



## **Azure**

### **Setup and administration**

NetApp  
April 26, 2024

# Table of Contents

- Azure ..... 1
  - Learn about Azure credentials and permissions ..... 1
  - Manage Azure credentials and marketplace subscriptions for BlueXP ..... 4

# Azure

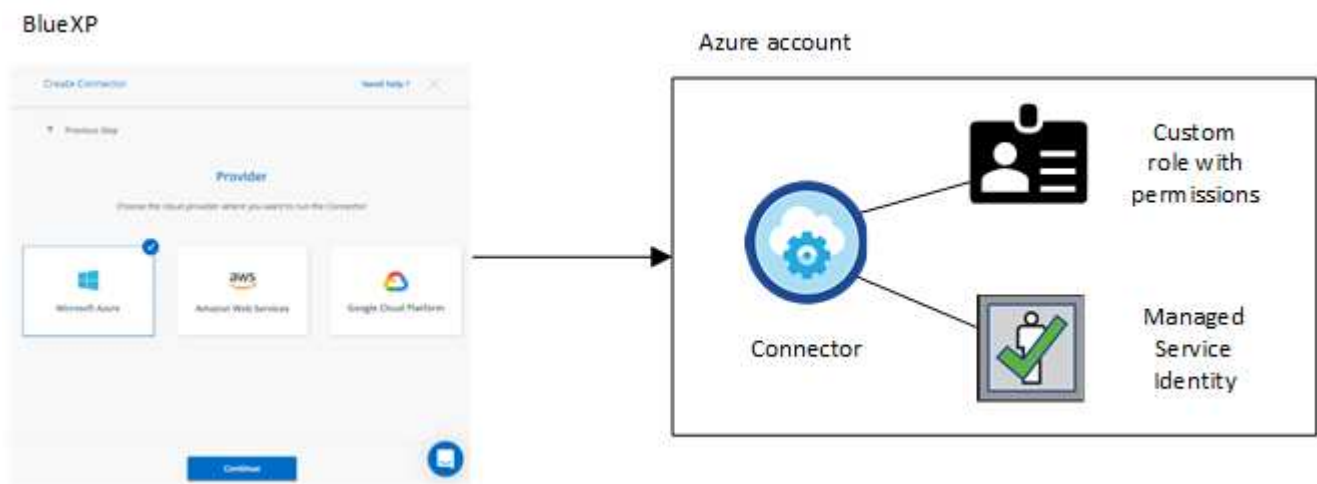
## Learn about Azure credentials and permissions

Learn how BlueXP uses Azure credentials to perform actions on your behalf and how those credentials are associated with marketplace subscriptions. Understanding these details can be helpful as you manage the credentials for one or more Azure subscriptions. For example, you might want to learn when to add additional Azure credentials to BlueXP.

### Initial Azure credentials

When you deploy a Connector from BlueXP, you need to use an Azure account or service principal that has permissions to deploy the Connector virtual machine. The required permissions are listed in the [Connector deployment policy for Azure](#).

When BlueXP deploys the Connector virtual machine in Azure, it enables a [system-assigned managed identity](#) on virtual machine, creates a custom role, and assigns it to the virtual machine. The role provides BlueXP with the permissions required to manage resources and processes within that Azure subscription. [Review how BlueXP uses the permissions](#).



If you create a new working environment for Cloud Volumes ONTAP, BlueXP selects these Azure credentials by default:

Details & Credentials			
Managed Service Ide...	OCCM QA1	<span>ⓘ</span> No subscription is associated	<a href="#">Edit Credentials</a>
Credential Name	Azure Subscription	Marketplace Subscription	

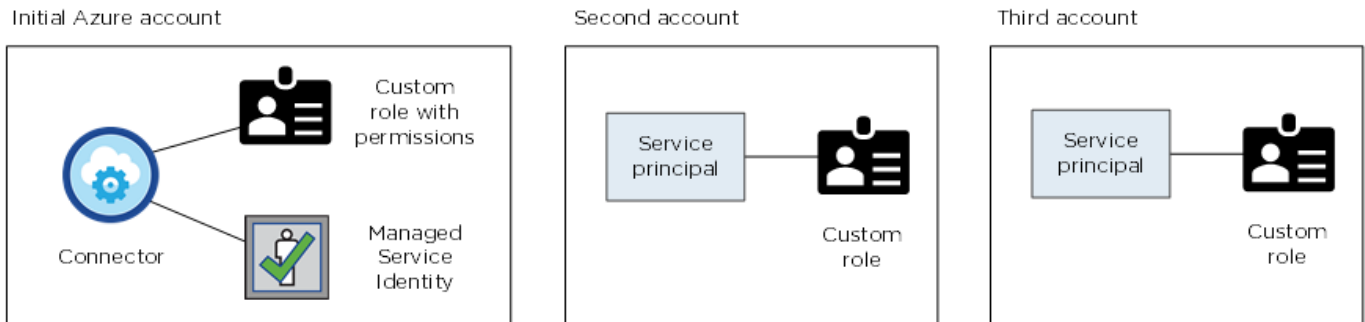
You can deploy all of your Cloud Volumes ONTAP systems using the initial Azure credentials, or you can add additional credentials.

## Additional Azure subscriptions for a managed identity

The system-assigned managed identity assigned to the Connector VM is associated with the subscription in which you launched the Connector. If you want to select a different Azure subscription, then you need to [associate the managed identity with those subscriptions](#).

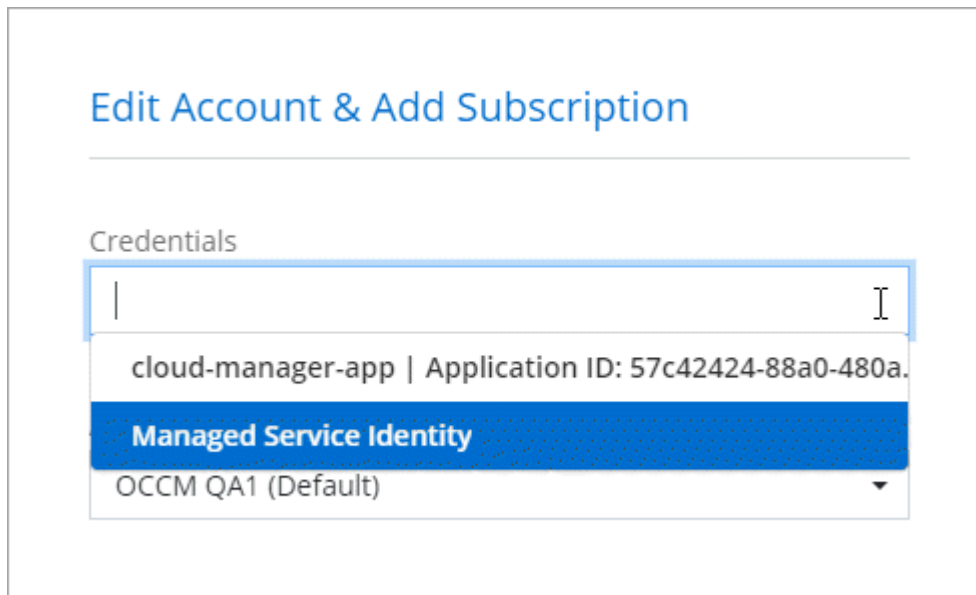
## Additional Azure credentials

If you want to use different Azure credentials with BlueXP, then you must grant the required permissions by [creating and setting up a service principal in Microsoft Entra ID](#) for each Azure account. The following image shows two additional accounts, each set up with a service principal and custom role that provides permissions:



You would then [add the account credentials to BlueXP](#) by providing details about the AD service principal.

For example, you can switch between credentials when creating a new Cloud Volumes ONTAP working environment:



## Credentials and marketplace subscriptions

The credentials that you add to a Connector must be associated with an Azure Marketplace subscription so that you can pay for Cloud Volumes ONTAP at an hourly rate (PAYGO) or through an annual contract, and to use other BlueXP services.

[Learn how to associate an Azure subscription.](#)

Note the following about Azure credentials and marketplace subscriptions:

- You can associate only one Azure Marketplace subscription with a set of Azure credentials
- You can replace an existing marketplace subscription with a new subscription

## FAQ

The following question is related to credentials and subscriptions.

### **Can I change the Azure Marketplace subscription for Cloud Volumes ONTAP working environments?**

Yes, you can. When you change the Azure Marketplace subscription that's associated with a set of Azure credentials, all existing and new Cloud Volumes ONTAP working environments will be charged against the new subscription.

[Learn how to associate an Azure subscription.](#)

### **Can I add multiple Azure credentials, each with different marketplace subscriptions?**

All Azure credentials that belong to the same Azure subscription will be associated with the same Azure Marketplace subscription.

If you have multiple Azure credentials that belong to different Azure subscriptions, then those credentials can be associated with the same Azure Marketplace subscription or with different marketplace subscriptions.

### **Can I move existing Cloud Volumes ONTAP working environments to a different Azure subscription?**

No, it's not possible to move the Azure resources associated with your Cloud Volumes ONTAP working environment to a different Azure subscription.

### **How do credentials work for marketplace deployments and on-prem deployments?**

The sections above describe the recommended deployment method for the Connector, which is from BlueXP. You can also deploy a Connector in Azure from the Azure Marketplace, and you can install the Connector software on your own Linux host.

If you use the Marketplace, you can provide permissions by assigning a custom role to the Connector VM and to a system-assigned managed identity, or you can use a Microsoft Entra service principal.

For on-premises deployments, you can't set up a managed identity for the Connector, but you can provide permissions by using a service principal.

To learn how to set up permissions, refer to the following pages:

- Standard mode
  - [Set up permissions for an Azure Marketplace deployment](#)
  - [Set up permissions for on-prem deployments](#)
- [Set up permissions for restricted mode](#)
- [Set up permissions for private mode](#)

# Manage Azure credentials and marketplace subscriptions for BlueXP

Add and manage Azure credentials so that BlueXP has the permissions that it needs to deploy and manage cloud resources in your Azure subscriptions. If you manage multiple Azure Marketplace subscriptions, you can assign each one of them to different Azure credentials from the Credentials page.

Follow the steps on this page if you need to use multiple Azure credentials or multiple Azure Marketplace subscriptions for Cloud Volumes ONTAP.

## Overview

There are two ways to add additional Azure subscriptions and credentials in BlueXP.

1. Associate additional Azure subscriptions with the Azure managed identity.
2. If you want to deploy Cloud Volumes ONTAP using different Azure credentials, grant Azure permissions using a service principal and add its credentials to BlueXP.

## Associate additional Azure subscriptions with a managed identity

BlueXP enables you to choose the Azure credentials and Azure subscription in which you want to deploy Cloud Volumes ONTAP. You can't select a different Azure subscription for the managed identity profile unless you associate the [managed identity](#) with those subscriptions.

### About this task

A managed identity is [the initial Azure account](#) when you deploy a Connector from BlueXP. When you deployed the Connector, BlueXP created the BlueXP Operator role and assigned it to the Connector virtual machine.

### Steps

1. Log in to the Azure portal.
2. Open the **Subscriptions** service and then select the subscription in which you want to deploy Cloud Volumes ONTAP.
3. Select **Access control (IAM)**.

- a. Select **Add > Add role assignment** and then add the permissions:

- Select the **BlueXP Operator** role.



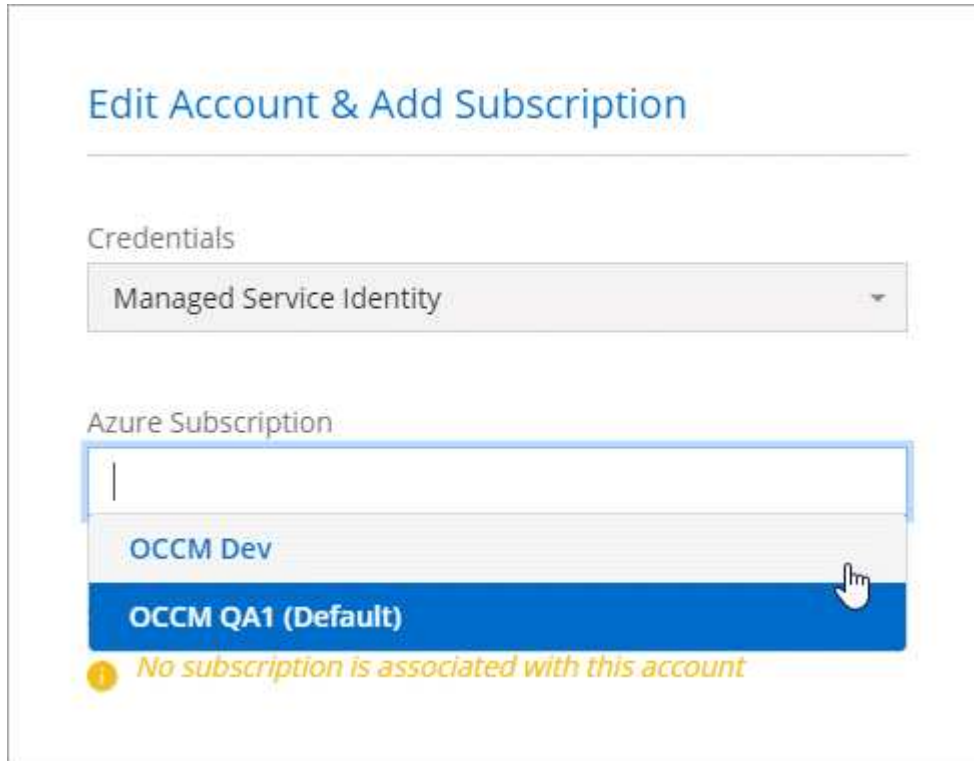
BlueXP Operator is the default name provided in the Connector policy. If you chose a different name for the role, then select that name instead.

- Assign access to a **Virtual Machine**.
- Select the subscription in which the Connector virtual machine was created.
- Select the Connector virtual machine.
- Select **Save**.

4. Repeat these steps for additional subscriptions.

### Result

When you create a new working environment, you should now have the ability to select from multiple Azure subscriptions for the managed identity profile.



**Edit Account & Add Subscription**

Credentials

Managed Service Identity

Azure Subscription

OCCM Dev

OCCM QA1 (Default)

**No subscription is associated with this account**

## Add additional Azure credentials to BlueXP

When you deploy a Connector from BlueXP, BlueXP enables a system-assigned managed identity on the virtual machine that has the required permissions. BlueXP selects these Azure credentials by default when you create a new working environment for Cloud Volumes ONTAP.



An initial set of credentials isn't added if you manually installed the Connector software on an existing system. [Learn about Azure credentials and permissions.](#)

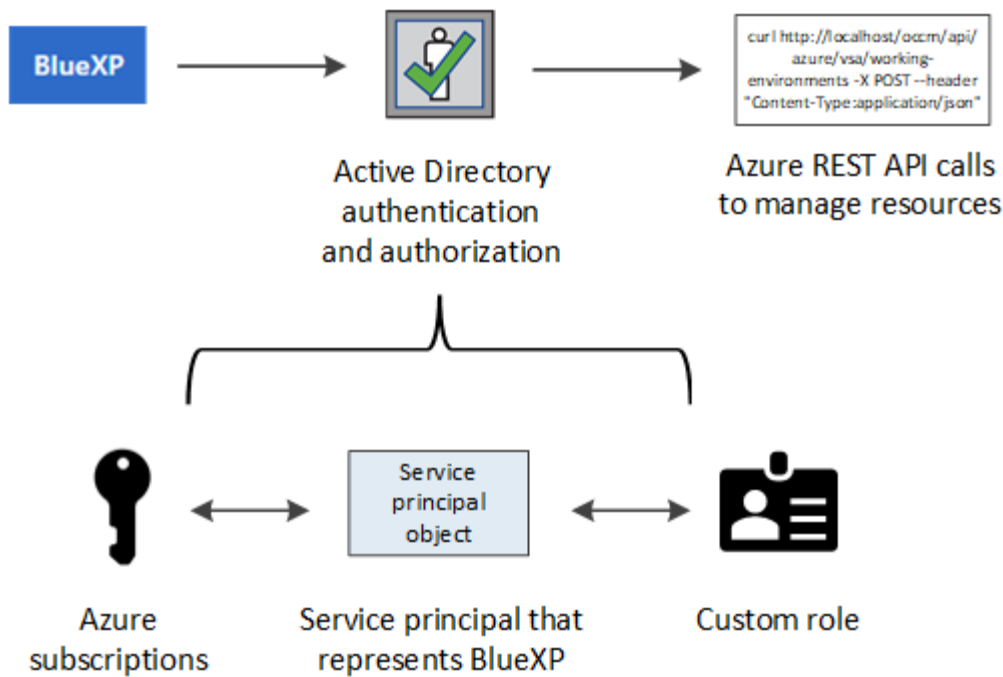
If you want to deploy Cloud Volumes ONTAP using *different* Azure credentials, then you must grant the required permissions by creating and setting up a service principal in Microsoft Entra ID for each Azure account. You can then add the new credentials to BlueXP.

### Grant Azure permissions using a service principal

BlueXP needs permissions to perform actions in Azure. You can grant the required permissions to an Azure account by creating and setting up a service principal in Microsoft Entra ID and by obtaining the Azure credentials that BlueXP needs.

#### About this task

The following image depicts how BlueXP obtains permissions to perform operations in Azure. A service principal object, which is tied to one or more Azure subscriptions, represents BlueXP in Microsoft Entra ID and is assigned to a custom role that allows the required permissions.



### Steps

1. [Create a Microsoft Entra application.](#)
2. [Assign the application to a role.](#)
3. [Add Windows Azure Service Management API permissions.](#)
4. [Get the application ID and directory ID.](#)
5. [Create a client secret.](#)

### Create a Microsoft Entra application

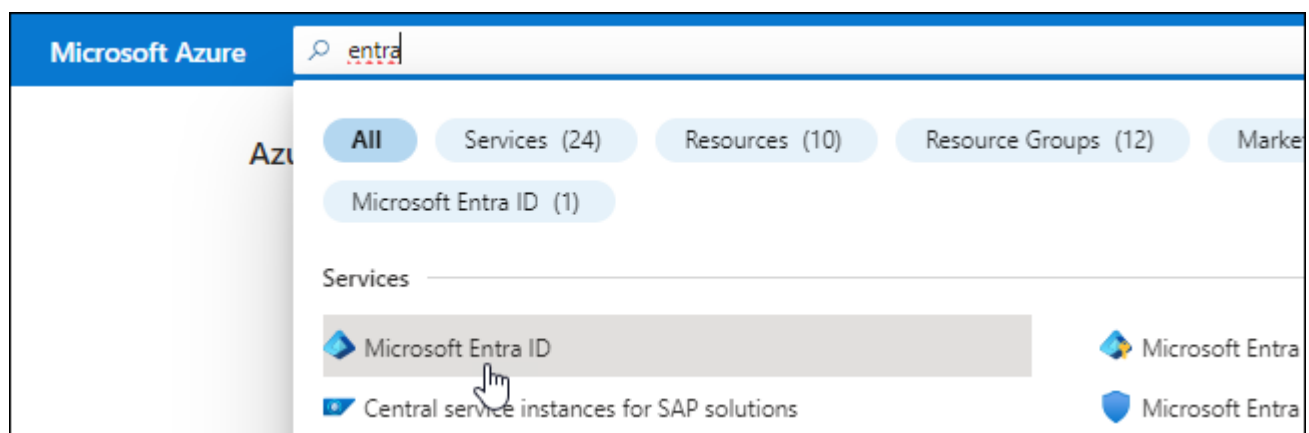
Create a Microsoft Entra application and service principal that BlueXP can use for role-based access control.

### Steps

1. Ensure that you have permissions in Azure to create an Active Directory application and to assign the application to a role.

For details, refer to [Microsoft Azure Documentation: Required permissions](#)

2. From the Azure portal, open the **Microsoft Entra ID** service.





3. In the menu, select **App registrations**.
4. Select **New registration**.
5. Specify details about the application:
  - **Name**: Enter a name for the application.
  - **Account type**: Select an account type (any will work with BlueXP).
  - **Redirect URI**: You can leave this field blank.
6. Select **Register**.

You've created the AD application and service principal.

## Result

You've created the AD application and service principal.

## Assign the application to a role

You must bind the service principal to one or more Azure subscriptions and assign it the custom "BlueXP Operator" role so BlueXP has permissions in Azure.

## Steps

1. Create a custom role:

Note that you can create an Azure custom role using the Azure portal, Azure PowerShell, Azure CLI, or REST API. The following steps show how to create the role using the Azure CLI. If you would prefer to use a different method, refer to [Azure documentation](#)

- a. Copy the contents of the [custom role permissions for the Connector](#) and save them in a JSON file.
- b. Modify the JSON file by adding Azure subscription IDs to the assignable scope.

You should add the ID for each Azure subscription from which users will create Cloud Volumes ONTAP systems.

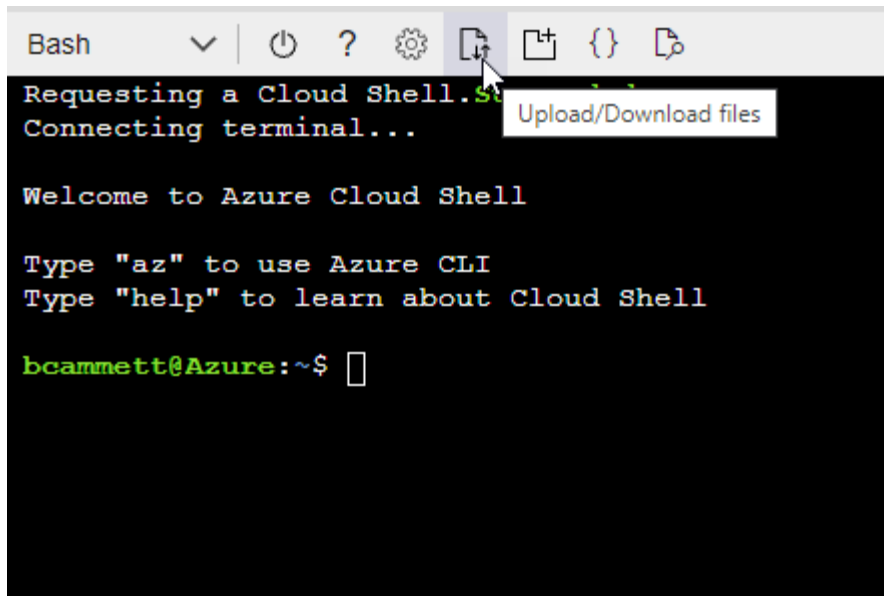
## Example

```
"AssignableScopes": [  
  "/subscriptions/d333af45-0d07-4154-943d-c25fbzzzzzzz",  
  "/subscriptions/54b91999-b3e6-4599-908e-416e0zzzzzzz",  
  "/subscriptions/398e471c-3b42-4ae7-9b59-ce5bbzzzzzzz"
```

- c. Use the JSON file to create a custom role in Azure.

The following steps describe how to create the role by using Bash in Azure Cloud Shell.

- Start [Azure Cloud Shell](#) and choose the Bash environment.
- Upload the JSON file.



- Use the Azure CLI to create the custom role:

```
az role definition create --role-definition Connector_Policy.json
```

You should now have a custom role called BlueXP Operator that you can assign to the Connector virtual machine.

2. Assign the application to the role:

- a. From the Azure portal, open the **Subscriptions** service.
- b. Select the subscription.
- c. Select **Access control (IAM) > Add > Add role assignment**.
- d. In the **Role** tab, select the **BlueXP Operator** role and select **Next**.
- e. In the **Members** tab, complete the following steps:
  - Keep **User, group, or service principal** selected.
  - Select **Select members**.

**Add role assignment** ...

[Got feedback?](#)

Role **Members** Review + assign

**Selected role** Cloud Manager Operator 3.9.12\_B

**Assign access to** ☒ User, group, or service principal ☐ Managed identity

**Members** [+ Select members](#)

- Search for the name of the application.

Here's an example:

**Select members** ✕

Select ⓘ

test-service-principal

test-service-principal

- Select the application and select **Select**.
- Select **Next**.

f. Select **Review + assign**.

The service principal now has the required Azure permissions to deploy the Connector.

If you want to deploy Cloud Volumes ONTAP from multiple Azure subscriptions, then you must bind the service principal to each of those subscriptions. BlueXP enables you to select the subscription that you want to use when deploying Cloud Volumes ONTAP.

### Add Windows Azure Service Management API permissions

The service principal must have "Windows Azure Service Management API" permissions.

### Steps

1. In the **Microsoft Entra ID** service, select **App registrations** and select the application.
2. Select **API permissions > Add a permission**.
3. Under **Microsoft APIs**, select **Azure Service Management**.


## Request API permissions


### Select an API


Microsoft APIs   [APIs my organization uses](#)   [My APIs](#)


#### Commonly used Microsoft APIs


**Microsoft Graph**  
Take advantage of the tremendous amount of data in Office 365, Enterprise Mobility + Security, and Windows 10. Access Azure AD, Excel, Intune, Outlook/Exchange, OneDrive, OneNote, SharePoint, Planner, and more through a single endpoint.





**Azure Batch**  
Schedule large-scale parallel and HPC applications in the cloud


**Azure Data Catalog**  
Programmatic access to Data Catalog resources to register, annotate and search data assets


**Azure Data Explorer**  
Perform ad-hoc queries on terabytes of data to build near real-time and complex analytics solutions


**Azure Data Lake**  
Access to storage and compute for big data analytic scenarios


**Azure DevOps**  
Integrate with Azure DevOps and Azure DevOps server


**Azure Import/Export**  
Programmatic control of import/export jobs


**Azure Key Vault**  
Manage your key vaults as well as the keys, secrets, and certificates within your Key Vaults

**Azure Rights Management Services**  
Allow validated users to read and write protected content

**Azure Service Management**  
Programmatic access to much of the functionality available through the Azure portal

**Azure Storage**  
Secure, massively scalable object and data lake storage for unstructured and semi-structured data

**Customer Insights**  
Create profile and interaction models for your products

**Data Export Service for Microsoft Dynamics 365**  
Export data from Microsoft Dynamics CRM organization to an external destination

4. Select **Access Azure Service Management as organization users** and then select **Add permissions**.

## Request API permissions

[← All APIs](#)



Azure Service Management

<https://management.azure.com/> [Docs](#) [↗](#)

What type of permissions does your application require?

### Delegated permissions

Your application needs to access the API as the signed-in user.

### Application permissions

Your application runs as a background service or daemon without a signed-in user.

Select permissions

[expand all](#)

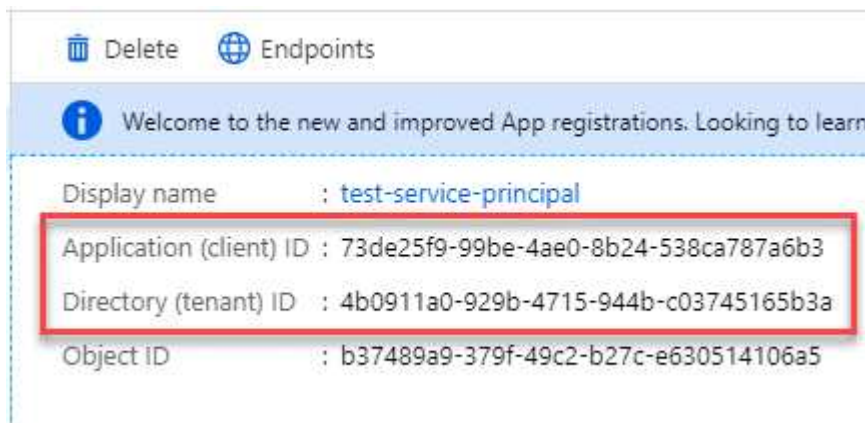
Type to search	
PERMISSION	ADMIN CONSENT REQUIRED
<input checked="" type="checkbox"/> <b>user_impersonation</b> Access Azure Service Management as organization users (preview) ⓘ	-

## Get the application ID and directory ID

When you add the Azure account to BlueXP, you need to provide the application (client) ID and the directory (tenant) ID for the application. BlueXP uses the IDs to programmatically sign in.

### Steps

1. In the **Microsoft Entra ID** service, select **App registrations** and select the application.
2. Copy the **Application (client) ID** and the **Directory (tenant) ID**.



When you add the Azure account to BlueXP, you need to provide the application (client) ID and the directory (tenant) ID for the application. BlueXP uses the IDs to programmatically sign in.

## Create a client secret

You need to create a client secret and then provide BlueXP with the value of the secret so BlueXP can use it to authenticate with Microsoft Entra ID.

### Steps

1. Open the **Microsoft Entra ID** service.

2. Select **App registrations** and select your application.
3. Select **Certificates & secrets > New client secret**.
4. Provide a description of the secret and a duration.
5. Select **Add**.
6. Copy the value of the client secret.

#### Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

<a href="#">+ New client secret</a>		
DESCRIPTION	EXPIRES	VALUE
test secret	8/16/2020	*sZ1jSe2By:D*-ZR0V4NLfdAcY7:+0vA

Copy to clipboard

You now have a client secret that BlueXP can use it to authenticate with Microsoft Entra ID.

### Result

Your service principal is now setup and you should have copied the application (client) ID, the directory (tenant) ID, and the value of the client secret. You need to enter this information in BlueXP when you add an Azure account.

### Add the credentials to BlueXP

After you provide an Azure account with the required permissions, you can add the credentials for that account to BlueXP. Completing this step enables you to launch Cloud Volumes ONTAP using different Azure credentials.

#### Before you begin

If you just created these credentials in your cloud provider, it might take a few minutes until they are available for use. Wait a few minutes before you add the credentials to BlueXP.

#### Before you begin

You need to create a Connector before you can change BlueXP settings. [Learn how to create a Connector](#).

### Steps

1. In the upper right of the BlueXP console, select the Settings icon, and select **Credentials**.

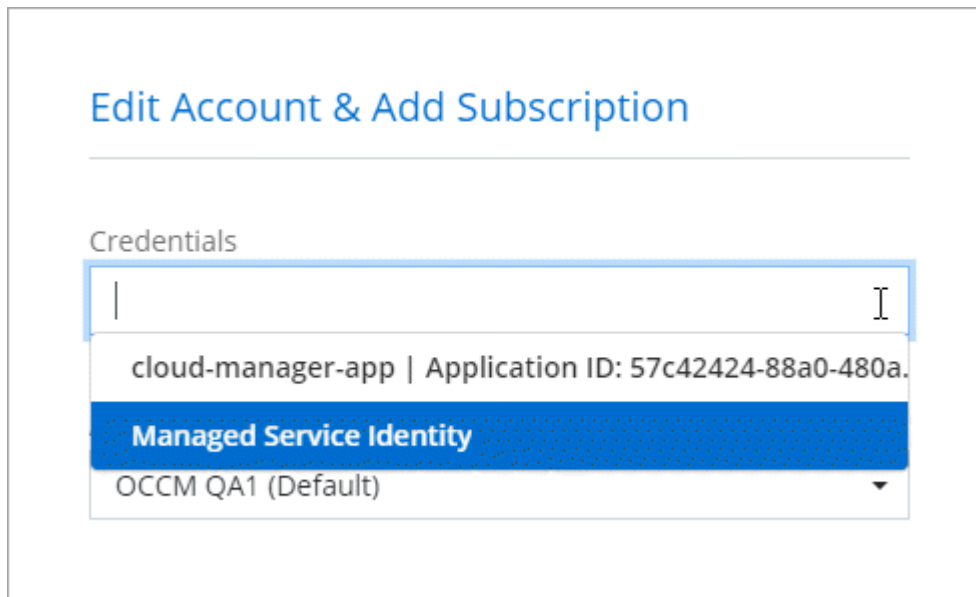


2. Select **Add Credentials** and follow the steps in the wizard.
  - a. **Credentials Location:** Select **Microsoft Azure > Connector**.
  - b. **Define Credentials:** Enter information about the Microsoft Entra service principal that grants the required permissions:
    - Application (client) ID

- Directory (tenant) ID
- Client Secret
- c. **Marketplace Subscription:** Associate a Marketplace subscription with these credentials by subscribing now or by selecting an existing subscription.
- d. **Review:** Confirm the details about the new credentials and select **Add**.

## Result

You can now switch to different set of credentials from the Details and Credentials page [when creating a new working environment](#)



## Manage existing credentials

Manage the Azure credentials that you've already added to BlueXP by associating a Marketplace subscription, editing credentials, and deleting them.

### Associate an Azure Marketplace subscription to credentials

After you add your Azure credentials to BlueXP, you can associate an Azure Marketplace subscription to those credentials. The subscription enables you to create a pay-as-you-go Cloud Volumes ONTAP system, and to use other BlueXP services.

There are two scenarios in which you might associate an Azure Marketplace subscription after you've already added the credentials to BlueXP:

- You didn't associate a subscription when you initially added the credentials to BlueXP.
- You want to change the Azure Marketplace subscription that is associated with Azure credentials.

Replacing the current marketplace subscription with a new subscription changes the marketplace subscription for any existing Cloud Volumes ONTAP working environments and all new working environments.

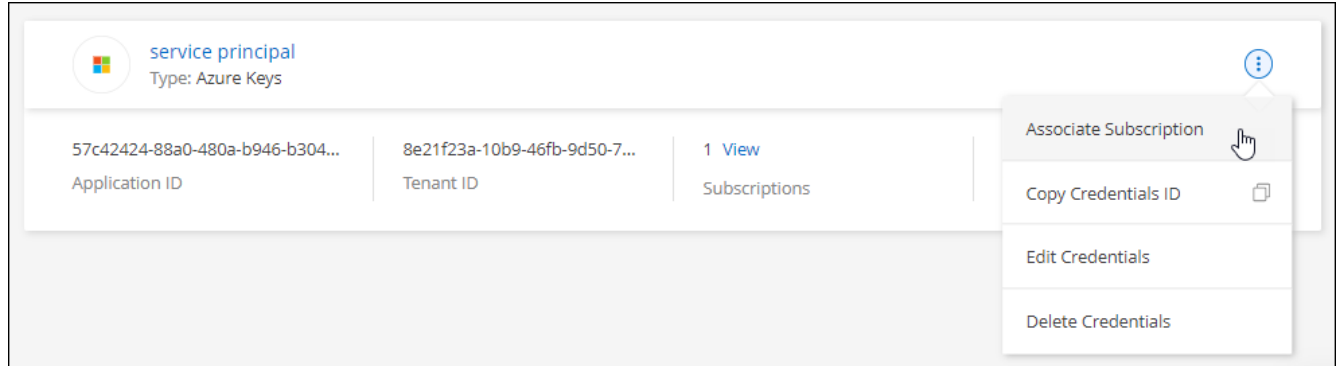
### Before you begin

You need to create a Connector before you can change BlueXP settings. [Learn how](#).

## Steps

1. In the upper right of the BlueXP console, select the Settings icon, and select **Credentials**.
2. Select the action menu for a set of credentials and then select **Associate Subscription**.

You must select credentials that are associated with a Connector. You can't associate a marketplace subscription with credentials that are associated with BlueXP.



3. To associate the credentials with an existing subscription, select the subscription from the down-down list and select **Associate**.
4. To associate the credentials with a new subscription, select **Add Subscription > Continue** and follow the steps in the Azure Marketplace:
  - a. If prompted, log in to your Azure account.
  - b. Select **Subscribe**.
  - c. Fill out the form and select **Subscribe**.
  - d. After the subscription process is complete, select **Configure account now**.

You'll be redirected to the BlueXP website.

- e. From the **Subscription Assignment** page:
  - Select the BlueXP accounts that you'd like to associate this subscription with.
  - In the **Replace existing subscription** field, choose whether you'd like to automatically replace the existing subscription for one account with this new subscription.

BlueXP replaces the existing subscription for all credentials in the account with this new subscription. If a set of credentials wasn't ever associated with a subscription, then this new subscription won't be associated with those credentials.

For all other accounts, you'll need to manually associate the subscription by repeating these steps.

- Select **Save**.

The following video shows the steps to subscribe from the Azure Marketplace:

[Subscribe to BlueXP from the Azure Marketplace](#)

## Edit credentials

Edit your Azure credentials in BlueXP by modifying the details about your Azure service credentials. For example, you might need to update the client secret if a new secret was created for the service principal



application.

### Steps

1. In the upper right of the BlueXP console, select the Settings icon, and select **Credentials**.
2. On the **Account credentials** page, select the action menu for a set of credentials and then select **Edit Credentials**.
3. Make the required changes and then select **Apply**.

### Delete credentials

If you no longer need a set of credentials, you can delete them from BlueXP. You can only delete credentials that aren't associated with a working environment.

### Steps

1. In the upper right of the BlueXP console, select the Settings icon, and select **Credentials**.
2. On the **Account credentials** page, select the action menu for a set of credentials and then select **Delete Credentials**.
3. Select **Delete** to confirm.

## Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

## Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.