<https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-overview?view=azuresql>

**Monitor Azure SQL workloads with database watcher (preview)**

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**Applies to:**  [Azure SQL Database](https://learn.microsoft.com/en-us/sql/sql-server/sql-docs-navigation-guide#applies-to)  [Azure SQL Managed Instance](https://learn.microsoft.com/en-us/sql/sql-server/sql-docs-navigation-guide#applies-to)

Database watcher is a managed monitoring solution for database services in the Azure SQL family. It supports [Azure SQL Database](https://azure.microsoft.com/products/azure-sql/database/) and [Azure SQL Managed Instance](https://azure.microsoft.com/products/azure-sql/managed-instance/).

Database watcher collects in-depth workload monitoring data to give you a detailed view of database performance, configuration, and health. Monitoring data from the databases, elastic pools, and SQL managed instances you select is [collected](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-data?view=azuresql#data-collection) into a central data store in your Azure subscription. [Dashboards](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-overview?view=azuresql#dashboards) in Azure portal provide a single-pane-of-glass view of your Azure SQL estate and a detailed view of each database, elastic pool, and SQL managed instance.

To store and analyze SQL monitoring data, database watcher can use either [Azure Data Explorer](https://learn.microsoft.com/en-us/azure/data-explorer/data-explorer-overview) or [Real-Time Analytics in Microsoft Fabric](https://learn.microsoft.com/en-us/fabric/real-time-analytics/overview). Azure Data Explorer is a fully managed, highly scalable data service, purpose-built for fast ingestion and analytics on time-series monitoring data. A single Azure Data Explorer cluster can scale to support monitoring data from thousands of Azure SQL resources. Real-Time Analytics uses the same core engine as a SaaS offering within Microsoft Fabric.

You can query data in an Azure Data Explorer or Real-Time Analytics database using [KQL](https://learn.microsoft.com/en-us/azure/data-explorer/kusto/query/) or [T-SQL](https://learn.microsoft.com/en-us/azure/data-explorer/t-sql), build custom visualizations using [Azure Data Explorer dashboards](https://learn.microsoft.com/en-us/azure/data-explorer/azure-data-explorer-dashboards), [Power BI](https://learn.microsoft.com/en-us/azure/data-explorer/power-bi-data-connector) or [Grafana](https://learn.microsoft.com/en-us/azure/data-explorer/grafana), and analyze data in [Excel](https://learn.microsoft.com/en-us/azure/data-explorer/excel-connector). You can set data [retention](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#manage-data-retention) policy per database or per table, and [scale](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#scale-azure-data-explorer-cluster) your Azure Data Explorer cluster automatically or manually to achieve the optimal price/performance ratio.

To start monitoring your Azure SQL resources, create a **watcher** resource in your Azure subscription. Configure the watcher by selecting a **data store** and a set of databases, elastic pools, or SQL managed instances to monitor, called **SQL targets**. Grant the watcher access to targets, and start the watcher.

* For the steps to get started quickly, see [Quickstart: monitor Azure SQL with database watcher](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-quickstart?view=azuresql). For setup and configuration details, see [Create and configure a database watcher](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql).
* For answers to frequently asked questions about database watcher, see [Database watcher FAQ](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-faq?view=azuresql).
* For a video overview of database watcher, watch a [Data Exposed](https://learn.microsoft.com/en-us/shows/data-exposed/) episode:

**Note**

Database watcher is currently in preview. Preview features are released with limited capabilities, but are made available on a *preview* basis so customers can get early access and provide feedback. Preview features are subject to separate [**supplemental preview terms**](https://go.microsoft.com/fwlink/?linkid=2240967), and aren't subject to SLAs. Support is provided as best effort in certain cases. However, Microsoft Support is eager to get your feedback on the preview functionality, and might provide best effort support in certain cases. Preview features might have limited or restricted functionality, and might be available only in selected geographic areas.

**Supported Azure SQL targets**

Database watcher supports all service tiers, compute tiers, and service objectives in Azure SQL Database and Azure SQL Managed Instance. This includes [vCore](https://learn.microsoft.com/en-us/azure/azure-sql/database/service-tiers-sql-database-vcore?view=azuresql) and [DTU](https://learn.microsoft.com/en-us/azure/azure-sql/database/service-tiers-dtu?view=azuresql) purchasing models, [provisioned](https://learn.microsoft.com/en-us/azure/azure-sql/database/service-tiers-sql-database-vcore?view=azuresql#compute) and [serverless](https://learn.microsoft.com/en-us/azure/azure-sql/database/serverless-tier-overview?view=azuresql) compute tiers, [single databases](https://learn.microsoft.com/en-us/azure/azure-sql/database/single-database-overview?view=azuresql) and [elastic pools](https://learn.microsoft.com/en-us/azure/azure-sql/database/elastic-pool-overview?view=azuresql), and [Hyperscale](https://learn.microsoft.com/en-us/azure/azure-sql/database/service-tier-hyperscale?view=azuresql).

Database watcher can monitor all types of secondary [readable replicas](https://learn.microsoft.com/en-us/azure/azure-sql/database/read-scale-out?view=azuresql), including high availability replicas, [geo-replicas](https://learn.microsoft.com/en-us/azure/azure-sql/database/active-geo-replication-overview?view=azuresql), and Hyperscale [named secondary](https://learn.microsoft.com/en-us/azure/azure-sql/database/service-tier-hyperscale-replicas?view=azuresql) replicas.

For a given watcher, the SQL targets can be in any subscription within the same Microsoft Entra ID tenant.

**Database watcher price**

Database watcher costs are incurred by its individual components, as follows:

Expand table

| **Component** | **Price** | **Notes** |
| --- | --- | --- |
| Watchers | **Free** |  |
| Dashboards | **Free** |  |
| Azure Data Explorer cluster\* | [Pricing details](https://azure.microsoft.com/pricing/details/data-explorer) | The optimal cluster SKU depends on the number of monitoring targets and the cluster query workload. For cluster sizing considerations, see [Manage Azure Data Explorer cluster](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#manage-data-store). |
| Real-Time Analytics in Microsoft Fabric | Included in the Power BI Premium workspace consumption model. Billing per use. | Use either Azure Data Explorer or Real-Time Analytics. Only one of these offerings is required. |
| A vault in Azure Key Vault | [Pricing details](https://azure.microsoft.com/pricing/details/key-vault/) | Required only if the optional SQL authentication is used instead of the default Microsoft Entra authentication. |
| Azure network bandwidth | [Pricing details](https://azure.microsoft.com/pricing/details/bandwidth/) | Cost is not incurred if a watcher, its targets, and its data store are deployed in the same Azure region. |

\*You can use a [free Azure Data Explorer cluster](https://learn.microsoft.com/en-us/azure/data-explorer/start-for-free) when a service level agreement is not required and when query performance and storage requirements are satisfied by the free cluster capacity specifications. The free cluster trial period is for a year and can be extended automatically.

There is no charge per monitored Azure SQL resource or per user, making database watcher an inexpensive monitoring solution for larger Azure SQL environments and larger teams.

**Regional availability**

At this time, you can create database watchers in the following Azure regions:

Expand table

| **Azure geography** | **Azure region** |
| --- | --- |
| Asia Pacific | Australia Central |
| Asia Pacific | Australia East |
| Asia Pacific | Australia Southeast |
| Asia Pacific | Japan West |
| Asia Pacific | Korea Central |
| Asia Pacific | Southeast Asia |
| Canada | Canada Central |
| Canada | Canada East |
| Europe | Germany West Central |
| Europe | North Europe |
| Europe | UK South |
| Europe | Sweden Central |
| Europe | West Europe |
| United States | Central US |
| United States | East US |
| United States | East US 2 |
| United States | North Central US |
| United States | West US |

**Tip**

A watcher in one Azure region can monitor targets in another region. Similarly, a watcher and its data store can be located in different regions.

When possible, colocate a watcher, its targets, and its data store in the same region. If database watcher is not yet available in your region, choose a region in the same Azure [**geography**](https://azure.microsoft.com/explore/global-infrastructure/geographies/#geographies). This can reduce Azure network bandwidth costs.

**Limits**

There is a limit on the number of SQL targets per watcher, and the number of watchers per subscription. Deployments exceeding these limits are not supported.

Expand table

| **Parameter** | **Limit** |
| --- | --- |
| SQL targets per watcher1 | 100 |
| Watchers per subscription | 20 |

1A high availability replica of a database, elastic pool, or SQL managed instance is monitored independently of its parent replica, and is considered a separate target.

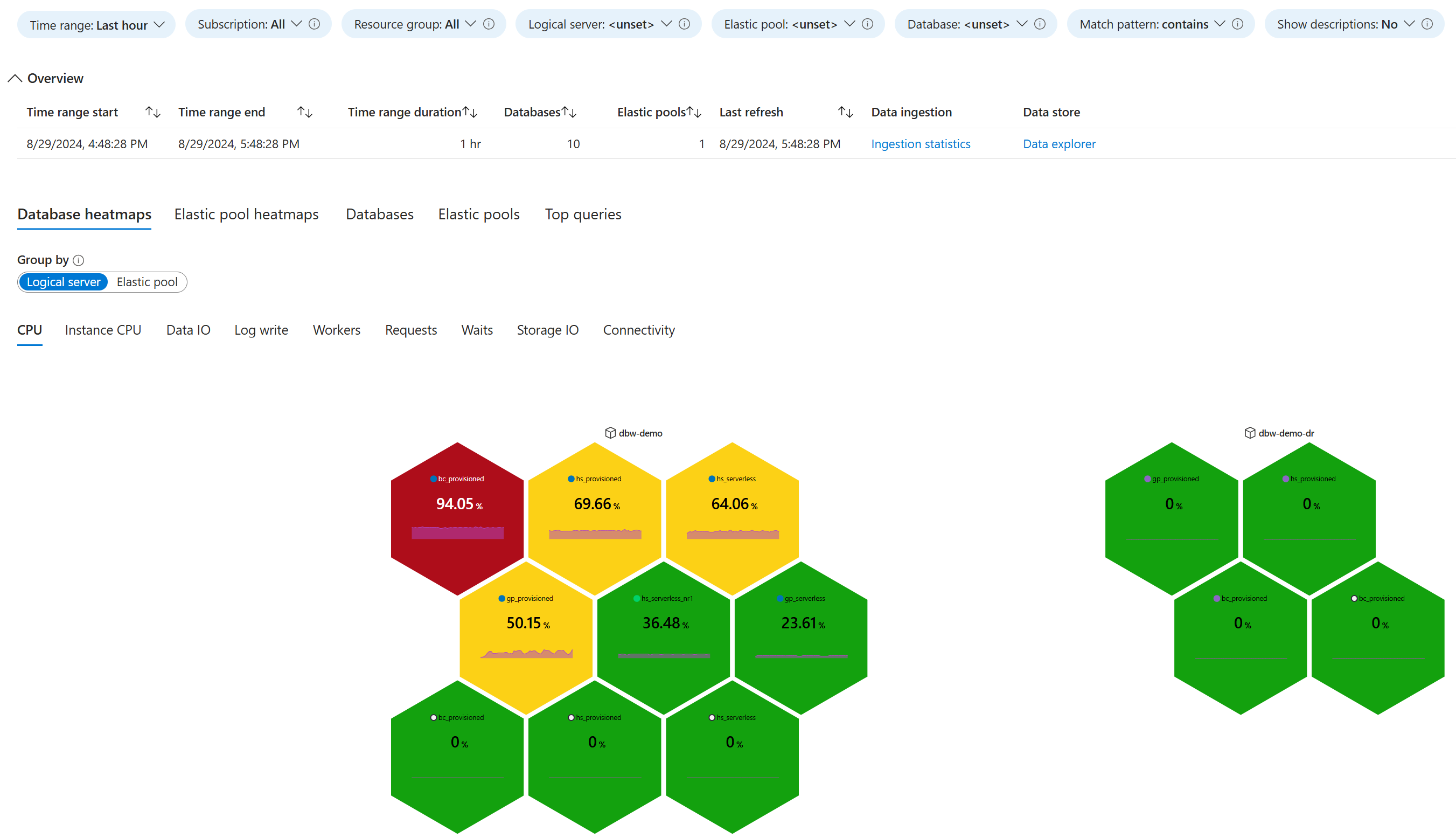
**Note**

During preview, limits are subject to change.

**Dashboards**

Database watcher uses [Azure Workbooks](https://learn.microsoft.com/en-us/azure/azure-monitor/visualize/workbooks-overview) to provide monitoring dashboards at the estate level and at the resource level.

Here is an example of a database CPU utilization heatmap on the estate dashboard. Each hexagon represents a SQL target. There are two logical servers, one with six databases and one with three databases. The high availability secondary replicas are shown on the heatmap as separate targets. Select the image to see additional details, including data ingestion statistics.

[](https://learn.microsoft.com/en-us/azure/azure-sql/media/database-watcher-overview/database-watcher-sql-database-estate-dashboard.png?view=azuresql#lightbox)

Here is an example showing a partial view of the **Performance** tab of an Azure SQL database dashboard. Select the image to zoom into details.

[](https://learn.microsoft.com/en-us/azure/azure-sql/media/database-watcher-overview/database-watcher-sql-database-resource-dashboard.png?view=azuresql#lightbox)

The following table describes the capabilities of database watcher dashboards in the Azure portal.

Expand table

| **Capability** | **Description** |
| --- | --- |
| **Estate dashboards** | Visualize high-level monitoring data for multiple monitored resources in a common view. Use **heatmaps** to find top resource consuming databases, elastic pools, or SQL managed instances.  Use the **top queries** view to find top resource consuming queries across your Azure SQL estate, ranking queries by CPU, duration, execution count, etc.  Use the subscription, resource group, and resource name filters to focus on subsets of your Azure SQL estate.  Drill through to detailed dashboards for specific resources. |
| **Resource dashboards** | Visualize detailed monitoring data for a database, an elastic pool, or a SQL managed instance, including:  - Active sessions - Backup history - Common performance counters - Connectivity probes - Database and instance properties and configuration - Geo-replication - Index metadata, usage statistics, warnings, and suggestions - Resource usage - Session and connection statistics - SQL Agent job state and history - Storage consumption and performance - Table metadata - Top queries - Wait statistics  Use resource dropdowns to quickly switch from one resource to another. Use the **estate** link to zoom out to an estate dashboard. |
| **Filter by time range** | On each dashboard, set the time range to focus on the desired time interval. Use standard or custom time ranges. Narrow down the time range to an interval of interest by "brushing", or dragging the mouse cursor over a chart to select a shorter time range. |
| **Historical data** | Depending on the dataset, dashboards show either a summary for the selected time interval, or the latest sample collected in the time interval.  Toggle between the latest and a historical view to look at data samples earlier in the selected time range. For example, instead of looking at the currently active sessions, review a previous sample of active sessions collected when a spike in resource usage occurred. |
| **Secondary replicas** | Monitor all types of replicas, including high-availability (HA) secondary replicas on estate dashboards. Toggle between viewing the primary replica and its HA secondary replica on resource dashboards. |
| **Download data to Excel** | Download data from charts and grids as csv files and open them in Excel for additional analysis. |
| **Data refresh** | Retrieve the latest data from the monitoring data store when you open a dashboard and as you switch from tab to tab. After a dashboard has been opened for some time, refresh it manually to see the latest data, or enable automatic dashboard refresh. |
| **Ad hoc KQL query** | Use a link on each dashboard to open the Azure Data Explorer [web UI](https://learn.microsoft.com/en-us/azure/data-explorer/web-ui-query-overview) and query your monitoring data with [KQL](https://learn.microsoft.com/en-us/azure/data-explorer/kusto/query/). For more information, see [datasets](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-data?view=azuresql#datasets) and [Use KQL to analyze monitoring data](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-analyze?view=azuresql#use-kql-to-analyze-monitoring-data). |
| **Descriptions** | Toggle the **Show descriptions** parameter to see descriptions that help you interpret displayed data and include relevant documentation links. |
| **Tooltips** | Hover over a field to see more details and context for displayed data. |
| **Ingestion statistics** | Use the **Ingestion statistics** link to see data ingestion latency and other ingestion statistics per dataset. |
| **Dark mode** | Switch the Azure portal appearance to use the dark theme to have database watcher dashboards use dark mode. |

**Note**

During preview, dashboard visualizations and capabilities are subject to change.

**SQL monitoring data**

Database watcher collects monitoring data from more than 70 SQL [catalog views](https://learn.microsoft.com/en-us/sql/relational-databases/system-catalog-views/catalog-views-transact-sql) and [dynamic management views](https://learn.microsoft.com/en-us/sql/relational-databases/system-dynamic-management-views/system-dynamic-management-views) (DMVs). Data from one or multiple related views is transformed into a dataset. For example, data from [sys.dm\_exec\_sessions](https://learn.microsoft.com/en-us/sql/relational-databases/system-dynamic-management-views/sys-dm-exec-sessions-transact-sql), [sys.dm\_exec\_requests](https://learn.microsoft.com/en-us/sql/relational-databases/system-dynamic-management-views/sys-dm-exec-requests-transact-sql), and other views forms the **Active sessions** dataset. For each [dataset](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-data?view=azuresql#datasets), there is a separate table in the Azure Data Explorer or Real-Time Analytics database.

Database watcher has separate dataset groups for databases, elastic pools, and SQL managed instances. There are 10 to 30 datasets in each group, providing a detailed view of database performance, configuration, and health for your Azure SQL resources.

For more information, see [Database watcher data collection and datasets](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-data?view=azuresql).

**Network connectivity**

Database watcher uses a remote data collection agent that connects to targets, data store, and key vault over the network. Depending on your network security requirements and the configuration of your Azure resources, database watcher can use either private or public connectivity. You always fully control network connectivity from database watcher to your Azure resources.

For more information about network connectivity in Azure SQL, see [Azure SQL Database connectivity architecture](https://learn.microsoft.com/en-us/azure/azure-sql/database/connectivity-architecture?view=azuresql) and [Azure SQL Managed Instance connectivity architecture](https://learn.microsoft.com/en-us/azure/azure-sql/managed-instance/connectivity-architecture-overview?view=azuresql).

**Private connectivity**

To provide private connectivity, database watcher uses [Azure Private Link](https://learn.microsoft.com/en-us/azure/private-link/private-link-overview). When you configure a watcher, you can [create managed private endpoints](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#create-a-managed-private-endpoint) to let the watcher connect to databases and elastic pools on [logical servers](https://learn.microsoft.com/en-us/azure/azure-sql/database/logical-servers?view=azuresql), or to SQL managed instances. You can also create a private endpoint for the Azure Data Explorer cluster, and for the key vault storing SQL authentication credentials. At this time, private connectivity is not available for connections to Real-Time Analytics in Microsoft Fabric.

A resource owner must approve a private endpoint before database watcher can use it. Conversely, resource owners can delete any database watcher private endpoint at any time to stop data collection.

Once a private endpoint for an Azure resource is created and approved, all network traffic between a watcher and the resource uses private connectivity, even if public connectivity for the resource remains enabled.

For more information about private endpoints in Azure SQL, see [Azure Private Link for Azure SQL Database](https://learn.microsoft.com/en-us/azure/azure-sql/database/private-endpoint-overview?view=azuresql) and [Azure Private Link for Azure SQL Managed Instance](https://learn.microsoft.com/en-us/azure/azure-sql/managed-instance/private-endpoint-overview?view=azuresql).

**Public connectivity**

If private connectivity is not required, database watcher can use public connectivity to connect to Azure resources. To enable a watcher to connect to databases and elastic pools on an Azure SQL Database logical server, [public access](https://learn.microsoft.com/en-us/azure/azure-sql/database/connectivity-settings?view=azuresql#deny-public-network-access) to the server must be enabled, and the [IP-based firewall](https://learn.microsoft.com/en-us/azure/azure-sql/database/firewall-configure?view=azuresql) must allow connections from all Azure services.

To enable a watcher to connect to a SQL managed instance using public connectivity, the instance must have its public endpoint enabled. Additionally, a Network Security Group (NSG) rule that allows inbound traffic on TCP port 3342 to the managed instance subnet must have its source set to AzureCloud. For more information, see [Configure public endpoints in Azure SQL Managed Instance](https://learn.microsoft.com/en-us/azure/azure-sql/managed-instance/public-endpoint-configure?view=azuresql-mi&preserve-view=true).

To enable a watcher to connect to an Azure Data Explorer cluster or a key vault using public connectivity, the cluster or vault must have its network access enabled from all networks.

**Data access**

Just like network connectivity, you fully control database watcher access to your databases. You grant access by creating dedicated database watcher logins on logical servers and SQL managed instances, and then granting specific, limited permissions to collect monitoring data from SQL system views.

**Watcher authentication**

Database watcher supports [Microsoft Entra authentication](https://learn.microsoft.com/en-us/azure/azure-sql/database/authentication-aad-configure?view=azuresql) (previously known as Azure Active Directory authentication). This is the preferred and recommended way for a watcher to authenticate to a SQL target. You create a Microsoft Entra authentication login for the [managed identity](https://learn.microsoft.com/en-us/entra/identity/managed-identities-azure-resources/overview) of the watcher on all logical servers and SQL managed instances that you want to monitor.

Database watcher also supports password-based SQL authentication. You might use SQL authentication if Microsoft Entra authentication is not enabled on your Azure SQL resources. For more information, see [Additional configuration to use SQL authentication](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#additional-configuration-to-use-sql-authentication).

**Watcher authorization**

To collect monitoring data, database watcher requires specific, limited access to each monitoring target, as described in the following table. These role memberships and permissions give the watcher the necessary access to the system monitoring data, but not to any other data in your databases.

Expand table

| **Azure SQL Database** | **Azure SQL Managed Instance** |
| --- | --- |
| Membership in all of the following [server roles](https://learn.microsoft.com/en-us/azure/azure-sql/database/security-server-roles?view=azuresql): ##MS\_ServerPerformanceStateReader## ##MS\_DefinitionReader## ##MS\_DatabaseConnector## | The following server permissions: CONNECT SQL CONNECT ANY DATABASE VIEW ANY DATABASE VIEW ANY DEFINITION VIEW SERVER PERFORMANCE STATE  The SELECT permission on the following tables in the msdb database: dbo.backupmediafamily dbo.backupmediaset dbo.backupset dbo.suspect\_pages dbo.syscategories dbo.sysjobactivity dbo.sysjobhistory dbo.sysjobs dbo.sysjobsteps dbo.sysoperators dbo.syssessions |

**Important**

When a watcher connects to an Azure SQL resource, it validates the SQL permissions it holds. If the permissions granted are insufficient, or *if unnecessary permissions are granted*, the watcher disconnects. This ensures that the watcher can collect system monitoring data, but is not accidentally granted access to any other data in your databases.

When configuring watcher access to a SQL target, always [**create a dedicated login using provided scripts**](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#grant-access-to-sql-targets-with-t-sql-scripts). Do not add the watcher login or user to any SQL roles or grant any SQL permissions other than the ones listed in the table.

If you [deny](https://learn.microsoft.com/en-us/sql/t-sql/statements/deny-transact-sql) the required permissions to the database watcher login or user, or to a role that has the database watcher login or user as a member (including the public database role), then database watcher might not collect monitoring data. Depending on which permissions are denied, this might affect some or all datasets.

Conversely, if you [grant](https://learn.microsoft.com/en-us/sql/t-sql/statements/grant-transact-sql) unnecessary permissions to the database watcher login or user, or to a role that has the database watcher login or user as a member, then database watcher might not collect monitoring data for some or all datasets. Similarly, data might not be collected if you add the database watcher login or user to a built-in server or database role.

**What's new**

This section describes recent database watcher fixes, changes, and improvements.

Expand table

| **Time period** | **Changes** |
| --- | --- |
| November 2024 | - Enable database watcher in the **Australia Central**, **Australia Southeast**, **Canada East**, **Central US**, **Germany West Central**, **Japan West**, **Korea Central**, and **North Central US** Azure regions. - Increase the limit on the number of SQL targets per watcher from 50 to 100. |
| October 2024 | - Fix bugs where the **Table metadata** dataset was not collected if there were any views with invalid table references, or any tables with multiple column check constraints. - Add support for using a user assigned identity as the watcher identity. For more information, see [Modify watcher identity](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#modify-watcher-identity). - Automatically grant the watcher access to key vault secrets when adding a SQL target that uses SQL authentication. - Automatically grant the watcher access to an Azure Data Explorer database when adding a data store to an existing watcher. - Add the feedback button on the **Overview** page and other pages. |
| September 2024 | - Fix a bug where the number of user logical sessions in the **Session statistics** dataset was always the same as the number of user sessions, even if [MARS](https://learn.microsoft.com/en-us/sql/relational-databases/native-client/features/using-multiple-active-result-sets-mars) logical sessions were used. - Fix a bug where elastic pool storage utilization wasn't reported correctly for Hyperscale elastic pools. - Resolve an issue where for certain datasets, the first sample collected after a watcher restart might contain data that has already been collected before restart. - Improve collection query performance to avoid timeouts for the **Table metadata** dataset. - Improve collection reliability for the **Query runtime statistics** and **Query wait statistics** datasets on SQL Managed Instance. - Add failover-related columns to the **Database replicas** dataset for SQL Managed Instance. - Add index operational statistics columns to the **Index metadata** datasets. - Add support for selecting multiple Azure SQL databases in the **Add SQL target** blade. |
| August 2024 | - Enable database watcher in the **Central US**, **East US 2**, **North Europe**, and **Sweden Central** Azure regions. - Add subscription and resource group filters in estate [dashboards](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-overview?view=azuresql#dashboards). |
| July 2024 | - Fix a bug where the **Performance counters** datasets were not collected from databases with a case-sensitive catalog collation, or managed instances with a case-sensitive database collation. - Fix a bug where data was not collected if the database name in the SQL metadata had a different case than the database name in the Azure Resource Manager (ARM) metadata. - Fix a bug where the **Query runtime statistics** and **Query wait statistics** datasets were not collected in databases with a large volume of new queries and query plans inserted into Query Store tables. - Resolve an issue where the **Geo-replicas** and **Replicas** datasets were not collected from Hyperscale databases. - Add the subscription\_id and resource\_group\_name [common columns](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-data?view=azuresql#common-columns) to all datasets. Requires a one-time [restart](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#start-and-stop-a-watcher) of a watcher. - Add the resource\_id [common column](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-data?view=azuresql#common-columns) to all datasets. The data appears for SQL targets added in July 2024 or later. To make data appear for an existing SQL target, [remove](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#remove-sql-targets-from-a-watcher) and [re-add](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#add-sql-targets-to-a-watcher) the target, and [restart](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#start-and-stop-a-watcher) the watcher. |
| June 2024 | - Fix a bug where data was not collected from some SQL targets added via Bicep or an ARM template. - Fix a bug where the **Backup history** dataset was not collected for some Azure SQL databases. - Fix a bug where the replica type of a managed instance was incorrectly determined as *Geo-replication forwarder* if the instance had a database using [Managed Instance link](https://learn.microsoft.com/en-us/azure/azure-sql/managed-instance/managed-instance-link-feature-overview?view=azuresql). The same bug caused the **Query runtime statistics** and **Query wait statistics** datasets to not be collected in this case. - Fix a bug that caused a *Failed to load targets* error on the **SQL targets** blade in the Azure portal if the user did not have access to the subscription of the SQL target, or if the subscription has been deleted. - Fix a bug where the retention and cache period for an Azure Data Explorer database created by default while creating a watcher in the Azure portal was set to *unlimited* instead of 365 and 31 days respectively. - Fix a bug where certain management operations such as creating or deleting a managed private endpoint were reported as successful in the Azure portal even though they have failed. - Fix a bug where for the **SQL database** targets, the list of databases in the dropdown was incomplete if the SQL logical server contained more than 1,000 databases. - Fix a bug where selecting an Azure Data Explorer database as the data store would remove the access that a different watcher in the same resource group had on this database. - Enable watcher ARM template export in the Azure portal. - Add a warning during watcher creation if the **Microsoft.Network** resource provider isn't registered in the subscription selected for the watcher. - Add a detailed error if deleting a watcher or a managed private endpoint fails because there is a delete [lock](https://learn.microsoft.com/en-us/azure/azure-resource-manager/management/lock-resources) on the resource scope. |
| April 2024 | - Enable database watcher in the **Australia East** and **UK South** Azure regions. - Fix a failure adding a managed private endpoint when multiple private endpoints are added quickly for the same watcher. - Fix the **Backup history** dataset for SQL databases to include full backups. - Improve collection query performance to avoid timeouts for the **Index metadata**, **Query runtime statistics**, **Query wait statistics**, and **Table metadata** datasets. - Fix a bug where for certain datasets data wasn't collected after a database was restored from a backup. - Fix a bug where the **Index metadata** dataset wasn't collected when indexes have many key or included columns or when the names of these columns are long. - Add the **SOS schedulers** dataset. - Add a button to download the selected query plan from the **Top queries** dashboards. - Add a quickstart [sample](https://learn.microsoft.com/en-us/samples/azure/azure-quickstart-templates/create-watcher/) to create and configure a watcher using Bicep or an ARM template. |

**Limitations**

This section describes database watcher limitations. Workarounds are provided if available.

Expand table

| **Limitation** | **Workaround** |
| --- | --- |
| If using smaller Azure Data Explorer SKUs such as **Dev/test** or **Extra small**, some dashboard queries might intermittently fail to execute with an "aborted due to throttling" error. | Reload the dashboard, or [scale up the Azure Data Explorer cluster](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#scale-azure-data-explorer-cluster) to the next higher SKU. |
| If you create a free Azure Data Explorer cluster from the database watcher UI in Azure portal, you might get a "Could not connect to cluster, 403-Forbidden" error if you try to access the cluster in the Azure Data Explorer [web UI](https://dataexplorer.azure.com/). | This issue doesn't occur if you create the free cluster using <https://aka.ms/kustofree>.  If you have already created a free cluster from Azure portal, follow these steps:  In the [Azure Data Explorer web UI](https://dataexplorer.azure.com/), select your profile name in the main bar to open the account manager, and select **Switch directory**. Select the directory *other than* **Microsoft Account**, and select **Switch**. You should now see the free Azure Data Explorer cluster you created.  Alternatively, you can edit the cluster connection in the Azure Data Explorer web UI using the edit (pencil) button, and similarly switch the directory. |
| If CPU consumption for a database, elastic pool, or a SQL managed instance persists near 100%, remaining CPU resources might be insufficient for database watcher data collection queries, causing gaps in the collected data. | If you observe data gaps that correlate with high CPU utilization in the database, elastic pool, or a SQL managed instance, consider tuning your application workload to reduce CPU consumption, or increase the number of vCores or DTUs to enable reliable monitoring. |

**Known issues**

During preview, database watcher has the following known issues.

Expand table

| **Issue** | **Mitigation or workaround** |
| --- | --- |
| If data collection cannot start or continue because of an error (for example, insufficient access to a SQL target or to the data store), the error is not exposed. | To troubleshoot, see [Data is not collected](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-overview?view=azuresql#data-is-not-collected). |
| If a [serverless](https://learn.microsoft.com/en-us/azure/azure-sql/database/serverless-tier-overview?view=azuresql) database has auto-pause enabled, and is added as a database watcher target, it might not auto-pause as expected. For a [free offer](https://learn.microsoft.com/en-us/azure/azure-sql/database/free-offer?view=azuresql) database, this might exhaust the free monthly credit sooner than expected. | If retaining the auto-pause functionality is required, do not use database watcher to monitor serverless databases at this time. |
| For Azure SQL Managed Instance, data is not collected from the readable high availability replica or from a geo-replica if you are using SQL authentication. | There are two workarounds: 1. Use the Microsoft Entra ID authentication (preferred). 2. Disable the password policy check. Execute ALTER LOGIN [database-watcher-login-placeholder] WITH CHECK\_POLICY = OFF;, replacing database-watcher-login-placeholder with the name of the SQL authentication login of the watcher. Execute this command on the primary replica, and on the geo-replica, if any. |
| In Azure SQL Managed Instance, data is not collected if the EXECUTE permission on the sys.xp\_msver system stored procedure is revoked or denied to the public role. | Grant the EXECUTE permission on sys.xp\_msver to the database watcher login.  On every SQL managed instance added as a database watcher target, execute USE master; CREATE USER [database-watcher-login-placeholder] FOR LOGIN [database-watcher-login-placeholder]; GRANT EXECUTE ON sys.xp\_msver TO [database-watcher-login-placeholder];, replacing database-watcher-login-placeholder with the name of the watcher login. |
| If you create a managed private endpoint for a watcher to connect to a SQL managed instance that is stopped, the provisioning state of the private endpoint is reported as **Failed**, and the watcher cannot connect to the instance. | Delete the managed private endpoint with the **Failed** provisioning state and [start](https://learn.microsoft.com/en-us/azure/azure-sql/managed-instance/instance-stop-start-how-to?view=azuresql) the SQL managed instance. Once the failed private endpoint is deleted and the instance is running, [re-create](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#create-a-managed-private-endpoint) the managed private endpoint. |
| Data is not collected if you use a database in Real-Time Analytics as the data store, and the **OneLake availability** option is enabled. | Disable the **OneLake availability** option and restart the watcher to resume data collection. |
| Database watcher deployments via Bicep or ARM templates aren't idempotent. If a watcher, SQL target, or a managed private endpoint already exists, deployment fails. | Use conditional deployment to skip deploying existing resources. For more information, see [Conditional deployments in Bicep with the if expression](https://learn.microsoft.com/en-us/azure/azure-resource-manager/bicep/conditional-resource-deployment) and [Conditional deployment in ARM templates](https://learn.microsoft.com/en-us/azure/azure-resource-manager/templates/conditional-resource-deployment). |
| Because of a known issue in Azure SQL Database, data in the **Backup history** dataset for Azure SQL databases is not collected if the database catalog collation is other than the default SQL\_Latin1\_General\_CP1\_CI\_AS. | None at this time. |

**Troubleshoot**

This section describes the steps you can take to solve common problems. If the steps in this section don't solve the problem, [open a support case](https://azure.microsoft.com/support/create-ticket/).

**Data is not collected**

If you create a new watcher and do not see monitoring data on dashboards and in the data store, or if you only see older data, review this section.

* On the watcher **Overview** page, check the **Status** field to see if the watcher is running. If not, use the **Start** button on the same page to start data collection. A new watcher is not [started](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#start-and-stop-a-watcher) automatically.
* Check that the watcher has [access to the data store](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#grant-access-to-data-store).
* If you use an Azure Data Explorer database as the data store, check that the Azure Data Explorer cluster is started. For more information, see [Stopped Azure Data Explorer clusters](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#stopped-azure-data-explorer-clusters).
* Check that the watcher has the specific, limited [access to SQL targets](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#grant-access-to-sql-targets). Additionally, if using SQL authentication for any targets, check watcher [access to key vault](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#additional-configuration-to-use-sql-authentication), or use the recommended Microsoft Entra authentication instead.
* If you want the watcher to use Microsoft Entra authentication to connect to SQL targets, make sure that [Microsoft Entra authentication is enabled](https://learn.microsoft.com/en-us/azure/azure-sql/database/authentication-aad-configure?view=azuresql) on the logical servers hosting the database and elastic pool targets, and on the managed instance targets.
* If you created any private endpoints for the watcher, make sure that they are approved by the resource owner.
* If you are using public connectivity, make sure that the [requirements](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-overview?view=azuresql#public-connectivity) to allow the watcher to connect to targets, data store, and key vault are met.
* The Azure Data Explorer cluster or database, or the Real-Time Analytics database might have been deleted after it was selected as the data store for your watcher. Navigate to the cluster and the database, and confirm that they exist.
* If you are using the free Azure Data Explorer cluster, make sure that you haven't reached the [storage capacity](https://learn.microsoft.com/en-us/azure/data-explorer/start-for-free#specifications) of the cluster. For more information, see [Free Azure Data Explorer cluster](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#free-azure-data-explorer-cluster).

If you make changes to watcher access or connectivity as part of troubleshooting, you might need to stop and restart the watcher for the changes to take effect.

**Dashboards are blank**

If you select the **Dashboards** page of a watcher, but do not see a summary of SQL targets on the page, expand the **Data store** section. If you see a *Cannot connect ...* error, review this section.

* You might not have access to the data store. For more information, see [Grant users and groups access to the data store](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#grant-users-and-groups-access-to-the-data-store).
* You might not have network connectivity to the data store. For example, this happens if connections from your browser to the Azure Data Explorer cluster use public connectivity, but you [disable public access](https://learn.microsoft.com/en-us/azure/data-explorer/security-network-restrict-public-access) to the cluster. In that case, you also cannot connect to the cluster from [Kusto Explorer](https://learn.microsoft.com/en-us/azure/data-explorer/kusto/tools/kusto-explorer) or the Azure Data Explorer [web UI](https://learn.microsoft.com/en-us/azure/data-explorer/web-ui-query-overview).

To resolve this, establish private connectivity from your machine to the Azure Data Explorer cluster as described in [Private connectivity to the data store](https://learn.microsoft.com/en-us/azure/azure-sql/database-watcher-manage?view=azuresql#private-connectivity-to-the-data-store).

To validate that you have access and can connect to the data store, and that the data store database exists, follow these steps:

* On the **Dashboards** page of a watcher, expand the **Data store** section, and copy the **Kusto query URI** value. Make sure to copy the entire URI string. Make a note of the **Kusto database** value as well.
* Open the Azure Data Explorer [web UI](https://dataexplorer.azure.com/clusters). Sign in if prompted.
* Select **Add**, **Connection**, and enter the copied URI as the **Connection URI**.
* Select **Add** to create a new connection.
* Once a new connection entry is added, expand it to view the databases.
* Select the database referenced as the **Kusto database** on the **Dashboards** page of your watcher, and select the **+** sign on the tab bar to open a new query tab connected to this database.
* Run the following KQL command:

KustoCopy

.show database principals;

Check that a row for a **Viewer** or a higher privileged role exists for your user account, or for a Microsoft Entra ID group that contains your user account.