SOP-AZ-005_Azure_VHD_Export_Import_v1.0

Standard Operating Procedure: Azure VHD Export and Import

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1.0 Purpose

This procedure documents the process for exporting Virtual Hard Disks (VHDs) from Azure VMs and importing them into different Azure subscriptions or tenants. This enables VM migration, disaster recovery, and infrastructure cloning scenarios.

2.0 Scope

This SOP applies to: - Exporting Azure managed disks to VHD format - Transferring VHDs between Azure storage accounts - Importing VHDs to create new managed disks - Cross-tenant and cross-subscription disk transfers

3.0 Definitions

Term	Definition
Managed Disk	Azure-managed storage disk with automatic replication
VHD	Virtual Hard Disk format used by Azure
Snapshot	Point-in-time copy of a managed disk
SAS URL	Shared Access Signature URL for secure blob access
AzCopy	Microsoft's high-performance Azure storage transfer tool
PageBlob	Azure blob type required for VHD storage

4.0 Roles & Responsibilities

Role	Responsibility
Source Admin	Create snapshots, generate SAS URLs, initiate export
Destination Admin	Prepare storage, receive VHDs, create disks
Security Admin	Approve cross-tenant transfers, manage SAS tokens

Role	Responsibility

5.0 Prerequisites

5.1 Source Environment

- ☐ Azure CLI or PowerShell Az module installed
- ☐ Contributor access to source subscription
- ☐ VM stopped/deallocated for consistent snapshot
- ☐ Sufficient storage quota for snapshots

5.2 Destination Environment

- ☐ Storage account created in target subscription
- ☐ Blob container for VHD import
- ☐ Sufficient storage quota for managed disks

5.3 Tools Required

- ☐ Azure CLI (`az`) or PowerShell Az module
- ☐ AzCopy v10 or later
- ☐ Azure Storage Explorer (optional, for GUI)

6.0 Procedure

Part A: VHD Export (Source Tenant)

6.1 Stop and Deallocate VM

```
# Stop VM to ensure consistent disk state
az vm deallocate \
  --resource-group <SOURCE_RG> \
  --name <VM_NAME>

# Verify VM is deallocated
az vm get-instance-view \
  --resource-group <SOURCE_RG> \
  --name <VM_NAME> \
  --query "instanceView.statuses[?starts_with(code, 'PowerState')].displayStatus" \
  -o tsv
```

Expected output: `VM deallocated`

6.2 Create Snapshot of OS Disk

```
# Get OS disk name
OS_DISK=$(az vm show \
  --resource-group <SOURCE_RG> \
  --name <VM_NAME> \
  --query "storageProfile.osDisk.name" \
  -o tsv)

# Create snapshot
az snapshot create \
  --resource-group <SOURCE_RG> \
```

```
  --name <VM_NAME>-os-snapshot-$(date +%Y%m%d) \
  --source $OS_DISK \
  --sku Standard_LRS
```

6.3 Create Snapshot of Data Disk(s)

```
# List data disks
az vm show \
  --resource-group <SOURCE_RG> \
  --name <VM_NAME> \
  --query "storageProfile.dataDisks[].name" \
  -o tsv

# Create snapshot for each data disk
az snapshot create \
  --resource-group <SOURCE_RG> \
  --name <VM_NAME>-data-snapshot-$(date +%Y%m%d) \
  --source <DATA_DISK_NAME> \
  --sku Standard_LRS
```

6.4 Generate SAS URL for Export

```
# Grant access and get SAS URL (valid for 24 hours)
az snapshot grant-access \
  --resource-group <SOURCE_RG> \
  --name <VM_NAME>-os-snapshot-$(date +%Y%m%d) \
  --duration-in-seconds 86400 \
  --access-level Read \
  --query "accessSas" \
  -o tsv
```

Save this SAS URL - needed for transfer!

Repeat for data disk snapshots.

6.5 Alternative: Export Directly from Managed Disk If you don't want to create snapshots:

```
# Grant access to managed disk directly
az disk grant-access \
  --resource-group <SOURCE_RG> \
  --name <DISK_NAME> \
  --duration-in-seconds 86400 \
  --access-level Read \
  --query "accessSas" \
  -o tsv
```

Note: VM must remain deallocated during export.

Part B: VHD Transfer

6.6 Option 1: Direct Transfer with AzCopy (Recommended) Transfer directly from source to destination storage:

```
# Install AzCopy if not present
# Download from: https://aka.ms/downloadazcopy
```

```
# Transfer VHD
azcopy copy \
  "<SOURCE_SAS_URL>" \
  "https://<DEST_STORAGE>.blob.core.windows.net/<CONTAINER>/os-disk.vhd?<DEST_SAS>" \
  --blob-type PageBlob
```

Important: Use `--blob-type PageBlob` for VHDs!

6.7 Option 2: Download Then Upload If direct transfer isn't possible:

Download to local:

```
azcopy copy "<SOURCE_SAS_URL>" "C:\VHD-Export\os-disk.vhd"
```

Upload to destination:

```
azcopy copy \
  "C:\VHD-Export\os-disk.vhd" \
  "https://<DEST_STORAGE>.blob.core.windows.net/<CONTAINER>/os-disk.vhd?<DEST_SAS>" \
  --blob-type PageBlob
```

6.8 Option 3: Azure Storage Explorer (GUI)

1. Open Azure Storage Explorer
2. Connect to source storage account
3. Navigate to snapshot/disk blob
4. Right-click > Copy
5. Connect to destination storage account
6. Navigate to target container
7. Right-click > Paste

6.9 Monitor Transfer Progress AzCopy shows progress automatically. For large VHDs:

```
# Check transfer status
azcopy jobs list
azcopy jobs show <JOB_ID>
```

Part C: VHD Import (Destination Tenant)

6.10 Prepare Destination Storage Account

```
# Create storage account (if not exists)
az storage account create \
  --name <DEST_STORAGE> \
  --resource-group <DEST_RG> \
  --location <REGION> \
  --sku Standard_LRS

# Create container
az storage container create \
  --account-name <DEST_STORAGE> \
  --name vhd-import \
  --auth-mode login

# Generate SAS token for uploads
az storage container generate-sas \
```

```
  --account-name <DEST_STORAGE> \
  --name vhd-import \
  --permissions racwdl \
  --expiry $(date -u -d "7 days" '+%Y-%m-%dT%H:%MZ') \
  --auth-mode login \
  --as-user \
  -o tsv
```

6.11 Verify VHD Upload

```
# List blobs in container
az storage blob list \
  --account-name <DEST_STORAGE> \
  --container-name vhd-import \
  --output table \
  --auth-mode login

# Check blob properties
az storage blob show \
  --account-name <DEST_STORAGE> \
  --container-name vhd-import \
  --name os-disk.vhd \
  --auth-mode login
```

Verify: - Blob Type: PageBlob - Size matches source

6.12 Create Managed Disk from VHD For OS Disk:

```
# Get VHD URL
VHD_URL=$(az storage blob url \
  --account-name <DEST_STORAGE> \
  --container-name vhd-import \
  --name os-disk.vhd \
  --auth-mode login \
  -o tsv)

# Create OS managed disk
az disk create \
  --resource-group <DEST_RG> \
  --name <NEW_VM>-OS-Disk \
  --location <REGION> \
  --sku Premium_LRS \
  --source "$VHD_URL" \
  --os-type Windows
```

For Data Disk:

```
DATA_VHD_URL=$(az storage blob url \
  --account-name <DEST_STORAGE> \
  --container-name vhd-import \
  --name data-disk.vhd \
  --auth-mode login \
  -o tsv)

az disk create \
  --resource-group <DEST_RG> \
```

```
  --name <NEW_VM>-Data-Disk \
  --location <REGION> \
  --sku Standard_LRS \
  --source "$DATA_VHD_URL"
```

Disk creation time: 10-30 minutes depending on size.

6.13 Verify Disk Creation

```
az disk show \
  --resource-group <DEST_RG> \
  --name <NEW_VM>-OS-Disk \
  --query "{Name:name, State:provisioningState, Size:diskSizeGb}" \
  -o table
```

Expected: `provisioningState: Succeeded`

Part D: Create VM from Imported Disks

6.14 Create Network Resources

```
# Create public IP
az network public-ip create \
  --resource-group <DEST_RG> \
  --name <NEW_VM>-PIP \
  --allocation-method Static

# Create NIC
az network nic create \
  --resource-group <DEST_RG> \
  --name <NEW_VM>-NIC \
  --vnet-name <VNET_NAME> \
  --subnet <SUBNET_NAME> \
  --public-ip-address <NEW_VM>-PIP
```

6.15 Create VM from Disks Azure CLI:

```
OS_DISK_ID=$(az disk show -g <DEST_RG> -n <NEW_VM>-OS-Disk --query id -o tsv)
DATA_DISK_ID=$(az disk show -g <DEST_RG> -n <NEW_VM>-Data-Disk --query id -o tsv)
NIC_ID=$(az network nic show -g <DEST_RG> -n <NEW_VM>-NIC --query id -o tsv)

az vm create \
  --resource-group <DEST_RG> \
  --name <NEW_VM> \
  --attach-os-disk $OS_DISK_ID \
  --attach-data-disks $DATA_DISK_ID \
  --nics $NIC_ID \
  --os-type Windows \
  --size Standard_D2s_v3
```

PowerShell:

```
$osDisk = Get-AzDisk -ResourceGroupName <DEST_RG> -DiskName <NEW_VM>-OS-Disk
$dataDisk = Get-AzDisk -ResourceGroupName <DEST_RG> -DiskName <NEW_VM>-Data-Disk
$nic = Get-AzNetworkInterface -Name <NEW_VM>-NIC -ResourceGroupName <DEST_RG>
```

```
$vmConfig = New-AzVMConfig -VMName <NEW_VM> -VMSize Standard_D2s_v3
$vmConfig = Set-AzVMOSDisk -VM $vmConfig -ManagedDiskId $osDisk.Id -CreateOption Attach -Windows
$vmConfig = Add-AzVMDataDisk -VM $vmConfig -ManagedDiskId $dataDisk.Id -Lun 0 -CreateOption Attach
$vmConfig = Add-AzVMNetworkInterface -VM $vmConfig -Id $nic.Id

New-AzVM -ResourceGroupName <DEST_RG> -Location <REGION> -VM $vmConfig
```

Part E: Cleanup

6.16 Revoke Source Access

```
# Revoke snapshot access
az snapshot revoke-access \
  --resource-group <SOURCE_RG> \
  --name <SNAPSHOT_NAME>

# Or revoke disk access
az disk revoke-access \
  --resource-group <SOURCE_RG> \
  --name <DISK_NAME>
```

6.17 Delete Temporary Resources

```
# Delete snapshots (after confirming VM works)
az snapshot delete \
  --resource-group <SOURCE_RG> \
  --name <SNAPSHOT_NAME>

# Delete VHD blobs from storage (after confirming disks work)
az storage blob delete \
  --account-name <DEST_STORAGE> \
  --container-name vhd-import \
  --name os-disk.vhd \
  --auth-mode login
```

7.0 Verification & Quality Checks

- ☐ Snapshot created successfully (source)
- ☐ SAS URL generated and valid
- ☐ VHD transfer completed (check size matches)
- ☐ VHD uploaded as PageBlob type
- ☐ Managed disk created successfully
- ☐ Disk shows “Succeeded” provisioning state
- ☐ VM created from disk
- ☐ VM boots and is accessible
- ☐ Source access revoked
- ☐ Temporary resources cleaned up

8.0 Troubleshooting

Issue	Resolution
"Blob type mismatch"	Ensure `--blob-type PageBlob` used with AzCopy
SAS URL expired	Regenerate with longer duration
Disk creation stuck	Check blob is fully uploaded, region matches
Transfer slow	Use AzCopy with `--cap-mbps` to throttle, or run from Azure VM
"Disk is not in correct state"	Ensure VM is fully deallocated, not just stopped
Access denied	Verify RBAC permissions, check SAS token permissions
VM won't boot from disk	Check OS type (Windows/Linux) specified correctly

8.1 Common AzCopy Errors

Error	Resolution
`AuthenticationFailed`	Regenerate SAS token, check expiry
`BlobTypeMismatch`	Use `--blob-type PageBlob`
`ServerBusy`	Retry with `--retry-policy exponential`
`Network timeout`	Reduce concurrency with `--cap-mbps 100`

9.0 Related Documents

Document	Description
SOP-AZ-001	Azure VM Administration
SOP-AZ-004	Azure Tenant-to-Tenant VM Migration

9.1 External References

- AzCopy Documentation
- Export Azure Managed Disk
- Create VM from Managed Disk

10.0 Revision History

Version	Date	Author	Change Description
1.0	2026-01-12	OberaConnect	Initial document creation

11.0 Approval

Name	Role	Signature	Date
	Technical Lead Operations Manager		

Appendix A: Quick Reference Commands

Export Snapshot to SAS URL:

```
az snapshot grant-access -g <RG> -n <SNAP> --duration-in-seconds 86400 --access-level Read -o tsv
```

AzCopy Transfer:

```
azcopy copy "<SOURCE_SAS>" "<DEST_URL>?<DEST_SAS>" --blob-type PageBlob
```

Create Disk from VHD:

```
az disk create -g <RG> -n <DISK> --source "<VHD_URL>" --os-type Windows --sku Premium_LRS
```

Create VM from Disk:

```
az vm create -g <RG> -n <VM> --attach-os-disk <DISK_ID> --os-type Windows
```

Appendix B: Estimated Transfer Times

VHD Size	~Transfer Time (100 Mbps)	~Transfer Time (1 Gbps)
30 GB	40 minutes	4 minutes
128 GB	3 hours	17 minutes
512 GB	12 hours	70 minutes
1 TB	24 hours	2.5 hours

Times vary based on network conditions and Azure region proximity