



# **BlueXP workload factory for VMware documentation**

## VMware workloads

NetApp  
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# **BlueXP workload factory for VMware documentation**

# Release notes

## What's new with BlueXP workload factory for VMware

Learn what's new with the VMware migration advisor component of workload factory.

### 3 August 2025

#### Improved migration advisor support for Amazon Elastic VMWare Service

The Amazon Elastic VMware Service migration advisor now supports automatic deployment and mounting of your Amazon FSx for NetApp ONTAP filesystem. This enables you to begin deploying your VMs on FSx for ONTAP filesystems when migration to the Amazon EVS environment is complete.

[Create a deployment plan for Amazon EVS using the migration advisor](#)

#### Calculate cost savings of migrating to Amazon Elastic VMware Service

You can now explore the potential savings for migrating your VMware workloads to Amazon Elastic VMware Service (EVS). The savings calculator enables you to compare costs of using Amazon EVS with and without Amazon FSx for NetApp ONTAP as underlying storage. The calculator displays potential savings in real-time as you adjust characteristics of your environment.

[Explore savings for Amazon Elastic VMware Service with BlueXP workload factory](#)

### 29 June 2025

#### Introducing migration advisor support for Amazon Elastic VMWare Service

BlueXP workload factory for VMware now supports Amazon Elastic VMware Service. You can rapidly migrate your on-premises VMware workloads to Amazon Elastic VMware Service using the migration advisor, optimizing cost and enabling more control over your VMware environment without needing to refactor or re-platform your applications.

[Create a deployment plan for Amazon EVS using the migration advisor](#)

### 4 May 2025

#### Amazon EC2 migration advisor improvements

This release of BlueXP workload factory for VMware features the following improvement to the Amazon EC2 migration advisor experience:

**NetApp Data Infrastructure Insights as a data source:** Workload factory now connects directly with NetApp Data Infrastructure Insights to gather VMWare deployment information when you use the EC2 migration advisor data collector.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

#### Updated permissions terminology

The workload factory user interface and documentation now use "read-only" to refer to read permissions and

"read/write" to refer to automate permissions.

## 30 March 2025

### Amazon EC2 migration advisor improvements

This release of BlueXP workload factory for VMware features several improvements to the Amazon EC2 migration advisor experience:

- **Enhanced volume assignment guidance:** The volume assignment information in the EC2 migration advisor "Classify" and "Package" steps features enhanced readability and usability. More useful information is displayed about each volume, enabling you to better identify volumes and determine how to assign them.
- **Data collector script efficiency improvements:** The EC2 migration advisor data collector script optimizes CPU usage when collecting data for smaller VM deployments.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

## 2 March 2025

### Amazon EC2 migration advisor improvements

This release of BlueXP workload factory for VMware features several improvements to the Amazon EC2 migration advisor experience:

- **Estimated instance type:** Migration advisor can now examine requirements of your environment and provide an estimated Amazon EC2 instance type for each VM. You can choose to include the estimated instance type for each VM during the Scope step of the migration advisor.
- **Ability to recommend Amazon EBS volumes:** The migration advisor can now recommend migrating data volumes to Amazon Elastic Block Store (EBS) instead of Amazon FSx for NetApp ONTAP due to specific capacity or performance needs of a certain region.
- **Enhanced filesystem auto assignment:** Amazon FSx for NetApp ONTAP filesystem assignment has been improved to better optimize cost and minimize throughput.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

## 5 January 2025

### Amazon EC2 migration advisor improvements

This release of BlueXP workload factory for VMware features several improvements to the migration advisor experience:

- **Save or download a migration plan:** You can now save or download a migration plan, and load the migration plan to populate the migration advisor. When you save a migration plan, the plan is saved with your workload factory account.
- **Improved VM selection:** BlueXP workload factory for VMware now supports filtering and searching the list of VMs that you want to include in your migration deployment.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

## 1 December 2024

### Amazon EC2 migration advisor improvements

This release of BlueXP workload factory for VMware features several improvements to the migration advisor experience:

- **Data collection:** BlueXP workload factory for VMware supports the ability to collect data for a specific time period when you use the migration advisor.
- **VM selection:** BlueXP workload factory for VMware now supports selecting VMs that you want to include in your migration deployment.
- **Quick vs. Advanced experience:** When you use the migration advisor, you can now choose a quick migration experience, using RVtools, or the advanced experience, which uses the migration advisor data collector.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

## 3 November 2024

### VMware migration advisor data reduction ratio help

This release of Workload Factory for VMware features a data reduction ratio assistant. The data reduction ratio assistant helps you decide which ratio is best for your VMware inventory and storage estate when preparing for AWS cloud onboarding.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

## 19 September 2024

### VMware migration advisor enhancements

This release of workload factory for VMware features functionality and stability enhancements as well as the ability to import and export migration plans when using the VMware migration advisor.

[Create a deployment plan for Amazon EC2 using the migration advisor](#)

## 1 September 2024

### Migrate to Amazon EC2

Workload factory for VMware now supports migration to Amazon EC2 using the VMware migration advisor.

## 7 July 2024

### Initial release of workload factory for VMware

The initial release includes the capability to use the VMware migration advisor to analyze your current virtual machine configurations in on-premises vSphere environments and generate a plan to deploy recommended VM layouts to VMware Cloud on AWS and use customized Amazon FSx for NetApp ONTAP file systems as external datastores.

# Get started

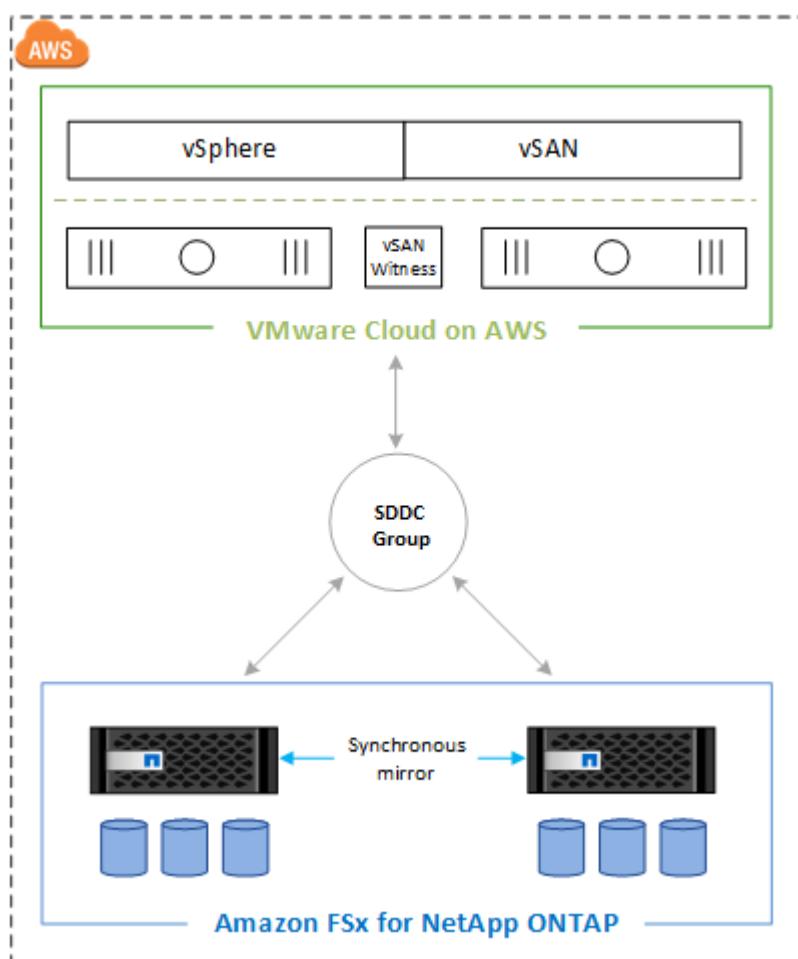
## Learn about BlueXP workload factory for VMware

BlueXP workload factory for VMware provides tools to move your data from on-premises systems to either VMware Cloud on AWS (VMC) or Amazon EC2.

### What is BlueXP workload factory for VMware?

BlueXP workload factory for VMware provides a migration advisor that enables you to analyze your current virtual machine configurations in on-premises vSphere environments. The migration advisor then generates a plan to deploy recommended VM layouts to Amazon EC2 or VMware Cloud on AWS vSphere clusters and use customized Amazon FSx for NetApp ONTAP file systems as external datastores.

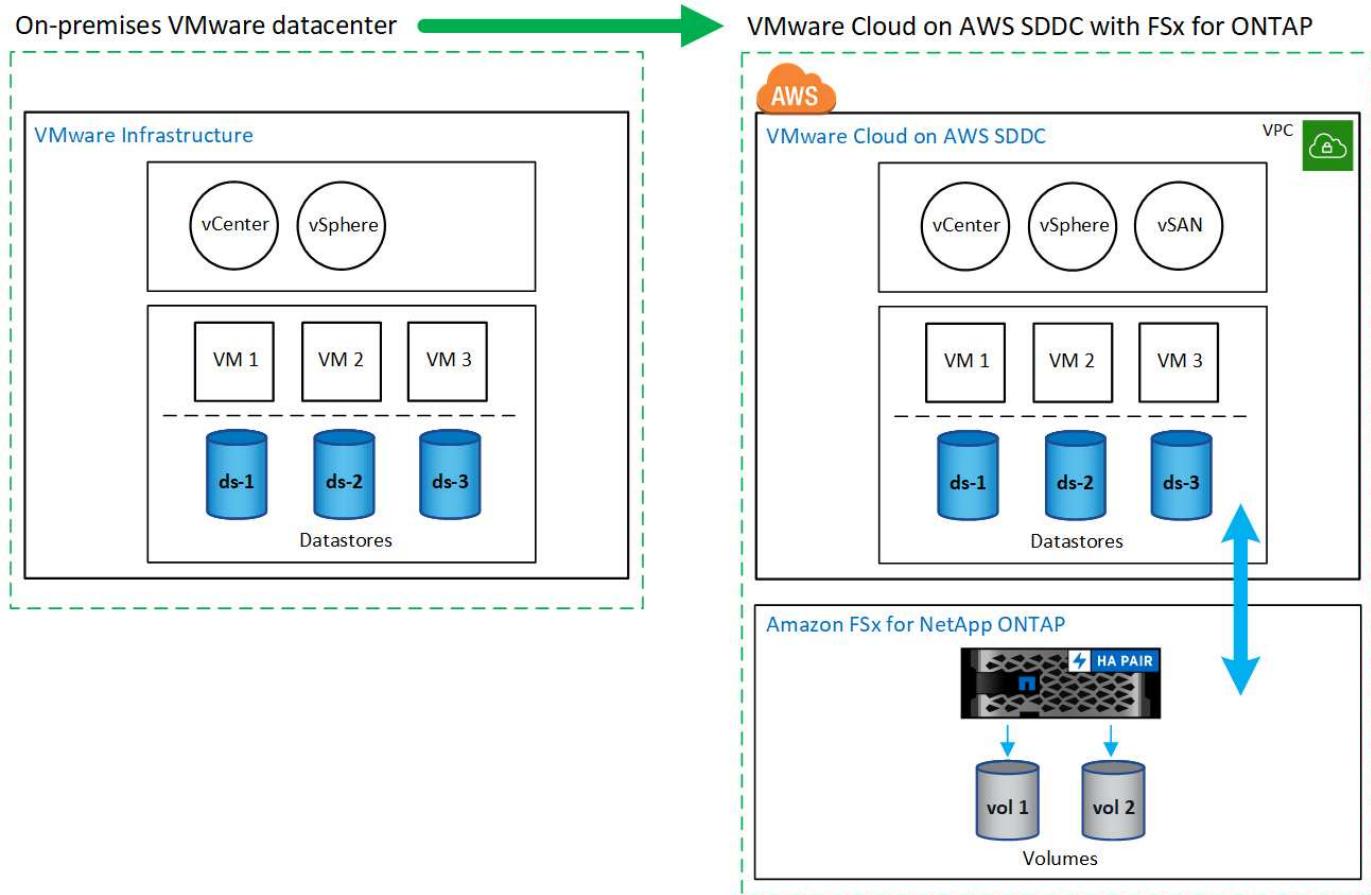
Amazon FSx for NetApp ONTAP is an external NFS datastore built on NetApp's ONTAP file system that can be attached to Amazon EC2 instances or VMware Cloud on AWS vSphere clusters. There is no need to add more hosts to increase available storage; instead, just use FSx for ONTAP volumes as external datastores to complement vSAN datastores. This provides you with a flexible, high-performance, virtualized storage infrastructure that scales independently of compute resources.



For more information about workload factory, refer to the [workload factory overview](#).

## How the VMware migration advisor works

The migration advisor can help you move on-premises virtual machines (VMs) and their data, running on any VMware supported datastores, to either Amazon EC2 or VMware Cloud datastores, which includes supplemental NFS datastores on an FSx for ONTAP file system.



Note that you can attach up to four (4) FSx for ONTAP volumes to a single vSphere cluster on VMware Cloud on AWS.

## What you can do with the migration advisor

The migration advisor provides the following functionality:

- Analyze current on-premises VM configurations
- Determine which VMs to migrate to Amazon EC2 or VMware Cloud on AWS
- Identify the space required on FSx for ONTAP volumes to be used as VM external datastores
- Review resulting report to understand the deployment steps
- Perform the actual deployment

The migration advisor supports configuration planning for a single Amazon EC2 instance or VMware Cloud on AWS cluster connected to a single FSx for ONTAP file system.

## Benefits of using the migration advisor

Transitioning parts of your current infrastructure to Amazon EC2 or VMware Cloud on AWS using Amazon FSx

for ONTAP as external NFS datastores provides the following benefits:

- Cost optimization due to host and storage decoupling and advanced data efficiency
- Ability to grow the storage capacity as needed without the need to purchase additional host instances
- NetApp ONTAP data management capabilities in the cloud, such as space efficient snapshots, cloning, compression, deduplication, compaction, and replication
- Reduction in management of hardware refreshes
- Ability to change data throughput, IOPS, and the size of the file system in addition to increase or decrease the size of volumes
- High availability supporting multiple Availability Zone (AZ) deployments
- Cost and latency reduction from single-AZ configurations that use VPC peering without requiring a Transit Gateway

## Tools to use workload factory

You can use BlueXP workload factory with the following tools:

- **Workload factory console:** The workload factory console provides a visual, holistic view of your applications and projects.
- **BlueXP console:** The BlueXP console provides a hybrid interface experience so that you can use BlueXP workload factory along with other BlueXP services.
- **Ask me:** Use the Ask me AI assistant to ask questions and learn more about workload factory without leaving the workload factory web UI. Access Ask me from the workload factory help menu.
- **CloudShell CLI:** Workload factory includes a CloudShell CLI to manage and operate AWS and NetApp environments across accounts from a single, browser-based CLI. Access CloudShell from the top bar of the workload factory console.
- **REST API:** Use the workload factory REST APIs to deploy and manage your FSx for ONTAP file systems and other AWS resources.
- **CloudFormation:** Use AWS CloudFormation code to perform the actions you defined in the workload factory console to model, provision, and manage AWS and third-party resources from the CloudFormation stack in your AWS account.
- **Terraform BlueXP workload factory provider:** Use Terraform to build and manage infrastructure workflows generated in the workload factory console.

## Cost

There is no cost for using the VMware migration advisor.

You'll need to pay for AWS resources that you deploy based on the recommendations from the migration advisor.

## Licensing

No special licenses are needed from NetApp to use the migration advisor.

# Quick start for migrating to Amazon EVS using the VMware workloads migration advisor

Get started with the VMware migration advisor to move your current infrastructure to Amazon EVS using Amazon FSx for ONTAP as external NFS datastores.

Before you get started, you should have an understanding of [operational modes](#).

1

## Log in to workload factory

You'll need to [set up an account with workload factory](#) and log in using one of the [console experiences](#).

2

## Add AWS credentials and permissions to your account

You can use workload factory in *Basic* mode without adding credentials to access your AWS account. Adding AWS credentials to workload factory in either *read-only* or *read/write* mode gives your workload factory account the permissions needed to create and manage FSx for ONTAP file systems, and to deploy and manage workloads within Amazon EC2.

[Learn how to add credentials and permissions.](#)

3

## Create a deployment plan using the VMware migration advisor

Launch the VMware migration advisor and manually configure the VM environment you want to create on Amazon Elastic VMWare Service infrastructure using an Amazon FSx for ONTAP file system as external NFS datastores.

[Learn how to use the VMware migration advisor to create a deployment plan.](#)

4

## Deploy the recommended FSx for ONTAP file system

Deploy the new FSx for ONTAP file system that will provide the datastores for your VMs in your Amazon EC2 infrastructure.

[Learn how to deploy your new FSx for ONTAP file system.](#)

# Quick start for migrating to Amazon EC2 using the VMware workloads migration advisor

Get started with the VMware migration advisor to move your current infrastructure to Amazon EC2 using Amazon FSx for ONTAP as external NFS datastores.

Before you get started, you should have an understanding of [operational modes](#).

1

## Log in to workload factory

You'll need to [set up an account with workload factory](#) and log in using one of the [console experiences](#).

**2**

## Add AWS credentials and permissions to your account

You can use workload factory in *Basic* mode without adding credentials to access your AWS account. Adding AWS credentials to workload factory in either *read-only* or *read/write* mode gives your workload factory account the permissions needed to create and manage FSx for ONTAP file systems, and to deploy and manage workloads within Amazon EC2.

[Learn how to add credentials and permissions.](#)

**3**

## Capture your current VM configurations in your vSphere environment

You can use the Migration advisor VM collector script, RVTools, or NetApp Data Infrastructure Insights to capture your current VM configurations before creating a deployment plan. You can also import an existing deployment plan as a template and then modify any required attributes.

[Learn how to capture your current VM configurations.](#)

**4**

## Create a deployment plan using the VMware migration advisor

Launch the VMware migration advisor and select the VMs that you want to migrate to Amazon EC2 infrastructure using an Amazon FSx for ONTAP file system as external NFS datastores. You can make some modifications before you save the plan.

[Learn how to use the VMware migration advisor to create a deployment plan.](#)

**5**

## Deploy the recommended FSx for ONTAP file system

Deploy the new FSx for ONTAP file system that will provide the datastores for your VMs in your Amazon EC2 infrastructure.

[Learn how to deploy your new FSx for ONTAP file system.](#)

# Quick start for migrating to VMware Cloud on AWS using the VMware workloads migration advisor

Get started with the VMware migration advisor to move your current infrastructure to VMware Cloud on AWS using Amazon FSx for ONTAP as external NFS datastores.

Before you get started, you should have an understanding of [operational modes](#).

**1**

## Log in to workload factory

You'll need to [set up an account with workload factory](#) and log in using one of the [console experiences](#).

**2**

## Add AWS credentials and permissions to your account

You can use workload factory in *Basic* mode without adding credentials to access your AWS account. Adding AWS credentials to workload factory in either *read-only* or *read/write* mode gives your workload factory account

the permissions needed to create and manage FSx for ONTAP file systems, and to deploy and manage workloads within VMware Cloud.

[Learn how to add credentials and permissions.](#)

**3**

### **Capture your current VM configurations in your vSphere environment**

You can use the Migration advisor VM collector script or RVTools to capture your current VM configurations in order to create a deployment plan. You can also import an existing deployment plan as a template and then modify any required attributes.

[Learn how to capture your current VM configurations.](#)

**4**

### **Create a deployment plan using the VMware migration advisor**

Launch the VMware migration advisor and select the VMs that you want to migrate to the new VMware Cloud on AWS infrastructure using an Amazon FSx for ONTAP file system as external NFS datastores. You can make some modifications before you save the plan.

[Learn how to use the VMware migration advisor to create a deployment plan.](#)

**5**

### **Deploy the recommended FSx for ONTAP file system**

Deploy the new FSx for ONTAP file system that will provide the datastores for your VMs in your VMware Cloud on AWS infrastructure.

[Learn how to deploy your new FSx for ONTAP file system.](#)

**6**

### **Connect your FSx for ONTAP file systems to VMware Cloud on AWS**

Your Software-Defined Data Center (SDDC) offers network options for connecting to the FSx for ONTAP file system by using the VPC Peering capability to extend network connectivity to the external NFS storage volumes.

[Learn how to connect your FSx for ONTAP file systems.](#)

**7**

### **Migrate data from your old systems to your new FSx for ONTAP file systems**

Use an external tool such as VMware HCX (Hybrid Cloud Extension) to move your data from your old virtual machine storage to the FSx for NetApp ONTAP volumes connected to your new virtual machines.

[Learn more about migrating your data.](#)

# Use the VMware migration advisor

## Migrate to Amazon Elastic VMware Service

### Explore savings for Amazon Elastic VMware Service with BlueXP workload factory

Explore potential savings for migrating your VMware workloads to Amazon Elastic VMware Service (EVS). The calculator enables you to compare costs of using Amazon EVS with and without Amazon FSx for NetApp ONTAP as storage.

If the savings calculator determines that the most cost-effective storage is FSx for ONTAP, you can create a detailed assessment, which provides a migration plan that you can review before using. You can then use the Codebox to generate Infrastructure-as-Code templates.

#### Explore savings for EVS environments

Follow these steps to explore potential savings for a planned migration to an Amazon EVS environment.



Before proceeding, review the disclaimer at the bottom of the savings calculator to understand more about how the pricing estimates are calculated.

#### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Explore savings** and then **Amazon Elastic VMware Service (EVS)**. The savings calculator is displayed.

The **Environment preferences** pane provides sliders that you can adjust depending on your environment's needs.

3. Adjust the following sliders as needed to see real-time savings calculations for the values that you choose. If using a keyboard, you can make small adjustments using the arrow keys:
  - a. **Required physical CPU (count)**
  - b. **Required physical memory (GiB)**
  - c. **Required VM storage (TiB)**
  - d. **EVS billing plan**
4. Do one of the following:
  - To use the migration advisor to [create a deployment plan](#) for an Amazon EVS environment, select **Create a detailed assessment**.
  - Select **Close** to close the TCO calculator.

### Create a deployment plan for Amazon EVS using the VMware workloads migration advisor

Log in to the NetApp workload factory to access the VMware migration advisor. You'll follow the steps in the wizard to create a deployment plan or migration plan that is customized for your needs.

Note that you must have a user name and password to access workload factory. If you don't have access, create an account now. See the instructions [here](#).

## Create a deployment plan by manually specifying environment requirements

You can manually specify your requirements for virtual machines in Amazon Elastic VMware Service and use customized Amazon FSx for NetApp ONTAP file systems as external datastores.

### Requirements

- You must have an Amazon Elastic VMware Service subscription.

### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. Optionally, if you accessed workload factory from the Workload Factory console, from the VMware workloads tile, select **Plan and create** and then select **Amazon Elastic VMware service**. The VMware migration advisor splash screen is displayed.
3. Select the **Amazon Elastic VMware service** tile.
4. When ready, select **Let's start**.
5. Enter the requirements for your VM environment.

Keep in mind the following VM migration performance requirements and recommendations:



- A minimum storage capacity of 10TiB is recommended for the VM inventory for performance reasons.
- A minimum throughput is required for the Amazon Elastic VMware Service datastores, depending on the required number of IOPS you specify for this deployment.
- Depending on the FSx for ONTAP filesystem configuration, a minimum number of external datastores is required for the Amazon Elastic VMware Service environment to reach optimal performance.

6. When ready, select **Next** to review the migration plan.
7. Review the plan. Expand each section to view the plan details.
8. Optionally, when you are satisfied with the migration plan, you can save it as a template or a PDF:
  - Select **Export plan** to save the migration plan as a template in a `.json` format on your computer. You can import the plan at a later time to use as a template when deploying systems with similar requirements.
  - Select **Download plan** to download the deployment plan in a `.pdf` format so you can distribute the plan for review.
9. [Deploy the VMware workloads recommended FSx for ONTAP file system](#).

## Deploy the recommended FSx for ONTAP file system

After you verify that the recommended FSx for ONTAP file system (or multiple file systems in some cases) meets your exact requirements, you can use workload factory to deploy the system in your AWS environment.

Depending on the policy and permissions that you added to your workload factory account, you can deploy the FSx for ONTAP file system completely using workload factory (using read/write mode). If you have fewer

permissions (read-only mode), or no permissions (Basic mode), you'll need to use the CloudFormation template from the Codebox and deploy the FSx for ONTAP file system yourself in AWS.

## Requirements for deployments to Amazon Elastic VMware Service

- You must have an Amazon Elastic VMware Service subscription.
- You must have the necessary permissions to create an FSx for ONTAP file system in your AWS account.

## Steps

1. At the bottom of the **Review plan** page, select **Deploy** and the Create an FSx for ONTAP file system page is displayed.

Most of the fields that define your FSx for ONTAP file system are completed based on the information you provided, but there are a few fields that you need to complete in this page.

You can use the Quick create or Advanced create option. Advanced create offers a few additional storage parameters that you can customize. [See what these two options offer.](#)

2. In the "File system general configuration" section, enter the following information:
  - AWS credentials:** Select or add credentials that will give workload factory the permissions necessary to create your FSx for ONTAP file system directly. You can also select the CloudFormation code from Codebox and deploy the FSx for ONTAP file system yourself in AWS.
  - File system name:** Enter the name that you want to use for this FSx for ONTAP file system.
  - Tags:** Optionally, you can add tags to categorize this FSx for ONTAP file system.
3. In the "Network & security" section, enter the following information:
  - Region & VPC:** Select the region and the VPC where the FSx for ONTAP file system will be deployed.
  - Security group (Advanced create only):** When using the **Advanced create** option, you can select the default security group for the FSx for ONTAP VPC so that all traffic can access the FSx for ONTAP file system. You can either create a new security group or select an existing one.

If you enable the **Adjust security group configuration to EVS NFS datastores** option, workload factory configures the security group according to the settings for EVS NFS datastores.

You can add an inbound rule to the security group that restricts what other AWS services can access the FSx for ONTAP file system. This will reduce the number of services that are open. These are the minimum ports and protocols:

Protocols	Ports	Purpose
TCP, UDP	111	Portmapper (used to negotiate which ports are used in NFS requests)
TCP, UDP	635	NFS mountd (receives NFS mount requests)
TCP, UDP	2049	NFS network traffic
TCP, UDP	4045	Network Lock Manager (NLM, lockd) - Handles lock requests.
TCP, UDP	4046	Network Status Monitor (NSM, statd) - Notifies NFS clients about reboots of the server for lock management.

- c. **Availability zone:** Select the availability zone and the subnet.

You should select the same availability zone as where your VMware SDDC is deployed if you want to avoid charges for cross-AZ traffic.

- d. **Encryption** (Advanced create only): When using the **Advanced create** option, you can select the AWS encryption key name from the dropdown.
- e. **NFS Datastores access** (Advanced create only): When using the **Advanced create** option, you can select whether all hosts can access the datastores or whether only the EVS management host can access the datastores.

4. In the "File system details" section, enter the following information:

- a. **ONTAP credentials**: Enter the ONTAP user name password.
- b. **Storage VM credentials** (Advanced create only): Enter and confirm the storage VM password. The password can be specific to this file system, or you can use the same password entered for ONTAP credentials.

5. In the "EVS Cluster attachment" section, enter the following information:

- a. **Datastore mount options**: Optionally, enable the **Mount datastores to EVS cluster** option to automatically connect the datastores to the Amazon EVS cluster. This option also causes workload factory to configure VMware ESXi host settings so that they match ONTAP best practice recommendations. Before you deploy the file system, you can review the plan details in the **Summary** section to see the settings that were changed.
- b. **EVS Cluster vSphere console details**: Enter the IP address or FQDN of the VMware vCenter server that should connect to Amazon EVS.
- c. **vSphere administrator credentials secret ARN**: Choose the secret ARN for the vSphere administrator credentials. These credentials are used to mount datastores and configure recommended VMware settings.

If Amazon EVS is not available in this region, or if your account doesn't have permissions to retrieve the list of available secret ARNs, you can manually enter a secret ARN value.

6. In the **Summary** section, you can view the FSx for ONTAP file system and datastore configuration that the VMware migration advisor has designed based on your information.

7. Select **Create** to deploy the FSx for ONTAP file system. This process can take up to 2 hours.

Optionally, in the Codebox window you can select **Redirect to CloudFormation** to create the file system and recommended VM configuration using a CloudFormation stack.

In either case, you can monitor the creation progress in CloudFormation.

## Result

The FSx for ONTAP file system is deployed. You can now use the AWS CloudFormation template in the Codebox to deploy the recommended VM configuration to your Amazon Elastic VMware Service environment.

## Migrate to Amazon EC2

### Capture your VM configurations before migrating to Amazon EC2 with VMware workloads

You can use the Migration advisor VM data collector script, RVTools, or NetApp Data Infrastructure Insights to capture your current VM configurations. We recommend that you

use the Migration advisor VM collector script or Data Infrastructure Insights because these options gather both VM configuration and performance data for the most accurate plan.

## Use RVTools (quick assessment)

RVTools is a Windows application that interacts with vCenter and ESX server (5.x to 8.0) to capture information about your VMware virtual environments. It gathers information about VMs, CPU, memory, disks, clusters, ESX hosts, datastores, and more. You can export this information to an xlsx file to use with the migration advisor.

[Learn more about RVTools](#)

### Steps

1. Download and install RVTools 4.4.2 or greater from [RVTools website](#)
2. Launch RVTools and log in to the target vCenter Server.

This will capture information about that vCenter Server.

3. Export your VMware information to an xlsx or xls file.

See the chapter on "commandline parameters" in the [RVTools documentation](#) for details.

### Result

The xlsx or xls file that contains your results is saved to your working directory.

## Use the Migration advisor VM collector script (detailed planning)

The NetApp Migration advisor VM collector script gathers VM configuration information from your vCenter similar to what RVTools collects, however, it captures current VM performance data to provide actual read and write IOPS and throughput statistics. You can use the script in one of two modes:

- Hourly data collection
- Daily data collection

You need to start the Migration advisor to copy the Migration advisor VM collector script from the Codebox window.

### Before you begin

The system where you'll be running the collector script must meet the following requirements:

- Microsoft PowerShell 7.0 or greater must be installed. See the [Microsoft PowerShell documentation](#) if you need to install PowerShell.
- VMware PowerCLI must be installed. See the [VMware PowerCLI documentation](#) if you need to install PowerCLI.
- SSL certificate checking must be disabled.
- PowerShell must allow running unsigned scripts.

Note that if you plan to capture long-term statistics from your VMs (daily statistics), you must have activated statistics level 3 or above in the vSphere management console (VMware management environment).

### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Assess and plan** and then select **Migration to AWS native compute**. The VMware migration advisor splash screen is displayed.

Review the information to learn about the benefits of the migration advisor.

3. When ready, select **Let's start**.
4. Select the **Detailed planning** tile, and select **Next**.

The Codebox window appears on the right side of the page.

5. In the Codebox window, select either  to save the Migration advisor data collector script (named "list-vms.ps1") to the target system, or select  to copy the script so you can paste it on the appropriate system.
6. Follow these steps to capture the configurations of your current VMs:

- a. Log in to the system where you downloaded the data collector, on which PowerShell and PowerCLI are installed.
- b. Connect to your VMware vCenter server by running the following command:

```
Connect-VIServer -server <server_IP>
```

Replace <server\_IP> with the IP address or hostname of your VMware server.

- c. Run the data collector script you downloaded and specify the data collection option for "hourly" or "daily" VM statistics.

```
./list-vms.ps1 -PerformanceStatisticsTimePeriod <LastHour |  
LastDay>
```

where:

- **LastHour** collects IOPS and throughput data for the past 1 hour with 20-second intervals.
- **LastDay** collects IOPS and throughput data for the past 24 hours with 5-minute intervals.

Optionally, you can run the data collector script without specifying any options; this enables you to select the data collection period from the interactive menu.

## Result

The script outputs a compressed file with a timestamp in the name in the current working directory. The .zip file contains a list of all VMs and their properties, along with their IOPS and throughput data.

## Use NetApp Data Infrastructure Insights (detailed planning)

NetApp Data Infrastructure Insights is a cloud infrastructure monitoring tool that gives you visibility into your complete infrastructure. You need to enable temporary API communication between the migration advisor and Data Infrastructure Insights so that the migration advisor can gather information about your VMware infrastructure.

[Learn more about Data Infrastructure Insights](#)

## Steps

1. Log in to your Data Infrastructure Insights account.

2. In the side navigation menu, select **Admin**.
3. In the resulting menu, select **API Access**.
4. In the **API Access Tokens** tab, select **+ API Access Token**.

The Create an API Access Token dialog appears.

5. Provide a name and description for the API token.
6. Under **What type of APIs will this token be used to call** select one of the following:
  - Acquisition Unit
  - Assets
  - Data Collection
7. Under **Permissions** select **Read Only**.
8. Under **Token expires in**, choose the length of time that you need the API token to be valid.
9. Uncheck **Automatically rotate tokens for Kubernetes**.
10. Select **Save**.
11. Select **Copy API Access Token**.
12. Save this token in preparation to use with the workload factory migration advisor.

#### What's next?

[Create an Amazon EC2 deployment plan using the migration advisor.](#)

### Create a deployment plan for Amazon EC2 using the VMware workloads migration advisor

Log in to the NetApp workload factory to access the VMware migration advisor. You'll follow the steps in the wizard to create a deployment plan or migration plan that is customized for your needs.

Note that you must have a user name and password to access workload factory. If you don't have access, create an account now. See the instructions [here](#).

#### Create a deployment plan based on an on-premises vSphere environment

You can migrate your current virtual machine configurations in on-premises vSphere environments to virtual machines in Amazon EC2 and use customized Amazon FSx for NetApp ONTAP file systems as external datastores.

#### Requirements

- You must have created the inventory file from your existing systems by using the migration advisor VM collector (.zip file) or by using RVTools (.xlsx file).
- You must have access to the inventory file from the system on which you are logging in to workload factory.

#### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Assess and plan** and then select **Migration to AWS native compute**. The VMware migration advisor splash screen is displayed.

Review the information to learn about the benefits of the migration advisor.

3. When ready, select **Let's start**.
4. Choose the level of detail and method you prefer during the process of creating a deployment plan:
  - **Quick assessment:** This option uses an RVtools inventory file to retrieve information about your VMs during an accelerated process, resulting in a design blueprint for your cloud migration.
  - **Detailed planning:** These options use either the migration advisor data collector inventory file or direct API access to NetApp Data Infrastructure Insights to collect detailed information, resulting in a deployment-ready design.

## RVTools (quick assessment)

### Steps

5. Select the **RVTools** tile and select **Next**.

The **Prepare for AWS Cloud onboarding** page is displayed.

6. In the *VM configuration upload* section, select  and select the .xlsx file created by RVTools.

The **Data collection details** section provides the date range and number of hours of data that was collected using the Onboarding Advisor data collector.

The **VM inventory summary** section is populated from the inventory file to reflect the number of VMs and the total storage capacity.

7. In the *VM inventory considerations* section, select the options to filter the list of VMs that you want to migrate.

- a. **Region:** Select the region where Amazon FSx for NetApp ONTAP file systems will be deployed.

For optimal performance and cost efficiency, this is typically the same region as where your existing Amazon EC2 SDDC is deployed.

- b. Choose a predicted performance level for the VMs in this region. We recommend that you begin with a smaller IOPS setting. You can increase your provisioned SSD IOPS after the file system is created as workloads are migrated or deployed:

- **Standard to high performance:** For VMs with average IO rates between 20 and 5000 IOPS.
- **Very high performance:** For VMs with average IO rates of greater than 5000 IOPS.
- **Very low performance:** For VMs with average IO rates lower than 20 IOPS.

8. In the *Target capacity and protection considerations* section, select from a few storage options.

- a. **VM Storage to consider:** Select whether the datastores created for each onboarded VM are sized based on their currently utilized size (recommended) or their provisioned size.

The external datastores will be implemented using Amazon FSx for NetApp ONTAP file system volumes.

- b. **Average data reduction ratio:** Choose from among the three common data reduction ratios. Select "1:1 - No reduction", "1:1.25 - 20% reduction", or "1:1.5 - 33% reduction".

Select **Help me decide** if you're unsure which ratio to choose. The *Data reduction ratio assistant* dialog appears. Select any statements that apply to your VM inventory and storage estate. The assistant will recommend an appropriate data reduction rate. Select **Apply** to use the recommended ratio.

- c. **Headroom percentage:** Enter the percentage of capacity growth that is added to the capacity for your FSx for ONTAP file systems.

Note that if you select an amount less than 20% you won't be able to create volume snapshots for protection and long-term backups.

- d. **VM snapshot protection:** Enable this option to protect the VMs with snapshots.

9. Select **Next**.

10. On the **Scope** page, select the VMs from the list that you want to include in the AWS migration. You can filter the list by the power state of each VM, and which data center and cluster the VM resides in.

In the VM list, you can select which types of VM information to display as columns. For example, selecting *Estimated instance type* displays a column with the estimated Amazon EC2 instance type for each VM, based on the VM resource requirements.

11. Select **Next**.
12. On the **Classify** page, review the VM information, volume classification rules, volume assignments, and list of volumes that will be migrated as part of deployment, and then select **Next**.



If a volume has capacity or performance requirements that exceed the capabilities of an Amazon FSx for NetApp ONTAP filesystem in a specific region, migration advisor recommends that the volume be deployed on an Amazon EBS filesystem.

13. On the **Package** page, review the EC2 instances and the volumes assigned to different FSx for ONTAP clusters, and then select **Next**.
14. On the **Review plan** page, review the estimated monthly savings and cost estimates for all the VMs that you plan to migrate.

The top of the page estimates the monthly savings for FSx for ONTAP file systems and EBS volumes. You can expand each section to view details for the suggested filesystem configuration, estimated savings breakdown, assumptions, and technical disclaimers.

## Migration advisor data collector (detailed planning)

### Steps

5. Select the **Migration advisor data collector** tile and select **Next**.

The **Prepare for AWS Cloud onboarding** page is displayed.

6. In the *VM configuration upload* section, select and select the .zip file created by the migration advisor data collector.

The **Data collection details** section provides the date range and number of hours of data that was collected using the Onboarding Advisor data collector.

The **VM inventory summary** section is populated from the inventory file to reflect the number of VMs and the total storage capacity.

7. In the *VM inventory considerations* section, select the region where Amazon FSx for NetApp ONTAP file systems will be deployed. For optimal performance and cost efficiency, this is typically the same region as where your existing Amazon EC2 SDDC is deployed.
8. In the *Target capacity and protection considerations* section, select from a few storage options.

- a. **VM Storage to consider:** Select whether the datastores created for each onboarded VM are sized based on their currently utilized size (recommended) or their provisioned size.

The external datastores will be implemented using Amazon FSx for NetApp ONTAP file system volumes.

- b. **Average data reduction ratio:** Choose from among the three common data reduction ratios. Select "1:1 - No reduction", "1:1.25 - 20% reduction", or "1:1.5 - 33% reduction".

Select **Help me decide** if you're unsure which ratio to choose. The *Data reduction ratio assistant* dialog appears. Select any statements that apply to your VM inventory and storage estate. The assistant will recommend an appropriate data reduction rate. Select **Apply** to use the

recommended ratio.

- c. **Headroom percentage:** Enter the percentage of capacity growth that is added to the capacity for your FSx for ONTAP file systems.

Note that if you select an amount less than 20% you won't be able to create volume snapshots for protection and long-term backups.

- d. **VM snapshot protection:** Enable this option to protect the VMs with snapshots.

9. Select **Next**.

10. On the **Scope** page, select the VMs from the list that you want to include in the AWS migration. You can filter the list by the power state of each VM, and which data center and cluster the VM resides in.

In the VM list, you can select which types of VM information to display as columns. For example, selecting *Estimated instance type* displays a column with the estimated Amazon EC2 instance type for each VM, based on the VM resource requirements.

11. Select **Next**.

12. On the **Classify** page, review the VM information, volume classification rules, volume assignments, and list of volumes that will be migrated as part of deployment, and then select **Next**.



If a volume has capacity or performance requirements that exceed the capabilities of an Amazon FSx for NetApp ONTAP filesystem in a specific region, migration advisor recommends that the volume be deployed on an Amazon EBS filesystem.

13. On the **Package** page, review the EC2 instances and the volumes assigned to different FSx for ONTAP clusters, and then select **Next**.
14. On the **Review plan** page, review the estimated monthly savings and cost estimates for all the VMs that you plan to migrate.

The top of the page estimates the monthly savings for FSx for ONTAP file systems and EBS volumes. You can expand each section to view details for the suggested filesystem configuration, estimated savings breakdown, assumptions, and technical disclaimers.

## NetApp Data Infrastructure Insights (detailed planning)

### Steps

5. Select the **NetApp Data Infrastructure Insights** tile and select **Next**.

The **Prepare for AWS Cloud onboarding** page is displayed.

6. In the *NetApp Data Infrastructure Insights connection configuration* section, enter the tenant endpoint for Data Infrastructure Insights.

This should be the URL you use to access Data Infrastructure Insights.

7. If you have not yet generated an API access token for Data Infrastructure Insights, follow the instructions on the page to create one. Otherwise, paste your API access token in the **Enter API Access Token** text box.

8. Select **Connect**.

Workload factory gathers information from Data Infrastructure Insights.

The **VM inventory summary** section is populated from the gathered information to reflect the number of VMs and the total storage capacity.

9. In the *VM inventory considerations* section, select the region where Amazon FSx for NetApp ONTAP file systems will be deployed. For optimal performance and cost efficiency, this is typically the same region as where your existing Amazon EC2 SDDC is deployed.

10. In the *Target capacity and protection considerations* section, select from a few storage options.

- VM Storage to consider:** Select whether the datastores created for each onboarded VM are sized based on their currently utilized size (recommended) or their provisioned size.

The external datastores will be implemented using Amazon FSx for NetApp ONTAP file system volumes.

- Average data reduction ratio:** Choose from among the three common data reduction ratios. Select "1:1 - No reduction", "1:1.25 - 20% reduction", or "1:1.5 - 33% reduction".

Select **Help me decide** if you're unsure which ratio to choose. The *Data reduction ratio assistant* dialog appears. Select any statements that apply to your VM inventory and storage estate. The assistant will recommend an appropriate data reduction rate. Select **Apply** to use the recommended ratio.

- Headroom percentage:** Enter the percentage of capacity growth that is added to the capacity for your FSx for ONTAP file systems.

Note that if you select an amount less than 20% you won't be able to create volume snapshots for protection and long-term backups.

- VM snapshot protection:** Enable this option to protect the VMs with snapshots.

11. Select **Next**.

12. On the **Scope** page, select the VMs from the list that you want to include in the AWS migration. You can filter the list by the power state of each VM, and which data center and cluster the VM resides in.

In the VM list, you can select which types of VM information to display as columns. For example, selecting *Estimated instance type* displays a column with the estimated Amazon EC2 instance type for each VM, based on the VM resource requirements.

13. Select **Next**.

14. On the **Classify** page, review the VM information, volume classification rules, volume assignments, and list of volumes that will be migrated as part of deployment, and then select **Next**.



If a volume has capacity or performance requirements that exceed the capabilities of an Amazon FSx for NetApp ONTAP filesystem in a specific region, migration advisor recommends that the volume be deployed on an Amazon EBS filesystem.

15. On the **Package** page, review the EC2 instances and the volumes assigned to different FSx for ONTAP clusters, and then select **Next**.

16. On the **Review plan** page, review the estimated monthly savings and cost estimates for all the VMs that you plan to migrate.

The top of the page estimates the monthly savings for FSx for ONTAP file systems and EBS volumes. You can expand each section to view details for the suggested filesystem configuration, estimated savings breakdown, assumptions, and technical disclaimers.

When you are satisfied with the migration plan, you have a few options:

- Select **Manage plan > Save a plan** to save the deployment plan data to your account, enabling you to import the plan at a later time to use as a template when deploying systems with similar requirements. You can name the plan before you save it (the username and timestamp are added to the name you provide).
- Select **Manage plan > Export a plan** to save the migration plan as a template in a .json format on your computer. You can import the plan at a later time to use as a template when deploying systems with similar requirements.
- Select **Manage plan > Download a report** to download the deployment plan in a .pdf format so you can distribute the plan for review.
- Select **Manage plan > Download instance storage deployment** to download the external datastore deployment plan in a .csv format so you can use it to create your new cloud-based intelligent data infrastructure.

You can select **Done** to return to the VMware migration advisors page.

### Create a deployment plan based on an existing plan

If you are planning a new deployment that is similar to an existing deployment plan that you've used in the past, you can import that plan, make changes, and then save it as a new deployment plan.

#### Requirements

You must have access to the .json file for the existing deployment plan from the system on which you are logging in to workload factory.

#### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Assess and plan** and then select **Migration to AWS native compute**.
3. Select **Import plan**.
4. Do one of the following:
  - Select **Load saved plan**.
    - a. From the list, select the plan you want to import.
    - b. Select **Load**.
  - Select **From my computer**.
    - a. Select the existing .json plan file that you want to import in the migration advisor, and then select **Open**.

The **Review plan** page is displayed.

5. You can select **Previous** to access previous pages and modify the settings for the plan as described in the preceding section.
6. After you have customized the plan to your requirements, you can save the plan or download the plan report as a PDF file.

### Deploy the recommended FSx for ONTAP file system

After you verify that the recommended FSx for ONTAP file system (or multiple file

systems in some cases) meets your exact requirements, you can use workload factory to deploy the system in your AWS environment.

Follow the instructions in [Create an FSx for ONTAP file system in BlueXP workload factory](#) to deploy the FSx for ONTAP file system according to the configuration recommended by workload factory. You can use the **Advanced create** steps in the instructions to fully customize the file system.

## Migrate to VMware Cloud on AWS

### Capture your VM configurations before migrating to VMware Cloud with VMware workloads

You can use the Migration advisor VM collector script or RVTools to capture your current VM configurations. We recommend that you use the Migration advisor VM collector script because it gathers both VM configuration and performance data for the most accurate plan.

If you plan to deploy a new system based on an existing deployment plan that you previously saved locally, you can skip this step and select the existing deployment plan. [Learn how to use an existing plan to build a new plan.](#)

## Use the Migration advisor VM collector script

The NetApp Migration advisor VM collector script gathers VM configuration information from your vCenter similar to what RVTools collects, however, it captures current VM performance data to provide actual read and write IOPS and throughput statistics.

You need to start the Migration advisor to copy the Migration advisor VM collector script from the Codebox window.

### Before you begin

The system where you'll be running the collector script must meet the following requirements:

- Microsoft PowerShell 7.0 or greater must be installed. See the [Microsoft PowerShell documentation](#) if you need to install PowerShell.
- VMware PowerCLI must be installed. See the [VMware PowerCLI documentation](#) if you need to install PowerCLI.
- SSL certificate checking must be disabled.
- PowerShell must allow running unsigned scripts.

Note that if you plan to capture long-term statistics from your VMs (daily statistics), you must have activated statistics level 3 or above in the vSphere management console (VMware management environment).

### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Assess and plan** and then select **Migration to VMware Cloud on AWS**.

The VMware migration advisor main page is displayed.

3. Select **Create a new deployment plan**, select the option for **Use the migration advisor VMware data collector**, and select **Next**.

The **Prepare for VMware Cloud on AWS migration** page is displayed.

4. In the Codebox window, select either  to save the Migration advisor VM collector script (named "list-vms.ps1") to the target system, or select  to copy the script so you can paste it on the appropriate system.
5. Follow these steps to capture the configurations of your current VMs:
  - a. Log in to the system where you downloaded the data collector, on which PowerShell and PowerCLI are installed.
  - b. Connect to your VMware vCenter server by running the following command:

```
Connect-VIServer -server <server_IP>
```

Replace <server\_IP> with the IP address or hostname of your VMware server.

- c. Run the data collector script you downloaded and specify the data collection option for "daily" or "hourly" VM statistics.

```
./list-vms.ps1 -isLongTermDataCollectionEnabled <true | false>
```

where:

- **true** collects IOPS and throughput data for the past 24 hours with 5-minute intervals
- **false** collects IOPS and throughput data for the past 1 hour with 20-second intervals.

## Result

The script outputs a CSV file named `list-vms-yyyy-MM-dd-HH-mm-ss.csv` in the current working directory. The CSV file contains a list of all VMs and their properties, along with their IOPS and throughput data.

## Use RVTools software

RVTools is a Windows application that interacts with VCenter and ESX server (5.x to 8.0) to capture information about your VMware virtual environments. It gathers information about VMs, CPU, memory, disks, clusters, ESX hosts, datastores, and more. You can export this information to an `xlsx` file to use with the migration advisor.

[Learn more about RVTools](#)

## Steps

1. Download and install RVTools 4.4.2 or greater from [RVTools website](#)
2. Launch RVTools and log in to the target VCenter Server.

This will capture information about that VCenter Server.

3. Export your VMware information to an `xlsx` or `xls` file.

See the chapter on "commandline parameters" in the [RVTools documentation](#) for details.

## Result

The `xlsx` or `xls` file that contains your results is saved to your working directory.

## What's next?

[Create a VMware Cloud on AWS deployment plan using the migration advisor.](#)

## Create a deployment plan for VMware Cloud on AWS using the VMware workloads migration advisor

Log in to the NetApp workload factory to access the VMware migration advisor. You'll follow the steps in the wizard to create a deployment plan or migration plan that is customized for your needs.

When migrating to VMware Cloud, you can use the migration advisor to create a deployment plan for the following scenarios:

- [To migrate your current on-premises vSphere environment to VMWare cloud.](#)
- [To deploy a system in the cloud based on an existing deployment plan that has similar requirements.](#)

Note that you must have a user name and password to access workload factory. If you don't have access, create an account now. See the instructions [here](#).

## Create a deployment plan based on an on-premises vSphere environment

You can migrate your current virtual machine configurations in on-premises vSphere environments to virtual machines in VMware Cloud on AWS and use customized Amazon FSx for NetApp ONTAP file systems as external datastores.

### Requirements

- You must have created the inventory file from your existing systems by using the migration advisor VM collector (.csv file) or by using RVTools (.xlsx file).
- You must have access to the inventory file from the system on which you are logging in to workload factory.

### Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Assess and plan** and then select **Migration to VMware Cloud on AWS**.

The VMware migration advisor main page is displayed.

3. Select **Create a new deployment plan**.
4. Select the type of inventory file you'll be using to populate workload factory with your current VM configuration and select **Next**.

- Select **Use the migration advisor VMware data collector** to use the .csv file that you created using the VMware data collector.
- Select **Use RVTools** to use the .xlsx file that you created using RVTools.

The "Prepare for VMware Cloud onboarding" page is displayed.

5. In the *Upload VM configuration* section, select  and select the file that you want to use.
  - Select the .csv file when using the Migration advisor VM collector.
  - Select the .xlsx file when using RVTools.

The VMs summary section is populated from the inventory file to reflect the number of VMs and the total storage capacity.

6. In the *VM inventory considerations* section, select the options to filter the list of VMs that you want to migrate.
  - a. **Consider VMs:** Indicate which VMs will be extracted from the .csv file based on their operating power state. You can bring in all VMs, or only those that are On, Off, or Suspended.
  - b. **VM Storage to consider:** Select whether the datastores created for each onboarded VM are sized based on their currently utilized size (recommended) or their provisioned size.

The external datastores will be implemented using Amazon FSx for NetApp ONTAP file system volumes.

- c. **VM Memory to consider:** Select whether the memory allocated for each onboarded VM is sized based on their currently utilized size (recommended) or their provisioned size.
7. In the *VMware Cloud on AWS deployment configuration* section, enter details about the required VMware

Cloud on AWS configuration.

- a. **Region:** Select the region where the VMs and Amazon FSx for NetApp ONTAP file systems will be deployed.

For optimal performance and cost efficiency, this is typically the same region as where your existing VMware Cloud on AWS SDDC is deployed.

- b. **VM estimated performance requirements:** This option is available only when using RVTools. The Migration advisor VM collector captures this information from your environment. Provide the following per virtual machine average performance parameters that you want to be applied to your new VMs that will be deployed:

- **Average IOPS per VM:**

Enter the number of IOPS required for your file systems. If you are unsure, you can use the default of 3 IOPS per GiB of SSD storage for Amazon FSx for ONTAP file systems. For example, if you deploy 2,000 GiB of capacity, this will be translated to 6,000 IOPS.

We recommend that you begin with a smaller IOPS setting. You can increase your provisioned SSD IOPS after the file system is created as workloads are migrated or deployed.

- **Average I/O block size:**

The size of each block containing read or write operations. The default size is 4 KB.

A larger block size may be better for large sequential read and write workloads. A smaller block size may offer better performance for workloads that perform small random writes to sparse files or to large files.

- **Average write ratio:**

The percentage of operations that are write operations for your workloads. The default ratio is 30% writes and 70% reads.

8. In the *VM storage capacity considerations* section, select from a few storage options.

- a. **Average data reduction ratio:** Choose from among the three common data reduction selection values. Select "1:1 - No reduction", "1:1.25 - 20% reduction", or "1:1.5 - 33% reduction".

- b. **Headroom percentage:** Enter the percentage of capacity growth that is added to the capacity for your FSx for ONTAP file systems.

Note that if you select an amount less than 20% that you won't be able to create volume snapshots for protection and long-term backups.

9. Select **Next** and the "VMware cloud on AWS node configuration" page is displayed.

This page enables you to define the VMware cloud on AWS cluster configuration using an estimated savings analysis and the recommended node type. You can configure the following:

- a. **vSAN architecture:** Select whether you want to use vSAN Express Storage Architecture (ESA) or vSAN Original Storage Architecture (OSA) architecture.

- b. **vSAN Fault Tolerance:** Select the level of fault tolerance that is required for the VMs. You can choose "Auto", which is recommended, or from among a variety of RAID levels.

- RAID-1 (FTT 1): consists of an exact copy (or mirror) of a set of data on 2 or more disks.
- RAID-5 (FTT 1): consists of block-level striping with distributed parity - parity information is distributed among 3 or more drives, and it can survive a single disk failures.
- RAID-5 (FTT 2): consists of block-level striping with distributed parity - parity information is distributed among 4 or more drives, and it can survive any two concurrent disk failures.
- RAID-6 (FTT 2): extends RAID 5 by adding another parity block; thus, it uses block-level striping

with two parity blocks distributed across all member disks. It requires 4 or more drives, and it can survive any two concurrent disk failures.

- c. **Nodes configuration selection list:** Select an EC2 instance type for the nodes.
10. Select **Next** and the "Select virtual machines" page displays the VMs that match the criteria you provided in the previous page.
  - a. In the *Selection criteria* section, select the criteria for the VMs that you plan to deploy:
    - Based on cost and performance optimization
    - Based on the ability to easily restore your data with local snapshots for recovery scenarios
    - Based on both sets of criteria: the lowest cost while still providing good recovery options
  - b. In the *Virtual machines* section, the VMs that matched the criteria you provided in the previous page are selected (checked). Select or deselect VMs if you want to onboard/migrate fewer or more VMs on this page.

The **Recommended deployment** section will be updated if you make any changes. Note that by selecting the checkbox in the heading row you can select all VMs on this page.
- c. Select **Next**.
11. On the **Datastore deployment plan** page, review the total number of VMs and datastores that have been recommended for the migration.
  - a. Select each Datastore listed across the top of the page to see how the datastores and VMs will be provisioned.

The bottom of the page shows the source VM (or multiple VMs) for which this new VM and datastore will be provisioned.
  - b. Once you understand how your datastores will be deployed, select **Next**.
12. On the **Review deployment plan** page, review the estimated monthly cost for all the VMs that you plan to migrate.

The top of the page describes the monthly cost for all deployed VMs and FSx for ONTAP file systems. You can expand each section to view details for "Recommended Amazon FSx for ONTAP file system configuration", "Estimated cost breakdown", "Volume configuration", "Sizing assumptions", and technical "Disclaimers".
13. When you are satisfied with the migration plan, you have a few options:
  - Select **Deploy** to deploy the FSx for ONTAP file systems to support your VMs. [Learn how to deploy an FSx for ONTAP file system](#).
  - Select **Download plan > VM deployment** to download the migration plan in a .csv format so you can use it to create your new cloud-based intelligent data infrastructure.
  - Select **Download plan > Plan report** to download the migration plan in a .pdf format so you can distribute the plan for review.
  - Select **Export plan** to save the migration plan as a template in a .json format. You can import the plan at a later time to use as a template when deploying systems with similar requirements.

### Create a deployment plan based on an existing plan

If you are planning a new deployment that is similar to an existing deployment plan that you've used in the past, you can import that plan, make edits, and then save it as a new deployment plan.

## Requirements

You must have access to the .json file for the existing deployment plan from the system on which you are logging in to workload factory.

## Steps

1. Log in to workload factory using one of the [console experiences](#).
2. From the VMware workloads tile, select **Assess and plan** and then select **Migration to VMware Cloud on AWS**. The VMware migration advisor main page is displayed.
3. Select **Import an existing deployment plan**.
4. Select  and select the existing plan file that you want to import in the migration advisor.
5. Select **Next** and the Review plan page is displayed.
6. You can select **Previous** to access the *Prepare for VMware Cloud onboarding* page and the *Select VMs* page to modify the settings for the plan as described in the previous section.
7. After you have customized the plan to your requirements, you can save the plan or begin the deployment process for your datastores on FSx for ONTAP file systems.

## Deploy the recommended FSx for ONTAP file system

After you verify that the recommended FSx for ONTAP file system (or multiple file systems in some cases) meets your exact requirements, you can use workload factory to deploy the system in your AWS environment.

Depending on the policy and permissions that you added to your workload factory account, you can deploy the FSx for ONTAP file system completely using workload factory (using read/write mode). If you have fewer permissions (read-only mode), or no permissions (Basic mode), you'll need to use the CloudFormation information from the Codebox and deploy the FSx for ONTAP file system yourself in AWS.

### Requirements for deployments to VMware Cloud on AWS

- You must be using VMware Cloud on AWS Software-Defined Data Center (SDDC) version 1.20 or greater to deploy FSx for ONTAP file systems.
- You must not deploy the FSx for ONTAP file system in the same VPC used during the SDDC deployment. Instead, you must deploy it in a new Amazon VPC that you own to enable VMware Cloud on AWS integration with Amazon FSx for NetApp ONTAP.
- You must deploy the FSx for ONTAP file system within the same AWS region as your SDDC.

## Steps

1. At the bottom of the **Review plan** page, select **Deploy** and the Create an FSx for ONTAP file system page is displayed.

Most of the fields that define your FSx for ONTAP file system are completed based on the information you provided, but there are a few fields that you need to complete in this page.

You can use the Quick create or Advanced create option. Advanced create offers a few additional storage parameters that you can customize. [See what these two options offer](#).

2. **AWS credentials:** Select or add credentials that will give workload factory the permissions necessary to create your FSx for ONTAP file system directly. You can also select the CloudFormation code from Codebox and deploy the FSx for ONTAP file system yourself in AWS.

3. **File system name:** Enter the name that you want to use for this FSx for ONTAP file system.
4. **Tags:** Optionally you can add tags to categorize this FSx for ONTAP file system.
5. In the "Network & security" section, enter the following information:
  - a. **Region & VPC:** Select the Region and the VPC where the FSx for ONTAP file system will be deployed.

If you are deploying to VMware Cloud on AWS, ensure you deploy it in a VPC that is different than the VPC where the VMware Cloud on AWS is deployed.

- b. **Security group:** When using the **Advanced create** option, you can select the default security group for the FSx for ONTAP VPC so that all traffic can access the FSx for ONTAP file system.

You can add an inbound rule that restricts what other AWS services can access the FSx for ONTAP file system. This will block the amount of services that are open. These are the minimum ports and protocols:

Protocols	Ports	Purpose
TCP, UDP	111	Portmapper (used to negotiate which ports are used in NFS requests)
TCP, UDP	635	NFS mountd (receives NFS mount requests)
TCP, UDP	2049	NFS network traffic
TCP, UDP	4045	Network Lock Manager (NLM, lockd) - Handles lock requests.
TCP, UDP	4046	Network Status Monitor (NSM, statd) - Notifies NFS clients about reboots of the server for lock management.

- c. **Availability zone:** Select the Availability Zone and the Subnet.

You should select the same availability zone as where your VMware SDDC is deployed if you want to avoid charges for cross-AZ traffic.

- d. **Encryption:** When using the **Advanced create** option, you can select the AWS encryption key name from the dropdown.
- e. **Datastore access control:** When using the **Advanced create** option, you can select whether all hosts can access the datastores or whether only certain vSphere cluster nodes on a specific subnet can access the datastores.
6. In the "File system details" section, enter the following information:
  - a. **ONTAP credentials:** Enter and confirm the ONTAP password.
  - b. **Storage VM credentials** (Advanced create only): Enter and confirm the storage VM password. The password can be specific to this file system, or you can use the same password entered for ONTAP credentials.
7. In the **Summary** section, you can view the FSx for ONTAP file system and datastore configuration that the VMware migration advisor has designed based on your information.
8. Select **Create** to deploy the FSx for ONTAP file system. This process can take up to 2 hours.

Optionally, in the Codebox window you can select **Redirect to CloudFormation** to create the file system using a CloudFormation stack.

In either case, you can monitor the creation progress in CloudFormation.

## Result

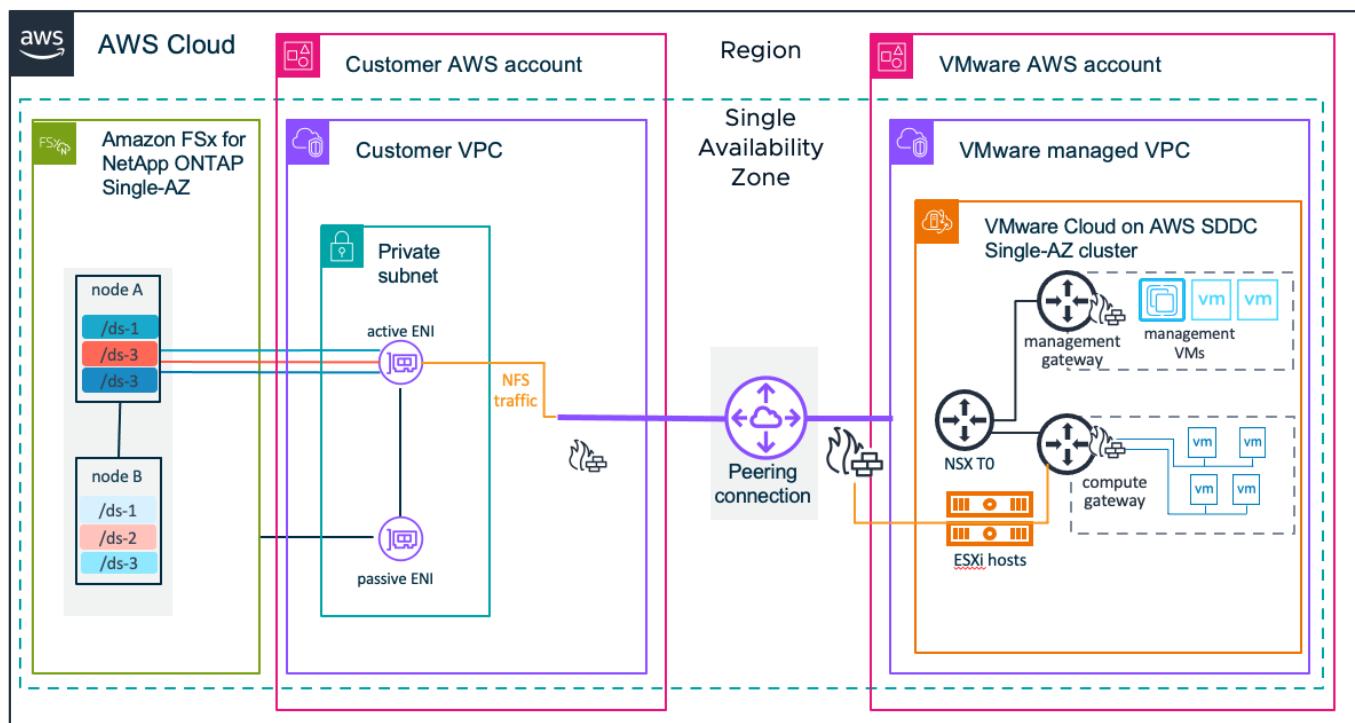
The FSx for ONTAP file system is deployed.

## Connect your FSx for ONTAP file systems to VMware Cloud on AWS

After you deploy FSx for ONTAP file systems, you need to connect that system to your VMware Cloud on AWS infrastructure. Your Software-Defined Data Center (SDDC) offers network options for connecting to the FSx for ONTAP file system by using the VPC peering capability to extend network connectivity to the external NFS storage volumes.

[Review the Amazon VPC peering documentation for details](#)

The following diagram shows how to use VPC peering to connect single Availability Zone (AZ) SDDC clusters to FSx for ONTAP single-AZ deployments.



## Migrate your data to the new infrastructure with BlueXP workload factory for VMware

Use a tool such as VMware Hybrid Cloud Extension (HCX) to move your data from your old virtual machine storage to the FSx for NetApp ONTAP volumes connected to your new virtual machines. VMware HCX core functionality enables you to migrate workloads from your on-premises data center to your Software-Defined Data Center (SDDC) transparently.

[Review the VMware HCX documentation for details.](#)

## What's next?

Now that you've migrated your data to VMware Cloud on AWS and Amazon FSx for NetApp ONTAP external datastores, you can back up and protect the important data on your FSx for ONTAP file system to make sure your data is always available.

For information about managing your FSx for ONTAP file system, go to the [Amazon FSx for NetApp ONTAP documentation](#) to view the the backup and protection capabilities you can use.

# Knowledge and support

## Register for support for BlueXP workload factory for VMware

Support registration is required to receive technical support specific to BlueXP workload factory and its storage solutions and services. You must register for support from the BlueXP console, which is a separate web-based console from workload factory.

Registering for support does not enable NetApp support for a cloud provider file service. For technical support related to a cloud provider file service, its infrastructure, or any solution using the service, refer to "Getting help" in the workload factory documentation for that product.

[Amazon FSx for ONTAP](#)

### Support registration overview

Registering your account ID support subscription (your 20 digit 960xxxxxxxxx serial number located on the Support Resources page in BlueXP) serves as your single support subscription ID. Each BlueXP account-level support subscription must be registered.

Registering enables capabilities like opening support tickets and automatic case generation. Registration is completed by adding NetApp Support Site (NSS) accounts to BlueXP as described below.

### Register your account for NetApp support

To register for support and activate support entitlement, one user in your account must associate a NetApp Support Site account with their BlueXP login. How you register for NetApp support depends on whether you already have a NetApp Support Site (NSS) account.

#### Existing customer with an NSS account

If you're a NetApp customer with an NSS account, you simply need to register for support through BlueXP.

#### Steps

1. In the upper right of the workload factory console, select **Help > Support**.

Selecting this option opens the BlueXP console a new browser tab and loads the Support dashboard.

2. In the upper right of the BlueXP console, select the Settings icon, and select **Credentials**.
3. Select **User Credentials**.
4. Select **Add NSS credentials** and follow the NetApp Support Site (NSS) Authentication prompt.
5. To confirm that the registration process was successful, select the Help icon, and select **Support**.

The **Resources** page should show that your account is registered for support.

 9601111222224444555555 Account Serial Number	 Registered for Support Support Registration
---	--

Note that other BlueXP users will not see this same support registration status if they have not associated a NetApp Support Site account with their BlueXP login. However, that doesn't mean that your BlueXP account is not registered for support. As long as one user in the account has followed these steps, then your account has been registered.

## Existing customer but no NSS account

If you're an existing NetApp customer with existing licenses and serial numbers but *no NSS account*, you need to create an NSS account and associate it with your BlueXP login.

### Steps

1. Create a NetApp Support Site account by completing the [NetApp Support Site User Registration form](#)
  - a. Be sure to select the appropriate User Level, which is typically **NetApp Customer/End User**.
  - b. Be sure to copy the BlueXP account serial number (960xxxx) used above for the serial number field. This will speed up the account processing.
2. Associate your new NSS account with your BlueXP login by completing the steps under [Existing customer with an NSS account](#).

## Brand new to NetApp

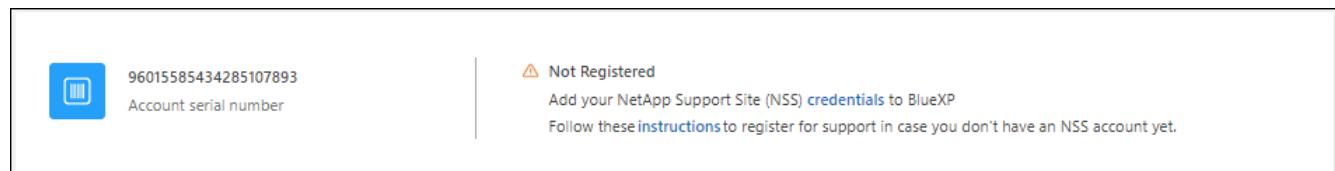
If you are brand new to NetApp and you don't have an NSS account, follow each step below.

### Steps

1. In the upper right of the workload factory console, select **Help > Support**.

Selecting this option opens the BlueXP console a new browser tab and loads the Support dashboard.

2. Locate your account ID serial number from the Support Resources page.



3. Navigate to [NetApp's support registration site](#) and select **I am not a registered NetApp Customer**.
4. Fill out the mandatory fields (those with red asterisks).
5. In the **Product Line** field, select **Cloud Manager** and then select your applicable billing provider.
6. Copy your account serial number from step 2 above, complete the security check, and then confirm that you read NetApp's Global Data Privacy Policy.

An email is immediately sent to the mailbox provided to finalize this secure transaction. Be sure to check your spam folders if the validation email doesn't arrive in few minutes.

7. Confirm the action from within the email.

Confirming submits your request to NetApp and recommends that you create a NetApp Support Site account.

8. Create a NetApp Support Site account by completing the [NetApp Support Site User Registration form](#)

- a. Be sure to select the appropriate User Level, which is typically **NetApp Customer/End User**.
- b. Be sure to copy the account serial number (960xxxx) used above for the serial number field. This will speed up the account processing.

#### After you finish

NetApp should reach out to you during this process. This is a one-time onboarding exercise for new users.

Once you have your NetApp Support Site account, associate the account with your BlueXP login by completing the steps under [Existing customer with an NSS account](#).

## Get help with BlueXP workload factory for VMware

NetApp provides support for BlueXP workload factory and its cloud services in a variety of ways. Extensive free self-support options are available 24x7, such as knowledgebase (KB) articles and a community forum. Your support registration includes remote technical support via web ticketing.

### Get support for FSx for ONTAP

For technical support related to FSx for ONTAP, its infrastructure, or any solution using the service, refer to "Getting help" in the workload factory documentation for that product.

#### Amazon FSx for ONTAP

To receive technical support specific to Workload Factory and its storage solutions and services, use the support options described below.

### Use self-support options

These options are available for free, 24 hours a day, 7 days a week:

- Documentation

The workload factory documentation that you're currently viewing.

- [Knowledge base](#)

Search through the workload factory knowledge base to find helpful articles to troubleshoot issues.

- [Communities](#)

Join the workload factory community to follow ongoing discussions or create new ones.

### Create a case with NetApp support

In addition to the self-support options above, you can work with a NetApp Support specialist to resolve any issues after you activate support.

#### Before you get started

To use the **Create a Case** capability, you must first register for support. associate your NetApp Support Site credentials with your workload factory login. [Learn how to register for support](#).

## Steps

1. In the upper right of the workload factory console, select **Help > Support**.

Selecting this option opens the BlueXP console a new browser tab and loads the Support dashboard.

2. On the **Resources** page, choose one of the available options under Technical Support:

- a. Select **Call Us** if you'd like to speak with someone on the phone. You'll be directed to a page on netapp.com that lists the phone numbers that you can call.

- b. Select **Create a Case** to open a ticket with a NetApp Support specialist:

- **Service:** Select **Workload Factory**.

- **Case Priority:** Choose the priority for the case, which can be Low, Medium, High, or Critical.

To learn more details about these priorities, hover your mouse over the information icon next to the field name.

- **Issue Description:** Provide a detailed description of your problem, including any applicable error messages or troubleshooting steps that you performed.

- **Additional Email Addresses:** Enter additional email addresses if you'd like to make someone else aware of this issue.

- **Attachment (Optional):** Upload up to five attachments, one at a time.

Attachments are limited to 25 MB per file. The following file extensions are supported: txt, log, pdf, jpg/jpeg, rtf, doc/docx, xls/xlsx, and csv.

ntapitdemo 

NetApp Support Site Account

---

Service Working Environment

Select Select

Case Priority i

Low - General guidance

Issue Description

Provide detailed description of problem, applicable error messages and troubleshooting steps taken.

Additional Email Addresses (Optional) i

Type here

Attachment (Optional) Upload  i

No files selected 

### After you finish

A pop-up will appear with your support case number. A NetApp Support specialist will review your case and get back to you soon.

For a history of your support cases, you can select **Settings > Timeline** and look for actions named "create support case." A button to the far right lets you expand the action to see details.

It's possible that you might encounter the following error message when trying to create a case:

"You are not authorized to Create a Case against the selected service"

This error could mean that the NSS account and the company of record it's associated with is not the same company of record for the BlueXP account serial number (ie. 960xxxx) or the working environment serial number. You can seek assistance using one of the following options:

- Use the in-product chat
- Submit a non-technical case at <https://mysupport.netapp.com/site/help>

## Manage your support cases (Preview)

You can view and manage active and resolved support cases directly from BlueXP. You can manage the cases associated with your NSS account and with your company.

Case management is available as a Preview. We plan to refine this experience and add enhancements in upcoming releases. Please send us feedback by using the in-product chat.

Note the following:

- The case management dashboard at the top of the page offers two views:
  - The view on the left shows the total cases opened in the past 3 months by the user NSS account you provided.
  - The view on the right shows the total cases opened in the past 3 months at your company level based on your user NSS account.

The results in the table reflect the cases related to the view that you selected.

- You can add or remove columns of interest and you can filter the contents of columns like Priority and Status. Other columns provide just sorting capabilities.

View the steps below for more details.

- At a per-case level, we offer the ability to update case notes or close a case that is not already in Closed or Pending Closed status.

### Steps

1. In the upper right of the workload factory console, select **Help > Support**.

Selecting this option opens the BlueXP console a new browser tab and loads the Support dashboard.

2. Select **Case Management** and if you're prompted, add your NSS account to BlueXP.

The **Case management** page shows open cases related to the NSS account that is associated with your BlueXP user account. This is the same NSS account that appears at the top of the **NSS management** page.

3. Optionally modify the information that displays in the table:

- Under **Organization's cases**, select **View** to view all cases associated with your company.
- Modify the date range by choosing an exact date range or by choosing a different time frame.

The screenshot shows a list of cases with the following filters applied:

- Date created: December 22, 2022
- Last updated: December 29, 2022
- Status: Unassigned
- Priority: High (P2)
- Case owner: Pending customer
- Last updated: December 15, 2022
- Last updated: December 27, 2022
- Status: Medium (P3)
- Case owner: Pending customer
- Last updated: December 14, 2022
- Last updated: December 26, 2022
- Status: Low (P4)
- Case owner: Solution proposed

- Filter the contents of the columns.

The screenshot shows a list of cases with the following filters applied:

- Last updated: December 29, 2022
- Priority: Critical (P1)
- Status: Active, Pending customer, Solution proposed, Pending closed
- Last updated: December 28, 2022
- Priority: High (P2)
- Status: Solution proposed
- Last updated: December 27, 2022
- Priority: Medium (P3)
- Status: Pending closed
- Last updated: December 26, 2022
- Priority: Low (P4)

- Change the columns that appear in the table by selecting and then choosing the columns that you'd like to display.

The screenshot shows a list of cases with the following filters applied:

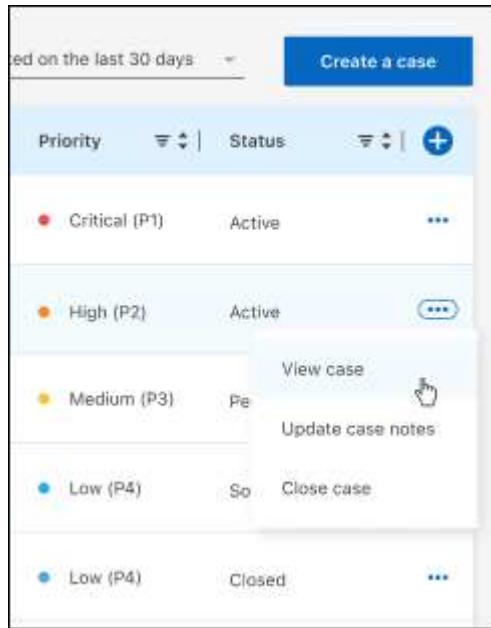
- Last updated: December 29, 2022
- Priority: Critical (P1)
- Status: Last updated, Priority
- Last updated: December 28, 2022
- Priority: High (P2)
- Status: Cluster name
- Last updated: December 27, 2022
- Priority: Medium (P3)
- Status: Case owner, Opened by
- Last updated: December 26, 2022
- Priority: Low (P4)

4. Manage an existing case by selecting **...** and selecting one of the available options:

- **View case:** View full details about a specific case.
- **Update case notes:** Provide additional details about your problem or select **Upload files** to attach up to a maximum of five files.

Attachments are limited to 25 MB per file. The following file extensions are supported: txt, log, pdf, jpg/jpeg, rtf, doc/docx, xls/xlsx, and csv.

- **Close case:** Provide details about why you're closing the case and select **Close case**.



The screenshot shows a user interface for managing cases. At the top, there is a search bar with the placeholder "Search on the last 30 days" and a "Create a case" button. Below this is a filter section with "Priority" and "Status" dropdowns and a "+" button. The main area displays a list of cases:

Priority	Status	Actions
Critical (P1)	Active	...
High (P2)	Active	...
Medium (P3)	Open	<a href="#">View case</a> (highlighted with a cursor icon)
Medium (P3)	Open	<a href="#">Update case notes</a>
Low (P4)	So	<a href="#">Close case</a>
Low (P4)	Closed	...

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[BlueXP workload factory](#)

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