Cloud Volumes Automation via Terraform

NetApp Solutions

NetApp
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Cloud Volumes Automation via Terraform

This solution documents the automated deployments of Cloud Volumes on AWS (CVO Single Node, CVO HA and FSX ONTAP) and Azure (CVO Single Node, CVO HA and ANF) using Terraform modules. The code can be found at https://github.com/NetApp/na_cloud_volumes_automation

Pre-requisites

1. Terraform >= 0.13
2. Cloud Manager Account
3. Cloud Provider Account – AWS, Azure
4. Host machine (any OS supported by Terraform)

Provider documentation

The documentation of Terraform provider for Cloud Manager is available at: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Controlling the provider version

Note that you can also control the provider version. This is controlled by a required_providers block in your Terraform configuration.

The syntax is as follows:

```
terraform {
  required_providers {
    netapp-cloudmanager = {
      source = "NetApp/netapp-cloudmanager"
      version = "20.10.0"
    }
  }
}
```

Read more on provider version control.

Running Specific Modules

AWS

CVO Single Node Deployment

Terraform configuration files for deployment of NetApp CVO (Single Node Instance) on AWS

This section contains various Terraform configuration files to deploy/configure single node NetApp CVO (Cloud Volumes ONTAP) on AWS (Amazon Web Services).

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation/
```

c. Configure AWS credentials from the CLI.

```
    aws configure
```

- AWS Access Key ID [None]: accesskey
- AWS Secret Access Key [None]: secretkey
- Default region name [None]: us-west-2
- Default output format [None]: json

d. Update the variable values in `vars/aws_cvo_single_node_deployment.tfvar`

> You can choose to deploy the connector by setting the variable "aws_connector_deploy_bool" value to true/false.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.aws_sn" -var
-file="vars/aws_cvo_single_node_deployment.tfvars"
```

h. Run the deployment

```
    terraform apply -target="module.aws_sn" -var
-file="vars/aws_cvo_single_node_deployment.tfvars"
```

To delete the deployment

```
    terraform destroy
```

Recipies:

`Connector`

Terraform variables for NetApp AWS connector instance for CVO deployment.

Name	Type	Description
aws_connector_deploy_bool	Bool	(Required) Check for Connector deployment.
aws_connector_name	String	(Required) The name of the Cloud Manager Connector.
aws_connector_region	String	(Required) The region where the Cloud Manager Connector will be created.
aws_connector_key_name	String	(Required) The name of the key pair to use for the Connector instance.
aws_connector_company	String	(Required) The name of the company of the user.
aws_connector_instance_type	String	(Required) The type of instance (for example, t3.xlarge). At least 4 CPU and 16 GB of memory are required.
aws_connector_subnet_id	String	(Required) The ID of the subnet for the instance.
aws_connector_security_group_id	String	(Required) The ID of the security group for the instance, multiple security groups can be provided separated by ','.
aws_connector_iam_instance_profile_name	String	(Required) The name of the instance profile for the Connector.

Name	Type	Description
aws_connector_account_id	String	(Optional) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.
aws_connector_public_ip_bool	Bool	(Optional) Indicates whether to associate a public IP address to the instance. If not provided, the association will be done based on the subnet's configuration.

`Single Node Instance`

Terraform variables for single NetApp CVO instance.

Name	Type	Description
cvo_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.
cvo_region	String	(Required) The region where the working environment will be created.
cvo_subnet_id	String	(Required) The subnet id where the working environment will be created.
cvo_vpc_id	String	(Optional) The VPC ID where the working environment will be created. If this argument isn't provided, the VPC will be calculated by using the provided subnet ID.
cvo_svm_password	String	(Required) The admin password for Cloud Volumes ONTAP.
cvo_writing_speed_state	String	(Optional) The write speed setting for Cloud Volumes ONTAP: ['NORMAL','HIGH']. The default is 'NORMAL'.

CVO HA Deployment

Terraform configuration files for deployment of NetApp CVO (HA Pair) on AWS

This section contains various Terraform configuration files to deploy/configure NetApp CVO (Cloud Volumes ONTAP) in high availability pair on AWS (Amazon Web Services).

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
cd na_cloud_volumes_automation/
```

c. Configure AWS credentials from the CLI.

```
aws configure
```

- AWS Access Key ID [None]: accesskey
- AWS Secret Access Key [None]: secretkey
- Default region name [None]: us-west-2
- Default output format [None]: json

d. Update the variable values in `vars/aws_cvo_ha_deployment.tfvars`.

> You can choose to deploy the connector by setting the variable "aws_connector_deploy_bool" value to true/false.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
terraform init
```

f. Verify the terraform files using terraform validate command.

```
terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
terraform plan -target="module.aws_ha" -var
-file="vars/aws_cvo_ha_deployment.tfvars"
```

h. Run the deployment

```
terraform apply -target="module.aws_ha" -var
-file="vars/aws_cvo_ha_deployment.tfvars"
```

To delete the deployment

```
terraform destroy
```

Recipies:

`Connector`

Terraform variables for NetApp AWS connector instance for CVO deployment.

Name	Type	Description
aws_connector_deploy_bool	Bool	(Required) Check for Connector deployment.
aws_connector_name	String	(Required) The name of the Cloud Manager Connector.
aws_connector_region	String	(Required) The region where the Cloud Manager Connector will be created.
aws_connector_key_name	String	(Required) The name of the key pair to use for the Connector instance.
aws_connector_company	String	(Required) The name of the company of the user.
aws_connector_instance_type	String	(Required) The type of instance (for example, t3.xlarge). At least 4 CPU and 16 GB of memory are required.
aws_connector_subnet_id	String	(Required) The ID of the subnet for the instance.
aws_connector_security_group_id	String	(Required) The ID of the security group for the instance, multiple security groups can be provided separated by ','.
aws_connector_iam_instance_profile_name	String	(Required) The name of the instance profile for the Connector.
aws_connector_account_id	String	(Optional) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.
aws_connector_public_ip_bool	Bool	(Optional) Indicates whether to associate a public IP address to the instance. If not provided, the association will be done based on the subnet's configuration.

`HA Pair`

Terraform variables for NetApp CVO instances in HA Pair.

Name	Type	Description
cvo_is_ha	Bool	(Optional) Indicate whether the working environment is an HA pair or not [true, false]. The default is false.
cvo_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.
cvo_region	String	(Required) The region where the working environment will be created.

Name	Type	Description
cvo_node1_subnet_id	String	(Required) The subnet id where the first node will be created.
cvo_node2_subnet_id	String	(Required) The subnet id where the second node will be created.
cvo_vpc_id	String	(Optional) The VPC ID where the working environment will be created. If this argument isn't provided, the VPC will be calculated by using the provided subnet ID.
cvo_svm_password	String	(Required) The admin password for Cloud Volumes ONTAP.
cvo_failover_mode	String	(Optional) For HA, the failover mode for the HA pair: ['PrivateIP', 'FloatingIP']. 'PrivateIP' is for a single availability zone and 'FloatingIP' is for multiple availability zones.
cvo_mediator_subnet_id	String	(Optional) For HA, the subnet ID of the mediator.
cvo_mediator_key_pair_name	String	(Optional) For HA, the key pair name for the mediator instance.
cvo_cluster_floating_ip	String	(Optional) For HA FloatingIP, the cluster management floating IP address.
cvo_data_floating_ip	String	(Optional) For HA FloatingIP, the data floating IP address.
cvo_data_floating_ip2	String	(Optional) For HA FloatingIP, the data floating IP address.
cvo_svm_floating_ip	String	(Optional) For HA FloatingIP, the SVM management floating IP address.
cvo_route_table_ids	List	(Optional) For HA FloatingIP, the list of route table IDs that will be updated with the floating IPs.

FSx Deployment

Terraform configuration files for deployment of NetApp ONTAP FSx on AWS

This section contains various Terraform configuration files to deploy/configure NetApp ONTAP FSx on AWS (Amazon Web Services).

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
cd na_cloud_volumes_automation/
```

c. Configure AWS credentials from the CLI.

```
aws configure
```

- AWS Access Key ID [None]: accesskey
- AWS Secret Access Key [None]: secretkey
- Default region name [None]: us-west-2
- Default output format [None]:

d. Update the variable values in `vars/aws_fsx_deployment.tfvars`

> You can choose to deploy the connector by setting the variable "aws_connector_deploy_bool" value to true/false.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
terraform init
```

f. Verify the terraform files using terraform validate command.

```
terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
terraform plan -target="module.aws_fsx" -var
-file="vars/aws_fsx_deployment.tfvars"
```

h. Run the deployment

```
terraform apply -target="module.aws_fsx" -var
-file="vars/aws_fsx_deployment.tfvars"
```

To delete the deployment

```
terraform destroy
```

Recipes:

`Connector`

Terraform variables for NetApp AWS connector instance.

Name	Type	Description
aws_connector_deploy_bool	Bool	(Required) Check for Connector deployment.
aws_connector_name	String	(Required) The name of the Cloud Manager Connector.
aws_connector_region	String	(Required) The region where the Cloud Manager Connector will be created.
aws_connector_key_name	String	(Required) The name of the key pair to use for the Connector instance.
aws_connector_company	String	(Required) The name of the company of the user.
aws_connector_instance_type	String	(Required) The type of instance (for example, t3.xlarge). At least 4 CPU and 16 GB of memory are required.
aws_connector_subnet_id	String	(Required) The ID of the subnet for the instance.
aws_connector_security_group_id	String	(Required) The ID of the security group for the instance, multiple security groups can be provided separated by ','.
aws_connector_iam_instance_profile_name	String	(Required) The name of the instance profile for the Connector.
aws_connector_account_id	String	(Optional) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.
aws_connector_public_ip_bool	Bool	(Optional) Indicates whether to associate a public IP address to the instance. If not provided, the association will be done based on the subnet's configuration.

`FSx Instance`

Terraform variables for NetApp ONTAP FSx instance.

Name	Type	Description
fsx_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.
fsx_region	String	(Required) The region where the working environment will be created.
fsx_primary_subnet_id	String	(Required) The primary subnet id where the working environment will be created.

Name	Type	Description
fsx_secondary_subnet_id	String	(Required) The secondary subnet id where the working environment will be created.
fsx_account_id	String	(Required) The NetApp account ID that the FSx instance will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.
fsx_workspace_id	String	(Required) The ID of the Cloud Manager workspace of working environment.
fsx_admin_password	String	(Required) The admin password for Cloud Volumes ONTAP.
fsx_throughput_capacity	String	(Optional) capacity of the throughput.
fsx_storage_capacity_size	String	(Optional) EBS volume size for the first data aggregate. For GB, the unit can be: [100 or 500]. For TB, the unit can be: [1,2,4,8,16]. The default is '1'
fsx_storage_capacity_size_unit	String	(Optional) ['GB' or 'TB']. The default is 'TB'.
fsx_cloudmanager_aws_credential_name	String	(Required) The name of the AWS Credentials account name.

Azure

ANF

Terraform configuration files for deployment of ANF Volume on Azure

This section contains various Terraform configuration files to deploy/configure ANF (Azure Netapp Files) Volume on Azure.

Terraform Documentation: https://registry.terraform.io/providers/hashicorp/azurerm/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation
```

c. Login to your Azure CLI (Azure CLI must be installed).

```
    az login
```

d. Update the variable values in `vars/azure_anf.tfvars`.

> You can choose to deploy the ANF volume using an existing vnet and subnet by setting the variable "vnet_creation_bool" and "subnet_creation_bool" value to false and supplying the "subnet_id_for_anf_vol". You can also set those values to true and create a new vnet and subnet in which case, the subnet ID will automatically be taken from the newly created subnet.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.anf" -var
-file="vars/azure_anf.tfvars"
```

h. Run the deployment

```
    terraform apply -target="module.anf" -var
-file="vars/azure_anf.tfvars"
```

To delete the deployment

```
  terraform destroy
```

Recipies:

`Single Node Instance`

Terraform variables for single NetApp ANF Volume.

Name	Type	Description
az_location	String	(Required) Specifies the supported Azure location where the resource exists. Changing this forces a new resource to be created.
az_prefix	String	(Required) The name of the resource group where the NetApp Volume should be created. Changing this forces a new resource to be created.
az_vnet_address_space	String	(Required) The address space to be used by the newly created vnet for ANF volume deployment.
az_subnet_address_prefix	String	(Required) The subnet address prefix to be used by the newly created vnet for ANF volume deployment.
az_volume_path	String	(Required) A unique file path for the volume. Used when creating mount targets. Changing this forces a new resource to be created.
az_capacity_pool_size	Integer	(Required) Capacity Pool Size mentioned in TB.
az_vnet_creation_bool	Boolean	(Required) Set this boolean to `true` if you want to create a new vnet. Set it to `false` to use an existing vnet.
az_subnet_creation_bool	Boolean	(Required) Set this boolean to `true` to create a new subnet. Set it to `false` to use an existing subnet.
az_subnet_id_for_anf_vol	String	(Required) Mention the subnet id in case you decide to use an existing subnet by setting `subnet_creation_bool` to true. If set to false, leave it at the default value.
az_netapp_pool_service_level	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.

Name	Type	Description
az_netapp_vol_service_level	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_protocol	String	(Optional) The target volume protocol expressed as a list. Supported single value include `CIFS`, `NFSv3`, or `NFSv4.1`. If argument is not defined it will default to `NFSv3`. Changing this forces a new resource to be created and data will be lost.
az_netapp_vol_security_style	String	(Optional) Volume security style, accepted values are `Unix` or `Ntfs`. If not provided, single-protocol volume is created defaulting to `Unix` if it is `NFSv3` or `NFSv4.1` volume, if `CIFS`, it will default to `Ntfs`. In a dual-protocol volume, if not provided, its value will be `Ntfs`.
az_netapp_vol_storage_quota	String	(Required) The maximum Storage Quota allowed for a file system in Gigabytes.

ANF Data Protection

Terraform configuration files for deployment of ANF Volume with Data Protection on Azure

This section contains various Terraform configuration files to deploy/configure ANF (Azure Netapp Files) Volume with Data Protection on Azure.

Terraform Documentation: https://registry.terraform.io/providers/hashicorp/azurerm/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation
```

c. Login to your Azure CLI (Azure CLI must be installed).

```
    az login
```

d. Update the variable values in `vars/azure_anf_data_protection.tfvars`.

> You can choose to deploy the ANF volume using an existing vnet and subnet by setting the variable "vnet_creation_bool" and "subnet_creation_bool" value to false and supplying the "subnet_id_for_anf_vol". You can also set those values to true and create a new vnet and subnet in which case, the subnet ID will automatically be taken from the newly created subnet.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.anf_data_protection" -var
-file="vars/azure_anf_data_protection.tfvars"
```

h. Run the deployment

```
    terraform apply -target="module.anf_data_protection" -var
-file="vars/azure_anf_data_protection.tfvars
```

To delete the deployment

```
  terraform destroy
```

Recipies:

`ANF Data Protection`

Terraform variables for single ANF Volume with data protection enabled.

Name	Type	Description
az_location	String	(Required) Specifies the supported Azure location where the resource exists. Changing this forces a new resource to be created.
az_alt_location	String	(Required) The Azure location where the secondary volume will be created
az_prefix	String	(Required) The name of the resource group where the NetApp Volume should be created. Changing this forces a new resource to be created.
az_vnet_primary_address_space	String	(Required) The address space to be used by the newly created vnet for ANF primary volume deployment.
az_vnet_secondary_address_space	String	(Required) The address space to be used by the newly created vnet for ANF secondary volume deployment.

Name	Type	Description
az_subnet_primary_address_prefix	String	(Required) The subnet address prefix to be used by the newly created vnet for ANF primary volume deployment.
az_subnet_secondary_address_prefix	String	(Required) The subnet address prefix to be used by the newly created vnet for ANF secondary volume deployment.
az_volume_path_primary	String	(Required) A unique file path for the primary volume. Used when creating mount targets. Changing this forces a new resource to be created.
az_volume_path_secondary	String	(Required) A unique file path for the secondary volume. Used when creating mount targets. Changing this forces a new resource to be created.
az_capacity_pool_size_primary	Integer	(Required) Capacity Pool Size mentioned in TB.
az_capacity_pool_size_secondary	Integer	(Required) Capacity Pool Size mentioned in TB.
az_vnet_primary_creation_bool	Boolean	(Required) Set this boolean to `true` if you want to create a new vnet for primary volume. Set it to `false` to use an existing vnet.
az_vnet_secondary_creation_bool	Boolean	(Required) Set this boolean to `true` if you want to create a new vnet for secondary volume. Set it to `false` to use an existing vnet.
az_subnet_primary_creation_bool	Boolean	(Required) Set this boolean to `true` to create a new subnet for primary volume. Set it to `false` to use an existing subnet.
az_subnet_secondary_creation_bool	Boolean	(Required) Set this boolean to `true` to create a new subnet for secondary volume. Set it to `false` to use an existing subnet.
az_primary_subnet_id_for_anf_vol	String	(Required) Mention the subnet id in case you decide to use an existing subnet by setting `subnet_primary_creation_bool` to true. If set to false, leave it at the default value.
az_secondary_subnet_id_for_anf_vol	String	(Required) Mention the subnet id in case you decide to use an existing subnet by setting `subnet_secondary_creation_bool` to true. If set to false, leave it at the default value.
az_netapp_pool_service_level_primary	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_pool_service_level_secondary	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_service_level_primary	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_service_level_secondary	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.

Name	Type	Description
az_netapp_vol_protocol_primary	String	(Optional) The target volume protocol expressed as a list. Supported single value include `CIFS`, `NFSv3`, or `NFSv4.1`. If argument is not defined it will default to `NFSv3`. Changing this forces a new resource to be created and data will be lost.
az_netapp_vol_protocol_secondary	String	(Optional) The target volume protocol expressed as a list. Supported single value include `CIFS`, `NFSv3`, or `NFSv4.1`. If argument is not defined it will default to `NFSv3`. Changing this forces a new resource to be created and data will be lost.
az_netapp_vol_storage_quota_primary	String	(Required) The maximum Storage Quota allowed for a file system in Gigabytes.
az_netapp_vol_storage_quota_secondary	String	(Required) The maximum Storage Quota allowed for a file system in Gigabytes.
az_dp_replication_frequency	String	(Required) Replication frequency, supported values are `10minutes`, `hourly`, `daily`, values are case sensitive.

ANF Dual Protocol

Terraform configuration files for deployment of ANF Volume with dual protocol on Azure

This section contains various Terraform configuration files to deploy/configure ANF (Azure Netapp Files) Volume with dual protocol enabled on Azure.

Terraform Documentation: https://registry.terraform.io/providers/hashicorp/azurerm/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation
```

c. Login to your Azure CLI (Azure CLI must be installed).

```
    az login
```

d. Update the variable values in `vars/azure_anf_dual_protocol.tfvars`.

You can choose to deploy the ANF volume using an existing vnet and subnet by setting the variable "vnet_creation_bool" and "subnet_creation_bool" value to false and supplying the "subnet_id_for_anf_vol". You can also set those values to true and create a new vnet and subnet in which case, the subnet ID will automatically be taken from the newly created subnet.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.anf_dual_protocol" -var
-file="vars/azure_anf_dual_protocol.tfvars"
```

h. Run the deployment

```
    terraform apply -target="module.anf_dual_protocol" -var
-file="vars/azure_anf_dual_protocol.tfvars"
```

To delete the deployment

```
  terraform destroy
```

Recipies:

`Single Node Instance`

Terraform variables for single ANF Volume with dual protocol enabled.

Name	Type	Description
az_location	String	(Required) Specifies the supported Azure location where the resource exists. Changing this forces a new resource to be created.
az_prefix	String	(Required) The name of the resource group where the NetApp Volume should be created. Changing this forces a new resource to be created.
az_vnet_address_space	String	(Required) The address space to be used by the newly created vnet for ANF volume deployment.

Name	Type	Description
az_subnet_address_prefix	String	(Required) The subnet address prefix to be used by the newly created vnet for ANF volume deployment.
az_volume_path	String	(Required) A unique file path for the volume. Used when creating mount targets. Changing this forces a new resource to be created.
az_capacity_pool_size	Integer	(Required) Capacity Pool Size mentioned in TB.
az_vnet_creation_bool	Boolean	(Required) Set this boolean to `true` if you want to create a new vnet. Set it to `false` to use an existing vnet.
az_subnet_creation_bool	Boolean	(Required) Set this boolean to `true` to create a new subnet. Set it to `false` to use an existing subnet.
az_subnet_id_for_anf_vol	String	(Required) Mention the subnet id in case you decide to use an existing subnet by setting `subnet_creation_bool` to true. If set to false, leave it at the default value.
az_netapp_pool_service_level	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_service_level	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_protocol1	String	(Required) The target volume protocol expressed as a list. Supported single value include `CIFS`, `NFSv3`, or `NFSv4.1`. If argument is not defined it will default to `NFSv3`. Changing this forces a new resource to be created and data will be lost.
az_netapp_vol_protocol2	String	(Required) The target volume protocol expressed as a list. Supported single value include `CIFS`, `NFSv3`, or `NFSv4.1`. If argument is not defined it will default to `NFSv3`. Changing this forces a new resource to be created and data will be lost.
az_netapp_vol_storage_quota	String	(Required) The maximum Storage Quota allowed for a file system in Gigabytes.
az_smb_server_username	String	(Required) Username to create ActiveDirectory object.
az_smb_server_password	String	(Required) User Password to create ActiveDirectory object.
az_smb_server_name	String	(Required) Server Name to create ActiveDirectory object.
az_smb_dns_servers	String	(Required) DNS Server IP to create ActiveDirectory object.

ANF Volume From Snapshot

Terraform configuration files for deployment of ANF Volume from Snapshot on Azure

This section contains various Terraform configuration files to deploy/configure ANF (Azure Netapp Files) Volume from Snapshot on Azure.

Terraform Documentation: https://registry.terraform.io/providers/hashicorp/azurerm/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation
```

c. Login to your Azure CLI (Azure CLI must be installed).

```
    az login
```

d. Update the variable values in `vars/azure_anf_volume_from_snapshot.tfvars`.

> You can choose to deploy the ANF volume using an existing vnet and subnet by setting the variable "vnet_creation_bool" and "subnet_creation_bool" value to false and supplying the "subnet_id_for_anf_vol". You can also set those values to true and create a new vnet and subnet in which case, the subnet ID will automatically be taken from the newly created subnet.

a. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

b. Verify the terraform files using terraform validate command.

```
    terraform validate
```

c. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.anf_volume_from_snapshot"
-var-file="vars/azure_anf_volume_from_snapshot.tfvars"
```

d. Run the deployment

```
    terraform apply -target="module.anf_volume_from_snapshot"
-var-file="vars/azure_anf_volume_from_snapshot.tfvars"
```

To delete the deployment

```
  terraform destroy
```

Recipies:

`Single Node Instance`

Terraform variables for single ANF Volume using snapshot.

Name	Type	Description
az_location	String	(Required) Specifies the supported Azure location where the resource exists. Changing this forces a new resource to be created.
az_prefix	String	(Required) The name of the resource group where the NetApp Volume should be created. Changing this forces a new resource to be created.
az_vnet_address_space	String	(Required) The address space to be used by the newly created vnet for ANF volume deployment.
az_subnet_address_prefix	String	(Required) The subnet address prefix to be used by the newly created vnet for ANF volume deployment.
az_volume_path	String	(Required) A unique file path for the volume. Used when creating mount targets. Changing this forces a new resource to be created.
az_capacity_pool_size	Integer	(Required) Capacity Pool Size mentioned in TB.
az_vnet_creation_bool	Boolean	(Required) Set this boolean to `true` if you want to create a new vnet. Set it to `false` to use an existing vnet.
az_subnet_creation_bool	Boolean	(Required) Set this boolean to `true` to create a new subnet. Set it to `false` to use an existing subnet.
az_subnet_id_for_anf_vol	String	(Required) Mention the subnet id in case you decide to use an existing subnet by setting `subnet_creation_bool` to true. If set to false, leave it at the default value.
az_netapp_pool_service_level	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_service_level	String	(Required) The target performance of the file system. Valid values include `Premium` , `Standard` , or `Ultra`.
az_netapp_vol_protocol	String	(Optional) The target volume protocol expressed as a list. Supported single value include `CIFS`, `NFSv3`, or `NFSv4.1`. If argument is not defined it will default to `NFSv3`. Changing this forces a new resource to be created and data will be lost.

Name	Type	Description
az_netapp_vol_storage_quota	String	(Required) The maximum Storage Quota allowed for a file system in Gigabytes.
az_snapshot_id	String	(Required) Snapshot ID using which new ANF volume will be created.

CVO Single Node Deployment

Terraform configuration files for deployment of Single Node CVO on Azure

This section contains various Terraform configuration files to deploy/configure Single Node CVO (Cloud Volumes ONTAP) on Azure.

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation
```

c. Login to your Azure CLI (Azure CLI must be installed).

```
    az login
```

d. Update the variables in `vars\azure_cvo_single_node_deployment.tfvars`.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan
-target="module.az_cvo_single_node_deployment" -var
-file="vars\azure_cvo_single_node_deployment.tfvars"
```

h. Run the deployment

```
    terraform apply
-target="module.az_cvo_single_node_deployment" -var
-file="vars\azure_cvo_single_node_deployment.tfvars"
```

To delete the deployment

```
  terraform destroy
```

Recipies:

`Single Node Instance`

Terraform variables for single node Cloud Volumes ONTAP (CVO).

Name	Type	Description
refresh_token	String	(Required) The refresh token of NetApp cloud manager. This can be generated from netapp Cloud Central.
az_connector_name	String	(Required) The name of the Cloud Manager Connector.
az_connector_location	String	(Required) The location where the Cloud Manager Connector will be created.
az_connector_subscription_id	String	(Required) The ID of the Azure subscription.
az_connector_company	String	(Required) The name of the company of the user.
az_connector_resource_group	Integer	(Required) The resource group in Azure where the resources will be created.
az_connector_subnet_id	String	(Required) The name of the subnet for the virtual machine.
az_connector_vnet_id	String	(Required) The name of the virtual network.
az_connector_network_security_group_name	String	(Required) The name of the security group for the instance.

Name	Type	Description
az_connector_associate_public_ip_address	String	(Required) Indicates whether to associate the public IP address to the virtual machine.
az_connector_account_id	String	(Required) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.
az_connector_admin_password	String	(Required) The password for the Connector.
az_connector_admin_username	String	(Required) The user name for the Connector.
az_cvo_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.
az_cvo_location	String	(Required) The location where the working environment will be created.
az_cvo_subnet_id	String	(Required) The name of the subnet for the Cloud Volumes ONTAP system.
az_cvo_vnet_id	String	(Required) The name of the virtual network.
az_cvo_vnet_resource_group	String	(Required) The resource group in Azure associated to the virtual network.
az_cvo_data_encryption_type	String	(Required) The type of encryption to use for the working environment: [`AZURE`, `NONE`]. The default is `AZURE`.
az_cvo_storage_type	String	(Required) The type of storage for the first data aggregate: [`Premium_LRS`, `Standard_LRS`, `StandardSSD_LRS`]. The default is `Premium_LRS`
az_cvo_svm_password	String	(Required) The admin password for Cloud Volumes ONTAP.
az_cvo_workspace_id	String	(Required) The ID of the Cloud Manager workspace where you want to deploy Cloud Volumes ONTAP. If not provided, Cloud Manager uses the first workspace. You can find the ID from the Workspace tab on https://cloudmanager.netapp.com.
az_cvo_capacity_tier	String	(Required) Whether to enable data tiering for the first data aggregate: [`Blob`, `NONE`]. The default is `BLOB`.
az_cvo_writing_speed_state	String	(Required) The write speed setting for Cloud Volumes ONTAP: [`NORMAL` , `HIGH`]. The default is `NORMAL`. This argument is not relevant for HA pairs.
az_cvo_ontap_version	String	(Required) The required ONTAP version. Ignored if 'use_latest_version' is set to true. The default is to use the latest version.

Name	Type	Description
az_cvo_instance_type	String	(Required) The type of instance to use, which depends on the license type you chose: Explore:[`Standard_DS3_v2`], Standard:[`Standard_DS4_v2`,`Standard_DS13_v2`,`Standard_L8s_v2`], Premium:[`Standard_DS5_v2`,`Standard_DS14_v2`], BYOL: all instance types defined for PayGo. For more supported instance types, refer to Cloud Volumes ONTAP Release Notes. The default is `Standard_DS4_v2` .
az_cvo_license_type	String	(Required) The type of license to be use. For single node: [`azure-cot-explore-paygo`, `azure-cot-standard-paygo`, `azure-cot-premium-paygo`, `azure-cot-premium-byol`, `capacity-paygo`]. For HA: [`azure-ha-cot-standard-paygo`, `azure-ha-cot-premium-paygo`, `azure-ha-cot-premium-byol`, `ha-capacity-paygo`]. The default is `azure-cot-standard-paygo`. Use `capacity-paygo` or `ha-capacity-paygo` for HA on selecting Bring Your Own License type Capacity-Based or Freemium. Use `azure-cot-premium-byol` or `azure-ha-cot-premium-byol` for HA on selecting Bring Your Own License type Node-Based.
az_cvo_nss_account	String	(Required) he NetApp Support Site account ID to use with this Cloud Volumes ONTAP system. If the license type is BYOL and an NSS account isn't provided, Cloud Manager tries to use the first existing NSS account.
az_tenant_id	String	(Required) Tenant ID of the application/service principal registered in Azure.
az_application_id	String	(Required) Application ID of the application/service principal registered in Azure.
az_application_key	String	(Required) The Application Key of the application/service principal registered in Azure.

CVO HA Deployment

Terraform configuration files for deployment of CVO HA on Azure

This section contains various Terraform configuration files to deploy/configure CVO (Cloud Volumes ONTAP) HA (High Availability) on Azure.

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
cd na_cloud_volumes_automation
```

c. Login to your Azure CLI (Azure CLI must be installed).

```
az login
```

d. Update the variables in `vars\azure_cvo_ha_deployment.tfvars`.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
terraform init
```

f. Verify the terraform files using terraform validate command.

```
terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
terraform plan -target="module.az_cvo_ha_deployment" -var
-file="vars\azure_cvo_ha_deployment.tfvars"
```

h. Run the deployment

```
terraform apply -target="module.az_cvo_ha_deployment" -var
-file="vars\azure_cvo_ha_deployment.tfvars"
```

To delete the deployment

```
terraform destroy
```

Recipies:

`HA Pair Instance`

Terraform variables for HA pair Cloud Volumes ONTAP (CVO).

Name	Type	Description
refresh_token	String	(Required) The refresh token of NetApp cloud manager. This can be generated from netapp Cloud Central.

Name	Type	Description
az_connector_name	String	(Required) The name of the Cloud Manager Connector.
az_connector_location	String	(Required) The location where the Cloud Manager Connector will be created.
az_connector_subscription_id	String	(Required) The ID of the Azure subscription.
az_connector_company	String	(Required) The name of the company of the user.
az_connector_resource_group	Integer	(Required) The resource group in Azure where the resources will be created.
az_connector_subnet_id	String	(Required) The name of the subnet for the virtual machine.
az_connector_vnet_id	String	(Required) The name of the virtual network.
az_connector_network_security_group_name	String	(Required) The name of the security group for the instance.
az_connector_associate_public_ip_address	String	(Required) Indicates whether to associate the public IP address to the virtual machine.
az_connector_account_id	String	(Required) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.
az_connector_admin_password	String	(Required) The password for the Connector.
az_connector_admin_username	String	(Required) The user name for the Connector.
az_cvo_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.
az_cvo_location	String	(Required) The location where the working environment will be created.
az_cvo_subnet_id	String	(Required) The name of the subnet for the Cloud Volumes ONTAP system.
az_cvo_vnet_id	String	(Required) The name of the virtual network.
az_cvo_vnet_resource_group	String	(Required) The resource group in Azure associated to the virtual network.
az_cvo_data_encryption_type	String	(Required) The type of encryption to use for the working environment: [`AZURE`, `NONE`]. The default is `AZURE`.

Name	Type	Description
az_cvo_storage_type	String	(Required) The type of storage for the first data aggregate: [`Premium_LRS`, `Standard_LRS`, `StandardSSD_LRS`]. The default is `Premium_LRS`
az_cvo_svm_password	String	(Required) The admin password for Cloud Volumes ONTAP.
az_cvo_workspace_id	String	(Required) The ID of the Cloud Manager workspace where you want to deploy Cloud Volumes ONTAP. If not provided, Cloud Manager uses the first workspace. You can find the ID from the Workspace tab on https://cloudmanager.netapp.com.
az_cvo_capacity_tier	String	(Required) Whether to enable data tiering for the first data aggregate: [`Blob`, `NONE`]. The default is `BLOB`.
az_cvo_writing_speed_state	String	(Required) The write speed setting for Cloud Volumes ONTAP: [`NORMAL` , `HIGH`]. The default is `NORMAL`. This argument is not relevant for HA pairs.
az_cvo_ontap_version	String	(Required) The required ONTAP version. Ignored if 'use_latest_version' is set to true. The default is to use the latest version.
az_cvo_instance_type	String	(Required) The type of instance to use, which depends on the license type you chose: Explore:[`Standard_DS3_v2`], Standard:[`Standard_DS4_v2`, `Standard_DS13_v2`, `Standard_L8s_v2`], Premium:[`Standard_DS5_v2`, `Standard_DS14_v2`], BYOL: all instance types defined for PayGo. For more supported instance types, refer to Cloud Volumes ONTAP Release Notes. The default is `Standard_DS4_v2` .
az_cvo_license_type	String	(Required) The type of license to be use. For single node: [`azure-cot-explore-paygo`, `azure-cot-standard-paygo`, `azure-cot-premium-paygo`, `azure-cot-premium-byol`, `capacity-paygo`]. For HA: [`azure-ha-cot-standard-paygo`, `azure-ha-cot-premium-paygo`, `azure-ha-cot-premium-byol`, `ha-capacity-paygo`]. The default is `azure-cot-standard-paygo`. Use `capacity-paygo` or `ha-capacity-paygo` for HA on selecting Bring Your Own License type Capacity-Based or Freemium. Use `azure-cot-premium-byol` or `azure-ha-cot-premium-byol` for HA on selecting Bring Your Own License type Node-Based.
az_cvo_nss_account	String	(Required) he NetApp Support Site account ID to use with this Cloud Volumes ONTAP system. If the license type is BYOL and an NSS account isn't provided, Cloud Manager tries to use the first existing NSS account.
az_tenant_id	String	(Required) Tenant ID of the application/service principal registered in Azure.
az_application_id	String	(Required) Application ID of the application/service principal registered in Azure.
az_application_key	String	(Required) The Application Key of the application/service principal registered in Azure.

GCP

CVO Single Node Deployment

Terraform configuration files for deployment of NetApp CVO (Single Node Instance) on GCP

This section contains various Terraform configuration files to deploy/configure single node NetApp CVO (Cloud Volumes ONTAP) on GCP (Google Cloud Platform).

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation/
```

c. Save the GCP authentication key JSON file in the directory.

d. Update the variable values in `vars/gcp_cvo_single_node_deployment.tfvar`

> You can choose to deploy the connector by setting the variable "gcp_connector_deploy_bool" value to true/false.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
    terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.gco_single_node" -var
-file="vars/gcp_cvo_single_node_deployment.tfvars"
```

h. Run the deployment

```
    terraform apply -target="module.gcp_single_node" -var
-file="vars/gcp_cvo_single_node_deployment.tfvars"
```

To delete the deployment

```
    terraform destroy
```

Recipies:

`Connector`

Terraform variables for NetApp GCP connector instance for CVO deployment.

Name	Type	Description
gcp_connector_deploy_bool	Bool	(Required) Check for Connector deployment.
gcp_connector_name	String	(Required) The name of the Cloud Manager Connector.
gcp_connector_project_id	String	(Required) The GCP project_id where the connector will be created.
gcp_connector_zone	String	(Required) The GCP zone where the Connector will be created.
gcp_connector_company	String	(Required) The name of the company of the user.
gcp_connector_service_account_email	String	(Required) The email of the service_account for the connector instance. This service account is used to allow the Connector to create Cloud Volume ONTAP.
gcp_connector_service_account_path	String	(Required) The local path of the service_account JSON file for GCP authorization purposes. This service account is used to create the Connector in GCP.
gcp_connector_account_id	String	(Optional) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.

`Single Node Instance`

Terraform variables for single NetApp CVO instance on GCP.

Name	Type	Description
gcp_cvo_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.

Name	Type	Description
gcp_cvo_project_id	String	(Required) The ID of the GCP project.
gcp_cvo_zone	String	(Required) The zone of the region where the working environment will be created.
gcp_cvo_gcp_service_account	String	(Required) The gcp_service_account email in order to enable tiering of cold data to Google Cloud Storage.
gcp_cvo_svm_password	String	(Required) The admin password for Cloud Volumes ONTAP.
gcp_cvo_workspace_id	String	(Optional) The ID of the Cloud Manager workspace where you want to deploy Cloud Volumes ONTAP. If not provided, Cloud Manager uses the first workspace. You can find the ID from the Workspace tab on https://cloudmanager.netapp.com.
gcp_cvo_license_type	String	(Optional) The type of license to use. For single node: ['capacity-paygo', 'gcp-cot-explore-paygo', 'gcp-cot-standard-paygo', 'gcp-cot-premium-paygo', 'gcp-cot-premium-byol'], For HA: ['ha-capacity-paygo', 'gcp-ha-cot-explore-paygo', 'gcp-ha-cot-standard-paygo', 'gcp-ha-cot-premium-paygo', 'gcp-ha-cot-premium-byol']. The default is 'capacity-paygo' for single node, and 'ha-capacity-paygo' for HA.
gcp_cvo_capacity_package_name	String	(Optional) The capacity package name: ['Essential', 'Professional', 'Freemium']. Default is 'Essential'.

CVO HA Deployment

Terraform configuration files for deployment of NetApp CVO (HA Pair) on GCP

This section contains various Terraform configuration files to deploy/configure NetApp CVO (Cloud Volumes ONTAP) in high availability pair on GCP (Google Cloud Platform).

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-cloudmanager/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation/
```

c. Save the GCP authentication key JSON file in the directory.

d. Update the variable values in `vars/gcp_cvo_ha_deployment.tfvars`.

You can choose to deploy the connector by setting the variable "gcp_connector_deploy_bool" value to true/false.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
terraform init
```

f. Verify the terraform files using terraform validate command.

```
terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
terraform plan -target="module.gcp_ha" -var
-file="vars/gcp_cvo_ha_deployment.tfvars"
```

h. Run the deployment

```
terraform apply -target="module.gcp_ha" -var
-file="vars/gcp_cvo_ha_deployment.tfvars"
```

To delete the deployment

```
terraform destroy
```

Recipies:

`Connector`

Terraform variables for NetApp GCP connector instance for CVO deployment.

Name	Type	Description
gcp_connector_deploy_bool	Bool	(Required) Check for Connector deployment.
gcp_connector_name	String	(Required) The name of the Cloud Manager Connector.
gcp_connector_project_id	String	(Required) The GCP project_id where the connector will be created.
gcp_connector_zone	String	(Required) The GCP zone where the Connector will be created.

Name	Type	Description
gcp_connector_company	String	(Required) The name of the company of the user.
gcp_connector_service_account_email	String	(Required) The email of the service_account for the connector instance. This service account is used to allow the Connector to create Cloud Volume ONTAP.
gcp_connector_service_account_path	String	(Required) The local path of the service_account JSON file for GCP authorization purposes. This service account is used to create the Connector in GCP.
gcp_connector_account_id	String	(Optional) The NetApp account ID that the Connector will be associated with. If not provided, Cloud Manager uses the first account. If no account exists, Cloud Manager creates a new account. You can find the account ID in the account tab of Cloud Manager at https://cloudmanager.netapp.com.

`HA Pair`

Terraform variables for NetApp CVO instances in HA Pair on GCP.

Name	Type	Description
gcp_cvo_is_ha	Bool	(Optional) Indicate whether the working environment is an HA pair or not [true, false]. The default is false.
gcp_cvo_name	String	(Required) The name of the Cloud Volumes ONTAP working environment.
gcp_cvo_project_id	String	(Required) The ID of the GCP project.
gcp_cvo_zone	String	(Required) The zone of the region where the working environment will be created.
gcp_cvo_node1_zone	String	(Optional) Zone for node 1.
gcp_cvo_node2_zone	String	(Optional) Zone for node 2.
gcp_cvo_mediator_zone	String	(Optional) Zone for mediator.
gcp_cvo_vpc_id	String	(Optional) The name of the VPC.
gcp_cvo_subnet_id	String	(Optional) The name of the subnet for Cloud Volumes ONTAP. The default is: 'default'.
gcp_cvo_vpc0_node_and_data_connectivity	String	(Optional) VPC path for nic1, required for node and data connectivity. If using shared VPC, netwrok_project_id must be provided.
gcp_cvo_vpc1_cluster_connectivity	String	(Optional) VPC path for nic2, required for cluster connectivity.

Name	Type	Description
gcp_cvo_vpc2_ha_connectivity	String	(Optional) VPC path for nic3, required for HA connectivity.
gcp_cvo_vpc3_data_replication	String	(Optional) VPC path for nic4, required for data replication.
gcp_cvo_subnet0_node_and_data_connectivity	String	(Optional) Subnet path for nic1, required for node and data connectivity. If using shared VPC, netwrok_project_id must be provided.
gcp_cvo_subnet1_cluster_connectivity	String	(Optional) Subnet path for nic2, required for cluster connectivity.
gcp_cvo_subnet2_ha_connectivity	String	(Optional) Subnet path for nic3, required for HA connectivity.
gcp_cvo_subnet3_data_replication	String	(Optional) Subnet path for nic4, required for data replication.
gcp_cvo_gcp_service_account	String	(Required) The gcp_service_account email in order to enable tiering of cold data to Google Cloud Storage.
gcp_cvo_svm_password	String	(Required) The admin password for Cloud Volumes ONTAP.
gcp_cvo_workspace_id	String	(Optional) The ID of the Cloud Manager workspace where you want to deploy Cloud Volumes ONTAP. If not provided, Cloud Manager uses the first workspace. You can find the ID from the Workspace tab on https://cloudmanager.netapp.com.
gcp_cvo_license_type	String	(Optional) The type of license to use. For single node: ['capacity-paygo', 'gcp-cot-explore-paygo', 'gcp-cot-standard-paygo', 'gcp-cot-premium-paygo', 'gcp-cot-premium-byol'], For HA: ['ha-capacity-paygo', 'gcp-ha-cot-explore-paygo', 'gcp-ha-cot-standard-paygo', 'gcp-ha-cot-premium-paygo', 'gcp-ha-cot-premium-byol']. The default is 'capacity-paygo' for single node, and 'ha-capacity-paygo' for HA.
gcp_cvo_capacity_package_name	String	(Optional) The capacity package name: ['Essential', 'Professional', 'Freemium']. Default is 'Essential'.
gcp_cvo_gcp_volume_size	String	(Optional) The GCP volume size for the first data aggregate. For GB, the unit can be: [100 or 500]. For TB, the unit can be: [1,2,4,8]. The default is '1' .
gcp_cvo_gcp_volume_size_unit	String	(Optional) ['GB' or 'TB']. The default is 'TB'.

CVS Volume

Terraform configuration files for deployment of NetApp CVS Volume on GCP

This section contains various Terraform configuration files to deploy/configure NetApp CVS (Cloud Volumes Services) Volume on GCP (Google Cloud Platform).

Terraform Documentation: https://registry.terraform.io/providers/NetApp/netapp-gcp/latest/docs

Procedure

In order to run the template:

a. Clone the repository.

```
    git clone
https://github.com/NetApp/na_cloud_volumes_automation.git
```

b. Navigate to the desired folder

```
    cd na_cloud_volumes_automation/
```

c. Save the GCP authentication key JSON file in the directory.

d. Update the variable values in `vars/gcp_cvs_volume.tfvars`.

e. Initialize the Terraform repository to install all the pre-requisites and prepare for deployment.

```
      terraform init
```

f. Verify the terraform files using terraform validate command.

```
    terraform validate
```

g. Make a dry run of the configuration to get a preview of all the changes expected by the deployment.

```
    terraform plan -target="module.gcp_cvs_volume" -var
-file="vars/gcp_cvs_volume.tfvars"
```

h. Run the deployment

```
    terraform apply -target="module.gcp_cvs_volume" -var
-file="vars/gcp_cvs_volume.tfvars"
```

To delete the deployment

```
    terraform destroy
```

Recipies:

`CVS Volume`

Terraform variables for NetApp GCP CVS Volume.

Name	Type	Description
gcp_cvs_name	String	(Required) The name of the NetApp CVS volume.
gcp_cvs_project_id	String	(Required) The GCP project_id where the CVS Volume will be created.
gcp_cvs_gcp_service_account_path	String	(Required) The local path of the service_account JSON file for GCP authorization purposes. This service account is used to create the CVS Volume in GCP.
gcp_cvs_region	String	(Required) The GCP zone where the CVS Volume will be created.
gcp_cvs_network	String	(Required) The network VPC of the volume.
gcp_cvs_size	Integer	(Required) The size of volume is between 1024 to 102400 inclusive (in GiB).
gcp_cvs_volume_path	String	(Optional) The name of the volume path for volume.
gcp_cvs_protocol_types	String	(Required) The protocol_type of the volume. For NFS use 'NFSv3' or 'NFSv4' and for SMB use 'CIFS' or 'SMB'.

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