Implement configuration best practices

Database workloads

NetApp
February 04, 2026

This PDF was generated from https://docs.netapp.com/us-en/workload-databases/optimize-overview.html on February 04, 2026. Always check docs.netapp.com for the latest.

Table of Contents

Implement configuration best practices . . . 1
- Configuration analysis for database environments in Workload Factory . . . 1
  - Components of the configuration analysis . . . 1
  - Analysis scope . . . 1
  - Analysis requirements . . . 2
- Implement well-architected database configurations in Workload Factory . . . 2
  - About this task . . . 2
  - Before you begin . . . 3
  - Fix a configuration issue . . . 3
  - Postpone or dismiss the analysis of database configurations . . . 4

Implement configuration best practices

Configuration analysis for database environments in Workload Factory

Workload Factory for Databases analyzes database configurations regularly to determine if there are any issues with Microsoft SQL Server and Oracle deployments on Amazon FSx for NetApp ONTAP storage. When issues are found, Workload Factory shows you what the issues are and explains what needs to change to ensure your database configurations achieve peak performance, cost efficiency, and compliance with best practices.

Key capabilities include:

- Daily configuration analysis
- Automatic best practice validations
- Right-sizing recommendations
- Proactive observability
- Insights to action
- AWS Well-Architected Framework advisor

Components of the configuration analysis

The configuration analysis includes the following components:

Well-architected status

The well-architected status refers to the overall health of your database configurations; configurations are categorized as "optimized", "not optimized", or "over-provisioned". The well-architected status of a configuration is referenced from within a Microsoft SQL Server instance or Oracle database in the Workload Factory console.

Well-architected score

The score includes all currently analyzed configurations and appears as a percentage. A 25% score means that 25% of your database deployments are well-architected. The well-architected score is referenced from the **Well-architected** screen and from within a Microsoft SQL Server instance or Oracle database in the Workload Factory console.

Configuration categories

The configurations are organized into the following categories: storage, compute, application, resiliency, and cloning. Each category includes specific configuration assessments that are analyzed regularly. Configuration categories are referenced from the **Well-architected** screen and from within a Microsoft SQL Server instance or Oracle database in the Workload Factory console.

Analysis scope

The scope of optimization is different depending on which component is being assessed. For example, storage optimization occurs at the SQL instance level whereas compute optimization occurs at the host level.

Analysis requirements

For a complete database environment analysis, resources must be registered and online.

Learn how to register resources.

What's next

Implement well-architected database configurations

Implement well-architected database configurations in Workload Factory

Using configuration analysis insights and recommendations, leverage NetApp Workload Factory to implement best practices for your database configurations with Microsoft SQL Server and Oracle. You can easily review the well-architected status, learn about issues with database configurations, and fix configurations that aren't optimized for reliability, security, efficiency, performance, and cost.

You can also dismiss the analysis of specific configurations that don't apply to your environment to avoid unnecessary alerts and inaccurate optimization results.

Learn about the configuration analysis and well-architected status in Workload Factory.

About this task

Workload Factory analyzes database configurations daily. The daily analysis provides the well-architected status, and insights and recommendations with options to automatically fix configuration issues so that your configurations meet best practices.

You have options to review the recommendations for configuration issues and fix those issues from the Databases inventory within the Workload Factory console.

What is analyzed

Workload Factory analyzes the well-architected status of the following configurations:

For Microsoft SQL Server instances:

- Storage sizing: includes storage tier, file system headroom, log drive size, and TempDB drive size
- Storage layout: includes user data files placement, log files placement, and TempDB placement
- Storage configuration: includes capacity management, thin provisioning, tiering policy, snapshots, Microsoft Multipath I/O (MPIO) status, and MPIO timeout setting
- Compute: includes rightsizing, operating system patches, and network adapter settings like Receive Side Scaling (RSS), TCP offloading, and MTU alignment
- Applications: includes Microsoft SQL Server licenses, Microsoft SQL Server patch, and MAXDOP settings
- Resiliency: includes local snapshots, FSx for ONTAP backups, cross-region replication (CRR), and Microsoft SQL High Availability.
- Clones: includes options to refresh and delete clones (sandboxes) that were created in or outside of Workload Factory and are older than 60 days

For Oracle databases:

- Storage sizing: includes swap space allocation and file system headroom
- Storage configuration: includes capacity management, thin provisioning, tiering policy, snapshots, storage efficiencies, and operating system configurations for deployments using NFS or iSCSI with or without Automatic Storage Management (ASM) including Microsoft Multipath I/O (MPIO) status and settings, and the following dNFS settings: dNFS enablement, dNFS consistent IP resolution, dNFS configuration file, and dNFS `nosharecache`
- Storage layout: includes redo log placement, temp tablespace placement, data files placement, archive log placement, control files placement and binaries placement, ASM disk groups LUN count

Before you begin

- You must grant *operations and remediation* permissions in your AWS account.
- To assess the storage of a Microsoft SQL Server instance or Oracle database, the resource must be registered in Workload Factory and the storage type must be FSx for ONTAP. Learn how to register resources.
- Make sure you review each recommendation carefully before selecting to fix a setting or configuration. For RSS and MAXDOP settings, we suggest that you test the recommended settings to determine performance improvements before making changes to your production environment.

The remediation process may cause instance downtimes or service interruptions. Make sure you review the recommendation carefully before you choose to fix a configuration.

Fix a configuration issue

Fix configuration issues for SQL Server or Oracle environments running on FSx for ONTAP storage.

The remediation process may cause instance downtimes or service interruptions. Make sure you review the recommendation carefully before you choose to fix a configuration issue.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Databases**.
3. In the **Inventory**, select the engine type: Microsoft SQL Server or Oracle.
4. Select resources to fix for specific configurations.
   - If you selected Microsoft SQL Server, select the **Instances** tab.
   - If you selected Oracle, select the **Databases** tab.
5. Select **View and fix** to view configuration issues for the instance.
6. On the Well-architected status page for the instance, review the findings from the analysis.

   You can filter configuration issues by categories, subcategories, status, severity, and tags.

   You can also download a report of the findings by selecting **Export PDF**.

7. Select the dropdown arrow to view the recommendation for any configuration. Recommendations include best practices, potential pitfalls of unoptimized configurations, and important considerations. Make sure you review the recommendation carefully.

8. Select to **View and fix** configuration issues when the option is available.

   Select all is the default, but you can select specific resources to fix.

   a. For all configurations except clone cleanup, review the recommendation details to learn what will happen if you choose to fix the issue. Some remediation operations may cause instance downtimes or service interruptions.

   b. For clone cleanup, select cloned databases (sandboxes) to refresh or delete.

      - Refreshing a clone synchronizes it with its source database. Refresh is available only for clones created in Workload Factory.
      - Deleting a clone removes it permanently, frees up storage space, and reduces costs. You can delete clones created in and outside of Workload Factory.

9. Select **Continue** to fix the configuration issue.

Result

Workload Factory begins fixing the issue(s). Select the **Job monitoring** tab to view the status of the operation.

Postpone or dismiss the analysis of database configurations

Postpone or dismiss the analysis of specific database configurations that don't apply to your database environment to avoid unnecessary alerts and inaccurate optimization results. You can reactivate a postponed or dismissed configuration analysis at any time.

The application requirements for database configurations vary. Workload Factory gives you two options for skipping the analysis of specific database configurations so that you can monitor only relevant issues and get an accurate view of the health of relevant configurations. When a specific configuration analysis is postponed or dismissed, the configuration isn't included in the total optimization score.

You can postpone, dismiss, and reactivate the configuration analysis at the configuration level and at the SQL Server instance or at the Oracle database level.

- **Postpone for 30 days**: Postponing the analysis will stop the analysis for 30 days. After 30 days, the analysis will restart automatically.
- **Dismiss**: Dismissing the analysis postpones the analysis indefinitely. You can restart the analysis if needed.

The following instructions describe how to postpone, dismiss, or reactivate an analysis at the configuration level. To complete the following tasks for specific SQL Server instances or Oracle databases, start in the **Dashboard** tab.

Postpone

Postpone to stop a configuration analysis for 30 days. After 30 days, the analysis will restart automatically.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Databases**.
3. From the Databases menu, select **Inventory**.
4. In the Inventory, select the database engine type: **Microsoft SQL Server** or **Oracle**.
5. Navigate to the SQL Server instance or Oracle database with the configuration to postpone, select the action menu, and then select **Well-architected**.
6. On the Well-architected analysis page, scroll down to the configuration to postpone, select the action menu, and then select **Dismiss**.
7. In the Dismiss configuration dialog, select **Postpone for 30 days** and then select **Dismiss**.

Result

The configuration analysis stops for 30 days.

Dismiss

Dismiss to stop a configuration analysis indefinitely. You can restart the analysis when needed.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Databases**.
3. From the Databases menu, select **Inventory**.
4. In the Inventory, select the database engine type: **Microsoft SQL Server** or **Oracle**.
5. Navigate to the SQL Server instance or Oracle database with the configuration to postpone, select the action menu, and then select **Well-architected**.
6. On the Well-architected analysis page, scroll down to the configuration to postpone, select the action menu, and then select **Dismiss**.
7. In the Dismiss configuration dialog, select the **Dismiss** option and then select **Dismiss** to confirm dismissal.

Result

The configuration analysis stops.

Reactivate

Reactivate a postponed or dismissed configuration analysis at any time.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Databases**.
3. From the Databases menu, select **Inventory**.
4. In the Inventory, select the database engine type: **Microsoft SQL Server** or **Oracle**.
5. Navigate to the SQL Server instance or Oracle database with the configuration to postpone, select the

action menu, and then select **Well-architected**.

6. On the Well-architected analysis page, select **Dismissed configuration** to display only dismissed configurations.
7. Select **Reactivate** to restart the configuration analysis for the postponed or dismissed configuration.

Result

The configuration analysis is reactivated and occurs daily moving forward.

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