Microsoft

Avere & Qumulo: Configuring SMB Shares

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Introduction

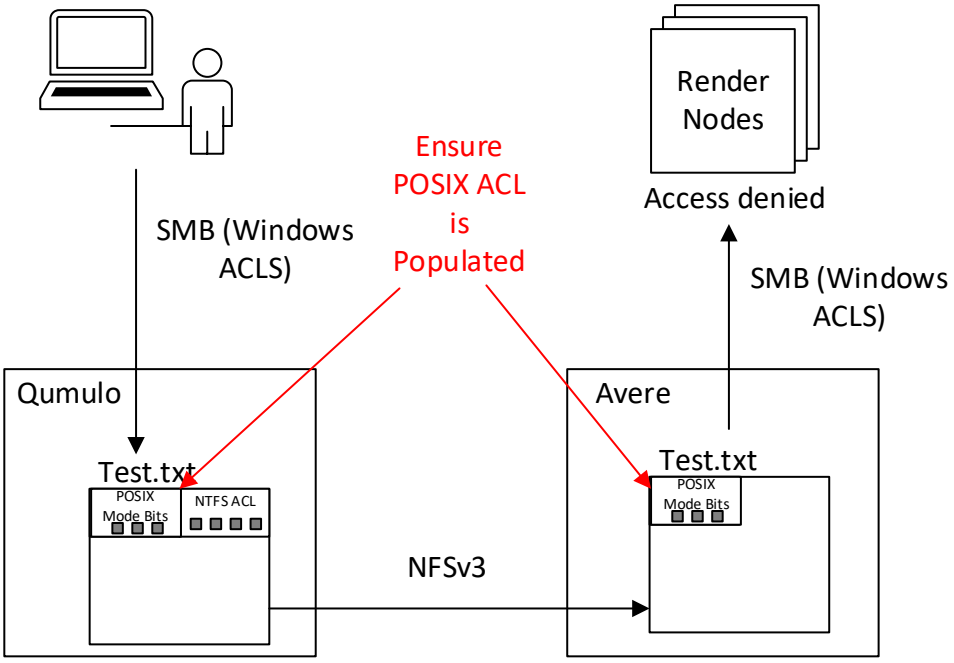
A popular media NAS storage filer for M&E Rendering Studios is the Qumulo file data platform. Artists create media content directly on the Qumulo filer using the NFS or SMB protocols. Content is then rendered on-premises or in the cloud on render nodes.

To help scale to tens of thousands of render nodes Avere Technology can mount a Qumulo to expand throughput and IOPs. The Avere may only mount NFSv3 shares. When the Qumulo only exposes NFSv3 shares the Avere can successfully mount and scale the IOPs and throughput. However, when a mixed mode environment of NFS + SMB is required, the default setup will result in permissions issues.

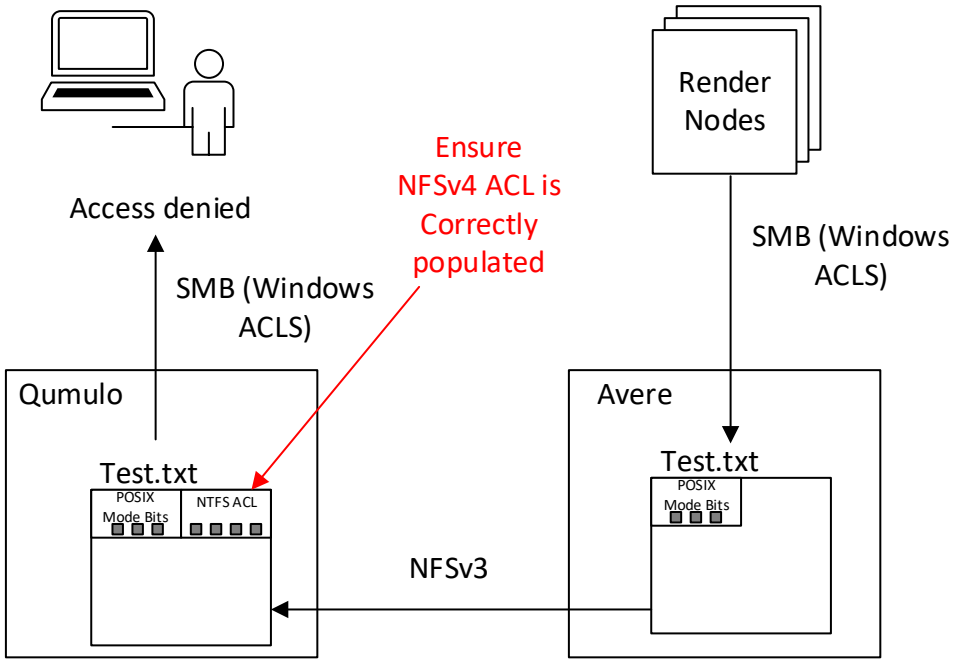
This document describes the steps to correctly setup an Avere and Qumulo in a mixed mode ftwo problems in a mixed mode environment.

ACL Interoperability Problem

Mixed mode environments have been challenging for many decades and is described in the linux nfs wiki [The ACL, 2020]. In summary, we want SMB users to be able to write files from on-premises to be picked up by the render nodes:



In reverse we want the files written from the render nodes to be able to be read by the on-premises workstations as shown in the following diagram.



This next section provides the configure steps required to successfully configure an Avere against a Qumulo.

Configuration

The following are the steps required to configure for the mixed mode environment:

1. Active Directory – Configure Users and Groups
2. Qumulo Active Directory for POSIX attributes
3. Qumulo Share configuration
4. Avere Share Configuration

Step 1: Active Directory – Configure Users and Groups

RFC2307 enables concurrent NFS and SMB access across mixed mode environments. To enable RFC2307, configure gidNumber and uidNumber according to the Avere Active Directory Administrator Guide to Avere FXT Deployment.

Step 2: Qumulo Active Directory for POSIX attributes

Once the active directory accounts have been enabled, you need to enable AD for POSIX attributes per the following article from Qumulo https://care.qumulo.com/hc/en-us/articles/115008011927-Use-Active-Directory-for-POSIX-attributes.

Step 3: Qumulo Share Configuration

Once you have created a folder on the Qumulo and configured with NFS and SMB, ensure the following configuration items are set:

1. POSIX mode bit masks. Setup 770 file and directory masks. An example command for doing this is the following:

```
qq smb_mod_share --name users --fs-path /users --default-file-create-
mode 770 --default-directory-create-mode 770
```

2. NTFS inherited permissions. At the base of the share add file and directory inheritance for all AD users and groups that need to access the share. (Ensure the all users and groups added have UID / GID added in previous steps)

Step 4: Avere Share Configuration

The Avere needs to be configured with CIFS enabled and configure each CIFS share with no ACES and an octal value of 0770 for the create and directory masks.

Here is an example configuration to use for the Avere Terraform Provider corefiler block:

```
core_filer {
    ...
    cifs_share_name = "exampleshare"
    # remove all aces
    cifs_share_ace = ""
    cifs_create_mask = "0770"
    cifs_dir_mask = "0770"
    ...
}
```

Testing and Troubleshooting

Once you have configured the share on both the Qumulo and the Avere vFXT test creating, writing, and removing files both in the cloud and on-premises. Below are the end to end debugging steps to confirm your installation.

1. **Mount Qumulo SMB** - Mount the Qumulo share and write a file "test.txt"

2. **Mount Qumulo NFS** – mount the nfs share, and run "ls -l" to confirm the user and group ids are expected and the mode bits set to 770

3. **Mount Avere SMB** – if #3 is successful, mount to SMB share on Avere, and write a file "test2.txt". Verify you can read "test.txt" and create a directory. If you experience trouble with user / group file retrieval on Avere, you can upload manually using the following two steps:
    a. Run the following powershell script against your Active Directory service using the integer offset with: https://github.com/Azure/Avere/blob/main/src/terraform/examples/houdinienvironment/Get-AvereFlatFilesRFC2307.ps1. This will generate a user and group file with the correct mappings using uidNumber and gidNumber.

    b. Store the user and group file on a web server that is reachable by the Avere. Next provide the two URLs of the user and group file to Avere Directory services. Alternatively, specify the two files to the Avere Terraform provider as shown in the following example: https://github.com/Azure/Avere/blob/main/src/terraform/examples/houdinienvironment/3.cache/main.tf#L66-L67.

4. **Mount Avere NFS** – run "ls -l" and verify test2.txt has the permissions 770, and the new directory has 770

5. **Test new files and directory from Qumulo Mounts** – confirm you can read "test2.txt" from the direct qumulo mounts, and browse to the directory.

References

Avere. Active Directory Administrator Guide to Avere FXT Deployment. 2014-07-16

Avere. Cluster->Directory Services. 2020

Qumulo. Use Active Directory for POSIX attributes. 2020

Qumulo. File Permissions Overview. 2020

Terraform avere_vfxt Provider junction CIFS configuration. 2020The ACL Interoperability Problem. 2020