



Manage resources

Workload Factory for NetApp Console

NetApp
October 07, 2026

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Manage resources

Resource management in NetApp Workload Factory for Databases

Managing resources in NetApp Workload Factory for Databases allows you to use advanced features including database and clone creation, resource utilization and monitoring. Additionally, you can analyze the well-architected status of your database configurations and implement configuration best practices to improve performance and lower operational costs. Resource management is only for Microsoft SQL Server and Oracle environments running on FSx for ONTAP file system storage.

You must [register resources](#) to do any of the following management tasks.

Management tasks include:

- Viewing databases from the Inventory
- [Creating a database](#)
- [Creating a database clone \(sandbox\)](#)
- [Implementing well-architected database configurations](#)

Register resources in NetApp Workload Factory for Databases

Register instances for Microsoft SQL Server and databases for Oracle so that you can manage your resources, create databases and sandbox clones, run error log analysis, and optimize configurations in NetApp Workload Factory for Databases.

You can register your resources only if they run on FSx for ONTAP file system storage.

About the task

Registering an instance (SQL Server) or database (Oracle) involves two steps: instance or database authentication and preparation. Authentication is the process of verifying the credentials for the instance or database. Preparation includes installing AWS, NetApp, and PowerShell modules on the instance or database, to meet the minimum requirements for Workload Factory for Databases features like [creating a database](#), [creating a sandbox](#), [error log analysis](#) or [the well-architected assessment](#).

Workload Factory supports only Microsoft SQL Server instance and Oracle database registration and management. Depending on the AWS account credentials you select in Workload Factory, PostgreSQL hosts appear in the Inventory. Currently, Workload Factory supports unregistered PostgreSQL instances running only on Amazon Linux operating systems.

Before you begin

You must do the following before you register an instance or database:

- Make sure the hosts of the resources that you want to register appear in the inventory. [Grant operations and remediation permissions](#) in your AWS account.
- Associate a link with the FSx for ONTAP file system that hosts the resources you want to register. [Learn how to associate an existing link or to create and associate a new link](#). After the link associates, return to this operation.

Registering an instance in a private network

To register an instance or database in a private network without external connectivity, make the required endpoints available in the VPC and associate them with the relevant subnets. Allow port 443 in the Security Group for interface endpoints.

- S3 Gateway/endpoint
- ssm
- ssmmessages
- fsx

If you use a proxy server for outbound EC2 connections, allow access to these domains for management operations:

- .microsoft.com (SQL Server)
- .powershellgallery.com (SQL Server)
- .aws.amazon.com
- .amazonaws.com

Register a Microsoft SQL Server instance

Registering an instance has two steps - instance authentication and preparation. You can register a single instance or multiple instances.

Workload Factory supports registration for Failover Cluster Instance (FCI) and Standalone deployment for SQL Server.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Inventory**.
4. In the Inventory, select **Microsoft SQL Server** as the engine type.
5. Select the **Instances** tab.
6. Select to register a single instance or multiple instances.
7. To Authenticate instances (step 1), do the following and then select **Next**:
 - a. Select to **Use the same credentials for all instances** or **Manage credentials manually**.
 - b. Authenticate SQL Server and Windows by providing user name and password information.

If instances are authenticated, select **Next**.

8. To Prepare (step 2), make sure the instance(s) meets the minimum requirements.

To meet the minimum requirements, the instance must have AWS and NetApp PowerShell modules and PowerShell 7 modules installed, and you must complete the prerequisites for at least one of the capabilities listed under Prerequisite check.

- a. Review the prerequisites in the **Prerequisite check view**.

You must complete all prerequisites for a single capability like **Review well-architected issues and recommendations** to register the instance.

- b. Select **Setup details** for each capability to learn about the capability prerequisites and follow the on-screen instructions to complete any missing prerequisites for a capability.

To enable Workload Factory to [review and fix well-architected issues](#), complete all prerequisites under **Review well-architected issues and recommendations** and **Fix well-architected issues**.

9. After you complete all prerequisites, **Register** the instance(s).

Result

Instance registration initiates. Select the **Job monitoring** tab to track progress.

Register an Oracle database

Registering an instance has two steps - database authentication and preparation. You can register a single instance or multiple databases.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Inventory**.
4. In the Inventory, select **Oracle** as the engine type.
5. Select the **Databases** tab.
6. Select to register a single database or multiple databases.
7. To Authenticate databases (step 1), do the following and then select **Next**:
 - a. Select to **Use the same credentials for all instances** or **Manage credentials manually**.
 - b. Authenticate Oracle user and Automatic Storage Management (ASM) grid user (if applicable) by providing user name and password information.

If databases are authenticated, select **Next**.
8. To Prepare (step 2), make sure the database(s) meets required prerequisites. If all required modules are installed and prerequisites are met, select **Next** to register the database. Otherwise, follow these steps.
 - a. Review the prerequisites in the **Prerequisite check view**.

You must complete all prerequisites for a single capability like **Review well-architected issues and recommendations** to register the database.

- b. Select **Setup details** for each capability to learn about the capability prerequisites and follow the on-

screen instructions to complete any missing prerequisites for a capability.

To have Workload Factory [review and fix well-architected issues](#) for your databases, complete all prerequisites listed under **Review well-architected issues and recommendations** and **Fix well-architected issues** capabilities.

9. After you complete the prerequisites, **Register** the database(s).

Result

Database registration initiates. Select the **Job monitoring** tab to track progress.

What's next

After registration, you can perform these tasks.

- View databases from the inventory
- [Create a database](#)
- [Create a database clone \(sandbox\)](#)
- [Get a comprehensive well-architected assessment of database configurations](#)

Manage database clones in NetApp Workload Factory for Databases

Manage your sandbox clones in NetApp Workload Factory for Databases to keep your development and testing environments reliable and cost-effective. Verify that a clone's data is intact, connect a clone to your CI/CD pipeline to automate software delivery, or refresh, revert, or split a clone to align it with your current development needs. When you no longer need a clone, delete it to free up storage capacity.

Check sandbox data integrity

Run an integrity check to determine if sandbox clone data is intact or corrupt in NetApp Workload Factory for Databases.

About this task

When you create a sandbox clone from a source database while it is busy, the clone's data may not be in sync with the most recent snapshot of the source database. This operation checks the integrity of all the objects in the sandbox clone to determine if the sandbox clone data is current.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the actions menu of the sandbox clone to check integrity for.
5. Select **Run integrity check**.
6. In the Integrity check dialog, click **Integrity check**.
7. Check the status of the integrity check in Sandboxes or in Job monitoring.

If the integrity check fails, we recommend that you do not use the sandbox clone and create a new sandbox clone.

Connect a sandbox clone to CI/CD

Connect a sandbox clone to a continuous integration and continuous delivery (CI/CD) pipeline with REST API code to improve software delivery via automation in NetApp Workload Factory for Databases.

About this task

To deliver a new version of software automatically to your database clone, you should connect to a CI/CD pipeline. Use the REST API code provided from this operation to make the connection.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the actions menu of the sandbox clone to connect to CI/CD tools.
5. Select **Connect to CI/CD tools**.
6. In the CI/CD dialog, copy or download the REST API code needed to connect to CI/CD tools.
7. Click **Close**.

Delete a database clone

Delete a sandbox clone in NetApp Workload Factory for Databases when you no longer need it and want to free up storage capacity.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the action menu of the sandbox clone you want to delete.
5. Select **Delete**.
6. In the Delete dialog, select **Delete** to confirm deletion.

Refresh a database clone

Refresh a database (sandbox) clone in NetApp Workload Factory for Databases so that it is equivalent to the source database at the current moment or a previous point in time.

About this task

Refreshing a clone updates the clone either to the source database at the current moment or to a snapshot of the source database taken at a previous point in time. Any changes made to the sandbox clone will be deleted.

Before you begin

A refresh is only possible when the source database is active.

To refresh a database clone from a snapshot, the source database must have at least one snapshot for the operation.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the action menu of the sandbox clone you want to refresh.
5. Select **Refresh**.
6. In the Refresh dialog, select one of the following options:
 - a. **Refresh to current time**
 - b. **Refresh to point in time**

For this option, select the database snapshot from the dropdown menu to refresh to.

7. Click **Refresh**.

Revert a database clone

Revert a database (sandbox) clone to its original version at the time of creation in NetApp Workload Factory for Databases.

When you clone a database, the clone at creation is a *baseline* clone. The data in the cloned database is the same as the source database at the time of creation. As data in a database clone changes over time, you might want to revert the data back to the baseline when the clone was first created. This operation is called re-baselining a clone. Re-baselining a clone rather than creating a new clone saves space; however, any changes made to the database clone will be deleted.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the action menu of the database clone you want to revert.
5. Select **Re-baseline**.
6. In the Re-baseline dialog, select **Re-baseline**.

Split a database clone

In NetApp Workload Factory for Databases, splitting a database clone from its source database creates a new database which will consume a certain amount of storage capacity. The clone gets deleted when the split is complete and the new database appears in the Inventory.

Before you begin

Consider how much storage capacity is needed for the new database. If needed, [increase file system capacity](#) for the FSx for ONTAP file system before you begin.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the action menu of the database clone you want to split.
5. Select **Split**.
6. In the Split dialog, select **Split**.

View a clone's connection information

View and copy the connection information of a database clone in NetApp Workload Factory for Databases.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Sandboxes**.
4. In Sandboxes, select the action menu of the sandbox clone to view its connection information.
5. Select **Show connection info**.
6. In the Show connection info dialog, copy the connection information if needed.
7. Select **Close**.

Deregister a resource in NetApp Workload Factory for Databases

Deregister a resource, such as a Microsoft SQL Server instance or an Oracle database, if you no longer want to deploy or monitor resources from the NetApp Workload Factory console. Deregistering resources also removes the amount of FSx for ONTAP storage capacity used by the instance.

You can register the resource again.

Steps

1. Log in to the [NetApp Console](#).
2. Select the menu , **Workloads > Databases**.
3. From the Databases menu, select **Inventory**.
4. In the Inventory, select the engine type: **Microsoft SQL Server**, **Oracle**, or **PostgreSQL**.
5. Locate the resource you want to deregister, select the action menu, and then select **Deregister**.

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