NetApp

Administer and monitor

Database workloads

NetApp
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Manage Microsoft SQL Server instances

Manage Microsoft SQL Server instances to monitor instance and database status, resource utilization, protection, and storage performance in Workload Factory for Databases.

Databases can only manage Microsoft SQL Server instances with FSx for ONTAP file system storage.

Microsoft SQL Server instance management

Microsoft SQL Server instance management includes the following tasks:

- Manage a host instance
- View a managed instance
- View databases
- Unmanage a host instance

To complete any of these tasks, you must detect one or more host instances.

Manage a host instance

Manage a detected or unmanaged Microsoft SQL Server instances for a host.

Before you begin

Complete the following prerequisites before you begin:

- You must have a detected instance in the host that is available for management.
- PowerShell7 is required to manage the database instance. Install PowerShell7 manually by referring to Microsoft PowerShell documentation for Windows.
- All manage operations are run by the AWS System Manager Agent using `NT Authority\SYSTEM` user privilege. Provide the following permissions for `NT Authority\SYSTEM` user in the database server:
  - "ALTER SETTINGS"
  - "CONTROL SERVER"
  - "ALTER ANY DATABASE"
  - "VIEW ANY DEFINITION"
  - "CONNECT ANY DATABASE"
  - "CREATE ANY DATABASE"

Steps

1. Log in to the Workload Factory console.
2. In the Databases tile, select **Go to Databases Inventory**.
3. In Databases, select the **Inventory** tab.

4. Click **Manage** in the row of the host to manage.

5. Select one or more host instances to manage.

6. Click **Manage**.

The operation fails when the Microsoft SQL Server is missing certain PowerShell modules and management scripts. Workload Factory triggers a prepare resource job to install missing modules and scripts which you can view in the Job monitoring tab. When the job completes, retry to manage the host instance.

View a managed instance

You can view a managed instance by following these steps.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Inventory** tab.

4. Click the dropdown arrow to expand the row of the host to view its managed instances.

   The host expands and the host instances appear.

5. Click the three dots menu of the instance to view and then select **View instance**.

Result
The overview of the instance appears in the Inventory tab.

View databases

You can view the databases managed by the managed instance by following these steps.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Inventory** tab.

4. Click the dropdown arrow to expand the row of the host to view its databases.

   The host expands and the host instances appear.

5. Click the three dots menu of the instance containing the databases to view.

6. Select **View databases**.

Result
The list of databases in the instance appears in the Inventory tab.

Unmanage a host instance

Unmanage a host instance by following these steps.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Inventory** tab.

4. Click the dropdown arrow to expand the row of the host instance to unmanage.

   The host expands and the host instances appear.

5. Click the three dots menu of the instance to unmanage.

6. Select **Unmanage**.

Result

The host instance is now unmanaged.

Manage clones

Create a sandbox clone in Workload Factory for Databases

Creating a sandbox clone of a database in Workload Factory for Databases lets you use the clone for development, testing, integration, analytics, training, QA, and more without altering the source database.

About this task

A sandbox clone is created from the most recent snapshot on the source database. It may be cloned in the same Microsoft SQL Server as the source database or cloned in another Microsoft SQL Server as long as they share the same FSx for ONTAP file system.

Before you begin

Ensure you complete the following prerequisites before you create a sandbox clone.

Credentials and permissions

You must have AWS account credentials and *read* or *automate* mode permissions to create a sandbox clone in Workload Factory.

Alternatively, you can use the Codebox to copy a partially completed template or create a completed template so that you can create the sandbox clone outside of Workload Factory using REST API. Learn more about Codebox automation.

Microsoft SQL Server

You must have a managed Microsoft SQL Server in Workload Factory for Databases to host the new sandbox clone.

AWS Systems Manager

Ensure the `NT Authority\SYSTEM` user privilege is enabled in the Microsoft SQL host via AWS Systems Manager.

Source database

You need a source database available for the clone.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, select **Create new sandbox**.

5. On the Create new sandbox page, under Database source, provide the following:

   a. **Source database host**: Select the source database host.

   b. **Source database instance**: Select the source database instance.

   c. **Source database**: Select the source database to clone from.

6. Under Database target, provide the following:

   a. **Target database host**: Select a target database host for the sandbox clone that is in the same VPC and has the same FSx for ONTAP file system as the source host.

   b. **Target database instance**: Select the target database instance for the sandbox clone.

   c. **Target database**: Enter a name for the sandbox clone.

7. **Mount**: Select **Auto-assign mount point** or **Define mount point path**. If you select **Define mount point path**, enter the mount point path.

8. **Define tag**: Select a tag to define the sandbox clone.

9. Click **Create**.

To check the job's progress, go to the **Job monitoring** tab.

Check the integrity of the data in a sandbox clone

Run an integrity check to determine if sandbox clone data is intact or corrupt.

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 Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, click the three dots 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.

Revert a sandbox clone in Workload Factory for Databases

Revert a database clone to its original version at the time of creation.

About this task

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 sandbox 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 sandbox clone will be deleted.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, click the three dots menu of the sandbox clone you want to revert.

5. Select **Re-baseline**.

6. In the Re-baseline dialog, click **Re-baseline**.

Refresh a sandbox clone in Workload Factory for Databases

Refresh a database clone 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 Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, click the three dots 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**.

Connect a sandbox clone to CI/CD tools

Connect a sandbox clone to a continuous integration and continuous delivery (CI/CD)

pipeline with REST API code to improve software delivery via automation.

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 Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, click the three dots 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**.

View connection information of a sandbox clone

View and copy the connection information of a sandbox clone.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, click the three dots 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. Click **Close**.

Split a sandbox clone from the source database

Splitting a sandbox 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 Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. In the Sandboxes tab, click the three dots menu of the sandbox clone you want to split.

5. Select **Split**.

6. In the Split dialog, click **Split**.

Split a sandbox clone from the source database

Delete a sandbox clone when you no longer need it and want to free up storage capacity.

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, click **Go to Databases Inventory**.

3. In Databases, select the **Sandboxes** tab.

4. Click the three dots menu of the sandbox clone you want to delete.

5. Select **Delete**.

6. In the Delete dialog, click **Delete**.

Monitor databases

Track database jobs and monitor databases with Workload Factory for Databases.

About this task

Databases provides job monitoring so you can track job progress, and diagnose and troubleshoot in case any failure occurs. In addition, filters by type and status, the search function, and the option to download the jobs table help with database jobs navigation and reporting.

Job monitoring supports up to three levels of monitoring depending on the job. For example, for new database and sandbox clone creation, job monitoring tracks parent jobs and sub-jobs.

Job monitoring levels

- Level 1 (parent job): Tracks the host deployment job.

- Level 2 (sub-job): Tracks the sub-jobs related to the host deployment parent job.

- Level 3 (task): Lists the sequence of actions taken on each resource.

Job status

The job monitoring feature tracks *in progress*, *completed*, and *failed* jobs daily, weekly, bi-weekly, and monthly.

Job events retention

Job monitoring events are retained in the user interface for 30 days.

Monitor jobs

Steps

1. Log in to the Workload Factory console.

2. In the Databases tile, select **Go to Databases Inventory**.

3. In Databases, select the **Job monitoring** tab.

4. In the Job monitoring tab, use the filters or search to narrow job results. You can also download a jobs report.

5. Click the three dots menu of the job and click **Go to CloudFormation** to view the job log in the AWS CloudFormation console.