Automated NetApp FSx ONTAP Setup with Ansible.

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This document guides you through the process of automating the creation of an FSx for NetApp ONTAP file system in AWS using Ansible. i'll cover everything from installing Ansible to creating the SVM and volume. This project was undertaken as a self-initiated effort to deepen my understanding of NetApp's cloud storage solutions and to demonstrate my enthusiasm for the company's innovation in automation and DevOps.

1. Prerequisites

Before we begin, ensure to have the following:

- **AWS Account:** An active AWS account with appropriate permissions to create FSx file systems, VPCs, subnets, and security groups.
- **AWS Credentials:** Configure your AWS credentials either through environment variables (`AWS_ACCESS_KEY_ID`, `AWS_SECRET_ACCESS_KEY`) or an AWS credentials file (`~/.aws/credentials`). The AWS CLI should be configured and working.
- **Python and pip:** Python and its package manager, pip, are required for Ansible.
- **Ansible:** Ansible will be used to automate the FSx creation.

2. Installing Ansible

If you don't have Ansible installed, follow these steps:

```
# For Debian/Ubuntu systems:
sudo apt update
sudo apt install ansible

# For macOS (using Homebrew):
brew install ansible

# For other distributions, refer to the Ansible documentation:
# https://docs.ansible.com/ansible/latest/installation_guide/intro_installation.html
```

Verify the installation:

```
ansible --version
```

3. Installing the AWS Collection for Ansible

Ansible interacts with AWS services through collections. Install the `amazon.aws` collection:

ansible-galaxy collection install amazon.aws

4. Creating the Ansible Playbook

Create a file named **createfsx.yaml** (or any name you prefer with a **.yaml** extension) and paste the following code into it:

```
---
- name: Create FSx for NetApp ONTAP with AWS CLI
  hosts: localhost
  gather_facts: yes
  tasks:


    - name: Get Default VPC
      amazon.aws.ec2_vpc_net_info:
        filters:
          is-default: true
      register: default_vpc


    - name: Get Default Subnet
      amazon.aws.ec2_vpc_subnet_info:
        filters:
          vpc-id: "{{ default_vpc.vpcs[0].vpc_id }}"
      register: default_subnet


    - name: Create or Get Security Group
```

```
    amazon.aws.ec2_security_group:
      name: "fsx-sg-ansible"
      description: "FSx Security Group"
      vpc_id: "{{ default_vpc.vpcs[0].vpc_id }}"
      rules:
        - proto: tcp
          from_port: 2049
          to_port: 2049
          group_id: "sg-0dc01264c3568dd53"
        - proto: tcp
          from_port: 445
          to_port: 445
          group_id: "sg-0dc01264c3568dd53"
        - proto: tcp
          from_port: 111
          to_port: 111
          group_id: "sg-0dc01264c3568dd53"
      rules_egress:
        - proto: "-1"
          cidr_ip: "0.0.0.0/0"
      state: present
    register: fsx_sg
```

```
  - name: Create FSx for NetApp ONTAP Using AWS CLI

    ansible.builtin.command: >-

      aws fsx create-file-system

      --region us-east-1

      --file-system-type ONTAP

      --storage-capacity 1024

      --subnet-ids {{ default_subnet.subnets[0].subnet_id }}

      --security-group-ids {{ fsx_sg.group_id }}

      --storage-type SSD

      --tags Key=Name,Value=fsx-ansible

      --ontap-configuration '{"DeploymentType":
"SINGLE_AZ_1","ThroughputCapacity": 512,"AutomaticBackupRetentionDays":
7,"DailyAutomaticBackupStartTime": "02:00","DiskIopsConfiguration":
{"Mode": "AUTOMATIC"}}'

    register: fsx_creation_result



  - name: Extract FSx FileSystem ID

    set_fact:

      fsx_id: "{{ fsx_creation_result.stdout |
regex_search('\"FileSystemId\": \"(fs-[a-z0-9]+)\"', '\\1') | first }}"



  - name: Wait for FSx to become available

    ansible.builtin.command: >

      aws fsx describe-file-systems --file-system-ids {{ fsx_id }}
--query 'FileSystems[0].Lifecycle'
```

```
    register: fsx_status
    until: fsx_status.stdout.find("AVAILABLE") != -1
    retries: 20
    delay: 60

  - name: Create Storage Virtual Machine (SVM)
    ansible.builtin.command: >
      aws fsx create-storage-virtual-machine
      --region us-east-1
      --file-system-id {{ fsx_id }}
      --name svm_default
      --root-volume-security-style UNIX
    register: svm_creation

  - name: Extract SVM ID
    set_fact:
      svm_id: "{{ svm_creation.stdout |
regex_search('\"StorageVirtualMachineId\": \"(svm-[a-z0-9]+)\"', '\\1') |
first }}"

  - name: Create Volume with Storage Efficiency and SnapLock (Fixed)
    ansible.builtin.command: >-
      aws fsx create-volume
      --region us-east-1
```

```
      --name vol1

      --volume-type ONTAP

      --ontap-configuration '{"StorageVirtualMachineId": "{{ svm_id
}}","JunctionPath": "/vol1","SizeInMegabytes": 500,"SnapshotPolicy":
"default","StorageEfficiencyEnabled": true,"OntapVolumeType": "RW"}'

    register: fsx_volume
```

5. Running the Playbook

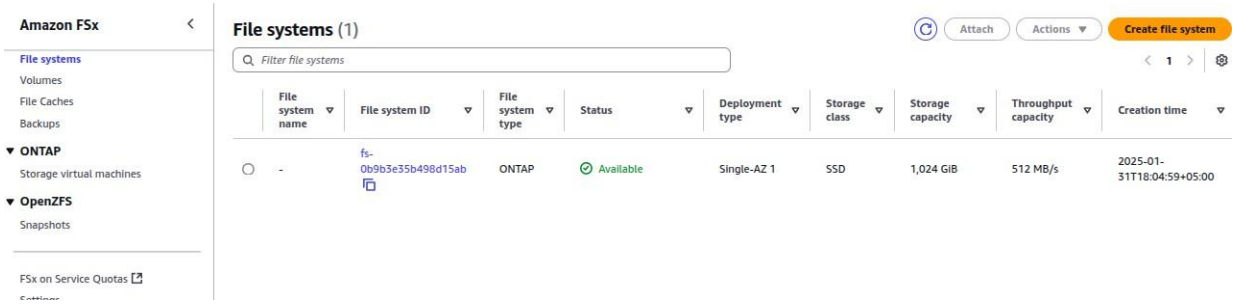
Navigate to the directory where you saved **createfsx.yaml** and run the playbook:

ansible-playbook createfsx.yaml

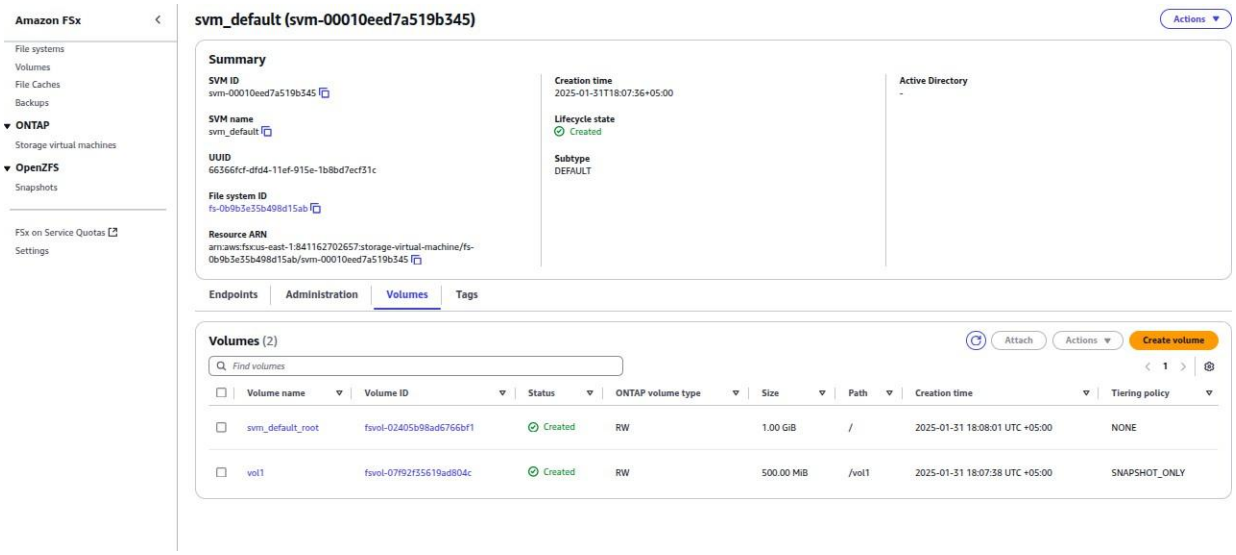
7. Verification

After the playbook completes successfully, you can verify the FSx file system creation in the AWS Management Console under the FSx service. You should see your file system, SVM, and volume listed.

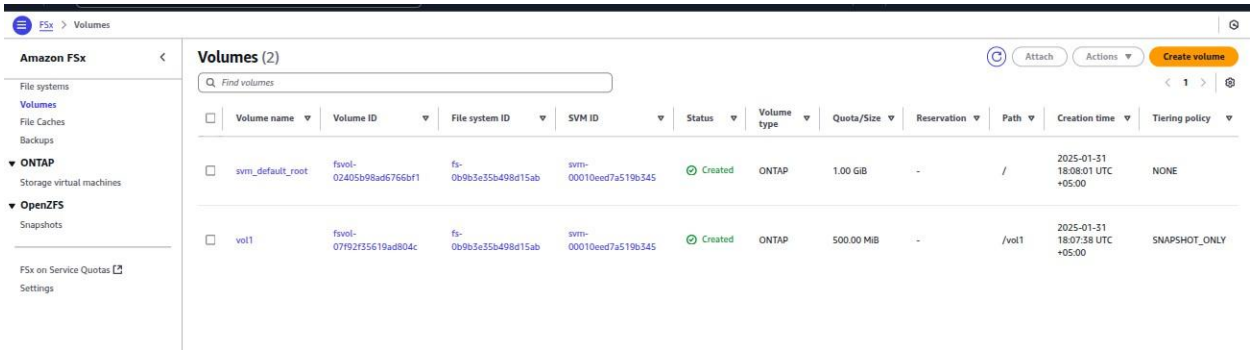
FSx File systems



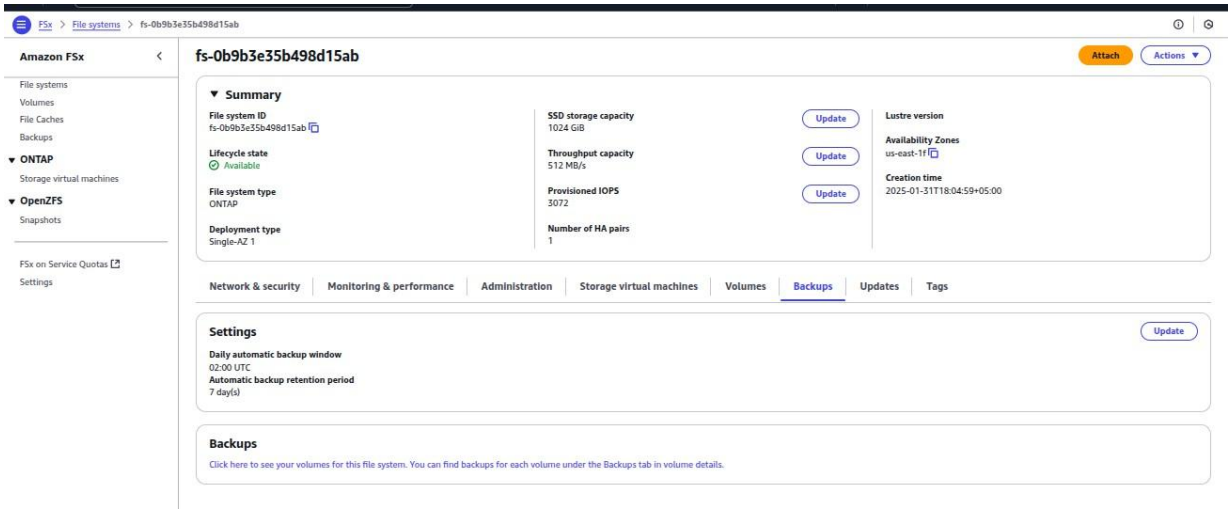
SVM



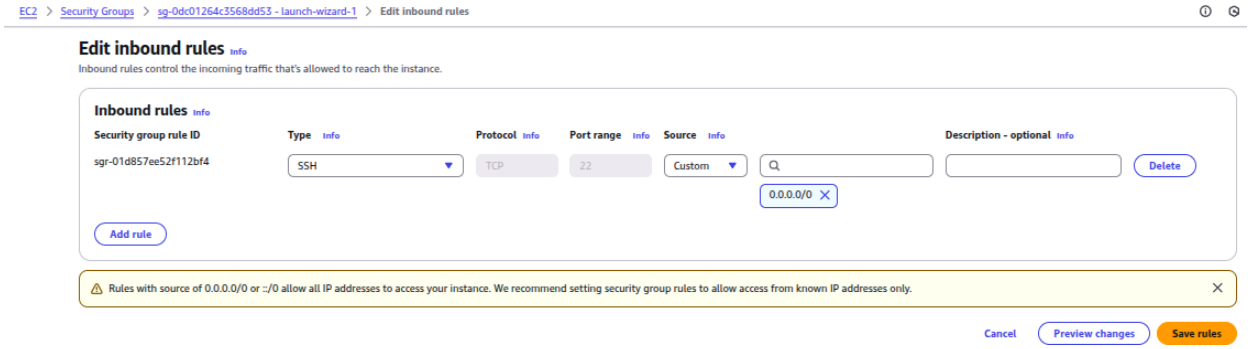
Volumes



Backup



Ec2 security group for mounting the vol1 volume



Access volume vol1

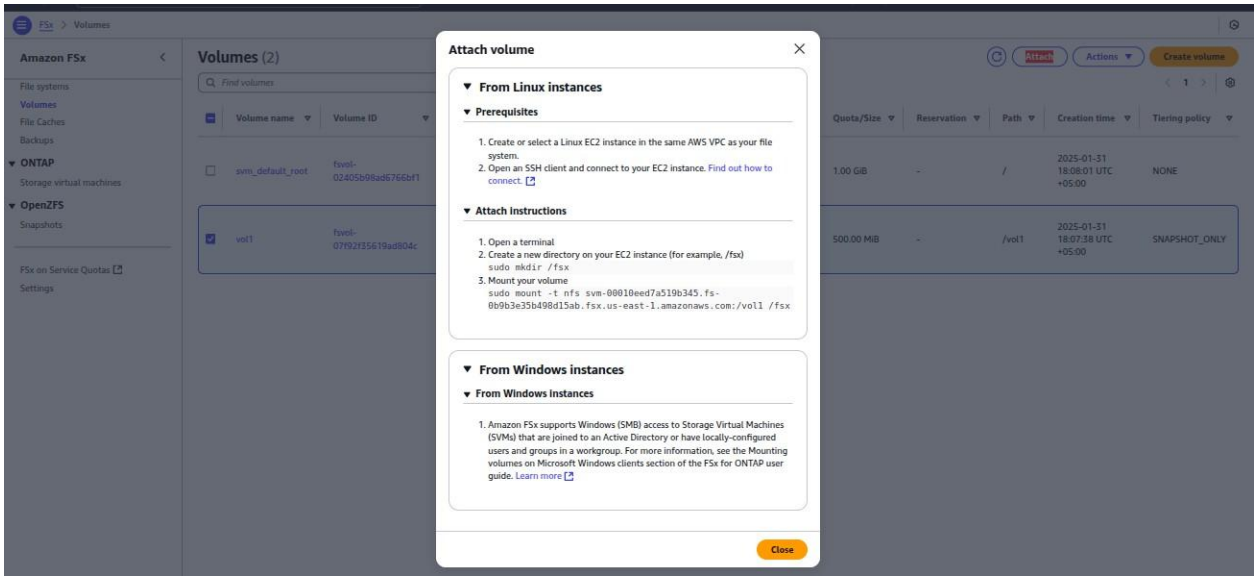
From Linux instances
Prerequisites

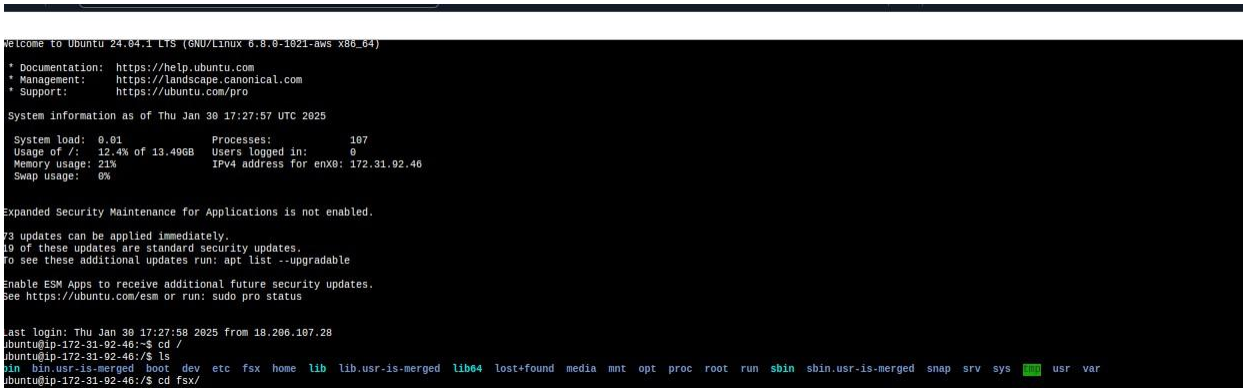
1. Create or Select a Linux EC2 instance in the same AWS VPC as the file system.
2. Open an SSH client and connect to the EC2 instance.

Note: Run the following command
sudo apt update && sudo apt install -y nfs-common

Attach instructions

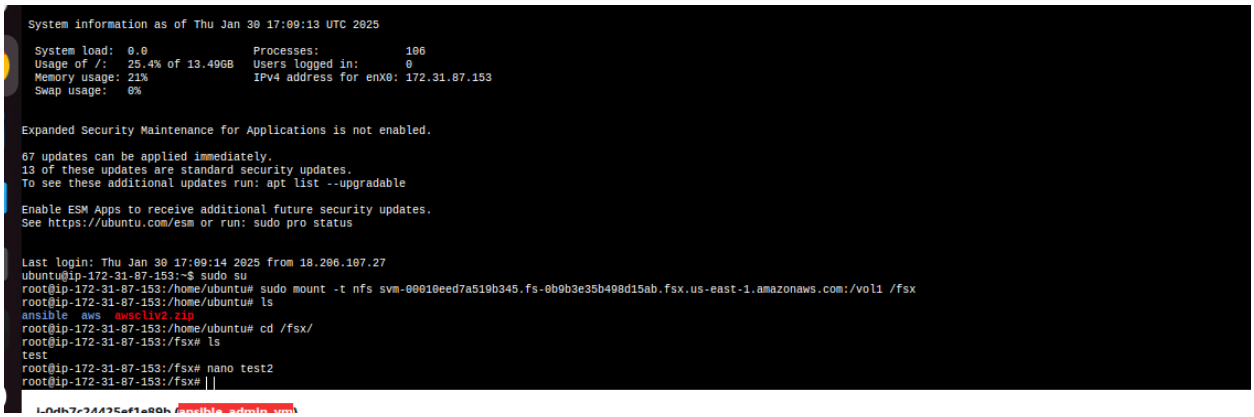
1. Open a terminal
2. Create a new directory on your EC2 instance (for example, /fsx)
3. `sudo mkdir /fsx`
4. Mount your volume
5. `sudo mount -t nfs svm-00010eed7a519b345.fs-0b9b3e35b498d15ab.fsx.us-east-1.amazonaws.com:/vol1 /fsx`





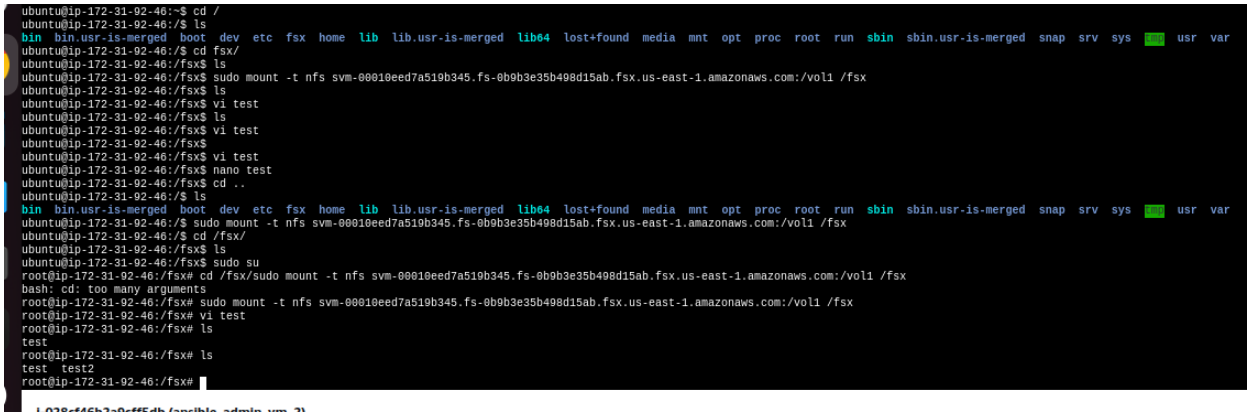
Ansible_admin_vm

We create test2 file in Ansible_admin_vm ec2 ubuntu vm



Ansible_admin_vm_2

We can see the test file in ec2



This document provides a complete guide to creating an FSx for NetApp ONTAP file system using Ansible.

Special Thanks

I would like to express my sincere gratitude to HR manager, Camille and the HR team at NetApp for this exciting opportunity. I truly appreciate the time and consideration given to my application and the chance to engage with NetApp's innovative cloud and automation solutions. This process has only strengthened my enthusiasm for the company, and I look forward to the next steps in the interview journey.