


UK Windows Virtual Desktop User Group

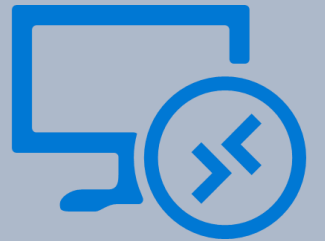


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Azure NetApp Files Cross Region Replication



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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 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

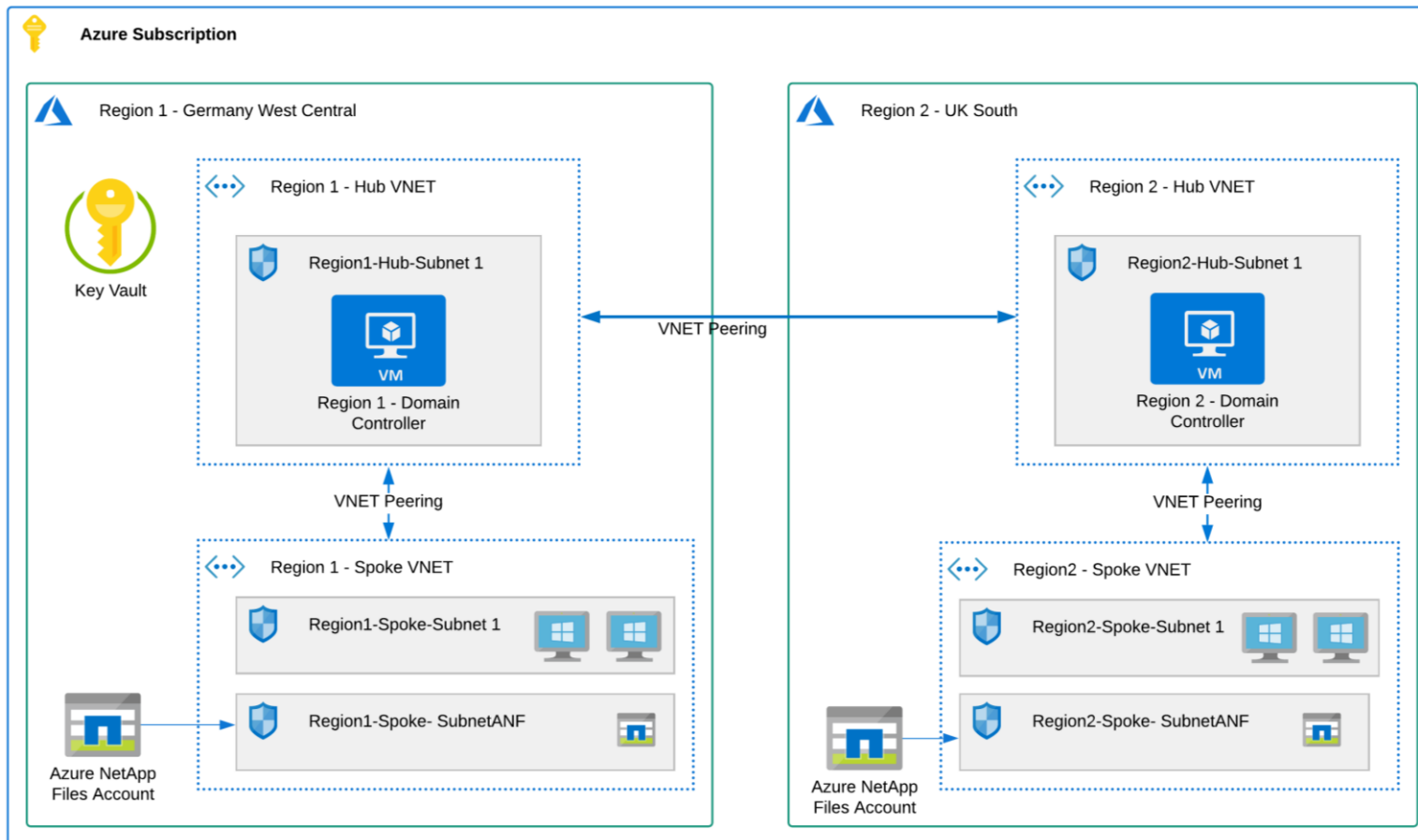
Requirements / Considerations

- 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

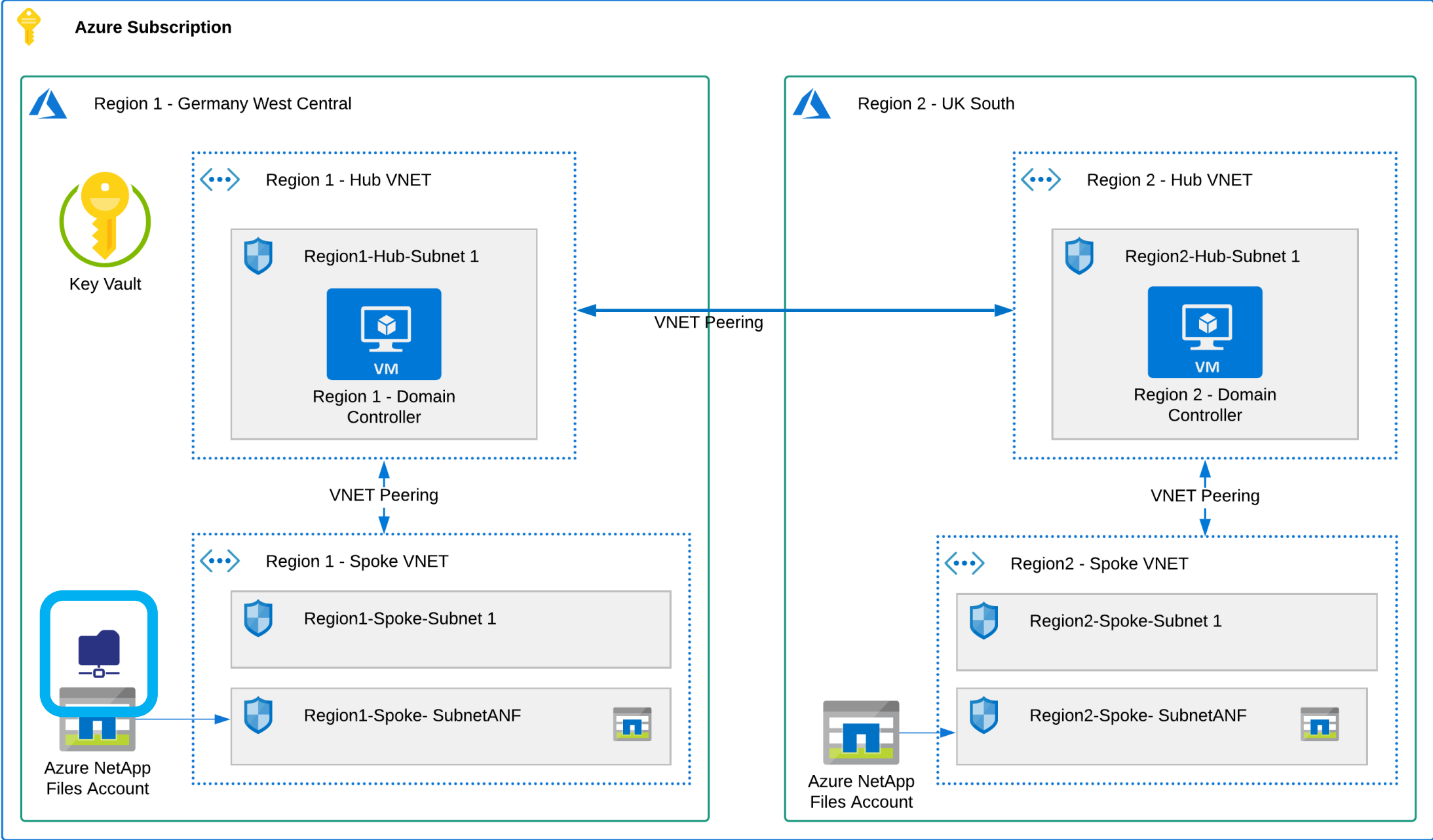
Active Directory available in both Regions

ANF Volume & AD Connection created in both Regions

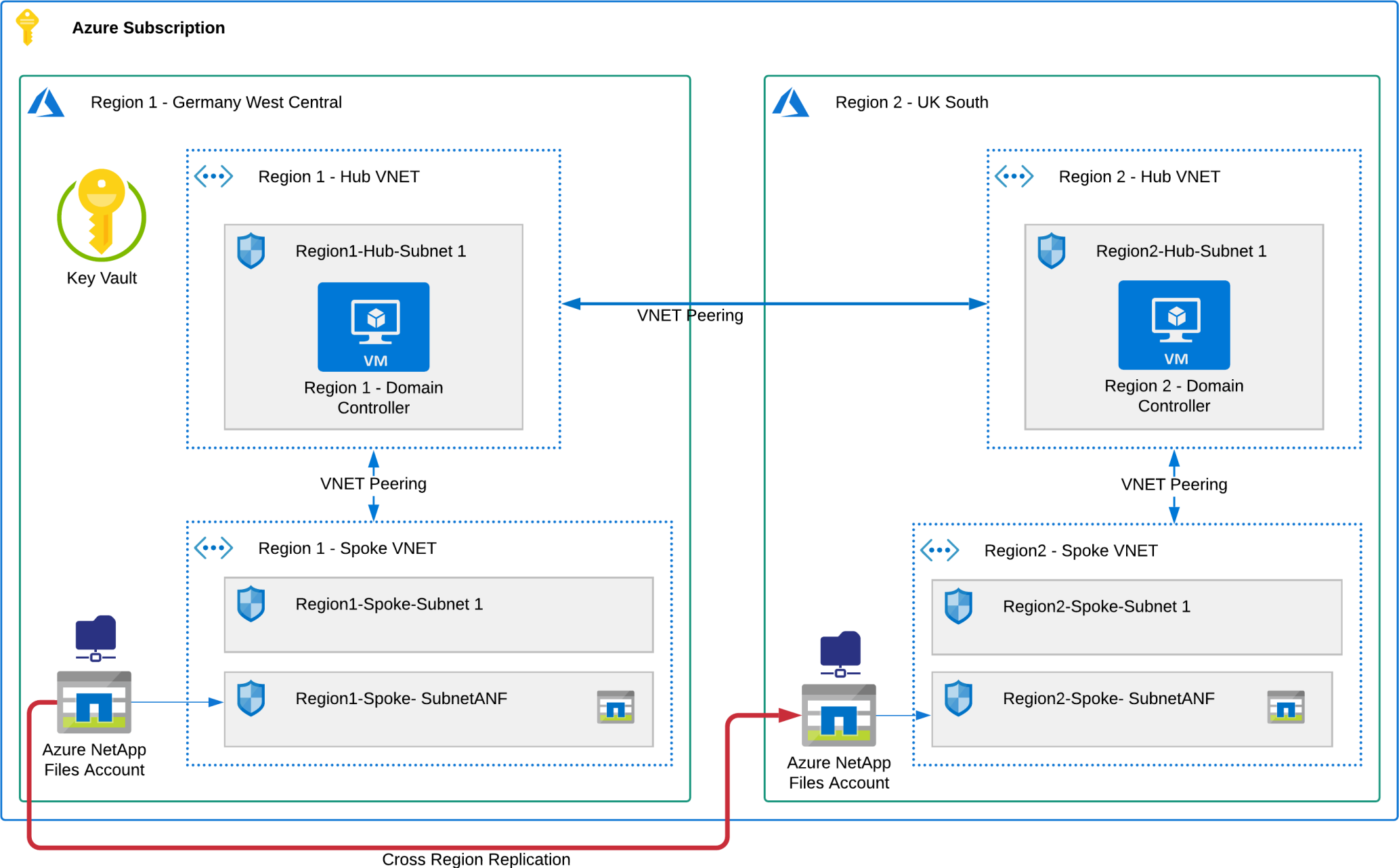
Lab Terraform available in my GitHub Account: github.com/jakewalsh90



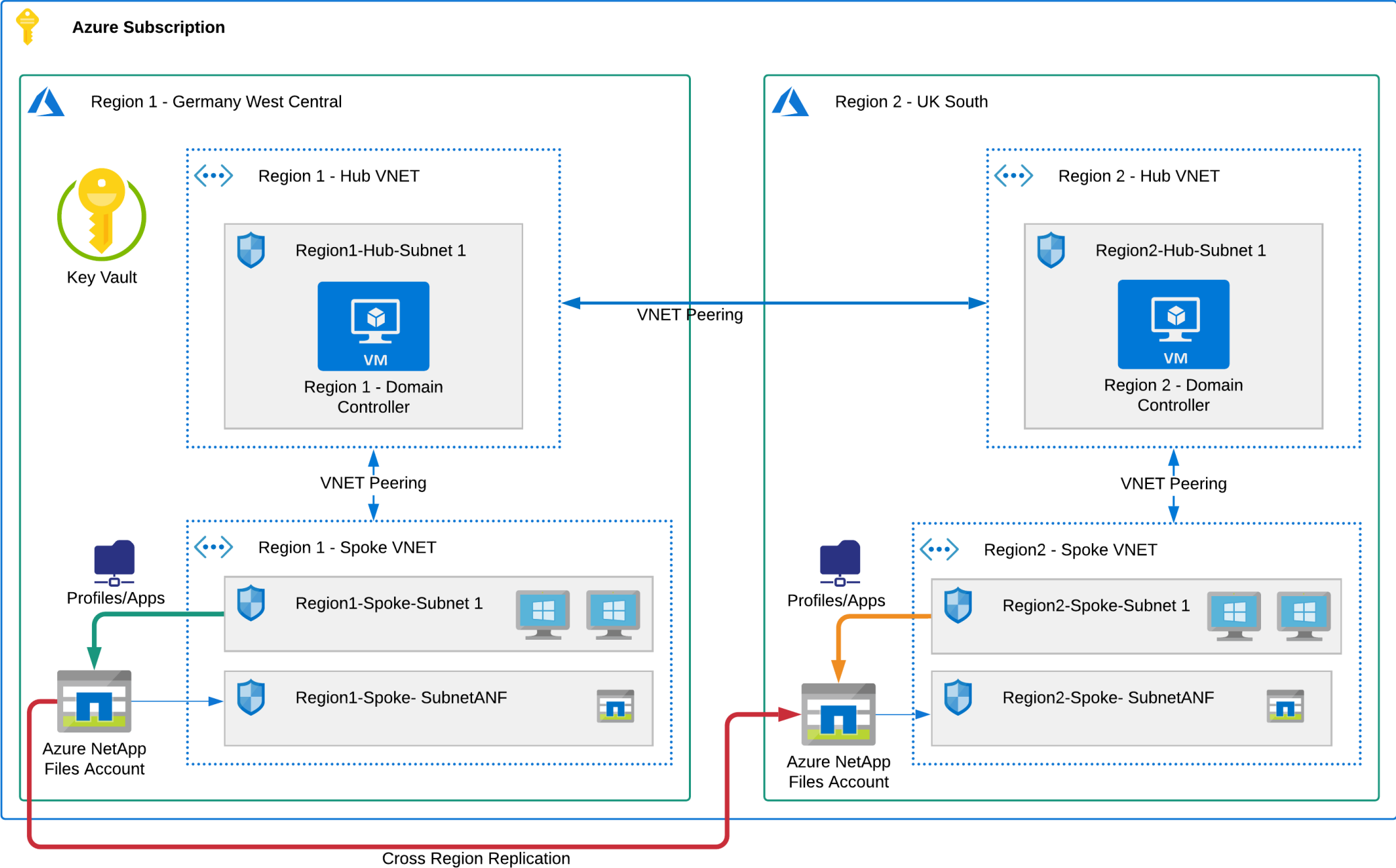
Initial Lab Environment



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

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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	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	...

Volume Creation – Region 1

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New

⚙

Manage view

↺

Refresh

↓

Export to CSV

🔗

Open query

💙

Feedback

🏷

Assign tags

Filter for any field...

Subscription == all

Resource group == all



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+ Add filter

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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	...

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Volume Creation – Region 1

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+ 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

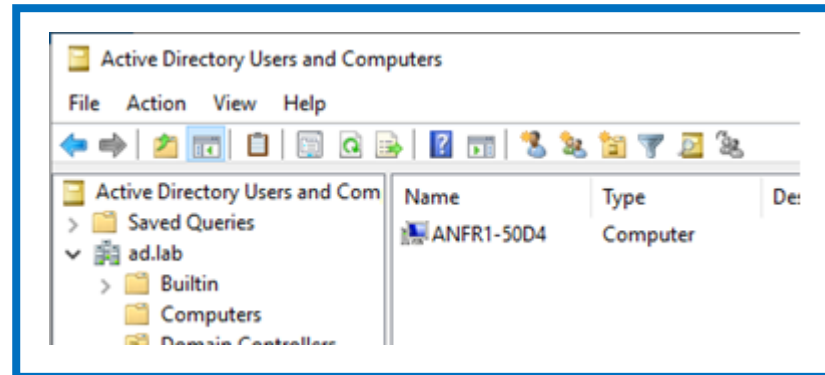
Notifications

More events in the activity log → Dismiss all ▾

✓ Deployment succeeded

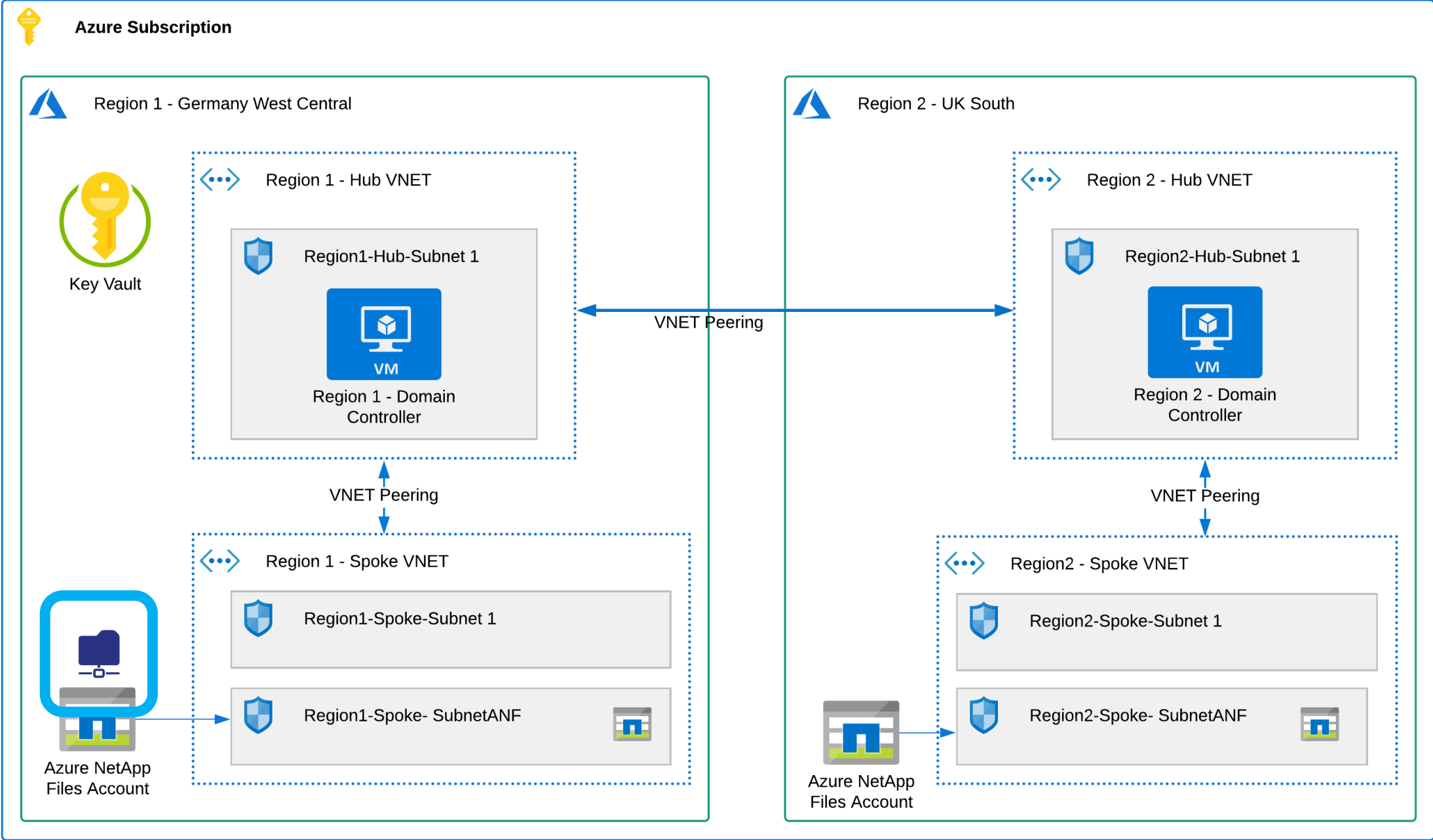
Deployment 'CreateVolume-20210414141526' to resource group 'baselabv2-region1infra' was successful.

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

Microsoft Azure

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

azadmin@lab.jakewalsh....
LAB.JAKEWALSH.CO.UK (LAB.JAK...

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+ 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	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	...

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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

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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

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<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 hour6 hours12 hours1 day7 days

Volume replication lag time

Is volume replication transferring

10min

8.33min

6.67min

5min

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

Healthy : Healthy

Mirror state : Mirrored

Source : profiles

Relationship status : Idle

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

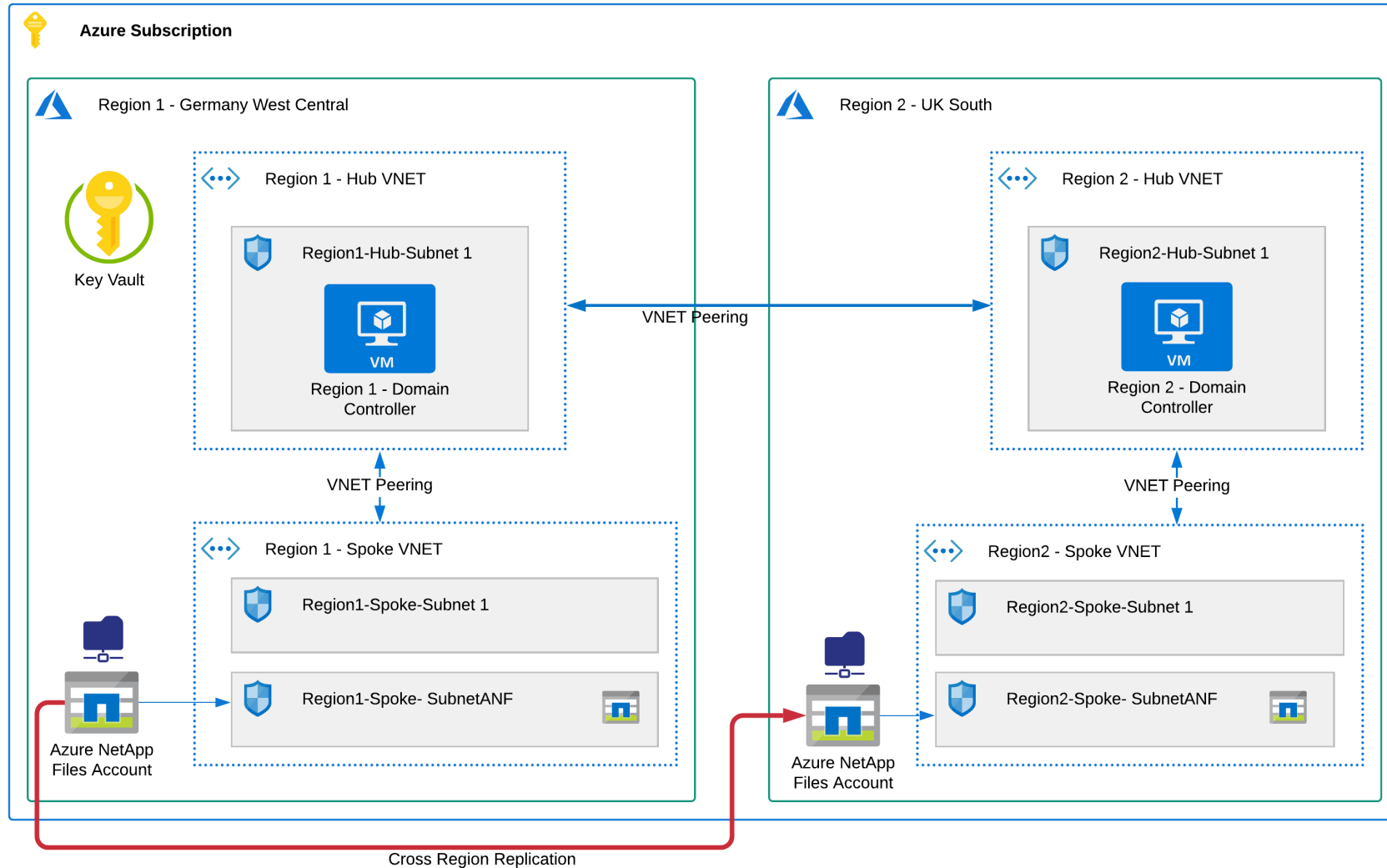
80

70

60

50

What have we configured?

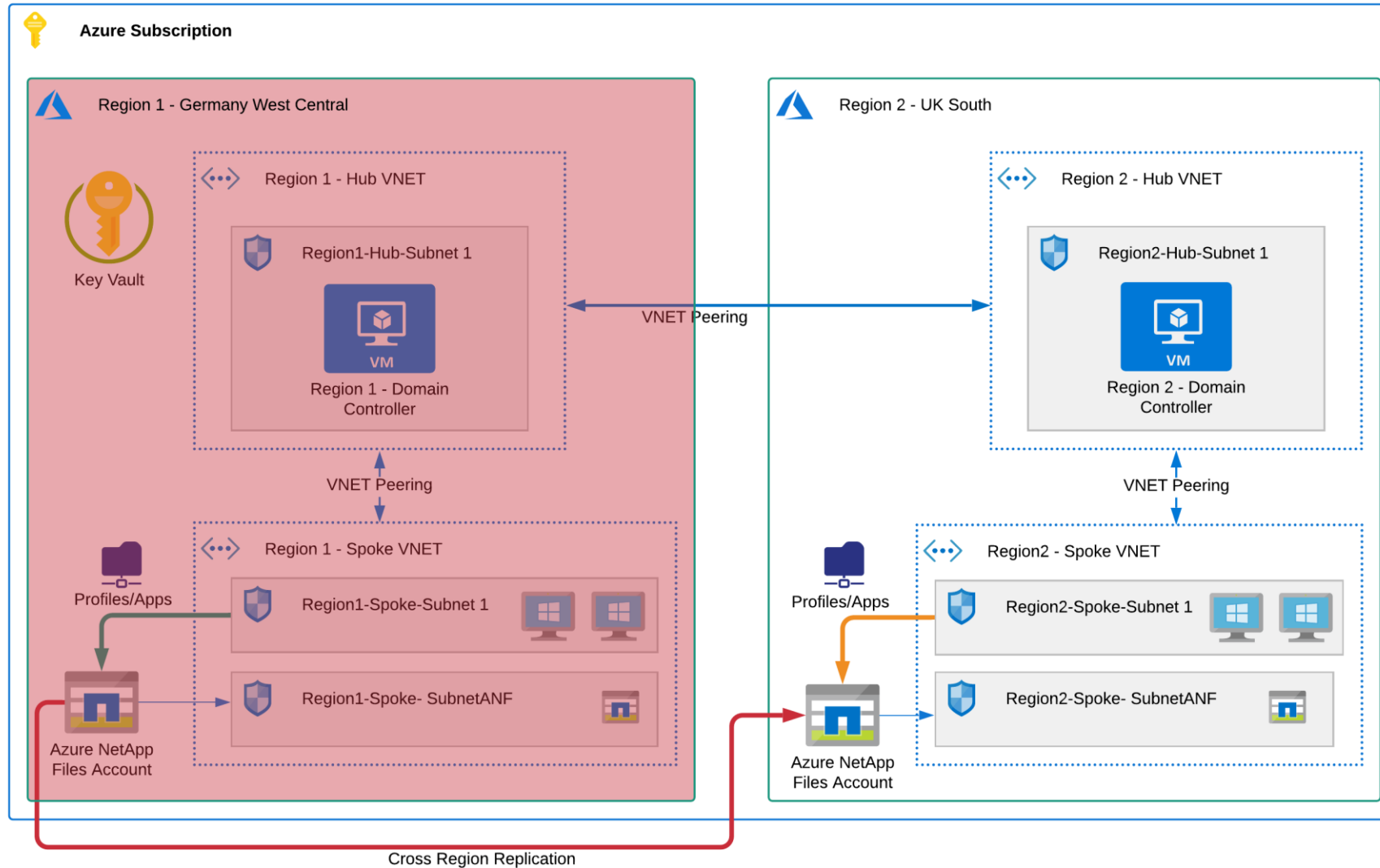


1. Replication between Region 1 and Region 2 now in place.
2. Volume in Region 1 can be used as normal
3. Volume in Region 2 is read only until we fail over

DR Operation



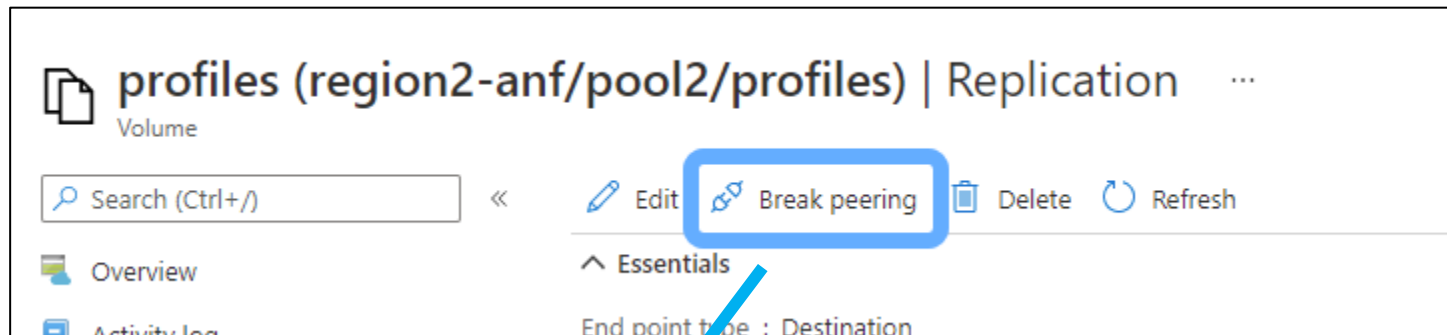
Invoking DR – what if we lose a Region?



Invoking DR – Just 1 Step

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

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

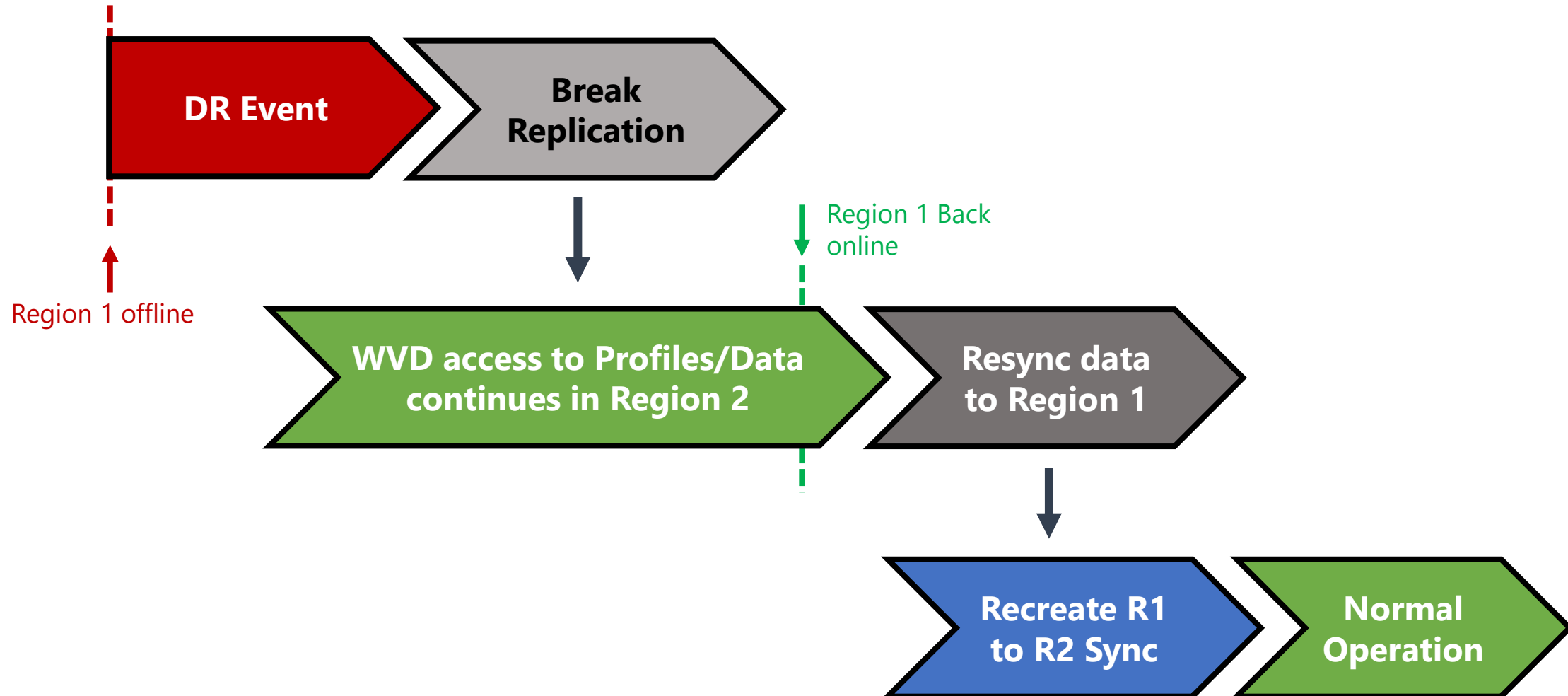


This enables read/write access to the replica Volume!

<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?

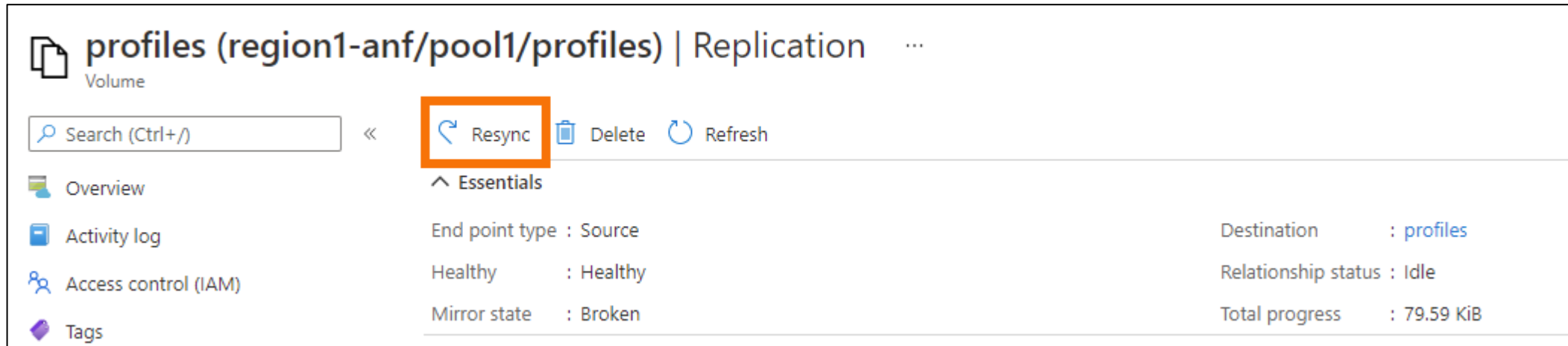
After DR – we need to resync the data back to Region 1, and then set up Replication again



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”

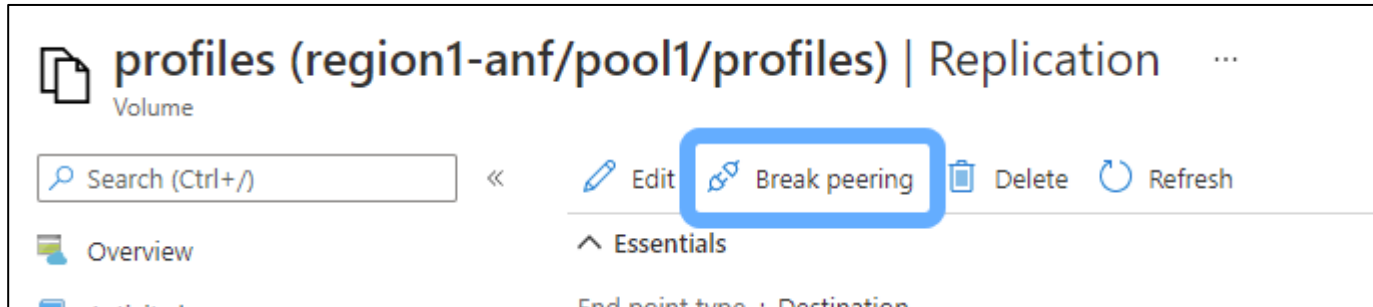


After this the Region 2 data is replicated back to Region 1 – getting us back ready to run from Region 1.

<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' which displays the following information:

Property	Value
End point type	Destination
Healthy	Healthy
Mirror state	Broken

On the right side of the 'Essentials' section, there is a table with the following information:

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

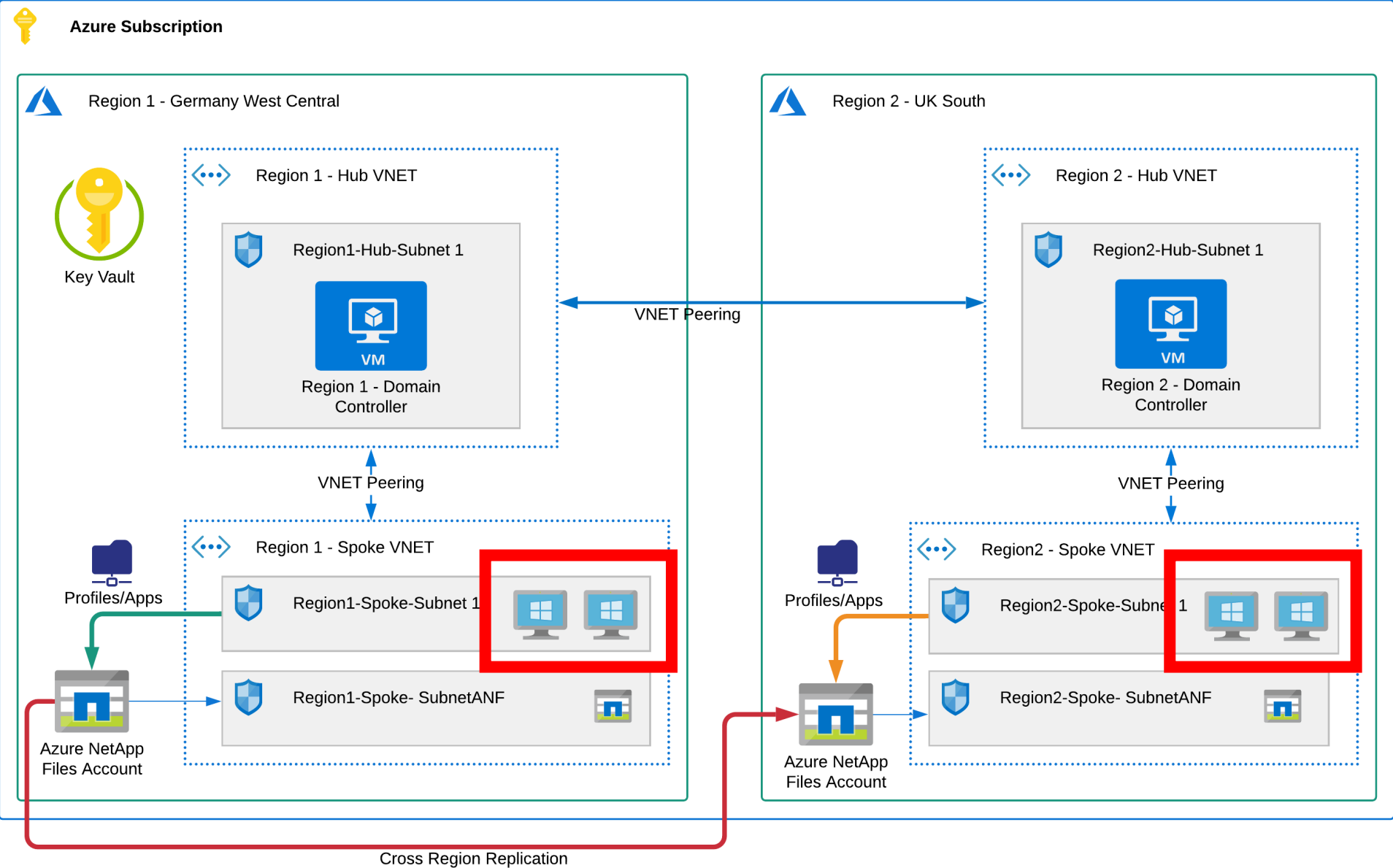
After this the Region 1 data is now being replicated to Region 2 – Normal Operation

<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](https://aka.ms/azurenetaappfiles)
- [CRR Sign up - https://aka.ms/anfcrrpreviewsignup](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

Thank You!

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