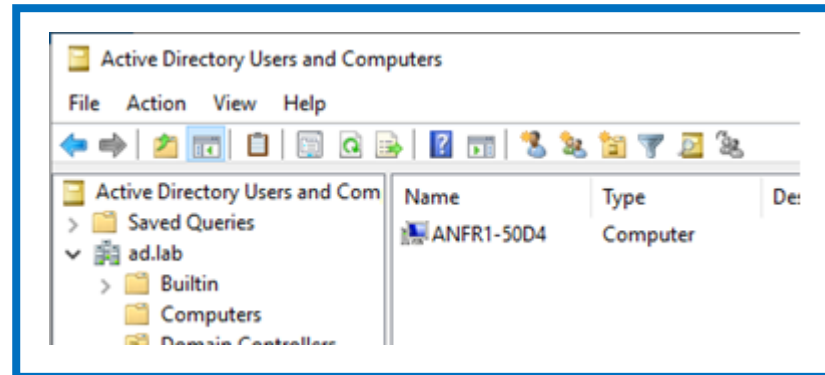
### Notifications

More events in the activity log → Dismiss all ▾

✓ Deployment succeeded

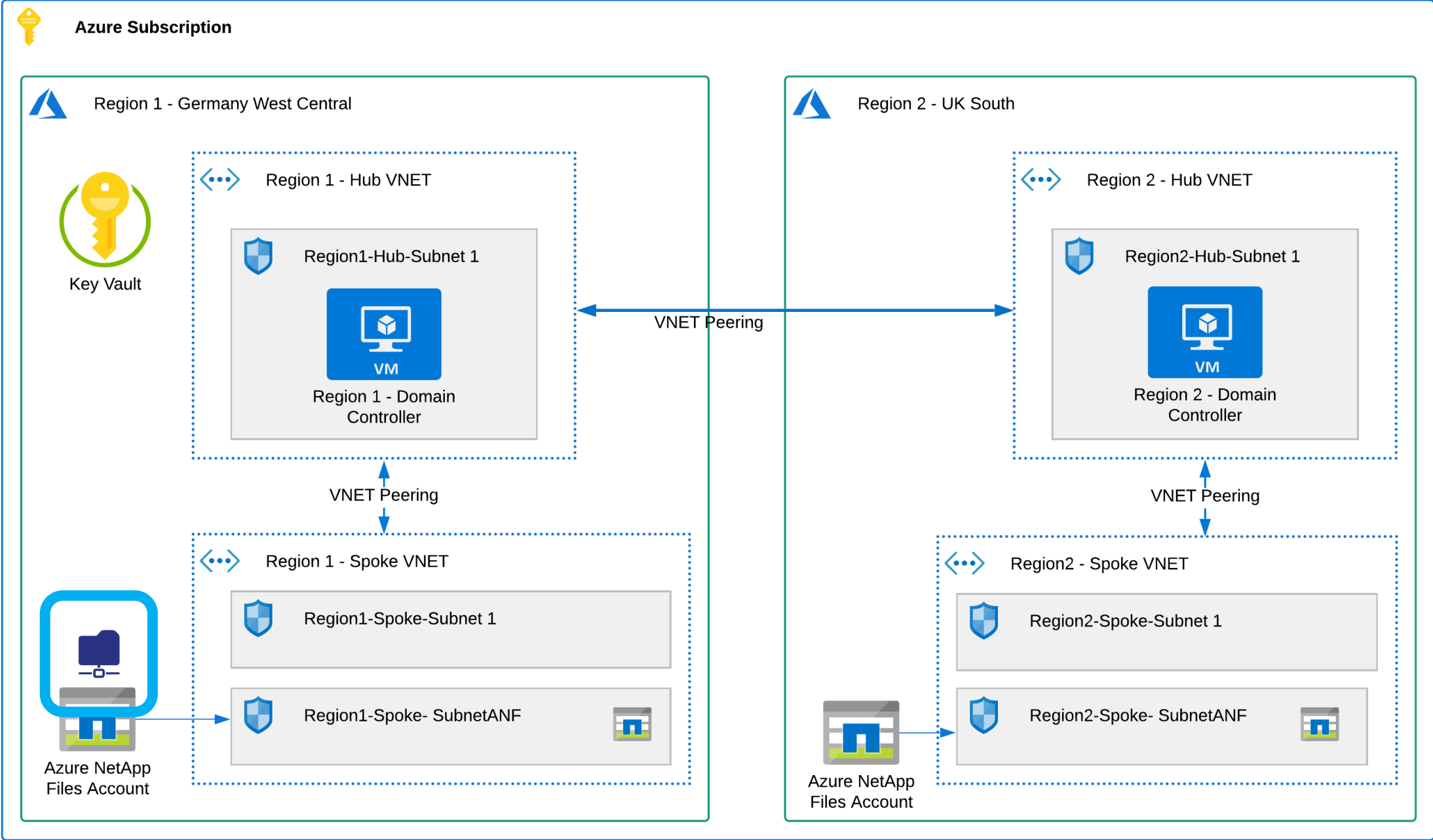
Deployment 'CreateVolume-20210414141526' to resource group 'baselabv2-region1infra' was successful.

3 minutes ago



**We now have the Primary ANF Volume setup – and we are ready to configure CRR**

# Initial Lab Environment



# Cross Region Replication Setup

**Setting up Cross Region Replication is a 3 step process:**

1. Locate the Source Volume ID
2. Create the Replica Volume in the Secondary ANF Account
3. Authorise Replication from the Source Volume





# Cross Region Replication Setup – Locate Source Volume ID

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## Azure NetApp Files

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Filter for any field... [Subscription == all](#) [Resource group == all](#) [Location == all](#) [Add filter](#)

Showing 1 to 2 of 2 records.

[No grouping](#) [List view](#)

<input type="checkbox"/> Name ↑↓	Type ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓	
<input type="checkbox"/> region1-anf	NetApp account	baselabv2-region1infra	Germany West Central	lab.jakewalsh.co.uk - CDW MSDN	...
<input type="checkbox"/> region2-anf	NetApp account	baselabv2-region2infra	UK South	lab.jakewalsh.co.uk - CDW MSDN	...

# Cross Region Replication Setup – Create Replica Volume

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⚙ Manage view

🔄 Refresh

📄 Export to CSV

🔗 Open query

💡 Feedback

🏷 Assign tags

Filter for any field...

Subscription == all

Resource group == all



Location == all

+ Add filter

Showing 1 to 2 of 2 records.

No grouping

List view

<input type="checkbox"/> Name ↑↓	Type ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓
<input type="checkbox"/>  region1-anf	NetApp account	baselabv2-region1infra	Germany West Central	lab.jakewalsh.co.uk - CDW MSDN
<input type="checkbox"/>  region2-anf	NetApp account	baselabv2-region2infra	UK South	lab.jakewalsh.co.uk - CDW MSDN

# Cross Region Replication Setup – Authorise Replication

[Home](#) >

## Azure NetApp Files

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Filter for any field...

Subscription == all

Resource group == all

Location == all

Add filter

Showing 1 to 2 of 2 records.

No grouping

List view

<input type="checkbox"/> Name ↑↓	Type ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓	
<input type="checkbox"/>  region1-anf	NetApp account	baselabv2-region1infra	Germany West Central	lab.jakewalsh.co.uk - CDW MSDN	...
<input type="checkbox"/>  region2-anf	NetApp account	baselabv2-region2infra	UK South	lab.jakewalsh.co.uk - CDW MSDN	...

# Replication Schedules

## 3 Options when setting up Replication Schedules:

Create a new protection volume ...

Basics Protocol Replication Tags Review + create

Source volume ID ⓘ

Replication schedule ⓘ 

Every 10 minutes ^

Every 10 minutes

Hourly

Daily

<https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-introduction#service-level-objectives>

# Confirming the Replication is configured – Region 1

profiles (region1-anf/pool1/profiles) | Replication

Volume

Search (Ctrl+ /)

Refresh

Overview

Activity log

Access control (IAM)

Tags

Settings

Properties

Locks

Storage service

Mount instructions

Export policy

Snapshots

Replication

Essentials

End point type : Source

Destination : profiles

Healthy : Healthy

Relationship status : Idle

Mirror state : Mirrored

Total progress : 23.14 KiB

Show data for last:

1 hour

6 hours

12 hours

1 day

7 days

Volume replication lag time

10min

8.33min

6.67min

5min

Is volume replication transferring

100

90

80

70

60

50

40

# Confirming the Replication is configured – Region 2

profiles (region2-anf/pool2/profiles) | Replication

Volume

Search (Ctrl+ /)

«

Edit

Break peering

Delete

Refresh

Overview

Activity log

Access control (IAM)

Tags

Settings

Properties

Locks

Storage service

Mount instructions

Export policy

Snapshots

Replication

Essentials

End point type : Destination

Source : profiles

Healthy : Healthy

Relationship status : Idle

Mirror state : Mirrored

Replication schedule : Every 10 minutes

Total progress : 26.15 KiB

Show data for last:

1 hour

6 hours

12 hours

1 day

7 days

Volume replication lag time

Is volume replication transferring

10min

8.33min

6.67min

5min

100

90

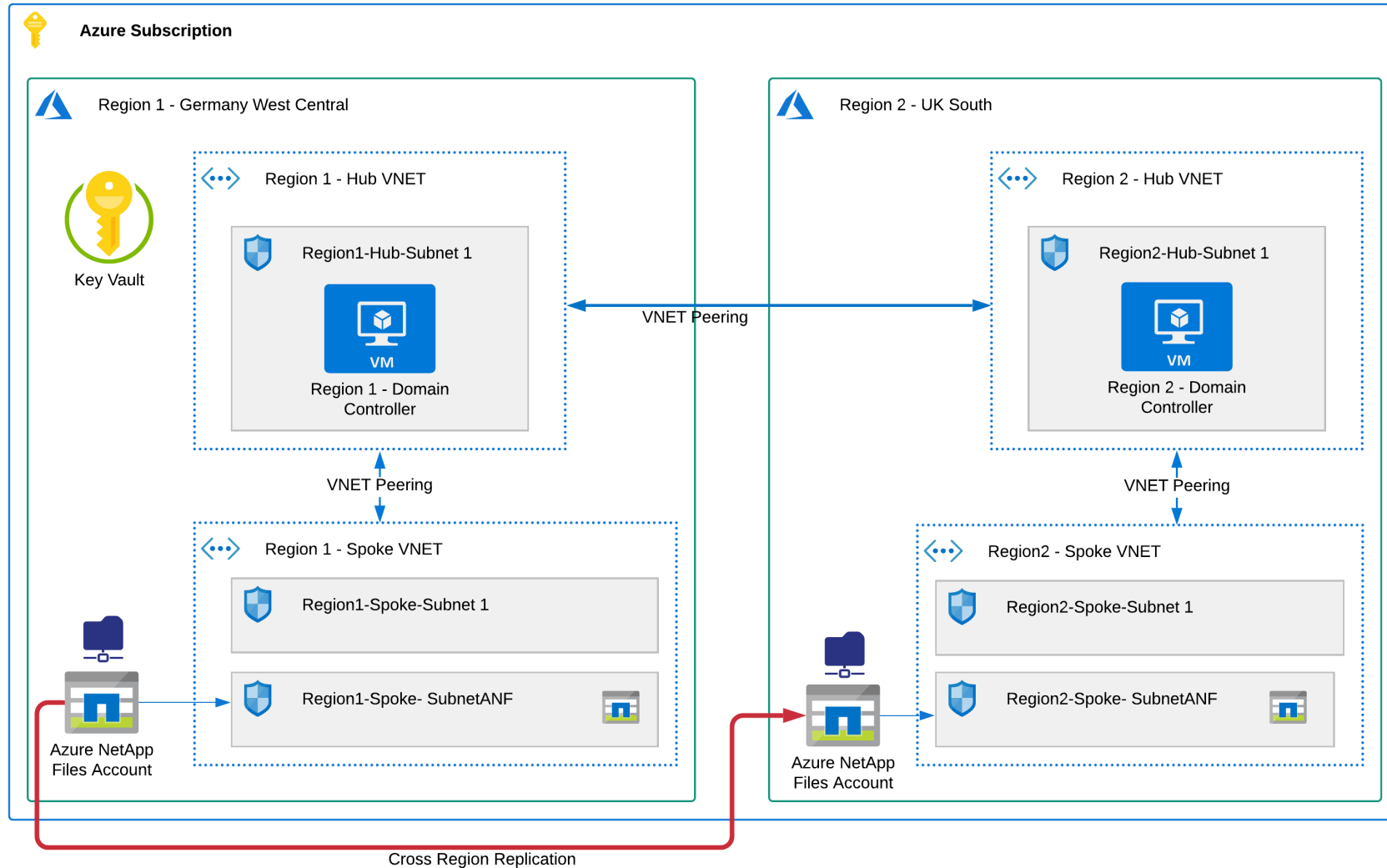
80

70

60

50

# What have we configured?



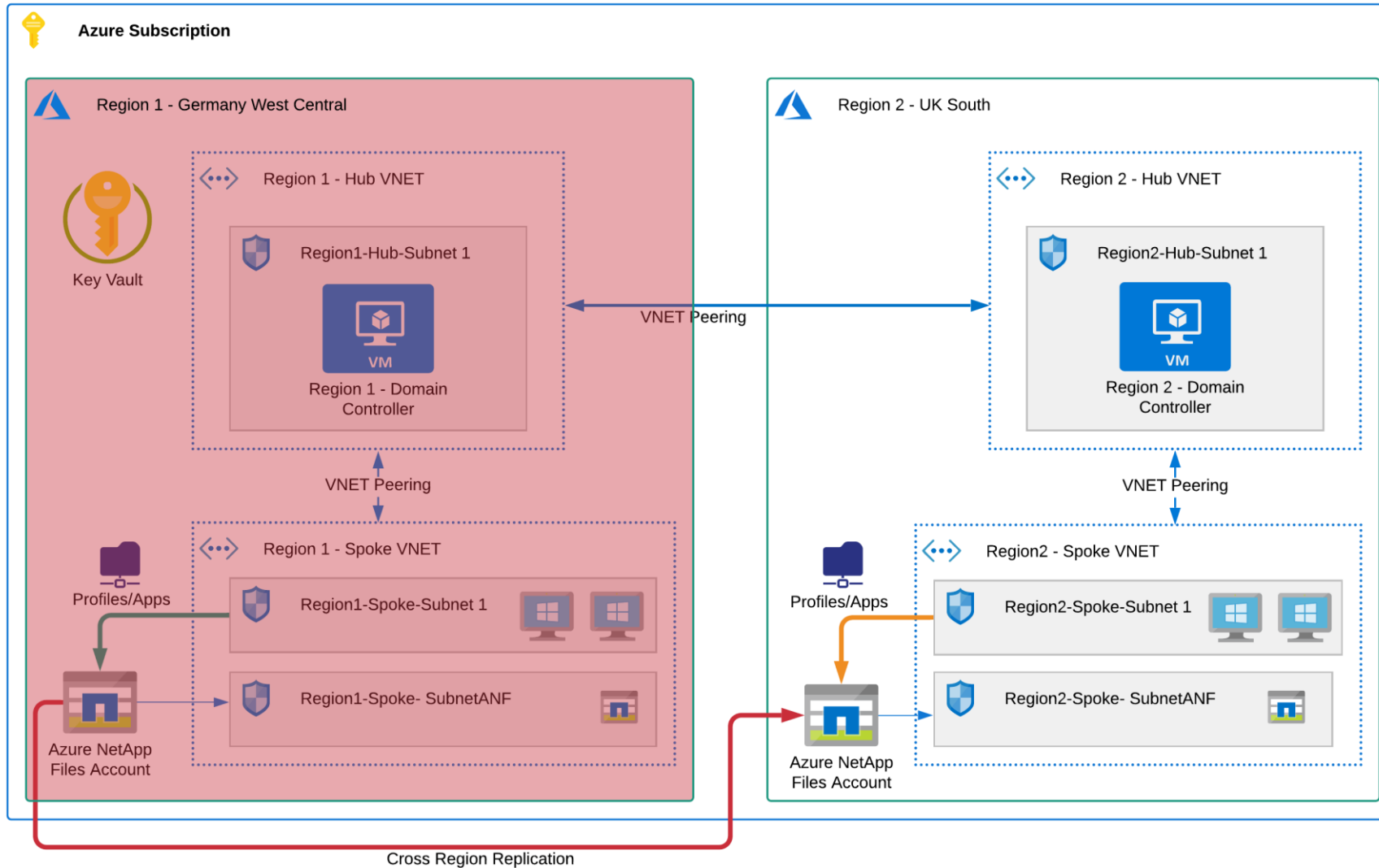
1. Replication between Region 1 and Region 2 now in place.
2. Volume in Region 1 can be used as normal
3. Volume in Region 2 is read only until we fail over

# DR Operation





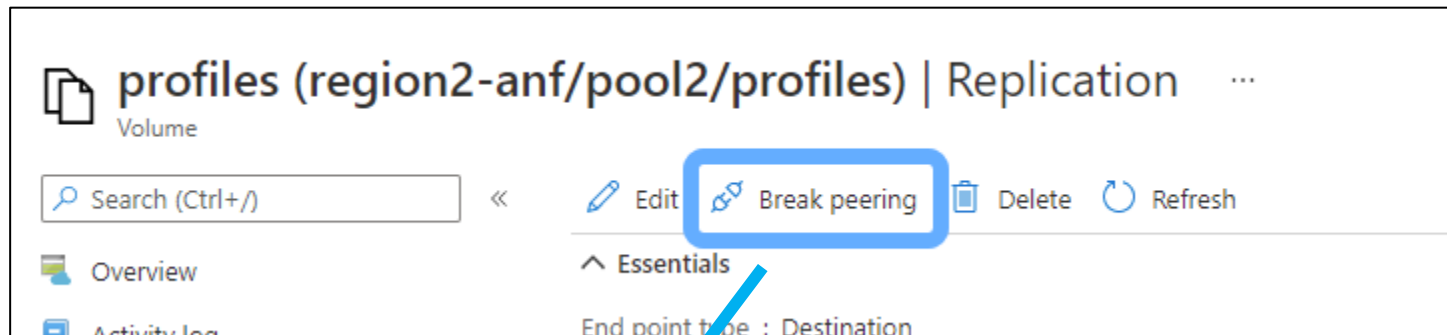
# Invoking Replication – what if we lose a Region?



# Invoking Replication – Just 1 Step

**DR invocation for failover – currently a manual (but very simple) process:**

1. Browse to Destination Volume – and select “Break peering”

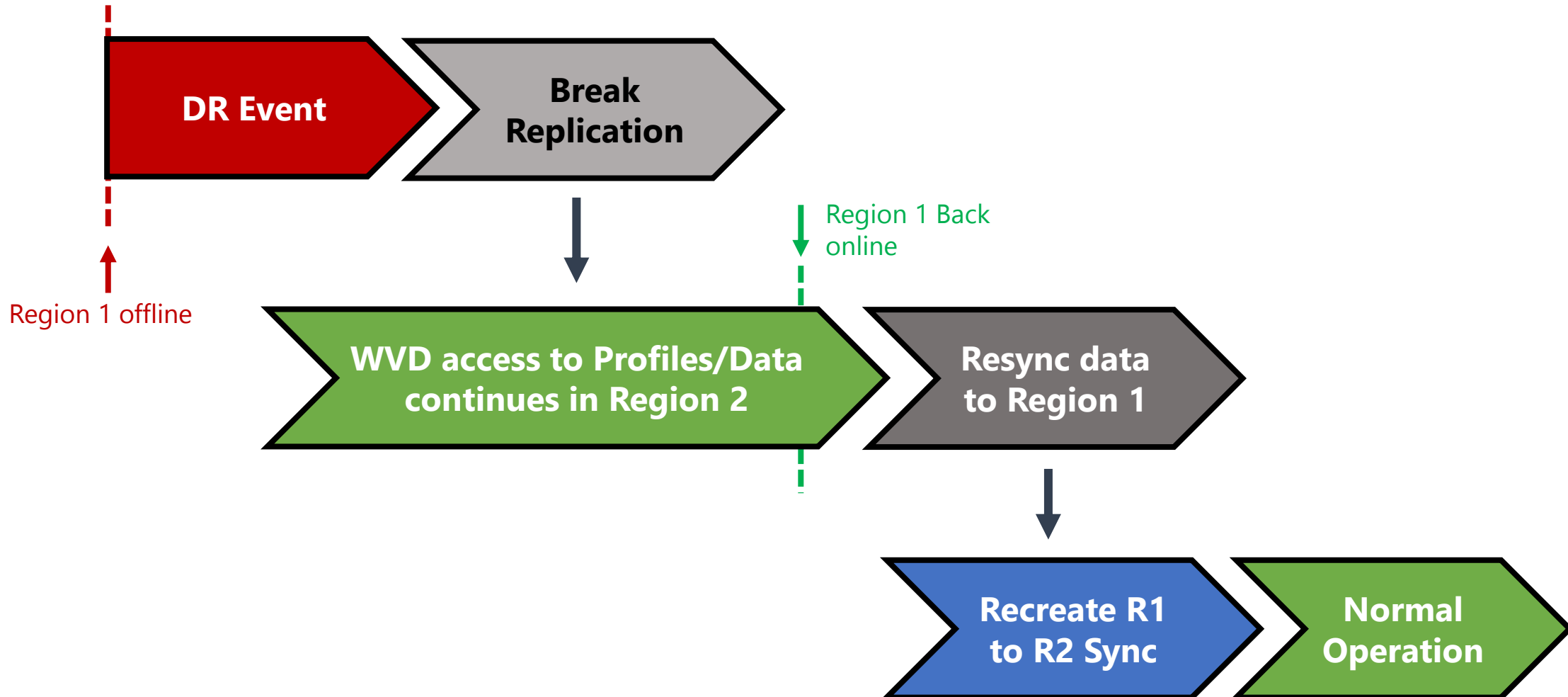


**This enables read/write access to the replica Volume!**

<https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-manage-disaster-recovery#fail-over-to-destination-volume>

# What about after DR?

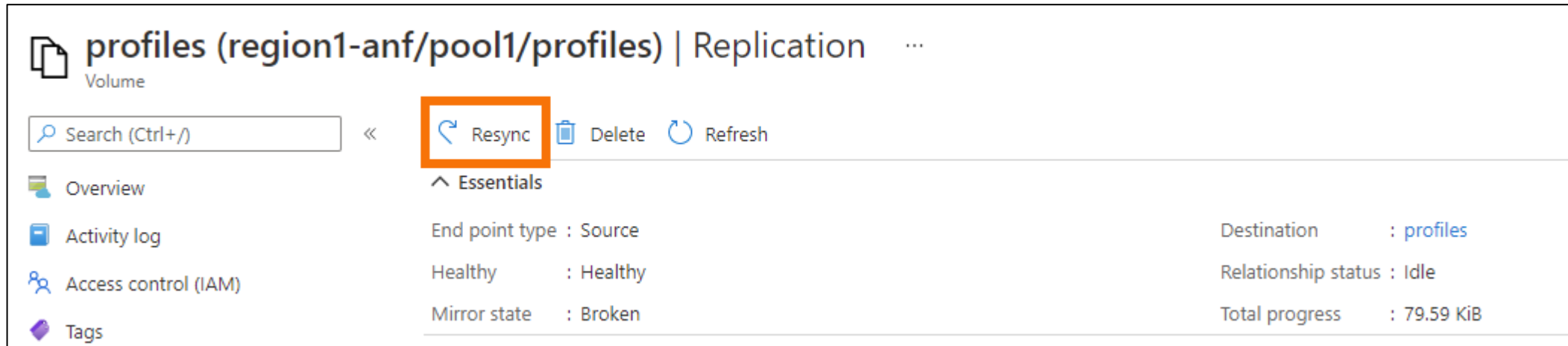
After DR – we need to resync the data back to Region 1, and then set up Replication again



# Post DR – Resync! (Step A – Region 2 sync to Region 1)

After a DR event, there is a need to resync data back from the DR Region

1. Browse to the **Source Volume (Region 1)** – and select “Resync”

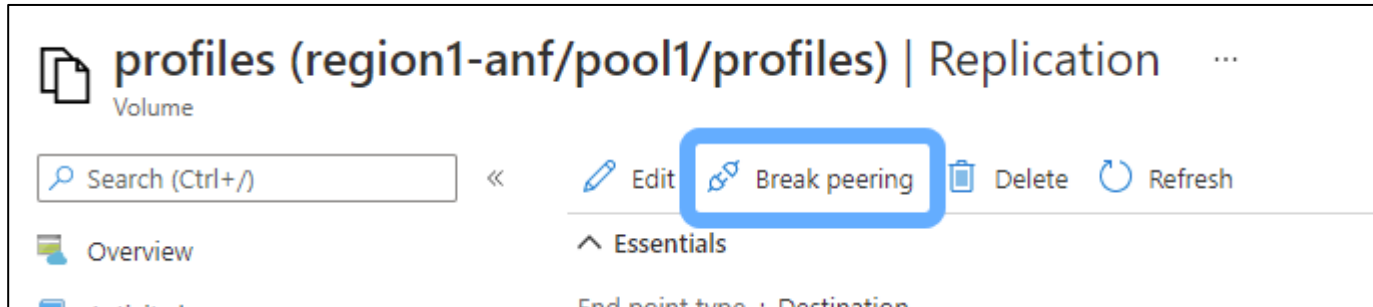


After this the Region 2 data is replicated back to Region 1 – getting us back ready to run from Region 1.

<https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-manage-disaster-recovery#resync-replication>

# Post DR – Resync! (Step A – Region 2 sync to Region 1)

Once this has run – we then **break the Peering**, so we can setup our Normal operation (R1 to R2).



Breaking the peering separates the volumes – so we can setup R1 to R2 sync

<https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-manage-disaster-recovery#resync-replication>

# Post DR – Resync! (Step B – Region 1 sync to Region 2)

After a DR event, there is a need to resync data back from the DR Region

1. Browse to the **Destination Volume (Region 2)** – and select “Resync”



The screenshot shows the Azure portal interface for a volume named 'profiles (region2-anf/pool2/profiles)'. The 'Replication' tab is selected. In the top navigation bar, the 'Resync' button is highlighted with a red box. Below the navigation bar, there is a section for 'Essentials' showing the volume's status: 'End point type : Destination', 'Healthy : Healthy', and 'Mirror state : Broken'. To the right, there is a table of replication details:

Source	: profiles
Relationship status	: Idle
Replication schedule	: Every 10 minutes
Total progress	: 33.09 KiB

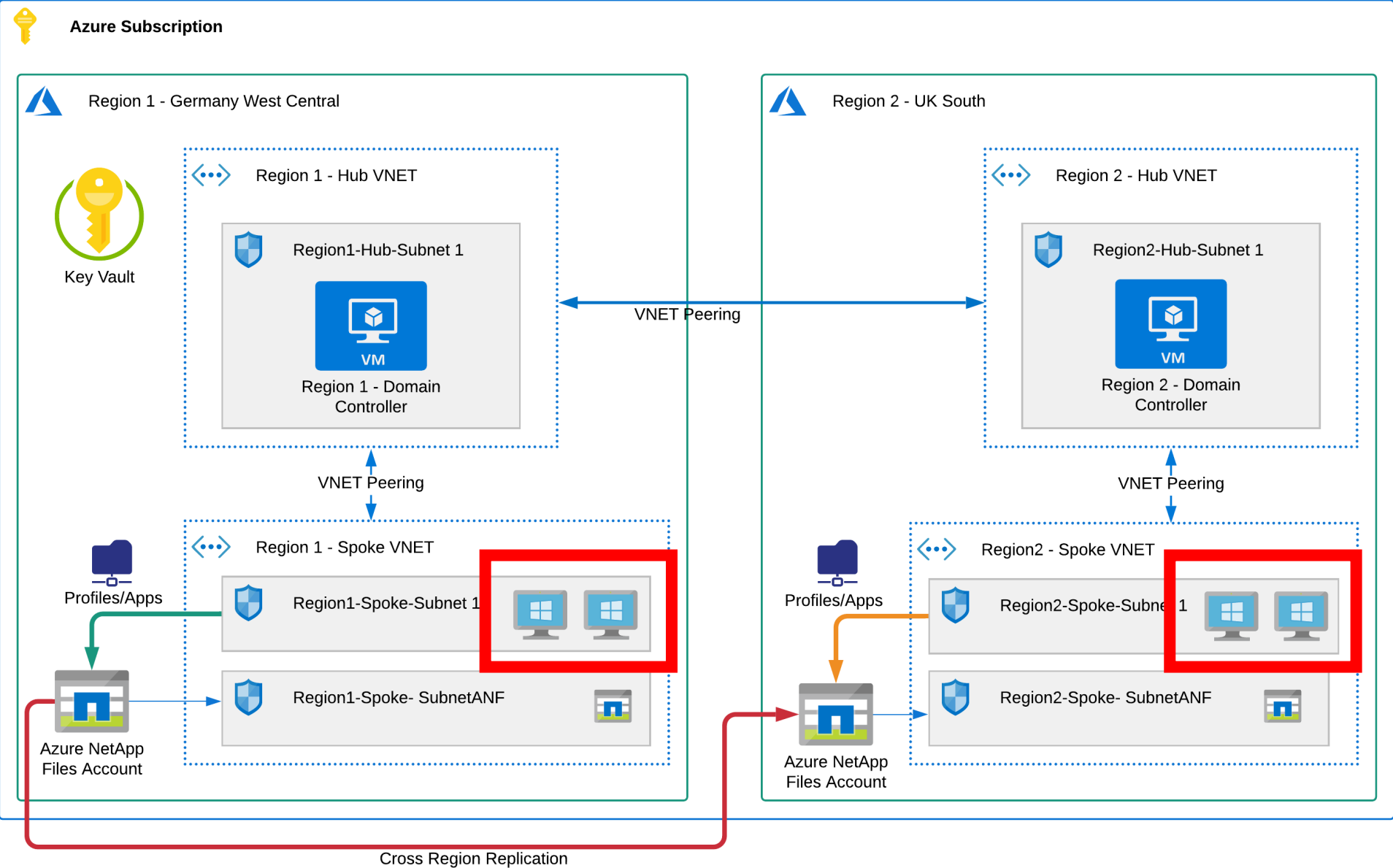
**After this the Region 1 data is now being replicated to Region 2 – Normal Operation**

<https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-manage-disaster-recovery#resync-replication>

# WVD Use Cases



# WVD Uses and Benefits





# WVD Uses and Benefits

## Core Use Cases and Benefits of Azure NetApp Files CRR for Windows Virtual Desktop:

- Replication of **User Profile data in FSLogix** without the need for Cloud Cache or any automated copy operation
  - Consider replication of User Profile Data, potentially excluding O365 data – this is already replicated by Microsoft and can be recreated at login in the DR Region.
- Replication of **Application Data**
  - Consider how applications will fail over to another Region during an outage and plan accordingly – the key here is around ensuring availability of applications that users will access using WVD.
  - Here we need to consider more than Application data, ensure server availability – Azure Site Recovery can help here
- Replication of **Application Packages & Binaries**
  - Application executables and packages can be replicated using CRR – ensuring packages and binaries are available during a DR event.

# Resources

## Technical Docs

- <https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-introduction>
- <https://docs.microsoft.com/en-us/azure/best-practices-availability-paired-regions#azure-regional-pairs>
- <https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-requirements-considerations>
- <https://docs.microsoft.com/en-us/azure/azure-netapp-files/cross-region-replication-introduction#cost-model-for-cross-region-replication>

## Preview Access:

- Azure NetApp Files Sign Up - <https://aka.ms/azurenetaappfiles>
- CRR Sign up - <https://aka.ms/anfcrrpreviewsignup>

## Lab Terraform Files

- <https://github.com/jakewalsh90/Terraform-Azure/tree/main/Azure-NetApp-Files-CRR-BaseLab>



**Twitter:** @jakewalsh90


**Website:** [jakewalsh.co.uk](http://jakewalsh.co.uk)

# Thank You!

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