



Create templates to standardize resource creation

Cloud Manager

NetApp
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Create templates to standardize resource creation

Learn about Application Templates

The Application Templates service enables you to standardize resource creation in your working environments. For example, you can hard-code required parameters in a "volume template" that are later applied when a storage admin creates a volume. This can include required disk type, size, protocol, snapshot policy, cloud provider, and more. You can also turn on certain services, like Cloud Backup, for every created volume.

Templates make it easy for your storage admins to create volumes that are optimized for the workload requirements for each deployed application; such as databases, email, or streaming services. And it makes life easier for your storage architects knowing that each volume is created optimally for each application.

Features

Application Templates offer the following features and benefits:

- Automates and improves the design and development of your infrastructure
- Provides a single location to activate different NetApp Cloud services
- Enforces template settings on created resources with the "drift" feature (future)

Pricing and licenses

The Application Templates feature requires no licensing and is free to use by all Cloud Manager users.



Templates enable you to apply a cloud service onto a created resources, for example, enable Cloud Backup on every volume. In this case there is a cost for using the Backup service and for the object storage space used by the backup files.

Available template actions

A template is a chain of "actions" that have some pre-defined values. You can build templates that include the following actions:

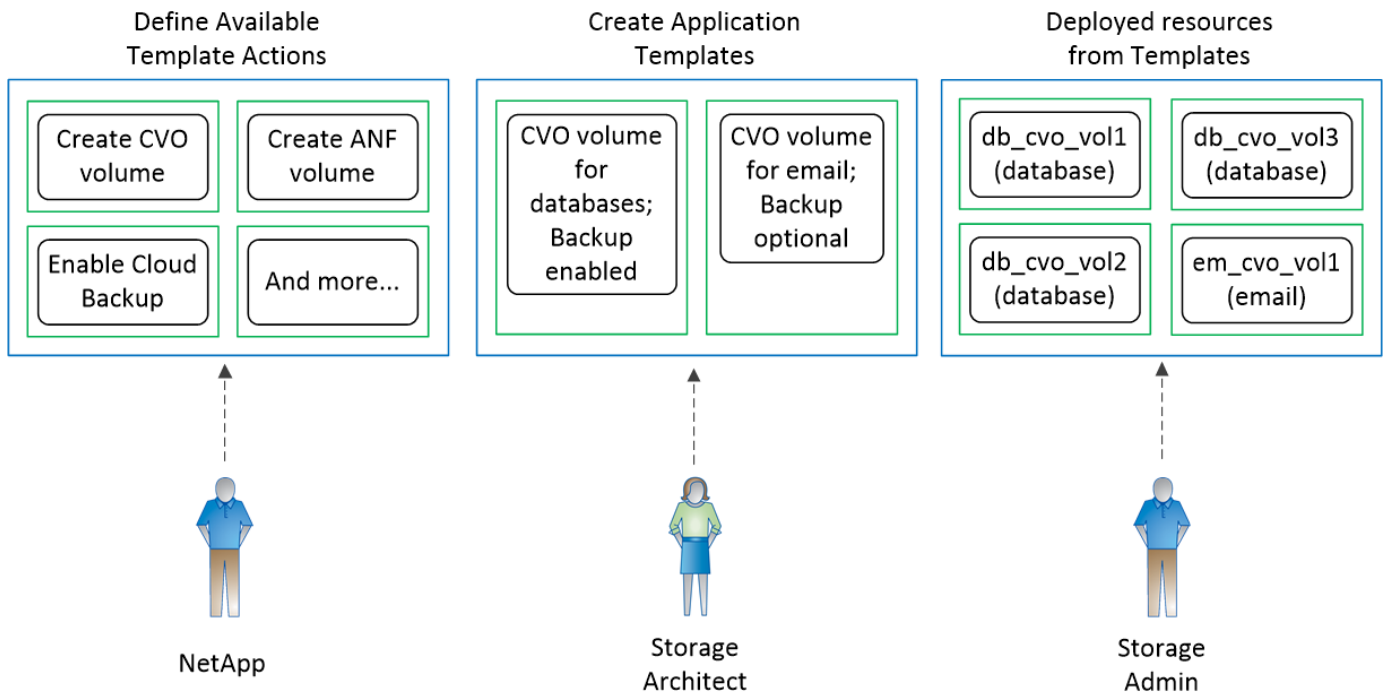
- Create a Cloud Volumes ONTAP volume
- Create an Azure NetApp Files volume
- Enable Cloud Backup on created volumes (Cloud Volumes ONTAP volumes only)
- Enable Cloud Compliance on created volumes

More actions will be added over time by NetApp.

How Application Templates work

The Application Templates service is made up of 3 parts. The available template "actions", the customized application template, and the deployed resource as a result of running the template. The following image

shows the relationship between each component:



At a high level, Templates work like this:

1. NetApp defines the available template "actions".

For example, an "action" to create a Cloud Volumes ONTAP volume or an Azure NetApp Files volume.

2. Your storage architect selects the "actions" they want use to create an Application Template, and then they hard-code certain values for the listed parameters.

For example, they select high speed disks and a large amount of RAM for Cloud Volumes ONTAP volumes that will be used to carry the workloads for Oracle databases. And they require that backups are made for each volume.

3. Your storage admins use the templates to create resources that are optimized for the application they will be used for.

For example, they create a volume that will be used for an Oracle database by using the volume template created for databases.

Limitations

- The Application Templates service is not supported in any of the Gov Cloud regions or in "dark" sites.
- You can't use a template to create a Cloud Volumes ONTAP volume on an existing aggregate. New volumes are created in a new aggregate.
- You can't use a template to create a volume on a Cloud Volumes ONTAP system that includes multiple Storage VMs (SVMs).

Building application templates for your organization

Select one or more of the NetApp-provided "actions" and quickly build an application template that your organization can use to start optimizing the creation of resources.

Quick start

Get started quickly by following these steps, or scroll down to the remaining sections for full details.



Verify required prerequisites

- Before users can create a Cloud Volumes ONTAP or Azure NetApp Files volume using a template, make sure they have access to a Cloud Volumes ONTAP or Azure NetApp Files Working Environment where the volume will be deployed.
- If you plan to add a Cloud service "action" to your template, such as [Cloud Backup](#), ensure that your environment has an active and licensed Cloud Backup service.



Launch the Application Templates service

Select the **AppTemplate** service and select the template.



Build the template by selecting "actions" and defining parameters

Follow the creation steps and define the actions that will be performed by the template.

Requirements

Read the following requirements to make sure that you have a supported configuration.

- If you don't already have a Connector, [see how to create Connectors](#) for AWS, Azure, and GCP.
- When creating a Cloud Volumes ONTAP volume template, make sure you have a Cloud Volumes ONTAP working environment available for your users. See how to launch a Cloud Volumes ONTAP system in [AWS](#), [Azure](#), or in [GCP](#).
- When creating an Azure NetApp Files volume template, make sure you have an Azure NetApp Files working environment available for your users. See how to [create an Azure NetApp Files working environment](#) in Cloud Manager.
- If you plan to enable Cloud Backup on Cloud Volumes ONTAP volumes, ensure that your environment has an active and licensed Cloud Backup service.
- If you plan to enable Cloud Compliance on Cloud Volumes ONTAP or Azure NetApp Files volumes, ensure that your environment has an active and licensed Cloud Compliance service.

Special template controls

Before you start creating your template, you should understand some special options that you can set when pre-populating a value for a parameter in a template.

Editable checkbox

Check this box to let the storage admin override the pre-populated value you have entered in the template. This gives the storage admin a suggestion for what the value should be, but it allows them to customize the value when creating the resource.

When unchecked, the user can't change the value and the hard-coded value in the template is always used when the admin deploys a resource.

Using a regular expression (regex) in fields

There are a few fields within templates that allow you to enter a regex to define the value that your admin can enter in the field; for example "Volume Name" and "Share Name".

As an example, if you enter `"^[a-zA-Z][0-9a-zA-Z]{0,149}$"` as the regex for the volume name, it means that *"the name should start with an alphabetic character, it can contain only numbers, letters, or the underscore, and it should be 150 or fewer characters in length"*.

Passing values between template actions

Templates have the ability to use information from a previous action to populate a field in a future action. For example, when defining the name of the volume that will have Cloud Backup functionality enabled, you can instruct the Backup action to use the value the storage admin entered as the name of the volume from the Create Cloud Volumes ONTAP action.

There are two types of information that the AppTemplate service can use from previous actions:

- Input value - This is the actual value the storage admin entered into a field in a previous template action.
- Output value - This is the value Cloud Manager generates after creating a resource from a previous template action.

For example, to enable Compliance on a volume, the Cloud Compliance service needs both the "volume name" that the storage admin enters (the Input value), and the "volume uuid" that Cloud Manager generates when it creates the volume (the Output value).

The following illustration shows how to enter this information in the Cloud Compliance action section of the template.

Enable Cloud Compliance (1)

Action Definition

Details

Volume Name ⓘ

Action ⓘ

Create Volume in Cloud Volumes ONTAP (1) X ▾

Input / Output

Input X ▾

Field ⓘ

Volume Name X ▾

Volume UUID ⓘ

Action ⓘ

Create Volume in Cloud Volumes ONTAP (1) X ▾

Input / Output

Output X ▾

Field ⓘ

uuid

Get the volume name from:

The earlier action used to create a CVO volume...

based on the value the storage admin entered...

in the "Volume Name" field.

Get the volume UUID from:

The earlier action used to create a CVO volume...

based on a value Cloud Manager generates...

in the "uuid" field.

Creating a template for a Cloud Volumes ONTAP volume

See [how to provision Cloud Volumes ONTAP volumes](#) for details about all the parameters you need to complete in the Cloud Volumes ONTAP volume template.

For this example we'll create a template named "CVO volume for databases" and include the following 2 actions:

- Create Cloud Volumes ONTAP Volume

Make the volume for the AWS environment, configure it with 100 GB of storage, set the Snapshot Policy to "default", and enable Storage Efficiency.

- Enable Cloud Backup

Create daily backups with a retention value of 30 copies.

Steps

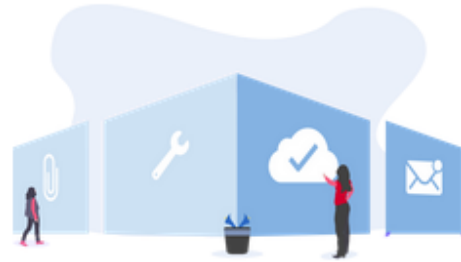
1. Select the **AppTemplate** service and click **Add new template**.

The *Select_a_Template* page is displayed.

Select a Template to Get Started

Choose a template for the type of resource you want to create and then customize the parameters for what's required in your environment.

For even greater flexibility, choose the "blank" template to mix and match configurations and to apply additional Cloud Manager services.



Start with a template of:

Four template options are displayed in a row:

- Blank template
- Volume for Cloud Volumes ONTAP
- Volume for Cloud Volumes ONTAP + Backup** (This option is selected, indicated by a blue checkmark in a circle at the top right corner of its box.)
- Volume for Azure NetApp files

At the bottom right, there are two buttons: "Get Started" (a solid blue button) and "Cancel" (a white button with a blue border).

2. Select **Volume for Cloud Volumes ONTAP + Backup** as the type of resource you want to create, and click **Get Started**.

The *Create Volume in Cloud Volumes ONTAP Action Definition* page is displayed.

The screenshot shows the "Create Volume in Cloud Volumes ONTAP (1)" action definition page. On the left, a flowchart on a grid background shows two steps: "Create Volume in Cloud Volumes ONTAP (1)" followed by "Enable Cloud Backup (1)".

On the right, the configuration panel is titled "Create Volume in Cloud Volumes ONTAP (1)" and "Action Definition". It contains the following sections:

- Details**:
 - Volume Name**: A dropdown menu with "Select..." and an "Editable" checkbox.
 - Volume Size (GB)**: Includes "Minimum" and "Maximum" input fields with up/down arrows, and a "Fixed value" section with a radio button selected and an "Enter volume size" input field.
- Protection**:
 - Snapshot Policy**: A dropdown menu with "Select snapshot policy" and an "Editable" checkbox.
- Usage Profile**: A section at the bottom with an "Apply" button and a "Cancel" button.

At the bottom right of the configuration panel, there is a blue circular icon with a white speech bubble.

3. **Details**: Enter the volume name and size.

Field	Description
Volume Name	Click in the field and select one of the 5 options. You can let the admin enter any name by selecting Free Text , or you can specify that the volume name must have a certain prefix or suffix, that it <i>contains</i> certain characters, or that it follows rules from a regular expression (regex) you enter. For example, you could specify that "db" be a required prefix, suffix, or contains; requiring the user to add volume names like "db_vol1", "vol1_db", or "vol_db_1".
Volume Size	You can specify a range of allowable values, or you can specify a fixed size. This value is in GB. For our example we can add a fixed value 100 .

- Protection:** Choose whether this volume will have Snapshot copies created by selecting "Default" or some other policy, or choose "None" if you do not want to create Snapshot copies.
- Usage Profile:** Choose whether or not NetApp storage efficiency features are applied to the volume. This includes Thin Provisioning, Deduplication, and Compression. For our example, keep storage efficiency enabled.
- Disk Type:** Choose the cloud storage provider and the type of disk. For some disk selections you can also select a minimum and maximum IOPS or Throughput (MB/s) value; basically defining a certain Quality of Service (QoS).
- Protocol:** Select **NFS** or **SMB** to set the protocol of the volume. And then the provide the protocol details.

NFS Fields	Description
Access Control	Choose whether access controls are needed to access the volume.
Export Policy	Create an export policy to define the clients in the subnet that can access the volume.
NFS Version	Select the NFS version for the volume: either <i>NFSv3</i> or <i>NFSv4</i> , or you can select both.

SMB Fields	Description
Share Name	Click in the field and select one of the 5 options. You can let the admin enter any name (Free Text) or you can specify that the share name must have a certain prefix or suffix, that it <i>contains</i> certain characters, or that it follows rules from a regular expression (regex) you enter.
Permissions	Select the level of access to a share for users and groups (also called access control lists, or ACLs).
Users / Groups	Specify local or domain Windows users or groups, or UNIX users or groups. If you specify a domain Windows user name, you must include the user's domain using the format domain\username.

- Tiering Policy:** Choose the tiering policy that you would like applied to the volume, or set this to "None" if you do not want to tier cold data from this volume to object storage.

See [volume tiering policies](#) for an overview, and see [Tiering inactive data to object storage](#) to make sure your environment is set up for tiering.

- Click **Apply** after you have defined the parameters needed for this action.

If the template values are correctly completed, a green box is shown around the "Create Volume in Cloud Volumes ONTAP" box.

10. Click the **Enable Cloud Backup** box and the *Enable Cloud Backup Action Definition* dialog is displayed so you can fill in the Cloud Backup details.

The screenshot shows a workflow editor on the left with two steps: 'Create Volume in Cloud Volumes ONTAP (1)' (highlighted in green) and 'Enable Cloud Backup (1)'. The right panel is the configuration dialog for the 'Enable Cloud Backup (1)' action. It includes the following fields:

- Policy - Retention & Schedule**
 - Backup Every**: Day (with an 'Editable' checkbox)
 - Number of backups to retain**: Fixed value (with an 'Editable' checkbox). The value is 30.
- Volume Name**: (Information icon)
- Action**: Create Volume in Cloud Volumes ONTAP (1)
- Input / Output**: Input
- Field**: Volume Name

Buttons: Apply, Cancel

11. Define the backup policy to create daily backups with a 30-day retention value.
12. Below the Volume Name field there are three fields you use to indicate which volume will have backup enabled. See [how to complete these fields](#).
13. Click **Apply** and the Cloud Backup dialog is saved.
14. Enter the template name **CVO volume for databases** (for this example) in the top left.
15. Click **Template settings** if you want to provide a more detailed description so that this template can be distinguished from other similar templates, and then click **Apply**.
16. Click **Save Template**.

Result

The template is created and you are returned to the Template Dashboard where your new template appears.

See [what you should tell your users about templates](#).

Creating a template for an Azure NetApp Files volume

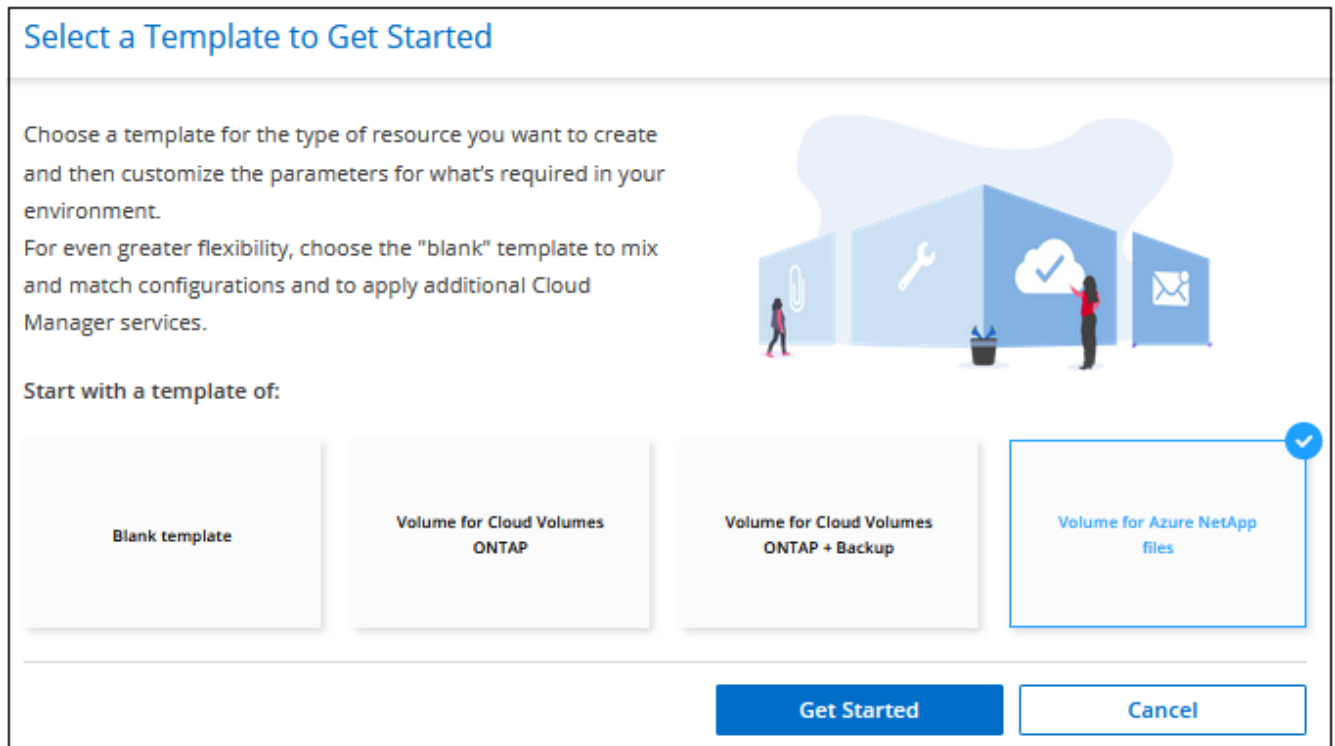
Creating a template for an Azure NetApp Files volume is done in the same manner as creating a template for a Cloud Volumes ONTAP volume.

See [how to provision Azure NetApp Files volumes](#) for details about all the parameters you need to complete in the ANF volume template.

Steps

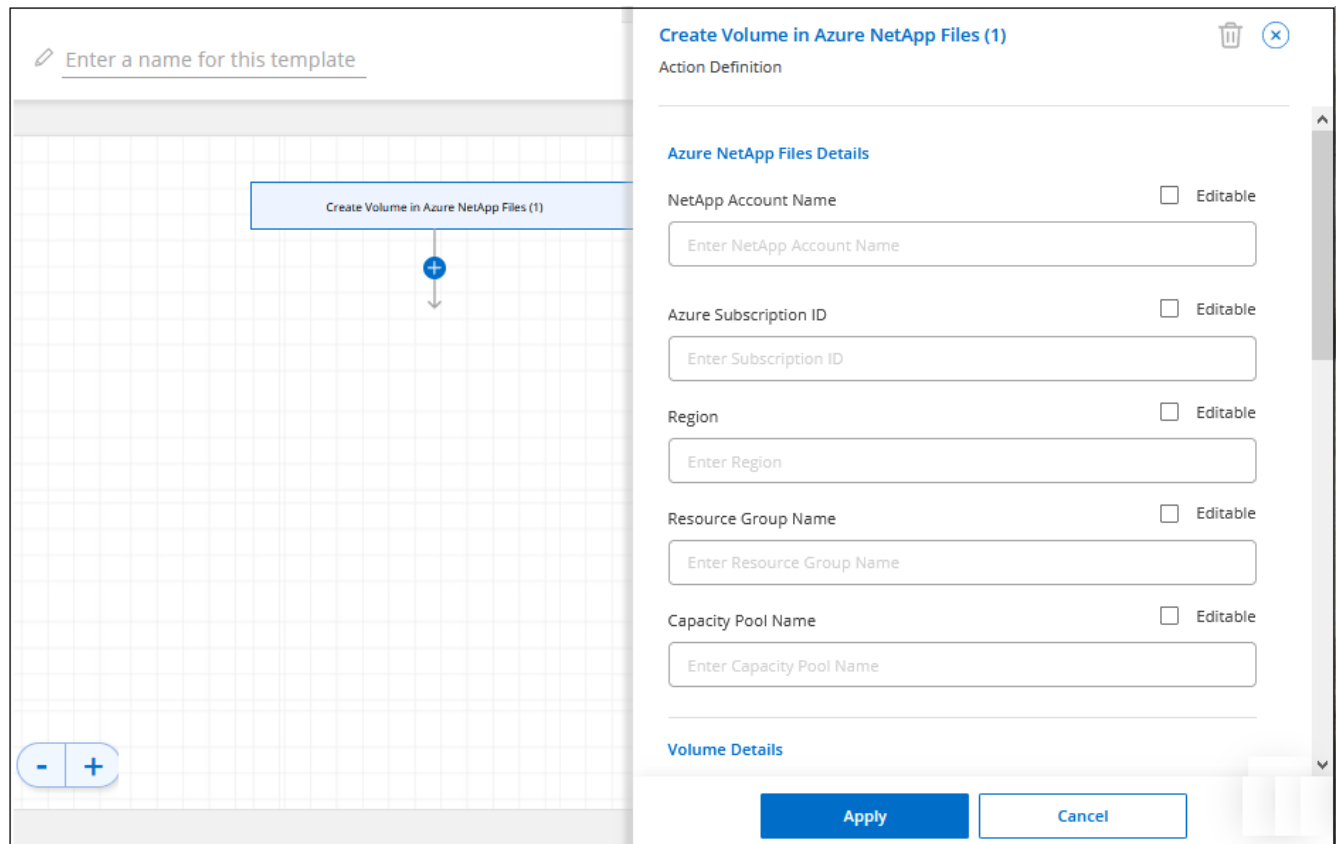
1. Select the **AppTemplate** service and click **Add new template**.

The *Select_a Template* page is displayed.



2. Select **Volume for Azure NetApp Files** as the type of resource you want to create, and click **Get Started**.

The *Create Volume in Azure NetApp Files Action Definition* page is displayed.



3. **Details:** Enter the details for a new or an existing Azure NetApp Files account.

Field	Description
NetApp Account Name	Enter the name you want to use for the account.
Azure Subscription ID	Enter the Azure Subscription ID. This is the full ID in a format similar to "2b04f26-7de6-42eb-9234-e2903d7s327".
Region	Enter the region using the internal region name .
Resource Group Name	Enter the name of the Resource Group you want to use.
Capacity Pool Name	Enter the name of an existing capacity pool.

4. **Volume Details:** Enter a volume name and size, the VNet and subnet where the volume should reside, and optionally specify tags for the volume.

Field	Description
Volume Name	<p>Click in the field and select one of the 5 options. You can let the admin enter any name by selecting Free Text, or you can specify that the volume name must have a certain prefix or suffix, that it <i>contains</i> certain characters, or that it follows rules from a regular expression (regex) you enter.</p> <p>For example, you could specify that "db" be a required prefix, suffix, or contains; requiring the user to add volume names like "db_vol1", "vol1_db", or "vol_db_1".</p>
Volume Size	You can specify a range of allowable values, or you can specify a fixed size. This value is in GB.

Field	Description
Subnet	Enter the VNet and subnet. This value includes the full path, in a format similar to "/subscriptions/<subscription_id>/resourceGroups/<resource_group>/providers/Microsoft.Network/virtualNetworks/<vpc_name>/subnets/<subhet_name>".

5. **Protocol:** Select **NFSv3**, **NFSv4.1**, or **SMB** to set the protocol of the volume. And then the provide the protocol details.

NFS Fields	Description
Volume Path	Select one of the 5 options. You can let the admin enter any path by selecting Free Text , or you can specify that the path name must have a certain prefix or suffix, that it <i>contains</i> certain characters, or that it follows rules from a regular expression (regex) you enter.
Export Policy Rules	Create an export policy to define the clients in the subnet that can access the volume.

SMB Fields	Description
Volume Path	Select one of the 5 options. You can let the admin enter any path by selecting Free Text , or you can specify that the path name must have a certain prefix or suffix, that it <i>contains</i> certain characters, or that it follows rules from a regular expression (regex) you enter.

6. **Snapshot Copy:** Enter the Snapshot ID for an existing volume Snapshot if you want this new volume to be created using characteristics from an existing volume.
7. Click **Next** after you have defined the parameters needed for this action.
8. Click **Next** as there are no additional Actions available at this time for ANF volumes.
9. Enter the name you want to use for the template in the top left.
10. Click **Template settings** if you want to provide a more detailed description so that this template can be distinguished from other similar templates, and then click **Apply**.
11. In the future the *Configure Drift* page will allow you to choose whether the Drift feature should be applied to the template. This will allow Cloud Manager to monitor the hard-coded values you entered for parameters when creating this template.
12. Click **Create Template**.

Result

The template is created and you are returned to the Template Dashboard where your new template appears.

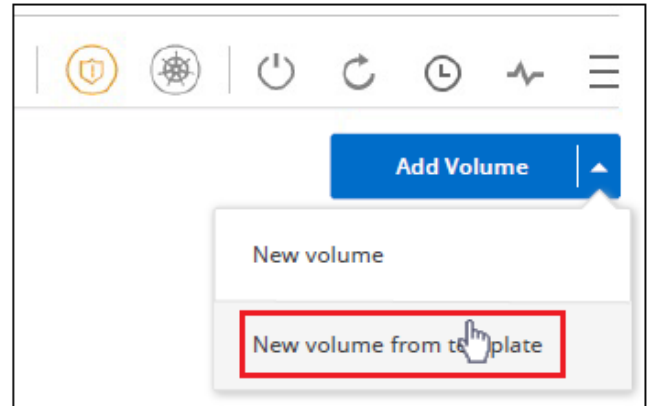
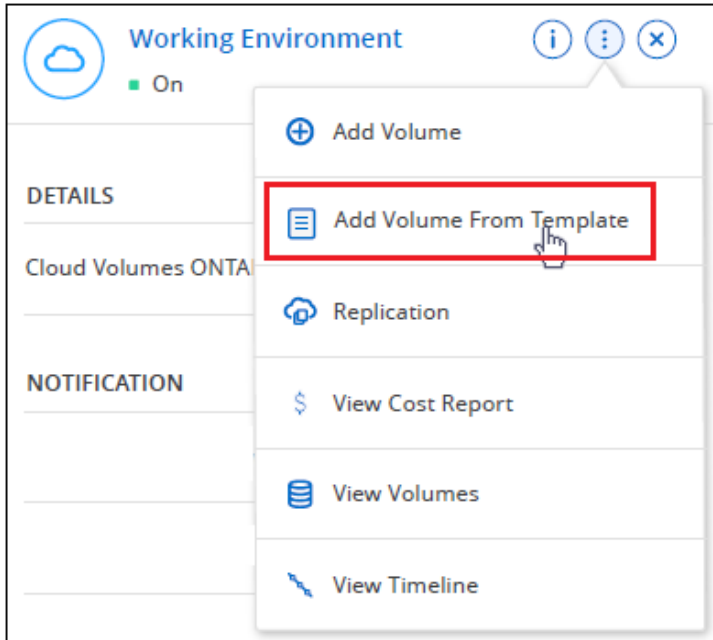
See [what you should tell your users about templates](#).

What to do after you have created the template

After you have created a template, you should inform your storage administrators to use the template when creating new volumes.

Your users should select **Add Volume From Template** when adding a volume to a Working Environment in the future. The selection is available from the *Working Environment* page, and from the *Volume Details* page. See

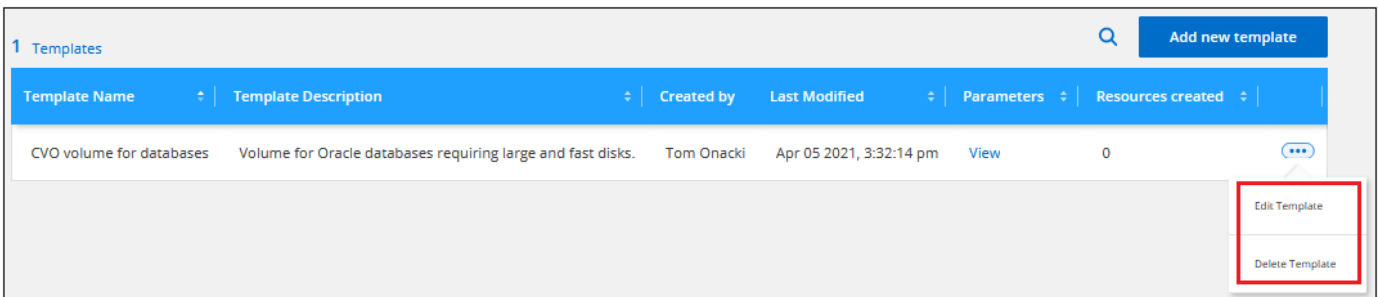
how to provision Cloud Volumes ONTAP volumes or how to provision Azure NetApp Files volumes using templates.



Editing and deleting a template

You can modify a template if you need to change any of the parameters. After you save your changes, all future resources created from the template will use the new parameter values.

You can also delete a template if you no longer need it. Deleting a template does not affect any of the resources that were created with the template.



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